



RUTGERS

School of Environmental
and Biological Sciences



School of Environmental and Biological Sciences

EXTERNAL REVIEW SELF-STUDY

November 2017



Table of Contents

i	Preface
iii	Charge Letter
1	Overall Organizational Structure, Vision and Strategic Plan
1	1 School History, Mission, Vision, Strategic Plan
2	2 Organizational Structure and Composition
4	4 Alignment of the School and New Jersey Agricultural Experiment Station
5	5 School Structure
6	6 Leadership
7	Faculty Quality, Recruitment, and Retention
7	7 Faculty Metrics
10	10 Long-term Faculty Recruitment Strategy
11	11 Faculty Recruitment and Retention
12	12 Staff Support
13	Research Excellence
13	13 Overview
14	14 Measures of Research Excellence
15	15 Integration of Research, Teaching, and Outreach
15	15 Teaching/Research Connection
16	16 Community-engaged Research, Outreach, and Service
16	16 Integration and Collaboration within SEBS and Rutgers
18	18 Collaboration with National and International Research Initiatives
19	Undergraduate Programs
19	19 Assessment
20	20 Student Profile
21	21 General Education and the Core Curriculum
22	22 Majors and Undergraduate Programs
26	26 Assessment of Program Enrollments Strengths
27	27 Distinctions and Synergies with Other Schools and Programs
27	27 Biology
28	28 Business and Economics
28	28 Microbiology and Biochemistry
30	30 Nutritional Sciences
30	30 Shared Majors
31	31 Student Advising, Career Advisement and Placement
33	33 Graduation and Matriculation into Graduate and Professional Programs
33	33 International Opportunities
35	35 Enrichment, Co-curricular, and Extracurricular Learning
35	35 Honors Programs
36	36 Co-curricular Learning
37	37 Extracurricular Activities/Recreation
39	Master's and Ph.D. Graduate Programs
39	39 Overview
40	40 Recruitment, Support, and Placement of Graduate Students
41	41 Graduate Student Profile



43 New Jersey Agricultural Experiment Station and Rutgers Cooperative Extension

- 43 New Jersey Agricultural Experiment Station
- 45 Rutgers Cooperative Extension

47 Partnerships

- 47 Intellectual Property
- 47 Relationship with RBHS, Rutgers–Newark and Rutgers–Camden
 - 47 Rutgers Biomedical and Health Sciences
 - 48 Rutgers University–Newark
 - 48 Rutgers University–Camden

51 Facilities, Infrastructure, and the Campus Community Experience

- 51 George H. Cook Campus
- 53 Off-Campus Facilities
- 53 The Lived Experience on the Cook Campus
- 54 Residential Life
- 54 Student Transportation, Mobility, and Safety

57 Planning and Budget

59 Advancement

- 59 Alumni and Community Engagement
- 60 Communications and Marketing
- 61 Philanthropy and Strategic Partnerships
- 61 Government Relations

63 Building on Our Strengths, Addressing Challenges, and Planning for the Future

- 63 Building on Our Strengths
- 64 Discussion of Rankings
- 64 Addressing Challenges in Achieving the School’s Full Potential
- 65 Conclusion

Supporting Materials



Preface

We are pleased to present this self-study of the Rutgers School of Environmental and Biological Sciences. Though describing clearly the complexity of our collective work—research, teaching, service in 15 departments—was a daunting task, the process of preparing this document was fruitful and satisfying. We used the opportunity to focus in on how our many facets combine into one comprehensive whole, and a whole that is greater than the sum of the parts. Preparation of the document required us to telescope from broad goals and school-level leadership to scholarly disciplines with varying approaches to evaluation, to individual faculty foci and strengths, and then to build back up to see how these different scales interact and form the coherence of our school.

We established a deliberate and inclusive process to write this report. The planning and the initial drafting fell to the Executive Leadership Team (the writing committee), who took responsibility for elements of the charge according to their individual alignment with academic, administrative, and extension leadership roles. The School's Chairs Council was then enlisted to focus on departmental assets, strategic plans, and metrics of their individual characteristics. At numerous meetings we discussed strategies for describing programs, research areas, and rankings, and the chairs along with departmental faculty prepared significant sections of the self-study. Next, a faculty reading committee was formed to join the Chairs Council to review and edit the penultimate draft. The final draft was the result of incorporating the many comments and edits from faculty and chair reviewers as well as another review by members of the writing committee.

We have endeavored to organize the self-study following the structure of the charge given by CAPR to the external review team. We hope that in doing so, we have provided a useful roadmap for the team as it goes about its challenging task. Following the narrative there are Supporting Materials elaborating on various topics raised more generally in the narrative of the report itself.

We submit this report as part of the ongoing Committee on Academic Planning and Review process. But the introspection and data collection driven by the CAPR process are also essential ingredients in the completion of our on-going formal strategic planning process for the School, which was initiated by the Chairs Council in January 2017. We, therefore, very much appreciate—and commit to using—the insights offered by the external review team and CAPR in their reports as we complete our strategic planning in summer 2018.

Charge to the External Review Team

1) Overall Organizational Structure, Vision, and Strategic Plan.

- a) SEBS Mission Statement, Vision, and Strategic Plan (Provided by SEBS).
 - i) Comment on the SEBS Mission Statement, Strategic Plan, and Vision.
 - ii) Is there a Strategic Plan that sets forth a strategy to accomplish SEBS' goals? If so, please comment on the Strategic Plan in terms of potential impact, feasibility, and fiscal responsibility.
 - iii) How does SEBS fit into the overall organization of Rutgers University? Both SEBS and SAS include extensive programs in "general education"; i.e. "non-professional undergraduate tracks." How does this organization of missions compare with that at institutions with which you are familiar? Please comment on whether you think that this is a potentially conflicting and overlapping mandate, or a strength of the overall organization of Rutgers University.
- b) School's Organizational Structure and Composition (Provided by SEBS).
 - i) How does this organizational structure of SEBS compare with Schools of Agriculture and/or similar programs in Environmental and Biological Sciences elsewhere?
 - ii) Are the compositions of departments and units in SEBS appropriate to the mission of the school? What is missing? Which units are not appropriate to the mission?
- c) Leadership of SEBS (Organizational Chart and Brief Summary of Leadership for each Major Unit, provided by SEBS).

Assess the quality of the leadership of SEBS, including the Dean of SEBS, and the directors of each major unit of SEBS.
- d) Please provide any additional comments or thoughts you have about how to improve the overall organizational structure, leadership, vision, and strategic plan of SEBS.

2) Faculty Quality, Recruitment, and Retention.

- a) Metrics on SEBS Faculty. Highlights of Faculty Strengths. Long-term Faculty Recruitment Strategy (Provided by SEBS).
 - i) Assess the overall quality of the faculty of SEBS.
 - ii) In which fields does SEBS have the strongest faculty? How do these top faculty compare with top faculty in similar departments at other peer schools?
- b) Please comment on the balance of faculty in terms of research field and career stage.
- c) SEBS Long-term Faculty Recruitment Strategy (Provided by SEBS).
 - i) Assess the SEBS Long-Term Faculty Recruitment Strategy.
 - ii) In which fields or departments are faculty enhancements through recruitment planned? In which areas are they needed?

- d) Faculty Recruitment and Retention (Summary Provided by SEBS).
 - i) Assess the quality of faculty recruited to SEBS in the last five years.
 - ii) How successful has SEBS been in recruiting faculty capable of meeting Rutgers' tenure standards?
 - iii) How successful has the school been in retaining its strongest faculty?
- e) Please provide any comments or thoughts you have on how to improve the quality of SEBS faculty.

3) Research Excellence.

- a) Areas of Research Excellence and Highlight Research Areas (Summary provided by SEBS).
 - i) Please comment on specific areas of research excellence at SEBS. Which are the key strong research programs at SEBS?
 - ii) What are some unique strengths of SEBS research programs relative to research programs at peer institutions?
 - iii) Which critical research programs need to be improved?
- b) How do the research initiatives of SEBS relate to the overall teaching and research mission of the University? (Summary provided by SEBS).
 - i) Assess the overall effectiveness of SEBS research programs in providing training to undergraduate, masters, and graduate students.
 - ii) Do these research programs impact outreach activities and/or other training programs of SEBS?
- c) Integration and/or collaboration with research programs in other Rutgers schools and units (e.g. School of Arts and Sciences, School of Engineering, RBHS, and other Rutgers schools) (Summary provided by SEBS).
 - i) Assess the impact and effectiveness of collaborative research programs with other Rutgers schools. Assess a few specific examples of synergistic research collaborations with faculty or programs in other schools at Rutgers University.
- d) Collaboration with national or international research initiatives (Summary provided by SEBS).
 - i) Assess the impact and effectiveness of any collaborative research programs with national or international research initiatives or consortia.
- e) Please suggest how the university can better foster top-tier research activities in SEBS?

4) General Education Undergraduate Programs.

- a) Summary of Undergraduate Teaching Programs and Assessment of Synergies or Redundancies of programs similar to those in other schools. (Provided by SEBS).
 - i) Comment on representative strong and weak undergraduate teaching programs at SEBS. How could the critical weaker programs be improved?
 - ii) Comment on the success of SEBS students in matriculating at top tier graduate, medical, veterinary, and other professional programs.
 - iii) To what degree are specific undergraduate programs of SEBS distinct from similar programs (or courses) in other schools of Rutgers (e.g. School of Arts and Sciences, School of Engineering, Business School, other Rutgers schools), and to what degree are they synergistic or redundant? In particular, please

comment on synergies or redundancies of the SEBS undergraduate teaching programs in Biological Sciences, Economics, Business, Microbiology, and Nutritional Science, relative to undergraduate teaching programs in other schools at Rutgers.

- iv) Assess the SEBS Undergraduate Core Curriculum. Assess the synergies and relationships to the SAS Undergraduate Core Curriculum. Assess synergies and relationships with School of Engineering and Edward J. Bloustein School of Planning and Public Policy.

- v) Summary of International Training Programs (Provided by SEBS).

Please assess any international undergraduate teaching programs administered by SEBS or the SEBS Office of International Programs, including faculty-led study abroad programs, research exchange opportunities, and/or traditional exchange or study abroad programs. Please assess any international teacher training programs. Do these activities effectively advance the mission and/or international reputation of Rutgers University and SEBS? How do these activities compare with programs at peer institutions? Based on information provided by SEBS, assess the synergies and/or overlap between SEBS Office of International Programs and the centralized Rutgers University Global Advancement and International Affairs (GAIA) Program.

- vi) Summary of Undergraduate Honors Research Programs (Provided by SEBS).

Please assess the impact of SEBS undergraduate research programs and how they compare with undergraduate research programs at other comparable institutions. Are these programs effective and useful for teaching and training of undergraduate students?

- b) Summary of Career Advisement and Placement Programs (Provided by SEBS).

Briefly assess SEBS' undergraduate career advisement placement services. How might these services be improved? How do faculty contribute in career placement? How do these career placement activities compare with programs at peer institutions?

5) Masters and Ph.D. Graduate Programs.

- a) Summary of Graduate (Masters and Ph.D.) Teaching Programs (Provided by SEBS)

- i) Comment on representative strong and weak graduate programs that are centered at SEBS. How could these programs be improved?
- ii) To what degree do SEBS faculty contribute to graduate training? To what degree are these activities synergistic or redundant with those of faculty from other schools?
- b) How are graduate students recruited to Masters and Ph.D. programs? How are they supported? What resources are used to attract graduate students? How are tuition costs paid for grant-funded graduate students? What other sources of university support are available for graduate students? What is the success in placement of Masters and Ph.D. students in career-appropriate jobs? (Summary provided by SEBS)
 - i) How can graduate student recruitment processes be improved?
 - ii) Are the areas of emphasis in SEBS doctoral programs tied to areas of faculty strength?
 - iii) How do resources available for graduate recruitment compare with those available at other institutions that you are familiar with?

- iv) Comment on the impact of graduate student tuition costs for grant-funded programs (e.g. NIH and NSF funded graduate students). How do policies for payment of tuition for grant-funded Ph.D. students at Rutgers compare with those at peer institutions that you are aware of?
- c) Comment on SEBS success in placement of Masters and Ph.D. program graduates in career-appropriate jobs. How might this success in job placement be improved?

6) New Jersey Agricultural Experiment Station and Rutgers Cooperative Extension.

- a) Description of services and funding (Summary provided by SEBS)
 - i) What is the role of the experiment station and extension, as it relates to SEBS?
 - ii) How is that role similar to or different from other School of Agriculture with which you are familiar?
 - iii) Comment on community outreach and continuing education initiatives.

7) Partnerships - Interactions with Business Communities and Intellectual Property Development.

- a) Interactions with Business Communities and Intellectual Property Development (Summary Provided by SEBS).
 - i) Assess SEBS programs providing internships and other interactions with appropriate business communities.
 - ii) Assess the teaching and training activities of SEBS that supports the broader business community.
 - iii) Is there appropriate support by the University for protection and development of intellectual property? How do Rutgers' intellectual property development efforts on behalf of SEBS compare with those at peer institutions that you are aware of?
 - iv) Relationship with Rutgers–Newark and Rutgers–Camden.
Assess the quality and extent of synergistic relationships with representative teaching and/or research programs at Rutgers–Newark and Rutgers–Camden campuses.

8) Facilities, Infrastructure and the Campus Community Experience.

- a) Summary of Key Facilities and Infrastructure (Provided by SEBS)
Comment on representative strong and weak key facilities and infrastructure that are centered at SEBS.
- b) What key investments in infrastructure are required to accomplish the mission of SEBS?

9) Budget and Planning Tools.

Please comment on the overall SEBS budget and process of annual budget reviews and adjustments. Please also comment on how NJ State appropriations to Rutgers University are distributed to SEBS, relative to NJ State appropriations assigned to other Rutgers schools.

10) Advancement.

- a) Description of the Division of Advancement (provided by SEBS)
Please assess the role of the division in supporting school programs and initiatives.

11) Trends.

- a) Which SEBS research programs are highest impact nationally and internationally? Which are the three to five most distinctive research units in SEBS, and why?
- b) Are there key current or emerging areas of research appropriate to the mission of SEBS that are currently weak or absent? How might these deficiencies be best addressed?
- c) Are the research programs at SEBS highly competitive for federal research funding? Please justify your answer, and state any specific suggestions you have to significantly improve one or more SEBS research programs in terms of funding competitiveness.
- d) Which are the three to five most promising teaching/training units in SEBS, and why? Which teaching and training programs are growing, and which are reducing?
- e) Can you suggest approaches to create or enhance synergies in teaching, research, and/or outreach with other schools or units at Rutgers University?
- f) Which research, teaching, and/or outreach activities at SEBS are the “best bets” for strategic investment of additional resources, in order to achieve outstanding national and international stature?

12) Overall Ranking and Stature.

- a) How can Rutgers University make SEBS more distinctive within Rutgers, nationally, and/or internationally?
- b) Have you identified any organizational or fiscal structure at Rutgers University that is limiting SEBS from reaching its full potential?
- c) Which other universities, schools, or programs should SEBS aim to emulate? In which areas are these institutions particularly good role models?
- d) How, in your opinion, do Rutgers SEBS’ research activities rank nationally with those at universities and schools with similar missions? How might SEBS achieve greater distinction as a research institute?
- e) How are each of the undergraduate and graduate programs offered by SEBS ranked nationally? (Provided by SEBS)
 - i) Assess SEBS’s analysis of the ranking of its undergraduate and graduate programs.
 - ii) Please suggest ideas for what might be done by SEBS and/or Rutgers University to improve these rankings of teaching programs.

13) Additional Comments and Suggestions

Please provide any additional comments or suggestions regarding strengths and weaknesses of Rutgers SEBS, and how SEBS can be best enabled to achieve its full potential and stature as a national and international leader in the fields of Agricultural, Environmental, and Biological Sciences.

Tables

Table 1: Overview of Schools at Rutgers–New Brunswick

Table 2: Faculty by Rank and Gender

Table 3: Faculty Title and Rank by Department

Table 4: Non-Tenure Track and Tenure Track Faculty by Department

Table 5: Tenure Track Rank by Salary and Gender

Table 6: Student Demographics

Table 7: Undergraduate Majors at the School (as primary)

Table 8: Minor and Certificate Programs Supported by the School

Table 9: Undergraduate Majors by Size

Table 10: Graduate Programs Located at the School

Table 11: Graduate Placement and Salary

Table 12: Revenue—Fiscal Year 2017

Table 13: Reserves—Fiscal Year 2017

Supporting Materials

1. School of Environmental and Biological Sciences Organizational Chart
2. New Jersey Agricultural Experiment Station Organizational Chart
3. Rutgers University–New Brunswick Organizational Chart
4. Rutgers University Office of the President Organizational Chart
5. Executive Leadership Team Descriptions
6. Centers and Institutes
7. School of Environmental and Biological Sciences Faculty Bylaws
8. Faculty and Staff Accomplishments—2014-2017
9. Listing of Faculty Fellows, Awards, and Honors
10. Department Profiles
11. 2016-2017 School Assessment Report, June 2017
12. List of Off-campus Research Farms, Centers, and Facilities
13. Map of Off-campus Facilities
14. Notable Alumni Highlights

Overall Organizational Structure, Vision, and Strategic Plan







School History, Mission, Vision, Strategic Plan

The Rutgers School of Environmental and Biological Sciences traces its origins directly to the decision in 1864 by the New Jersey Legislature to designate Rutgers College (as it was then) as the New Jersey land-grant college. Upon this designation, the Rutgers College Trustees created the Rutgers Scientific School to carry out the mandates of the Morrill Act of 1862 (the U.S. Congress' land-grant act). Both today's School of Environmental and Biological Sciences and the School of Engineering have their roots in what was the Rutgers Scientific School; the first director of the School was George Hammell Cook, after whom the George H. Cook campus is named.

In the early 20th century, the Rutgers Scientific School became, in part, the New Jersey College of Agriculture, a public institution. When Rutgers University was created mid-century, the College of Agriculture was combined with Rutgers College, still a private men's college, and Douglass College (originally the New Jersey College for Women), a private women's college, to create Rutgers, The State University of New Jersey. In the 1960s, the Rutgers College of Agriculture added the word "Environmental," becoming the Rutgers College of Agriculture and Environmental Science (CAES). A major reorganization of undergraduate education in the 1970s resulted in CAES becoming Cook College. In 2007, another reorganization ("Transforming Undergraduate Education") led to the renaming of Cook College; hence, the name we have today, the School of Environmental and Biological Sciences. Among the 2007 changes were the university-wide adoption of the term "School" to designate all degree-granting units of the university (retiring the use of the term "College"). Since that time, our major strategic goals for the School have been to move the School into a position of academic excellence at the center of academic life of the university, while maintaining a strong financial position and faculty reinvestment focused on excellence.

The School's mission is to provide excellence in research, teaching, and outreach in the sciences, from molecular to global scales, as well as their social and human dimensions.

Proud of our legacy as an origin of Rutgers University–New Brunswick, our School strives to address the issues facing society and, indeed, global civilization in the 21st century. As part of "One Rutgers," we share the aspiration found in the 2014 Rutgers Strategic Plan, "to be a national leading public university that is preeminent in research, excellent in teaching, and committed to community." The 2014 document now serves as a guide for the university, acknowledging

Our vision is to continue at all levels to meet the challenges of the future in the development of knowledge and its application to global needs in our scholarly work, teaching, and outreach. Our vision is guided by our commitment to Access, Excellence and Relevance.

important roles the School plays as well as identifying new opportunities as we plan for the future. The School is also central to many of the initiatives identified in the Rutgers–New Brunswick Strategic Plan 2015-2020, including One Nutrition; the interdisciplinary Institute of Earth, Ocean, and Atmospheric Sciences; community health, wellness and science; leadership in sustainability; the Raritan River initiative; development of unoccupied autonomous vehicles; international service learning; and more.

Our vision is to continue at all levels to meet the challenges of the future in the development of knowledge and its application to global needs. The School's mission is to provide excellence in research, teaching, and outreach in the agricultural and environmental sciences, from molecular to global scales, as well as their social and human dimensions. We examine the biological environment from organisms to ecosystems and explore the ways in which humans interact with and steward these realms. Our vision is guided by a commitment to Access, Excellence and Relevance. These principles are core to the School's continued embrace of the land-grant philosophy of engagement with

and responsiveness to the needs of our students and society at large. They are embodied in our pursuit of scholarly excellence and leadership, development of new pedagogical approaches and instructional innovations that enhance student learning, and the diffusion of scientific, research-based information that addresses societal issues.

Four themes provide an inter-related framework for much of our teaching, scholarship, and research in the natural and social sciences:

- Agriculture, natural resources, and the food system
- Food, nutrition, and health
- Climate, energy, and ocean sciences
- Global engagement

In addition, we embrace our context in New Jersey, the most densely populated state in the nation, and seek to address urban environmental and social concerns facing communities in the 21st century. These themes will be woven into the 2018 School of Environmental and Biological Sciences Strategic Plan, currently in development under the leadership of the School's Chairs Council and committees of faculty, staff, students, and academic leadership.

A “new” Rutgers has emerged in the past decade due to the work of the Transformation of Undergraduate Education, the acquisition and integration of the University of Medicine and Dentistry–New Jersey, membership in the Big Ten Athletic Conference and the Big Ten Academic Alliance, the re-commitment of Rutgers University–New Brunswick to a 21st century land-grant mission, and its flagship status as New Jersey's premier public research university. During these transformations, the School of Environmental and Biological Sciences has emerged right where it belongs—as one of the leading schools of its kind among Rutgers University's peer and aspirational peer institutions and an integral school in the scholarly fabric of Rutgers University–New Brunswick.

Organizational Structure and Composition

The School of Environmental and Biological Sciences is one of 17 schools at Rutgers–New Brunswick, including five within Rutgers Biomedical and Health Sciences, a university division aligned with Rutgers–New Brunswick, and the School of Graduate Studies. Best described as “one community, five campuses,” Rutgers–New Brunswick includes five geographically distinct campuses: Busch, College Avenue, Cook, Douglass, and Livingston. Schools are geographically identified as being on one of five campuses in the New Brunswick and Piscataway community. In some cases, a school is closely identified with its physical campus, as is the case for our School and its close association with the Cook campus. In other cases, school departments and faculty may be located at different campuses.

The School of Environmental and Biological Sciences is one of the larger schools at Rutgers–New Brunswick, with 3,428 students and 329 full time faculty. It is also the largest in physical area due to its farms and agricultural research facilities.

The structure of Rutgers–New Brunswick's schools, as well as the recent (2013) creation of Rutgers Biomedical and Health Sciences (RBHS), leads to new synergies and a few overlaps among programs. In particular, the question of why we have a School of Environmental and Biological Sciences and, in the School of Arts and Sciences, a Division of Life Sciences, arises occasionally and is one of the inquiries raised in this review's charge.

Every large public land-grant university in the Big Ten Academic Alliance plus many other institutions (e.g., Cornell, NC State, Missouri, UC Davis) are structured so



Table 1: Overview of Schools at Rutgers–New Brunswick

Overview of Schools at Rutgers New Brunswick*			
	Number of Students	Number of Faculty	Campus
School of Graduate Studies	over 5,200	over 2,000 drawn from all schools at Rutgers	all campuses
School of Arts and Sciences	20,481	1,695	all campuses
Rutgers Business School–Newark and New Brunswick	6,890	291	Newark and New Brunswick Livingston
School of Engineering	3,455	223	Busch
School of Environmental and Biological Sciences	3,428	445	Cook
School of Nursing (RBHS)	1,850	125	Newark and New Brunswick
School of Health Professions (RBHS)	1,762	450	Newark and New Brunswick
School of Social Work	1,640	326	College Avenue
Ernest Mario School of Pharmacy (part of RBHS)	1,282	212	Busch
Mason Gross School of the Arts	1,037	313	Douglass and College Avenue
Graduate School of Education	1,004	134	College Avenue
Edward J. Bloustein School of Planning and Public Policy	984 (310 graduate, 674 undergraduate)	140 (50 fulltime; 90 part-time)	College Avenue
Robert Wood Johnson Medical School (RBHS)	750	748 + 460 residents and fellows	RWJ University Hospital and Busch
School of Management and Labor Relations	697	126	Livingston and Cook
School of Communication and Information	407	180	College Avenue
School of Public Health (RBHS)	364 (graduate)	79	Newark and New Brunswick
Graduate School of Applied and Professional Psychology	200	42	Busch

* Source: Rutgers and Rutgers Biomedical and Health (RBHS) websites and School of Environmental and Biological Sciences, Fall 2017

Note: Faculty numbers include full-time and part-time

academic units in more than one college or school have “biological” or “life” sciences divided between the “ag school” and the college or school of arts and sciences. At Rutgers, the delineation of specialization between the scholarship and teaching of these two schools is clear.

Life sciences in the Rutgers School of Arts and Sciences is organized around four departments: cell biology and neuroscience, genetics, kinesiology and health, and molecular biology and biochemistry, as well as two sections, the biological chemistry section of the Department of Chemistry, and the behavioral neuroscience section of the Department of Psychology. As stated on its home page, “The primary goal of the Division is to provide a high caliber of interdisciplinary teaching and research in the life sciences as we train the next generation of teachers, researchers, and health-care professionals.”

Life sciences in the School of Environmental and Biological Sciences grows out of its origin as a land-grant and agricultural college and its ongoing evolution to meet contemporary scholarly, teaching, and outreach needs in environmentally-based issues and areas. The School is home to plant and animal sciences, plant and animal breeding and genetics, microbiology and entomology, natural resources and agronomy, horticulture, forestry and wildlife studies, agriculture and food systems, food and nutritional sciences, and the modern applications of agricultural economics and rural sociology that are commonly found elsewhere in a state’s historical school or college of agriculture. In addition, our School also includes fields that are not typical in other historical agriculture colleges but serve key environmental science needs. These include ecology, evolution, atmospheric sciences, meteorology, bioenvironmental engineering, oceanography, marine science, landscape architecture, environmental planning, human ecology, biotechnology, limnology, fisheries sciences, hydrology, geomatics and remote sensing, public health and vector biology, climate sciences, polar studies, natural products chemistry and drug discovery, resource economics, and environmental sociology.

Within this context, there are many instances of collaboration across the schools. Faculty from multiple schools often serve on the graduate faculties in other schools. For example, most of the faculty who serve on the School’s microbial biology graduate faculty are also full members of the SAS-administered programs in molecular biosciences and vice versa. It is not uncommon for someone to serve on four or more graduate faculties across the university. Another example is found in the Department of Human Ecology, which does not have a graduate program. However, many of its faculty serve on graduate faculties of disciplinary departments across the university, including anthropology, geography, psychology, and sociology in SAS; ecology, evolution, and natural resources and nutritional sciences in our School; as well as on the graduate faculties of the Bloustein School of Planning and Public Policy, the Graduate School of Applied and Professional Psychology, and the Rutgers School of Law. There are also many successful interdisciplinary research efforts, which will be described in Research Excellence (Section 3) of this report.

From the student experience perspective, the School structure is not intended to limit study options. Undergraduates at Rutgers–New Brunswick select a school upon entry into the university. If a student later selects a major not located within their school of matriculation, they need to transfer, with a few exceptions. Students can double-major with majors outside their school. Easing the ability for students to transfer through coordination of undergraduate core curriculum requirements is discussed in Undergraduate Education (Section 4).

Alignment of the School and New Jersey Agricultural Experiment Station

In the land-grant tradition, an examination of the School of Environmental and Biological Sciences, the academic unit, is incomplete without a discussion of the New Jersey Agricultural Experiment Station (NJAES), the applied research and extension unit (see Section 6). While the two purposely and purposefully operate under different leadership structures, they are inextricably connected. They are dedicated to public responsibility and cooperate in teaching, research, delivery of knowledge, and service to the community. The Office of the Executive Dean of Agriculture and

Natural Resources sets the strategic direction and vision for both the School of Environmental and Biological Sciences and the New Jersey Agricultural Experiment Station. The executive dean leads the efforts to advance the mission and vision of both units, while playing an essential role within Rutgers University leadership. As shown in the organizational chart, provided in the Supporting Materials, the experiment station leadership consists of directors, and the School leadership consists of deans.

School Structure

The School is organized into 12 disciplinary departments that are tenure homes of the faculty. In addition, there are three that are tenure homes for Rutgers Cooperative Extension (RCE) faculty:

- Agricultural, Food, and Resource Economics
- Animal Sciences
- Biochemistry and Microbiology
- Ecology, Evolution, and Natural Resources
- Entomology
- Environmental Sciences
- Food Science
- Human Ecology
- Landscape Architecture
- Marine and Coastal Sciences
- Nutritional Sciences
- Plant Biology
- 4-H Youth Development (RCE)
- Agriculture and Natural Resources (RCE)
- Family and Community Health Sciences (RCE)

All full-time non-tenure and tenure track faculty members have academic homes (and tenure, where applicable) in these departments. Faculty in the three departments of the experiment station's cooperative extension unit—the departments of 4-H Youth Development, Agriculture and Natural Resources, and Family and Community Health Sciences—also are tenured in the School.

At the undergraduate level, the School offers the B.S. degree (except for a B.A. in Biological Sciences offered through the School of Arts and Sciences) and a five-year dual B.S. degree in Bioenvironmental Engineering offered jointly with the School of Engineering. Graduate degrees—M.S., M.L.A. (an accredited master's in landscape architecture), M.Phil., and Ph.D.—are granted through the School of Graduate Studies, formerly the Graduate School–New Brunswick (GSNB). A master of business in science (M.B.S.) degree is a professional science master's program degree offered in collaboration with the Rutgers Business School.

In addition, the School and experiment station have a number of on-campus administrative units, centers, and institutes. They are composed of personnel from various departments within the School and, in many cases, across the university and in cooperation with other universities. They are oriented primarily toward research, outreach, and service activities.

They include nine that are School-based:

- Center for Environmental Prediction
- Center for Lipid Research
- Center for Urban Environmental Sustainability
- Hutcheson Memorial Forest (off campus)
- Institute of Earth, Ocean, and Atmospheric Sciences
- New Jersey Institute for Food, Nutrition, and Health
- Rutgers Climate Institute
- Rutgers Ecological Preserve (off campus)
- Rutgers Energy Institute

Centers and institutes that are units of the experiment station include:

- Center for Controlled-Environment Agriculture
- Center for Turfgrass Science
- Center for Urban Restoration Ecology
- Center for Vector Biology
- Equine Science Center
- Grant F. Walton Center for Remote Sensing and Spatial Analysis
- New Jersey Water Resources Research Institute

Much of the research and teaching at the School is enhanced by a variety of research farms, land preserves, and gardens. These provide educational and outreach programming and include the on-campus facilities of Rutgers Gardens and the Rutgers University Ecological Preserve as well as off-campus facilities such as Hutcheson Memorial Forest and our many farms. A list of off-campus research facilities is provided in the Supporting Materials.

Leadership

The School of Environmental and Biological Sciences is led by an executive dean, currently Robert M. Goodman. This position has three integrated responsibilities—the Rutgers executive dean of agriculture and natural resources, the executive dean of the School, and the executive director of the New Jersey Agricultural Experiment Station. The executive dean serves as the chief executive and chief academic officer of the School. He reports to the chancellor of Rutgers–New Brunswick.

The executive dean is advised and guided by an Executive Leadership Team (ELT), which oversees the academic, research, advancement, and administrative functions of the School and NJAES. The ELT meets twice monthly.

The ELT includes the vice dean for advancement and the vice dean for administration; the dean of academic programs; the dean of agricultural and urban programs; the dean of international programs; and the two senior associate directors of NJAES, who oversee research and cooperative extension. The School organizational chart and executive leadership team descriptions are provided in the Supporting Materials.

The executive dean and the ELT share governance of the School and its faculty with an active Department Chairs Council, which consists of the chairs of the 15 academic and extension departments and meets on a monthly basis during the academic year. In addition, the faculty bylaws, provided in Supporting Materials, allow for a Committee for Off-Campus Centers, Bureaus, and Institutes; an Advisory Committee on Appointments and Promotions; a Committee of Review; a Planning and Infrastructure Committee; a Structure and Governance Committee; an International Programs Committee; and a Diversity, Communication, and Philanthropy Committee.

Periodically, the executive dean convenes a meeting of the Dean’s Cabinet, which consists of the directors of administrative and research units, the secretary of the faculty and the dean for undergraduate education for the George H. Cook campus.

In addition, the faculty participate in two official faculty meetings per year; the secretary of the faculty is responsible for scheduling the meetings, setting the agenda, and producing the minutes.

Faculty Quality, Recruitment, and Retention





Faculty Quality, Recruitment, and Retention

Faculty Metrics

The school employs 246 tenured or tenure track faculty and 80 non-tenure track faculty, as well as part-time lecturers, adjuncts, graduate assistants, and teaching assistants (totaling 445). Because the School includes faculty serving Rutgers Cooperative Extension, we have a wider range of titles in the tenure and tenure track categories than other Rutgers schools, including extension specialists and county agents. Faculty in tenured and tenure track positions have varying percentages of teaching, research, and outreach responsibilities. The School also uses several title series in the non-tenure track categories, including research professors, teaching professors, and professors of practice, consistent with the university-wide personnel policy. Many faculty members hold appointments with some percentage of responsibilities to the experiment station and/or to extension.

Table 2: Faculty by Rank and Gender

FACULTY	Male		Female		Total
	N	%	N	%	
TENURE/TENURE-TRACK					
Distinguished Professor	25	78%	7	22%	32
Professor 1	54	77%	16	23%	70
Associate Professor	24	55%	20	45%	44
Assistant Professor	8	50%	8	50%	16
Extension Specialist	10	77%	3	23%	13
Associate Extension Specialist	5	56%	4	44%	9
Assistant Extension Specialist	3	60%	2	40%	5
County Agent 1 (highest rank)	8	73%	3	27%	11
County Agent 2	12	34%	23	66%	35
County Agent 3	4	36%	7	64%	11
TOTAL	153	62%	93	38%	246
NON-TENURE TRACK					
Research Professor	3	75%	1	25%	4
Associate Research Professor	5	56%	4	44%	9
Assistant Research Professor	9	47%	10	53%	19
Teaching Professor	0	0%	0	0%	0
Associate Teaching Professor	3	60%	2	40%	5
Assistant Teaching Professor	3	25%	9	75%	12
Professor of Practice	0	0%	0	0%	0
Associate Professor of Practice	1	50%	1	50%	2
Assistant Professor of Practice	2	100%	0	0%	2
Research Associate	7	47%	8	53%	15
Instructor	3	25%	9	75%	12
TOTAL	36	45%	44	55%	80

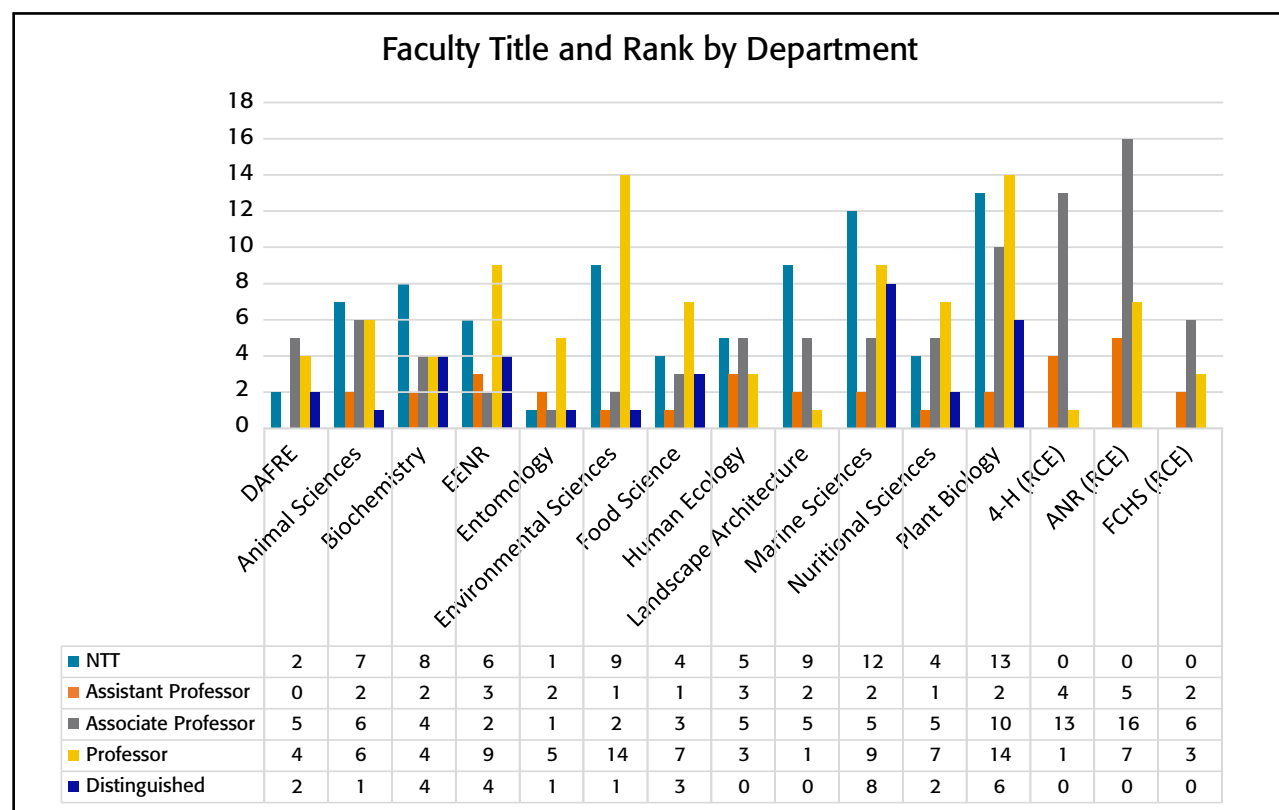
Analysis of faculty by rank reveals overall balance as well as successful advancement. Assistant professors represent 10 percent of tenure track faculty and associate professors represent 40 percent. This compares with 17 percent assistant professors and 30 percent associate professors at Rutgers–New Brunswick and 19 percent and 31 percent at the university as a whole. In the past three years, 22 faculty have been promoted to the rank of associate professor with tenure, and our five-year analysis reveals that 92.3 percent of our tenure cases have been approved by the university’s Board of Governors. This compares favorably to the most recent success rate of the university overall, which was 90.6 percent in 2016-17. These percentages reflect the School’s recent success in recruiting outstanding early-career faculty and preparing them to successfully compete for promotion and tenure at Rutgers.

The percentage of faculty at the professor (36 percent) and distinguished professor (14 percent) rank at the School are almost identical to the percentages at Rutgers–New Brunswick and the university (Rutgers–New Brunswick: 38 and 15 percent; university: 37 and 13 percent, respectively). The School has successfully promoted 19 faculty members to the rank of distinguished professor over the past 10 years.

Part of our success in advancement through ranks is attributable to the mentoring practices employed by the School. Department chairs are encouraged to develop a mentoring procedure for all tenure track faculty, and many also have mentoring available to tenured and non-tenure track faculty. Typically, a department chair appoints a mentoring committee for each tenure track junior faculty member. The group meets once a semester or once a year and provides a summary/report of the meeting content and recommendations to the department chair.

Departments also conduct post-tenure reviews in which the faculty member meets with the chair to discuss his/her CV and five-year goals for teaching, scholarship, and service and any other information (e.g., description of work in progress, activities scheduled for the year) that the faculty member would like to bring to the chair’s attention. This post-tenure activity also involves a review by the executive dean and two members of his Executive Leadership Team.

Table 3: Faculty Title and Rank by Department



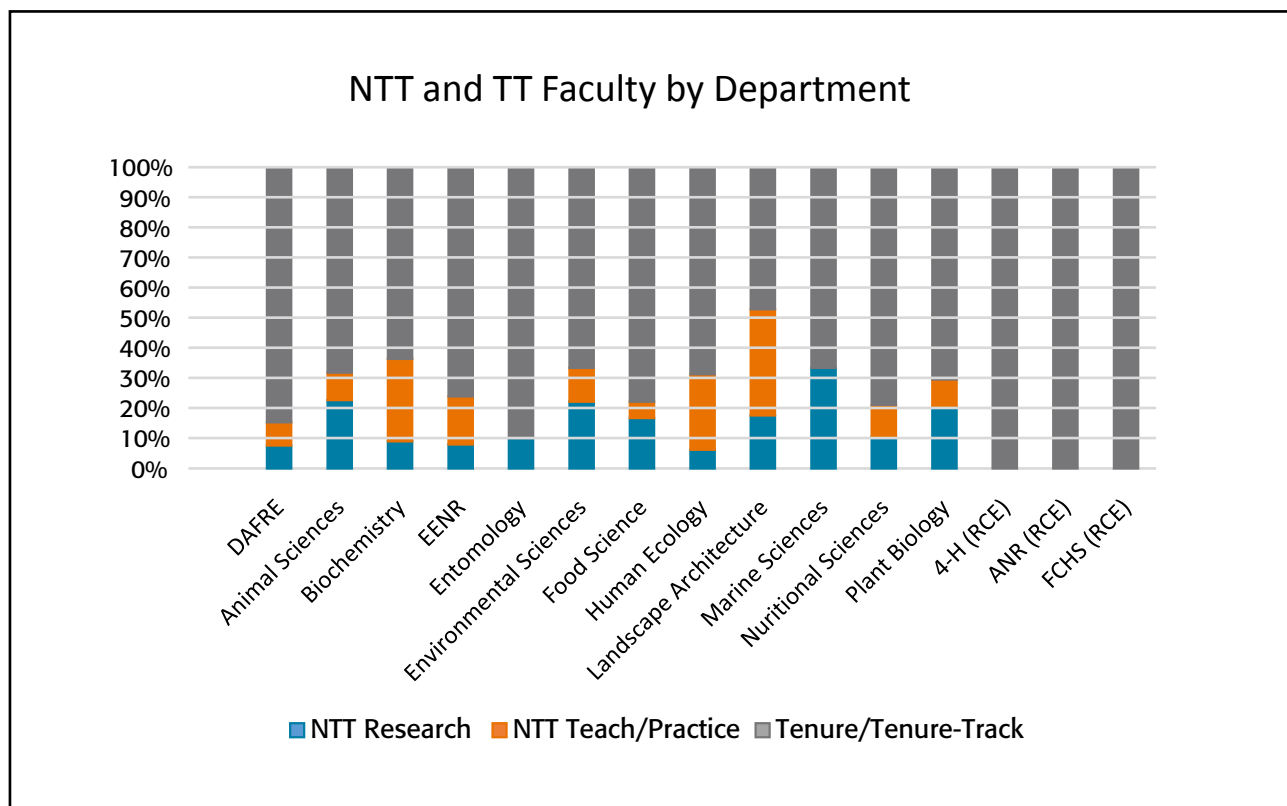
Each of the 15 tenure-home departments within the School has a unique composition of faculty by title and rank. In terms of faculty numbers, our smallest department is entomology, with nine full-time faculty, while plant biology is the largest with 47. There is considerable variability as to the composition of faculty titles by department that reflects teaching demands (number of majors, number of courses) as well as research positions to support funded research programs.

Some of our science programs, particularly those with strong research foci, have 50 percent or more of full and distinguished professors (entomology, environmental sciences, food science). Other programs, like landscape architecture and human ecology, have been in a building phase and reflect a higher number of assistant and recently promoted associate professors.

A review by department also reveals varying splits between tenured/tenure track and non-tenure track faculty. As the different title series indicates, the roles of non-tenure track faculty include research, teaching, and professional practice/teaching. Landscape architecture, which is currently evenly balanced between tenured/tenure track and non-tenure track, is an accredited professional program that includes faculty with active professional practice in the professor of practice NTT category, as well as a number of NTT teaching professors responsible for skills-based courses. The Department of Environmental Sciences (DES) includes a number of non-tenure track faculty teaching many of the undergraduate courses. For example, five non-tenure track faculty in DES teach many of the introductory and upper-level courses in the undergraduate programs in environmental sciences and meteorology. Other departments include a number of NTT faculty conducting research, such as marine and coastal sciences with 13 NTT research faculty, plant biology with nine, and environmental sciences with six. There are no non-tenure track faculty in the extension departments.

With the university's adoption of promotion within the non-tenure track titles in recent years, our School has established procedures that have successfully promoted many of our long-term non-tenure track faculty, reflecting their commitment and excellence to teaching and research.

Table 4: Non-Tenure Track and Tenure Track Faculty by Department



Through a successful strategy of recruitment, mentoring, and fostering a supportive environment, we have been able to significantly increase the number of female professors at the School, from 28 percent in 2006 to 38 percent of the School's tenure and tenure-track faculty. Analysis by gender reveals a more even gender split at assistant (45 percent female) and associate level (57 percent) and greater disparity at the professor (24 percent female) and distinguished professor levels (23 percent female). Analysis by salary reveals minimal differences by gender except at the distinguished professor level.

Table 5: Tenure Track Rank by Salary and Gender

Salaries (9/11/17)*				
	Average Salary	Median Salary	Average Male	Average Female
Tenure/Tenure Track				
Distinguished Professor	\$194,386	\$192,152	\$198,555	\$179,497
Professor	\$135,224	\$133,493	\$137,346	\$133,134
Associate Professor	\$106,943	\$106,334	\$105,596	\$108,571
Assistant Professor	\$87,741	\$86,913	\$86,974	\$88,584

*Figures reflect academic year salary or equivalent

Although the School is committed to increasing faculty diversity, the university does not collect data on faculty race and ethnicity that would allow an analysis of our School.

Long-term Faculty Recruitment Strategy

Faculty reinvestment has been a major focus of the School's academic leadership for a decade. We entered this period knowing that there was a significant demographic transition during these years, which is continuing. Our approach has been strategic, flexible, inclusive, and creative. First and foremost, we had the commitment from the central administration that all faculty openings that occurred would remain within the School. Over time, with changing leadership, there have been minor procedural modifications, but the core commitment has been unwavering.

A core cultural value within the School (Cook College before 2007) was the importance of and a commitment to undergraduate instruction, both in the classroom and beyond. This value has been maintained and strengthened. Another value introduced early and since enhanced has been to view faculty hiring as a programmatic, rather than strictly a departmental, activity. In recent years, very few hires have been made where the primary driver was tightly focused on the "needs" of a single department. Departments are still important, especially as the home of curricular responsibilities and the respective majors, and also as tenure homes for the tenured/tenure track faculty. But to the greatest extent possible, we seek department partnerships or clusters to promote the rationale for each new faculty hire.

Over the past years, the annual department-level strategic planning process has become increasingly socialized around curricular needs, collegial partnerships, fiscal planning, and informing the collective planning process at the School level. This lattermost point has then informed the key scholarly values inherent in our overall faculty reinvestment strategy, which is to be relentlessly forward looking; we believe, and act accordingly, that frontier scholarship occurs at boundaries and at intersections. This formulation goes beyond "multidisciplinary" or even "transdisciplinary." It embraces the power of avowedly disciplinary-based minds coming together to find the inspiration and creative power that lies at intersections of knowledge and cultures. We do this imperfectly, to be sure, but it is what we strive to achieve, to make the whole much greater than the sum of the parts, to fully take advantage of the emergent (and, where possible, self-assembling) properties of the disciplinary parts.

Our School has an established process to articulate needs and opportunities as well as guide discussion and decision-making. Chairs include anticipated hiring needs in annual planning documents. Chairs also are responsible for initiating, or responding to requests, to consult across departmental boundaries about shared interests in faculty hires. For example, a recent hire and an ongoing search were proposed by the departments of Marine and Coastal Sciences and Ecology, Evolution and Natural Resources. Another ongoing search was jointly proposed by the departments of Human Ecology, Marine and Coastal Sciences, and Ecology, Evolution and Natural Resources. In addition, the executive dean may suggest specific ideas to chairs. This is a process that begins in the late spring or early summer prior to the typical search season, which begins in early fall. Such proposals are framed around departmental need for particular scholarly and teaching needs, as well as other departmental concerns, such as balance of rank and pending retirements that pose problems for course offerings and scholarly contributions. In addition, proposals must also address the revenue and expense issues that arise with new hires. The chair is expected to address department targets for increasing credit hour teaching, appropriate adjustment of section size limits, control of the budget for teaching assigned to adjuncts and part time lecturers, new course offerings, plans for more firmly bringing new and existing pre-tenure faculty, as well as long-past-tenure faculty, into appropriate teaching workloads, and more.

The ELT and the Chairs Council meet once, or if needed, twice in the early to mid- summer to discuss recruitment priorities. All chairs with proposals present their proposal , and subsequent discussion often sheds light on as-yet unexplored synergies between departments, and in some cases, even with units of other schools. After further discussion with the leadership team and groups of chairs as needed, the executive dean then develops three lists—the first listing highest priority hiring areas based on needs and opportunities; the second is a list of ideas that need further development (rank, teaching expectations, estimated start-up, proposed joint appointments, etc.), and a third lists proposals requiring more conversation, consultation, and collaboration between departments.

Thus, our overall faculty hiring planning is not year to year, but is a continuing process. It is also highly consultative and participatory and thoughtful.

As everyone in academia knows, unexpected opportunities too good not to consider appear from time to time. Sometimes it's a donor who brings a really creative idea and along with it the funding, such as for an endowed chair. Sometimes it's a truly gifted scholar who for personal or professional reasons will appear with a compelling reason to want to join us. Sometimes it's an opportunity involving another school wishing to make an appointment that raises the need for a spousal hire in an area of scholarship covered by our School.

In recent years, the Rutgers University strategic plan has resulted in a program whereby multidisciplinary, multi-school groups of faculty can propose and, in essence, "compete" for a Henry Rutgers Professorship, a named and funded but not endowed, chair sponsored by the President's office. We have been involved in four Henry Rutgers Professorship searches; one has been filled, two others are ongoing, and in one case, the search failed and the approval was withdrawn. In all such cases, we attempt to bring the thoughtfulness and inclusive consultative process described above to these situations. A key point is that with any faculty hire, there must be a welcoming departmental tenure home. By its very nature, this essential factor makes the faculty recruitment process a faculty-based process.

Faculty Recruitment and Retention

The quality of faculty recruited to the School in the past decade has been outstanding. The School has successfully attracted both rising stars who are in the early stages of their careers as well as established leaders who are making major impacts in their fields. As one example, an assistant professor with a Stanford doctorate and a research fellowship at Princeton was recruited to the School in 2013 in the Department of Ecology, Evolution, and Natural Resources. Since arriving here, he is credited with

bringing \$3.34 million in grants to the university and has been named a Kavli Fellow of the National Academy of Sciences and an Alfred P. Sloan Research Fellow in Ocean Sciences.

Another example is an assistant professor in the Department of Biochemistry and Microbiology hired in 2010 with special expertise in bioinformatics. With a doctorate from Columbia, her professional experience includes a post-doctoral appointment at Columbia and work in the private sector before joining us. She is a Hans Fischer Fellow with the Institute for Advanced Study at the Technical Institute of Munich, and this past year, she received the prestigious Faculty Early Career Development Program (CAREER) award from the National Science Foundation, along with \$1.1 million in NSF funding. She is one of three recent faculty hires with CAREER awards, all of whom are female. In addition, we also have continued our successful recruitment of new faculty with K01 and K99 awards from the National Institutes of Health, with the addition of two more junior members in 2016.

While hiring is typically focused on entry level assistant professors entering the tenure track, strategic hires and opportunity hires also are made when circumstances warrant and the prospect of making a transformative hire presents itself. An example of a strategic hire is that of the chair of the Department of Nutritional Sciences. He was brought in as a tenured professor in 2012, having been a tenured professor with the Department of Medical Pathology and Laboratory Medicine at the University of California Davis School of Medicine. His early credentials include a Ph.D. in nutrition from Tufts University and professional positions with the USDA Human Nutrition Research Center in Boston and the Department of Pharmacology at Duke University Medical Center. For more examples, please refer to the accomplishments of selected faculty, provided in the Supporting Materials.

Moreover, the School is proud of its record of retaining our strongest faculty. It is a reality of the current environment in higher education that accomplished faculty and rising stars often are the target of recruiting efforts from competing institutions. It is also the case that faculty, like other professional employees, sometimes seek employment elsewhere for personal, professional, or family reasons. It is our practice to move aggressively to retain our strongest faculty when they have received a competitive outside offer, and often we are supported by the Office of the Chancellor–New Brunswick when we do so. In the last 10 years we have successfully retained 15 faculty members (both junior and senior) who received competitive offers from outside institutions. During that same 10-year period we had four faculty members leave Rutgers to pursue employment elsewhere.

Staff Support

The instructional, research, and service activities of the faculty are supported and facilitated by approximately 575 full time staff members who serve the School and the New Jersey Agricultural Experiment Station. From field researchers to mass spectrometrists, unit computing managers to laboratory technicians, administrative assistants to accounting specialists, skilled staff ably led by managerial and supervisory employees, work side by side with faculty as they pursue knowledge, solve problems, and conduct research.

Our School staff employees may connect and communicate through “functional communities,” (a form of “learning community”) in which groups of staff from disparate departments who share similar responsibilities (e.g., financial, human resources) connect regularly to share information, problem solve, and learn best practices. At our twice-yearly staff assemblies, staff are invited to meet with the executive dean and learn of news and developments at the School and university level. There also is a regular program of staff-planned and staff-led activities designed to acquaint staff with the activities and resources of their School.

Most staff employees at Rutgers are covered by collective bargaining agreements negotiated with employee unions, the majority with one of three unions: AFSCME Local 888, AFSCME Local 1761, or the Union of Rutgers Administrators, URA-AFT. Approximately 200 staff employees are designated as managerial, professional, supervisory, confidential (MPSC) and are not represented by a union.

Research Excellence





Overview

Our School's scholarship and public engagement reflect our commitment to addressing local, regional, and global needs within the historical context of the land-grant tradition. Unique strengths include the integration of research, teaching, and extension across a broad spectrum of programs. Much of the research conducted in our School is integrated into the research funding portfolio of the New Jersey Agricultural Experiment Station, and examples of applied research and community engagement are reflected through the scholarship of Rutgers Cooperative Extension faculty.

Historical research excellence at the School includes plant breeding, applied plant sciences, and applied microbiology, especially soil microbiology and microbial product discovery including antibiotic discovery. The single Nobel Prize laureate among Rutgers faculty was Selman Waksman (a Rutgers alumnus who joined the faculty of what is now the Department of Biochemistry and Microbiology in 1918) for his systematic and successful studies of soil microbes culminating in the discovery of streptomycin in the first half of the 20th century. Excellence in these fields continues, and the School has grown in other important areas, particularly in marine and ocean sciences, environmental sciences, ecology and evolution, and endocrinology. For instance, faculty associated with the Department of Marine and Coastal Sciences have published on average more than 80 research papers per year over the past five years, including many in the highest impact, broad readership journals such as *Nature*, *Science*, *Proceedings of the National Academy of Sciences*, and more, and have generated more than \$100 million in competitive grant support during that same period. Recent investment in new faculty within the Department of Landscape Architecture has led to increased international recognition through winning national design competitions and prizes associated with articles and books.

Given our context in the most densely populated state in the nation, leadership at the School quickly realized the value of aggressive inclusion of urban programs and human ecology into the land-grant model and, thus, into the School's faculty psyche. This has proven to be a great benefit in an era when an increasing number of stakeholders and funding agencies value direct engaged research to address pressing environmental, social, and economic concerns facing communities.

Each of our 12 academic departments has research strengths in specific areas, and there are some that stand out at the national and international levels. A quick review of the departments appears in the department profiles provided in the Supporting Materials. A condensed list of exceptional research programs at the School includes the following:

Marine and coastal sciences

- Ocean exploration and polar research
- Coastal and ocean ecology and marine molecular microbiology
- Aquaculture and fisheries
- Coastal resilience and sea level rise

Climate change and adaptation

- Tropical climate dynamics
- Reconstruction of past climates
- Movement and adaptation of biological species in oceans
- Modeling climate and environment, including effects of nuclear conflict

Agriculture

- Plant breeding of new ornamental and specialty crop varieties
- Turfgrass science
- Natural plant products and phytochemicals and new-use agriculture

- Agricultural entomology
- Urban agriculture
- Equine science

Nutrition and health

- Child obesity, weight management, and metabolic disease
- Lipid biology
- Macronutrient and micronutrient metabolism
- Food access and food policy

Microbiology

- Environmental microbiology, land, ocean, and atmosphere
- Gut microbiome
- Bioinformatics

Endocrinology

- Endocrine disruptors and the environment
- Maternal programming of development
- Neuroendocrinology of stress and disease

Environment

- Environmental policy
- Watershed management
- Environmental restoration
- Mid-20th century landscape architectural history

Adaptive urban land use and policy implications

- Restoration ecology
- Geographic information systems analysis of land use
- Brownfield remediation
- Urban, suburban and public and private open space, park, streetscape, and greenway design
- Planning and design of the built environment

Measures of Research Excellence

Assessment of research excellence is complicated by the wide range of disciplines represented in the School and the diversity of recognition in practice among these fields. The department profiles, available in the Supporting Materials, provide each department's self-assessment of research strengths. In addition, lists of prestigious national and international awards are also provided in the Supporting Materials. Our faculty include five members of the National Academy of Sciences; two Kavli Fellows of the NAS; two members of the American Academy of Arts and Sciences; and 25 Fellows of the American Association for the Advancement of Science. Also cited for research excellence are the School's three Board of Governors professors and 32 faculty, as well as the executive dean, who hold the rank of distinguished professor. Faculty members have updated CVs available through their department websites that illustrate individual expressions of scholarly excellence.

Another measure of excellence is competitive research funding. In FY2016, the SEBS/NJAES Office of Grants Facilitation processed 643 submissions requesting ~\$205 million. In the same year, 395 proposals were funded with direct awards of ~\$62 million and associated indirect costs of ~\$14 million. In FY2017, there were 704 submissions processed, requesting ~\$257 million. As it is with all Research I/Tier I institutions, competitive grant support is the driver of research excellence, and Rutgers relies on indirect cost returns associated with external grants to support its facilities and administration. Allocation of the use of the F & A funds returned to the School are managed by the executive dean.

Success in securing protection and commercialization of intellectual property and associated royalty returns are a significant outcome of research, and these are largely associated with our plant breeding programs. The university Office of Research Commercialization is designed to be responsive and flexible, and aims to facilitate faculty entrepreneurship. This is discussed in the section on Partnerships (Section 7).

Integration of Research, Teaching, and Outreach

Teaching/Research Connection

Research participation by graduate students follows the standard university model; in most SEBS graduate programs, the best students compete for first-year fellowships and then are funded through a combination of program-based research or teaching assistantships, or grants won by associated faculty or the students themselves. Costs of graduate students' stipend, fringe, and tuition remission are high at Rutgers, and it is increasingly rare that a faculty member can afford to host a long-term Ph.D. student on grant funds alone. Postdoctoral trainees also are an important component of the research community and are represented at the university level by the Office of Postdoctoral Affairs.

The School has a robust history of and a strong commitment to undergraduate research. In part because of our role as a pre-professional and professional school, research is a required component of many of our curricula. As a result, faculty members at the School embrace this model and most serve as enthusiastic advisors for undergraduate student research. The School encourages students to become actively involved in research as soon as possible and independent research fulfills a School graduation requirement. In an effort to facilitate such participation, the dean for undergraduate education for the George H. Cook campus supports a research mixer during each spring and fall semester. This event brings out approximately 75 (spring) to 175 (fall) students who meet with and discuss research opportunities with 15 to 20 faculty and staff researchers; this research "speed dating" event serves to both advertise and facilitate such undergraduate participation in research.

Another resource available to students is the university-wide Aresty Research Center. Faculty in the School take advantage of the programs and networking opportunities organized by the Aresty Research Center, which supports and facilitates undergraduate student engagement with scholarship at Rutgers–New Brunswick. The Aresty center acts as a "matchmaker" to connect interested students with our School's faculty research projects that have been registered with the center. The center also organizes specific research opportunities for rising sophomore students through a highly selective summer science program that provides a stipend of \$3,000 and on-campus housing and board for approximately 60 students each summer. Through the center's research associate program, students are able to gain their first authentic research experience by engaging in independent research for credit during the fall and spring semester. Both of these programs are open to any undergraduate student without prior research experience. This past summer, our School had eight students participate in the summer science program for 2017. In 2016-17, our School had 44 students conducting research with 30 faculty members through the Aresty research assistant program. In addition, nine students received funding to attend conferences.

Another important undergraduate research program, George H. Cook Scholars, recruits students in the winter of their junior year. The top 15 percent (by GPA) of all students at the School are invited to participate; other students can participate with support of a faculty mentor. This program supports a capstone research experience, typically during a student's final two semesters. Students identify a new research project and mentor or expand an ongoing independent research project and then write a George H. Cook Scholar's thesis (typically 30-40 pages) and defend it publicly before a committee, consisting of their mentor plus one additional faculty member. Many theses become peer-reviewed publications. Our School has experienced a steady growth in the number of George H. Cook theses, from 52 in 2012-13 to 69 in 2016-17.

Community-engaged Research, Outreach, and Service

An example of engaged research that embraces community partners occurs through the Center for Urban Environmental Sustainability (CUES), an interdisciplinary research initiative involving faculty from environmental science, landscape architecture, and ecology. CUES combines scientific understanding, engineering, and planning and design expertise to address urban environmental issues. CUES projects include urban water management, coastal restoration, open space planning and design, and brownfield redevelopment. Many of these projects are funded by New Jersey municipalities and involve the efforts of multiple undergraduate and graduate students. These projects also have led to the development of independent student research, George H. Cook Scholars theses, and M.L.A. master's theses.

The Raritan Scholars program seeks to support engaged research to address environmental and policy issues in the Raritan River basin. This program in the Department of Human Ecology matches government agencies and non-profit organizations with student interns in a four-credit program that commits 125 hours of student work and produces a clear product or finished result.

Integration and Collaboration within SEBS and Rutgers

Collaborative research is ingrained in the culture of the School simply because of its historical association with NJAES-associated research and extension. One deliberate mechanism for fostering collaborative research is the creation of several offices that encourage collaboration:

- The Office of Grants Facilitation is charged specifically with helping research scientists develop large, collaborative, cross-cutting research proposals, such as USDA SCRI and NIH T-32 training proposals. This office helps to focus large proposals and identify faculty or staff members who could complete a team. It also serves as an important liaison between departmental grant officers and the Rutgers Office of Research and Sponsored Programs.
- The Office of Research Analytics is charged with helping scientists by providing advanced statistical, spatial, economic, and technological analysis to projects and programs.
- The Genotyping Laboratory works primarily, but not exclusively, with plant breeders to develop and deploy tools for genotyping plants and animals, especially shellfish, as well as facilitating enforcement of intellectual property ownership.
- The Genome Cooperative provides nucleotide sequencing and sequence analysis support.
- The Core Facility provides access to a number of imaging and molecular analytical tools and the training to use those tools.

In the best cases, these support groups are contacted early in a grant-planning process, often through encouragement of the Office of Grants Facilitation, and facility use is written into grant proposal budgets.

There are many outstanding examples of integration and collaboration among our School's faculty and those from other units at Rutgers. A few recent examples include:

- One Nutrition (mentioned in the first section of this document as an example of interdisciplinary work aligned with the Rutgers–New Brunswick strategic plan) supports collaborative interdisciplinary projects and translational research in the fields of nutrition, foods, and dietetics and address undergraduate, graduate, and professional educational needs. Collaborations include faculty from our School's departments of Nutritional Sciences and Animal Sciences with those from such areas as the Department of Pediatrics at the Robert Wood Johnson Medical School, the Rutgers Brain Health Institute, the School of Health Professions and the Department of Medicine within RBHS.

- The Institute of Earth, Ocean, and Atmospheric Sciences unites faculty, researchers, and graduate students studying the Earth's interior, continents, oceans, atmosphere, and biosphere. More than 90 faculty participate, representing 12 major disciplinary areas university-wide.
- The New Jersey Institute for Food, Nutrition, and Health (IFNH) exists to improve health through interdisciplinary research and programs related to food, nutrition, and physical activity. It draws its 100+ membership from across Rutgers, including two chancellorships, nine schools, and 28 departments. The IFNH has a resident research population of 14 PIs and 62 research staff and students. Since its inception in 2010, the IFNH has grown its grants and contracts portfolio to over \$16 million and established a \$10 million endowed research fund. The institute oversees centers of excellence related to lipid metabolism, digestive health, human performance, and early childhood nutrition education. It also sponsors programs related to culinary health and wellness, agriculture and food systems, microbiome in human health and nutrition, and peer-to-peer nutrition education programs. The IFNH is home to the newly opened Culture of Health Children's Academy, a "lab school" with facilities for teaching nutrition and developing cooking skills. In partnership with the Office of Student Affairs, the IFNH has a student health clinic and a healthy eating courtyard called the Harvest Café.
- The one-year-old Rutgers Raritan River Consortium (R3C) employs the adjacent Raritan River and its environs as a living classroom and laboratory for research, scholarship, policy-making, student and professional training, stakeholder outreach, and collaboration across 10 (and growing) schools, centers, campuses, administrative units and governmental agencies. Included in this is Rutgers–Newark Meadowlands Environmental Research Institute.
- Coastal Climate Risk & Resilience Traineeship (C2R2) is a recently funded \$3 million NSF program that includes seven faculty members from six academic units across the university. The C2R2 traineeship works with research-based master's and Ph.D. students to build the skills needed to address real-world resilience issues in the face of climate change through courses, internships, summer field courses on coastal resilience, and coastal climate risk and resilience-related research with a C2R2 faculty member.
- ENIGMA: Evolution of Nanomachines In Geospheres and Microbial Ancestors is a pending \$5.5 million proposal to NASA that includes nine faculty members from seven academic units across the university and members from six other institutions. The ENIGMA research team proposes to conduct integrated and coordinated experimental, bioinformatic, and data-driven studies to explore the origin of catalysis, the evolution of protein structures in microbial ancestors, and the co-evolution of proteins and the geosphere.
- Integrating Management of Vector Borne Diseases and Public Health is a \$10 million proposal to the CDC that involves eight faculty members from three academic units across the university and faculty from four other institutions. This initiative engages regional expertise in training and operational research across diverse fields, including public health, vector/pest control, and entomology, and facilitates synergistic interactions with professional groups involved in vector-borne disease surveillance, control, and management.
- Molecular Neuroendocrinology of Alcohol and Drug Abuse Research Training is a \$1.5 million T-32 training proposal to NIH that brings together nine faculty members from seven academic units across the university. This training program will emphasize a multidisciplinary approach, including molecular and cellular techniques, electrophysiology, optogenetics, designer receptors exclusively activated by designer drugs, stem cell technology, neuroimaging, neuroimmunology, neurobehavioral pharmacology, and genetics to increase the understanding of pathogenesis in alcoholism.

Collaboration with National and International Research Initiatives

3

Collaboration among our School’s scientists in the area of international research has been strong, especially over the past 15-20 years. Major efforts include ongoing collaborations among Department of Nutritional Sciences faculty and students with the University of São Paulo and Federal Universities of São Paulo and Alagoas participating in projects focused on growth, nutrition, and the microbiome. Other ongoing activities include collaborations among the departments of Plant Biology and Biochemistry and Microbiology with the University of São Paulo; faculty from the departments of Marine and Coastal Sciences and Environmental Sciences participating in projects in Antarctica in direct partnership with the United Kingdom, Argentina, and Germany; and faculty from the departments of Plant Biology; Agriculture, Food, and Resource Economics; Nutritional Sciences; and Human Ecology in USAID and other funded projects in Africa and Asia focused on agricultural development and food security. In addition to these, a recent survey conducted by Rutgers Global Health Institute revealed that our School is number one among 15 Rutgers schools in several measures of faculty engagement in and commitment to research and education across the spectrum of global health.

A very recent collaboration entails a program generously funded by the Stavros Niarchos Foundation involving the School and its Greece-based program partners, the Agricultural University of Athens (AUA) and the American Farm School (AFS). The goal of this collaboration is to create a bold implementation plan to engage youth, expand capacity, and create pathways to employment in the agrofood sector. This program serves to combat high youth unemployment and debilitating economic conditions that have affected Greece in recent years. An initial grant led to 16 sectoral studies, two feasibility studies on farm and food processing incubators, an e-commerce study, and a study on identifying young people as potential new farmers. Along with the studies, the partners also developed four technology-based pilot applications specifically designed to support data collection, community and industry development, agro-tourism, and ongoing youth engagement. (See greece.rutgers.edu.) This initial work resulted in an approved \$27.5 million transformative gift to support youth workforce development in the agrofood sector of Greece.

Notes

Undergraduate Programs





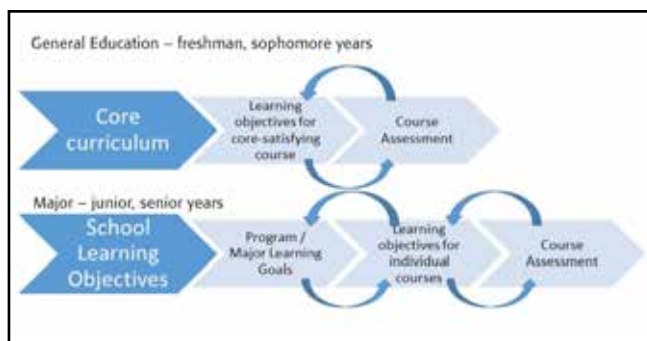
Undergraduate Programs

The undergraduate curriculum at the School comprises a common Core Curriculum as well as comprehensive disciplinary concentrations through 21 major and 34 minor and certificate programs leading to the B.S. degree (with one exception noted in Section 1).

Assessment

The School follows the university's efforts to organize curriculum around learning goals and assessment. Already, this structure is fundamental to the Core Curriculum, as will be described later in this section. To guide departments and program development, the School is currently discussing the following core learning objectives:

- Competency in critical thinking, evidence-based argument, and quantitative reasoning
- Proficiency in oral, written, and digital communication and argument
- Ability to evaluate and assess the ethical implications and consequences of specific policies or actions
- Mastery of the fundamentals of a chosen discipline
- Application of disciplinary knowledge to contemporary social, environmental, and biological problems



Each program, in turn, has a specific set of learning goals described on the individual program websites. Our undergraduate program directors engage in a regular and thoughtful practice of articulating and assessing student learning outcomes to demonstrate that students have met learning goals and, as needed, improve our curricula based on feedback obtained through assessment. Our review process seeks the following:

- To guide the direction and priorities for our academic programs
- To document and affirm the academic successes of departments/programs
- To identify areas for improvement and development
- To promote goal-setting within and across departments/programs
- To identify opportunities to generate and use incremental resources
- To identify opportunities to redirect existing resources
- To fulfill assessment requirements set by Rutgers central administration
- To fulfill requirements of program accreditation
- To assure institutional quality to students, faculty, parents, alumni, and other stakeholders

The School provides an annual assessment report to the Instructional Assessment Committee, a standing committee of the School composed of six faculty members and under the *ex-officio* leadership of the associate dean for academic administration and assessment. (A copy of the 2016-17 School Assessment Report is included in the Supporting Materials.)

Student Profile

Students at our School are part of a rich history of learning, innovation, service, and community. Close interactions among students, faculty, and staff give students a small-college experience while providing all the benefits of a top class public research university. We foster an environment that provides access, encourages leadership, values each individual, and expects excellence. Our well-rounded education both inside and outside the classroom prepares students for employment and citizenship in an increasingly interrelated, global community.

An analysis of fall 2016 data illustrates our undergraduate student demographics. Of the 3,428 students enrolled, 62.1 percent are female and 37.9 percent male. Like the state of New Jersey, our student population is very diverse, consisting of 51.1 percent who self-identify as white and 43 percent as minority students, with seven percent identifying as African American, 0.1 percent as American Indian, 17.9 percent as Asian, 0.2 percent as Hawaiian, 14.1 percent as Latino, 1.5 percent as two or more Asian/White, and 2.4 percent as two or more underrepresented minority (URM).

In addition, 15.7 percent of our students self-identify as the first in their family to go to a college, and 39.5 percent speak a language other than English at home. Ninety percent (89.9) of our undergraduate students came from within the state of New Jersey; 5.6 percent are from out of state, predominantly from the Northeast and California; and 4.4 percent are from other countries. In the fall of 2016, there were 120 international undergraduate students at our School who came from 17 countries, with the majority of them (77) from China.

Transfers from another institution of higher education make up approximately 30 percent of the undergraduate student population. In fall 2017, for example, 525 new students are first year admits and 265 new students are transfers. We expect an additional 40 transfer students in spring 2018. The majority of these transfers originate from community colleges in New Jersey, reflecting in part an active program of recruiting community college transfer students by the School. The Office of Academic Programs works proactively with community college advisors to educate them about opportunities available at the School and regularly visits about half of the New Jersey community college campuses to meet with prospective transfer students and answer questions about the transfer process and the programs available for study.

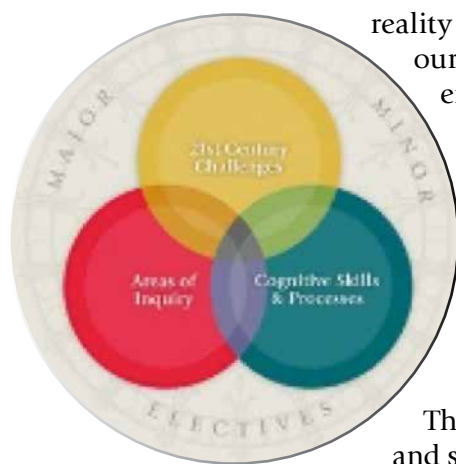
For the 2015-16 academic year, the number of our students receiving any type of aid (need/non-need, grants/loans/employment) was 3,057, out of approximately 3,655 students. Average loan indebtedness was \$24,763 for our May 2016 graduates who started at Rutgers as freshmen and received their undergraduate degree.

Table 6: Student Demographics

Students, fall 2016	SEBS	RU-NB
Undergraduate Enrollment	3,428	36,168
Male	37.9%	49.6%
Female	62.1%	50.4%
Minority	43.0%	49.8%
Underrepresented Minority	24.0%	22.8%
New Jersey Residents	89.9%	86.0%
Out-of-State Residents	5.6%	5.5%
Foreign	4.4%	8.3%
Unknown	0.1%	0.2%
Campus Residents	43.4%	41.0%
Off Campus Residents, Including Commuters	56.6%	59.0%

General Education and the Core Curriculum

Following the development of a learning goal-based Core Curriculum by the Rutgers–New Brunswick School of Arts and Sciences, SEBS adopted a similar learning goal-based Core Curriculum effective for incoming first-year students in fall 2015 and for incoming transfer students in fall 2016. Our decision to adopt a similar model as SAS responds to the



reality that SAS is the largest school at Rutgers, and it is consistent with our goal to facilitate ease of school-to-school transfer by students, ensuring that a change in major does not result in significant additional course work to satisfy school requirements. The Core Curriculum satisfies the general education requirements of several schools at Rutgers–New Brunswick: the School of Arts and Sciences, the Mason Gross School of the Arts, and the School of Environmental and Biological Sciences (not included is the School of Engineering). It thus reflects the general education requirements of over 90 percent of the undergraduate students at Rutgers University–New Brunswick.

The Core Curriculum provides a background in the liberal arts and sciences through courses satisfying learning objectives in areas of contemporary challenges; areas of inquiry in the natural sciences, historical analysis, social analysis, and arts and humanities; and cognitive skills and processes in writing and communication, in quantitative and formal reasoning, and in information technology and research. To reflect our historical roots in applied science and the environment, the School requires additional experience-based education that can be satisfied with independent research (in the lab or in the field); with a working internship in a commercial, governmental, or non-governmental organization; or with another experience applying disciplinary knowledge to the real world.

Students satisfy requirements of the Core Curriculum by taking specific courses that have been certified as meeting core competencies. A course typically is certified as meeting one or two learning goals, and students typically satisfy the Core Curriculum by taking 10-12 distinct courses; most students complete their core requirements within their first two years at the School of Environmental and Biological Sciences. Because the Core Curriculum seeks to provide educational breadth, students take courses at different schools.

Courses for the Core Curriculum are certified by a standing committee of the School of Arts and Sciences, which includes a representative from SEBS. This administrative structure, which reflects the historical origins of the learning goal-based core within SAS, ensures that all core courses are certified identically and, thus, reflect a true common academic consensus. Application for certification requires both a thorough description of learning goals and course content, including all expectations and requirements for student work, as well as a detailed summary of those instruments (e.g., exam questions, problem sets, written assignments, presentations, and other specifics) and rubrics by which competencies in learning goals are evaluated. Courses may be certified for one or more learning goals, but a learning goal must be a significant component of course content. All courses certified for the Core Curriculum must evaluate and summarize competence in learning goals through a written report (which includes competency data) to the CRC every other year, or more frequently if requested.

The experience-based education requirement, because it is unique to SEBS, is managed solely within our School under the supervision of the associate dean for academic administration and assessment.

Across Rutgers New Brunswick, there are approximately 1,100 courses that satisfy the various core curriculum requirements, with the majority (951) taught by departments in the School of Arts and Sciences. Our school currently teaches 52 courses in the core, primarily in the areas of natural sciences (17), 21st century challenges (17), and social analysis (10).

Majors and Undergraduate Programs

Undergraduate and graduate education at the School of Environmental and Biological Sciences investigates the world from organisms to ecosystems to earth systems and focuses on competency, innovation, application, service, and community. The School trains the next generation of professionals and leaders by instilling a deep appreciation for the importance of evidence and reason for understanding and managing the critical interrelationship between human actions and the natural environment. We also strive to foster a setting that encourages leadership and that values individuals. The integrated teaching, research, and outreach programs offer students a complete and well-rounded education both inside and outside the classroom and prepare students for careers and citizenship in an increasingly interrelated, global community.

Our students experience a range of courses—from large lecture courses to independent studies, and from labs and field work to design studios. Our School currently has a student-to-faculty ratio of 17:1. This is calculated based on enrolled students at the school (not including non-school students taking school courses) and teaching faculty (research and RCE faculty who are not teaching were not included in calculation).

Students enrolled in our School must complete a total of 128 credits of course work and satisfy requirements of the Core Curriculum and of a specific disciplinary major. The credits required beyond the 120 credits typically required for an undergraduate degree by the Rutgers School of Arts and Sciences, for example, reflect additional course requirements associated with competence in our professional programs.

Students must select a primary (their first or sole) major from among the 21 offered by the School (see Table 7). Of these, 18 are supported by faculty in departments within our School (the bioenvironmental engineering major, although jointly offered with the School of Engineering, is overwhelmingly supported by our faculty), while three are supported by departments from other schools (biological science, exercise science, public health). There are three primary majors that SAS students can take that do not require transferring to our School; these are ecology, evolution, and natural resources; marine science; and microbiology.

For both SEBS and SAS, students can select a second major from among any of those offered throughout Rutgers–New Brunswick (with some restrictions defined by the unit offering the major). The School of Environmental and Biological Sciences has a liberal policy with respect to allowing students to add a second (and, occasionally, even a third) major based solely on fulfilling the major course requirements (in contrast, double majoring in closely related fields is not allowed in the School of Arts and Sciences). However, given the extensive required course load of SEBS majors, ranging from 60 to more than 90 credits for some options in some majors, students do not commonly opt for multiple majors except for closely related disciplines (food science majors adding nutritional sciences, for example).

The School has recently (fall 2015) made important changes to its list of supported majors, removing six majors not supported by School faculty—chemistry, communication, geography, geological sciences, journalism and media studies, and genetics—and adding agriculture and food systems in 2012 and entomology in 2016. The former reflected a major rethinking of the old agricultural science major, appealing to students interested in an entrepreneurial and innovative agricultural sciences education, from product to table. In another change, designed to address clarity for accreditation and licensure purposes, the previous landscape architecture option within the environmental planning and design major was made a discrete major in 2012. Graduates are now able to formally cite the appropriate accredited degree for future employment.

The School also supports 24 minor and 10 certificate programs (see Table 8.) Note that Rutgers does not provide institutional definitions differentiating the two categories. At SEBS, a minor program is often closely affiliated with a major, while a certificate program is generally independent of a major; both are available to all matriculated undergraduate students but only certificate programs,

with state approval, are available for non-matriculated students. Although, in general, minors at the School are course-light versions of specific majors, several of the minors offered are independent of a specific major and cross disciplinary boundaries. Examples are community health outreach, leadership skills, science communication, and sustainability.

Looking at just one of these—sustainability—our School led a campus-wide series of meetings starting in January 2013 to develop a concept for a sustainability program. Those meetings included faculty representatives and sustainability leaders from multiple decanal units at Rutgers–New Brunswick. Ultimately, the larger group consolidated into a smaller committee focused on the development of the sustainability minor, which was approved by the School’s Curriculum and Educational Policy Committee and offered for the first time in spring 2015. Since then, the sustainability minor has grown in popularity, with rapid growth in enrollment. At present (fall 2017), 56 students have declared the minor; required courses are oversubscribed. Key contributing departments include human ecology; ecology, evolution, and natural resources; and agricultural, food, and resource economics. Notably, the sustainability minor is administered by the Department of Human Ecology and draws students from across Rutgers–New Brunswick.

Several of the minors and certificate programs are made possible through the efforts of Rutgers Cooperative Extension agents who are tenured and tenure track faculty members. The primary responsibility of an extension agent is extension practice; that is, the application of knowledge to the needs of the community. Extension agents are also expected to deliver effective teaching, a fundamental endeavor of all members of the faculty. While extension teaching has traditionally meant the training of extension volunteers and paraprofessionals, we have recently expanded the expectation for extension teaching to include the delivery of credit-bearing courses to undergraduate students. To date, this effort has generated three minors within the School—leadership skills, community health outreach, and non-profit leadership. A minor in agriculture and natural resources management is under development. To support these minors as well as some of the majors, RCE faculty and staff offer approximately 35 different courses ranging from one to four semester credits.

RCE faculty also lead the recently established Clearing Corporation Charitable Foundation Agribusiness Scholars Program, which provides students selected into the two-year program with the applied knowledge, leadership qualities, and professional skills required for successful careers in the global agribusiness sector. The program, inspired by the traditional extension model of direct client engagement, integrates coursework with experiential learning and co-curricular activities with agribusiness leaders in the private and public sectors.

Notes

Table 7: Undergraduate Majors at the School (as primary)

Undergraduate Majors at the School (as Primary)		
Major	Home Department(s)	Supporting Schools
Agriculture and Food Systems	An interdisciplinary major supported by Plant Biology and other departments, including extension	Environmental and Biological Sciences
Animal Sciences	Animal Sciences	Environmental and Biological Sciences
Biochemistry	Biochemistry and Microbiology	Environmental and Biological Sciences
Bioenvironmental Engineering	Environmental Sciences	Environmental and Biological Sciences; Engineering
Biological Sciences	Division of Life Sciences	Arts and Sciences
Biotechnology	Interdisciplinary major supported by Plant Biology and Animal Sciences	Environmental and Biological Sciences
Ecology, Evolution and Natural Resources	Ecology, Evolution, and Natural Resources	Environmental and Biological Sciences
Entomology	Entomology	Environmental and Biological Sciences
Environmental and Business Economics	Agricultural, Food, and Resource Economics	Environmental and Biological Sciences
Environmental Planning and Design	Landscape Architecture	Environmental and Biological Sciences
Environmental Policy, Institutions and Behavior	Human Ecology	Environmental and Biological Sciences
Environmental Sciences	Environmental Sciences	Environmental and Biological Sciences
Exercise Sciences	Kinesiology and Health	Environmental and Biological Sciences
Food Science	Food Science	Environmental and Biological Sciences
Landscape Architecture	Landscape Architecture	Environmental and Biological Sciences
Marine Sciences	Marine and Coastal Sciences	Environmental and Biological Sciences
Meteorology	Environmental Sciences	Environmental and Biological Sciences
Microbiology	Biochemistry and Microbiology	Environmental and Biological Sciences
Nutritional Sciences	Nutritional Sciences	Environmental and Biological Sciences
Plant Biology	Plant Biology	Environmental and Biological Sciences
Public Health	(none)	E. J. Bloustein School of Planning and Public Policy

Table 8: Minor and Certificate Programs Supported by the School

Minor and Certificate Programs Supported by the School		
Program	Type	Home Department(s)
Agriculture and Food Systems	Minor	Plant Biology
Agroecology	Minor	Environmental Sciences; Plant Biology
Animal Science	Minor	Animal Sciences
Biochemistry	Minor	Biochemistry and Microbiology
Community Health Outreach	Minor	(Rutgers Cooperative Extension)
Ecology, Evolution, and Natural Resources	Minor	Ecology, Evolution and Natural Resources
Entomology	Minor	Entomology
Environmental and Business Economics	Minor	Agricultural, Food, and Resource Economics
Environmental Policy, Institutions, and Behavior	Minor	Human Ecology
Environmental Sciences	Minor	Environmental Sciences
Fisheries Science	Minor	Marine and Coastal Sciences; Ecology, Evolution, and Natural Resources
Food Science	Minor	Food Science
Leadership Skills	Minor	(Rutgers Cooperative Extension)
Marine Sciences	Minor	Marine and Coastal Sciences
Meteorology	Minor	Environmental Sciences
Microbiology	Minor	Biochemistry and Microbiology
Nonprofit Leadership	Minor	(Rutgers Cooperative Extension)
Nutrition	Minor	Nutritional Science
Plant Science	Minor	Plant Biology
Professional Outreach and Development	Minor	(Rutgers Cooperative Extension)
Science Communication	Minor	Human Ecology
Science Learning	Minor	Human Ecology
Science Teacher Education	Minor	Graduate School of Education
Sustainability	Minor	Human Ecology; Ecology, Evolution, and Natural Resources
Environmental Geomatics	Certificate	Ecology, Evolution, and Natural Resources; Landscape Architecture
Environmental Planning	Certificate	Landscape Architecture
Evolutionary Medicine	Certificate	Ecology, Evolution, and Natural Resources; Anthropology (SAS)
Food Systems Education and Administration	Certificate	Agricultural, Food, and Resource Economics
Horticultural Therapy	Certificate	Plant Biology
International Agriculture/Environment	Certificate	Human Ecology
Medicinal and Economic Botany	Certificate	Plant Biology
Plant Biosecurity	Certificate	Entomology
Professional Youth Work	Certificate	(Rutgers Cooperative Extension)
Urban/Community Forestry	Certificate	Ecology, Evolution, and Natural Resources

Four majors at the School are governed by formal requirements for accreditation or certification by national professional organizations. These include bioenvironmental engineering (by the Accreditation Board for Engineering and Technology), the dietetics option in nutritional sciences (by the Accreditation Council for Education in Nutrition and Dietetics), and landscape architecture (by the American Society of Landscape Architects). These three majors undergo a formal, regular accreditation process involving preparation of a self-study document followed by an onsite visit by an accreditation team. The research option in food science also undergoes a formal, regular certification process by the Institute of Food Technologists, which involves submission of a self-study document but no onsite review. All four programs are currently in good standing.

Assessment of Program Enrollments and Strengths

Over the 10-year period 2007-2016, School enrollment increased from ~3,000 to ~3,450 or about 60 students per year. However, most of this growth occurred during the period from 2007-2013, with enrollment peaking at 3,733 in fall 2013. An enrollment cap imposed on the School by the university's central administration in 2015 has limited entry of freshman into SEBS and is impacting lower program enrollments.

Programs at the School vary considerably in the number of declared majors. For analysis purposes, we study programs in terms of large (over 141 students) medium (50 – 140), and small (fewer than 50), with enrollment reflecting declared majors in fall of 2016 (and, thus, not including first year students).

Over this 10-year period, most of the majors showed moderate or robust growth. Five programs—agriculture and food systems; bioenvironmental engineering; food science; microbiology; and public health—exhibited double-digit annual growth, ranging from 10-13 percent, over this period. Both nutritional sciences and food science have seen significant growth over the last decade, more than doubling the number of declared majors, reflecting in part the growing interest in local, organic, and healthy food and the growing realization of its centrality to promoting wellness. While plant biology remained constant, only four of our 21 majors declined in enrollment—biotechnology; environmental business economics; environmental policy, institutions, and behavior; and meteorology. The environmental planning and design major was divided into two majors that have since grown in size.

The following are examples of programs that have consistently demonstrated

Table 9: Undergraduate Major by Size.

Size	Undergraduate Major	2016 Declared Students
Large	Animal Science	360
	Biotechnology	149
	Environmental and Business Economics	169
	Nutritional Sciences	275
	Biochemistry	131
Medium	Food Science	122
	Ecology, Evolution, and Natural Resource	108
	Environmental Policy, Institutions, and Behavior	125
	Environmental Sciences	111
	Landscape Architecture	64
Small	Marine Sciences	57
	Microbiology	53
	Plant Biology	50
	Meteorology	47
	Environmental Planning and Design	33
	Bioenvironmental Engineering (Five-Year Program)	30
	Agriculture and Food Systems	25
	Entomology	3

excellence in fulfilling their undergraduate mission over the past decade and show promise of maintaining excellence into the future:

- **Animal Science** is consistently the largest major (in number of students) at the School. The program has an outstanding record of placing students in veterinary medicine schools in part due to the faculty's excellent mentoring program. A hallmark of our program is a strong pre-veterinary curriculum that provides students with the science, laboratory skills, research experience, and large animal handling that is required to be competitive for entrance into veterinary school. Over the past five years, 88 students have been accepted to approximately 17 different U.S. veterinary colleges, including top-ranked schools such as UC Davis, University of Pennsylvania, Cornell University, Tufts, University of Wisconsin, and NC State.
- **Nutritional Sciences** is now the second largest major at the School, primarily due to its large accredited didactic dietetics option. This program has a strong track record of placing students in post-graduate supervised practice internships and subsequent attainment of the registered dietitian/nutritionist (RDN) credential.
- **Biotechnology** is one of the larger majors at the School despite also being one of the most demanding, requiring over 90 credit hours of coursework in the life sciences. This major has a long and distinguished record of placing students in exceptional graduate programs. The list is long and includes Princeton, Harvard, Yale, Cornell, Stanford, Johns Hopkins, Vanderbilt, Wisconsin, Michigan, and Cambridge University, where one of our recent graduates was accepted into the graduate school under a Gates Fellowship.
- **Landscape Architecture** only recently has risen to the level of a stand-alone major (rather than an option within the environmental planning and design major). This program is supported by an exemplary culture of faculty involvement and commitment to instruction that reflects the strong and, in fact, unique, at least within our School, practice in which faculty research is deeply integrated and embedded within undergraduate and graduate studio classes. As an accredited professional program, the program receives an external review every six years. In the 2016 *Design Intelligence* rankings, Rutgers was listed as 18th in the top 20 undergraduate programs nationwide.
- **Marine and Coastal Sciences**—while a small- to medium-sized major—has an exemplary history of involving undergraduates in the global research program of the Center for Ocean Observing Leadership, and has placed students in the top graduate programs in the country, including the MIT/Woods Hole Oceanographic Institution, Stanford, Scripps Institution of Oceanography, University of Washington, University of California Santa Barbara, and USC.
- **Meteorology** has been ranked among the top 10 in the country by USA Today/College Factual, as noted in President Barchi's 2017 State of the University Report.

Distinctions and Synergies with Other Schools and Programs

As previously noted, the school structure at Rutgers–New Brunswick can present some confusion in terms of similar-sounding departments and programs. Especially with the integration of the medical schools in RBHS, the fields of biochemistry, microbiology, and nutrition have the appearances of duplication within our School. The following analysis sheds some light on the distinctions in these disciplinary departments:

Biology

Both the School of Environmental and Biological Sciences and the School of Arts and Sciences support a variety of departments focused on the life sciences: cell biology and neuroscience,

genetics, and kinesiology and health at the School of Arts and Sciences, and animal sciences; biochemistry and microbiology; ecology, evolution, and natural resources; entomology; and plant biology at the School of Environmental and Biological Sciences. The departmental structures in practice reflect significant synergies. Simply put, the life science departments at SAS are focused on basic and applied research and pedagogy in areas related to human health and physiological function while the life science departments at our School focus on the wider biological world, especially as it relates to an environmental context, either in isolation, in ecosystems, or in terms of their impact on or interactions with humans. Specific synergies between the Department of Biochemistry and Microbiology (SEBS) and other SAS departments are discussed below.

The School offers the same major in biological sciences that is supported by the School of Arts and Sciences, with specific required and elective courses available from courses offered at our School. This is a popular, large major in our School with 186 declared majors in fall 2016. We intend to continue offering this major to our students, but are also investigating an alternative biology major which involves an applied ecosystems and evolution approach to biological study.

Business and Economics

The School's Department of Agricultural, Food, and Resource Economics (DAFRE) focuses on economic analysis and business management in the areas of agriculture, food, resources, and the environment. The research program builds on the New Jersey experience as a pioneer state in issues related to rapidly changing agriculture, a rapidly evolving food industry, high demands on natural resources and the environment, and the urban environment.

Compared with the economics departments in the School of Arts and Sciences (SAS) and Rutgers Business School (RBS), DAFRE is the only department in the university that concentrates on the intersection of agriculture, food, and the environment, both in terms of teaching and research. DAFRE has a close connection with the Rutgers Cooperative Extension agricultural agents who are serving agricultural clientele throughout the state, and many DAFRE faculty have an extension appointment as well as experiment station appointments, with a mandate to teach and serve the clientele in the agriculture and food industries.

Most of the courses taught in DAFRE use agriculture, food, and environment-based industries as examples. Faculty who teach these courses get their grants from sources such as the U.S. Department of Agriculture and the U.S. Agency for International Development. Neither economics department in SAS or RBS focuses on these matters or on problems facing agriculture.

DAFRE graduates are well prepared for careers in general business, commodities, sustainability, government policy-making, environmental consulting, and much more. In fact, the School is working on some new initiatives with RBS to bring its expertise to many of our departments, including DAFRE, Nutritional Sciences, Food Science and Plant Biology, exploring the possibility of offering innovative programs in food business economics in cooperation with RBS.

Microbiology and Biochemistry

Microbiology: The School's microbiology community is considered one of the strongest in environmental microbiology and microbial evolution in the U.S. This has deep roots in the pioneering history of soil microbiology in the early 20th century (as evidenced by the work of Selman Waksman and many others). The program was enhanced by the re-establishment in 2004 of the undergraduate major and minor in microbiology (it had been combined with genetics during earlier consolidations) and the launch of the organismic-focused microbial biology graduate program in 2010.

We are committed to building depth in microbial metabolism based on strengths in environmental microbiology and microbial diversity. We also are strong in mycology (centered in the Department of Plant Biology). The School is building bridges between our environmental microbiology focus

and that of the Public Health Research Institute and public health in medical microbiology, particularly with the Department of Microbiology, Biochemistry and Molecular Biology at the New Jersey Medical School in Newark.

Biochemistry: The faculty members who are biochemists are significantly reduced in numbers through retirements (five in the past 10 years). The three remaining in the department are “traditional” biochemists (enzymology, nucleic acids, protein isolation and characterization, cell walls), with additional department members providing strength in microbial biochemistry, molecular biology, and biochemical toxicology.

There are a number of other faculty who are biochemists in other departments in the School (including food science, nutritional sciences, environmental sciences, plant biology, animal sciences). We are very strong and intend to increase investment in microbial diversity and biochemistry, and in metabolism (lipids and metabolomics), vitamins (B vitamins and one-carbon metabolism, vitamin D, and vitamin A), environmental toxicology, and endocrinology. Lipid research and vitamin research is centered in food science and nutritional sciences, endocrinology is in animal sciences, and environmental toxicology is found in the Department of Environmental Sciences and in the Department of Biochemistry and Microbiology. We are the home to a strong and growing cross-university program in endocrinology. We are small, but robust in and well connected to the Environmental and Occupational Health Sciences Institute in environmental toxicology.

A careful look at the specific faculties in biochemistry at Rutgers reveals that there is very little scholarly overlap between the department in SAS and the one in the School of Environmental and Biological Sciences or, for that matter, with the relevant departments in the two medical schools. The New Jersey Medical School in Newark has a large and very strong program and faculty in basic biochemistry with a potent biomedical and molecular bent in its Department of Microbiology, Biochemistry and Molecular Biology. The Robert Wood Johnson Medical School in New Brunswick has a Department of Biochemistry and Molecular Biology with a number of cross-appointments with other departments at Rutgers. There is also strong “biochemistry” work being done in several other places, including chemistry and chemical biology in SAS, chemical biology in the School of Pharmacy, and those aforementioned in the School of Environmental and Biological Sciences.

Thus, there is very little, if any, duplication other than the use of the terms “biochemistry” and “microbiology” to mean different things. The larger challenge is to build strong collaborations and synergies among the largely complementary units bearing these names, perhaps in time to address the “signage” issue by selective name changes to reduce the superficial appearance of duplication and to better exploit the strengths that can come from cooperation and collaboration.

Microbiome: A recent development is a new emphasis on research into the microbiome. Several years ago, the executive dean identified the human microbiome as an emerging field in environmental microbiology and also saw the linkage of research in this field as becoming central to the study of the interactions pertinent to obesity and metabolic syndrome, a focus for new research investments in the New Jersey Institute for Food, Nutrition, and Health’s Center for Digestive Health. He set out to recruit a major international leader in the human microbiome, and seven years later succeeded in bringing Dr. Liping Zhao to Rutgers as the Eveleigh-Fenton Endowed Chair in Applied Microbiology. In the meantime, two junior faculty were recruited to the Center for Digestive Health, and subsequently a third faculty member was recruited to join Rutgers as the Henry Rutgers Chair in Microbiomes and Health. As these developments were underway, the executive dean began discussions, which are ongoing and very productive, with the senior vice president for research and economic development around corporate partnerships in human microbiome research, and with Chancellor Brian Strom of Rutgers Biomedical and Health Sciences about further joint faculty hiring as well as program development. This has become a very robust discussion, involving the deans of both of the Rutgers medical schools (New Jersey Medical School and the Robert Wood Johnson School of Medicine). An internal Rutgers workshop to integrate all

of these efforts and create a vibrant community around human microbiome research and funding is in the planning stages and involves all of the named parties and groups.

Nutritional Sciences

The SEBS Department of Nutritional Sciences (DNS) has both distinct and synergistic educational roles within the university with only minimal redundancies. The primary distinct program is the undergraduate didactic program in dietetics (DPD). It is the only such program in the university and is nationally accredited by the Accreditation Council for Education in Nutrition and Dietetics. The DPD is designed to prepare students for post-graduate dietetic internships and, subsequently, the national exam required for the credential of registered dietitian/nutritionist (RDN). Typically, ~60 students graduate each year with the nutritional sciences degree through the dietetics track. Up to an additional 40 students per year graduate with a nutritional sciences degree through one of four additional tracks, including nutrition; community nutrition; food service administration; and nutrition, food, and business. None of these tracks is offered in any other school within the university.

Since the merger with UMDNJ in 2013, the university now has two departments of Nutritional Sciences, with the other department found in the School of Health Professions within Rutgers Biomedical and Health Sciences (SHP-DNS). Although the existence of two departments with the same name does cause some confusion for incoming students, the two departments offer almost entirely complementary and non-overlapping opportunities for students. The SEBS nutritional sciences department is highly focused on undergraduate education as well as graduate level education in basic, translational, and community/applied nutrition research. SHP-DNS focuses primarily on graduate level education in clinical nutrition. Importantly, many SEBS-DNS graduates are accepted into the SHP-DNS dietetics internship program each year. Changes in national standards for dietetics education will be affecting the dynamic between the two departments, but there is a high expectation that the synergy between the programs will continue—if not increase—in the next several years, making Rutgers a premiere institution for all aspects of nutrition education.

Another synergy of note has developed in the last few years between SEBS Department of Nutritional Sciences and Robert Wood Johnson Medical School. These two schools have developed a course titled “Culinary Medicine” in which senior undergraduate dietetics students are teamed with first-year medical students for hands-on educational experiences in how to cook healthy meals for patients with specific diseases and disorders, such as diabetes, kidney disease, and heart disease. The course contributes to the university’s commitment to inter-professional education.

Shared Majors

As noted earlier in this document, beginning in fall 2015, we discontinued allowing newly enrolled students in our School to declare (as their only major) six majors offered by other schools. These are journalism and media studies, communication, genetics, chemistry, geological sciences, and geography. (Students who first enrolled before fall 2015 can continue to declare these majors as their only major.)

Three other majors offered by other schools remain available to our students: exercise science, public health and biological sciences. Each of these presents different dynamics.

Exercise Science, one of two major options offered by the Department of Kinesiology and Health in SAS, is the one place we can offer access to a degree program in physiology for students in our School. We enroll a large cohort of students who look for this major. Out of 180 current exercise science majors at our School, 150 are in the applied kinesiology option, 24 in sport management, and six undecided. The occupancy by exercise science faculty in the New Jersey Institute for Food, Nutrition, and Health (IFNH) building on the Cook campus reinforces the argument to have this SAS major available to students in the School of Environmental and Biological Sciences.

There has been some informal discussion initiated by faculty in both schools, who see exercise science and kinesiology (not sport management) as having closer ties academically to animal sciences and to nutritional sciences in the School of Environmental and Biological Sciences than to programs in the School of Arts and Sciences. We acknowledge, however, that it would be politically difficult to envision moving the Department of Kinesiology and Health from Arts and Sciences to Environmental and Biological Sciences, although numerous faculty in both schools can make a strong case for such a move.

Biological Sciences as a major is core to programs in both the School of Arts and Sciences and the School of Environmental and Biological Sciences. Our School typically enrolls around 300 students in this major, making it the third most popular major in our School. We believe that the major in biological sciences must remain available to students in both Arts and Sciences and Environmental and Biological Sciences.

Some peer institutions organize differently to address this issue of the biology major, with a school or college of natural sciences (e.g., Michigan State). Others house biology solely within a school or college of arts and sciences (Ohio State is an example).

Others have the biological sciences major and responsibility for teaching the foundational courses in the major shared between two colleges (Cornell and Wisconsin-Madison are two examples). The academic leadership of our School strongly prefers the Cornell and Wisconsin model and believes that Rutgers should adopt that model. First of all, to cover properly the breadth of biology at the undergraduate level, at Rutgers you need to draw on faculty from both schools. Moreover, the two schools offer students different opportunities aside from the content of the biology major—a bachelor of arts degree program in Arts and Sciences and a bachelor of science degree program in Environmental and Biological Sciences. Note that under the current structure, SEBS graduates who major in biology are “forced” to receive a bachelor of arts degree, and this is wildly unpopular with parents.

Public Health at the undergraduate level at Rutgers–New Brunswick is offered through the Bloustein School; there are currently 109 public health majors at our School. We consider public health to be a distinct strength of our School in the scientific underpinnings of this field. The existing Bloustein major requires very little preparation in the sciences or related mathematical tools that are used, for example, in epidemiology; indeed, although the major requirements include courses in biology and chemistry, these science courses are not required as prerequisites for any other course required to complete the major.

Today we have a School of Public Health at Rutgers, and in our School we have a vast array of science that is foundational in public health (microbiology, nutrition, water management, meteorology, ocean science, atmospheric science, landscape architecture, vector biology, etc.). Many of us believe that a thorough revamping of what Rutgers offers in public health at the undergraduate level is needed and timely.

Student Advising, Career Advisement and Placement

The School provides a comprehensive program of student advising that begins before official matriculation in a student’s first year and continues through graduation (and in some cases beyond). All incoming students are assigned a first-year advisor (faculty or staff); students are organized into cohorts based on their prospective major or interests. Upon declaring their major in February of their second semester, students are assigned a faculty mentor who provides guidance (both academic and professional) through to graduation. In addition, all students at the School are advised when appropriate by staff in the Office of Academic Programs.

The School offers numerous support services to ease students' transition into the college environment and to help them achieve academic success. Among these are the Office of Academic Programs, Career Services, counseling services, the Alcohol and Other Drug Assistance Program,

the Psychological Services Center, the Educational Opportunity Fund, Rutgers Learning Centers, the Writing Center, the Math and Science Learning Center, and the Douglass Project for Rutgers Women in Math, Science, and Engineering.

One of the most influential support services is the **Educational Opportunity Fund (EOF)**, a state-supported enrichment program designed to provide an academic support network for disadvantaged and low income New Jersey students seeking to improve their academic performance. Every admitting school at Rutgers has an EOF office; approximately 45 EOF eligible students enroll in our School each fall. Our School's EOF program serves as a supportive and professional resource that assists students in navigating the complexities of life at Rutgers. The services and activities offered by the EOF foster students' understanding of what is required to succeed in college.

EOF staff members encourage students to assess and realize their personal skills, abilities, strengths, and capacities. They also guide, inform, and instruct, while encouraging a student's academic, personal and professional success. The EOF staff offers a series of academic sessions—summer, fall and spring—designed to facilitate an entering student's successful transition to college life. Each session builds upon a student's individual skills as determined by discussions, academic performance, and observed social skills.

In another area, nutrition counseling services are available to both undergraduate and graduate students on the G.H. Cook campus through Rutgers Student Health Services. Students who have concerns related to weight management, metabolic disorders, gastrointestinal issues, or eating disorders, and disordered eating can call Rutgers Student Health Services or stop into one of the health centers on campus to schedule an appointment to meet with one of the medical providers (physician, nurse practitioner, physician's assistant). If the student meets the appropriate referral criteria and the medical provider believes that nutrition counseling would be beneficial, the student is referred to the registered dietitian/nutritionist, based at the IFNH on the Cook campus, for an initial nutrition assessment and services.

The School supports a **Student to Professional Internship Network (SPIN)** office which makes it possible for students to earn the academic credits needed to fulfill their experience-based education requirement while gaining real-world proficiency related to their course of study and career interests. Credits are earned through the completion of academic assignments while the student is engaged in a part-time or full-time work experience with business, industry, government, or non-profit organizations.

The SPIN office, typically, is contacted by employers looking for interns. It makes the opportunities available to all qualified students, then the employer chooses from the applicants who have applied directly to the company. The students obtain the jobs/internships on their own, in part to promote self-sufficiency and to avoid legal ramifications that might arise as a result of SPIN "placing" students. The SPIN office works with the SEBS faculty, the student, and the work supervisor to make sure the student is performing meaningful work of educational value in the project areas for which the internship is designed.

Companies such as News 12, Colgate-Palmolive, AT&T, Unilever, Johnson & Johnson, International Flavors and Fragrances, NBC, ABC, CBS, MTV, the National Weather Service, Roche Diagnostics, Fastenal, L'Oreal, Nasdaq, and Mondelez have hosted SEBS interns. Other recent well-known employers have been Ready Pac Foods, NOAA, the New Jersey Department of Environmental Protection, Chromocell, and Terracycle. Others are smaller, local employers that may not have big-name recognition, but provide a proven, valuable experience for the student.

In addition, some academic departments encourage students to sign up for a laboratory or "practical problem" class that will fulfill experiential learning by allowing the students to get credits for an internship. Many companies also reach out to departments directly with job opportunities, and the department communicates those opportunities to their students. In some cases, summer and semester internships evolve into full-time employment after graduation.

Other opportunities for career advisement are provided by **University Career Services**, a robust organization serving all Rutgers–New Brunswick students in the area of career planning and placement. Career Services provides career-related counseling, resources, and programs to help individuals clarify academic and career goals, establish career plans, develop job-search skills, and make successful career transitions. It does this by building relationships with alumni, employers, and graduate schools to optimize internship, job, and career opportunities while also creating strategic partnerships with campus departments to assist students in developing and articulating co-curricular experiences that will help to ensure they are competitive in their future pursuits.

Career Services provides professional resources and educational seminars and also conducts job fairs and networking opportunities. An example that particularly applied to SEBS students occurred this past November when Career Services organized a job information and networking event on the Cook/Douglass campus with dozens of employers, many of whom were alumni, in the broad fields of agriculture and environmental services. A similar event is scheduled for November 2017. University Career Services also provides job counseling for Rutgers and School alumni on an on-going basis.

Another important source of support is found within the academic departments. Due to the active participation of nearly all School faculty in advising within the major, career counseling and preparation also occurs within the context of academic advising (which often includes job placements that result from faculty contacts).

Graduation and Matriculation into Graduate and Professional Programs

Graduation rates at the School compare favorably with those for all Rutgers–New Brunswick. When a cohort of 678 students who entered the School as freshman in 2009 was followed, we found that 51.8 percent graduated with a B.S. degree in four years, 73.7 percent in five years, and 79.1 percent in six years. A significant number (approximately 20 percent) transferred out of the School to other schools within Rutgers or outside Rutgers. The corresponding numbers for the same period at Rutgers–New Brunswick are 58.4 percent, 77.2 percent, and 80.3 percent, respectively.

The School does not have a consistent method for tracking students after graduation. Many students stay in touch with their departments through personal relationships or alumni groups. University Career Services has conducted post-graduation surveys since 2014, soliciting career information that reflects current (within approximately one month of graduation) status of the graduates. Overall placement rates (employment, continuing education, military service, and voluntary or service work) for 2014, 2015, and 2016 were 76 percent, 84 percent, and 56 percent respectively for School graduates, with the overwhelming majority of positions located in New Jersey, New York and Pennsylvania. Most were employed full time or were continuing their education.

Anecdotally, the School compiles “alumni stories” as features on several of our websites and in our publications. Examples of notable alumni whose stories have appeared are included in the Supporting Materials.

International Opportunities

The School of Environmental and Biological Sciences has multiple faculty-led study abroad programs that typically take place over the summer or in an embedded fashion such as spring break. It also participates in research exchange opportunities that include no less than a one-week visit to a partner university. Additionally, SEBS students take part in traditional exchange study-abroad programs and in program-provider exchanges that are not run by the School or Rutgers faculty. In total, approximately 65 students participate annually in this type of programming with scholarship funding from the SEBS Office of International Programs. Approximately 30 to 40 additional students participate without any financial assistance from the School or the Office of International Programs.

The School is unique among other schools at Rutgers in supporting a designated office to coordinate the international activities for faculty and students. The Office of International Programs is served by a dean, appointed by the executive dean, and an assistant dean, a staff position. In addition, a program coordinator serves the office to organize activities focused on international student engagement, including recruitment and orientation, social events, and field trips. The office is responsible for student exchanges, academic partnerships with universities abroad, international student recruitment and engagement. It also works with faculty and the departments to develop MoUs with universities and institutions abroad for research collaborations, student exchange, study abroad, and double degree programs such as the undergraduate 2+2, master's 3+2, and double doctoral programs.

The office strives to provide students with international curriculum and opportunities for educational experiences abroad. It coordinates faculty-led summer and winter study abroad programs, and works with the Center for Global Education, a unit of the university-wide Rutgers–Global (formerly the Centers for Global Advancement and International Affairs) for students wishing to study abroad during fall or spring semesters. The School's Office of International Programs offers scholarships to selected deserving students from our School to pursue study abroad opportunities.

In 2015-16, nine students from our School participated in a semester-long study abroad program, while 60 participated in all study abroad programs, including faculty-led summer programs. The School awarded 38 scholarships of between \$1,000 and \$5,000 to students for the summer programs, seven for the winter programs, and one for a semester-long program. These numbers are expected to be higher in the current year. Students also receive scholarships from the Department of Landscape Architecture, Douglass Residential College, and the Rutgers Study Abroad Office. An advancement goal is to significantly increase fundraising to support international experiences for our students. In addition, 13 students from the School were awarded scholarships to participate in independent study or non-credit bearing research projects with international partners.

Examples of international study-abroad programs in which students from the School participate are:

- Black Tea – From Farm to Cup in India
- Microbiology and the Culture of Cheese and Wine in France
- Culture and Community Health in Mexico
- Coral Reef Internship in Little Cayman Island
- Landscape Architecture in Germany/Spain/Italy
- Roy DeBoer Travel Award for Landscape Architecture undergraduate and graduate students for independent exploration/study
- Community Health in Thailand
- Center for Engaged Learning Abroad—Large Animal Veterinary Science and Wildlife Biology in Belize
- Sustainable Food and Environmental Systems in Florence, Italy

In the area of special program opportunities offered to students, two undergraduate students from marine sciences were sent to South Africa in April 2016 for a week-long underwater glider launch program. Every fall, five students are sent, all expenses paid, to Brazil as part of an annual exchange. The School additionally hosted and received five students from the University São Paulo, Brazil, in April 2017. In this regular exchange, five students from Brazil and five students from Rutgers spend one week abroad presenting research, visiting laboratories, and participating in cultural events.

The School offers 2+2 B.S. dual degree academic programs in biotechnology, environmental science, food science, and plant science, all with universities in China, including South China University of Technology, Nanjing Agriculture University, China Agriculture University, Shanghai

Jiao Tong University, and Jilin University. In 2015 and 2016, 16 students were enrolled in the 2+2 program. All participants in this program also benefit from one-on-one career and graduate school advising with the Office of International Program's program coordinator.

The School also has one established 3+2 M.S. program and one new program in environmental science; these are with Tianjin University and Zhejiang University in China. Four students were in this program in 2015 and 2016. In addition, there are recently started dual doctoral programs in plant biology with the University of São Paulo. Currently one student is enrolled in this program.

The School of Environmental and Biological Sciences specifically partners with the Center for Global Education to manage its study-abroad exchange programs, which allows for participation from non-SEBS students and provides a broader marketing capability. However, it individually manages the annual research exchange between our School and the University of São Paulo.

In another area, the School works with the Rutgers' China Office for various programs, including faculty training opportunities in which we accept Chinese faculty who participate in summer teacher training programs hosted by School faculty. The China Office facilitates this process by acting as the first point of contact. It also organizes all administrative aspects, including housing and transportation. However, none of the exchanges currently maintained with the China Office include student participants.

In addition to these collaborations, the School and the Office of International Programs also work very closely with Rutgers–Global on various levels that include, but are not limited to, institutional level international collaborations, university cooperative agreements, marketing, university internationalization, funding opportunities, and research initiatives. The School, and specifically the Office of International Programs, considers Rutgers–Global to be an integral part of the Rutgers community in an effort to create a more internationalized culture in support of our students, faculty, staff, and our surrounding community.

Enrichment, Co-curricular, and Extracurricular Learning

The School provides and supports a variety of enrichment programs designed to offer selected (and self-selected) individuals the opportunity to add significant academic content to their already rich academic experience.

Honors Programs

The **Honors College** of Rutgers–New Brunswick, which was initiated in fall 2015, offers the top seven percent of incoming students in every admitting undergraduate school at Rutgers–New Brunswick a rich first-year living-learning experience. Approximately 500 students are admitted to the Honors College each year, of which approximately 55 are enrolled at our School (with the exception of the first cohort, as noted earlier). All students in the Honors College receive significant scholarship support (an average of \$13,000 a year for four years, assuming that the student maintains a minimum GPA of 3.25 to 3.5, depending upon the scholarship level). The students must live on campus in the Honors College residence hall on the College Avenue campus during their first year and must fulfill an array of academic requirements that include interdisciplinary first-year seminars, honors seminars in disciplinary topics, a service learning project, and a “capstone” academic experience that could involve independent research or other intensive activity. After the first year, students in the Honors College can live where they wish (on the G.H. Cook campus, off campus, or elsewhere) and are intentionally integrated into each school's existing general honors programs.

The **SEBS General Honors Program** has been supported for many decades and invites approximately 40 incoming students to participate in a four-year sequence of academic enrichment. Students invited into the program are in the top 12 to 15 percent of the admitted incoming students (including those admitted to the Honors College who do not wish to participate due to the requirement of living

in the Honors College residence hall). Students in the honors program may live where they wish, but are provided with an honors program housing option, take a first-year seminar, take advanced disciplinary seminars, and must take part in a senior “capstone” academic experience that usually involves participating in George H. Cook Scholars research or another activity.

The **George H. Cook Scholars Program** is an independent research program for our undergraduates under the mentorship of an approved advisor. The program is meant to act as an intensive capstone project for undergraduates seeking the challenge and experience of performing their own independent research. Students are not constrained to the laboratory research fields and are free to propose projects and seek advisors in the disciplines of policy, public health, and many more. Moreover, they are not limited to their major; this program provides the creative freedom for students to perform research across disciplines of interest for an enriching educational experience. They are also encouraged to seek advisor support in the extension and research stations. Students graduate from the School “with honors” on the basis of their final cumulative grade-point average, regardless of participation in the General (four-year) Honors or George H. Cook Scholars programs.

Co-curricular Learning

Rutgers University–New Brunswick supports 12 first-year **living-learning communities** as well as a variety of non-residential learning communities focused on specific disciplinary topics; these communities are open to all RU–NB first-year students. Two of these communities are supported by faculty in our School:

The **RU-tv WeatherWatchers** community, located in the Perry Residence Hall on the Cook campus, is geared for students interested in the weather, in weather forecasting, and in video production and broadcast journalism. It is supported by meteorology faculty in the Department of Environmental Sciences. Students live in Perry Hall and participate in generating local weather forecasts and broadcasting a local weather show on RU-tv twice a day. The tools for weather forecasting, which include an on-campus weather radar system installed in partnership with NBC Universal television, are available through the meteorology program while the broadcasting facilities supported by RU-tv are located in a studio in the residence hall. Upper level students participate in WeatherWatchers without the residential component.

The **Oceanography Learning Community** is a non-residential community that attracts first-year students in any major interested in the world’s oceans and the methods for their study. Supported by faculty in the Department of Marine and Coastal Sciences who are affiliated with the Center for Ocean Observing Leadership (COOL) lab, students take a 1.5 credit course in the fall which connects them to the research and exploration research done in the COOL lab. In addition, they investigate the Raritan River on the *RV Rutgers*, our new research-teaching vessel, and have the option of continuing their involvement through a spring course. The community is open to students from any school with any proposed major.

Another co-curricular living opportunity for students is found at **Helyar House** on the Cook campus, a cooperative living community where members have a greater responsibility of self-government than students in traditional residence halls. The house is staffed by a resident counselor under whose supervision and guidance each house member works cooperatively with others to achieve common goals in a supportive living environment. Approximately 50 to 65 students apply for a place in Helyar House for 10 to 15 openings each year; there are a total of 40 available beds. Along with a demonstrated ability and sincere desire to serve others in a cooperative living community, financial need is an important component for admission into Helyar House. Students benefit from reduced housing and meal expenses and are awarded scholarships, primarily supported by Rutgers cooperative living alumni. Students also are required to complete community service hours.

There are over 400 registered **undergraduate student clubs and organizations** at Rutgers–New Brunswick, with 35 of these clubs specifically located within the School. Note that all student clubs are by rule open to all Rutgers undergraduates. The clubs located at our School focus on a variety of topics, ranging from the raising of puppies for the Seeing Eye (a foundation that provides guide dogs for the blind) to environmental awareness to composting to disciplinary majors (Designer Genes for biotechnology majors, etc.). These clubs offer students many opportunities to become involved in activities outside of, but related to, the classroom and to learn essential leadership skills that enhance their career preparedness.

The **School's Student Governing Council (SGC)** serves students and the community in general. By reaching out to both the community and the faculty/administration, the SGC works to amplify the student voice and represent the needs and concerns of the student body. The council also allocates budgets for student groups/clubs affiliated with the School. Each semester, 80 percent of our School student fee money (on the order of \$100,000) is allocated to student groups that have applied to the council in the previous semester for funds.

In addition, the **Fraternity of Alpha Zeta/Cook Chapter** has a strong presence on campus. Alpha Zeta is a co-ed honors and service fraternity established in 1922. Prospective members are required to be in the top 40 percent academically of their class. There are typically between 50 and 70 active members at a given time. Alpha Zeta service projects include adopting a “spot” on campus to keep clean, farm gleanings, cleaning up the bamboo forest in the Rutgers Gardens, and volunteering at a local soup kitchen. Each year, the fraternity votes on and presents a “Teacher of the Year” award, a highly prized faculty honor.

Extracurricular Activities/Recreation

Students on the G.H. Cook campus have access to the extensive facilities of the Cook/Douglass Recreation Center, maintained by Rutgers Recreation. All students enrolled at the School are encouraged to participate in the wide range of campus recreational/intramural activities, including informal drop-in recreation, organized intramural leagues (team, individual, and dual activities), structured recreation (group fitness, aqua aerobics, swim lessons, club sports, and more) and special events (trips, theme nights, community service projects, and similar).

Other students are active in Rutgers Athletics. Currently, there are 20 students from our School who represent Rutgers in various Rutgers intercollegiate athletic programs, which include rowing, baseball, softball, football, women's track, and women's swimming. The largest representation—10 students—is in rowing.

Notes

Master's and Ph.D. Graduate Programs





Master's and Ph.D. Graduate Programs

Overview

Graduate education at Rutgers–New Brunswick is organized on a disciplinary basis into autonomous graduate programs that, within the overall oversight and constraints of the School of Graduate Studies, establish their own course and exam requirements for graduation. Although graduate programs are usually based within and supported by specific departmental foci (food science, plant biology, etc.), they span departmental units, and membership is open to all; any tenure track faculty member at Rutgers University can apply for membership in any appropriate graduate program and, thus, support graduate research for students admitted to that program. Consequently, faculty members are often members of two or more graduate programs, and a typical graduate program may have members from many Rutgers departments (in New Brunswick and elsewhere). Scholars not employed by Rutgers may also affiliate with programs as adjunct members.

The graduate curriculum at the School comprises a mix of academic course work and independent research leading to master's (M.S., M.L.A., and M.B.S.) or doctoral (Ph.D.) degrees. The School of Graduate Studies has established learning goals for master's and doctoral programs as follows:

Master's Degree Learning Goals

- Attain mastery of a broad field of learning.
- Engage in and conduct original research (for master's degrees with thesis options).
- Prepare to be professionals in the discipline.

Doctoral Degree Learning Goals

- Attain marked ability, scholarship, and research skills in a broad field of learning.
- Engage in and conduct original research.
- Prepare to be professionals in the discipline.

Of the 12 graduate programs supported within our School, all offer M.S. degrees (or its equivalent, the Master of Landscape Architecture degree, or M.L.A.), and 10 offer Ph.D. degrees through the School of Graduate Studies. Degree requirements vary across programs but typically include 30 total credits (24 of course work and six of research) for the M.S. degree, and 72 total credits (30 of course work and 42 of research) for the Ph.D.; some programs (food science) offer a non-thesis (terminal) M.S. degree which does not require independent research or research credits but does require a critical paper outlining the current state of knowledge and research needs in a specific area. Students working toward a Ph.D. degree may also qualify under certain circumstances for the M.Phil. degree.

Various programs in the School also partner with the Rutgers Business School to offer the M.B.S. (master of business in science) degree; this degree, a hybrid of an M.S. and an M.B.A., requires 43 total credits of coursework with 24 credits coming from a supporting science program and 19 credits from the Business School. This terminal degree, the only one offered in New Jersey that is part of a national focus on professional science master's programs, specifically prepares students for careers in industry and, thus, has a decidedly practical and commercial focus. Faculty within departments at the School support six M.B.S. programs: biotechnology and genomics (interdepartmental); food science (Department of Food Science); geospatial information systems and technology (departments of Ecology, Evolution, and Natural Resources and Landscape Architecture, with the Bloustein School of Public Policy and Planning); horticulture and turfgrass science (Department of Plant Biology); international agriculture (Department of Plant Biology); sustainability (Plant Biology with the Bloustein School and Newark–Biological Sciences); and urban environmental analysis (Department of Environmental Sciences with Newark–Earth & Environmental Sciences).

Table 10: Graduate Programs Located Within the School

Graduate Programs Located Within the School		
Program	Degrees	Supporting Department
Atmospheric Science	M.S., Ph.D.	Environmental Sciences
Ecology and Evolution	M.S., Ph.D.	Ecology, Evolution, and Natural Resources
Endocrinology and Animal Biosciences	M.S., Ph.D.	Animal Sciences
Entomology	M.S., Ph.D.	Entomology
Environmental Sciences	M.S., Ph.D.	Environmental Sciences
Food and Business Economics	M.S.	Agricultural, Food, and Resources Economics
Food Science	M.S., Ph.D.	Food Science
Landscape Architecture	M.L.A.	Landscape Architecture
Microbial Biology	M.S., Ph.D.	Biochemistry and Microbiology
Nutritional Sciences	M.S., Ph.D.	Nutritional Sciences
Oceanography	M.S., Ph.D.	Marine and Coastal Sciences
Plant Biology	M.S., Ph.D.	Plant Biology

5

The evaluation and comparison of graduate programs, especially at the Ph.D. level, is notoriously murky and uncertain. Rutgers is assisted in this process through a subscription to Academic Analytics, a provider of data for research universities. By aggregating markers of scholarly productivity that include publications (articles and books), citations, grants, and awards for individual faculty members across Rutgers–New Brunswick, Academic Analytics generates metrics for departments and graduate programs that can be explicitly compared with data for programs in other research universities. Data are reported in various ways, but one of the most useful is in terms of percentile rank of programs with respect to specific data categories.

A September 15, 2017, survey using Academic Analytics of the scholarly productivity of the 10 Ph.D. graduate programs located within our School provides a snapshot of the current comparative excellence of our programs with respect to the categories of productivity cited above. Eight of our programs are ranked in the 50th percentile or above in all four categories, while endocrinology and animal biosciences ranked slightly below the 50th percentile in only one category (articles) and plant biology ranked below the 50th percentile in citations and only slightly below in grants. Although Academic Analytics provides our only unbiased review of the comparative excellence of programs, it is important to note the deficiencies of this service due to the specific manner in which it accumulates data. Metrics for one category, at least—grants—appears suspect due to systematic underreporting. For example, the grants of one faculty member in the Department of Marine and Coastal Sciences are seriously underreported in the neighborhood of over \$1 million per year.

Since our 10 graduate programs compete internally for Excellence Fellowships (described below), the record of fellowships garnered over the previous five years (AY 2013-17) provides an internal ranking of the ability of programs to recruit high quality students. Over this period ecology and evolution received eight; plant biology seven; atmospheric science, endocrinology and animal biosciences, and oceanography five each; microbial biology and nutritional sciences four each; environmental sciences and food science three each; and entomology one.

Recruitment, Support, and Placement of Graduate Students

Graduate recruitment of M.S. and Ph.D. students is handled locally within each program (and thus within a department) using, unfortunately, limited resources. Consequently, recruitment primarily depends upon programmatic and individual faculty member reputations within the discipline. Graduate students are supported by a mixture of School resources (limited), individual

programmatic resources (even more limited), and faculty grants. School resources include graduate research assistantships and teaching assistantships, both of which provide salary plus full tuition.

The School provides a total of 26 G.A. positions each year; these are distributed as follows:

Nine **Excellence Fellowships** are available to incoming doctoral students in the 10 Ph.D. programs supported through the School; programs compete for potential positions through an internal evaluation conducted by the graduate program directors. Each fellow is offered two years of support (with the second year provided by departmental resources—either a T.A., other, or faculty member grant).

The Institute for Earth, Ocean, and Atmospheric Sciences (EOAS) controls **EOAS fellowships**—17 G.A. lines which are distributed among the four SEBS-based graduate programs affiliated with EOAS (atmospheric sciences, ecology and evolution, oceanography, and microbial biology).

The School also provides 59 teaching assistant lines (in AY17-18) to support undergraduate teaching efforts across the School; T.A. lines are distributed to departments for use in the courses offered within their programs (primarily labs).

School support is not available for students in the two programs—landscape architecture and food & resource economics—that offer only master's degrees.

Financial support for graduate education also includes program grants for graduate education (GANN, IGERT, NIFA, etc.) awarded to specific programs, student-generated support (NSF, HHMI, Fulbright, etc.) as well as research grants to individual faculty (NSF, NIFA, NIH, DOE, EPA, etc.).

University Career Services surveys master's and Ph.D. graduates on a yearly basis with respect to a variety of career metrics: placement, subsequent plans, salaries, etc. Representative data with regard to placement and salary for 2014-16 graduates are included in the following table. Data on individual programs have not been collected.

Table 11: Graduate Placement and Salaries for SEBS Students

Graduate Placement and Salaries for SEBS Students				
Degree	Graduation Year	N	Overall Placement (6 months)	Median Salary
MS	2014	14	79%	\$47,000
	2015	24	85%	\$42,000
	2016	30	97%	\$54,000
PhD	2014	22	91%	\$50,000
	2015	34	85%	\$47,000
	2016	18	94%	\$85,500

Graduate Student Profile

In fall 2016, 428 graduate students were affiliated with the graduate programs at the School, of which 63 percent were females; 65 percent were in doctoral programs; 29 percent were in master's programs; and six percent were non-matriculated. Of the cohort, 66 percent were domestic students and, within those, 73 percent were from the state of New Jersey. As of fall 2016, there were 145 international graduate students at the School from 20 countries, the majority of them from China (90). About 73 percent of the international graduate students were in doctoral programs.

Notes

5

New Jersey Agricultural Experiment Station and Rutgers Cooperative Extension





New Jersey Agricultural Experiment Station and Rutgers Cooperative Extension

An integral part of Rutgers–New Brunswick and the School of Environmental and Biological Sciences is the New Jersey Agricultural Experiment Station (NJAES), the research and extension/outreach (via Rutgers Cooperative Extension) arm of the university established in the tradition of land-grant institutions throughout the country. Even though it supports portions of some faculty lines, the NJAES, in large part, receives no tuition dollars and is funded through federal, state, county, and other sources, as described below.

New Jersey Agricultural Experiment Station

The NJAES is an essential partner of the School of Environmental and Biological Sciences, and it is important to note that the New Jersey state appropriation for the experiment station is a separate item in the state's annual budget. The experiment station provides a diverse range of research, extension, and education programs that serve the people of New Jersey and the urban, suburban, and rural communities in which they live. Through Rutgers Cooperative Extension (see below) offices in all 21 New Jersey counties, our county agent faculty and program staff in youth development, family and community health sciences, and agricultural and natural resources work to serve New Jersey residents in every area of the state. In addition, nine off-campus centers and farms focus on research that supports local agriculture, fisheries, and food-related businesses, and 10 centers on the George H. Cook campus engage in translational research outreach that provides solutions for the problems facing New Jersey residents.

The NJAES was established by the New Jersey state legislature in 1880 as part of Rutgers (and combined with the federal AES system when the Hatch Act was passed in 1887). Since that time, NJAES has been the critical link through which the people of New Jersey gain education, research, and delivery of information on issues relating to food, agriculture, youth development, community and family health, nutrition, and the environment of their state. NJAES has evolved during its 137-year existence, but its mission and goals have remained remarkably stable. It has been and continues to be an engine of economic growth and job creation in the agricultural, food, and environmental sectors of New Jersey's economy. These roles also have driven innovation to meet changing needs and spread the opportunities arising from new technologies, know-how, and products.

The NJAES has two major thrusts—research and extension.

The research arm is responsible for programs focused on economic growth and development, including the Center for Turfgrass Science, the Center for Vector Biology, the Equine Science Center, the nine research and extension farms, and the New Jersey Water Resources Research Institute. The extension arm oversees county extension department heads and chairs of extension departments (family and community health sciences, 4-H youth development, and agriculture and natural resources), as well as the New Brunswick Community Farmer's Market and the Rutgers Against Hunger community service program. County extension agents at Rutgers are tenure track faculty members, and these three departments are tenure homes for their respective faculty.

As is the practice at nearly all state agricultural experiment stations, base funding from state and federal sources along with county salary support for agents and county office staff provides the foundation for the development and delivery of NJAES programs, while competitive contracts, grants, and gifts increase the scope and impact of research and extension programs. NJAES receives minimal funds from tuition (though this is an area of intended future growth) and must not use appropriated funds to support work not related to the experiment station's mission. The NJAES relies increasingly on sources of funds other than legislative appropriations, particularly licensing and royalty revenues and grants and contracts, for its operation. Philanthropy is a relatively new, but promising, focus for future NJAES support and growth.

Unlike all other units at Rutgers, faculty lines in the School may in part be funded with state and/or federal dollars provided to NJAES, carrying with such funding the responsibility of the faculty member to appropriately devote the NJAES-funded portion of their effort on research or extension in accordance with the NJAES mission. We thus operate NJAES as a granting agent, although almost entirely for partial salary support, for a fractional portion of some School faculty members.

The state appropriation to NJAES has been reduced from a high point of more than \$28 million in FY2006 to the FY2011 level of \$20.7 million, which has remained unchanged up to and including FY 2017. The federal appropriation through formula funds has remained relatively stable, totaling \$6.3 million in FY2017. Approximately \$10 million of the state appropriation and \$3 million of the federal Smith-Lever dollars are dedicated to cooperative extension, as is approximately \$6 million from 20 of the state's 21 county governments. These budget lines provide the primary sources of hard line salary support for faculty and staff members associated with NJAES. Most of the total funding to NJAES programs comes through competitive grants and contracts from federal, state, industry, and other sources.

Intellectual property and associated royalty returns are a significant component of the NJAES operation and revenues. From relatively early in its history, NJAES has capitalized on its ability to protect its intellectual property through patents or plant variety protection certificates. We continue to do so, and the result has been that the dollar total of royalty returns to Rutgers (and inventors) from our plant-related properties has traditionally been greater than the total from all other intellectual property at Rutgers combined. NJAES reinvests these funds in programs that expand the scholarship around these properties, in, for example, nutrition, genomics, and host-pathogen interactions projects.

Three farms near the Rutgers New Brunswick campus—Horticulture (Hort) Farms 1, 2, and 3—are used by New Brunswick-based faculty for agricultural research and educational projects. These are discussed in greater detail in the Facilities section of this report.

Major off-campus research and extension facilities maintained by NJAES are the Snyder Research and Extension Farm in Hunterdon County, the Adelphia Turfgrass Research Farm in Monmouth County, the Marucci Blueberry and Cranberry Research and Extension Center in Burlington County, the Cream Ridge Fruit and Nursery Research Center in Monmouth County, and the Agricultural Research and Extension Center in Upper Deerfield Township, Cumberland County. The Marucci and Upper Deerfield farms have resident extension specialist faculty; all of these farms are heavily used by county agent faculty and staff to support their extension activities. A map of these facilities is provided in the Supporting Materials.

Some of the specific areas of strength supported by NJAES funding in academic departments of the School include:

- Marine and coastal sciences (aquaculture, fisheries, ocean processes, Office of the State Oceanographer)
- Environmental sciences (climate and atmospheric processes, water resources, New Jersey weather data networks, Office of the State Climatologist)
- Animal sciences (reproduction, endocrinology, equine science)
- Entomology (integrated pest management, vector biology, urban entomology)
- Nutritional sciences (obesity, lipid and protein metabolism, osteoporosis, community nutrition)
- Food science (microbial food safety, food processing, school lunch program)
- Plant biology (plant breeding, agronomy, turf, bioenergy crops, horticulture and management)
- Biochemistry and microbiology (microbial bioremediation and bioenergy)

- Landscape architecture (urban landscapes, built environments, community and school gardens)
- Ecology, evolution, and natural resources (storm water and ground water management, invasive species, urban forestry, wildlife habitat and management)
- Human ecology (food policy, climate and environmental vulnerability)
- Agricultural, food, and resource economics (land use, farmland assessment, farmland preservation, resource economics).

Among the NJAES programs that are implemented through organized interdisciplinary centers and are particularly strong are:

- Equine Science Center brings together faculty with an interest in research and education focused on better care of horses and the sustainability of the \$1 billion horse industry in New Jersey.
- Center for Turfgrass Science provides a broad range of basic and applied research and education on turf and other grasses and conducts a training and outreach program for golf course superintendents and others in the “green industries.”
- Haskin Shellfish Research Lab in Cumberland County is the NJAES center for research on the genetics and diseases of shellfish, with particular strengths related to oysters.
- Aquaculture Innovation Center in Cape May County serves as a research and business program incubator for the growing aquaculture and fisheries industries in southern New Jersey.
- Food Innovation Center in Bridgeton, Cumberland County, is a unique business incubator with complete industrial kitchen facilities and offices to assist stakeholders in developing novel food products and plans to launch related businesses.
- EcoComplex in Burlington County serves as the focal point for application-driven energy projects at NJAES.

Rutgers Cooperative Extension

Rutgers Cooperative Extension (RCE) helps the diverse population of New Jersey adapt to a rapidly changing society and improve their lives and communities through an educational process that uses science-based knowledge. Through its programs, RCE aims to enhance the quality of life for residents of New Jersey and brings the wealth of knowledge of the state university to local communities.

RCE’s goals are to ensure healthy lifestyles; provide productive futures for youth, adults, and communities; enhance and protect environmental resources; ensure economic growth and agricultural sustainability; and improve food safety and nutrition. The program areas for cooperative extension include economic growth and agricultural sustainability, climate-smart agriculture and fisheries, healthy lifestyles, human and community development, environment and natural resources, food safety, and nutrition.

The extension programming is created and implemented by county agents (faculty) with tenure homes in one of three extension departments: 4-H youth development, agriculture and natural resources, and family and community health sciences. A master’s degree in appropriate discipline areas is required for faculty members of these departments (although in recent years faculty openings in these positions increasingly attract holders of doctoral degrees) and promotion and tenure decisions are based on excellence in the criteria of extension practice, teaching, and service.

Faculty members with appointments as county agents are required to concentrate their primary efforts on extension practice; that is, the application of knowledge to the needs of the community.

Extension practice is typically demonstrated by interpretation of research results, identification of ways of applying research, achieving the adoption of improved practices by client groups, participation in the design and execution of applied research in the laboratory and in the field, identification of problems requiring investigation by researchers, and attraction of appropriate external support or awards.

A description of the extension departments' responsibilities follows:

- 4-H Youth Development focuses on educational outreach and enrichment programming for youth in grades K-13 through 4-H clubs, special interest programs, school enrichment, and after school child care education programs. It emphasizes science education and the expressive arts through a learn-by-doing approach to teach responsibility, community awareness, and character development. The program reaches 50,000 members in New Jersey and 2,000 adult volunteers, with more than 200 volunteer hours each, valued at more than \$11 million annually.
- Agriculture and Natural Resources assists commercial farms and fisheries, governmental agencies, agribusinesses, and residents with information, field research, and consultation on various issues related to agriculture, fisheries and aquaculture, environmental issues, natural resources management, and integrated pest management. It manages the Master Gardener and Environmental Steward programs and runs rain barrel and rain garden workshops, pesticide applicator recertification, and horticultural therapy.
- Family and Community Health Sciences emphasizes nutrition education, well-being, exercise, and fitness to improve quality of life and reduce health care costs. Its faculty and staff partner with schools, civic organizations, municipalities, state agencies, and families.

The **Office of Continuing Professional Education (OCPE)**, housed within Rutgers Cooperative Extension, provides programs, classes, and certificates around a broad range of topics, including workforce development, turf management, beekeeping, food safety, and pest management. Also part of OCPE are the Youth Employment and Education Success Centers in Camden and Newark and the Youth Success Network in Ocean County. These connect adjudicated youth to school and employment opportunities. More than 28,000 New Jersey residents each year take classes and attend other programs offered by OCPE.

Another important program of extension, the **Expanded Food and Nutrition Education Program (EFNEP)**, helps limited-resource families and youth improve their eating behaviors and contributes to other personal development skills through behaviorally focused nutrition education. The program is administered by RCE and is supported by USDA's National Institute of Food and Agriculture (NIFA) Smith-Lever funds. The desired outcomes of EFNEP education are improved diets and nutritional welfare; increased knowledge of the essentials of human nutrition; increased ability to select and buy food that satisfies nutritional needs; improved practices in food production, preparation, storage, safety and sanitation; and increased ability to manage food budgets and related resources, such as food stamps. EFNEP programming in New Jersey follows the USDA's EFNEP teaching model; i.e., it provides nutrition education through paraprofessionals who are peer educators indigenous to the target population.

Partnerships





Partnerships

Partnerships at our School include a wide range of activities that have been addressed in previous sections of this report or will be addressed in future sections. Our School collaborates at various levels with the university organizational structure and with other institutions of higher education, governmental agencies, non-governmental organizations, and private sector corporations and foundations in New Jersey and around the world. Such collaborations arise from individual faculty and staff members interacting with their colleagues, whether it is in connection with shared research interests or common educational goals for their students. When applicable and advantageous to our School and the partner, collaborations are formalized in officially sanctioned written documents by the appropriate entities, such as Rutgers University or the Rutgers University Foundation.

Intellectual Property

As also discussed, intellectual property and associated royalty returns are a significant component of the SEBS/NJAES research portfolio, and these are largely, but not exclusively, associated with our plant breeding programs. As previously noted, from relatively early in its history, SEBS/NJAES has capitalized on its ability to protect its intellectual property. We continue to do so, and the result has been that up until the acquisition of the medical school as an arm of Rutgers University, the dollar total of royalty return to Rutgers (and to inventors) from our plant properties was greater than the total from all other intellectual property at Rutgers combined. The funds that are returned to SEBS/NJAES are reinvested into the breeding programs and into programs that expand the scholarship around these programs, in, for example, nutrition, genomics, and host-pathogen interactions projects. The university Office of Research Commercialization is generally responsive and flexible, and aims to facilitate faculty entrepreneurship.

Relationship with RBHS, Rutgers–Newark, and Rutgers–Camden

The School of Environmental and Biological Sciences encourages and supports faculty research, instructional, and outreach partnerships with the other chancellor-led units at Rutgers. These are most well developed with Rutgers Biomedical and Health Sciences in areas such as microbiology, microbiome studies, environmental toxicology, public health, molecular biosciences, drug discovery and development, cancer research, nutritional sciences, and nutrition education. With Rutgers University–Newark, we have partnerships in ecology and evolution, entomology, marine sciences, business, alternative energy, climate sciences, and community gardens/urban agriculture. The partnerships with Rutgers University–Camden include environmental law, community gardens/urban agriculture, biostatistics and computational biology, and urban entomology. Illustrative examples of each are presented below.

Rutgers Biomedical and Health Sciences

We are well along in faculty recruitment and infrastructure investment to build a robust center of excellence in the studies of the human microbiome. As we do so, we maintain close communications with the RBHS chancellor, the new dean of the School of Public Health and the deans of the two Rutgers medical schools. Our shared goal is to build at Rutgers a broad program that will cover the spectrum of fundamental science, translational sciences, and clinical medicine.

Both our School and RBHS have a Department of Nutritional Sciences (at RBHS, nutritional sciences is found in the School of Health Professions). As discussed previously, while bearing the same names, the departments are quite distinct in their programs and expertise, reflecting their very different origins within UMDNJ and legacy Rutgers. The RBHS program is highly clinical in focus, whereas our School's program has a dual focus, one in basic research (strengths in lipid research, amino acid metabolism, one-carbon biochemistry, and vitamins) and in community

nutrition, reflecting the land-grant mission of outreach to families, communities, schools, and local government and state agencies. The two departments share a history and focus on education in the dietetics profession, which is undergoing external changes driven by evolving accreditation considerations. This external challenge, together with the merger of UMDNJ and Rutgers, have driven attempts to develop a new “One Nutrition” partnership, with the vision of a coherent yet multiple educational pathways for students to pursue undergraduate, graduate, professional and clinical careers, taking full advantage of what both programs have to offer. This is a work in progress, to which the deans of the two schools are fully committed.

In a related area, the Institute for Food, Nutrition, and Health (IFNH) has joined forces and resources with the Child Health Institute of New Jersey, a program of the Rutgers Robert Wood Johnson Medical School, to launch a signature program called the New Jersey Healthy Kids Initiative (NJHKI). This initiative was launched with a planning grant obtained from the Robert Wood Johnson Foundation Special Contribution Fund of the Princeton Area Community Foundation and is the basis of a recently submitted multimillion dollar grant proposal. The NJHKI will provide the leadership and organizational infrastructure to oversee an integrated matrix of activities that have the collective goal of improving the health of children in New Jersey. The driving premise of the research program is that there exists a constellation of biological endpoints or biomarkers that can provide new and actionable ways to modify untoward obesogenic trajectories during the early years of childhood. Specifically it is hypothesized that the powerful science of metabolomics can be leveraged to reveal these biomarkers. Metabolomics is the technology of choice as it offers information on a person’s metabolic health, nutrient intake, and exposure to environmental xenobiotics. After establishing a reference metabotype for healthy children, the IFNH will launch a child cohort study called the New Jersey Growth and Nutrition study that includes metabolomic profiling, body composition, fitness testing, nutrition, and healthy lifestyle counseling.

Rutgers University–Newark

Most of the interactions between our School and Rutgers–Newark are at the individual faculty level. In entomology, for example, research collaboration and teaching are shared with a member of the faculty from the Department of Biological Sciences in the Faculty of Arts and Sciences–Newark. In landscape architecture, faculty have arranged for a cross-listed course on ecological history between landscape architecture and Rutgers–Newark’s biological sciences as well.

In addition to individual efforts, there are some promising larger collaborations underway. As mentioned earlier in this document, the Rutgers Raritan River Consortium includes collaboration with Rutgers–Newark Meadowlands Environmental Research Institute, a multimillion dollar ecology think tank presented to Rutgers–Newark in 2016 from the State of New Jersey. Faculty from the School’s Department of Marine and Coastal Sciences and Rutgers–New Brunswick’s Department of Biology anchored joint expeditions to the Ross Sea Antarctica through externally-funded programs. In addition, a proposed urban open space education and management program shared between Rutgers–Newark and Rutgers–New Brunswick, in partnership with the Branch Brook Park Alliance, will provide engaged courses, internships, and service opportunities.

Rutgers University–Camden

Rutgers–Camden has three notable strengths that intersect with our School. In computational biology, we share an adjunct faculty appointment with a computer scientist who is also engaged in cooperation and teaching at New Brunswick. In the area of Rutgers Law, the Camden School of Law has appointed a member of our Department of Human Ecology to a courtesy position, and she teaches environmental law courses at Camden as well as at New Brunswick. There is also a strong program at Camden in child development, which offers an as yet unfulfilled opportunity to link more closely with the work we do in childhood nutrition education through the New Jersey Institute for Food, Nutrition, and Health.

One strong and longstanding linkage between Rutgers–Camden and our School is the Pinelands Research Station, led by Dr. John Dighton who has a 50/50 joint appointment between the Department of Biology at Camden and the Department of Ecology, Evolution, and Natural Resources in our School. The Pinelands station is also supported in information technology from our School, which also appoints and supports its lab director. The work of the Pinelands station is in forest ecology and soil microbial processes. Faculty from Rutgers–Newark also conduct research and instruct graduate students at the Pinelands station.

Notes

Facilities, Infrastructure, and the Campus Community Experience





Facilities, Infrastructure, and the Campus Community Experience

Faculty and staff at the School of Environmental and Biological Sciences and the New Jersey Agricultural Experiment Station have access to the most diverse facilities of any school at Rutgers and in New Jersey. The School is centered on the George H. Cook campus, which was purchased with funds obtained from the sale of the original land granted to the state of New Jersey following the Morrill Act of 1862. Buildings and facilities housing the 12 academic departments, the leadership of the three extension departments, and most programs at SEBS are located on the Cook campus. The total building area charged to the School and NJAES is just over 1 million square feet, approximately one-quarter of the total for the university.

George H. Cook Campus

The George H. Cook campus, which began as the Rutgers College Farm, has a pleasant, open feel with trees and lawns framing its low density buildings. Passion Puddle and the central lawn form the iconic core of the historic campus. The older buildings that represent the core, including Waller, Martin, Old Blake, Bartlett, Thompson, and Lipman halls, were built in the first half of the 20th century and present maintenance issues expected from older structures. Most recent major additions to the campus infrastructure include Foran Hall, the largest research laboratory space on the campus, and the Institute for Food, Nutrition, and Health, an open-plan multi-use space.

Three farms near the campus, Horticulture (Hort) Farms 1, 2, and 3, are used by New Brunswick-based faculty for research and education projects. Hort Farm 1 includes Rutgers Gardens and also houses the ornamental tree breeding programs; Hort Farm 2 is operated for and maintained primarily by turfgrass research programs; Hort Farm 3 is a multi-use facility that includes greenhouse space for several of the plant breeding programs. Hort Farm 3, in particular, will require infrastructural investment over the next few years to replace several obsolete greenhouses and farm buildings. These facilities are key to delivery of programs such as the agricultural and food systems major and other programs for new farmers. The Cook campus large animal farms also are located in the same general vicinity.

There are a number of “special places” on or near the main campus that serve both the SEBS and the surrounding communities:

Rutgers Gardens is a 200-acre public garden that serves education, research, and outreach functions. Its role has evolved from breeding research and ornamental tests when it was Hort Farm 1 to now include children’s gardens and programs, horticultural displays, a weekly farmers market, and an active internship program. The Gardens includes the adjoining 70-acre Frank G. Helyar Woods, an old-growth forest.

The **Student Sustainable Farm**, established in 1993 at the Hort Farm 3 research farm, moved in 2015 to the nearby Rutgers Gardens so as to increase educational opportunities and community involvement. The farm functions as an outdoor classroom that offers a sequence of interdisciplinary place-based and hands-on courses on small-scale organic production throughout the year. Produce grown is sold to Rutgers Dining Services, at the two Rutgers-supported farmers markets, and donated to Elijah’s Promise, a New Brunswick soup kitchen.

The campus has two greenhouse facilities. The **Research Greenhouse** on the Cook campus is a center for basic and applied research in the agricultural and natural resource sciences that supports a diverse group of faculty from Rutgers as well as visiting researchers from universities around the world. The facility contains more than 27,000 square feet of usable greenhouse space and 14 environmental chambers for controlled-environment studies. Within the facility is a containment greenhouse wing consisting of six individual greenhouse zones for advanced research. Additionally, the **Floriculture Greenhouses**, located on the Cook/Douglass campus features a 4,600-square-foot tropical plant collection used by more than 15 classes conducted by the Department of Plant

Biology and provides teaching environments for students in ecology, evolution, and natural resources, landscape architecture, general biology and the Mason Gross School of the Arts. The facility includes a classroom, a second greenhouse for class experiments, and outside raised beds used to demonstrate various gardening techniques. Each year the Floriculture Greenhouses host the poinsettia trials, giving the public and growers the opportunity to see new cultivars.

The Bartlett Hall **Animal Care Program** is a service unit within NJAES and SEBS, registered with the USDA and adhering to the regulations set forth in the USDA Animal Welfare Act. It has an animal care and use assurance statement filed with the Public Health Services Office of Laboratory Animal Welfare (OLAW). The Rutgers University Animal Care and Facilities Committee and the vice president for research provide internal regulatory oversight. The Animal Care Program director and supervisory staff assist faculty and students with their research planning and provide information for animal-related needs. The animal care supervisory staff also is actively involved with teaching the animal sciences practicum offered through the Department of Animal Sciences. Students are assigned to work in the animal facilities alongside the supervisory staff with an emphasis on hands-on learning.

The **Cook Organic Community Garden**, a 30,000-square-foot facility divided into nearly 80 plots, serves nearby residents and students with space to garden. A recently renovated hoop house is being used by community organizations experimenting with urban agriculture. It is located behind the Environmental and Natural Resource Sciences Building on the Cook campus.

The **New Brunswick Community Farmers Market** serves as an outlet for healthy food choices for both students and the New Brunswick community. It operates during the summer and early fall in three locations weekly on a rotating basis: Tuesdays and Saturdays on Jones Avenue adjacent to the Cook campus, Wednesdays in downtown New Brunswick, and Thursdays on Nichol Avenue on the Cook campus. Local farmers and food vendors offering healthy food options supply the produce and goods. At most locations, vendors accept federal food assistance benefits for allowable items. This is one of two farmers markets operated by the School; the other is the Rutgers Gardens Farmers Market, officially called Cook's Market.

The New Brunswick Community Farmers Market also houses the **Jardín de Esperanza** community garden on its Jones Avenue site. It includes approximately 50 raised beds available to community members for annual rental, as well as urban agriculture demonstration spaces that include a heated greenhouse, two unheated hoop houses, composting areas, and drip irrigation and rainwater collection systems, all contributing to vegetable, fruit, and flower production. It also supports a small flock of laying hens, producing eggs on site.

The School will soon be home to a new **Makerspace**, through an agreement with the Rutgers Division of Continuing Studies to establish an advanced manufacturing and prototyping facility for the educational and entrepreneurial benefit of Rutgers students, faculty, staff, and the surrounding communities. The facility will be located in the former New Jersey Museum of Agriculture, a 30,000-square-foot building on the G.H. Cook campus next to Route 1, a major north-south traffic artery in central New Jersey, and will support our evolution into a 21st century land-grant institution through integration of the Makerspace into the academic course work, faculty research, and independent student research of the School at all levels. This fully equipped Makerspace will support independent research activities throughout Rutgers–New Brunswick, additional existing and planned disciplinary-focused Makerspaces (including an existing Makerspace for large scale fabrication within landscape architecture, and a planned Makerspace on environmental sensors within marine and coastal sciences), as well as the potential for individual and group production and prototyping projects that add an experiential component to a standard lecture course.

In addition to these facilities, the School is currently engaged in efforts to identify and support additional ways in which the Rutgers–New Brunswick campus and its surrounding landscape can be used as a classroom and/or a living lab for experiential learning. These efforts include the Rutgers Collaborative for Raritan Education and Observation to integrate the Raritan River and its

watershed into the curriculum as a laboratory for ecological, environmental, estuarine, historical, and even sociological studies of New Jersey's relationship to its largest river system. This initiative includes the recent acquisition of the *RV Rutgers*, a 37-foot shallow-draft research vessel capable of carrying 20 students as a floating laboratory, as well as an innovative partnership with Rutgers Recreation that will safely put students on the river in kayaks and canoes to enable environmental studies of the entire river basin and its tributaries. In other areas, work is being done to effectively use the Cook/Douglass campus as a laboratory for environmental and agricultural studies. As noted previously, recent developments include a community garden near the EENR building on the G.H. Cook campus as well as a student farm in Rutgers Gardens on nearby Ryders Lane.

Off-Campus Facilities

A number of SEBS and NJAES-associated facilities are physically separate from the Cook campus. These include research farms, marine facilities on the Atlantic Coast and the Delaware Bay, business incubator facilities, and county extension offices throughout the state (see the map in the Supporting Materials). The property occupied by the school and experiment station around the state totals approximately 2,230 acres, which represents more than one-third of the entire university footprint. Off-campus facilities are discussed under New Jersey Agricultural Experiment Station (Section 6) and a summary is provided in the Supporting Materials.

The Lived Experience on the Cook Campus

Much of the lived experience at Rutgers–New Brunswick is shaped by its structure of five geographically dispersed and culturally distinct campuses: College Avenue, Livingston, Busch, Douglass, and Cook (often described together as Cook/Douglass). To address the perceived lack of overall legibility and to build a stronger cohesive sense of purpose, the Rutgers 2030 Master Plan has reframed the campus structure into four districts, each with an entry point transit hub surrounded by the most intensively used academic and social elements. The plan conceptually links Cook and Douglass as one campus. Each has a rich historical legacy—the Cook campus began in 1864 as the Rutgers Scientific School and maintains its farmland character, while wooded Douglass campus began in 1918 as the New Jersey College for Women—and shares the landmark Passion Puddle at their intersection. The Cook campus makes up the physical home of the School of Environmental and Biological Sciences while Douglass includes a large presence of Mason Gross School of the Arts and SAS teaching and office space.

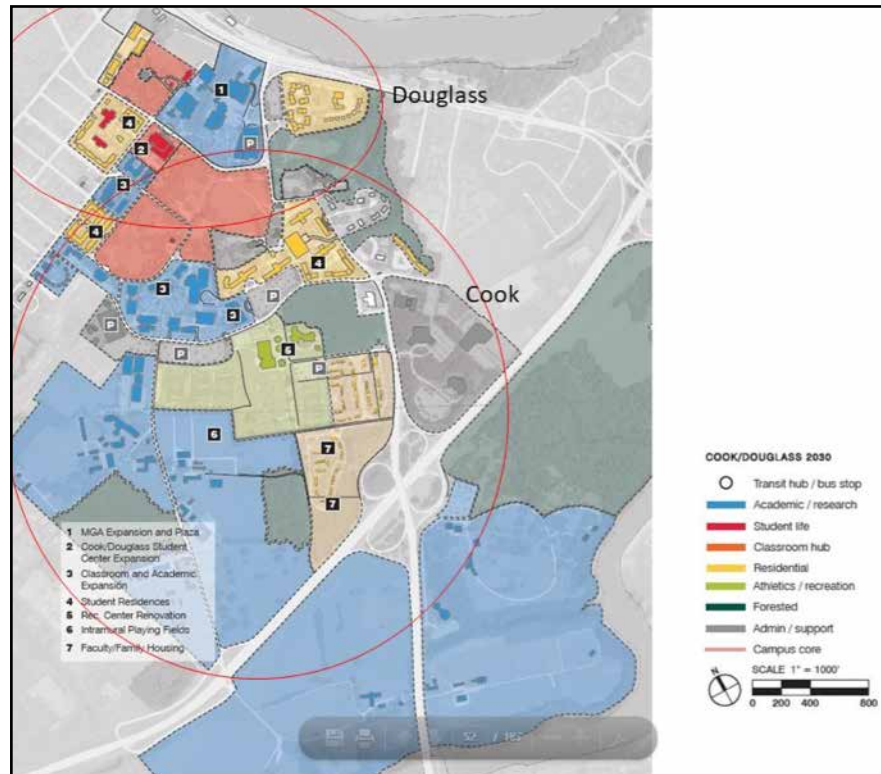
Conceptually, Passion Puddle is the “heart” of the Cook campus—it is the major open space on the campus, it is at the center of the main circulation road, and it is the site of graduation and many other social celebrations on campus. Increasingly, the Institute for Food, Nutrition, and Health has become a hub of activity due to its Harvest café, student health services, and lectures and events that occur in the building. Classrooms, office space, and labs intermix in campus academic buildings in the academic core, with student housing, recreation, farm research fields, and Rutgers Gardens stretching to the south. While many of the School's activities focus on the Cook Student Center, the Douglass Student Center is also a hub for social life. Students and faculty have access to the Cook/Douglass Recreation Center, a fitness center and gym with a 25-meter pool, meeting spaces, and indoor and outdoor courts for a variety of sports.

Although daily life on campus is largely dominated by laboratory and classroom activities, overall there is a strong sense of community. The Cook community spirit is best expressed in the planning and experience of our annual Ag Field Day/Rutgers Day, a large, public open house event every April that attracts upwards of 20,000 visitors and features departmental and club displays, 4-H animal fairs, farm tours, plant sales, games, and food. Through the efforts of the Cook campus dean, students are encouraged to participate in extracurricular intellectual and social engagement opportunities, including lectures, film discussions, science “cafes,” fieldtrips, and receptions.

Residential Life

SEBS undergraduate students may live on any of the five Rutgers–New Brunswick campuses. Options include large residence halls, suites with shared kitchens and living rooms, and garden-style apartments. Cook campus residential facilities include:

- Helyar House - a cooperative housing option serving 40 students
- Newell Apartments - garden-style apartments built in 1973 serving 992 students
- Nicholas Hall - a traditional residence hall built in the 1960s serving 235 students
- Perry Hall - a traditional residence hall built in 1986 serving 175 students
- Starkey Apartments - built 1979 serving 384 graduate students
- Voorhees Hall - a traditional residence hall built 1976 serving 225 students



Douglass also has a number of residence halls, including several women-only options. Designated first-year honors students may opt to live in the newly constructed Honors College on the College Avenue campus. The most recent campus housing options are on the Livingston and College Avenue campuses and tend to be favored by students over the much older accommodations on Cook/Douglass.

Students who live in residence halls buy meal plans that can be used at any of the Rutgers Dining Services facilities, including the Cook campus Neilson Dining Hall, the Knight Wagon mobile truck that frequently parks on campus, the student center cafes, Harvest at IFNH, and certain other retail cash locations.

Student Transportation, Mobility, and Safety

Rutgers is unusual among land-grant institutions in its geographic and physical complexity. Within Rutgers–New Brunswick, most of the five campuses are geographically separate, the only exception being the G.H. Cook campus as adjacent to the Douglass campus. Because of the geographic and physical expanse and complexity of Rutgers, transportation among the various units often represents a greater challenge than at peer institutions.

In recent years, many improvements have been made to the Rutgers University transportation services available for faculty, staff, students, and visitors. There are additional plans for future developments that will further improve functionality, safety, and communication. For example, additional bike paths and bus routes are needed to help students get from the main Cook campus

to Rutgers Gardens and Horticultural Farms 1, 2, and 3. These locations are currently accessible safely only by car. One of the primary objectives for further advances is to reduce driving where possible in an effort to address parking limitations, increase environmental sustainability, and promote travel time efficiency.

Bicycle: There has been more encouragement of bicycling as a preferred mode of transportation in recent years. BikeRU is a campuswide initiative from the Rutgers University Department of Transportation Services (RUDOTS) to create a more bicycle-friendly university. This initiative includes a bicycle rental program, bicycle locker rental program, and bicycle repair stations. RUDOTS recently updated the BikeRU campus bicycle maps for the Livingston, Cook, Douglass, Busch, and College Avenue campuses.

Bus: The Rutgers–New Brunswick/Piscataway inter-campus bus and shuttle system is a service provided by RUDOTS for all five campuses. It is available at no cost to all members of the university community. In addition to several regular bus routes, there is also the New BrunsQuick Shuttle, the Knight Mover (which provides individualized service when buses are not running from all Rutgers–New Brunswick/Piscataway campuses), and a Library Shuttle service (which loops the Cook/Douglass campus, providing transportation to and from the residence halls and the Mabel Smith Douglass Library, with stops at all regular bus stops on Cook/Douglass campus). Route maps, route schedules, and summer schedules are available online and estimated arrival times are available through NextBus, an online application available for mobile download on smart phones.

Car: All five New Brunswick/Piscataway campuses are accessible by car. Parking is available to those who purchase permits for specified lots through RUDOTS. Most students, faculty, and staff purchase a permit for only one designated lot and, therefore, rely on the bus and bike systems to travel from campus to campus for classes, meetings, and events. In recent years, additional parking has been constructed. On the College Avenue campus, there is now a parking garage where a single-level lot once was located. On the Livingston campus, there is an expanded parking lot covered by solar panels.

Safety and Security on Campus: Public safety efforts include high-visibility patrols by the Rutgers University Police Department (RUPD); responding to and investigating on- and off-campus incidents; providing comprehensive policing, fire safety and security services; and increasing student and employee awareness through crime prevention seminars, workshops, and other activities. RUPD works closely with New Brunswick, Middlesex County, and state authorities in the investigation and prevention of crime. It issues an annual “Safety Matters” security report to the Rutgers community, as required by federal law.

On the Cook campus, the Rutgers University Mounted Patrol Club is the only student-run horse mounted unit in the nation. It is part of a larger program known as Community Service Officers (CSOs), full-time students—uniformed, but unarmed—who have chosen to work for RUPD. The mounted officers patrol on horseback and notify police of suspicious persons or activities.

Notes

Planning and Budget





Planning and Budget

The university recently converted to a Responsibility Center Management (RCM) budgeting model. In the RCM model, revenues are credited to the responsibility center (schools, research centers, and auxiliary units) that generate them. Each unit is financially responsible for its activities and held accountable for direct and indirect expenditures, with strategic investments by academic leadership to advance the university and local/regional support units. Many public and private universities have converted to the RCM model, including several of Rutgers' peers in the Big Ten (University of Michigan, University of Minnesota, Indiana University). The recently completed fiscal year (FY17) was the second budget year under the RCM model.

Appropriations from the State of New Jersey to Rutgers University are distributed to the four chancellors of Rutgers University (Rutgers–New Brunswick, Rutgers–Camden, Rutgers–Newark and Rutgers Biomedical and Health Sciences). The Chancellor–New Brunswick, in turn, allocates funds to the individual schools and units of the New Brunswick campus. This allocation is based partially on a combined metric of student FTEs (full time equivalents) and research activities for the School. The remaining portion of this allocation is a discretionary subvention and is based on projected actuals from the prior year and the net amount of funds the School itself has available to fund direct expenses.

The level of subvention, accuracy, and appropriateness of cost pool methodologies and allocations and proper recognition of revenue generation continue to evolve as the university refines the RCM methodology. The School has taken a very active role in working with the university's financial administration team to make RCM an accurate and effective tool to inform academic decision-making. This continues to be a work in progress.

The school expenses are primarily in the category of general operating, which includes salary and fringes (\$68 million). The school is responsible for paying into several cost pools that include general administration, academic and student support, libraries, research support, information technology, facilities, public safety, and utilities. There also is a cost pool covering debt service.

The leadership of the School meets on an annual basis with the Chancellor–New Brunswick to present the School's annual planning report, which is reviewed within the context of the overall university mission and strategic priorities. In order to prepare for this, the school has an established process that engages departments and programs in annual planning that is then incorporated into the School's plan.

Table 12: Revenue—Fiscal Year 2017

FY2017 Revenue (as of October 30, 2017)				
	School		NJAES	
	Unrestricted	Restricted	Unrestricted	Restricted
Description	Actual	Actual	Actual	Actual
Educational and General	\$81,898,511	\$499,864	\$65,310,054	\$3,907,177
Endowment	\$87,805	\$2,010,148	\$663,134	\$479,077
Contributions & Gifts	\$0	\$522,441	\$27,251	\$1,125,737
Grant & Contract	\$27,712	\$12,957,822	\$47,843	\$47,600,678
Total by category	\$82,014,028	\$15,990,275	\$66,048,282	\$53,112,669
TOTAL	\$98,004,303		\$119,160,951	

Table 13: Reserves—Fiscal Year 2017

FY2017 Reserves				
	School		NJAES	
	Unrestricted	Restricted	Unrestricted	Restricted
Description	Actual	Actual	Actual	Actual
Capital Reserves	\$946,133	\$451,368	\$960,624	\$146,008
Endowment	\$2,874,174	\$22,859,023	\$13,426,529	\$9,473,936
Contributions & Gifts	\$0	\$2,679,744	\$0	\$8,451,570
General Operating	\$5,649,557	\$0	\$26,685,627	\$0
Total by category	\$9,469,864	\$25,990,135	\$41,072,780	\$18,071,514
TOTAL	\$35,459,999		\$59,144,294	

The Office of Planning and Budgets supports the executive dean of agriculture and natural resources in the strategic management of all resources for School of Environmental and Biological Sciences and the New Jersey Agricultural Experiment Station and ensures efficient and effective utilization of all funds to best support the goals of the School and the experiment station. This includes strategic planning and developing, coordinating, and implementing procedures for the creation, control, and reporting of both units' budgets. These budgets include state and federal appropriations, tuition revenues, and all other resources.

The Office of Financial and Business Administration serves as the central financial office for the School and NJAES. This office's primary function is to facilitate accurate and appropriate processing of financial transactions through the central university controller's office. The business office also is charged with the responsibility for protecting the assets of the School and experiment station, providing fund and cash management functions, and interpreting financial policies and procedures.

These offices together are responsible for implementing, adjusting, and monitoring the School budget as well as the budget of the New Jersey Agricultural Experiment Station and its federally-mandated regulations, restrictions, and reporting requirements associated with federal formula funds and sponsored programs.

Department and program leadership typically begin their planning process in January. With a two- to three-year progressive timeline, chairs submit a plan that includes highlights, progress towards goals, new or ongoing initiatives, tactics for enhancing revenue and reducing operational costs, and other considerations in planning for the subsequent two- to three-year period. Chairs and directors meet with the director of the Office of Planning and Budget to review each unit's expenditures and revenues and to facilitate planning for the coming fiscal year. Course offerings, personnel actions, strategic hires, and new programs are discussed and developed with the goal of enhancing unit revenues while also closely monitoring expenses. These meetings ultimately contribute to the creation of a bottom-up budget for the unit. Although permanent faculty and staff salaries are "above the line" and not included in department or program budgets, chairs and directors use this process to provide information on anticipated promotions and faculty and staff needs.

The budget of the School is then built up from the departmental budget submissions while working within parameters set by the university. For example, the university has currently set a cap on the number of first-year undergraduate admissions that the School may accept, limiting the amount of tuition revenue that may be projected.

Advancement





Advancement

The Division of Advancement coordinates the external affairs for the School of Environmental and Biological Sciences and leads the efforts to secure philanthropic resources that will enhance the mission of the School.

Advancement brings together the offices of Alumni and Community Engagement, Communications and Marketing, Philanthropy and Strategic Partnerships, and Government Relations into a team whose primary purposes include building enduring relationships with its constituents and generating diverse resources that facilitate the School's academic, research, and public service excellence through the integration of communications; alumni, community, and government relations; and development. These efforts are supported by the School's bylaws, which provide for a Faculty Diversity, Communication, and Philanthropy Committee to assist in establishing priorities for philanthropy and development. Working together, the Division of Advancement raises the profile of the School, promotes its outstanding reputation, and reaches its strategic goals.

Among the 10 universities that have agricultural colleges within the Big Ten, the majority of advancement or development offices include both fundraising efforts and alumni affairs. However, the advancement model is new to Rutgers University and is the result of a decision two years ago by the executive dean to strategically realign several functions at the School in order to better serve its constituencies and secure resources for the School. The Division of Advancement supports both the School and the New Jersey Agricultural Experiment Station.

Alumni and Community Engagement

The approximately 32,000 living alumni (both undergraduate degree-holders and those with advanced degrees) of the School of Environmental and Biological Sciences advance the legacy of a Rutgers education through their occupations, their service to their communities, their ideals and values, their loyalty to their families and others, and their enjoyment of life and leisure. As the mission of the School is to prepare individuals for lifelong learning, discovery, and service to society, this goal is amply demonstrated by its graduates. Learned microbiologists, environmentalists, plant scientists, pharmaceutical researchers, physicians, veterinarians, dentists, dieticians, oceanographers, food professionals, lawyers, educators, writers, accountants, corporate executives, and men and women in many other fields improve lives for those around them. Notable alumni highlights are provided in the Supporting Materials.

The purpose of the Office of Alumni and Community Engagement is to engage graduates in a variety of activities on campus and regionally, including encouraging them to volunteer for university-wide boards and committees; to promote their achievements where appropriate and, thereby, underscore the value of the School's educational excellence; and to keep alumni informed on a regular basis (via the monthly *Discovery* newsletter) about news of the School, its faculty, students, staff and fellow alumni. The office also strives to connect stakeholders with the School where their interests align with the programs of the School. The office also provides the editorial functions for the School's semi-annual magazine, *Explorations*, and the monthly electronic newsletter, *Discovery*.

Several advisory boards and committees exist to provide feedback and counsel to departments and units within the School. They include the Food Science Advisory Council; Landscape Architecture Alumni Advisory Committee; Institute for Food, Nutrition, and Health External Advisory Board; and Rutgers Gardens Advisory Board.

Due to its history, the School also has a chartered alumni group, the Cook Community Alumni Association (CCAA), related to the Rutgers University Alumni Association (RUAA), which serves more than 470,000 alumni and more than 130 diverse charter groups around the world. The

CCAA's purpose is the promotion and perpetuation of amity among its members, graduates, students, faculty, and staff while engaging in, promoting, and sponsoring activities in support of the educational and social goals of Cook College (and its successors) and graduates from the George H. Cook campus.

Across the country and internationally, our alumni are honored by their professional associations, civic organizations and other groups. News of these achievements is published in the thrice-yearly Rutgers magazine and in the biennial *Explorations*, the school's magazine for alumni, donors and friends. Arguably, the most notable alumnus is the late Selman Waksman, who received his B.S. in 1915 from the College of Agriculture and his M.S. in 1916. Waksman was a prominent faculty member and researcher who was awarded the Nobel Prize for Physiology or Medicine in 1952 for his work that led to the discovery of streptomycin, the first antibiotic effective against tuberculosis.

Communications and Marketing

The Office of Communications and Marketing collaborates with faculty, staff, and its colleagues across Rutgers to meet the wide-ranging communication needs of the School and experiment station. It utilizes organizational information in multiple formats, venues, and media. These include:

- Marketing, promotion, and recruitment materials
- Website design, development, hosting, and support
- Graphic design and printing
- Legislative and advocacy efforts
- Executive Dean's Office communications (speeches and presentations)
- Departmental identity, awareness, and branding
- Reports (annual reports, monthly and topic/audience-specific)
- Event planning
- Public and media relations
- Publication development (fact sheets, newsletters, curricula, reports, etc.)
- Social and digital media (Facebook, Twitter, You Tube and various newsletters)
- Photography and videography
- Branding and visual identity management

The office works closely with the various academic, research, and extension departments and units to find the right communication tools and vendors to meet their specific goals and stay within budget.

The office strives to keep both its internal and external audiences well informed about initiatives of the School and experiment station through the wide-ranging, active online Newsroom; several publications, including the experiment station annual report; production management of *Explorations*; and organization of major campus-wide events, such as the annual Rutgers Day/Ag Field Day in the spring.

Another critical function of the Office of Communications and Marketing is its work to improve the accessibility of all of its websites to better comply with federal American with Disabilities Act accessibility regulations, university requirements, and current accessibility best practices to ensure that websites are available to the widest range of users regardless of ability.

Thanks to our long-standing attention to accessibility issues, many of our websites are currently far ahead of the curve compared with other Rutgers sites. Our goal is to bring all of our websites into compliance with the Rutgers Accessibility Checklist, which will be updated over time with progressively stronger accessibility requirements. That means that this is not just a one-time update to each site—it will be a continually evolving process that will become an integral part of the web team's core mission.

Philanthropy and Strategic Partnerships

Every year, the School receives an average of 2,500 gifts from individuals, corporations, and foundations. Over the past five years, the School's average of cash, pledges, documented bequests, and gifts-in-kind has been \$9.5 million, and the Rutgers University Foundation (RUF) total has been almost \$143 million. The School's endowment stands at just over \$45 million, and the Rutgers University Foundation endowment's market value as of June 30, 2016, was approximately \$1.1 billion. The School's largest gifts to date are an approved \$27.5 million transformative gift for youth workforce development training in Greece (2017) and two \$10 million contributions in support of the new facility for the Institute for Food, Nutrition, and Health, which opened on the George H. Cook campus in fall 2015.

During the most recent fundraising campaign, which was completed in December 2014, the School raised a total of \$86.4 million. Rutgers University as a whole raised over \$1 billion during that campaign (2007-2014), compared with two peers, the University of Maryland, which raised over \$1 billion (2006-2013), and Pennsylvania State University, which raised \$2.1 billion (2007-2014). (The dates are for the public phase of the campaigns.) The Rutgers University Foundation is currently planning to launch the quiet phase of the next campaign in 2020.

The Office of Philanthropy and Strategic Partnerships' focus is donor-centric, mindful of what the donors and the School's constituents want to accomplish with their money. The staff recognizes the importance of donors' intentions and facilitates the necessary interactions to support the School and Rutgers. The priorities of the executive dean include an endowment for research and education; endowment of the executive dean position; international programs; food, nutrition, and health; Rutgers Gardens; and the Coastal Resources Center (an addition to the Marine and Coastal Sciences Building). Collectively, the academic departments' priorities are for graduate student support to recruit and retain students. These goals include fellowships, vanity awards, and travel awards. The university's fundraising priorities include the Honors College and Rutgers Future Scholars, a program to prepare academically ambitious high school students from less-advantaged communities for college. Our new Chancellor–New Brunswick also brings a fundraising focus on endowed chairs, a direction we enthusiastically endorse.

An example of success in the area of philanthropy is the School's four-year relationship with the Stavros Niarchos Foundation. Due to the School's demonstrated accomplishments in agriculture and workforce training programs, the foundation sought proposals from the School to address youth unemployment in Greece. The result is the previously mentioned approved proposal for a \$27.5 million transformative gift for youth workforce development training in Greece. This was preceded by a \$2.1 million gift that funded a prior feasibility study.

Government Relations

The School collaborates with the University's Department of External Affairs, which is responsible for advocating on the university's behalf with elected and other government policymakers across New Jersey and in Washington, D.C.

The office of State Government Affairs performs a variety of important functions on behalf of the School, including notifying the Executive Leadership Team of various bills introduced in the state legislature and seeking advice from research or policy perspectives. The Office of Federal Relations, located in Washington, collaborates with the School to represent the University's policy and funding interests to national policymakers. Local and county governments are engaged on behalf of the School through their relationship with Rutgers Cooperative Extension.

Building on Our Strengths, Addressing Challenges, and Planning for the Future





Building on Our Strengths, Addressing Challenges, and Planning for the Future

Building on Our Strengths

This self-study reveals a School that retains its strong foundation as the original “ag school” of New Jersey as it has evolved over decades and emerges as unique due to its scholarship and teaching strengths in a wide range of disciplines. As a critical part of Rutgers–New Brunswick, our School addresses environmentally-based issues at a range of scales from a systems understanding of oceans, ecology, food, environmental economies, natural resources, and human health to the essential functioning of microorganisms and biochemistry that provide the foundation for life. Out of this richly diverse contextual view, our School becomes a community of scholars who engage with their own disciplines, while also building on opportunities for interdisciplinary dialogue that reveal new questions, methods, and opportunities for outreach to address critical 21st century concerns. The principles of access, excellence, and relevance are core to the School’s continued embrace of the land-grant philosophy of engagement with and responsiveness to the needs of our students and society at large. They are embodied in our pursuit of scholarly excellence and leadership, development of new pedagogical approaches and instructional innovations that enhance student learning, and the diffusion of scientific, research-based information that addresses societal issues.

Some of the key strengths identified in this report are:

- Clarity in our mission that sheds any concern about redundancy or overlap across disciplines and in relation to other units at Rutgers University, and reframes complementary features of similarly named units and related disciplines as opportunities for interdisciplinary collaboration.
- Supportive environment for faculty success that includes an effective recruitment, mentoring, and promotion process as well as successful efforts to address gender equity in terms of salary and rank.
- Key and unique areas of research strength that set us apart from other units at Rutgers and complete the picture of Rutgers University–New Brunswick as a comprehensive, public, land-grant research university.
- Strength that comes from bridges between the School and the New Jersey Agricultural Experiment Station, both in research and extension and in service to the people across many dimensions, including education, fundamental and translational research, workforce development, economic growth and development, entrepreneurship, and global partnerships.
- Our commitment to undergraduate teaching, both as a critical part of the core curriculum for all students and also through clearly articulated disciplinary programs built on learning objectives and assessment.
- Our commitment to students through a supportive environment that has strong advising, support for transfer students, and opportunities for experiential learning, internships, study abroad, and service learning opportunities.
- A robust post-baccalaureate program including M.S., M.L.A., M.B.S., and Ph.D. offerings covering all areas of the School’s academic expertise.
- Our commitment to a campus community experience through a strong sense of place and programming that supports positive social and educational opportunities for faculty, students, and staff.
- Our commitment to partnerships across New Brunswick and the rest of Rutgers in the spirit of “One Rutgers”.

Discussion of Rankings

Our school's historical roots and strength in similar programs leads to obvious comparisons to other land-grant schools and their colleges that grew out of the agricultural college model. However, we also see ourselves as in some ways expanding beyond the more traditional model through our unique academic emphases and interdisciplinary nuances.

The Executive Leadership Team of the School believes that, overall, we rank in the top 10 among the comparable schools and colleges of the large public land-grant research universities (the "AAU publics"). Among these universities, we include our aspirational peers Cornell, Wisconsin, and UC Davis as well as our Big Ten colleagues Penn State, Ohio State, Michigan State, and Minnesota.

We are, however, quite distinct among all of these peers and aspirational peers in the spectrum of academic programs housed in our School, and this makes overall ranking a dodgy business. Oceanography and marine sciences, for example, is a top-ranked program at Rutgers that is not found in any of our peer institutions.

There is also the matter of comparative rankings of undergraduate programs on the one hand and graduate programs on the other. Several of the stronger graduate programs at Rutgers to which our faculty make major contributions are not "just" in our School. We believe, for example, that the graduate programs in ecology and evolution, microbial biology, oceanography, molecular biosciences, and atmospheric sciences can claim membership in the upper tier of such programs nationally; but while our faculty make major contributions to each, neither all of the strengths nor any of the weaknesses can be solely traced to the participating faculty from our School.

And then there is the matter of what deserves weight in a ranking program and what does not, and which characteristics that are used in various rankings are under a School's or its faculty's control (faculty productivity, teaching skills, and advising, for example) and which characteristics are not (institutional tuition, housing, or regional cost of living, for example).

To help the external review committee focus on the topic of "overall ranking and stature," we opened discussion to the department chairs and program directors, providing an opportunity to delve into the particular approach to ranking and evaluations of "excellence" by discipline. For example, while some of the science fields—animal science, environmental science, and marine and coastal sciences—highlight high levels of federal grant funding as evidence of excellence, landscape architecture cites design awards. Toward this end, each chair was asked to write a short profile to be included in this report that highlights departmental accomplishments (these are found in the Supporting Materials).

Another measure of excellence relates to individual faculty accomplishments. Each department can cite highly productive scholars who receive recognition through grants, awards, citation numbers, and external recognitions. The Supporting Materials includes a list of faculty who have received some of the internationally recognized fellowships, awards and honors, while other more discipline-related awards are listed in the departmental profiles and Faculty and Staff Accomplishments 2017-2017.

Addressing Challenges in Achieving the School's Full Potential

While the analysis that went into this report reveals many strengths, it also reveals opportunity areas and challenges to our success. Certain institutional constraints impinge on the financial status and sustainability of the School. One is that a significant percentage of faculty salary dollars supporting tenured and tenure-track faculty positions in the School are internally appropriated from the budget of the NJAES, and the NJAES revenue stream from state and federal sources has been flat for nearly a decade. Thus, we have experienced a steady decline in the public resources that support the inevitable rise of salary and fringe benefit costs for tenured faculty.

A second is that for most of the past decade, the School has been on a trajectory to increase its enrollment at the undergraduate level to 4,000 (from 2,800 in 2005). This annually reviewed and approved enrollment increase was halted and, indeed, reversed in 2015 by the university's central administration for incoming first-year students. In the meantime, faculty reinvestment and modest growth, together with significant self-investment in renovations of research space and supporting infrastructure had been made; in a very real sense, the current enrollment cap at about 3,400 students is fiscally out of synch with the prior investments made in new faculty. Measures are being taken to address this issue by further increasing enrollment of transfer students (whose numbers are not capped presently), and by moderately adjusting the balance of first-year students to increase enrollments of students from out of state and abroad, who pay full out-of-state tuition. We believe that such adjustments actually are pedagogically sound in addition to being financially sound, inasmuch as a diverse pool of students from other states and nations enriches the educational environment for all.

In addition, in our commitment to continued investment in faculty who will shape the future of the school, we proactively seek to address the challenges of diversity and inclusion. In our efforts to provide a thorough analysis of our school, we were confronted by a lack of data available to us on how our faculty and staff self-identify according to race and ethnicity. Given our university's commitment to student diversity, we urge a change in policy that would allow greater access concerning how members of our community self-identify in order to determine areas that would benefit from more diversity. We believe our scholarship, teaching, and service would benefit from a proactive effort to increase diversity. Further, these data would help us to evaluate how inclusive our community is in terms of advancement and access to leadership positions.

Finally, another challenge we face, particularly acute with the change in the university budget model to Responsibility Center Management, is the age and condition of our facilities to house and the infrastructure to support research and teaching. Recent commitments from the central university to addressing the decades of deferred maintenance are welcome, but they do not keep up with the growing needs. Aging laboratory animal facilities no longer meeting contemporary research standards, the lack of a modern high performance computing infrastructure, older buildings lacking compliance with modern codes such as disability access, costly renovation issues that exist in older buildings (including, for example, asbestos abatement and modern standards for power requirements), and many more issues drain our discretionary resources for the self-funding of needed upgrades.

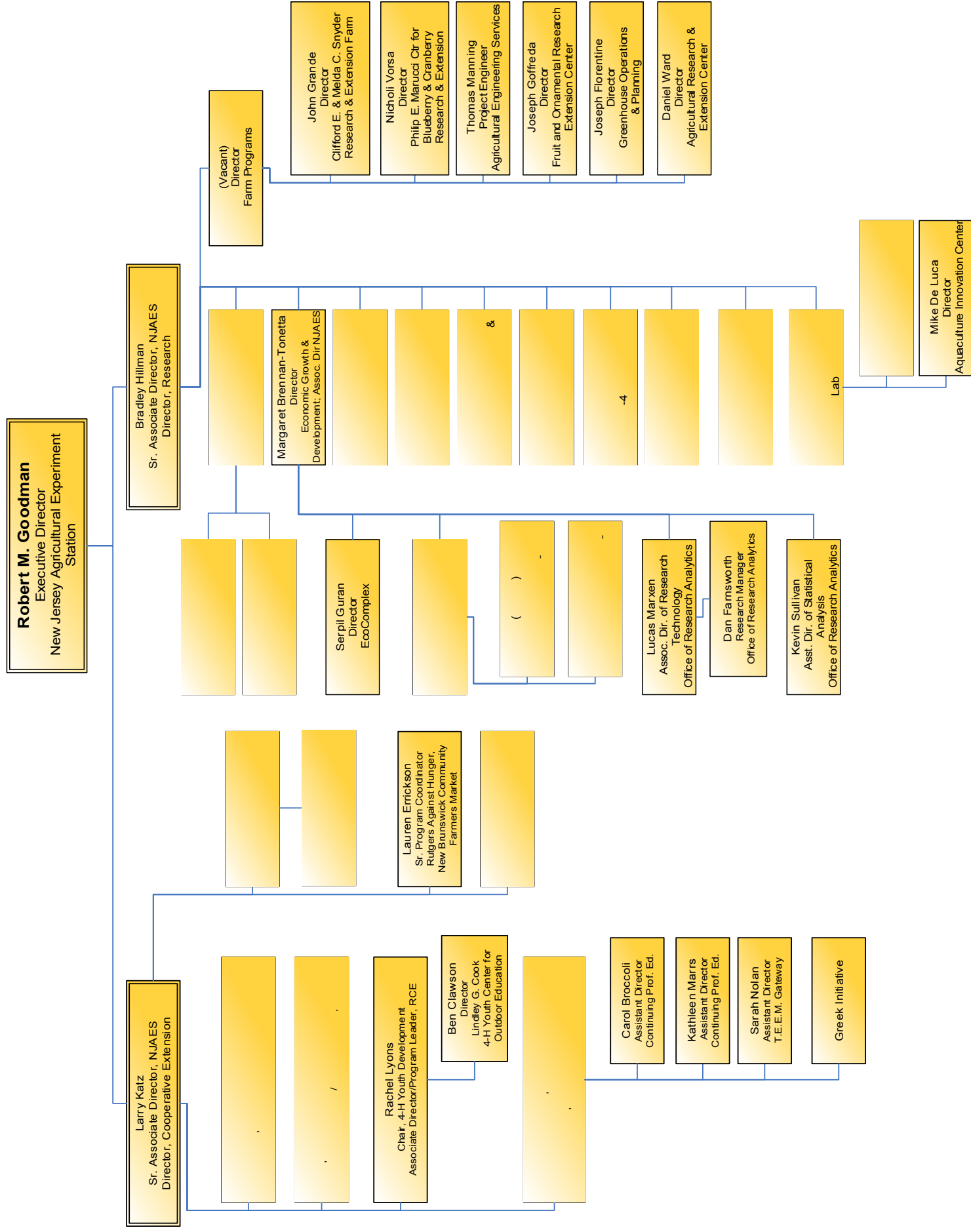
Conclusion

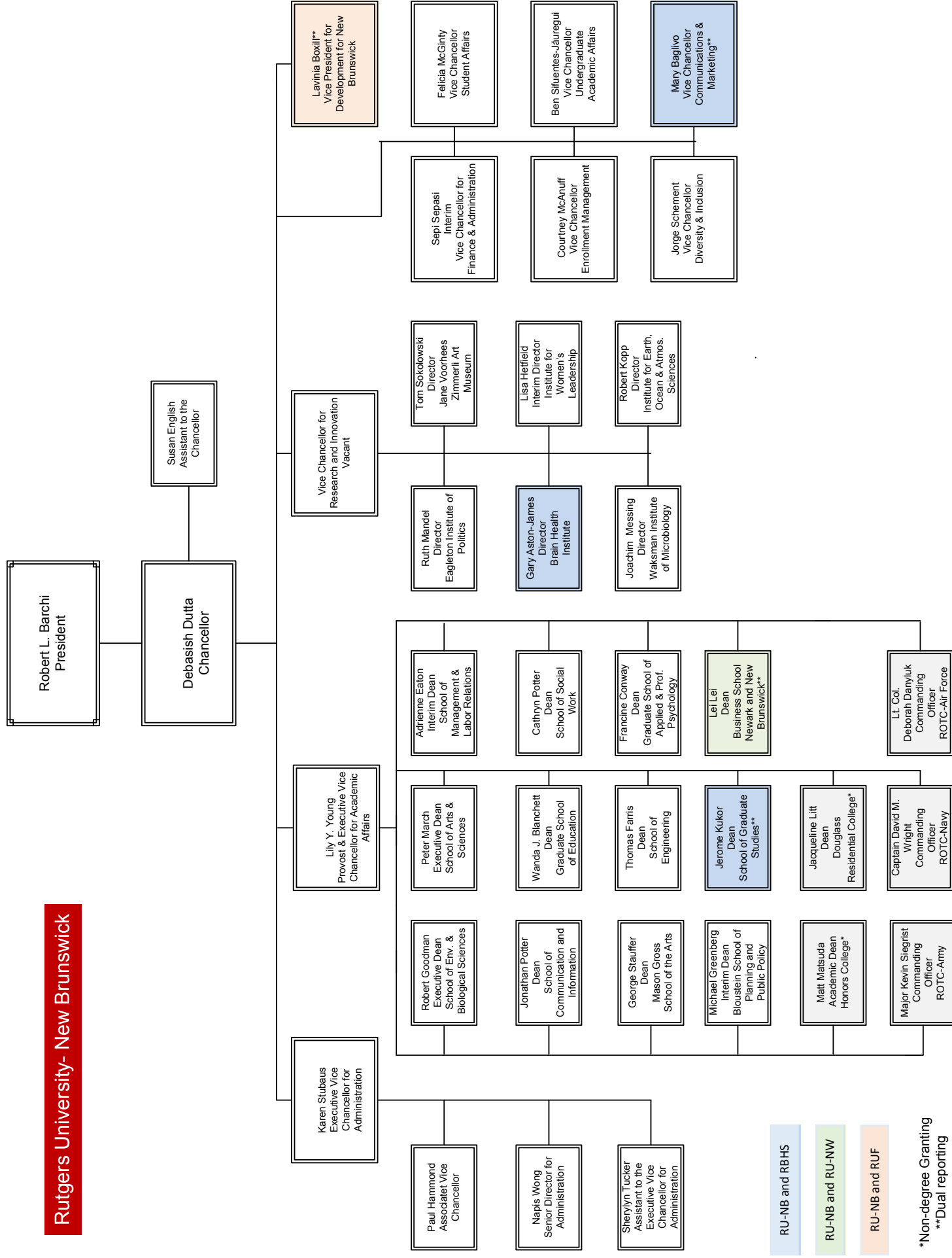
The faculty, staff, students, and leadership of the Rutgers School of Environmental and Biological Sciences are proud of the many changes and strengths—and of the cohesion—of our School, and we see a near ideal “fit” of the School in the overall organization and academic profile of Rutgers University–New Brunswick. At the same time, we are well aware of many opportunities for advancement, partnerships, and synergies that being a part of this great university offer us. We see the preparation of this self-study and the overall process of which it is a part as a major contribution toward strengthening future excellence. At no time in the memory of any of us in public higher education have the stakes been higher than they are today. We live in changing and charged times—times that illustrate how essential our mission is and how critical it is that we rebuild and regain the faith and confidence of the people we serve.

Supporting Materials









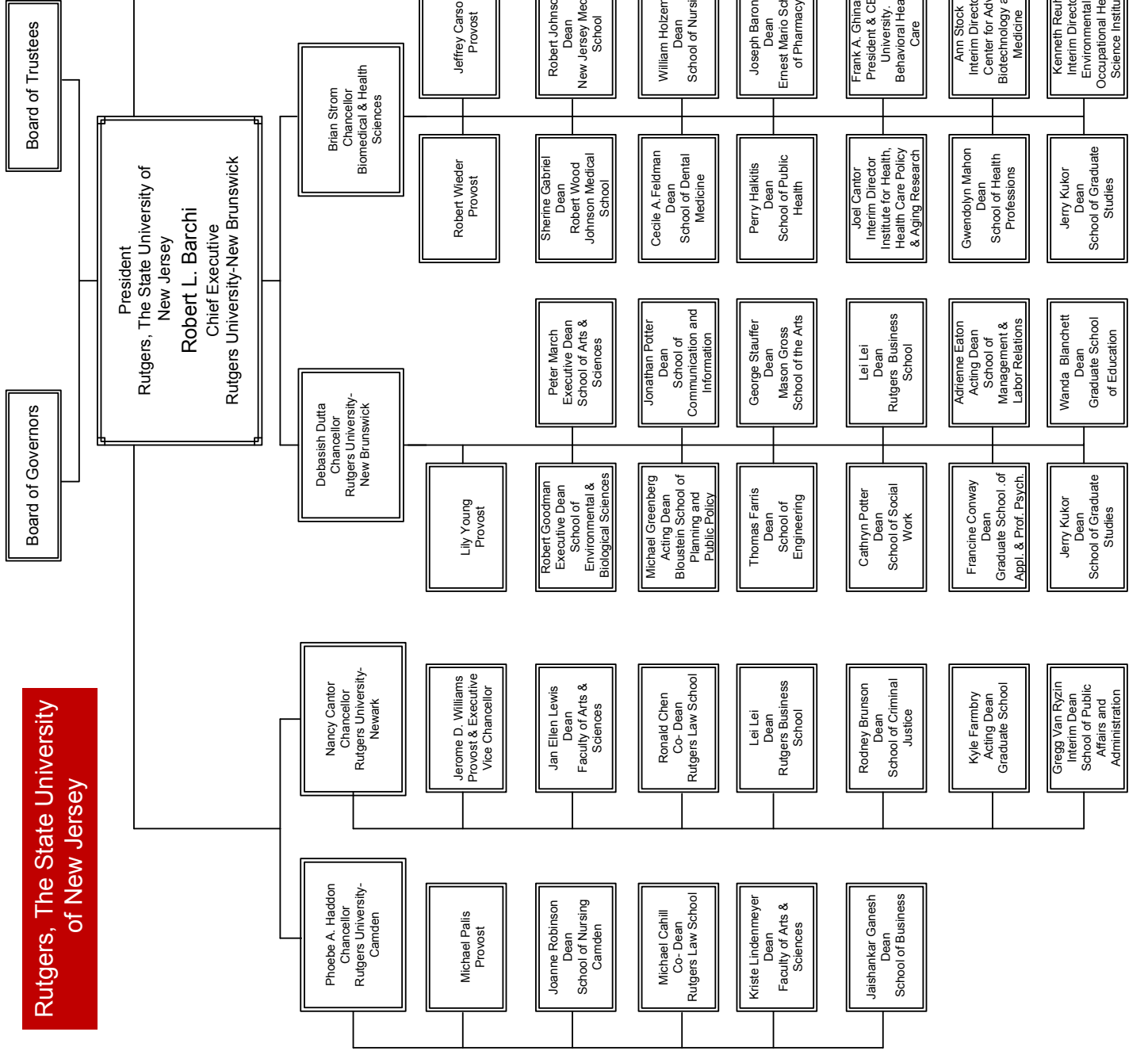
RU-NB and RBHS

RU-NB and RU-NW

RU-NB and RUF

*Non-degree Granting

**Dual reporting



Summary of Leadership Positions

Executive Dean of Agriculture and Natural Resources provides leadership and oversight for the School of Environmental and Biological Sciences and the New Jersey Agricultural Experiment Station and works closely with university leaders to develop and implement strategic initiatives that reflect and advance the university's research, education, and outreach missions.

Dean of Academic Programs is responsible for all undergraduate and graduate programs, budget, and general administration for the School of Environmental and Biological Sciences.

Dean of Agriculture and Urban Programs supports academic and outreach efforts that connect urban and suburban communities with agriculture and open space to enhance the economy, landscape, and culture of New Jersey. This office serves to bridge academic and cooperative extension engagement to enhance education, demonstration, disciplinary contributions, and networks with New Jersey communities.

Dean of International Programs is engaged in expanding the international agenda for the School of Environmental and Biological Sciences. This includes increasing the opportunities for undergraduates to spend a semester or summer abroad in programs that fit within their curriculum and educational goals, developing academic partnerships with universities abroad, highlighting and supporting the many international activities among the faculty, and cultivating an international community at the School.

Senior Associate Director, New Jersey Agricultural Experiment Station/Director of Research is responsible for research programs and resources associated with NJAES. The office ensures effective use of federal formula funding and of state resources directed to NJAES. It also oversees intellectual property of NJAES scientists, such as plant variety patents and royalties, and coordinates various NJAES centers and research farms.

Senior Associate Director, New Jersey Agricultural Experiment Station/Director of Cooperative Extension leads all programs for Rutgers Cooperative Extension, helping New Jersey's diverse population adapt to a rapidly changing society and improve their lives and communities through an educational process that uses science-based knowledge.

Vice Dean for Advancement/Associate Dean of Philanthropy and Strategic Partnerships has responsibility for the integrated management of philanthropy and strategic partnerships, communications and marketing, alumni and community engagement, and external affairs for the School and NJAES. The position also is responsible for forecasting and achieving fundraising goals for the units and for collaborating with the Rutgers University Foundation.

Vice Dean for Administration/Associate Dean of Academic Personnel is responsible for the oversight and administration of financial and business administration, planning

and budget, human resources, and information technology for the School and NJAES. The office leads efforts to identify and implement new processes to meet unit and university goals as well as institutional planning and operational strategies, and to develop and implement policies and procedures associated with human resources functions.

Chair of Department Chairs Council, an advisory body for the executive dean, is elected by the chairs of the 15 academic and extension departments, along with a vice chair and secretary, in accordance with the School's Faculty Bylaws. The chair manages the agenda for Chairs Council meetings, which generally focus on issues that impact departments and provide a forum for discussion with university entities. The Chairs Council also is responsible for conducting an annual review of the organization and function of the Office of the Executive Dean.

Dean for Undergraduate Education-Cook Campus is the advisor for the School's Student Governing Council and works closely with students, faculty, and staff to create cohesive, diverse, and inclusive communities on campus, providing academic and social programs that enhance student life on the G.H. Cook campus.

SEBS Centers and Institutes

<https://sebs.rutgers.edu/centers/>

Center for Environmental Prediction
Center for Lipid Research
Center for Urban Environmental Sustainability
Hutcheson Memorial Forest (off campus)
Institute of Earth, Ocean, and Atmospheric Sciences
New Jersey Institute for Food, Nutrition, and Health
Rutgers Climate Institute
Rutgers Ecological Preserve (off campus)
Rutgers Energy Institute

NJAES Centers and Institutes

<http://njaes.rutgers.edu/centers/>

Center for Controlled-Environment Agriculture
Center for Turfgrass Science
Center for Urban Restoration Ecology
Center for Vector Biology
Equine Science Center
Grant F. Walton Center for Remote Sensing and Spatial Analysis
New Jersey Water Resources Research Institute
Office of Continuing Professional Education

BYLAWS

of the Faculty of the

SCHOOL OF ENVIRONMENTAL AND BIOLOGICAL SCIENCES

I. PREAMBLE

The School of Environmental and Biological Sciences (the School) is a professional unit of Rutgers University whose origins date to the designation of Rutgers College in 1864 as the land-grant college in New Jersey and the creation of the Rutgers Scientific School in that year. Located on the George H. Cook Campus in New Brunswick, New Jersey, the School was designated as the State University of New Jersey in 1917 and renamed the College of Agriculture in 1921, the College of Agriculture and Environmental Science in 1965, Cook College in 1973, and, following the reorganization of Rutgers' academic units in 2006, the School of Environmental and Biological Sciences.

The School's mission is to pursue excellence in research, teaching, and outreach in the sciences from microscopic to global scales as well as their social and human dimensions.

These bylaws establish the structures and procedures for governance of the School and the means to provide advice and consent to the School's Executive Dean and administration. In the event of any conflict or inconsistency between these bylaws and the regulations governing Rutgers University, the University regulations shall prevail.

II. THE FACULTY

A. Membership

1. By virtue of their offices, The President, the New Brunswick Chancellor, the Executive Vice President for Academic Affairs, the Senior Vice President for Research and Economic Development, and the Dean of the Graduate School-New Brunswick.
2. The Executive Dean of the School, hereinafter referred to as the Executive Dean, other deans and directors, associate deans and associate directors, assistant deans, assistant to dean and academic directors of the School.
3. Members of the School faculty at the rank or equivalent rank of Distinguished Professor, Professor, Associate Professor, Assistant Professor, Instructor, including extension, research and teaching faculty, members on leave, professional librarians of equivalent rank and other non-tenure track faculty who have served at least one year.
4. Faculty members holding University appointments outside the School but whose tenure is in the School.

5. Other faculty, including but not limited to visiting and adjunct faculty members, may be granted membership in the School faculty upon the recommendation of one School department to the Executive Dean. The Executive Dean shall approve or disapprove membership recommendations, which must show substantial participation by the recommended faculty member in the recommending department. The department shall also recommend a term of service, e.g., one-year, three-year, or indefinite terms. Each department, in its bylaws, shall specify the criteria and procedures for making such recommendations to the Executive Dean.
6. Officers of the University and representatives of other schools who are invited by the Executive Dean.

B. Voting

1. Voting members of the faculty shall be those members listed in II.A. whose appointment is in the School.
2. Tenure-eligible voting members of this faculty are automatically voting members of the School department that processes their personnel actions. Additional department members may vote as provided in section III.D.2.f.

C. Officers

1. The Executive Dean or designee shall chair as Presiding Officer at all faculty meetings unless the University President or designee attends and chairs.
2. A Secretary shall be elected by the faculty for a three-year term. The Secretary's responsibilities shall be:
 - a. to record minutes of the School faculty meetings,
 - b. to implement *Robert's Rules of Order* as needed,
 - c. to conduct the elections for positions for faculty committees, the University Senate, and the New Brunswick Faculty Council, for faculty representatives to the SEBS Governing Council, for nominees for Department Chair, and for the Secretary's successor, and
 - d. for each standing committee, to name a committee member to act as convener with the announcement of election results.

D. Meetings

1. Regular meetings shall be scheduled and announced by the Executive Dean during the first week of the academic year, arranged so the meetings do not fall on the same day of the week in any academic semester. Meetings may be subsequently cancelled, but at least one regular meeting must be held each semester. An agenda shall be prepared and circulated by the Secretary seven days prior to each meeting, after consultation with the Executive Dean and committee chairs.
2. Special meetings may be held at the call of the Executive Dean or the University President and also shall be held upon written request to the Executive Dean by at least

10 percent of the voting membership for the current academic year. Unless the Executive Dean proclaims the existence of an emergency, such special meetings shall not be convened until a period of at least 72 hours has elapsed from the time that the call was issued. Resolutions and supporting data for consideration at the special meeting shall be transmitted to the members of the faculty as expeditiously as possible in advance of the meeting date. The agenda of the meeting shall be limited to such resolutions.

3. A quorum shall consist of 10 percent of the voting members of the faculty for the current academic year as defined annually on September 1st. Voting shall be by simple majority except as otherwise specified in these bylaws.
4. The latest edition of *Robert's Rules of Order* shall govern, except as modified in these bylaws. Under normal circumstances, a speaker shall be limited to three minutes on each question. An additional minute per person may be allowed for rebuttal.
5. All resolutions, motions, and reports that will commit the faculty to any policy position must be submitted to the Secretary in sufficient time that a copy can be made available to each member of the faculty no later than seven calendar days before the meeting at which action is contemplated. Motions or resolutions normally shall be referred for consideration to a standing or *ad hoc* committee. Committees shall report as expeditiously as possible, or, where necessary, a specific reporting date may be established by action of the faculty.
6. All other motions or resolutions that have not been circulated at least seven calendar days prior to the meeting may be put on the floor and debated, by vote of two-thirds of the voting members present, and will require a two-thirds majority for adoption. A ballot, to be submitted to all eligible voting members of the faculty, may be ordered on any question, before the final vote shall be taken, at the request of the majority of the voting members present. A motion requesting a ballot shall take precedence over a call for question. A motion to reconsider shall not be applicable to votes taken by electronic or mail ballot.
7. The Secretary shall invite the leadership of the SEBS Student Council to attend faculty meetings.
8. Meetings of the faculty shall normally be open to the public. Members of the faculty may at any time, however, by majority vote move to close a meeting to the public. The Presiding Officer shall be responsible for the decorum of the meeting.

III. FACULTY ORGANIZATION

A. Departments and Administrative Units

1. Departments
 - a. Departments are the basic administrative units of the School and, unless otherwise designated, must consist of at least three tenured faculty members with the rank of Associate Professor, Professor, or Distinguished

Professor.

- b. The faculty is organized into departments along discipline or functional lines by the Executive Dean, and departments may have several interrelated areas of subprograms. A department is responsible for the development, maintenance, and assessment of undergraduate, non-degree, and graduate teaching, basic and applied research, and outreach that meets the needs of students and the people of the State. A current list of School departments may be obtained from the Office of the Executive Dean.
2. Administrative units, Centers, and Institutes
Administrative units, centers, and institutes are special purpose groups with a specific theme or function. They may be composed of personnel from various departments and are oriented primarily toward research, outreach, and service activities. This definition shall include special purpose groups now in existence or created in the future. A list of current administrative units, centers, and institutes may be obtained from the Office of the Executive Dean.
3. Academic units, administrative units, centers, and institutes may be established, authorized to function, and dissolved in accordance with university policy.

B. Departmental Voting

1. Personnel Matters
Department members have voting rights in personnel matters (reappointment, promotion, tenure, dismissal, salary improvement, and similar actions) based on appointment, rank, line support, and degree of participation.
 - a. Those members eligible to vote in personnel matters include all members of the School on tenure-eligible lines for which the department holds more than 50 percent of their line support or that processes their personnel actions.
 - b. Each faculty member so eligible to vote on matters of personnel shall do so in only one academic unit with the exceptions of SEBS faculty invited by the Executive Dean to vote on the promotion of a faculty member of a department with fewer than three professors of the appropriate rank.
2. Nomination of Department Chair
Those department members eligible to vote for nomination of Department Chair include all faculty eligible to vote on matters of personnel. In addition, if provided for in the bylaws of a given department, all members on annual or other non-tenure track appointments who hold the rank of Teaching Instructor, Research Associate, or higher in the department and who have completed a year of service may also vote for nomination of Department Chair.
3. Other Departmental Matters
Voting rights on issues not concerning personnel or nomination of Department Chair shall be extended to all full-time (tenure-eligible or not) as well as part-time members of a given department as provided for in the bylaws of a given department, such approval being based on substantial involvement of the faculty member in that department.

C. Personnel Actions

1. In the case of split appointments for tenure-eligible faculty, personnel actions on faculty members will be initiated and carried out by the department holding the majority portion of the line. The department(s) holding the minority portion(s) of the line shall conduct a separate review prior to the primary department evaluation and shall communicate those results to the primary department in a timely manner.
2. For non-tenure track faculty, personnel actions will be initiated and carried out by the department in which their appointment is held.
3. All tenure-eligible faculty members of a department shall be consulted on all new tenure-eligible appointments to that department, including joint hires, and on the transfer of tenure-eligible faculty from other academic units. Each department shall develop a procedure, involving all tenure-eligible members, to provide advice, in writing, to the Executive Dean prior to the appointment of tenure-eligible faculty members to department membership.

D. Department Bylaws

1. Each department shall adopt a set of bylaws which will be voted upon by the faculty members eligible to nominate for Department Chair. The department bylaws shall be in accordance with University regulations and the School bylaws.
2. Department bylaws, at a minimum, shall include provision for the following matters:
 - a. Procedures for adding voting and/or non-voting members to the department, in addition to those specified in these bylaws.
 - b. A schedule of regular departmental meetings with a minimum of one meeting each six months.
 - c. Detailed procedure for the convening of a departmental meeting and a definition of quorum.
 - d. Detailed procedure for making recommendations concerning appointments, reappointments, promotions, non-reappointments, and dismissals.
 - e. A specific procedure to nominate search committee members to the Executive Dean.
 - f. The eligibility to vote for Department Chair of non-tenure track faculty as well as tenure-track faculty with discipline, split, or minority appointments in that department as per III.B.
 - g. A provision that permits the Chair to appoint an acting chair in the event of short-term absences.
 - h. Procedures to be used by the department for recommending faculty members of other divisions of the University for voting or non-voting membership in the School faculty as per II.A.5. and II.B.
3. A copy of the bylaws as adopted and/or amended by the department shall be forwarded to the Structure and Governance Committee, which will review them

for compliance with the bylaws of the School. Upon approval by the Structure and Governance Committee, a copy will be filed with the Secretary of the Faculty and the Executive Dean.

4. All subsequent amendments shall be forwarded by the department to the Structure and Governance Committee for review prior to adoption. Approved and amended bylaws will be forwarded to the Secretary of the Faculty and the Executive Dean.

E. Department Chair

1. There shall be a chair for each department of the School, appointed by the Executive Dean upon recommendation by the department faculty.
2. Only a voting member of the department who is a Distinguished Professor, Professor, or Associate Professor (or equivalent rank), with tenure, is eligible to serve as chair. External candidates for chair of a department must become a member of that department prior to assuming the position of chair.
3. Nomination and Selection
 - a. Whenever a department includes at least three tenured members with the rank or equivalent rank of Associate Professor, Professor, or Distinguished Professor, faculty members in that department on tenure-eligible lines as described in III.B.2. or faculty granted such privileges in the department bylaws as described in III.D.2.f shall by ballot, conducted by the Secretary of the Faculty, recommend to the Executive Dean one of the eligible persons for appointment as department chair when a vacancy shall occur through expiration of term or otherwise.
 - b. Two months prior to the expiration of a chair's term or, in the case of an out-of-term vacancy upon request of the Executive Dean, the Secretary of the Faculty shall conduct a ballot for nomination of chair. The Secretary shall notify all qualified department faculty members of their eligibility to serve as chair. This notification will include a list of all department faculty members eligible to serve as chair and a request that nominations be sent to the Secretary of the Faculty by a specific date. All eligible department faculty members who are nominated and agree to serve will be considered candidates and included on the ballot.
 - c. Vote tallies of the secret ballot are confidential and advisory to the Executive Dean. The name of the candidate with the majority of votes is made public. In the case of a tie, the names of the candidates with the most votes are made public.
 - d. In the case of the temporary absence of a chair, the Executive Dean may appoint, without balloting, an interim chair who is a member of the School for a period not to exceed six months. If it is necessary to appoint an interim chair for a period longer than six months, the department shall recommend to the Executive Dean a person to serve in this capacity according to the procedure for the nomination of a chair.
 - e. In the event of short-term absences, the Department Chair may appoint an acting chair for administrative purposes. This process shall be reflected in the department bylaws.

- f. The chair of the Structure and Governance Committee shall conduct the election for nomination and selection of chair for the department in which the Secretary of the Faculty resides.
4. Where an outside search for a department chair is conducted, the majority of the search committee membership shall be from that department.
5. Term of Office shall be up to three years at the discretion of the Executive Dean. A chair may serve successive terms upon recommendation of the department faculty according to the nomination and selection process in III.E.3. and subsequent appointment by the Executive Dean. The Dean may remove a chair before the expiration of term based on substantial evidence of non performance.
6. The Department Chair shall have administrative responsibility for the overall program of the department according to the provisions and the regulations governing Rutgers University and departmental bylaws. General responsibilities include:
 - a. To plan with the members of the department a progressive program for the department.
 - b. To evaluate the instruction, research, outreach, and administrative processes of the department, and to make appropriate recommendations to the Executive Dean.
 - c. To conduct post-tenure review of tenured members of the department, to annually evaluate untenured members, and to report these evaluations as required by the regulations governing Rutgers University.
 - d. To recommend appointments, reappointments, promotions, non-reappointment, and dismissals, in consultation with the tenured members of the department.
 - e. To see that adequate supervision, advice, and training are afforded to new members of the department and to other members who might profit thereby.
 - f. In general, to promote the effectiveness of the department, School, and University by every appropriate means.
7. Responsibilities of the Chair in the Teaching Program:
 - a. In consultation with the appropriate Undergraduate Program Director, to be responsible for the general supervision of all courses which fall under the subject index numbers assigned to the department by the Academic Programs and Research Office.
 - b. To have primary responsibility for decisions on which courses should be offered and by whom they should be taught, with the concurrence of the Undergraduate Program Director and of the Graduate Program Director when necessary.
 - c. To initiate any budget requests or proposals relating to the undergraduate and graduate teaching programs, including below-the-line budget items needed to support courses falling under the department's subject index number(s), and to submit them to the appropriate office.
 - d. To initiate corrections and additions to the Schedule of Classes and submit them to the Undergraduate and Graduate Program Directors.
 - e. To ensure that class rosters and registration printouts are distributed to the appropriate faculty members in the department.

- f. To take responsibility for all assessment aspects of the undergraduate programs(s) administered by that department.

F. Recruitment

1. Faculty

- a. Generally, the Department Chair, in consultation with those who have direct interest in the position, shall prepare a job description and the Line Allocation Request Form (LARF). The department shall nominate to the Executive Dean suggested faculty members for a search committee. The Executive Dean appoints the Search Committee, normally of faculty members nominated by the department, but may also appoint other appropriate persons to a number less than the number of department members appointed. The Search Committee shall have an odd number of members. The Department Chair shall not be the chair of the Search Committee, unless specifically named by the Executive Dean.
- b. When a Cooperative Extension position is appropriately associated with a discipline department, that discipline department shall be represented on the Search Committee by at least one member.
- c. Each Search Committee shall appoint a diversity advocate to proactively ensure a strong, diverse applicant pool for each faculty vacancy. The diversity advocate shall consult University policy and personnel responsible for diversity.
- d. The chair of each Search Committee, with the assistance of the diversity advocate, shall submit a Search Plan to the Office of the Executive Dean that will include a description of the applicant pool; UPF-1 forms; and other pertinent data for review prior to the conclusion of the search.

2. Executive Dean

In the event of a vacancy in the position of Executive Dean, the University President shall appoint an Acting Executive Dean. An Executive Dean Search Committee will be selected by the appropriate groups as follows:

- a. The faculty will elect four representatives from faculty members funded primarily by teaching or research lines and two from Extension Specialists. The Secretary will conduct the election within 30 days of the announcement of the vacancy, and the election will be conducted as specified in IV.A.1.c.
- b. The Board of Managers will designate two representative members.
- c. The SEBS Governing Council will designate one student representative.
- d. The State Board of Agriculture will designate one representative member.
- e. The Rutgers Alumni Association will designate one representative from the branch associated with SEBS.
- f. The University President may designate additional members.

The names of the nominees will be forwarded to the New Brunswick Chancellor, who will, in turn, report to the University President.

IV. STANDING COMMITTEES

A. Structure and Operation of Committees

Except for the Department Chairs Council, Committee for Off-Campus Centers, Bureaus and Institutes, and as otherwise specified in these bylaws for specific committees of the faculty, the following general rules shall govern.

1. Membership of Committees

- a. Unless otherwise noted, there shall be two appointed and two elected faculty members funded primarily by teaching or research lines and one elected and one appointed Extension Specialist. Only one person may be appointed from any given department.
- b. Candidates for elected membership shall be voting members of the faculty. Such candidates shall be nominated by the Department Chairs Council or by written petition containing a statement certifying agreement of the nominee to serve, if elected, and signed by at least five voting members of the faculty. The names of all candidates shall be reported to the Secretary of the Faculty, who shall conduct all faculty elections.
- c. Appointed members of the faculty committees shall be appointed by the Executive Dean from among the voting members of the faculty unless otherwise indicated.
- d. *Ex officio* members, where such members are specified, normally shall not have voting rights. The Executive Dean or designee shall be an *ex officio* member of all committees except the Appointments and Promotions Committee. The Executive Dean shall be a voting member of the Department Chairs Council and the Committee for Off-Campus Centers, Bureaus and Institutes.
- e. Student members, where such members are specified, shall be students in the School, shall have voting rights in the committee, and can represent the committee before the faculty. They shall not have access to confidential faculty or student records. They shall be elected in accordance with procedures specified by the SEBS Governing Council.

2. Officers

All standing committees shall be appointed prior to July 1. Committee structure shall consist of a chair, a vice chair, and a secretary.

3. Terms of Office

- a. The normal term of membership shall be three years, unless otherwise specified, whether elected or appointed. Terms shall be staggered.
- b. Vacancies in the elected membership shall be filled temporarily by the Executive Dean or designee until the incumbent is able to resume his/her duties or until the next election; the person with the next highest number of votes at the previous election shall be requested to fill the vacancy. If that person cannot serve, the chair of the standing committee shall be empowered to appoint a member of the faculty or a student eligible to serve according to the requirements of these bylaws. No elected or appointed member's terminal date of office shall be altered or extended as a result of absence from the committee.
- c. Regular elections shall take place in the spring of each year. The term of all

standing committees will be from July 1 through June 30 of each year.

4. Meetings

- a. The committee shall convene its first meeting of the year before the first Faculty Meeting. The Secretary of the Faculty shall name a committee member to act as convener for each committee with the announcement of election results.
- b. The committee shall meet at least once per semester and as often as needed.
- c. Officers of the committee shall be elected at the committee's first meeting.
- d. Committee meetings may be held in person, by teleconference or equivalent.

5. Quorum

A quorum shall consist of a majority of the members eligible to vote on a committee, unless that committee establishes a different quorum and registers it with the Secretary of the Faculty and the Chair of the Structure and Governance Committee.

6. Records

Staff support will be provided to assist each standing committee by the Office of the Dean of Academic Programs. The records of each committee shall be filed in the Office of the Executive Dean at the end of each academic year and shall be kept for a period of not less than three years. Records of the Committee on Appointments and Promotions and the Committee of Review shall be confidential and shall be kept only for the use of the Executive Dean and the respective committees. None shall remain in the hands of committee members. Records of all other committees shall be available to members of the faculty.

7. Reporting

- a. The Appointments and Promotions Committee and the Committee of Review are advisory to the Executive Dean. All other committees shall report to the faculty and to the Executive Dean. All committees shall report to the Structure and Governance Committee any recommendations for changes in the bylaws concerning their organization or function.
- b. Each committee shall report its activities to the faculty meeting at least once each academic semester.

B. Committees of the School of Environmental and Biological Sciences

1. Department Chairs Council

- a. Membership: Department Chairs. Ex officio members: Executive Dean, Chair and Vice Chair of the Committee for Off-Campus Centers, Bureaus and Institutes, the Associate Dean of Planning and Budgets, the Associate Dean for Academic Personnel, and at the discretion of the Executive Dean, other vice and associate deans.
- b. Officers: A Chair, Vice Chair, and Secretary shall be elected from the voting membership, excluding the Executive Dean.
- c. The chair of the Chairs Council shall convene meetings at least twice each semester. The Chairs Council shall hold at least one joint meeting with the Committee for Off-Campus Centers Bureaus and Institutes each semester.
- d. Responsibilities:

- (1) To provide advice to the Executive Dean and, at the discretion of the Executive Dean, other vice and associate deans on relevant topics.
 - (2) To provide a forum for discussion of School issues that impact departments;
 - (3) To provide a forum for discussion with University entities;
 - (4) To establish program priorities in the area of faculty line assignments, teaching, research, and extension in relation to resources to be allocated to the School.
 - (5) Membership and nominating responsibilities: To nominate to the faculty through the Secretary of the Faculty the members of standing committees as required in these bylaws, and to nominate appropriate members of other Schools for membership in the School faculty.
 - (6) To conduct an annual review of the organization and function of the Office of the Executive Dean. The Executive Dean will submit a report describing the current organization of the Office of the Executive Dean, plans for future change, and a self-evaluation of its current structure and function. The committee will structure the performance review to provide constructive feedback on the organization and function of the Office of the Executive Dean. Upon completion of the review, the committee will meet with the Executive Dean to discuss the review.
 - (7) Receive Office of the Executive Dean's yearly report to the School faculty, Annual Analysis of Faculty Demographics, including an analysis of women and minorities in relation to rank, tenure, and promotions.
2. Committee for Off-Campus Centers, Bureaus and Institutes
 - a. Membership: Directors of off-campus centers, institutes, and administrative units. *Ex officio* members: Chair and Vice Chair of the Department Chairs Council, the Associate Dean of Planning and Budgets, the Associate Dean for Academic Personnel, and, at the discretion of the Executive Dean, other associate deans and directors.
 - b. Officers: A Chair, Vice Chair, and Secretary shall be elected from the voting membership, excluding the Executive Dean and those who serve *ex officio*.
 - c. The chair of the Committee shall convene meetings at least once each semester. The Committee shall hold at least one joint meeting with the Department Chairs Council each semester.
 - d. Responsibilities: To discuss and make recommendations to the Executive Dean on relevant topics including staffing, developing and maintaining research, educational and outreach infrastructure, and the coordination of interactions of the units.
3. Advisory Committee on Appointment and Promotions
 - a. Membership: There shall be nine members appointed by the Executive Dean: six faculty members funded primarily from teaching or research lines and three primarily funded by Cooperative Extension.
 - b. Term of Office: Three years with staggered terms so that three members are

- appointed each year.
 - c. Participation: Committee members may not participate in the discussion and subsequent vote for candidates that are in their own department.
 - d. Responsibilities:
 - (1) To advise the Executive Dean and other administrative officers on appointments, reappointments, and promotions of faculty members, and on personnel matters in general.
 - (2) To advise the Executive Dean on all new tenure appointments, applying the same standards as those established for promotions to the rank proposed.
- 4. Committee of Review (Grievance Committee)
 - a. Membership: The members shall be selected in accordance with University regulations and the collective bargaining agreement between the University and the American Association of University Professors - American Federation of Teachers. All members shall be associate or full professors (or equivalent ranks) on indefinite tenure, chosen from units of the School for which the Executive Dean has budgetary responsibility.
 - b. Chair: The members of the Committee of Review chosen as above shall elect a chair for purposes indicated in items IV.B.4.c.2.-3. below.
 - c. Purposes and Responsibilities:
 - (1) Grievance subcommittees drawn from the pool in accordance with the collective bargaining agreement shall hear formal grievances as defined by that agreement.
 - (2) In case of claims initiated by a faculty member of alleged failure to follow the requirements and procedures set forth in the bylaws of the School or of a department, the Chair shall appoint a Committee of Review, of three members, to hear such claims and submit a report concerning them to an appropriate officer of the School. If either the faculty members or those against whom the claim is made so desire, the committee shall be selected by lot. No more than one member of any committee may be from any one department.
- 5. SEBS Planning and Infrastructure Committee
 - a. Membership: There shall be a total of six faculty members and two students chosen by the SEBS Governing Council. Faculty members shall include: four elected (three faculty that are primarily funded from teaching or research lines and one faculty that are primarily funded by Cooperative Extension) and two appointed by the Executive Dean. Only one faculty member from any given department may serve on this committee.
 - b. Term of Office: For faculty members, three years, with staggered terms so that three members are elected each year. Student members shall serve for one year. All members may succeed themselves.
 - c. Officers: A Chair, Vice Chair, and Secretary shall be elected from the voting membership, excluding the Executive Dean.
 - d. A quorum shall consist of four members.
 - e. Responsibilities:
 - (1) To advise the Executive Dean on funding and resource allocation

- recommendations for the current budget and suggested future strategies.
 - (2) To advise the Vice Dean for Administration and Planning, the Associate Dean of Planning and Budgets, and the faculty on needs, plans and/or proposals that impact the infrastructure as it pertains to the environmental and educational quality of the Cook Campus.
 - (3) To select a sub-committee to serve in an oversight role for relevant issues affecting the library.
 - (4) To define both long-term and short-term academic goals for the School.
 - (5) To develop and review long-range strategic plans (three to five years) in the areas listed above.
6. Structure and Governance Committee
- a. Membership: In addition to regular membership, the Secretary of the Faculty shall be a voting member.
 - b. Responsibilities:
 - (1) To act as the bylaws committee for the School.
 - (2) To annually review and recommend changes in the bylaws.
 - (3) To receive and review recommendations from the faculty for changes in the bylaws.
 - (4) To supervise the preparation of a current edition of the bylaws for periodic distribution to the members of the faculty.
 - (5) To interpret the bylaws in cases where they may be found to be ambiguous or incomplete.
 - (6) To provide temporary rules as required during the implementation or amendment of new bylaws.
 - (7) To review departmental bylaws or amendments to existing departmental bylaws for compliance with School bylaws; department bylaws with any amendments shall be filed with the Secretary of the Faculty and the Executive Dean.
7. International Programs Committee
- a. Membership: Five or more faculty members appointed by the Executive Dean.
 - b. Term of Office: Staggered, two-year terms.
 - c. Responsibilities: To advise the Executive Dean and the Dean of International Programs on appropriate School/NJAES-wide international activities. Further duties include:
 - (1) To advise the Dean of International Programs on establishing, maintaining, and enhancing the School's character as a place for international studies and community in areas of its scholarship.
 - (2) To provide faculty leadership in creating strong connections between international programs and corporate, public, educational, and other appropriate constituencies and stakeholders.
8. Diversity, Communication and Philanthropy Committee
- a. Membership: there shall be three elected faculty members and three faculty members appointed by the Executive Dean.

- b. Term of Office for faculty members shall be three years.
- c. The committee shall be responsible for establishing priorities for:
 - (1) Diversity and campus climate in conjunction with the Campus Dean and the SEBS Governing Council,
 - (2) Student recruitment in conjunction with the Dean of Academic Programs,
 - (3) Communication of SEBS identity in conjunction with the Director of Communications,
 - (4) The promotion of positive alumni relations in conjunction with the Director of Alumni and Community Engagement, and
 - (5) Philanthropy and development in conjunction with the Director of Philanthropy and Strategic Partnerships.

C. Academic Programs and Research Committees

Membership shall include the School faculty as listed in II.B. Where student members are specified, they shall be elected by students according to procedures specified by the SEBS Governing Council, in consultation with the Cook Campus Dean. Students serve one-year terms. The Chair of each committee shall be elected by the voting members of the committee without regard to whether that person was elected or appointed.

The Dean of Academic Programs shall be an *ex officio* member of each committee, in addition to one associate or assistant dean who shall serve as staff support for the committee.

All committees shall report to the Faculty Meeting and to the Dean of Academic Programs as appropriate, but not less than once during each academic year.

- 1. Scholastic Standing and Admissions Committee
 - a. Membership: Six elected faculty members and *ex officio* a representative from the SEBS Educational Opportunity Fund Office program.
 - b. Responsibilities:
 - (1) To consider and report to the Faculty Meeting any proposed changes in admission requirements or procedures in the School, provided they conform to the minimum requirements approved by the University Senate for admission to all schools in the University. Upon approval of the Faculty, to make policy recommendations to the University Committee on Admissions.
 - (2) To review and act on requests for waiver or substitution of School and curriculum requirements.
 - (3) To review the records of students rated deficient in their work and whose weighted numerical average to date does not meet appropriate standards established by the Faculty. The committee shall take appropriate action in each case and report its action to the Faculty.
 - (4) To ensure an effective program of student advising.
 - (5) To consider general problems relating to grades, grading, readmission, and other pertinent matters brought to its attention by the Dean of Academic Programs or members of the Faculty.

- (6) To advise the Dean of Academic Programs on enrollment at the School and the mix of freshman and transfer student admissions.
2. Curriculum and Educational Policy Committee
 - a. Membership: The Committee shall be composed of the School Undergraduate Program Directors, the Dean of Academic Programs or designee, the Cook Campus Dean or designee, the Dean of Agricultural and Urban Programs, the Dean of International Programs and two students.
 - b. Responsibilities: To consider the undergraduate curricula of the School as a whole in relation to the objectives of the School. Furthermore:
 - (1) To consider and to approve all proposals for new undergraduate courses, deletion of old courses or changes in content of courses, and requests for independent majors brought before it. To consider and vote on all changes in curricular programs for recommendation to the SEBS Faculty. To provide oversight to the Student to Professional Internship Network (SPIN) Program. Proposals for the consideration of the committee may come from Department Chairs, Undergraduate Program Directors, the Dean of Academic Programs, the Executive Dean, or University administration. Recommendations from the Committee regarding changes to curricular programs shall be presented to the SEBS faculty for final approval at the faculty's next scheduled meeting.
 - (2) To serve in an advisory capacity to the Dean of Academic Programs in matters pertaining to educational policy, to receive and review educational policy proposals originating with the faculty and/or students, and to assume the initiative in bringing such proposals to the Faculty with its recommendations.
3. Instructional Assessment Committee
 - a. Membership: There shall be four elected faculty members and four faculty members appointed by the Dean of Academic Programs. Three students shall also serve on this committee, appointed annually by the SEBS Governing Council.
 - b. Term of Office for faculty members shall be three years, with two new members each year and with the privilege of successive terms.
 - c. Responsibilities:
 - (1) To review on an annual basis the instructional assessment plans of all SEBS undergraduate programs.
 - (2) To evaluate the results of instructional assessments of SEBS undergraduate programs as they occur and compile them into an annual report to the Dean of Academic Programs.
 - (3) To assist the Dean of Academic Programs in conducting the annual Celebration of Excellence Awards and to advise the Dean of Academic Programs of possible candidates for additional teaching honors and awards sponsored by the university as well as by state and national professional associations.
4. Financial Aid Committee
 - a. Membership: There shall be eight faculty members appointed by the Dean

- of Academic Programs. One representative each from the SEBS Office of Special Programs and the Office of Financial Aid shall serve *ex officio*.
 - b. Term of Office shall be four years with the privilege of successive terms, with two members appointed each year.
 - c. Responsibilities: To review on a continuing basis the policies under which scholarship funds and other forms of student aid are administered, and to examine applications for all forms of financial aid and to recommend awards.
- 5. George H. Cook Honors Committee
 - a. Membership: There shall be five elected faculty members, five appointed faculty members, four student members, and *ex officio*, the SEBS Director of Honors Programs. The Dean of Academic Programs may appoint additional adjunct members for a one-year term upon recommendation of the Committee.
 - b. Term of Office shall be five years for faculty members, with the privilege of successive terms, with one to be elected and one to be appointed each year.
 - c. Responsibilities: To review and administer the George H. Cook Scholars Program for the faculty and to search for new ways of encouraging and rewarding superior scholarship.
- 6. General Honors Program Committee
 - a. Membership: There shall be six faculty members appointed by the Dean of Academic Programs with three appointed each year, and *ex officio*, the SEBS Director of Honors Programs.
 - b. Term of Office shall be three years, with the privilege of successive terms.
 - c. Responsibilities: This committee ensures the implementation of the SEBS General (Four-Year) Honors Program as described in the catalog and as mandated by the University.

D. *Ad Hoc* Committees

- 1. To further the work of the faculty, the Executive Dean may create *ad hoc* committees.
- 2. Ten voting members of the faculty may present a request for an ad hoc committee to any meeting of the faculty. Endorsement by majority vote of faculty present at the meeting is required for formation of such a committee.
- 3. Members shall be appointed by the Executive Dean for the life of the committee.
- 4. After three years such a committee shall either be established as a standing committee or be disbanded.

E. University Senate Representatives

- 1. The number of elected representatives from the School is determined by University regulations. The number of representatives will maintain the balance

of faculty representation as in IV.A.1.a. Any remaining number of Senate positions beyond the number that can be divided by three shall be elected at large with nominees from each of the areas, in the same two to one proportion.

2. Term of Office shall be three years with privilege of successive nominations.
3. Responsibilities:
 - (1) To serve as representatives of the School in establishing such university policies as are the function of the Senate.
 - (2) To assure that the unique interests of the School are appropriately represented to the Senate and its committees.

F. SEBS Governing Council Representatives

1. The number of faculty representatives is determined by the bylaws of the SEBS Governing Council.
2. Term of Office shall be one year.
3. Responsibilities: To serve as representatives of the School faculty and participate with the student representatives in fulfilling the purposes of the SEBS Governing Council as stated in its Constitution.

G. New Brunswick Faculty Council Representatives

1. Number of Representatives: Faculty members are represented according to department. Each department of at least 15 members (including Extension departments) shall elect one representative. Departments of fewer than 15 members will share representation as per the bylaws of the New Brunswick Faculty Council.
2. Term of Office shall be three years.
3. Responsibilities:
 - a. To serve as representatives of the School faculty and participate in the New Brunswick Faculty Council.
 - b. To report to the faculty on a regular basis regarding this council.
 - c. To interact with standing or *ad hoc* committees of the School as needed to facilitate the functioning of those committees with respect to the University.

V. CURRICULA

A list of the current undergraduate curricula in the School may be obtained from the Office of Academic Programs and Research.

A. Curriculum Group Membership

Those faculty members who teach one or more of the undergraduate courses offered in a curriculum of the School, or who are advisors within the curriculum, including those who do not have the majority of their appointment at the School, are members of that major program curriculum group. Faculty members may belong to more than one curriculum group.

B. Meetings

Meetings of the curriculum group are called by the Undergraduate Program Director as necessary, but at least one meeting should be called each academic year

C. Undergraduate Program Director

The Undergraduate Program Director is responsible for the supervision, operations, and academic quality of the undergraduate programs in their curriculum, and for keeping the appropriate Department Chair(s) informed about all aspects of the undergraduate programs of study.

1. Selection
 - a. In those instances in which program requirements are wholly or largely delivered by the faculty of a single department, the Department Chair, in consultation with the faculty, recommends to the Dean of Academic Programs the appointment of an Undergraduate Program Director. At the discretion of the Department Chair, this individual may also serve as Vice Chair.
 - b. In those instances in which the program requirements are delivered by faculty from two or more departments, the curriculum faculty shall by ballot nominate one member to the Dean of Academic Programs to serve as Undergraduate Program Director. The Dean of Academic Programs will consult with the appropriate department chairs prior to making the appointment.
2. Term of Office shall be three years, with the privilege of successive terms. The incumbent may be reappointed after consultation with the faculty, as outlined in section VI.C.3.a.
3. Responsibilities: The Undergraduate Program Director is responsible, in consultation with the department chair(s) and faculty, for facilitating the offerings of the academic programs. The department chair(s), however, have the ultimate responsibility for the allocation of resources and faculty assignments. Specific responsibilities of the Undergraduate Program Director include the following:
 - a. To represent the curriculum to prospective students.

- b. To admit students into the curriculum, assign advisers, review senior evaluations and transcripts to verify requirement satisfaction, and recommend variances from curriculum requirements.
- c. To convene the curriculum faculty to review and update the curriculum.
- d. To work with the department chair(s) in the assignment of faculty teaching loads.
- e. To share with the department chair(s) the responsibility for course and curriculum quality.
- f. In consultation with the department chair(s), to schedule course meeting times and complete course construction sheets.
- g. To advise the department chair(s) of the budgetary and staffing needs of the curriculum.
- h. To participate in the recruitment of new faculty for the undergraduate program, to assist in the development of a job description and preparation of the LARF form, and to participate in the search process.
- i. To participate in the evaluation of teaching effectiveness and provide input to the reappointment/promotion process.
- j. To serve as curriculum spokesperson in all appropriate venues.
- k. To gather student views on program content and operations and communicate findings to appropriate faculty groups and School administrators.

VI. AMENDMENTS

Proposed amendments to these bylaws shall be submitted to the Structure and Governance Committee. After consideration and evaluation by the Committee, amendments shall be circulated as specified for resolutions in sections II.D.5. A two-thirds majority at a regular or special meeting shall be required for approval.

Cook College Bylaws Adopted December 12, 1984

Amended March 25, 1987 and December 17, 1987

Amended April 23, 1990

Amended April 26, 1991

Corrected, updated and revised October 1993 (Rules of Procedure Committee)

Amended December 16, 1993

Amended March 16, 1994

Amended September 19, 1994

Amended September 27, 1995

Amended December 12, 1995

Amended September 24, 1997

Amended December 4, 1997

Amended April 30, 1998

Amended September 23, 1998

Amended May 2003

School of Environmental and Biological Sciences Bylaws Adopted May 6, 2008

Amended May 3, 2016, effective July 1, 2016

Amended May 3, 2017, effective July 1, 2017

SEBS/NJAES Faculty and Staff Accomplishments 2013-2017

<https://sebsnjaesnews.rutgers.edu/accomplishments/>

2017

Scott Glenn, distinguished professor in the Department of Marine and Coastal Sciences and co-director of the Center for Ocean Observing Leadership, has been named a Fellow of the Marine Technology Society. This honor recognizes his career of developing novel technologies that have been used to forecast the Gulf Stream dynamics, developing integrated ocean observatories, improving the ability to sample and forecast hurricane intensity, and his focus on integrating undergraduate education into his research.

Beverly Tepper, professor in the Department of Food Science and director of the Center for Sensory Sciences & Innovation, was elected a 2017 Fellow of the Institute of Food Technologists for her “important and sustained contributions to the field of sensory science” and “exemplary leadership in promoting the understanding of sensory science through her various roles as a researcher, educator, and mentor.”

Paul Gottlieb, associate professor in the Department of Agricultural, Food, and Resource Economics, is the principal investigator of an award totaling \$381,154. The project, “Industry Clusters and the Location of Agriculture: Establishing a Theoretical Base for Economic Development Practice,” is supported by the U.S. Department of Agriculture’s National Institute of Food and Agriculture.

Siobain Duffy, associate professor in the Department of Ecology, Evolution, and Natural Resources, was awarded the Ann Palmenberg Junior Investigator Award by the American Society for Virology.

Lena Struwe, professor in the departments of Ecology, Evolution, and Natural Resources, and Plant Biology, and **Myla Aronson**, assistant professor in the Department of Ecology, Evolution, and Natural Resources, are co-PIs on a four-year, \$1.5 million NSF Advancing Digitization of Biodiversity Collections program collaborative research grant, “Digitization TCN: The Mid-Atlantic Megalopolis: Achieving a greater scientific understanding of our urban world.” The lead PI is Cynthia Skema, University of Pennsylvania.

Pamela McElwee, associate professor in the Department of Human Ecology, won the EuroSEAS Book Prize for the best academic book on Southeast Asia published in the social sciences for *Forests are Gold: Trees, People and Environmental Rule in Vietnam*. The book was also shortlisted as one of the five best 2015-2017 books on Asia in the social sciences category by the International Convention of Asia Scholars.

Kay Bidle, professor in the Department of Marine and Coastal Sciences and Board of Trustees research fellow, begins his fourth year as the recipient of the Gordon and Betty Moore Foundation Investigator Award in marine microbiology. Funding for this award was \$1.7 million for the 66-month period beginning in 2013. He was one of 16 scientists from such institutions as Harvard, Cal Tech and MIT who were selected to share up to

\$35 million in funding over five years to pursue pioneering research in the field of marine microbial ecology.

Joan Bennett, professor in the Department of Plant Biology, received the Tai Fung-Lan Award for International Cooperation from the Mycological Society of China, a scientific society that promotes mycological studies. In addition, she was the chair of a committee tasked with producing the report, “Microbiomes of the Built Environment,” for the National Academy of Sciences.

Bonnie McCay, professor emeritus in the Department of Human Ecology, and **Eleanor Bochenek**, director of the Fisheries Cooperative Center at Rutgers Haskin Shellfish Research Laboratory, were selected to serve on the Fisheries Steering Committee of the National Academies of Sciences, Engineering, and Medicine. The goal of the committee is to examine issues related to Atlantic offshore renewable development, as well as commercial and recreational fisheries. McCay serves as the chair of the committee.

RCE agricultural agents **Wesley Kline** (Cumberland County) and **Meredith Melendez** (Mercer County) and the NJAES on-farm food safety team were awarded the National Association of County Agricultural Agents Search for Excellence National Award for Farm Health and Safety.

Joseph Heckman, extension specialist in the Department of Plant Pathology, was awarded a two-year USDA Sustainable Agriculture Research and Education Program grant for the project, “Farmer-generated training and equipment solutions for producing and processing value-added grains.” This grant is in partnership with the Organic Growers’ Research and Information-Sharing Network (OGRIN), and the Northeast Organic Farming Association of New Jersey (NOFA-NJ).

Bill Sciarappa, county agent and department head, Cooperative Extension of Monmouth County, **Vivian Quinn**, program associate, RCE of Monmouth County and **Dan Ward**, director of the Rutgers Agricultural Research and Extension Center and assistant extension specialist in pomology in the Department of Plant Biology, have been named the American Society for Horticultural Science Outstanding Education Publication Award winners for papers published in 2016 for their joint submission, “Comparing Conventional, Hybrid, and Distance Learning Courses in Horticulture,” published in *HortTechnology*.

RCE Water Resources Program and the NY/NJ Baykeeper were awarded a Conservation Achievement Award by the NY/NJ Harbor Estuary Program for their work establishing municipal action teams in seven New Jersey ‘combined sewer system’ (CSS) communities to foster community engagement and advocate for implementation of green infrastructure.

Changlu Wang, associate extension specialist in the Department of Entomology, is the principal investigator of an award totaling \$50,000. The project, “Developing Aesthetic Injury Level for German Cockroach IPM,” is supported by the U.S. Department of Agriculture.

Alan Robock, distinguished professor in the Department of Environmental Sciences, was awarded a grant totaling \$2,982,206 over three years. The project, “Environmental and Human Impacts of Nuclear War,” is supported by The Open Philanthropy Project.

Nicholi Vorsa, research professor in the Department of Plant Biology and director of the Marucci Center for Blueberry and Cranberry Research and Extension, NJAES, received an award totaling \$456,727. The project, “Targeting Cranberry Fruit Chemistry to Develop Cultivars with Novel Phytochemical Profiles for Healthier, Reduced ‘Added-Sugar’ Products,” is supported by USDA-National Institute for Food and Agriculture’s Agriculture and Food Research Initiative.

Lena Struwe, professor in the departments of Ecology, Evolution, and Natural Resources, and Plant Biology, was elected to a six-year term as a member of the council of the International Plant Taxonomists Association.

Malin Pinsky, assistant professor in the Department of Ecology, Evolution, and Natural Resources, is the principal investigator of an award totaling \$86,036. The project, “Projecting and Communicating Changes in North American Marine Species Distributions,” is supported by the National Oceanic and Atmospheric Administration and the U.S. Department of Commerce.

JeanMarie Hartman, associate professor in the Department of Landscape Architecture, is the principal investigator of an award totaling \$300,000. The project, “Research for Targeting Regulatory Protections to Vulnerable Forests in the Delaware River Watershed,” is supported by the William Penn Foundation.

Nilgun Tumer, distinguished professor in the Department of Plant Biology, is the principal investigator of a five-year award totaling \$2,182,115. The project, “Inhibitors targeting ribosome interactions of ricin,” is supported by the National Institute for Health.

Nicholi Vorsa, research professor in the Department of Plant Biology and director of the Marucci Center for Blueberry and Cranberry Research and Extension, New Jersey Agricultural Experiment Station, received an award of \$154,954. The project, “Isolation of Individual Proanthocyanidin (PAC) Compounds and Fractions from Cranberry and Cocoa” is supported by Ocean Spray Cranberries, Inc.

Andrew Wyenandt, extension specialist in vegetable pathology, Rutgers Agricultural Research and Extension Center, was honored with a Distinguished Service to Agriculture citation by the New Jersey State Board of Agriculture during the New Jersey State Agricultural Convention in Atlantic City in February.

The following **SEBS faculty** were recipients of Rutgers Raritan River Consortium minigrants of \$7,500 that involve partnerships with Raritan stakeholders to support research by university faculty, staff, and postdoctoral researchers on Raritan River, basin, and bay resource issues:

- **Olaf Jensen**, Department of Marine and Coastal Sciences, with NJDEP and New Jersey American Water Company, for “Monitoring Fish Migration on the Raritan River: A Live Stream of Fish Ladder Passage.”
- **Josh Kohut**, Department of Marine and Coastal Sciences, and **Robert Schuster**, NJDEP Marine Water Monitoring Bureau, for “2017 Raritan River Water Quality Sampling: Introducing Rutgers Students to NJDEP Sampling and Quality Control Standards.”
- **Max Häggblom**, Department of Biochemistry and Microbiology, and wastewater treatment plants discharging to the Raritan, for “Anaerobic Biodegradability of Pharmaceuticals and Personal Care Products in Raritan River Sediments.”
- **Beth Ravit**, Department of Environmental Sciences, and **Keith Cooper**, Department of Biochemistry and Microbiology, with New York/New Jersey Baykeeper, for “Microplastic Pollution in the Raritan River.”

Gediminas Mainelis, professor in the Department of Environmental Sciences, is the principal investigator of an award totaling \$161,306. The project, “The Investigation in the Characteristics of Nanoparticle Release from Nano-Enabled Consumer Sprays (FP2395),” is supported by the U.S. Consumer Product Safety Commission.

Hernan Arango, research programmer in the Department of Marine and Coastal Sciences, is the principal investigator of an award totaling \$148,000. The project, “A Terrain-Following Ocean Modeling System,” is supported by the Department of the Navy, Office of Naval Research.

Lena Struwe, professor in the departments of Ecology, Evolution, and Natural Resources, and Plant Biology, was elected a council member to the International Association of Plant Taxonomists, a global organization uniting researchers in botanical systematics across the world.

Jerry Baron, executive director of the IR-4 Project, NJAES, is the principal investigator of an award totaling \$356,559. The project, “Development and Utilization of Sufficient Residue Data to Satisfy International Data Requirements for Establishment of Appropriate Maximum Residue Levels to Facilitate Exports of U.S.-Grown Specialty Crops,” is supported by the U.S. Department of Agriculture.

Tamar Barkay, distinguished professor in the Department of Biochemistry and Microbiology, and **Nicole Fahrenfeld**, associate professor in the School of Engineering, are co-principal investigators of an award totaling \$191,904. The project, “Unlocking the Microbial Ecology of Environmental Antibiotic Resistance,” is supported by the U.S. Centers for Disease Control and Prevention.

Tracy Anthony, associate professor in the Department of Nutritional Sciences, is the principal investigator of an award totaling \$2,730,392. The project, “Homeostatic Responses to Amino Acid Insufficiency,” is supported by the National Institutes of Health.

Mike De Luca, director of the Aquaculture Innovation Center, NJAES, is the principal investigator of an award totaling \$709,558. The project, “Research, Education, Coastal

Training, and Stewardship Programs at the Jacques Cousteau National Estuarine Research Reserve,” is supported by the U.S. Department of Commerce.

2016

Henry John-Alder, professor and chair of the Department of Ecology, Evolution, and Natural Resources, and **Pal Maliga**, professor of plant biology in the Department of Plant Biology and principal investigator at the Waksman Institute of Microbiology, were named Fellows of the American Association for the Advancement of Science (AAAS) Fellows. They joined eight other Rutgers professors who were among 391 fellows from the U.S. and abroad who were chosen by their peers for this prestigious honor, for “efforts to advance science applications that are deemed scientifically or socially distinguished.”

Tung-Ching Lee, distinguished professor in the Department of Food Science, was named University Chair Professor of Food Science and Technology by the National Chung Hsing University, Taiwan.

David Robinson, professor in the Department of Geography and for the past 25 years the head of the Office of the New Jersey State Climatologist, which is supported by NJAES, received 2017 Life Achievement Honors from the Association for American Geographers. An excerpt of his award reads: *“David Robinson is a multi-dimensional geographer who has achieved extraordinary success and impact in many domains simultaneously; he is an international and national scientific leader in cryosphere and hydrological studies; he is the scholarly public face of climate and weather for the State of New Jersey; he is a long-serving departmental leader; and he is a beloved teacher...who has mentored many geographers who have gone on to become important scholars and leaders in their own right.”*

Scott Glenn, distinguished professor in the Department of Marine and Coastal Sciences and co-director of the Center for Ocean Observing Leadership, was named the recipient of the Oceanography Award for “outstanding contributions to the field of oceanography” by the Society for Underwater Technology.

Christopher Obropta, associate professor in the Department of Environmental Sciences and extension specialist in water resources, received the 2016 National Epsilon Sigma Phi Visionary Leadership Award for the Northeast Region.

Randy Gaugler, distinguished professor in the Department of Entomology and director of the NJAES Mosquito Control Program, received the 2017 Medal of Honor, the association’s highest award, from the American Mosquito Control Association for his work and leadership in the field of managing mosquitoes.

Elisabeth Sikes, associate professor in the Department of Marine and Coastal Sciences, is the principal investigator of an award totaling \$104,926. The project, “Pacific Ocean Stratification since the Last Ice Age: New Constraints from Benthic Foraminifera,” is supported by the National Science Foundation.

Benjamin Horton, professor in the Department of Marine and Coastal Sciences, was named the winner of the Plinius Medal by the European Geosciences Union (EGU). The award honors scientists for their important contributions to the Earth, planetary and space sciences.

Sarah Ralston, professor in the Department of Animal Sciences, received the inaugural “Educator of the Year” award from the New Jersey Veterinary Foundation for her long career of nurturing pre-veterinary and veterinary students.

Daniel Van Abs, associate professor in the Department of Human Ecology won a 2016 Governor’s Environmental Excellence Award through his collaborative work with Jersey Water Works (JWW), in the category of water resources.

Barbara O’Neill, distinguished professor in the Department of Agricultural, Food and Resources Economics and extension specialist in financial resource management, received a Distinguished Fellow award from the Association for Financial Counseling and Planning Education, which honors innovation, expertise, and leadership in financial counseling and education.

Barbara Tangel, professor in the Department of Nutritional Sciences and director of the Didactic Program in Dietetics, received the Carolyn Sebastianelli Distinguished Member Award from the New Jersey Dietetic Association (NJDA). The award, the highest given by the NJDA, honors a member who has been a role model, demonstrating commitment to the nutritional needs of the community, leadership, mentoring, service to others, and professionalism and high ethical standards in practice.

Max Häggblom, distinguished professor and chair of the Department of Biochemistry and Microbiology, was named a U.S.-Faculty Scholar for the 2016-17 academic year by the Vietnam Education Foundation, an independent federal government agency created by the U.S. Congress with the mission to strengthen the U.S.-Vietnam bilateral relationship through educational exchanges in the STEM fields. Häggblom also received a grant from the VEF U.S. Faculty Scholar Program to teach a course in environmental microbiology in Vietnam.

Jack Rabin, associate director for farm programs, NJAES, was awarded the 2016 New Jersey Farm Bureau Distinguished Service to Agriculture Award, presented at the Annual Meeting of the Farm Bureau, the state’s largest membership organization representing farmers and the wider community of agriculture.

Mark Vodak, associate professor in the Department of Ecology, Evolution, and Natural Resources, and extension specialist in forestry, received the W.D. Hagenstein Communicator Award from the Society of American Foresters (SAF). This award is given to an SAF member who leads innovative and exemplary communications initiatives and program that increase public understanding of forestry and natural resources.

Mark Robson, distinguished service professor and professor, Department of Plant Biology, was unanimously selected to receive the 2016 Frank J. Osborne Memorial Award by the New Jersey Association of County and City Health Officials (NJACCHO) at the Atlantic City Convention Center on November 16. The award, the highest honor bestowed upon a member of New Jersey's public health community, recognizes meritorious achievement in public health.

Pal Maliga, professor in the Department of Plant Biology and distinguished professor in the Waksman Institute of Microbiology, won the Lawrence Bogorad Award for Excellence in Plant Biology Research from the American Society of Plant Biologists.

Paul Breslin, professor in the Department of Nutritional Sciences, has been elected to Distinguished Fellowship in the National Academies of Practice (NAP) and the Psychology Academy.

Margaret Brennan-Tonetta, associate vice president for economic development at Rutgers and associate director, NJAES, was appointed to the Board of Directors of Einstein's Alley, a private, non-profit economic development initiative located in Central New Jersey whose mission is to foster economic growth through advocacy and delivery of services.

Co-PI **Rachael Shwom**, associate professor, and **Cara Cuite**, associate research professor, Department of Human Ecology, are part of a multi-university team awarded a five-year grant of \$2,983,358 by the National Science Foundation, through its Innovations at the Nexus of Food, Energy and Water program. The subcontract to Rutgers is \$419,184. The project, "Reducing Household Food, Energy and Water Consumption: A Quantitative Analysis of Interventions and Impacts of Conservation," runs from October 2016-October 2021.

Christopher Obropta, associate professor in the Department of Environmental Sciences and extension specialist in water resources, was awarded \$500,000 from the William Penn Foundation for the RCE Water Resources Program's project, "Technical Support Program for Municipalities and Watershed Partners."

Robert Kopp, associate professor in the Department of Earth and Planetary Sciences and associate director of the Rutgers Energy Institute, is co-principal investigator of an award totaling \$3 million along with **Rebecca Jordan** (Department of Human Ecology), **Lisa Auermueller** (Jacques Cousteau National Estuarine Research Reserve), **Clint Andrews** (Bloustein) and **Jie Gong** (Civil & Environmental Engineering). The project, "NSF Research Traineeship in Coastal Climate Risk and Resilience," is supported by the National Science Foundation.

Max Häggblom, distinguished professor and chair of the Department of Biochemistry and Microbiology, has been named a US-Faculty Scholar by the Vietnam Education Foundation for the 2016-2017 academic year.

Tom Leustek, professor in the Department of Plant Biology and Pathology, and associate dean of academic administration, was appointed the Academic Leadership Program Fellow from Rutgers to the Big Ten Academic Alliance for the 2016-17 academic year.

Stacy Bonos, associate professor in the Department of Plant Biology and Pathology, was elected a 2016 Crop Science Society of America (CSSA) Fellow, the highest recognition bestowed by the CSSA to its members based on their professional achievements and meritorious service.

Cristi Palmer, ornamental horticulture program manager, IR-4Project, is the principal investigator of an award totaling \$121,435. The project, "Enhanced Mitigation and Detection of Impatiens, Cucurbit, Hops, and Basil Downy Mildews," is supported by the Department of Agriculture.

Mehmet Uzumcu, associate professor in the Department of Animal Sciences, is the principal investigator of an award totaling \$232,500. The project, "Detrimental Effects on Female Reproduction of in Utero and Neonatal Exposure to Common Phthalates DEHP and Its Replacement DINP," is supported by the National Institutes of Health.

Larry Katz, professor in the Department of Animal Sciences and director of Rutgers Cooperative Extension, has been named a Fellow in the Society for the Study of Reproduction.

Scott Glenn, distinguished professor in the Department of Marine and Coastal Sciences and co-director of the Center for Ocean Observing Leadership, is the principal investigator of an award totaling \$3.1 million. The project, "MARACOOS: Preparing for a Changing Mid-Atlantic," is supported by the National Oceanic and Atmospheric Administration.

Andrew Wyenandt, extension specialist in vegetable pathology, Rutgers Agricultural Research and Extension Center, is the principal investigator, and **Jim Simon**, professor in the Department of Plant Biology and Pathology, and **Ramu Govindasamy**, professor and chair of the Department of Agricultural, Food, and Resource Economics, are co-principal investigators, of an award totaling \$563,852. The project, "A Production System for High Value Crops at Risk from Downy Mildew, Integrating Detection, Breeding, Extension, and Education," is supported by the U.S. Department of Agriculture.

Michael Camasso, professor in the Department of Agricultural, Food, and Resource Economics, and **Radha Jagannathan**, professor of statistics in the Edward J. Bloustein School of Planning and Public Policy, received the New Brunswick Education Foundation Board of Directors Outstanding Contribution Award for "outstanding innovative design and implementation of educational enrichment activities and curriculum that impacts New Brunswick Public School students through the wonders of nature and natural science."

Diana Roopchand, assistant research professor in the Department of Plant Biology and Pathology, is the principal investigator of an award totaling \$422,247. The project,

“Interactions of Dietary Polyphenols, Gut Microbiota and Intestinal Epithelium,” is supported by the National Center for Complementary and Integrative Health.

Tom Leustek, professor in the Department of Biology and Pathology, and associate dean of academic administration, was named a guest associate editor for *PLOS Genetics*, an open access, peer-reviewed journal published monthly by Public Library of Science (PLOS).

Richard Lutz, distinguished professor in the Department of Marine and Coastal Sciences, and director of the Rutgers Center for Deep Sea Ecology and Biotechnology, is the principal investigator of an award totaling \$342,987. The project, “Biomass Production from Deep Sea Organisms,” is supported by a major pharmaceutical company.

Cara Cuite, associate research professor in the Department of Human Ecology, and community co-directors **Patricia Sadowski** and **Jennifer Shukaitis**, New Brunswick Board of Education, are recipients of the 2016-2017 Community-University Research Partnership Grants for New Brunswick. Their project evaluates Breakfast After the Bell, a program that offers free breakfast to all K–8 students and was implemented in the New Brunswick Public Schools in 2014. This grant program funds the work of faculty members and community partners who are collaborating on new and existing research projects that advance scholarly knowledge while providing meaningful benefit to the New Brunswick community.

Michael J. Camasso, professor in the Department of Agricultural, Food, and Resource Economics, and **Radha Jagannathan**, professor in the Edward J. Bloustein School of Planning and Public Policy served as distinguished visiting research scholars in France. They were selected by the Centre d’Études et de Recherches sur les Qualifications, a joint project of the Ministère de l’Éducation and the Ministère du Travail in Paris, to collaborate with French and German researchers around issues and policies addressing youth unemployment.

Siobain Duffy, Department of Ecology, Evolution, and Natural Resources and **Ning Zhang**, Department of Plant Biology & Pathology and Department of Biochemistry & Microbiology, were selected as Chancellor’s Scholars for 2016-2017. The Rutgers New Brunswick Strategic Plan called for the creation of a Chancellor’s Excellence Fund, which designates a select group of faculty members at the associate professor level as “Chancellor’s Scholars” who are nominated by their respective deans.

Christopher Obropta, associate professor in the Department of Environmental Sciences and extension specialist in water resources, is the principal investigator of an award totaling \$470,000. The project, “New Technical Assistance Program for Combined Sewer Overflow Communities,” is supported by the Surdna Foundation.

Anne Nielsen, assistant extension specialist in the Department of Entomology, is the principal investigator of an award totaling \$299,953. The project, “IPM-CPR: A Systems-Level Approach to Manage Brown Marmorated Stink Bug and Conserve Beneficial Insects in Tree Fruit,” is supported by the U.S. Department of Agriculture.

Karen Schaich, associate professor in the Department of Food Science, won the 2016 Stephen S. Chang Award for Lipid and Flavor Science from the Institute of Food Technologists.

Lena Struwe, associate professor in the departments of Ecology, Evolution and Natural Resources, and Plant Biology and Pathology, received a 2016 Warren I. Sussman Award for Excellence in Teaching from Rutgers University.

The following faculty and staff were recognized with 2016 **“Celebration of Excellence”** Awards from SEBS and NJAES:

Teaching Excellence Award

Marci Meixler, Department of Ecology, Evolution and Natural Resources

Research Excellence Award

Jennifer Francis, Department of Marine and Coastal Sciences

Outreach Excellence Award

Christopher Obropta, Department of Environmental Science

International Excellence Award

Weilin Huang, Department of Environmental Science

Team Excellence Award: Rutgers On-Farm Food Safety Team

Christian Kleingunther, USDA

Wesley Kline, RCE

Meredith Melendez, RCE

Donald Schaffner, Department of Food Science

Jennifer Todd, Ph.D. candidate, Department of Food Science

Staff Excellence Award

Dalynn Knigge, Office of Continuing and Professional Education

Jenice Sabb, SEBS Educational Opportunity Fund Office

Barbara Munson Goff “Teacher of the Year,” selected by Alpha Zeta Fraternity

Rick Ludescher, Dean of Academic Programs; Department of Food Science

Christopher Obropta, associate professor in the Department of Environmental Sciences and extension specialist in water resources, received a 2016 Education and Public Service Award from the Universities Council on Water Resources.

Donna Fennell, associate professor in the Department of Environmental Sciences, is the principal investigator of an award totaling \$345,968. The project, “Microbial Processes at AOC1of Chamber Works,” is supported by a corporate contract.

Richard Lathrop, professor in the Department of Ecology, Evolution and Natural Resources, and director of the Grant F. Walton Center for Remote Sensing and Spatial Analysis, is the principal investigator of an award totaling \$38,937. The project, “Shorebird Conservation in Brazil and Delaware Bay,” is supported by the Neotropical Migratory Bird Conservation Act 2015 IMPACT Program.

Jerry Baron, executive director, IR-4 Project, is the principal investigator of an award totaling \$33,000. The project, “Phosphorous Acid MRL Barrier to EU Export of California Tree Nuts: Residue Studies,” is supported by the U.S. Department of Agriculture.

Rich Lutz, professor in the Department of Marine and Coastal Sciences, has been named a National Fellow of the Explorers Club, a U.S.-based international multidisciplinary professional society dedicated to the advancement of field research, scientific exploration, resource conservation, and the ideal that it is vital to preserve the instinct to explore.

Lena Struwe, associate professor in the departments of Ecology, Evolution and Natural Resources, and Plant Biology and Pathology, was elected a Fellow of the Linnean Society of London.

Loredana Quadro, associate professor in the Department of Food Science and member of the Rutgers Center for Lipid Research at the New Jersey Institute for Food, Nutrition, and Health, is the principal investigator of an award totaling \$316,147. The project, "The Asymmetric Cleavage of Beta-Carotene in Mammalian Embryonic Development," is funded by the U.S. Department of Health and Human Services.

Michael Westendorf, associate professor and associate extension specialist in the Department of Animal Sciences, is the principal investigator of an award totaling \$162,000. The project, "Best Management Practices Implementation Program," is supported by the U.S. Department of Agriculture.

Louis Cooperhouse, director of the Rutgers Food Innovation Center, is the principal investigator of an award totaling \$150,000. The project, "Development of Food Business Innovation Network (FoodBIN) and Best Practice/Next Generation Models of Food Industry Incubation and Acceleration," is supported by the U.S. Department of Agriculture. The **Food Innovation Center** received a \$70,000 grant from the Paterson Restoration Corporation to lead a feasibility study on creating a food business incubation program in Paterson.

Cesar Rodriguez-Saona, associate extension specialist in the Department of Entomology, is the principal investigator of an award totaling \$331,480. The project, "Sustainable Strategies to Manage *Spotted Wing Drosophila* in U. S. Fruit Crops," is supported by the U.S. Department of Agriculture.

2015

Bruce Clarke, professor in the Department of Plant Biology and Pathology; extension specialist of turfgrass pathology; and director of the Rutgers Center for Turfgrass Science, received the 2016 USGA Green Section Award from the United States Golf Association.

Diane Adams, assistant professor in the Department of Marine and Coastal Sciences, received the 2015 Bergmann Memorial Award, which recognizes promising young scientists who are recipients of new grants from the United States-Israel Binational Science Foundation.

Ilya Raskin, distinguished professor in the Department of Plant Biology and Pathology and president of the Global Institute for Bio-Exploration, is the principal investigator of an award totaling \$2,879,891 over five years. The project, “Botanicals and Metabolic Resiliency,” is supported by the National Institutes of Health.

Loredana Quadro, associate professor in the Department of Food Science, received the 2015 First-year Interest Group Seminars (FIGS) Faculty Mentor Award.

Richard Lathrop, professor in the Department of Ecology, Evolution and Natural Resources, was appointed by the Rutgers Board of Governors as the inaugural holder of the new Johnson Family Chair in Water Resources and Watershed Ecology. In his role as chair, Lathrop leads an interdisciplinary program to study how human activities in upland watersheds affect downstream aquatic ecosystems and how that knowledge can be applied to promote restoration and better stewardship of water resources.

Benjamin Horton, professor in the Department of Marine and Coastal Sciences, was named the winner of the Plinius Medal by the European Geosciences Union (EGU). Since 2012, the Plinius medal, which was established by the EGU Natural Hazards Division, recognizes interdisciplinary research in natural hazards by mid-career scientists and honors scientists for their important contributions to the Earth, planetary and space sciences.

Tamar Barkay, distinguished professor in the Department of Biochemistry and Microbiology, was elevated to the rank of fellow in the American Association for the Advancement of Science (AAAS). A top national association, AAAS selects its fellows based on their efforts in advancing science or fostering applications considered scientifically or socially distinguished. Barkay was cited for “distinguished contributions to the field of environmental science, particularly for advancing our understanding of how microorganisms effect the fate of mercury in the environment.”

Joseph Goffreda, associate professor in the Department of Plant Biology and Pathology and director of the Rutgers Fruit and Ornamental Research Extension Center, was honored with the “Inventor of the Year Award” by the New Jersey Inventors Hall of Fame. Goffreda was honored for breeding a hybrid peach (NJF16) marketed under the name TangOs®, which has a combination of attributes attractive to commercial producers and consumers, yet is resistant to major diseases, particularly bacterial spot.

Mark Robson, professor and chair of the Department of Plant Biology and Pathology, was named a Distinguished Service Professor by the Rutgers Board of Governors. Robson was recognized for “sustained and exceptional service to the University, to the academic profession, to the state or nation, or to the broader community by a faculty member at the full professorial rank.”

Ning Zhang, associate professor in the Department of Plant Biology and Pathology, and **Siobain Duffy**, associate professor in the Department of Ecology, Evolution and Natural Resources, received prestigious Faculty Early Career Development Program (CAREER) awards from the National Science Foundation. Zhang’s award is worth \$592,980 over five years and Duffy’s award is worth \$675,000 over five years.

Serpil Guran, director of the Rutgers EcoComplex, New Jersey Agricultural Experiment Station, is the principal investigator of an award totaling \$157,517. The project, "Achieving a Greener and Safer Food Supply Chain in the Newark, N.J. Region: Realizing Pollution Prevention, Energy Efficiency, and Water Conservation Benefits through Sustainability and Resiliency Training," is funded by the U.S. Environmental Protection Agency and will involve the Rutgers EcoComplex and Food Innovation Center.

Richard Lutz, professor in the Department of Marine and Coastal Sciences, was honored by the Academy of Underwater Arts and Sciences with a NOGI Award, the oldest and most prestigious award in the diving industry, which celebrated Lutz's contributions to the underwater world at the 55th NOGI Awards Gala in Orlando, FL.

Rutgers Cooperative Extension (RCE) was awarded a grant of \$460,170 by the United States Department of Agriculture (USDA) as part of \$17 million in new federal funding to benefit beginning farmers and ranchers across the U.S. The three-year grant to Rutgers, awarded through the Beginning Farmer and Rancher Development Program administered by USDA's National Institute of Food and Agriculture, will be used by RCE to educate new and beginning farmers in New Jersey on how to grow high-value crops on small acreage.

Ramu Govindasamy, professor and chair of the Department of Agricultural, Food, and Resource Economics, and associate director of the New Use Agriculture and Natural Plant Products Program in the Department of Plant Biology and Pathology, is the principal investigator of an award totaling \$99,803. The project, "Assessment of Organic Produce Marketing Opportunities in the Mid-Atlantic Region," is funded by the U.S. Department of Agriculture.

Naa Oyo Kwate, associate professor in the Department of Human Ecology, and in the Department of Africana Studies, School of Arts and Sciences, is the principal investigator of an award totaling \$142,172. The project, "The City as Health Policy," is funded by the Robert Wood Johnson Foundation.

Joan Bennett, professor in the Department of Plant Biology and Pathology, was presented the Waksman Teaching Award of the Society for Industrial Microbiology and Biotechnology. The award recipient "shall have been an active full time professor at a recognized institution of higher education for a minimum of 10 years or has attained emeritus status."

Lena Struwe, associate professor in the departments of Ecology, Evolution and Natural Resources, and Plant Biology and Pathology, and director of the Chrysler Herbarium at Rutgers, was awarded the 2015 American Society of Plant Taxonomists' Innovations in Plant Systematics Education Prize (IPSEP) for developing novel and innovative resources for teaching plant systematics.

Department of Ecology, Evolution and Natural Resources faculty **Brooke Maslo**, assistant professor and extension specialist in wildlife ecology, **Malin Pinsky**, molecular ecologist and assistant professor, and **Nina Fefferman**, epidemiologist and associate

professor, received funding of more than \$300,000 dollars from the U.S. Fish and Wildlife Service to investigate strategies to fight White-nose Syndrome, a fungal disease in bats.

Jenny Carleo, agricultural and resource management agent, Rutgers Cooperative Extension of Cape May County, was recognized with the 2015 Distinguished Service Award by the National Association of County Agricultural Agents.

Carey Williams, associate director of extension at the Equine Science Center and associate professor in the Department of Animal Sciences, won the 2015 American Society of Animal Science and Equine Science Society's Equine Science Award.

Changlu Wang, associate extension specialist in urban pest management in the Department of Entomology, received the 2015 Award of Excellence from the Northeast Cooperative Extension Directors, the highest award presented by the directors of Extension in the northeast.

Joan Bennett, professor in the Department of Plant Biology and Pathology, was elected Secretary of Division VI of the National Academy of Sciences.

Bingru Huang, professor in the Department of Plant Biology and Pathology and graduate program director in Plant Biology, won the Tengtou Agricultural Science Award given by the American Society of Agronomy.

V. Monica Bricelj, research professor in the Department of Marine and Coastal Sciences & Haskin Shellfish Research Laboratory, and adjunct professor in the Department of Ecology, Evolution & Natural Resources, was awarded a Mexico-U.S. Commission for Educational and Cultural Exchange COMEXUS/Fulbright-Garcia Robles fellowship to conduct research at the Shellfish Biotechnology Laboratory at the Universidad Autónoma de Baja California in Mexico from August 2015-July 2016.

Oscar Schofield, professor in the Department of Marine and Coastal Sciences, is the principal investigator of an award totaling \$929,919. The project, "Polar Interdisciplinary Coordinated Education," is funded by the National Science Foundation.

Josh Kohut, associate professor in the Department of Marine & Coastal Sciences and **Pamela McElwee**, associate professor in the Department of Human Ecology were named inaugural "Chancellor's Scholars" by the New Brunswick Chancellor's Office. **Robert Kopp**, SAS associate professor and associate director of the Rutgers Energy Institute, was also named a Chancellor Scholar.

Ramu Govindasamy, professor and extension specialist in the Department of Agricultural, Food, and Resource Economics, was selected to receive the Emerald Award of Excellence as the Highly Commended Paper, "Agritourism Consumer's Participation in Wine Tasting Events: An Econometric Analysis," by the *International Journal of Wine Business Research*. The paper was co-authored with Kathleen Kelley of The Pennsylvania State University.

George Carman, Board of Governors Professor in the Department of Food Science; chief scientific officer of the New Jersey Institute for Food, Nutrition, and Health; and director of the Rutgers Center for Lipid Research, is the principal investigator of an award totaling \$2,067,434 over five years. This is the second installment of a 10-year MERIT award. The project, "Phospholipid Metabolism and Membrane Function," is being supported by the National Institute of General Medical Sciences.

Leonard Bielory, an allergy specialist with the Rutgers Center of Environmental Prediction at the School of Environmental and Biological Sciences and the Rutgers Robert Wood Johnson University Hospital, was appointed by Governor Chris Christie as a public member to the New Jersey Clean Air Council.

William Hallman, professor and chair of the Department of Human Ecology, is the principal investigator of an award totaling \$450,000. The project, "Food Nanotechnology: Expanding the Parameters of Consumer Acceptance," is funded by the National Institute of Food and Agriculture.

Malin Pinsky, assistant professor in the Department of Ecology, Evolution, and Natural Resources, is the principal investigator of an award totaling \$180,745. The project, "Climate Impact Projections for U.S. Fisheries," is being supported by The Pew Charitable Trusts.

The following five SEBS faculty were honored by the university for their "outstanding contributions in the classroom, to their disciplines, or for the benefit of the community or world":

Siobain Duffy, Ecology Evolution and Natural Resources:

Board of Trustees Research Fellowship for Scholarly Excellence & the Presidential Fellowship for Teaching Excellence

Ning Zhang, Plant Biology and Pathology:

Board of Trustees Research Fellowship for Scholarly Excellence

Tamar Barkay, Biochemistry and Microbiology:

Board of Trustees Award for Excellence in Research

Mark Robson, Plant Biology and Pathology:

Warren I. Susman Award for Excellence in Teaching

Tom Rudel, Human Ecology:

Board of Trustees Award for Excellence in Research

Barbara O'Neill, extension specialist in financial management, won two awards in the "Best Personal Finance Resource" and "Best Personal Finance Activity" categories in the Next Gen Personal Finance's First Annual Financial Literacy Month Contest.

The following faculty received Rutgers Centers for Global Advancement and International Affairs grants for their proposals under the category "International Collaborative Research Grant for Tenured Faculty."

Eric Lam, Department of Plant Biology and Pathology

"Enabling the creation of a pilot facility for wastewater-to-biomass pipeline in the Northeast region of Brazil."

Rick Ludescher, Department of Food Science

“Pathways to International Study at the School of Environmental and Biological Sciences.”

Heidi Hausermann, Department of Human Ecology

“Producing disease in commodity landscapes: A pilot study from Ghana’s alluvial gold mining belt.”

Lena Struwe, Department of Ecology, Evolution and Natural Resources

“Formation of a world-wide urban plant evolution and education network.”

The following faculty and staff were recognized with 2015 “Celebration of Excellence”

Awards from SEBS and NJAES:

Teaching Excellence Award

Lena Struwe, departments of Ecology, Evolution and Natural Resources, and Plant Biology and Pathology

Research Excellence Award

Robert J. Chant, Department of Marine and Coastal Sciences

Outreach Excellence Award

Rachel E. Lyons, Department of 4-H Youth Development

International Excellence Award

Scott Glenn, Department of Marine and Coastal Sciences

Oscar M. Schofield, Department of Marine and Coastal Sciences

Staff Excellence Award

Marsha Morin, Department of Ecology, Evolution and Natural Resources

John Sarti, Department of Plant Biology and Pathology

Barbara Munson Goff “Teacher of the Year,” selected by Alpha Zeta Fraternity

Timothy Casey, Director of the General Honors Program; Department of Ecology, Evolution and Natural Resources

Lena Struwe, associate professor in the Department of Ecology, Evolution and Natural Resources, was appointed as a member-at-large of the Board of Directors of the Organization of Tropical Studies from March 2015-March 2018.

Richard Lutz, professor in the Department of Marine and Coastal Sciences, was recognized by the National Shellfisheries Association, Inc., with its Life Member Award for his “exemplary service and outstanding contributions to the National Shellfisheries Association and to shellfisheries science and education.”

Kenneth Karamichael, senior associate director in the Office of Continuing Professional Education (OCPE) and director of the Transitional Education and Employment Management (TEEM) Gateway, is the principal investigator of an award totaling \$2,122,000. The project, “New Agriculture for a New Generation: Recharging Greek Youth to Revitalize the Agriculture and Food Sector of the Greek Economy,” is funded by the Stavros Niarchos Foundation.

Sue Shapses, professor in the Department of Nutritional Sciences, and acting chair of the Department of Exercise Science and Sport Studies, School of Arts and Sciences, is the principal investigator of an award totaling \$521,201. The project, “Alpha-Glucosidase Inhibitor and Satiety,” is funded by a corporate contract.

Christopher Obropta, associate professor in the Department of Environmental Sciences, , and extension specialist in water resources with Rutgers Cooperative Extension, is the principal investigator of an award totaling \$489,156. The project, "Green Infrastructure for the City of Perth Amboy," is being supported by the New Jersey Department of Environmental Protection.

Nilgun Tumer, distinguished professor in the Department of Plant Biology and Pathology, is the corresponding author of the original research paper, "Trichothecene Mycotoxins Inhibit Mitochondrial Translation—Implication for the Mechanism of Toxicity," based on research conducted in her lab. The paper won the first annual "*Toxins* Best Paper Award" for 2015. Established by the Editorial Board, the award recognizes "outstanding papers related to biotoxins and toxinology that have been published in [the journal] *Toxins*."

Three 4-H programs originated by **Julie Karavan**, 4-H agent in Cumberland County, were recognized with program of excellence awards from the New Jersey Association of 4-H Agents.

David Bushek, associate professor in the Department of Marine and Coastal Sciences, and director of the Haskin Shellfish Research Laboratory, is the principal investigator—along with co-principal investigators **Lisa Calvo**, aquaculture program coordinator, and **Tal Ben-Horin**, postdoctoral researcher at the Haskin Lab—of an award totaling \$190,421. The project, "Minimizing Risks of Vibrio Bacteria in Farm-Raised Oysters Grown in Mid-Atlantic Intertidal Environments", is funded by the National Oceanic and Atmospheric Administration.

Malin Pinsky, assistant professor in the Department of Ecology, Evolution, and Natural Resources, is the principal investigator of an award totaling \$139,990 over two years. The project, "Genetic Monitoring to Improve Fish Stock Assessments," is funded by the New Jersey Sea Grant Consortium.

Richard VanVranken, agricultural agent and chair of Rutgers Cooperative Extension of Atlantic County, was the recipient of the 2015 Distinguished Service to New Jersey Agriculture Award from the State Board of Agriculture. VanVranken received the award at the annual New Jersey Agricultural Convention in Atlantic City, NJ.

Faith Belanger, associate professor in the Department of Plant Biology and Pathology, is the principal investigator of an award totaling \$90,000 over three years. The project, "Understanding Endophyte-Mediated Dollar Spot Resistance in Red Fescue," is funded by the United States Golf Association.

Jeff Boyd, assistant professor in the Department of Biochemistry and Microbiology, is the principal investigator of a corporate contract totaling \$145,740. The project, "The Effect of Zinc and Tin on the Growth and Oxidative Stress Response of Key Oral Bacteria," is funded by Colgate-Palmolive.

Michael Camasso, professor in the Department of Agricultural, Food, and Resource Economics, is designated the visiting scholar for the study of youth employment policy by the vice-rector's Office for Scientific Policy and Research at the University of Granada, Spain. Camasso will lecture and lead a research team that will examine the role played by the inter-generational transmission of values on youth labor market participation.

Kenneth McKeever, professor in the Department of Animal Sciences and Associate Director at the Rutgers Equine Science Center, was appointed to the new scientific advisory board of the Association of Racing Commissioners International, a top-tier international body of regulators, scientists and others involved in the oversight of equine and canine racing.

Thomas Molnar, assistant professor, and **Josh Honig**, research associate, both in the Department of Plant Biology and Pathology, are the principal investigators of an award totaling \$500,000. The project, "Securing and Expanding the U.S. Hazelnut Industry through Breeding for Resistance to Eastern Filbert Blight," is funded by the U.S. Department of Agriculture.

2014

Nicholi Vorsa, research professor in the Department of Plant Biology and Pathology and director of the Marucci Center for Blueberry and Cranberry Research and Extension, New Jersey Agricultural Experiment Station, has been named fellow of the National Academy of Inventors.

Ben Horton, professor in the Department of Marine and Coastal Sciences, received the 2014 Ocean Sciences Voyager Award from the American Geophysical Union. The award is given to mid-career scientists in recognition of significant contributions and expanding leadership in ocean sciences.

John Reinfelder, professor in the Department of Environmental Sciences, is the principal investigator of an award totaling \$70,285. The project, "Stable Isotopic Composition of Mercury in Hackensack Estuary Sediments," is funded by the New Jersey Department of Environmental Protection.

Daniel Hoffman, associate professor in the Department of Nutritional Sciences, received a Fulbright Grant for research and teaching in Brazil.

Eric Lam, professor in the Department of Plant Biology and Pathology, received a Fulbright Grant for research and teaching in Brazil.

Nilgun Tumer, distinguished professor in the Department of Plant Biology and Pathology, has been appointed chair of the Gene Discovery and Engineering Resistance Advisory Committee of the U.S. Department of Agriculture Wheat and Barley Scab Initiative for a two-year term beginning January 1, 2015.

Anne Marie Carlton, assistant professor in the Department of Environmental Sciences, has been appointed to a newly established ad hoc National Research Council committee on the future of atmospheric chemistry, whose goal is to identify priorities and strategic steps forward for atmospheric chemistry research for the next decade.

At the 2014 Green Expo held in Atlantic City and hosted by the NJ Turfgrass Association (NJTA), the Rutgers Organic Land Care Program was presented the NJTA's Environmental Stewardship Award "in recognition of a continuing commitment to environmental preservation and conservation." Program coordinators **Amy Rowe** and **Michele Bakacs**, both environmental and resource management agents for Rutgers Cooperative Extension, were on hand to receive the award.

Lisa A. Rodenburg, associate professor of environmental organic chemistry in the Department of Environmental Sciences, received the Excellence in Review Award from *Environmental Science and Technology*.

Robert Kopp, associate professor in the Department of Earth & Planetary Sciences and associate director of the Rutgers Energy Institute, has been named a 2015 Leopold Leadership Fellow for his work in environmental decision making.

Eleanor Bochenek, marine scientist and director of the Fisheries Cooperative Center at the Haskin Shellfish Research Laboratory, has been appointed to the Board of Directors of the Cape May Forum.

James Murphy, extension specialist in turfgrass management, has been elected Fellow of the Crop Science Society of America, the highest recognition bestowed by the society.

Laura Lawson, professor and chair of the Department of Landscape Architecture, was named one of the "Thirty Most Admired Educators for 2015" in a report by DesignIntelligence, which also ranked the department fourth among the top undergraduate landscape architecture programs on the East Coast. Lawson was the only educator listed from a department of landscape architecture.

Lisa Calvo, program coordinator at Haskin Shellfish Research Laboratory, Rutgers New Jersey Agricultural Experiment Station, is the principal investigator of an award totaling \$119,865. The project, "Establishing a Resilient Coastal Shorelines Program for the State of New Jersey," is funded by the U.S. Department of Interior.

Richard VanVranken, agricultural agent and chair of Rutgers Cooperative Extension of Atlantic County, was the recipient of the 2014 Northeast Region Excellence in Extension award from the Cooperative Extension Committee on Organization & Policy.

Karl Maramorosch, emeritus member of the Department of Entomology, was awarded the Honoris Causa Doctorate by his alma mater, the Warsaw University of Life Sciences, at a ceremony in Warsaw in October.

Dave Lee, agricultural and resource management agent for Rutgers Cooperative Extension of Salem County, was awarded both the County Faculty Person of the Year and Award of Excellence for Faculty at the 2014 Rutgers Cooperative Extension Annual Conference.

Peter Oudemans, extension specialist in blueberry / cranberry pathology, was named Specialist of the Year Award at the 2014 Rutgers Cooperative Extension Annual Conference.

Anita Wagner, clerk at Rutgers Cooperative Extension of Atlantic County, received the Award of Excellence for Support Staff at the 2014 Rutgers Cooperative Extension Annual Conference.

Marycarmen Kunicki, 4-H senior program coordinator, Rutgers Cooperative Extension of Passaic County, received the Award of Excellence for a Program Associate at the 2014 Rutgers Cooperative Extension Annual Conference.

Kendrin Dyitt, 4-H urban program associate in Rutgers Cooperative Extension of Atlantic County, received the Diversity Award for the 4-H Youth Development Department at the 2014 Rutgers Cooperative Extension Annual Conference.

Amy Rowe, environmental and resource management agent, Rutgers Cooperative Extension Essex and Passaic Counties, received the Diversity Award for the Agricultural and Resource Management Agents Department at the 2014 Rutgers Cooperative Extension Annual Conference.

Miss Harmon, urban 4-H program associate, Rutgers Cooperative Extension of Mercer County, received the Equal Employment Opportunity Award at the 2014 Rutgers Cooperative Extension Annual Conference.

Jenny Carleo, agricultural and resource management agent, Rutgers Cooperative Extension (RCE) of Cape May County; **Robin Brumfield**, farm management specialist; **Jeffrey Heckman**, videographer, Office of Continuing Professional Education; **April Lippert-Faczak**, administrator for Annie's Project; **Jennifer Matthews**, project coordinator, RCE of Cape May County; **Meredith Melendez**, senior program coordinator, RCE of Mercer County; **Barbara O'Neill**, financial resource management specialist; and **Nicholas Polanin**, agricultural and resource management agent, RCE Extension of Somerset County received the Rutgers Cooperative Extension Team Award at the 2014 Rutgers Cooperative Extension Annual Conference for their work on Annie's Project.

Mark Robson, professor in the Department of Plant Biology and Pathology and dean of Agricultural and Urban Programs, was presented with a Ramazzini Medal as a Fellow of the Collegium Ramazzini, an international scientific society that examines critical issues in occupational and environmental medicine with a view towards action to prevent disease and promote health.

Barbara Turpin, distinguished professor in the Department of Environmental Sciences and Campus Dean for Undergraduate Education for the George H. Cook Campus, has been elected a 2014 Fellow of the American Association for Aerosol Research.

Malcolm Watford, professor in the Department of Nutritional Sciences and director of the George H. Cook Scholars Program, was appointed Associate Editor for Molecular Nutrition for the journal, *Animal Nutrition* (Elsevier).

Tom Rudel, Distinguished Professor in the Department of Human Ecology, won the 2014 Gerald L. Young Book Award from the Society of Human Ecology for *Defensive Environmentalists and Dynamics of Global Reform*.

Brooke Maslo, assistant professor in the Department of Ecology, Evolution and Natural Resources and Rutgers NJAES specialist in wildlife ecology, received a 2014 Conserve Wildlife Foundation of New Jersey's Women in Wildlife Award, which recognizes outstanding women for their achievements and advances in protecting New Jersey's endangered and threatened wildlife species.

Mark Robson, professor in the Department of Plant Biology and Pathology and dean of Agricultural and Urban Programs, received the Sullivan Award from the New Jersey Public Health Association (NJPHA). Established in 1976 and named after Dennis J. Sullivan, a health officer who dedicated his life to improving the public health of New Jersey, it's the NJPHA's highest award presented to an individual for dedicated and outstanding public service and contributing to the cause of public health in New Jersey.

Alan Robock, distinguished professor in the Department of Environmental Sciences and director of the Meteorology Undergraduate Program, is the winner of the Jule G. Charney Award of the American Meteorological Society in recognition of "highly significant research or development achievement in the atmospheric or hydrologic sciences."

Ken Able, distinguished professor in the Department of Marine and Coastal Sciences and director of Rutgers Marine Field Station at Tuckerton, is the recipient of the 2014 Dr. Nancy Foster Habitat Conservation Award from NOAA's Fisheries Office of Habitat Conservation for "extraordinary dedication, innovation, and excellence to the coastal and marine habitat conservation fields."

Lily Young, professor of environmental microbiology and dean of international programs at SEBS, has been appointed provost of Rutgers University–New Brunswick, effective October 1.

Yana Bromberg, assistant professor in the Department of Microbiology and Biochemistry, was awarded a TUM-IAS Hans Fischer Fellowship for outstanding early-career scientists by the Institute for Advanced Study at the Technical University of Munich (TUM-IAS) in Germany.

Enrique Curchitser, associate professor of physical oceanography and modeling in the Department of Environmental Sciences, was appointed United States Academic Delegate to the North Pacific Marine Science Organization by the U.S. Department of State.

Michael De Luca, senior associate director of the Institute of Marine and Coastal Sciences, has been named chair of the Public Policy Committee and president-elect of the National Association of Marine Laboratories.

William Hallman, professor and chair of the Department of Human Ecology, has been appointed chair of the Risk Communication Advisory Committee by the commissioner of the U.S. Food and Drug Administration.

William Meyer, professor in the Department of Plant Biology and Pathology and director of the Rutgers Turfgrass Breeding Project, was awarded the 2014 Impact Award by the National Association of Plant Breeders. The Impact Award “recognizes an individual active in the plant breeding field that has shown exceptional accomplishments in their research, teaching and collaborations with others.”

Daniel J. Van Abs, associate research professor in the Department of Human Ecology at the School of Environmental and Biological Sciences, Rutgers University–New Brunswick, has been elected chair of the N.J. Clean Water Council, a statutory advisory body to the commissioner of the N.J. Department of Environmental Protection, for 2014 and 2015. He is a public member of the council, appointed by the governor.

Max Häggblom, distinguished professor and chair of the Department of Biochemistry and Microbiology, is the winner of the 2014 Society for Industrial Microbiology and Biotechnology Waksman Outstanding Teaching Award, funded by the Waksman Foundation for Microbiology.

Joan Bennett, professor in the Department of Plant Biology and Pathology and Associate Vice President of the Office for the Promotion of Women in Science, Engineering and Mathematics at Rutgers, was awarded the Stuart Mudd Award for Studies in Basic Microbiology by the International Union of Microbiological Societies in recognition of “outstanding, selfless endeavours and contributions in microbiology for the good of society.”

Fellow	Department	Name	
Academic Leadership Program, Big Ten Academic Alliance	Plant Biology	Thomas	Leustek
Academy of Nutrition and Dietetics	Family and Community Health Sciences	Karen	Ensle
	Nutritional Sciences	Carol	Byrd-Bredbenner
Academy of Toxicological Sciences	Plant Biology	Mark	Robson
Aldo Leopold Leadership Ecological Society of America	Ecology, Evolution, and Natural Resources	Steven	Handel
	Marine and Coastal Sciences	Robert	Kopp
American Academy of Arts and Sciences	Marine and Coastal Sciences	Paul	Falkowski
	Waksman Institute of Microbiology	Joachim	Messing
American Academy of Microbiology	Biochemistry and Microbiology	Max	Haggbloom
	Biochemistry and Microbiology	Liping	Zhao
	Biochemistry and Microbiology	Gerben	Zylstra
	Biochemistry and Microbiology	Tamar	Barkay
	Ecology, Evolution, and Natural Resources	Robert	Goodman
	Environmental Sciences	Lily	Young
	Food Science	George	Carman
	Food Science	Donald	Schaffner

	Marine and Coastal Sciences	Paul	Falkowski
	Plant Biology	Joan	Bennett
American Association for Aerosol Research	Environmental Sciences	Barbara	Turpin
American Association for the Advancement of Science	Animal Sciences	Dipak	Sarkar
	Biochemistry and Microbiology	Tamar	Barkay
	Biochemistry and Microbiology	Charles	Dismukes
	Biochemistry and Microbiology	Gerben	Zylstra
	Ecology, Evolution, and Natural Resources	Debashish	Bhattacharya
	Ecology, Evolution, and Natural Resources	Joanna	Burger
	Ecology, Evolution, and Natural Resources	Peter	Morin
	Ecology, Evolution, and Natural Resources	Robert	Goodman
	Ecology, Evolution, and Natural Resources	Henry	John-Alder
	Ecology, Evolution, and Natural Resources	Steven	Handel
	Entomology	Randy	Gaugler
	Environmental Sciences	Anthony	Broccoli
	Environmental Sciences	Alan	Robock
	Environmental Sciences	Lily	Young

	Human Ecology	Thomas	Rudel
	Human Ecology	Bonnie	McCay
	Marine and Coastal Sciences	Paul	Falkowski
	Marine and Coastal Sciences	Karl	Nordstrom
	Plant Biology	Joan	Bennett
	Plant Biology	Bingru	Huang
	Plant Biology	Pal	Maliga
	Plant Biology	Mark	Robson
	Plant Biology	James	White
	Plant Biology	Barbara	Zilinskas
	Waksman Institute of Microbiology	Joachim	Messing
American Chemical Society	Food Science	Chi-Tang	Ho
American College of Sports Medicine	Animal Sciences	Kenneth	McKeever
American Geophysical Union	Environmental Sciences	Alan	Robock
	Marine and Coastal Sciences	Paul	Falkowski
American Heart Association	Nutritional Sciences	Peter	Gillies
American Meteorological Society	Environmental Sciences	Anthony	Broccoli

	Environmental Sciences	Alan	Robock
American Ornithological Society	Ecology, Evolution, and Natural Resources	Joanna	Burger
American Phytopathological Society	Plant Biology	Bruce	Clarke
	Plant Biology	Bradley	Hillman
American Psychological Association	Nutritional Sciences	John	Worobey
American Society for Nutrition	Nutritional Sciences	Malcolm	Watford
American Society of Agronomy	Plant Biology	Bruce	Clarke
	Plant Biology	Bingru	Huang
	Plant Biology	James	Murphy
American Society of Civil Engineers	Environmental Sciences	Christopher	Uchrin
American Society of Landscape Architects	Ecology, Evolution, and Natural Resources	Steven	Handel
	Landscape Architecture	Dean	Cardasis
Board of Governors Professor, Rutgers University	Animal Sciences	Dipak	Sarkar
	Food Science	George	Carman
	Marine and Coastal Sciences	Paul	Falkowski
Chancellor's Scholars, Rutgers University	Ecology, Evolution, and Natural Resources	Siobain	Duffy
	Human Ecology	Pamela	McElwee

	Marine and Coastal Sciences	Joshua	Kohut
	Plant Biology	Nina	Zhang
Collegium Ramazzini	Plant Biology	Mark	Robson
Crop Science Society of America	Plant Biology	Stacy	Bonos
	Plant Biology	Bingru	Huang
	Plant Biology	Bruce	Clarke
	Plant Biology	James	Murphy
Distinguished Professor, Rutgers University	Agricultural, Food, & Resource Economics	Barbara	O'Neill
	Agricultural, Food, & Resource Economics	Carl	Pray
	Animal Sciences	Dipak	Sarkar
	Biochemistry and Microbiology	Tamar	Barkay
	Biochemistry and Microbiology	Max	Haggbloom
	Biochemistry and Microbiology	Gerben	Zylstra
	Ecology, Evolution, and Natural Resources	Debashish	Bhattacharya
	Ecology, Evolution, and Natural Resources	David	Ehrenfeld
	Ecology, Evolution, and Natural Resources	Robert	Goodman
	Ecology, Evolution, and Natural Resources	Steven	Handel

	Ecology, Evolution, and Natural Resources	Peter	Morin
	Ecology, Evolution, and Natural Resources	Peter	Smouse
	Entomology	Randy	Gaugler
	Environmental Sciences	Alan	Robock
	Environmental Sciences	Lily	Young
	Food Science	George	Carman
	Food Science	Chi-Tang	Ho
	Food Science	Donald	Schaffner
	Marine and Coastal Sciences	Kenneth	Able
	Marine and Coastal Sciences	Paul	Falkowski
	Marine and Coastal Sciences	Scott	Glenn
	Marine and Coastal Sciences	Dale	Haidvogel
	Marine and Coastal Sciences	Richard	Lutz
	Marine and Coastal Sciences	Karl	Nordstrom
	Marine and Coastal Sciences	Yair	Rosenthal
	Marine and Coastal Sciences	Oscar	Schofield
	Nutritional Sciences	Carol	Byrd-Bredbenner

	Nutritional Sciences	Judith	Storch
	Plant Biology	Joan	Bennett
	Plant Biology	Bingru	Huang
	Plant Biology	Eric	Lam
	Plant Biology	Ilya	Raskin
	Plant Biology	James	Simon
	Plant Biology	Nilgun	Tumer
Distinguished Service Professor, Rutgers University	Human Ecology	Bonnie	McKay
	Plant Biology	Mark	Robson
Ecological Society of America	Marine and Coastal Sciences	Paul	Falkowski
Entomological Society of America	Entomology	Randy	Gaugler
Equine Science Society	Animal Sciences	Carey	Williams
	Animal Sciences	Karyn	Malinowski
	Animal Sciences	Kenneth	McKeever
Explorers Club	Marine and Coastal Sciences	Richard	Lutz
Geological Society of America	Marine and Coastal Sciences	Benjamin	Horton
Institute for Advanced Study Hans Fischer Fellowship	Biochemistry and Microbiology	Yana	Bromberg

Institute of Food Technologists	Food Science	Chi-Tang	Ho
	Food Science	Mukund	Karwe
	Food Science	Thomas	Montville
	Food Science	Donald	Schaffner
	Food Science	Beverly	Tepper
International Academy of Food Science and Technology	Food Science	Chi-Tang	Ho
International Association of Plant Taxonomists	Ecology, Evolution, and Natural Resources	Lena	Struwe
International Ornithological Union	Ecology, Evolution, and Natural Resources	Joanna	Burger
International Union of Pure and Applied Chemistry	Ecology, Evolution, and Natural Resources	Joanna	Burger
Kavli Fellow of the National Academy of Sciences	Ecology, Evolution, and Natural Resources	Malin	Pinsky
	Marine and Coastal Sciences	Kay	Bidle
Leopoldina, the German National Academy of Sciences	Waksman Institute of Microbiology	Joachim	Messing
Linnean Society	Ecology, Evolution, and Natural Resources	Lena	Struwe
	Marine and Coastal Sciences	Benjamin	Horton
Marine Technology Society	Marine and Coastal Sciences	Scott	Glenn
National Academies of Practice	Nutritional Sciences	Paul	Breslin
National Academy of Inventors	Plant Biology	Nicholi	Vorsa

National Academy of Sciences	Human Ecology	Bonnie	McCay
	Marine and Coastal Sciences	Paul	Falkowski
	Plant Biology	Joan	Bennett
	Waksman Institute of Microbiology	Hugo	Dooner
	Waksman Institute of Microbiology	Joachim	Messing
Northeastern Agricultural and Resource Economics Association	Agricultural, Food, and Resource Economics	Ramu	Govindasamy
Psychology Academy	Nutritional Sciences	Paul	Breslin
Society for the Study of Reproduction	Animal Sciences	Larry	Katz
	Animal Sciences	Carol	Bagnell
Society of American Foresters	Ecology, Evolution, and Natural Resources	Steven	Handel
Society of Toxicology	Nutritional Sciences	Peter	Gillies
Wolf Prize in Agriculture-2013	Waksman Institute of Microbiology	Joachim	Messing

Department of Agricultural, Food, and Resource Economics

<http://dafre.rutgers.edu/>



The Department of Agricultural, Food, and Resource Economics (DAFRE) is building a critical mass of researchers focused on policy and management issues in four key areas: food and agricultural systems; technology and innovation; land use; and nutrition, health, and community development.

The department was created in 1914. Its mission, which has evolved as the needs of society have changed, is to support society's need for economic analysis and business management in the areas of agriculture, food, resources, and the environment. Our world-class teaching, research, and outreach improves businesses, communities, and the lives of people in New Jersey and beyond. In the last 20 years, DAFRE has transformed itself from an undergraduate teaching department with a few economists who achieved national recognition for their scholarship, to a department in which all faculty have strong research programs, many internationally recognized, while serving as one of the largest undergraduate programs at the School of Environmental and Biological Sciences.

DAFRE has 13 faculty members: 11 tenure track and two non-tenure track. It has a solid record of scholarship and grantsmanship related to traditional areas of agriculture, including production, marketing, trade, food systems, and international agriculture research and development. Faculty members maintain research that links with other SEBS units in traditional agricultural areas, as well as having some links to the Department of Economics in the School of Arts and Sciences and to the Bloustein School of Planning and Public Policy. Measured by number of faculty, food and agricultural systems remains the dominant area of applied research in the department. Research questions in this focus area include how to respond to challenges like bioterrorism; how to seize opportunities related to the growing demand for produce, organic food, ethnic produce, greenhouse products, and bio-fuels; how traceability and country-of-origin labeling affect agricultural trade and consumer behavior; how biotechnology increases productivity and affects the demand for food products; and how to best organize agribusiness to improve economic efficiency and ensure the welfare of farm families.

Faculty members have published in *Science*, *Nature*, and in leading economics journals on the impact of biotechnology on economic development and on the health of people in the United States, China, India, and South Africa. This research has been expanded to examine the potential role of biotechnology to improve nutrition in Africa and Asia, to reduce the impact of drought in Asia, and to reduce cancer and birth defects by reducing the consumption of mycotoxins in South Africa. DAFRE faculty have achieved national scholarly recognition for their analyses of child protective services and public assistance programs in the U.S. In welfare policy, their scholarship is being published in leading economics and policy journals, as well as two books by Oxford University Press. Research in the department's nutrition and health focus area has led to testimony before Congress, an appearance on *McNeil/Lehrer News Hour* and NBC's *Today*, and quotes published in the *New York Times* and other leading newspapers. The department's scholarship in land use policy, urbanization, "sprawl," agricultural land, and habitat preservation has also achieved national and international recognition. This recognition is shown through publications in the leading academic journals in environmental and resource economics, editorships of important journals in the field, and invitations to edit key books that summarize the latest land use scholarship. Other evidence of excellence has been the long-term collaboration by one faculty member with one of the leading resource

economics departments in Europe, and another professor's association with the Brookings Institution's Metropolitan Policy Program, the American Planning Association, and the Lincoln Institute of Land Policy.

The department teaches many undergraduates and maintains a master's degree program. The bachelor of science in environmental and business economics (EBE) seeks to provide students with a foundation in the principles of economics, a knowledge of practical economic and analytical problem-solving techniques, critical reasoning and communication skills, an ability to apply economic concepts to the analysis of private and public policy issues, and an understanding of the institutional factors underlying and influencing policy decisions. Majors in the program select one of the following four options: business economics, environmental and resource economics, food industry economics, and food Science and management economics. We also offer a minor in EBE. The graduate program in food and business economics teaches students to apply economic theory and analytical skills to solve problems facing society in the areas of: economics of biotechnology and pharmaceutical sectors, production and marketing of agricultural products, land/environmental policy and management, and international development.

Our department has seen a growth in publishing in peer-reviewed journals, research grants and outreach from 2012-2017 because of our faculty being current and relevant in dealing with the issues of our day. External funded grants per DAFRE faculty member increased from \$74,904 in 2012 to \$762,438 in 2015. This includes all grant dollars secured by DAFRE faculty as a P.I. or Co P.I. Peer-reviewed journal articles per faculty per year increased from 1.9 in 2013 to 3.4 in 2015. Total number of undergraduates in our environmental and business economics major increased from 155 in 2012 to about 200 in 2017. The enrollment in the graduate program has been steady at about five students per year.

Using Academic Analytics (AA), the cluster that includes agricultural economics comprises of 42 institutions, including University of California, Davis; Texas A&M University; Iowa State University; Michigan State University; The Ohio State University, University of Illinois at Urbana-Champaign; University of Maryland, College Park; University of Massachusetts, Amherst; University of Georgia, etc. Unlike Rutgers' DAFRE, most institutions offer a Ph.D. program in agricultural economics.

AA compares all 42 departments across many productivity variables such as articles, grants, citations and awards. Although we don't have a Ph.D. program, DAFRE is ranked above the national median in many of these productivity variables. Specifically, among the variables such as awards per faculty member, number of faculty members with an award, percent of faculty with an award, citations per faculty member, citations per publication, articles per author, articles per faculty member, dollars per grant, grant dollars per faculty member and total grant dollars, DAFRE is ranked above the national median. In terms of number of faculty in the department, DAFRE is ranked 35th out of 42 institutions.

In summary, DAFRE is a small, vigorous academic department with a solid foundation in agricultural production, marketing, trade, and food systems, along with areas that are a bit more exotic for agricultural economics departments, such as land use at the urban fringe, bioscience research policy, and social welfare policy. Research funding and output have increased markedly over the past 20 years, and the department continues to serve many undergraduate majors using the same number of FTEs. DAFRE's major opportunity for improvement will come from embracing questions that relate to emerging food, biological, and resource economic issues.

Department of Animal Sciences

<http://animalsciences.rutgers.edu/>



The Department of Animal Sciences focuses on improving the health and well-being of animals, including humans, through integration of teaching, research, and outreach. The department consists of 17 tenure-track faculty, including three extension faculty, with broad expertise in the areas of comparative endocrinology and integrative physiology.

Research faculty study the integrated physiological processes that regulate biological systems such as reproduction, metabolism and energy balance, food intake, and the immune system. They bring unique skills and expertise ranging from whole animal approaches to cell and molecular biology techniques to gain new knowledge and translate it to improvements in human and animal health. Our faculty are integral members of several institutes and centers across Rutgers, including the Institute for Food, Nutrition, and Health (IFNH), the Environmental and Occupational Health Sciences Institute, the Equine Science Center, and the Cancer Institute of New Jersey. Since New Jersey lacks a large production animal agriculture footprint due to its demographics, much of our research addresses issues that affect health and well-being of New Jersey residents. For example, recognizing that many adult diseases and disorders (e.g., infertility, obesity, diabetes, addiction and cancer) have developmental origins that are influenced by the environment, many of our faculty study the effects of the fetal and perinatal environment on long-term health and well-being of the offspring. Examples include the effects of maternal obesity, fetal alcohol exposure, and fetal exposure to chemicals such as pesticides and flame-retardants on reproductive and mammary development, metabolism, and the stress axis. Studies also focus on the positive effects of nursing versus milk replacer on reproductive biology and overall growth of the offspring. These research efforts have garnered \$11.5 million in competitive research funding over last five years (~ 90% from NIH). This includes a 10-year NIH Merit Award from the NIAAA and two minority fellowship supplements to NIH grants.

The Animal Sciences undergraduate major is the largest at the School of Environmental and Biological Sciences, with more than 450 upper-level students enrolled each year. Our curriculum provides training and career development for students with an interest in animal biology or related fields. The major offers five options in pre-veterinary medicine/research, laboratory animal science, equine science, production animal science, and companion animal science as well as a minor in animal science. A hallmark of our program is a strong pre-veterinary curriculum that provides students with the science, laboratory skills, research experience, and large animal handling that is required to be competitive for entrance into veterinary school (Rutgers does not have a School of Veterinary Medicine). Each year, approximately 75% of our majors who apply to veterinary schools are admitted. In addition, our graduates provide a workforce for companies located in New Jersey and neighboring states that conduct animal research and develop and market human and animal health products. Members of the department belong to several graduate programs across Rutgers, including endocrinology and animal biosciences, nutritional sciences, neuroscience, toxicology, and molecular biosciences and presently mentor 21 graduate students through these programs.

A unique feature of our department is our campus farm, which houses cows, pigs, goats, sheep, and horses. This provides hands-on experience for students working with production animals in several ways,

including practicums, research-oriented techniques courses, and our animal handling course that culminates each spring with animal shows on Rutgers Day, an annual event that draws large numbers of alumni and New Jersey residents. Students also start preparing in the fall for a spring competition that is held among northeast animal science departments which consists of quiz bowl, oral research competitions, and animal showing and judging competitions. These unique production agriculture-based activities draw students from other SEBS majors and schools university-wide. The department offers approximately 35 different courses, several of which are taught in the fall, spring and summer.

Extension and outreach initiatives in our department focus on equine science research that seeks to improve the well-being and performance of horses, while ensuring the vitality and viability of the equine industry, both statewide and nationally. This work seeks to support a sustainable animal industry with positive economic and environmental impacts for the State of New Jersey. A key area of departmental faculty has been the development of an outreach program that focuses on best technology and feeding practices in horses to reduce waste nutrient excretion and protection of water resources.

Other selected accomplishments of the Department of Animal Sciences:

- 143 peer-reviewed publications and 15 book chapters over last five years
- Fellow, the American College of Sports Medicine (Kenneth McKeever)
- Fellow, American Association for the Advancement of Science (Dipak Sarkar)
- Distinguished Service Award in Equine Science from the Equine Science Society (Ken McKeever)
- New Jersey Association of 4-H Agents Educator of the Year Award
- ASAS and Equine Science Society Equine Science Award (Carey Williams)

Department of Biochemistry and Microbiology

<http://dbm.rutgers.edu/>



The department combines biochemistry and microbiology in an overarching theme in the study of fundamental life processes and their applications. Microorganisms are the smallest living things, the oldest form of life on Earth, account for the greatest diversity in the biosphere, and perform diverse metabolic functions and ecosystem services that are central to and essential for life on Earth. Microbiology is the study of all aspects of microorganisms, encompassing bacteria, archaea, fungi, protists, and viruses; biochemistry is the study of life processes of all living systems at the level of molecules and their interactions. Our department combines these disciplines in one comprehensive theme in the study of fundamental life processes and their applications from molecules to biomes.

The department reflects a rich heritage for both disciplines. Edward Voorhees established the Department of Soil Chemistry and Bacteriology in 1901, the first department of agricultural microbiology in the country. The Biochemistry component of the department had its genesis at the School of Agriculture as the Department of Agricultural Biochemistry. In 1965, these departments were merged to form the current Department of Biochemistry and Microbiology. The academic programs in biochemistry and microbiology serve the central mission of the School of Environmental and Biological Sciences, the New Jersey Agricultural Experiment Station, and Rutgers University through their fundamental and applied research and instruction in microbiology and biochemistry. The fields of microbiology and biochemistry are major contributors to industrial development; human, animal and plant health; environmental integrity; and agricultural productivity.

The Department of Biochemistry and Microbiology currently has 14 tenure-track faculty and six non-tenure-track teaching faculty members. Current research strengths of the department are in the areas of environmental microbiology, microbiome-host interactions, endosymbiosis, genomics, bioinformatics, protein structure and function, biofuels, pathogenic microbiology and aquatic toxicology, with internationally recognized faculty. Their research is supported by grants from diverse state and federal agencies (NSF, NIH, NIEHS, DOE, NOAA/EPA, NASA, NJDEP), a range of foundations (Hudson River Foundation, PhRMA, Johnson & Johnson) and industry contracts. Members of the department have published over 200 peer-reviewed publications, many in highly ranked journals such as *Science*, *Proceedings of the National Academy of Sciences USA*, *eLife*, *ISME Journal*, *Trends in Ecology and Evolution*, and book chapters from 2012-2017.

The department offers two undergraduate majors and minors, biochemistry and microbiology, currently with over 150 majors combined. The curricula in microbiology and biochemistry cover the professional degree requirements for undergraduate and graduate programs and integrate well with the academic model of SEBS as a professional school. Each encompasses the entire complement of courses as they are recommended by the corresponding professional organizations for the education and training of students heading into the work force and further academic pursuits. Hands-on laboratory education is the foundation for excellence in our academic programs. In addition, the department offers many of the core and advanced courses in biochemistry and microbiology required by other undergraduate majors at Rutgers, including the microbial biotechnology option of the biotechnology major. Annually over 700 students take one of our two core biochemistry lecture courses and over 350 students take our general microbiology lecture/lab course. To enhance the appreciation for microbiology and biochemistry by non-

scientists, the department offers several introductory courses that provide a lecture and interdisciplinary engaged learning experience for undergraduates with limited or no science background.

The department provides a key leadership role for microbiology at Rutgers University. Our aim is to broadly advance the diverse research and educational experience in the field of microbiology and promote our rich traditions of microbiology, for example by organizing and hosting an annual microbiology symposium. The department faculty shoulder the core teaching for the School-based organismal-centered graduate program in microbial biology launched in 2010, currently with 34 Ph.D. and 11 master's of science students. The program is focused on fundamental microbial life processes and their applications and offers a strong focus in understanding how microbes occupy every possible environmental niche on Earth (including frozen arctic tundra, deep sea hydrothermal vents, hazardous waste sites, and the human body) and how the diversity of microbial activities can be exploited to discover novel bioactive compounds, to characterize metabolic traits for degradation of hazardous chemicals, to develop new biofuel production methods, and to promote human health. Since its inception, this program has graduated nine Ph.D. and 25 M.S. students who are well trained for their future careers in academia, government, and industry.

Highlights in the Department of Biochemistry and Microbiology

Honors:

- Fellow American Association for the Advancement of Science
- Fellow of American Academy of Microbiology
- Vietnam Education Foundation Faculty Scholar
- Visiting Professorship for Senior International Scientists of the Chinese Academy of Sciences
- American Society for Microbiology US-Indo Professorship
- American Society for Microbiology International Professorship for Latin America
- Phycological Society of America Award of Excellence
- Marie-Curie Scholar
- Hans Fischer Fellow
- Darbaker Prize
- NSF Young Investigator/CAREER Award
- Society for Industrial Microbiology and Biotechnology
- Waksman Outstanding Teaching Award.

Select Research Programs:

- Microbial transformation of metals
- Bioinformatics approaches to protein function prediction and genome variation analysis
- Detection and response of organisms to oxidative stress
- Protein folding and subunit assembly
- Algal phylogeny and evolution
- Xenobiotic metabolism in aquatic animals
- Gut microbiomes and health
- Microbial degradation of environmental pollutants
- Elucidating prokaryote activities in geothermal environments
- Microbial ecology of Arctic soils.

Department of Ecology, Evolution, and Natural Resources

<http://deenr.rutgers.edu/>



Mindful of grand challenges in ecology and evolutionary biology in a changing world, the Department of Ecology, Evolution, and Natural Resources (DEENR) discovers and disseminates knowledge about life on Earth, and contributes to the conservation, restoration, and management of biotic natural resources. DEENR was founded through the merger of ecologists and evolutionary biologists from the former Department of Biological Sciences into the then-existing Department of Natural Resources and has evolved into an internationally recognized research program even while retaining its strong teaching tradition. DEENR consists of 22 full-time faculty members (15 tenured, three tenure track, four non-tenure track) plus four part-time lecturers. DEENR is the only department at Rutgers centered on whole organisms, although faculty research covers all levels of biological organization—from molecules to ecosystems—and includes observational, computational, and field- and laboratory-based experimental approaches.

Research at DEENR is broad in scope, covering molecular to ecosystem ecology, through mathematical, experimental, and observational approaches; molecular and physiological evolution through experimental, computational, and comparative approaches; systematics and taxonomy; and the application of geo-spatial information technology to landscape ecology, land use planning, and natural resource management. To illustrate DEENR's diversity, specific areas of research include:

- Evolution of emergent viruses
- Conservation of biodiversity and ecosystem services
- Pollination ecology
- Invasion ecology
- Parasite ecology
- Biometrics and forest ecology
- Urban and restoration ecology
- Marine ecology and fisheries management.

As a unit, DEENR is strongest as an ecology department, and it aims for growth in the areas of evolution and natural resource management. Common research facilities supported and used by DEENR include the Grant F. Walton Center for Remote Sensing and Spatial Analysis, the Chrysler Herbarium (New Jersey's only internationally recognized herbarium), Rutgers Pinelands Research Station in the Pinelands National Reserve, Tuckerton Marine Field Station, Rutgers Ecological Preserve, and Hutcheson Memorial Forest, which is the world-renowned site of the longest continuous old-field successional study. These facilities also support teaching and community engagement. DEENR faculty collaborate with many other departments and units in the School of Environmental and Biological Sciences and beyond. Research is supported by federal and state agencies (NSF, NIH, USDA, USFWS, NOAA, New Jersey Sea Grant, New Jersey Department of Environmental Protection) as well as foundations and private funds. From 2012-2017, DEENR faculty members have produced 622 peer-reviewed publications, 15 books, 44 book chapters, and 32 technical reports.

DEENR annually teaches about 55 courses, 40 percent of which include laboratory or field components. DEENR offers the most hands-on and field-oriented biological learning experience at Rutgers, including immersive week-long opportunities in the Adirondacks, the highlands of northwestern New Jersey, the

pinelands at Rutgers Pinelands Research Station, and the Atlantic coast at the Tuckerton Marine Field Station. In addition to major and minor degree options in ecology, evolution, and natural resources, DEENR supports two other minors (sustainability and science learning) and three undergraduate certificate programs (environmental geomatics, urban/community forestry, and evolutionary medicine), wholly or in part. DEENR is closely associated with the graduate program in ecology and evolution (E & E), which includes 40 active faculty members. Approximately 50 graduate students are supported by national and international fellowships and traineeships from NSF, USAID, NOAA, USDA, U.S. Department of Education, Fulbright (Chile), and the Chinese Academy of Sciences as well as research grants and Rutgers fellowships, GAs, and TAs. From 2012-2017, 31 Ph.D. students and 21 M.S. students have earned their degrees in Ecology and Evolution, and E & E graduate students have won a disproportionately large share of School and university fellowships.

DEENR's outreach, both formal and informal, is broad in scope. Examples include:

- Congressional testimony on climate change and fisheries
- Incorporation of professionals from the public and private sectors into courses to mentor and supervise students, and to provide venues for student project work and internships
- "Evolution in Action!," an annual six-week hands-on enrichment cluster for middle-schoolers in the Greater Brunswick Charter School
- Three-week biotechnology elective in South Brunswick High School, leading to publication of student work on host range mutants of phage phi6
- Summer science on the Raritan for inner-city high school students
- STEM night at Parsons Elementary School, a majority-minority school in New Brunswick
- Leadership in the New Jersey wildlife community, including chairmanship of the New Jersey Endangered & Nongame Species Advisory Committee
- Evaluation of the conservation status of native bee species and development of science-based pollinator restoration, in collaboration with NJDEP, Natural Resource Conservation Service, U.S. National Park Service, and the Xerces Society for Invertebrate Conservation
- Partnership with NJDEP for statewide training in urban and community forestry
- Rutgers as living laboratory; publication of Flora and Fauna of Rutgers on *iNaturalist* (<https://www.inaturalist.org/projects/flora-and-fauna-of-rutgers-campus-new-jersey-usa>)
- Sustainable Raritan River Initiative, Co-Leadership
- Development and implementation of annual international "Personal Bioblitz," published in *Bioscience* (2015. 65:1154-1164)
- Use of Chrysler Herbarium to train students in plant curatorial skills (45 students 2014-2017)
- Websites: OceanAdapt (<http://oceanadapt.rutgers.edu/>); Botanical Accuracy (<http://www.botanicalaccuracy.com/>); For Weeds Everywhere (<http://4weeds.blogspot.com/>)

Departmental faculty, graduate students, and staff are disproportionately well represented in university awards for research, teaching, and professional service. Significant external faculty awards from 2012-2017 include: Fellow, American Association for the Advancement of Science; Award of Excellence, Phycological Society of America; Ann Palmenburg Junior Investigator, American Society for Virology; Young Investigator Award, Theobald Smith Society of American Society of Microbiologists; LC Chadwick Award for Arboricultural Research, International Society of Arboriculture; Fellow, Society of American Foresters; Theodore Sperry Award, Society for Ecological Restoration; National Academies Teaching Fellow; Women in Wildlife Education Award; Merit Award, American Society of Landscape Architects; Early Career Scientist Award, International Council for the Exploration of the Sea; Kavli Fellow, National Academy of Sciences; Sloan Fellow in Ocean Sciences; Jasper Loftus-Hills Young Investigators Award, American Society of Naturalists; Innovations in Plant Systematics Education Prize, American Society of Plant Taxonomists; Faculty of 1000; ISI Highly Cited Scientist; First-class Award of Science and Technology Advancement, Sichuan Province, China; Science and Technology Advancement Award, Qinghai Province, China; Liangxi Award of Forest Science and Technology (China National Award).

Department of Entomology

<http://entomology.rutgers.edu/>



The Department of Entomology in the School of Environmental and Biological Sciences (SEBS) at Rutgers University is providing leadership in the study of insects and other arthropods, management of agricultural pests, arthropod vectors of human disease and urban pests, and outreach to local, regional, national and international audiences.

The Department of Entomology research programs center on the emerging challenges of urbanization and invasive species. We base this on our ideal location in New Jersey, a diverse coastal state and crossroads of the world, and on our faculty's superlative connections with local, national and international stakeholders.

Key areas of research include agricultural entomology, turf entomology, urban entomology, vector biology, toxicology, ecology and evolution, invasive species, and biological control of insects.

Our faculty (nine tenure track and one non-tenure track) are actively involved in outreach activities associated with their research, extension and teaching. Much of this work is conducted through the Center for Vector Biology, Rutgers Cooperative Extension, and by our graduate students through their student organization, the Graduate Entomology Students Association.

The Department supports one undergraduate major – a B.S. in entomology that was offered for the first time in 2015, and master's and doctoral programs in entomology. Currently, there are 10 undergraduate and 18 graduate students. The department also offers a minor in entomology and department courses that satisfy SAS and SEBS undergraduate major requirements.

From 2012-2017, faculty members published 22 book chapters, 247 peer-reviewed articles in a variety of scientific journals, and received more than \$18.6 million in grant funding.

Department faculty members received many awards between 2012 and 2017.

In 2012: Professorship for Senior International Scientists from the Chinese Academy of Sciences; Golden Service Award from Dakota College; Invited Foreign Expert from the China International Economic & Trade Exposition; International Excellence Award from the Rutgers University School of Environmental & Biological Sciences; L.O. Howard Distinguished Achievement Award from the Entomological Society of America (Eastern Branch); and National Communication Award (Video Category) from the National Association of County Agricultural Agents for *Asian Tiger Mosquito Public Service Announcement*.

In 2013: Fulbright Senior Scholar from Egypt; Memorial Lecturer from the American Mosquito Control Association; Fenton Award for Outstanding Cook College Graduate School Alumni from Rutgers University; and Herb Streu Meritorious Service Award from the Entomological Society of America (Eastern Branch).

In 2014: Team Excellence Award for the Asian tiger mosquito project from the Rutgers University School of Environmental and Biological Sciences; and Team Award for the Asian tiger mosquito project from the Entomological Society of America.

In 2015: George C. Burch Fellowship in Theoretical Medicine at the Smithsonian National Zoological Park from the Center for Conservation and Evolutionary Genomics; Association of Natural Resource Extension Professionals Short Publication Silver Award for *Rain Barrels and Mosquitoes*; USDA International IPM Award of Recognition for the Brown Marmorated Stink Bug (BMSB) Specialty Crop Research Initiative Coordinated Agricultural Project, StopBMSB Team, from the 8th International IPM Symposium in Salt Lake City, UT; Recognition Award from the New Jersey Turfgrass Association; Merle V. Adams Award for Outstanding Achievement as a Junior Faculty Member from Rutgers Cooperative Extension; Premier presentation *Best Bed Bug Monitoring Practices* at the 63rd Entomological Society of America in Minneapolis, MN; Eastern Regional Excellence in Extension Award from the U.S. Department of Agriculture's National Institute of Food and Agriculture; and Award of Excellence from the Northeast Cooperative Extension Directors; and International IPM Award for Recognition from the 8th International IPM Symposium.

In 2016: *Ding Ying Professor* prize from South China Agricultural University.

In 2017: Medal of Honor from the American Mosquito Control Association; Distinguished Fulbright Chair Award from the United States Department of State Bureau of Educational and Cultural Affairs; Award for Healthy Homes Research Innovation from the U.S. Department of Housing & Urban Development Secretary; and Excellence in Integrated Pest Management from the Entomological Society of America (Eastern Branch).

Department of Environmental Sciences

<http://envsci.rutgers.edu/>



The Department of Environmental Sciences (DES) stands apart from our AAU and Big Ten peers as one of the oldest in the United States in its discipline, with its formation originating in an act of the New Jersey legislature in 1920. The mission of DES is the interdisciplinary study of natural processes and human impacts in the atmosphere, aquatic systems, and soils. DES is a multidisciplinary department, with scholarly activity concentrated in atmospheric science, environmental engineering, and environmental science. DES faculty (21 full-time tenure track and nine full-time non-tenure track), students, and research staff are engaged in state-of-art research in areas such as bioremediation of contaminated groundwater and sediments, natural and human-induced climate change, the impact of microorganisms on the geochemical cycling of inorganic elements, and bioaccumulation of trace metals in marine plankton, to name a few.

DES is home to undergraduate and graduate programs in bioenvironmental engineering, environmental sciences, and meteorology/atmospheric science. An important focus of DES is to educate students in all of these disciplines through classroom teaching and mentoring of research and independent study projects. DES faculty members typically involve both graduate and undergraduate students in their research, providing them with the type of hands-on learning opportunities that are expected to exist at a major research university. Brief summaries of these academic programs follow:

Bioenvironmental Engineering

The undergraduate program provides a broad and multi-disciplinary education in the fundamentals of bioenvironmental engineering as well as proactive opportunities to utilize classroom learning in environmental engineering applications and design. The program is accredited under environmental engineering by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (ABET), resulting in preparation for the Fundamentals of Engineering exam and licensure as a professional engineer. Unique about the program are the strong science fundamentals of the students, the small class sizes, the hands-on learning environment, real projects during senior design, and abundant research, internship, employment, and graduate school opportunities. A new M.S. program has also been initiated in 2013 in anticipation of the possible implementation of a graduate education requirement for licensed professional engineers. Two of the three students who have completed the M.S. program are working as engineers for environmental companies and the other has returned to her home country to seek employment there.

The main challenge faced by these programs is that training in environmental engineering is offered by two departments at Rutgers—the Department of Environmental Sciences and the Department of Civil and Environmental Engineering. However, this challenge is being addressed, as a long-term plan currently going forward is an Environmental Engineering program jointly administered by both departments.

Environmental Sciences

The undergraduate program in environmental sciences is built on a foundation of biology, chemistry, physics and mathematics. All students also complete a series of environmental sciences courses that

demonstrate the application of the basic science principles to solution of environmental problems. The program prepares students for careers in environmental consulting, regulatory agencies, industry, legal and science policy professions, and education, and for graduate study in related fields. The graduate program offers several options for M.S. and Ph.D. students that represent major lines of research of our graduate faculty: air pollution and control, environmental chemistry, environmental engineering, environmental microbiology, exposure science (Ph.D. only) and pollution prevention and control. The integration of science and engineering is expressed in the curriculum of the program, with all options requiring courses in both areas. This integration constitutes one of the strengths of our program and makes us distinctively different from similar programs in peer institutions.

The main challenge these programs currently face is the loss of two faculty members who specialized in atmospheric pollution and chemistry. We urgently need to add at least one professor in this area to shore up that part of our program and to offer critical graduate and undergraduate courses. At the graduate level, securing adequate funds to recruit/support outstanding applicants (fellowships and training grants) can also be challenging. An emerging opportunity with the incorporation of the medical school into Rutgers is the possible development of a joint program in environmental health with the School of Public Health. In addition, the integration of the curricula of the graduate program with the complementary environmental sciences program at Rutgers–Newark would be a strategic move that would improve both programs and increase their visibility.

Meteorology (undergraduate)/Atmospheric Science (graduate)

The undergraduate meteorology program is the only one in New Jersey that meets the guidelines of the federal government and American Meteorological Society. A well-rounded curriculum includes options that let students tailor their academic experience to their interests. Distinctive features of the program that are not available at most of our AAU peers include the availability of a weather radar on campus (in partnership with NBC Universal) and the WeatherWatcher Living-Learning Community, which allows students interested in broadcast meteorology to live together with a TV studio down the hall. The graduate program offers comprehensive education in atmospheric science and also provides an identity to the community of atmospheric scientists at Rutgers, which includes faculty from five departments across Rutgers-New Brunswick. Graduate program alumni have gone on to postdoctoral and research positions with NOAA, NASA, and major research universities.

One key challenge facing the undergraduate program is becoming more visible to prospective students, especially out-of-state students. Plans to overcome this challenge include the production of recruitment videos highlighting the program and the development of a “weather lounge” to show off some of our technology to visiting prospective students. The principal challenge facing the graduate program is limited internal funding for students (i.e., one teaching assistant line for 15-20 students), which places our program at a competitive disadvantage relative to aspirant public AAU peers with strong programs in atmospheric science. Thus, student funding comes primarily from external grants, which is especially problematic for early-stage students who are concentrating on coursework. We will seek to expand the funding base for our students by encouraging students to apply for external programs such as the NSF Graduate Research Fellowship. We will also explore opportunities for promoting the international visibility of the program in an effort to recruit more high-achieving students from abroad, many of whom have access to funding from their home countries.

DES faculty are also committed to service and outreach. The current provost of Rutgers–New Brunswick and the dean of the School of Graduate Studies are members of the DES faculty, as is the co-director of the Rutgers Climate Institute. DES faculty also serve on the Science Advisory Board of the New Jersey Department of Environmental Protection. Others have served the scientific community as current or former editors of technical journals (e.g., *Soil Science*, *Reviews of Geophysics*, and *Journal of Climate*).

Department of Food Science

<http://foodsci.rutgers.edu/>



“Rutgers Food Science: A Translational Program for Healthy Food” is the vision that drives the Department of Food Science to be the preeminent internationally recognized student-centered program for innovative undergraduate and graduate education and research centered on global concerns of hunger and metabolic disease.

The department has 14 faculty members, and there are currently 156 undergraduate and 132 graduate students. The department has three options and supports a minor in food science and is an Institute of Food Technologist-approved program. The international reputation of the program attracts undergraduate students through our 2+2 programs and graduate students (77 percent international). In a global food marketplace, skills beyond the science are required, and the department has developed a Master of Business and Science program which is part of the university’s professional science master’s program that brings together master’s level study in science with courses in business and policy. The department also offers a Master of Business Science 4+1 program for exceptional Rutgers undergraduate students; students earn both a bachelor’s degree and the master’s degree in a shorter period of time and at a lesser cost.

The faculty has a rich history of being in the forefront of research that impacts human health and well-being. The innovative research conducted by the faculty has proved transformative leading to the development of novel food products and processes. In the past 10 years, Rutgers Food Science faculty have obtained >\$15 million in funding from NIH, Bill and Melinda Gates Foundation, American Heart Association, the Department of Defense, USDA, American Chemical Society, and others. Research efforts directly address areas under the one-health umbrella – zoonotic infections (food safety, antimicrobial resistance, intervention) and comparative medicine/translational medicine (metabolic disorders, cancer, cardiovascular disease). Our faculty has been leaders in identifying active packaging, lipid metabolism, food microbiology, taste genetics, and natural antioxidants. More than 1,000 peer-reviewed papers have been published by our faculty in the past 10 years, underscoring their productivity and desire to share information with the global community. The research leading to those publications are often collaborative efforts with local, national, and international colleagues. Funding support from PepsiCo, MARS, Mirtech Inc., and others has influenced research direction that benefits that specific company and the industry as a whole.

Food science is a multidisciplinary, multifaceted field. Food is integral to human and animal health and well-being; individuals within and well beyond the borders of the State of New Jersey desire to learn and know about the food they eat. Employers and representatives of New Jersey agriculture and multi-national food companies recognize the contribution of the Rutgers food science program in supporting the food system in New Jersey, regionally, nationally, and internationally.

Alumni of the Rutgers Department of Food Science are employed by PepsiCo, MARS Inc., CJ CheilJedang, Heinz, Mondelez International, Firminich, Ingredion, Unilver and many more. The Department of Food Science has a strong bond with stakeholders through extension activities, distance learning programs, and

internships/employment of program graduates. The Food Science Alumni Committee and the Food Science Advisory Council provide guidance and insight to the program. Outreach to the community is further achieved by undergraduate and graduate students disseminating educational and research materials to area high schools, community colleges, and various organizations. The Department has developed a robust distance learning program aimed at fulltime employees and works with the American Chemical Society SEED project to provide STEM opportunities to underrepresented groups.

Student Engagement

The Department of Food Science supports activities of the undergraduate and graduate food science clubs. The Food Science Graduate Club was honored as the 2017 Chapter of the Year by the Institute of Food Technologists. Student teams also participate in product development competitions and in developing healthy and wholesome foods.

Department of Human Ecology

<http://humanecology.rutgers.edu/>



With deep roots in both the natural and social sciences, human ecology is the discipline that examines the patterns and processes of human interactions with the environment, recognizing that humans both affect and are affected by their physical and biological environments.

The Rutgers Department of Human Ecology was established in 1973 as one of the very first interdisciplinary social/behavioral science departments at any university with a specific focus on emerging environmental, natural resource, and health issues. The department was established as a core teaching and research unit explicitly designed to foster the collegial integration of scholars from the natural, social, and behavioral sciences able to work together to teach about, conduct research, and find solutions to substantive problems involving people and the environment. Since then, Harvard, Brown, Columbia, Berkeley and many other universities have developed departments and programs patterned on the Rutgers model.

The department's mission is to provide high-quality scholarship and education about environmental, natural resource and health issues from a rigorous, interdisciplinary perspective that integrates social, behavioral, and bio-physical sciences and to promote the use of that knowledge to address real world problems in the state, nation, and the world.

To achieve this mission, the department's 11 tenure-track and five non-tenure-track faculty members use methods and theoretical approaches drawn from the disciplines of anthropology, geography, psychology, sociology, communications, science education, environmental planning, law, public administration, public health, and political science to address problems involving how humans change the environment and how environmental changes impact individuals, communities, cultures, societies, and the planet. Significantly, the department is composed of "boundary spanners," trained in a specific social science discipline but able to work with economists, hydrologists, toxicologists, climatologists and others to collaboratively produce and communicate new knowledge. Furthermore, we span the boundaries between the university and civil society, working with immigrant communities, emergency managers, food manufacturers, local land use planners and other diverse groups. In doing so, we are uniquely positioned to address wicked problems from genuinely transdisciplinary perspectives, which, in many ways, represents the future of academics.

The department has significant strengths in risk and science communication ; common property governance; cultural and societal uses and management of natural resources and resulting conflicts; climate change vulnerability, mitigation and adaptation; food security, food safety, nutrition, and health; health disparities and social and environmental inequalities; societal implications of emerging technologies; sustainability. The department also has a strong focus on global and international initiatives. More than half the faculty have research projects and collaborations abroad.

From 2012-2017, department faculty have been PI's or Co-PI's of more than 55 competitive grants and contracts totaling more than \$20 million, awarded by the NSF, NIH, NOAA, USDA, Robert Wood Johnson Foundation (RWJF), and others. In addition, they have published more than 120 peer-reviewed journal articles, four books, 28 book chapters, more than 75 reports and other publications and have given more than 360 invited talks and conference presentations. Honors for this work include: the RWJF Young Leaders Award, designation of two faculty members as chancellor's scholars, several national book awards, two Partnership for Enhanced Engagement in Research grants from the National Academy of Sciences, USAID and NSF, the US FDA Service Award, a Fulbright Fellowship, a National Academies Teaching Fellowship, as well as fellowships at the Smithsonian, the European Institutes for Advanced Study, the Annenberg Public Policy Center, and the Rachel Carson Center for Environment and Society.

For nearly 45 years, the teaching mission of the department has been to educate students to become involved citizens and effective leaders able to understand the human dimensions of environmental change. The department offers a B.S. in environmental policy, institutions, and behavior (EPIB), with approximately 140 students enrolled in the major, and 45 enrolled in the associated minor. The skills-based curriculum emphasizes an understanding of the varied perspectives offered by the social and natural sciences regarding the causes and consequences of social, ecological, and environmental change. Consistent with its unique name, the EPIB major goes beyond the curriculum of most environmental studies majors and prepares students for careers directly involved with transforming policies, institutions, and individual behaviors that can help society prevent, mitigate, and ameliorate the negative effects of environmental changes and to construct a more positive and resilient future. The department also hosts a cross-disciplinary certificate/minor in sustainability, with more than 50 students enrolled, and a new minor in science communication, enrolling about a dozen students. It also offers an undergraduate certificate in international agriculture and the environment, enrolling about a half-dozen students. In addition, the department's introductory courses serve as part of the core curriculum, with more than three-quarters of the students graduating from SEBS enrolling in one or more of these courses during their undergraduate careers. The department also hosts a student-run newsletter, *The EPIB Trail*.

The department offers an interdisciplinary graduate certificate in the human dimensions of environmental change. However, it has no master's or doctoral graduate program of its own. Instead, faculty are members of the graduate faculties of several disciplinary departments, and teach and work with graduate students from multiple schools across Rutgers, including SEBS, SAS, SCI, the School of Law, the Bloustein School of Planning and Public Policy, and the School of Public Health and other units within the Rutgers Biomedical and Health Sciences. As such, the department serves as a nexus for faculty and students from across the University who are interested in the human dimensions of environmental problems and their solutions.

Department of Landscape Architecture

<http://landarch.rutgers.edu/>



Guided by our mission to provide leadership in the design and stewardship of the environment, the Department of Landscape Architecture advances teaching, scholarship, and outreach in the art, science, and practice of landscape architecture and environmental planning.

The department supports two undergraduate majors—an accredited BSLA in Landscape Architecture and a B.S. in Environmental Planning—as well as an accredited MLA program. Currently, there are 132 undergraduate and 28 graduate students. The department also supports a minor in geomatics and two certificate programs. In addition, the department is committed to courses that satisfy the SAS and SEBS core curriculum, with specific strength in 21st Century Challenges and Arts and Humanities areas of inquiry. Community-engaged studios and service-learning are central to our curriculum.

The faculty in the Department of Landscape Architecture reflect the diverse disciplines informing the planning and design of the built landscape. Our 16 full-time faculty members include landscape architects, architects, art historians, ecologists, environmental planners, and artists. As such, our scholarship is reflected in an array of outlets, including books, peer-reviewed articles, reports, exhibits, design competitions, and awards. In addition to disciplinary scholarship, our faculty are involved in professional activities and outreach. Five of our faculty are licensed landscape architects. One faculty member is a Fellow in the American Society of Landscape Architects.

Most faculty are actively involved in outreach activities associated with their research and teaching. Much of this work is conducted through the Center for Urban Environmental Sustainability (cues.rutgers.edu), Rutgers Cooperative Extension, the Grant F. Walton Center for Remote Sensing and Spatial Analysis (deathstar.rutgers.edu), and the Office of Agriculture and Urban Programs (agriurban.rutgers.edu).

Key areas of research include participatory design and planning, urban parks and open space, urban ecological design, wetland ecology and management, modern landscape history, design practice, geographic information sciences, and construction technology and practice.

From 2012-2017, faculty members published nine books, 27 book chapters, and 55 peer-reviewed articles in design, planning, history, ecology, and science journals.

Department faculty members received many professional design awards between 2013 and 2017.

In 2013: Environmental Quality Award from the U.S. Environmental Protection Agency and Merit Award from the N.J. Chapter of the American Society of Landscape Architects (NJASLA) for Category Unbuilt Project: *Voorhees Environmental Park—Concept for a Solar Park on a Landfill*.

In 2014: Merit Award from NJASLA for *Landscape Planning & Analysis: Socialspaces Masterplan—Stonebridge at Montgomery Retirement Community*.

In 2015: Merit Award from the NJASLA for *Gil Hodges Community Garden Design*; Federal Design Award from Switzerland; National Honor Award in Research from the American Society of Landscape Architects (ASLA) for *Collective Visions: Exploring the Design Potential of Landscape History*; National Honor Award in Design from the ASLA for *Mill River Park and Greenway*; Lifetime Achievement in Environmental Education Award from the American Forest Foundation; National Honor Award from the American Institute of Architects (AIA) for Regional and Urban Design; Urban Design Merit Award from AIA NY Chapter; National Planning Excellence Award from the American Planning Association (APA) for Urban Design; and Merit Award from NJASLA for Unbuilt Project: *Shallcross Hall Addition at Friends Central School, Wayne, PA*.

In 2016: Semi-Finalist in the National Park Service's *Memorials for the Future* Design Competition; Architectural Book Award from Deutsches Architekturmuseum (DAM) for *Keinist*; German Garden Book Award from STIHL for Category Best Book on Garden History and Special Prize for *Keinist*; and multiple awards for *HUD/ Rebuild by Design – the Big U*, including: ALSA Honor Award in Analysis and Planning.

In 2017: Winner of the Urban Design Competition from the Rethinking the Future/International Architecture Thesis Awards (RTF/ IATA) for Urban Design Category: *The Organic Highway*; Merit Award from NJASLA for *The Replacement of the 14th Street Viaduct, Hoboken, NJ.*; and National Award of Excellence in Research from the ASLA for *Fluid Territory: A Journey into Svalbard, Norway*.

Selected Publications

Cardasis, Dean. *James Rose*. Amherst: Library of American Landscape History, 2017.

Bakshi, Anita. *Topographies of Memories: A New Poetics of Commemoration*, New York & London: Palgrave Macmillan, 2017 (Forthcoming).

De La Pena, David, Diane Jones Allen, Randy Hester, Jeffrey Hou, Laura Lawson, and Marcia McNally, editors. *Design as Democracy: Techniques for Collective Creativity*. Island Press, 2017 (Forthcoming).

Freytag, Anette. *Dieter Kienast – Stadt und Landschaft lesbar machen*, Zurich: gta, 2016.

Freytag, Anette. *The Landscapes of Dieter Kienast*, Zurich: gta (US distribution: University of Chicago Press, anticipated 2018)

Freytag, Anette. *La Gara: Réinventer aux XX^e siècle un domaine genevois du XVIII^e siècle avec les jardins d'Erik Dhont et le labyrinthe de Markus Raetz*, Zurich: Park Books (anticipated 2018).

Department of Marine and Coastal Sciences

<https://marine.rutgers.edu>



The Department of Marine and Coastal Science (DMCS) is exploring and discovering critical processes on this ocean planet and applying new knowledge for the benefit of society. DMCS has 37 faculty members and another 17 faculty members being full members of the graduate program of oceanography with expertise spanning all branches of oceanography. Faculty programs span polar, temperate, and tropical regions around the world. The faculty are internationally recognized in research excellence and for developing cutting edge undergraduate and graduate education programs.

Marine science at Rutgers has a rich, century-long legacy. At the turn of the 20th century, Rutgers scientist Julius Nelson led the nation away from unregulated shellfish “harvesting” to sustainable yield strategies. DMCS research spans from paleo-oceanography, microbiology, biogeochemistry, ocean modeling and observation, fisheries, environmental forecasting, aquaculture, biomineralization, estuarine processes, and climate. Examples of DMCS discoveries include understanding how corals make skeletons, how warming polar systems are altering food webs, and the sustainability of global fisheries. DMCS has led the way to the development of global ocean observing networks and the development of novel sensors and numerical models. Activities at New Brunswick are complemented with extensive field research facilities at Tuckerton and Cape May. The research is supported from diverse state and federal agencies (NSF, NASA, ONR, NJDEP, and NOAA) and a range of foundations (Vetelsen, Gordon and Betty Moore Foundation).

Looking at the past five years (2012-2017), the department has received just over \$100 million from 463 competitive grants. From 2012-2014, the annual award totals averaged approximately \$13 million; they have increased to just under \$20 million annually in recent years, reflecting large NSF and NOAA awards for ocean observing research. Over the past five years, there have been 349 peer-reviewed publications, 39 book chapters, four national reports, and two books published. Publications are in high tier journals such as *Science*, *Nature*, *Proceedings of the National Academy of Sciences*, *Geophysical Research Letters*, *Ecology*, and *FEMS Microbiology Reviews*. (<https://marine.rutgers.edu/main/research/publications>)

DMCS has developed extensive undergraduate and graduate programs. The graduate program, established in 1994, has produced the 54 Ph.D. and 36 master’s students. The undergraduate program, initiated in 1998, currently has 70 majors. Students anchor expeditions around the globe and are integrated into research in laboratories. Undergraduates have access to a fisheries minor program that provides deeper understanding of the ecology of fish, humans, and international policies/regulation/law. The department is innovating education programs, such as the new Master of Operational Oceanography, training students in operating new ocean and numerical technologies for the blue economy that requires expertise to support decision-making in the maritime sector industries. This is a 4+1 program where students can enroll in an accelerated 14-month master’s degree after completing their undergraduate degree.

The department has focused on increasing the diversity of marine sciences and has developed new undergraduate programs that have doubled the number of non-Caucasian marine science majors. Rutgers undergraduates made history, piloting an underwater glider across the Atlantic Ocean (first basin

underwater robot crossing in history) which was recognized by the White House and the government of Spain.

The Department has extensive outreach and community engagement programs. Working in collaboration with the New Jersey Agricultural Experiment Station (NJAES) and other departments, DMCS faculty are supporting New Jersey in developing a thriving aquaculture industry, assessing offshore wind energy potential, and implementing modern practices to ensure sustainable fisheries. The department has automated water quality data collection with NJDEP with robots and trained undergraduate cohorts to collect data. Nationally, the Center of Ocean Observing Leadership (COOL) provides streaming data to National Weather Service, U.S. Coast Guard, and the U.S. Navy. DMCS maintains active outreach to K-12 teachers and has trained >15,000 teachers through a range of active programs. The faculty have produced three award-winning full length documentaries that have been broadcast nationally.

Department facilities include two field stations and three research vessels. With the NJAES, it helps manage the Jacque Cousteau National Estuarine Research Reserve. DMCS maintains the third largest global underwater glider fleet (behind the U.S. Navy and National Science Foundation); runs the only triple frequency HF Radar network in the world, spanning the northeast United States; and is home to the to the Regional Ocean Modeling System (ROMS). The department hosts other campus-wide programs including the Rutgers Energy Institute and Rutgers Institute of Earth, Ocean, and Atmospheric Sciences. In collaboration with the Department of Environmental Sciences, DMCS is developing the Raritan Initiative, an education/local public outreach effort, which is focused on transforming the local watershed into a laboratory immersing the students and community in their local environment through classes and citizen science.

Selected Faculty Awards/Recognitions

Member of the National Academy of Sciences, Huntsman Medal, Hutchinson Award, Fellow of American Geophysical Union, Fellow of American Academy of Arts and Sciences, International Cosmos Prize, Verdansky Medal, Fellow of American Academy of Microbiology, Prince Albert 1^{ER} de Monaco, Grass Fellow, Fellow, Benjamin Franklin Medal, Ecological Society of America, Kavli Fellow, Einstein Professor, Chinese Academy of Sciences, AGU Voyager Award, European Geosciences Union Fellow, EGU Plinius Medal, Storrs Coles Memorial Award, Fellow of Geological Society, Fellow of Marine Technology Society, Technology Collaboration Award of the Naval Research Laboratory, recognition by New Jersey in State Resolutions, Port Security Center of Excellence, Gordon and Betty Moore Microbiology Fellow, ASLO Refield Lifetime Achievement Award.

Selected Programs at DMCS

Lead for the Mid-Atlantic Regional Observing System for NOAA IOOS, Gordon & Betty Moore Foundation Programs in Marine Microbiology Initiative Fellow and to Map Earth's Metabolism, taking the lead of Palmer LTER program, Gulf of Mexico Research Initiative, lead in several IODP research legs, extensive NSF programs in developing paleo-chemistry climate proxies, lead in Naval Directed Research Initiative, education-based Challenger Mission, development of first triploid oyster.

Selected Outreach

AI Giddings Video Imagery Collection, development of the Tools of Science videos, hosts a Research Experience for Undergraduates program, development of the Polar Ice teacher site, JC NERR Coastal Training Site, developed NSF COSEE Networked Ocean World, Shore Bowl host.

Department of Nutritional Sciences

<http://nutrition.rutgers.edu/>



Rutgers University's interdisciplinary Department of Nutritional Sciences (DNS) emphasizes excellence in undergraduate and graduate education, cutting-edge nutrition research, and public service that uses evidence-based research results to improve the nutritional habits, general health, and overall well-being of the populace. Special departmental emphases include molecular, biochemical, physiological, clinical, psychological, and cultural dimensions of human nutrition. The combination of biology and social science in teaching and research equips the department to take a fresh look at nutrition problems and develop unique solutions that improve the quality of life for people throughout New Jersey, the United States, and the world. Members of the DNS faculty bring a multidisciplinary approach to their teaching and research, for their training represents, among various disciplines and expertise, nutrition, dietetics, biochemistry, education, and human development.

Founded as the Department of Nutrition in 1966, the DNS celebrated its 50th anniversary in 2016. The founding chair was Dr. Hans Fisher, who in keeping with the land-grant mission of the university, pioneered interdisciplinary research in dietary amino acid and fatty acid metabolism and requirements in poultry that informed the New Jersey farming community and beyond. In 1988, the Department of Nutrition merged with the Department of Home Economics to become the DNS. The legacy of that merger continues today, as the department harbors strengths in basic, translational, applied, and community nutrition research and dietetics.

The undergraduate curriculum is created and delivered by 15 full-time tenured and tenure-track faculty (including three extension specialists), and five non-tenure track faculty. The department has two distinguished professors, including one of only two extension specialists at Rutgers University to have achieved this highest faculty rank. DNS faculty conduct nationally and internationally recognized research on a wide variety of topics, including lipid metabolism; protein and amino acid metabolism; B vitamins and one-carbon metabolism; DNA integrity and metabolic health; obesity, vitamin D and bone health; energy metabolism and body composition; applied and community nutrition; nutrition education and health promotion; food security; sensory perception; and infant nutrition and behavior. Current (fiscal year 2017-2018) federal and non-federal research funding awarded to the faculty is approximately \$2.5 million. In addition to membership in the DNS, the faculty are members of the graduate program in nutritional sciences (GPNS), which consists of 46 professors from various disciplines in addition to nutritional sciences, including animal science, food science, kinesiology, and medicine, among others. Currently, there are 22 doctoral and 16 master's students in the GPNS.

Between 2012 and 2017, DNS faculty have published ~300 peer-reviewed publications and over 50 books, book chapters, and reviews. The department's three extension specialists have also contributed hundreds of newsletters, online media presentations, videos, computer software, and other educational material designed for education of both consumers and health professionals. Over half of the tenured faculty

currently hold editorial board positions for various prestigious journals in the field of nutrition, including *Annual Review of Nutrition*, *American Journal of Clinical Nutrition*, *British Journal of Nutrition*, and *Nutrition Reviews*, among others.

The undergraduate nutritional sciences major is divided into five distinct options depending on the goals of the students: didactic program in dietetics; nutrition; community nutrition; food service administration; and nutrition, food, and business. The majority of nutritional science majors (~60 percent) are enrolled in the didactic program in dietetics (DPD), which is nationally accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND). The DPD is designed to prepare students for post-graduate supervised practice internships and subsequent attainment of the Registered Dietitian/Nutritionist (RDN) credential. Graduates of the DPD program are matched into dietetic internship programs at a rate over 65 percent, which is well above the national average of 48 percent. DPD graduates are also recognized nationally for their strengths in hard sciences such as chemistry, biochemistry and biology, as these and other related courses are required and emphasized in their undergraduate training to a greater extent than most other undergraduate dietetics programs.

The nutrition option provides training for those intending to go to graduate school in any of the life sciences, conduct biomedical research, or pursue pre-professional (i.e., medical, dental) studies. The nutrition option also prepares for entry-level jobs in biomedical research fields in industry and academia. The community nutrition option addresses the growing need for nutrition professionals to work with youth in structured organizations at the local, state, and national level such as WIC, Head Start, 4-H, cooperative extension, after school care, day care, environmental education, and programs for homeless children and families. The food service administration option is for students who want careers in food service marketing or in managing food service in schools, hotels, restaurants, cafeterias, corporations, hospitals, and long-term care facilities. The nutrition, food, and business option prepares professionals to work in food and food related industries at the interface of nutrition, food, and business. The fundamentals of nutrition, the science of food, and business prepare students for positions in test kitchens of food companies, product development in the food industry, public relations, pharmaceutical companies, the supermarket industry, and in research.

A selection of distinctions and awards made to the faculty by their peers and professional organizations include: 2003 American Society for Nutrition: Peter J. Reeds Memorial Young Investigator Award; 2001 American Psychological Association: Distinguished Scientific Award for Early Career Contribution to Psychology; 1995-present Fellow, Academy of Nutrition and Dietetics, 2016 Society for Nutrition Education: Helen Denning Ullrich Award for Lifetime Excellence in Education, and 2016 American Society for Nutrition: Excellence in Nutrition Education Award; 1985-present Fellow, American Heart Association, and 2005-present Fellow, Society of Toxicology; 2015 J. William Fulbright Scholar Award for Interdisciplinary Research in Global Health; 2004 American Cancer Society: Research Scholar Award; 2007-2008 Society for Nutrition Education: President, Board of Directors; 2012 Academy of Nutrition and Dietetics: Abbott Nutrition Award in Women's Health; 2010 American Society for Nutrition: Osborne and Mendel Award; 2007, 2012 Rutgers NJ Agricultural Experiment Station/Cooperative Extension of Middlesex County: 4H Leader of the Year; 2008 American Society for Nutrition: Excellence in Nutrition Education Award, and 2017-present Fellow, American Society for Nutrition; 2011-present Fellow, American Psychological Association.

Department of Plant Biology

<http://plantbiology.rutgers.edu/>



The Department of Plant Biology offers undergraduate, graduate, and post-doctoral educational and research opportunities within a broad range of scientific disciplines, ranging from crop production to plant molecular biology and genomics. Strong programs in extension and outreach are another hallmark of our department; faculty with extension appointments conduct research and extension programming in a variety of disciplines throughout the state.

With roots in the Morrill Act of 1862, the mission of the Department of Plant Biology is to provide leadership in teaching, research, and outreach in plant biology to benefit society. It is the largest department at the School of Environmental and Biological Sciences (SEBS), serving as home to 40 tenured/tenure-track faculty with responsibilities in research, teaching, and/or extension and outreach, and 15 fulltime non-tenure-track faculty, of whom five have primary responsibilities in teaching, nine with primary responsibilities in research, and one with primary responsibilities in extension and outreach. Faculty research interests and expertise are grouped into four sections: Sustainable Agricultural Systems; Plant Breeding and Genomics; Plant Protection and Biotic and Abiotic Interactions; and Natural Products and Human Health.

Research strengths include:

- The Center for Turfgrass Science, a world-class research, education, and extension program
- An internationally renowned research program in bioexploration and characterization of natural products, with emphasis on the discovery, study, and economic development of plant and fungal products for human and plant health
- Excellence in breeding and genetic improvement of plants, including plant-based biofuels and commodities of significant economic importance to the state
- Excellence in plant molecular biology and biotechnology, including contributions from internationally renowned faculty shared with the Waksman Institute of Microbiology
- Excellence in a broad range of practical research emphasizing sustainable production of specialty crops, including ethnobotanical and nursery crops, as well as innovations in plant protection through research in weed science and plant pathology, endophyte biology, rapid detection of new and emerging diseases, and incorporation of modern technologies for production and disease control

Heavily invested in instruction at the undergraduate and graduate levels, plant biology offers three undergraduate majors, three minors, and three certificates. Unique among departments at SEBS, the agriculture and food systems and biotechnology majors are interdisciplinary, utilizing faculty teaching participation from multiple departments in these curricula. Combined enrollment for all three majors approximate 300 students. Altogether, department faculty combined offer more than 65 different courses as well as teach and advise students within these instructional programs. There is a strong international presence, enhanced by dual degree (2+2 enrollment) articulations with four international universities.

The plant biology and agriculture and food systems majors prepare students for careers or further study in specialty areas related to food production, organic and sustainable agriculture, horticulture and turfgrass industry, pest management and plant pathology, plant breeding, plant molecular biology, or horticultural therapy. We offer minors in agroecology, plant science, and agriculture and food systems. Matriculating

and non-matriculating students can pursue certificate programs in plant biosecurity, horticultural therapy, or medicinal and economic botany. The department is a leader in professional training for horticultural therapy, offering coursework that satisfies educational requirements for board certification as well as exclusive partnerships providing internships for in-field training. Established in the 1980s, the undergraduate program in biotechnology was one of the first of its kind and continues to be at the forefront of the biotechnological revolution. Primary objectives of the program are to educate students for positions in the biotechnology industry and to prepare students for graduate and professional study in the life sciences. Option specialization fields include microbial biotechnology, animal biotechnology, plant biotechnology, bioinformatics, and bioscience policy and management. Students majoring in biotechnology may apply to the five-year program (4+1) to complete a Master's of Business and Science degree one year after completing their B.S. degree requirements.

The graduate program is a comprehensive program of study and research, drawing participating faculty of close to 50 from at least six different units across Rutgers. Currently, there are 67 students in the program consisting of five specialty tracks aligned closely with department research expertise. These are molecular and cellular biology, plant breeding and genomics, horticulture and plant technology, plant pathology, and natural products and human health. From 2007-2017, the program has graduated 35 Ph.D. and 27 M.S. students.

In addition to the traditional academic programs, many faculty members associated with the Center for Turfgrass Science contribute to instruction within the two-year certificate program for the Rutgers Professional Golf Turf Management School offered through the Office of Continuing Professional Education, enrolling more than 100 students each year.

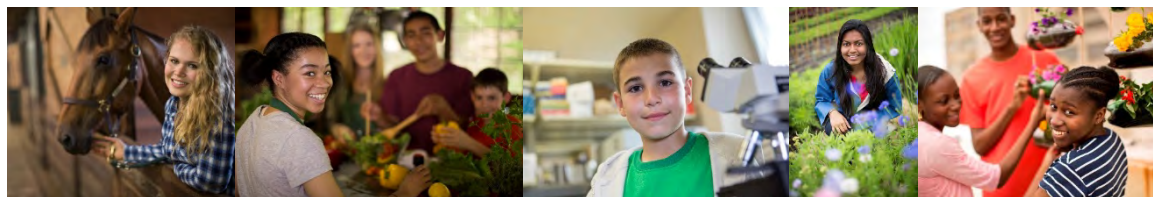
The department faces a few major challenges as it prepares to transition into the next decade. One is to increase enrollment in our courses and our undergraduate programs. There are clear plans in place to achieve both, including increasing the number of student transfer articulations with state two-year colleges and dual degree articulations with international universities. Another major challenge is to address the issue of aging faculty, of which 75 percent of the 40 T/TT faculty are in their mid-50s or older. The department has a young, vibrant, productive faculty cohort that will provide strong leadership moving forward in department strengths, including turfgrass science, plant breeding, plant molecular biology, plant microbiology, and sustainable agricultural systems. The department is now devising a strategic plan to add new faculty to sustain other department strengths.

Select faculty awards include: National Academy of Sciences; European Academy of Sciences and Arts; Hungarian Academy of Sciences; Fulbright Scholarship; Waksman Outstanding Teaching Award; Stuart Mudd Award for Basic Microbiology; Young Crop Science Award; Musser International Turfgrass Foundation Award of Excellence; USDA Secretary of Agriculture Honor Award; USGA Green Section Award; National Epsilon Sigma Phi Visionary Leadership Award; Golf Course Superintendents Association Distinguished Service Award; Alexander von Humboldt Research Award in Molecular Biology; Johnson and Johnson Discovery Fellow; Lawrence Bogorad Award for Excellence in Plant Biology Research; Thomas Alva Edison Patent Award; American Society of Plant Physiologists Charles A. Shull Award; World Technology Award for Biotechnology.

Fellows include: AAAS; Academy of Toxicological Sciences; Alfred P. Sloan; American Society of Agronomy; American Phytopathological Society; American Society of Microbiology; Collegium Ramazzini; Crop Science Society of America; American National Academy of Inventors; Society for Industrial Microbiology and Biotechnology.

Department of 4-H Youth Development

<http://nj4h.rutgers.edu>



The Department of 4-H Youth Development provides leadership for the youth development component of Rutgers Cooperative Extension of the New Jersey Agricultural Experiment Station. 4-H uses a learn-by-doing approach to enable youth to develop the knowledge, attitudes, and skills they need to become competent, caring, and contributing citizens of the world. This positive youth development is accomplished through a variety of delivery modes using hands-on, experiential learning programs. The 4-H faculty and staff partner with Rutgers faculty members representing a wide variety of fields to ensure programs are contemporary and relevant to today's youth. In addition, 4-H faculty and staff recruit and train adult and teen volunteers who are responsible for teaching, mentoring, and guiding youth involved in the program.

The Department of 4-H Youth Development provided educational outreach programming for 39,584 New Jersey youth in 2016. These youth were involved in programs such as 4-H clubs, special interest programs, school enrichment, after school child care education programs, overnight camping, and other special programs. Volunteers are the backbone of the program and are essential to the successful delivery of 4-H youth programs. In 2016, 2,428 adults and 442 youth volunteered an average of 220 hours in preparing for club meetings, teaching, and managing programs. At a rate of \$27.46/hour (according to the Independent Sector), this equates to over \$14.6 million in donated time by caring adult volunteers.

The New Jersey 4-H Program is an acknowledged leader in New Jersey youth development, creating extraordinary opportunities for youth to meet today's challenges and tomorrow's opportunities by:

- Providing a safe and supportive environment for youth to acquire skills and attitudes that promote positive youth development
- Implementing resourceful and innovative delivery modes, which rely upon experiential learning and set the stage for life-long learning
- Fostering volunteer development and youth-adult partnerships that enhance ethical decision-making, leadership skills, teamwork, and goal setting
- Empowering youth to become an active voice in their community
- Participating in a culturally diverse global organization
- Creating opportunities for youth of all ages to learn skills and attitudes that prepare them for success now and for prosperity in the future
- Leading collaborative efforts within the land-grant university system to develop nationally recognized programs and curricula

Our 18 full-time faculty members and 23 field staff members, contribute to the advancement of 4-H programs in the following areas:

- **Science**—Science literacy, animal science, plant science, environmental science, life sciences, robotics
- **Healthy Lifestyles**—Physical and emotional health, foods and nutrition, safety
- **Citizenship**—Youth engagement, community youth development, community service, character development, civic engagement

The department offers a host of on-campus experiences for youth and professional educators in the areas of science and leadership. Department facilities include a 90-acre residential summer camp, the LG Cook Outdoor Education Center, that serves as a living laboratory for effective youth development practices related to camping and environmental education.

Selected grants secured (2012-2017)

USDA Children, Youth, Family, at Risk. 2014-2019. Competitive grant to implement Science Pathways program for five years. Pellien, T. & Lyons, R. \$623,000.

National Science Foundation, Advancing Informal Science Learning. 2015. Understanding the Challenges to Achieving Best Practice in Afterschool Science. Hutchison, C., Ripberger, C., Dvorak, M.. \$50,000.

Samsung. 2015. Grant for the Rutgers Summer Science Program. Ripberger, C. \$73,000.

Office of Citizen Exchanges, Bureau for Educational and Cultural Affairs, U.S. Department of State. 2014. Competitive grant for an international youth leadership and civic engagement program. Torretta, A. \$180,000.

Selected faculty publications (2012-2017)

Pellien, T. & Yergeau, S. (2017). *Shark Bite Meetings for Creative Program Planning*. Journal of Extension.

Torretta, A. (2017). *Two Key Aspects of Maintaining Professionalism during Conflict*. Journal of Extension.

Torretta, A. Black, L. (2017). *Using Pop Culture to Teach Life Skills and Disaster Preparedness*. Journal of Extension.

Pellien, T. (2016) *Building 4-H Program Capacity and Sustainability Through Collaborative Fee-Based Programs*. Journal of Extension.

Ripberger, C., Blalock, L.B. (2015). *From Kickoff to Handoff: Coaching Teens to Tackle STEM Literacy*. Journal of Extension.

McDonnell, J. S. Lichtenwalner, S. Glenn, C. Ferraro, K. Hunter Thomson, and J. Hewlett. (2015). *The challenges and opportunities of using data in teaching from the perspective of undergraduate oceanography professors*. Journal of Marine Technology.

Ripberger, C., Blalock, L.B. (2015). *Science Saturdays: A Ground Up Approach to Partnering with Corporate Volunteers*. Journal of Youth Development.

Ripberger, C., Blalock, L.B. (2011, revised 2013). *4-H Science in Urban Communities Promising Practices Guide*, a 202 page National 4-H resource available at <http://urban4hscience.rutgers.edu>.

Torretta, A. (2014). *A Funny Thing Happened on the Way to the Fair: Using Humor to Decrease Stress and Increasing Productivity*. Journal of Extension.

Department of Agriculture and Natural Resources

<http://njaes.rutgers.edu/anr/>



The Department of Agriculture and Natural Resources (ANR) serves the residents of New Jersey through the development and dissemination of research-based information. Our goal is to teach people new skills and information so they may make better-informed decisions and changes in themselves, their businesses, and their personal lives. Broadly defined, our programs assist commercial businesses, governmental agencies, and residents through personal or group requests for assistance. We offer information and consultation on issues related to agriculture, the environment, and natural resources management. Our work with commercial clientele and governmental agencies is intended to improve public understanding of the relationship between agriculture and open space and the general economic and environmental vitality of the state. Our programs focus on commercial agriculture and horticulture, fisheries and aquaculture, environmental and natural resource management issues, farm business development and marketing, pesticide safety and training, integrated pest management (IPM), and other related subjects. New Jersey's urban, suburban, and rural landscapes coexist with forests, rivers, streams, beaches, wetlands, estuaries, bays, and the ocean in a dynamic relationship shaped by use. Our residential clientele include individuals and organizations. We provide information and educational resources on a diverse range of topics, including gardening, household and structural pest identification and control, tick identification, composting, and environmentally-sound gardening practices.

The Rutgers Master Gardener Program serves as one of two volunteer arms of ANR programming. Since its inception in 1984, nearly 8,600 residents have been trained in applied integrated pest management. Nearly 3,000 residents are currently volunteering within 16 county programs for an annual average of 160,000 hours valued at \$4.3 million dollars.

Established in 2005, the Rutgers Environmental Stewards Program, the second volunteer arm of ANR, educates the public about the science behind environmental issues and helps participants create positive change in their communities. Their volunteer internships are uniquely aligned with their interest and passion, the needs of the program, and those of their community. As of 2017, 400 residents have been trained and, in 2016, 15 internship projects were completed in nine counties.

ANR is comprised of 29 faculty members and eight staff, joined by an additional 32 county- and grant-positions and research farm staff that fulfill our mission across the state of New Jersey. Programmatic focus areas for ANR, as described in our 2013 Strategic Plan, include those base programs, localized needs, and emerging issues identified under the general strategic areas of "Growing the Garden State" (economic sustainability of New Jersey's broadly defined agricultural industry), "Horticulture for the Health of It" (nursery and horticultural industries, commercial and residential clientele), and "Conserving Our Natural Resources" (sustainability of our land, water, forest, and environmental resources).

Regional collaboration of programmatic efforts along with stakeholder input within commodity and issue-based working groups are vital in meeting and sustaining these goals and continuing positive impacts to

our existing and new audiences. Statewide newsletters, such as the Plant and Pest Advisory, provide information for commercial agricultural and horticultural businesses, but may also be of general interest to non-commercial clientele. Our department also offers courses for undergraduates that utilize the expertise of ANR faculty and staff, providing students with knowledge and practical skills for understanding current agricultural, environmental, and horticultural topics.

Selected Publications

- Polanin, N., Melendez, M., Carleo, J., Matthews, J., Brumfield, R., O'Neill, B., Heckman, J. (2017). Social Media: Cultivating Peer-to-Peer Farm Women Networks in New Jersey. *International Journal of Agricultural Science*, ISSN 2367-9026, 2, 37-41.
- Rowe, A. and Bakacs, M. (2017). "Organic Land Care Best Management Practices Manual," <http://njaes.rutgers.edu/pubs/publication.asp?pid=E357>.
- Keller M., Gohil H., Romero P., Carmassi, G., and Harbertson, J. (2016). Deficit Irrigation for red wine quality: Effects on grapevine growth and physiology. *American Journal of Enology and Viticulture*. 67:4: 426-435.
- Sciarappa, W. J., J. Simon, R. Govindasamy, K. Kelley, F. Mangan, S. Zhang, S. Arumugam, P. Nitzsche, R. Van Vranken, S. Komar, A. Ayeni, G. McAvoy, C. Park, W. Reichert, D. Byrnes, Q. Wu, B. Shilling. (2016) Asian Crops Overview: Consumer Preference and Cultivar Growth on the East Coast of the United States. *HortScience* 51(11) 1344-1350.
- Schilling, B.J., Komar, S., Infante-Casella, M., Bamka, W.J., Rabin, J., Kluchinski, D. (2016). From the Field to the Classroom: The Experiences of Extension Faculty in Undergraduate Instruction. *North American Colleges and Teachers of Agriculture Journal*, 6(2).
- Rector, P., P. J. Nitzsche and S.S. Mangiafico. (2015). Temperature and herbicide impacts on germination of water chestnut seeds. *Journal of Aquatic Plant Management*. Vol 53: 105-112.
- Brumfield, R., Carleo, J., Heckman, J., Melendez, M., Oneill, B., Parsons, R., Polanin, N. (2015). Estate Planning - Transitioning for the Future of Horticultural Businesses in NJ. *HortSci* 50(9):S206.
- Nitzsche, P., N. Polanin. (2014). Utilizing Web-based Surveys to Evaluate Field Day Open Houses: The Great Tomato Tasting Case Study. *Journal of Extension*. [on-line] 52(1) article 1IAW4.
- Flimlin, G., S. Macfarlane, K. Rhodes, E. Rhodes. (2010). "Best Management Practices for the East Coast Shellfish Aquaculture Industry," njaes.rutgers.edu/pubs/publication.asp?pid=NRACBMP-2010.

Selected Grants

- \$597,000 "Stormwater Management for Jackson Township: Best Management Practice Implementation in the Metedeconk River Watershed," NJ Department of Environmental Protection (NJDEP) 319(H) Funds, 2017 - 2021.
- \$120,000 "Demographics Research for Ethnic Produce Sales and SARE Outreach," USDA Sustainable Agriculture Research and Education (SARE) Program Grant, 2017 - 2020.
- \$176,359 "Food Safety Modernization Act," New Jersey Department of Agriculture, 2016 - 2017.
- \$460,170 "Ultra-Niche Crops for the Progressive, New Farmer" USDA NIFA - Beginning Farmer, Rancher Development Program, 2015 – 2018.
- \$ 99,803 "Organic Produce Marketing Opportunities Assessment in the Mid-Atlantic United States". USDA Agricultural Marketing Service - Federal State Marketing Improvement Program, 2015.
- \$175,539 "Royce Brook Implementation Project," NJDEP 319(H) Funds, 2015 - 2018.
- \$1,672,500 "Lower Passaic River Fish Exchange and Veterans Training Program," Lower Passaic River Cooperating Parties Group, 2014 - 2016.
- \$312,517 "Green Infrastructure for the City of Newark" NJDEP, 2013 -2016.

Department of Family and Community Health Sciences

<http://njaes.rutgers.edu/fchs/>



Family and Community Health Sciences (FCHS) has been at Rutgers University for over 100 years. FCHS is one of the four parts of the cooperative extension model. There are 12 faculty members and three Senior Program Coordinators in the FCHS Department. The mission of family and community health sciences is to promote health and wellness through education, research and collaboration with outreach in food, nutrition and health. FCHS operates within a socioecological framework. At FCHS, family is considered the cornerstone of a healthy society and the focus of most FCHS programs. The main objective of FCHS education is to contribute to advancing the empowerment of people to achieve optimal well-being.

On a larger scale, all FCHS goals translate to the larger overarching wellness goal of the National Institute of Food and Agriculture (NIFA). This includes addressing childhood obesity, food safety, and global food security and hunger. On the local scale, FCHS targets health promotion programming to the diverse needs of each county's needs at the local and state overall.

FCHS achieves its mission of promoting healthy families, schools and communities through the implementation of resources and programs throughout the state. Through leadership, collaborative efforts, research, science and evidence-based education, FCHS fosters a culture of health and wellness for New Jersey residents of all ages. FCHS outreach covers a broad area of consumer needs, which include:

- Educational opportunities for stakeholders of all ages on nutrition and wellness for health promotion and chronic disease prevention
- Professional development programs for teachers, school nurses, school administrators and school nutrition professionals
- Worksite wellness programs and resources for local businesses and companies
- Resources for early care centers and schools to develop healthier school environments

Advances in science and technology have generated a new era in providing outreach and engagement to extension stakeholders. *E-Learning* has been critical to meet this new digital challenge for FCHS. It is evident how quickly skills become outdated, usually within 3-5 years. Rather than replacing our regular face-to-face programming, *E-Learning* serves as a complementary alternative to lifelong and remote learning. To meet clientele needs, FCHS educators began to develop webinars, videos, podcasts, websites, and presence on Facebook, Twitter, and YouTube. The majority of the FCHS educators also teach a variety of online courses to undergraduate students.

Several FCHS educators are trained in the Stanford Chronic Self-Disease Management Program in the standard model as well as the diabetes and cancer model. This helps chronic disease participants make weekly action plans, share experiences, and help each other solve problems they encounter in creating and carrying out their self-management program. For FCHS, the ultimate goal is helping all of those within the state and community achieve health and wellness.

Key Family and Community Health Sciences Health Promotion Programs

Get Moving Get Healthy NJ Workforce was created as a means of engaging employees in a walking program. Employees are encouraged to wear a pedometer to track daily activity and walking steps. The 52 – week online program is provided for employees who want to participate in a project that will raise awareness of the importance of daily physical activity as well as eating healthy.

The **Grow Healthy Teacher Institute** program was developed to strengthen teachers' academic program and build leadership in the field. Teachers learn and experience first-hand the core principles and practical tools for bringing academic subjects to life in the garden and the classroom, as well as enhancing the overall school wellness environment.

Functional Foods For Life—Consumers continue to be interested in the connection between the food they eat and the possible benefits foods may provide to their health. The curriculum for *Functional Foods for Life* (FFL) was developed to meet this consumer need by providing evidence-based information on six specific functional foods that have research linking them to playing a role in the prevention of certain chronic diseases.

Selected publications

- Brinkman, P., Kinsey, J., Henneman, A. (2017) Increasing the Capacity of Social Media to Extend Your Outreach, *Journal of Extension*, 55(1) Article 1TOT4. <https://www.joe.org/joe/2017february/tt4.php>
- O'Neill B, Xiao J, Ensle K. (2016). Positive Health and Financial Behaviors: The Impact of Daily Time Commitment and Avoidance *Journal of Personal Finance* 15 (2): 41-51. www.journalofpersonalfinance.com. 10 pages.
- Brinkman, P., Kinsey, J., Henneman, A. (2017) Increasing the Capacity of Social Media to Extend Your Outreach, *Journal of Extension*, 55(1) Article 1TOT4. <https://www.joe.org/joe/2017february/tt4.php>
-
- O'Neill B, Xiao J, Ensle K. (2016). Reading Nutrition Labels: A Predictor of Health and Wealth? *Journal of Nutrition Education and Behavior*, rejected, 15 pages.
- Brill, M. 2016. Cooperative Extension Answers the Call to Action to Support Breastfeeding. *Journal of Extension* [On-line], Article 1IAW2. Available at: <http://www.joe.org/joe/2016february/iw2.php>
- O'Neill B, Xiao J, Ensle K. (2016). **Propensity to Plan: A Key to Health and Wealth?** *Journal of Financial Planning* 29 (3): 42-50. <https://www.onefpa.org/journal/Pages/MAR16-Propensity-to-Plan-A-Key-to-Health-and-Wealth.aspx>. 9 pages.

Brill M., Greci A., Cirignano S., Hughes LJ, Minch, D., Morgan, K., Helfrich, M., An Extension Program Model to Sustain School Wellness Partnerships. *Journal of the National Extension Association of Family and Consumer Sciences*. Vol. 9, January, 2014. Permanently archived at http://www.neafcs.org/assets/documents/journal/jneafcs%20volume%209_2014%20final-rev-2-27.pdf

2017 Learning Outcome Assessment Report ***School of Environmental and Biological Sciences***

BACKGROUND

Context

The disciplinary emphasis of the *Rutgers School of Environmental and Biological Sciences (SEBS)* is on the applied sciences in agriculture, environmental studies, and understanding/managing the interrelationship between human actions and the natural environment. Aligned with this disciplinary focus, our mission for undergraduate education is to prepare the next generation of leaders and professionals skilled at applying evidence and reason to solving real-world problems.

Philosophy of Program Assessment at SEBS

To ensure that our graduates are receiving the world-class education that we have promised them, *SEBS* engages in a regular and thoughtful practice of articulating and assessing student learning outcomes to demonstrate that our students have met learning goals and to continuously review and affirm or improve our curricula based on feedback obtained through assessment.

Through an ongoing review process, *SEBS* aspires to certify that the learning goals of academic majors align with the overarching mission and learning goals of the school and the university; and to guarantee our strategic goal of excellence in academic programs. In specific, the review process allows *SEBS* to:

- guide the direction and priorities for our academic programs
- document and affirm the academic successes of departments/programs
- identify areas for improvement and development
- promote goal-setting within and across departments/programs
- identify opportunities to generate and use incremental resources
- identify opportunities to redirect existing resources
- fulfill assessment requirements set by Rutgers central administration
- fulfill requirements of program accreditation
- assure institutional quality to students, faculty, parents, alumni, and other stakeholders

SEBS Curricula

The curricula at *SEBS* include 21 majors and 33 minor/certificate programs. Of the 21 majors, 18 are hosted only at *SEBS* including: Agriculture and Food Systems, Animal Science, Biochemistry, Bioenvironmental Engineering, Biotechnology, Ecology Evolution and Natural Resources, Entomology, Environmental Business Economics, Environmental Planning and Design, Environmental Policy Institutions and Behavior, Environmental Sciences, Food Science, Landscape Architecture, Marine

Sciences, Meteorology, Microbiology, Nutritional Sciences, and Plant Biology. Program assessment at *SEBS* focuses only on these local majors. The remaining programs: Biological Sciences, Exercise Science and Sports Studies and Public Health are hosted and independently assessed by the *School of Arts and Sciences (SAS)*.

Learning Goal-Directed Core Curriculum

The underpinning for advanced-level achievement in major/minor/certificate programs is foundational learning by means of a liberal-arts core curriculum fashioned as a set of eight learning goals. *SEBS* has adopted this core along with six other schools on the Rutgers-New Brunswick campus¹. Core learning outcomes are independently assessed and reported to the *Assessment Council for Learning Outcomes*, so this part of *SEBS'* program assessment activity is not the subject of this report.

***SEBS* Signature Core Learning Goal**

A signature element of the undergraduate core curriculum at *SEBS* is practical application of disciplinary knowledge realized in the form of a learning goal; to complete and report on an applied experience, e.g. professional practice, service learning, or research, in order to examine and evaluate ideas within a discipline. The Experience-Based Education learning goal (EBEd) distinguishes the *SEBS* core curriculum from the Rutgers-New Brunswick campus-wide core, so it is assessed locally, and not by the *Core Requirements Committee*. *SEBS* will begin EBEd assessment for the first time during AY 2017-2018 for the simple reason that this learning goal was adopted in 2015 so the inaugural class of students has not yet sought to achieve EBEd, but will be doing so in the next two years (AY 2017-2018 and AY 2018-2019).

A diversity of opportunities is available for completion of EBEd including formal courses, internship courses, research experiences with faculty from any school at Rutgers, and internship opportunities in the private sector managed by the *SPIN* office (*Student to Professional Internship Network*). The great variety of opportunities presents a challenge of how EBEd will be assessed. A further complication is that some experiences are not graded (they are pass/no credit) and others are not credit-bearing. None-the-less, the criteria and benchmarks that define the EBEd experience are a necessary component of assessment, and therefore, the *SEBS* faculty formally adopted an EBEd [policy](#) on April 2, 2015. Central features of the policy are that a student must work with a supervisor/advisor, they must prepare a learning contract that details the specific objectives of the experience, and they

¹ The Core Curriculum consists of eight learning goals in the general categories of 21st Century Challenges, Areas of Inquiry, and Cognitive Skills and Processes. Student achievement is measured by course-specific learning outcome assessments. Students can complete the Core Curriculum with 10 to 14 courses of 3 or 4 credits each. Undergraduates select from 740 core certified courses, of which 36 courses are taught at *SEBS* (as of AY2016-2017). The core was first developed by the *School of Arts and Sciences (SAS)* nearly a decade ago, but has since been adopted by an additional six schools, including *SEBS* in 2015 (the class of 2019). The Core Curriculum is managed by an *SAS* committee named the *Core Requirements Committee (CRC)* with delegates from each of the seven schools that have adopted the Core. The CRC certifies core courses proposed by each of the participating schools and is also responsible for periodic review of learning outcome assessment data. The CRC submits a separate report to the *Assessment Council for Learning Outcomes*.

must produce an evaluable report of the experience. These criteria form the basis for assessment using an evaluative survey that is completed by the supervisor/advisor with prompts that must be scored using a rubric. The provisional survey and rubric is found in [Appendix A](#). EBed experiences and survey results will be administered, analyzed, and reported by the undergraduate's major program.

PASS- A Unique Feature of the General SEBS Undergraduate Experience

Another signature component of the SEBS undergraduate experience is a study skills training class that is mandatory for all first-year students with GPA less than 2.0 after their incoming Fall semester. The course, named 11:015:103 *Portals to Academic Study Success (PASS)*, is taught in the Spring semester to small, focused, class sections of six to eight students. The learning goals for PASS are mastery of: 1) class attendance and note-taking skills, 2) learning strategies, 3) time and stress management skills, and 4) development of individualized 4-year study plan towards graduation. The PASS program aligns with the SEBS tradition of individual personal advisement of our undergraduates; and underpins achievement of all SEBS learning goals for some students. PASS is assessed by tracking each student's term GPA after the semester in which they take PASS, their cumulative GPA, and their four-year graduation rate. We are able to assess the success of the program by comparing our students with a similar cohort from SAS. Since SAS does not offer a mandatory study skills course it is possible to obtain a quantitative direct measure of PASS effectiveness.

RESPONSES TO PROMPTS (scarlet font) IN THE LEARNING OUTCOME CHECKLIST

1. Learning Goals: Please provide a detailed description of your program level and school level learning goals. Learning goals should be clear, publically available and aligned in a hierarchy; University learning goals, School or Decanal level learning goals, Program/department level learning goals and course learning goals. Give examples and provide links to the public sites where these are available.

School Level Learning Goals

A preliminary statement of the overarching undergraduate learnings goals at SEBS was drafted and discussed by the *Curriculum and Education Policy (CEP) Committee* in AY2016-2017. The statement can be found in [Appendix B](#). The objective was to align the school learning goals in a hierarchy with Rutgers University learning objectives and individual major programs at SEBS.

The provisional contextual statement and a draft of the learning goals are shown below. The expectation is that the SEBS faculty will discuss and adopt a final statement of School learning goals in the Fall of 2017. The text will form the core of the website

<http://academicexcellence.sebs.rutgers.edu/sebsassessment/>, currently being revamped, that will serve as a clearing-house for information on academic program assessment at SEBS.

Program/Department Level Learning Goals

A web directory of program webpages, where Program/Department Level Learning Goals can be viewed is found at <https://SEBS.rutgers.edu/majors/>. With respect to 18 SEBS-supported majors, as of the current years' review all of them have high quality program learnings goals posted front and center at their individual program webpages. The 2017 review by the [*Instructional Assessment Committee*](#) (IAC) revealed, with regard to (a) online posting and (b) quality of Learning Goals, that the average scores for the programs were 2.9 and 2.7, respectively, rated on a three-point rubric scale (3=OUTSTANDING, 2=ON THE WAY, 1=UNSATISFACTORY. The less-than-perfect scores are likely inconsequential, arising due to disagreement about where exactly on the webpage the most appropriate place to post Learning Goals is and on the exact wording of goals. The significant point is that over time the programs have made a strong effort to comply with our expectations. With respect to (a) online posting and (b) quality of Learning Goals the year-to-year improvement of the programs is charted in [Appendix C](#).

As an example of a program that has served as a model for our other programs with regard to its learning goals is *Bioenvironmental Engineering (BEE)*. The BEE webpage is publicly available here <http://academics.envsci.rutgers.edu/bee/>. The link to learning objectives is on the homepage sidebar http://academics.envsci.rutgers.edu/bee/program_objectives_outcomes.html, the link to syllabi are found here <http://academics.envsci.rutgers.edu/bee/courses.html>. The major is professionally accredited by the *Accreditation Board for Engineering and Technology*, Inc. (ABET). BEE majors are thus prepared for the Fundamentals of Engineering Exam and licensure as a Professional Engineer.

2. Syllabi: Course syllabi or a course synopsis of some kind should be available publically, should include appropriate learning goals for the course and program, and should identify how the learning goals are met in the course. Please give links to examples or to a general website where the syllabi are made available.

Course syllabi are available at each of the major program webpages. A central directory of program webpages is found here <https://SEBS.rutgers.edu/majors/>. An outstanding example is the BEE major with syllabi posted at <http://academics.envsci.rutgers.edu/bee/courses.html>.

Overall, the SEBS majors are doing reasonably well on public posting of syllabi that contain assessment-relevant information. Based on the most recent IAC review, on average the programs scored 3.1 on a 4-point rubric scale (4=OUTSTANDING, 3=ON THE WAY, 2=EARLY STAGES, 1=UNSATISFACTORY). To the positive, there has been steady improvement over the past two years as shown in the charts in [Appendix C](#). In 2015 the average score was 2.1 so in two years there has been overall improvement from EARLY STAGES to ON THE WAY. There was some variation between programs, whose scores ranged from 4.0 to 2.7. It is the lagging programs that will, in the coming year, be the focus of individualized attention. These programs will be urged to have their assessment committee manage course syllabi and ensure that they are publicly posted. Although the *Curriculum and Educational Policy*

committee's (CEP) [oversight of new and changed courses](#) is having a positive overall effect on syllabi, most of the courses that underpin the learning goals of programs were approved prior to 2015 when the more stringent oversight by the CEP began.

3. Assessment Plan, Structure and Process: Please describe how you have structured your school or program assessment plan and process. Is there a standing faculty committee in place? How often does it meet? How does the planning for assessment operate in your school or department? The assessment plan or process should be efficient, effective, and sustainable and reviewed annually.

School Level Assessment Plan

***Instructional Assessment Committee Guides Program Assessment Practices at SEBS**

Assessment of program-level disciplinary learning goals at SEBS is managed by the *Instructional Assessment Committee (IAC)*, along with the SEBS Office of Academic Programs. The IAC is a product of the SEBS faculty governance process and is stipulated in the [SEBS Bylaws](#). The primary job of the IAC is to help the undergraduate programs develop and refine their assessment practices, to align the programs in a hierarchy with assessment objectives of the school and university, to promote goal-setting and active management of undergraduate programs, and to document institutional quality. The IAC also serves as an information conduit to the academic and executive Deans on matters of program assessment that these decision-makers can use to set direction and priorities, to take advantage of opportunities for generation of new resources, distribution of existing resources, and to help with accountability to stakeholders and reporting requirements to university central administration.

One of the tasks of the IAC is to review annual assessment reports from the undergraduate major programs and to provide guidance to programs through constructive feedback of their reports. The reviews are carried out as follows. Each program is reviewed by three members of the IAC. The reviewers score the programs based on four criteria using a rubric. The rubric is found in [Appendix D](#). The same rubric has been used for the past three years, providing the mechanism to assess [year-to-year improvement](#). The criteria are versions of the prompts found on the [Learning Outcome Checklist](#) that is provided by the *Assessment Council for Learning Outcomes*. The average of three scores provides a quantitative measure of how well the programs are meeting expectations. The IAC reviewers also write constructive critiques. The three reviews are then summarized. The committee meets to agree on a consensus summary. The summary response is returned to the programs along with a school-wide analysis, which is intended to provide the programs with the opportunity to compare their evaluation with the other programs, which provides peer-pressure motivation, as well as the potential for lagging programs to contact and learn about best-practices from the best programs.

Another activity of the IAC is to organize “best practices” sessions, which has included presentation from the higher ranked programs on their practices. One of the IAC members, Dr. Ines

Rauschenbach runs a workshop on program assessment at the annual meeting of the American Society for Microbiology (ASM), and she has been able to provide respected advice to the *IAC*.

During the post-review year, the Associate Dean of Academic Administration and Assessment energizes the assessment conversation by scheduling discussions at staff meetings and having individual discussions with undergraduate program directors and program assessment committees. Throughout the year the Office of Academic Programs assists departments in designing, applying, understanding and refining their assessment efforts.

The current faculty members on the *IAC* (and their programmatic affiliations) include: Albert Ayeni (Plant Biology), Sharron Crane (Biochemistry), Kristin Hunter-Thomson (Environmental Policy, Institutions and Behavior), Tom Leustek (representing the Office of Academic Programs), Kyle Murphy (Biochemistry), Karl Nordstrom (Marine Sciences), Ines Rauschenbach (Microbiology), Lena Struwe (split line in Ecology, Evolution and Natural Resources and Plant Biology), and James White (Plant Biology).

It is important to state that *SEBS* was a relative latecomer at Rutgers in strongly advocating for an assessment culture at the School. Although the *IAC* has existed for many years it was mostly inactive until 2015. The current year (2017) marks the third annual cycle of program assessment by the *IAC*. Despite the relatively recent activation, the *IAC* has made a significant positive impact. The programs have all been receptive to the work of the *IAC* and have shown steady improvement in their program assessment practices (as shown in Appendix C and referred to elsewhere in this report). They have all expressed appreciation for the clear guidance provided by the *IAC* on what they must do to meet expectations.

✳ **Curriculum Committee Supports Program Assessment Practices at *SEBS***

Program assessment practices are supported by the *SEBS Curriculum and Educational Policy (CEP) Committee*. The CEP is a standing committee with oversight of courses, curricula and educational policies. The committee members include the 18 undergraduate program directors, the Dean of Academic Programs, the Cook Campus Dean, the Dean of Agricultural and Urban Programs, and the Dean of International Programs. In 2015 the *CEP* instituted a policy over new course and revised course proposals. Such proposals must state how the course maps the program learning goals and must describe the assessment plan. In addition, the syllabus must boldly state which program learning goal the course fulfills, and must include well written and measurable course learning goals. This policy has had a twofold effect. First, the policy ensures that proposers of all new and revised courses incorporate assessment concepts at the outset of course development. Secondly, discussion at the *CEP* meetings provides an opportunity to educate undergraduate program directors on the principles and requirements for program assessment.

Program/Department Level Assessment Plans

The management of assessment at the program level varies by major/department. All have formal or informal faculty committees in place to oversee the process. In some cases, such as *Agriculture and Food Systems* the major is still in the building stage and has few students. In addition, it is an interdisciplinary major drawing on expertise from a number of departments. In this instance, the program director relies on an informal group of founder faculty to work on assessment.

In other programs assessment is much more formal. An example is *Environmental Sciences*, where a faculty committee has formulated an exacting map of courses that underpin program learning goals and the instructors submit assessment data every time that the course is taught and the data are collected and analyzed.

One of the IAC review criteria gets to the heart of the question of assessment plan, structure, and process. Based on the current years' IAC analysis of assessment reports the average program competency can best be described as ON THE WAY. The average score on the question "*Is there a clearly articulated blueprint of program assessment?*" was 3.4 on a 4-point rubric scale (4=OUTSTANDING, 3=ON THE WAY, 2=EARLY STAGES, 1=UNSATISFACTORY). The 2017 score is significantly improved from 2015, as shown in the chart in [Appendix C](#) when the average was 1.6. But there was variation between programs with the low score being 2.3 and the high 4.0, indicating the need for more exacting feedback for lagging programs and a more structured follow-up during the post-review year for the lagging programs. However, the results show a significant overall improvement on program assessment practices.

4. Assessment Tools and Measures: *Please discuss the assessment tools and measures most used by your program or school in the past year.*

Discuss why these tools or measures were chosen, and why various direct or indirect methods were chosen. Show that the tools and measures used are appropriate to the learning goals of your program or school, and that they produce useful results for program improvement.

School Level Assessment Tools

The assessment tools and measures have been [detailed above in the description of the IAC](#).

Program/Department Level Assessment Tools

The programs use a variety of assessments. These tools include direct measures including a variety of both standard and discipline-specific direct—tests, written and oral reports, problem sets, posters, animal handling behavior, performance in capstone course/experience, licensure exam, design projects, weather forecasts — and indirect measures including SIRS questionnaires, self and peer-to-peer evaluations, employment of graduates, graduate/professional school admits, employer evaluations, exit interviews/questionnaires, student performance at regional competitions— indicators of student achievement.

5. Benchmarks and Standards: Please describe the benchmarks or standards you use to guide your assessment process. Indicate whether these are established by a professional assessment or accreditation body, or by peer comparisons, or by historical comparisons. These benchmarks should provide rigorous standards for judging student attainment of the stated learning goals, and identify unacceptable levels of student performance across all learning goals.

School Level Benchmarks and Standards

SEBS 'expectations' for program assessment have been detailed above in the description of the IAC and earlier in the section describing our [Philosophy of Program Assessment at SEBS](#). These benchmarks were established by the Office of Academic Programs. We are optimistic that soon all of our programs will have outstanding, genuine program assessment practices. Many have already met expectations.

Program/Department Level Benchmarks and Standards

Many programs have set benchmarks for learning outcomes. In some instances, the benchmarks have been established by a professional accrediting organization. Of the eighteen majors at SEBS two are professionally accredited. *Bioenvironmental Engineering* is accredited by *The Accreditation Board for Engineering and Technology, Inc.* *Landscape Architecture* is accredited by the *American Society of Landscape Architects*. In addition, the *Nutritional Science Dietetics Option* is professionally accredited by the *Accreditation Council for Education in Nutrition and Dietetics* and the *Plant Biology* department offers a *Horticultural Therapy Certificate* that is accredited by the *American Horticultural Therapy Association*. Each of these have well established assessment programs.

Otherwise, the programs have set their own specific benchmarks for learning outcome assessment. Some programs have not clearly articulated benchmarks. Indeed, benchmarks are a component of the evaluation criteria for "blueprint for program assessment," and accounts for the [low score of some programs](#) and indicates the need for more exacting feedback for lagging programs and a more structured follow-up during the post-review year.

6. Types of Assessments Used: Please give examples of the successful conduct of assessments. Discuss how the results were compiled. At least one direct assessment measure of at least one of the primary program level student learning goals should be included in your report.

School Level Conduct of Assessments

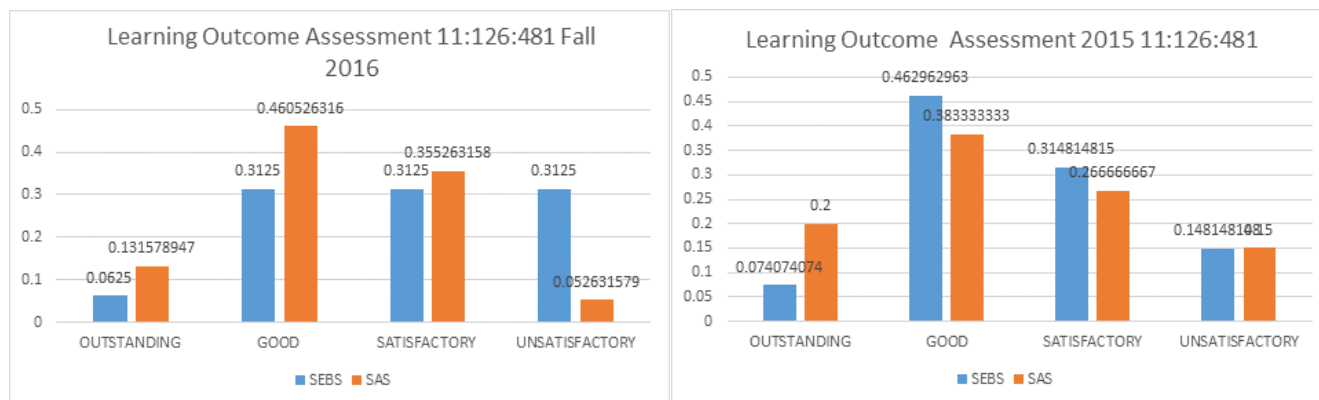
The results of school-level assessments carried out by the IAC have been described throughout this report; as has the success of the report-review-feedback cycle been affirmed by tracking outcomes over three years.

Program/Department Conduct of Assessments

By way of an example, the below describes assessment results for 11:126:481 Molecular Genetics, a key course of the *Biotechnology* major at SEBS. The assessment results document and affirm the success of achievement of one *Biotechnology* major learning goal by both peer comparisons and historical comparisons.

After taking this course, *Biotechnology* majors "...will be able to describe the basic molecular concepts essential for understanding the field of biotechnology and the applications of biotechnology." In the past 2 years 11:126:481 has attracted about 140 students, half from the *Biotechnology* major and the other half from the SAS program in *Cell Biology and Neuroscience* (this, as a result of a change in course requirements for the *CBN* Major). The Learning Goals for *CBN* are distinct from those of *Biotechnology*, but the programs share foundational underpinnings. Therefore, the two student cohorts take different courses converging at 11:126:481 and achievement of the cohorts in 11:126:481 provides a measure of how the course is taught and also the preparation of the cohorts in foundational courses. In addition, since 11:126:481 assessment has been tracked over time the historical assessment aids in interpretation of the data.

Learning Outcome Assessment in 11:126:481 is carried out through multiple choice exams. The questions are carefully written to challenge both knowledge of course content and interpretation of information. Course grading also includes out of class assignments, extra credit assignments, and attendance; but none of these other grading components are used for assessment. The graphs below illustrate the assessment distribution for Fall 2016 and Fall 2015, comparing SEBS *Biotechnology* and SAS *CBN* students. The two cohorts show similar distributions except for an alarming 31.25% unsatisfactory rate for SEBS students in 2016. Whether this result reflects a structural problem with the course is not certain, however, because the 2015 results do not show the same trend even though the class was taught by the same instructor, unchanged both semesters. Only through additional years of assessment analysis will it be possible to draw conclusions about the achievement by *Biotechnology* majors. Overall, however, the results indicate that the majority of students learned at a satisfactory level.



7. Implementation of change based on assessment results: Please discuss the successful implementation of change in your curriculum or program.

Provide evidence of any modification or refinement of pedagogy, of the curriculum, or of a particular assessment tool or learning goal based on assessment results. Provide evidence that the changes that were implemented resulted in improved student attainment of the stated learning goals.

School Level Implementation of Change Based on Assessment Results

Change to the IAC

Based on three years of program assessment review it was realized that additional members are required on the *IAC* in order to reduce individual workload and to increase the foundation of expertise. On May 3rd 2017 the *SEBS* Faculty approved a change to the Bylaws, increasing the number of faculty on the *IAC* from six to eight. Now, four members are elected by the faculty and four members are appointed by the Academic Dean. The *IAC* members serve 3-year terms and this year there was an election for two members. Therefore, this year saw the addition of three new members to the team. Faculty are selected for the committee based on willingness to serve, independence of thinking, a commitment to undergraduate education, and also an interest in and in some cases, prior experience in program assessment.

Change to Review Protocol

After three annual cycles of program review using the same criteria, the *IAC* has discussed changes for the coming year including: 1. changing the review cycle for consistently high-ranking programs to every three years instead of every year, 2. but informing the high ranking programs at the start of the three-year cycle that the *IAC* will be expecting a detailed account of assessment data and a full cycle in which they used such data to make program changes and whether the changes succeeded, 3. creating additional review criteria that more carefully parse the various facets of the “blue-print of program assessment”, 4. placing greater emphasis on mentoring of lagging programs by specifically outlining what they **MUST DO** to have their assessment practices meet standards.

Change to *PASS*

After the results of last year’s assessment data (see last years’ school report to ECA) that affirmed the significant benefit of *PASS* for borderline students it was decided to create a new course with the same objectives for newly matriculate first year students. The new course, 11:015:112 ACADEMIC MENTORING was approved by the CEP curriculum committee on 3/1/2017 and is has been scheduled for Fall 2017. The course is modeled after *PASS* and will be recommended for incoming Freshmen with secondary school records that indicate that they would benefit from the course. The course will first be offered on a voluntary basis. In the future, if assessment data indicate that the course is beneficial it may be made a mandatory course based on the recommendation of advisors.

Program Level

Overall, the majors report that their assessment results document and affirm the academic successes of their program. Several examples of fine tuning were reported this year. A few examples include the following.

- *Environmental Sciences* reported that as a result of a high (27%) unsatisfactory rate in one of their required classes 11:375:453 Soil Ecology in 2015 the program assessment committee met with the instructor to help revise the delivery of course content. The instructor is a junior faculty member. As a result of the intervention the unsatisfactory rate decreased to 19%.
- *Environmental Sciences* also reported that assessment results indicated that a required course in another major *Microbiology*, 11:680:390 General Microbiology wasn't focused enough on environmental issues. Therefore, the program worked with *Microbiology* faculty to develop a new course 11:680:201 Introduction to Microbiology, which has been taught for the first time in spring of 2017.
- *Bioenvironmental Engineering* reported on deficiencies that assessment results identified in 11:117:100 INTR BIORESOURCE ENG with respect to their 'Ethical Issues' learning goal, which were resolved by emphasizing this learning goal to a greater extent in the course.

8. Maintenance and Updating of Learning Goals and the Assessment Plan and Process: *Describe the process used to review and update the relevance of the program's or school's learning goals.* Changes can be driven by changes in the University, unit or program mission or strategic plans, or in light of advances in disciplinary knowledge, or in light of the evolution of stakeholder needs or changes in student preparation or capacity.

It is the view of the SEBS Associate Dean for Academic Administration and Assessment that school and program learning goals should not be frequently changed. To use an analogy, the learning goals are like our U.S. Constitution, which was well designed and written by committed, intelligent people intending to memorialize fundamental principles. And so it should be for learning goals. The heavy-lift is in writing appropriate learning goals that well reflect the fundamental principles of the program and institutional mission. At SEBS, the learning goals have evolved as the faculty discuss and debate what the fundamental principles are. This process has been in full-swing at SEBS only since 2014.

The assessment plan is altogether different. Here the question is what the best mechanism is. As the school has thought about program assessment, has learned from other units and institutions how they conduct assessment, has learned what methods can be carried out efficiently, and successfully, with the available resources; the assessment plans have changed. As an example, we have described above the changes that the IAC are implementing in the next review cycle.

This report was drafted by Thomas Leustek with recommendations by the *Instructional Assessment Committee* and Dean Richard Ludescher. The report is dated June 26, 2017.

Appendix A

DRAFT Experience-Based Education (EBEd) Learning Outcome Questionnaire 4/12/2017

Administration

1. The questionnaire is intended to be administered to the direct supervisor of the student using a scantron form.
2. Another possibility is to set up a Qualtrics online questionnaire.
3. The program UPD administers, collects, analyzes and reports the cumulative data for their students each year.
4. At the outset of the experience the student lets the instructor/supervisor know that with the course/internship/experience they are intending to fulfill their EBEd requirement.
5. They also let the instructor/supervisor know that a learning contract will be required- e.g. a brief outline of the expectations of the experience and the work that will be carried out. Students should hand the instructor/supervisor a copy of the SEBS EBEd Policy.
6. The student, in cooperation with the instructor/supervisor prepare the learning contract, which is signed by both parties and returned to the UPD, who ensures that the learning contract is related to the student's academic program and keeps a record of the contract.
7. The student then engages in the experience.
8. At the end of the experience the below questionnaire is given to the instructor/supervisor

Experience-Based Education (EBEd) Learning Outcome Questionnaire

The experience that your student has completed was intended to fulfill their EBEd Core Curriculum Requirement.

The learning goal is to complete and report on an applied experience (e.g., professional practice, service learning, or research) in order to examine and evaluate ideas within a discipline.

In the following questionnaire specific information is being requested about the outcome of the learning experience for your student. Your answers should

evaluate your student's learning outcome without regard to the grade that you have assigned and regardless of whether the experience is graded.

1. At the outset of the experience did your student prepare a learning contract that you approved. Did the student fulfill the provisions of the learning contract?

☐ YES

☐ NO

2. Did your student complete 130 hours of work during the experience (about 9 hours per week over a 14-week semester, or some other aggregate if the experience period was not on a semester basis)

☐ YES

☐ NO

3. At the end of the experience did your student prepare a report, paper, oral presentation or poster presentation of the experience?

☐ YES

☐ NO

4. How would you score your student's work with respect to completion of the provisions of their learning contract?

☐ 1=unsatisfactory

☐ 2=minimum acceptable

☐ 3=good

☐ 4=outstanding

5. How would you score your student's learning outcome with regard to the ability to interpret data, information, and ideas?

- ☐ 1=unsatisfactory
- ☐ 2=minimum acceptable
- ☐ 3=good
- ☐ 4=outstanding

Appendix B

Undergraduate Education Learning Objectives at the School of Environmental and Biological Sciences

Undergraduate education at the Rutgers School of Environmental and Biological Sciences investigates the biological world from organisms to ecosystems and focuses on competency, innovation, application, service and community. The School trains the next generation of professionals and leaders by instilling a deep appreciation of the importance of evidence and reason for understanding and managing the critical interrelationship between human actions and the natural environment.

We foster a setting that encourages leadership and that values individuals. Our integrated teaching, research, and outreach programs offer students a complete and well-rounded education both inside and outside the classroom and prepares students for careers and citizenship in an increasingly interrelated, global community.

The undergraduate curriculum at the School of Environmental and Biological Sciences comprises a common *Core Curriculum* as well as comprehensive disciplinary concentration through 21 major and 34 minor and certificate programs. Our programs focus on the biological environment from organisms to ecosystems and the ways in which humans interact with and modulate these worlds.

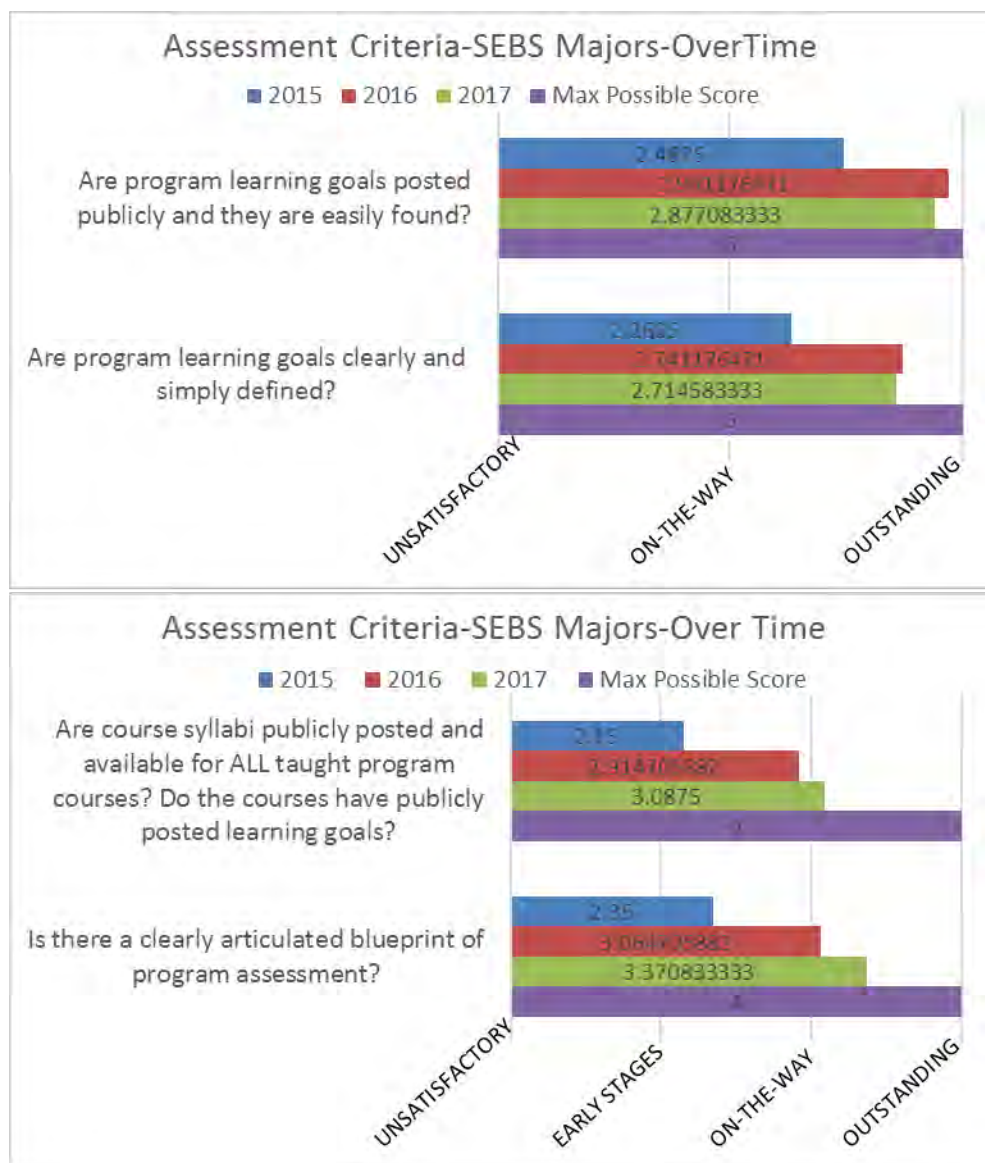
The [Core Curriculum](#) provides a background in the liberal arts and sciences through courses satisfying learning objectives in areas of: 21st Century Challenges; Experienced-based Education; Areas of Inquiry in the Natural Sciences, in Historical Analysis, in Social Analysis, and in Arts and Humanities; and Cognitive Skills and Processes in Writing and Communication, in Quantitative and Formal Reasoning, and in Information Technology and Research.

This *Core Curriculum* provides the foundation for specialized training in a required disciplinary [major](#) and for optional concentrations in [minor and certificate](#) programs. Each program has a specific set of learning goals described at the individual [program websites](#). However, all programs are guided by the following five overarching [School learning objectives](#):

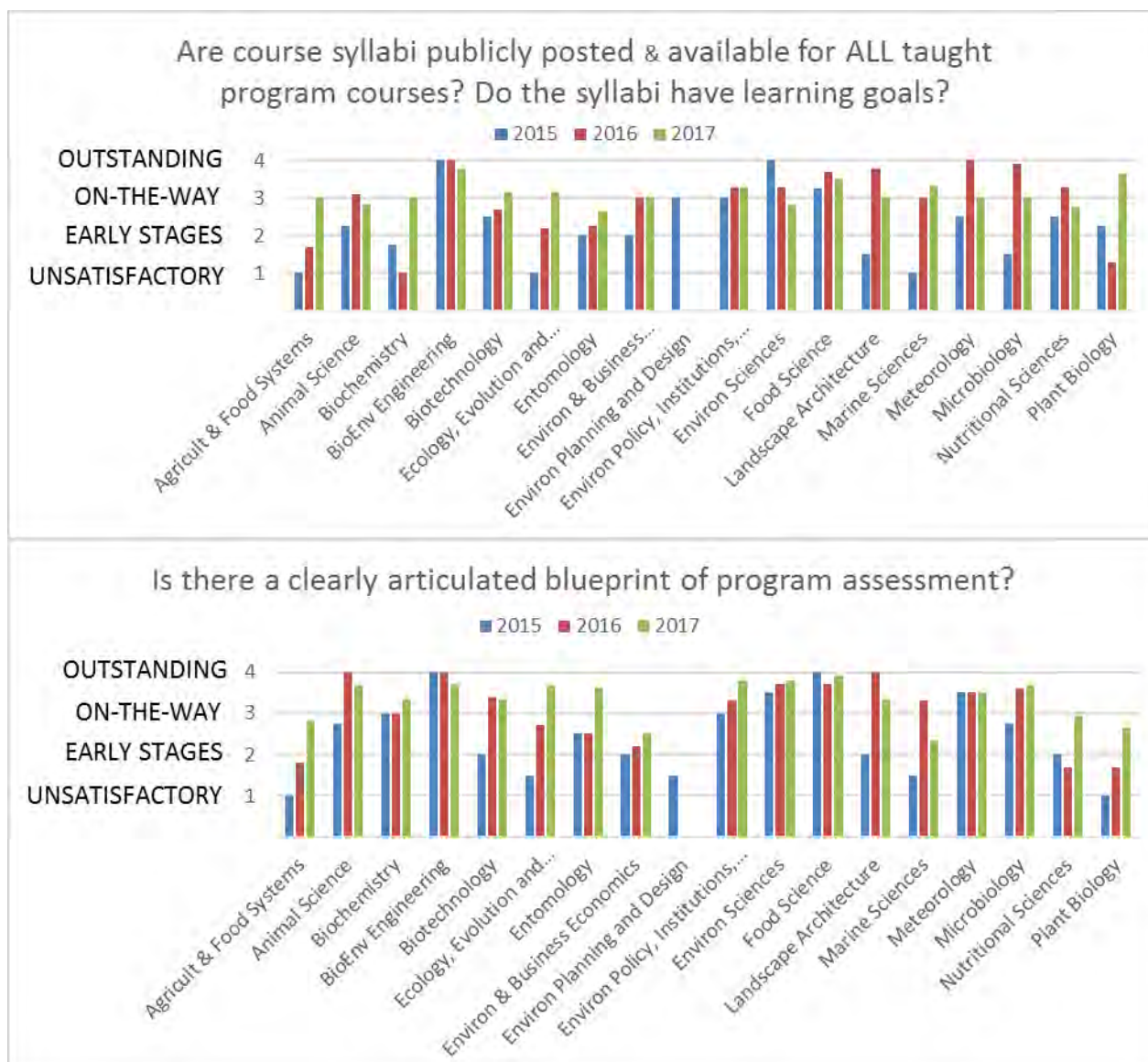
- Competency in critical thinking, evidence-based argument, and quantitative reasoning
- Proficiency in oral, written, and digital communication and argument
- Ability to evaluate and assess the ethical implications and consequences of specific policies or actions
- Mastery of the fundamentals of a chosen discipline
- Application of disciplinary knowledge to contemporary social, environmental and biological problems

Appendix C

The graphs chart the assessment of SEBS Major programs with respect to the criteria in [Appendix D](#) carried out by the IAC in 2015, 2016 and 2017. The bars represent the average score for all programs; the purple bar represents that maximum possible score for that assessment criterion.



The charts on the next page illustrate individual program performance over time on assessment criteria (C) and (D) in Appendix D. While most have shown improvement, a few programs require additional help and time to attain the expectation of having an OUTSTANDING program assessment practice.



Note should be made of the missing bars for *Enviornmental Planning and Design*. This Major is hosted by the Department of landscape Architecutre along with the Major in Landscape Architecutre. The department faculty have chosen to submit a single assessment report for both programs in 2016 and 2017. In 2015, however, two independent assessment reports were written, hence the blue bar for EPD in 2015.

It should be pointed out that a significant factor in scoring is the quality and completeness of the report that is submitted. Another factor is that attention that the faculty give to program management. The best undergraduate programs are those with actively engaged faculty.

This summary was drafted by Thomas Leustek on behalf of the *Instructional Assessment Committee*. The summary is dated June 26, 2017.

Appendix D

Assessment Report Review criteria:

- A. Are program learning goals posted publicly and are they easily found?
 B. Are program learning goals clearly and simply defined and are they measurable?
 C. Are course syllabi publicly posted and available for ALL taught program courses? Do the syllabi include course-specific learning goals? Do the syllabi indicate which program learning goals the course fulfills?
 D. Is there a clearly articulated blueprint of program assessment?

A. Are program learning goals posted publicly and they are easily found?		
OUTSTANDING (3)	ON THE WAY (2)	UNSATISFACTORY (1)
LG easily found, posted online front and center	LG are posted online, but they are difficult to find and/or aren't front and center	LG cannot be found online

B. Are program learning goals clearly and simply defined and are they measurable? https://www.youtube.com/watch?v=KA0DeysBX7M&feature=related		
OUTSTANDING (3)	ON THE WAY (2)	UNSATISFACTORY (1)
<ul style="list-style-type: none"> •LG written in active voice •LG are measurable •LG touch on the following <ol style="list-style-type: none"> (1) What will graduates know (2) What will graduates be able to do (3) What distinguishes the program from other similar programs 	The LG have some flaw that should be remedied. For example, LG are written in a passive voice, or are not measurable, or are generic and do not highlight the unique attributes that distinguish the program from other similar programs	The program has presented a menu of activities that students must accomplish in order to graduate. No true LG.

C. Are course syllabi publicly posted and available for ALL taught program courses? Do the syllabi include course-specific learning goals? Do the syllabi indicate which program learning goals the course fulfills?			
OUTSTANDING (4)	ON THE WAY (3)	EARLY STAGES (2)	UNSATISFACTORY (1)
Syllabi for >90% of program courses are posted online. These syllabi have course LG and they are well written. The program LG(s) that the course underpins is indicated. Courses should emphasize some, but not all program LG.	Syllabi for most program courses are posted online. This fraction of syllabi have course LG and they are well written. The program LG(s) that the course underpins is indicated	Syllabi for most program courses are posted online. But there is need for improvement. Many don't have clearly written LG or don't indicate the underpinning program LG(s)	There are major gaps in posting of program syllabi and in the quality of the syllabi

D. Is there a clearly articulated blueprint of program assessment? Based on the program report have you been convinced that there is faculty committee oversight of curriculum assessment, that the committee has developed an assessment plan that is being implemented, and that data from assessment is being used to improve the program? In short, is the program being actively managed based on evidence from assessment measures.			
OUTSTANDING (4)	ON THE WAY (3)	EARLY STAGES (2)	UNSATISFACTORY (1)
<ul style="list-style-type: none"> •Active committee management of the program (note: small programs might have small committees) •A genuine assessment plan has been developed and is being implemented •Genuine assessment data is being evaluated •And used for program improvement 	<ul style="list-style-type: none"> •A committee has just been formed and is active •An assessment plan is in development •Data collection is at beginning stages •But the committee has strongly articulated plans for use of the data for program improvement 	<ul style="list-style-type: none"> •A committee is being planned •The bare outline of an assessment plan is evident •Data collection is at beginning stages •A plan for use of data for program management is not well developed 	<ul style="list-style-type: none"> •The program appears to be passively managed •Courses are being taught but not coordinated with program LG •Data hasn't yet been collected. The description speaks to plans for the future. •Program improvement based on learning outcome assessment data hasn't been possible yet

Off-Campus Stations and Facilities

Clifford E. & Melda C. Snyder Research and Extension Farm - Rutgers Center for Sustainable Agriculture

Pittstown, NJ

Haskin Shellfish Research Laboratory

Bivalve, NJ

IR-4 Project: Center for Minor Crop Pest Management

Princeton, NJ

Lindley G. Cook 4-H Youth Center for Outdoor Education

Branchville, NJ

New Jersey Aquaculture Innovation Center

Cape May, NJ

New Jersey Center for Wine Research and Education

Upper Deerfield, NJ

Philip E. Marucci Center for Blueberry and Cranberry Research and Extension

Chatsworth, NJ

Rutgers Agricultural Research and Extension Center

Upper Deerfield, NJ

Rutgers EcoComplex - Clean Energy Innovation Center

Bordentown, NJ

Rutgers Food Innovation Center - North

Piscataway, NJ

Rutgers Food Innovation Center - South

Bridgeton, NJ

Rutgers Fruit and Ornamental Research Extension Center

Cream Ridge, NJ

Rutgers University Marine Field Station

Tuckerton, NJ

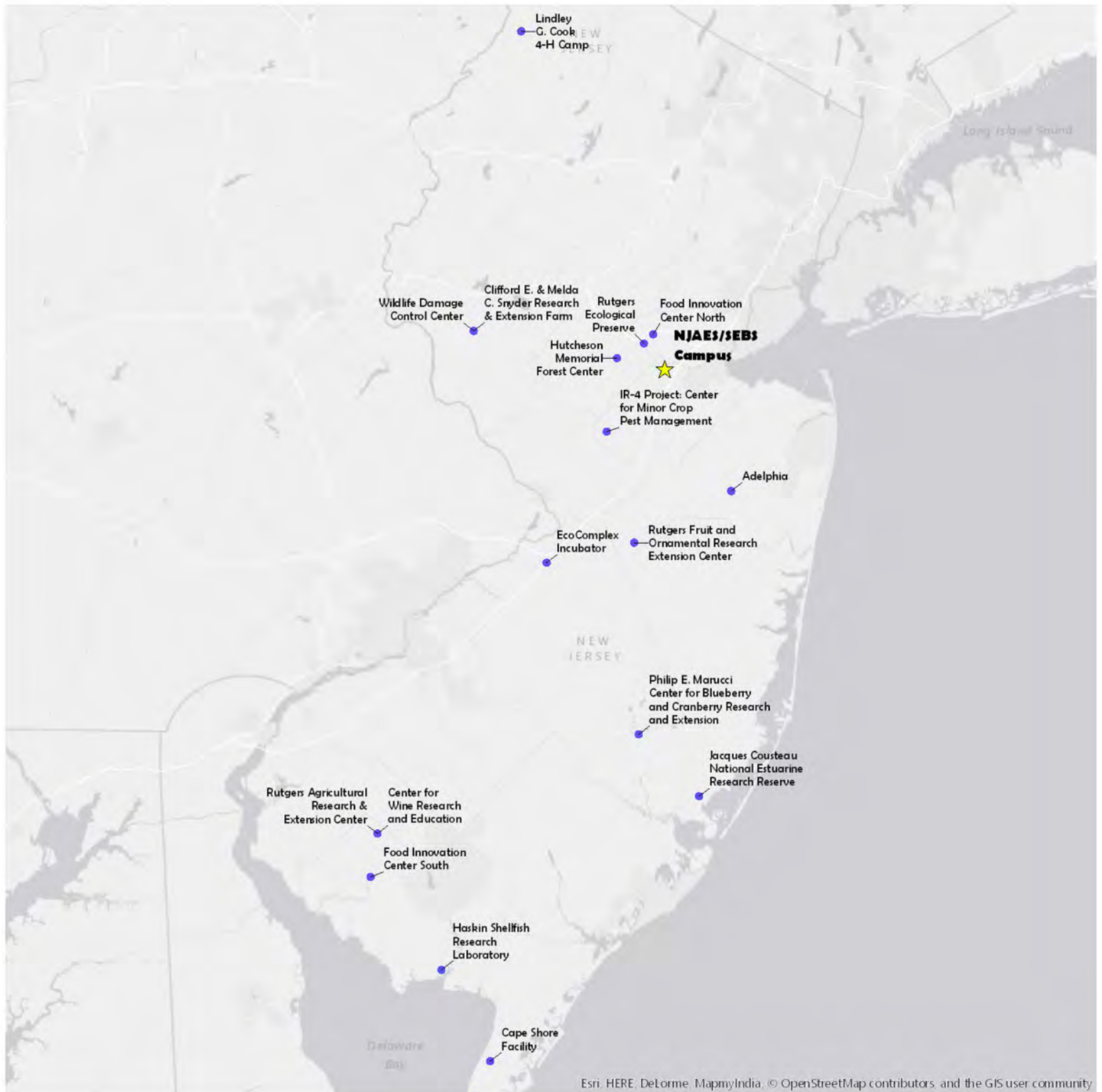
Rutgers Plant Science Research and Extension Farm

Adelphia, NJ

Youth Education and Employment Success Center - Camden
Camden, NJ

Youth Education and Employment Success Center - Newark
Newark, NJ

Youth Success Network of Ocean County
Toms River, NJ



Notable Alumni

Zaid Abuhouran, SEBS'12 (public health & political science), White House Domestic Policy Council in the education office, US Department of Education Office of Elementary and Secondary Education.

Barry Adler, AG'72 (veterinary medicine specialties), founder & director of Woodbridge Veterinary Group and Hospital.

James Alampi, AG'69 (veterinary medicine specialties), former President and Chief Executive Officer of e-Chemicals Inc., former Chairman, Chief Executive Officer and President of Insurance Auto Auctions, Inc.

Phillip Alampi, AG'34 (agricultural education), GSNB'45 (agricultural education), former Secretary of Agriculture, "Mr. Garden State," helped pass Farmland Assessment Act of 1963 & Farmland Retention Bond Issue of 1981.

Christopher Alton, CC'10 (meteorology), commodity markets risk management, Mars, Incorporated.

Marielle Anzelon, CC'93 (environmental sciences), GSNB'00 (ecology), urban conservation biologist, founder of NYC Wildflower Week.

Myla Aronson, GSNB'02 & '07 (ecology), assistant professor in the Department of Ecology, Evolution and Natural Resources.

Susan Becker, CC'85 (animal science), GSNB'92 (animal science), Research Assistant in Rutgers University Animal Science department, former manager of white-tailed deer herd at the University, manager of Equine Research Facility.

Lisa Beirn, CC'07 (biological sciences), GSNB'11 (plant biology), Watson Fellowship Program as part of the Golf Course Superintendents Association of America, 2013 Gerald O. Mott Scholarship for Meritorious Graduate Students in Crop Science.

Justen Beneduce Hiles, CC'08 (agriculture and environmental sciences), Event Director and co-owner of Beneduce Vineyards.

Jorge Berkowitz, AG'68 (environmental science), GSNB '74 & '78 (Environmental Science), former Administrator for the Department of Environmental Protection's Superfund Program, former Director of the DEP Air Quality Program and Water Resource Management and Protection Program.

Stephen Birchard, AG'72 (animal science), Chief Editor of the *Saunders Manual of Small Animal Practice*, runs an educational blog for veterinarians.

Doug Blonsky, CC'83 (landscape architecture), President and CEO of Central Park Conservancy.

Ben Bobowski, CC'91 (natural resource management), superintendent of the Wrangell St. Elias National Park and Preserve in Alaska.

Stacy Bonos, GSNB'97 (plant biology), 2016 Crop Science Society of America Fellow, associate professor, Department of Plant Biology.

F. Herbert Bormann, AG'48 (agricultural science), co-founder of the Hubbard Brook Ecosystem Study in the White Mountain National Forest, helped coin the term "acid rain," former President of the Ecological Society of America.

Gary Brackett, CC'03 (environmental and business economics), retired NFL (Super Bowl winner), restaurateur, philanthropist.

Peggy Brennan-Tonetta, GSNB'96 (agricultural economics), Associate Vice President for Economic Development at Rutgers University and Associate Director of the Rutgers New Jersey Agricultural Experiment Station.

Nancy Brill, CC'00 (natural resource management), field researcher in vegetable pathology at Rutgers Agricultural Research and Extension Center and an Agronomic Service Representative at Syngenta Crop Protection.

Ralph Brinster, AG'53 (animal science), transgenic researcher, President's Medal/NSF National Medal of Science.

Anthony Broccoli, CC'77 (meteorology), GSNB'79 & '98 (meteorology), former research scientist at the National Oceanic and Atmospheric Administration (NOAA) Geophysical Fluid Dynamics Laboratory, Chair of the Department of Environmental Sciences, co-director of Rutgers Climate Institute and director of the Center for Environmental Prediction.

Arthur Brown, Jr. GSNB'77 (horticulture), retired New Jersey Secretary of Agriculture.

Lester Brown, AG'55 (agriculture and environmental sciences), retired founder and president, Earth Policy Institute, author and environmental activist.

Robert Bruch CC'69 (agriculture), GSNB'77 (agricultural economics), worked for the Department of Agriculture in economic development for 38 years, Director of the New Jersey Christmas Tree Growers Association.

Donald Burdick, AG'56 (veterinary medicine specialties), GSNB'58 (animal science), research scientist with the USDA Regional Laboratory, Director of the US Army National Guard in the Pentagon.

Clint Burgher, CC'89 (animal science), GSNB'91 (animal science), Research Farm Manager.

Ryan Burrows, GSNB'13 (ecology), COO and Founding Principal of EcoWalls along with fellow alum Michael Coraggio, installed the largest living wall in New Jersey.

Alyssa Caroprese, SEBS'12 (meteorology), on-camera meteorologist for CBS affiliate in Albany, NY.

Lauren Casey, CC'06 (meteorology), member of CBS3 Eyewitness News weather team in Philadelphia, PA.

Joe Charette, CC'73, executive director, Rutgers Dining Services.

Rob Chenaux, AG'66 (agricultural economics), former president of Loblaw Brands in Toronto, Canada.

Prasert Chitapong, GSNB'83 (soils & crops), Dean, then Vice President for Research, and President of the Prince of Songkla University in Hat Yai in the south of Thailand, member of the Thai Parliament.

Kelly Ann Cicalese, SEBS'11 (meteorology), On-camera meteorologist for WCVB StormTeam 5 news in Boston.

John Cifelli, CC'10 (meteorology), Director of Operations for Unionville Vineyards.

Bruce Clarke, CC'77 (forestry and wildlife biology), GSNB'82 (plant pathology), director Rutgers Center for Turfgrass Science.

Andrea Cochran, CC'76 (landscape architecture), owner Andrea Cochran Landscape Architecture, Cooper-Hewitt design award winner.

Brevoort Conover, AG'52 (veterinary medicine specialties), GSNB '67 (adult education), Professor Emeritus Rutgers University, NJ State Department Chair of 4-H, inducted into National 4-H Hall of Fame.

Michael Coraggio, CC'06 (environmental planning & design), CEO and founding principal of EcoWalls along with fellow alum Ryan Burrows, installed largest living wall in New Jersey.

Paul Cowie, CC'85 (natural resource management), owner and president of Paul Cowie & Associates, Inc. professional consulting firm.

Enrique Curchitser, GSNB'99 (oceanography), associate professor of physical oceanography and modeling in the Department of Environmental Sciences, United States Academic Delegate to the North Pacific Marine Science Organization.

Greg Dahle, GSNB'09 (ecology), co-recipient of the International Society of Arboriculture's Early-Career Scientist Award.

Jessie Davis SEBS'16 (public health), public health intern, Health Outreach, Promotion and Education (H.O.P.E.).

Roy DeBoer, GSNB'59 (horticulture), founded Rutgers' Landscape Architecture program, Department Chair of Landscape Architecture for 25 years, former Director of Rutgers Gardens.

Christopher Dorko, CC'95 (environmental science), vice president and risk management resources officer with Berkeley Life Sciences, professional firefighter.

Dylan Dreyer CC'03 (meteorology), meteorologist, NBC television network (NBC Evening News and Today).

David Earl, CC'76 (landscape architecture), section chief in the Office of Landscape Architecture of the New Jersey Department of Transportation.

Hank Ebert, CC'79 (international environmental studies), Idaho Department of Commerce's business development liaison.

Mark Elliot, SEBS '04 (meteorology & environmental science), on-camera meteorologist for The Weather Channel.

John Erdman, AG'68 (food science), and GSNB '75 (food science), Professor emeritus of food science and human nutrition at the University of Illinois at Urbana-Champaign.

Dennis Fenton, GSNB '77 (microbiology), former Executive Vice President at Amgen.

Hans Fisher, AG'50 (food science), Former Nutrition Research Council, Professor Emeritus of Nutritional Sciences, researched amino acids and their roles in alcoholism, schizophrenia treatment, and wound healing.

Russell Fredericks, CC'91 (environmental planning & design), Chief of Operations for Central Park Conservancy.

John Gerwig, GSNB '56 (foods and nutrition), 30 years as Rutgers Cooperative Extension director.

John "Rusty" Gilbert, Jr., CC'77, GM of Technology Deployment and Adoption at Chevron Technology Ventures.

Joseph Goffreda, CC'83 (plant science), associate professor of plant biology and pathology and director of the Rutgers Fruit and Ornamental Research Extension Center, "Inventor of the Year" 2015 by the New Jersey Inventors Hall of Fame.

Steven Gomez CC'01, GSNB'10 (food science), food innovation expert, Taco Bell.

Michael Gould, GSNB'76 (environmental science), manager with the US Agency for International Development.

Nicki Graf, CC'77, Research Farm Supervisor at Rutgers.

Robert Gravani, AG'67 (food science), awarded Calvert Willey Distinguished Service Award by the Institute of Food Technologists, the Emmett R. Gauth Award by the NY State Association for Food Protection.

Michael Graziano, CC'79 (animal science), Vice President, Drug Safety Evaluation, Bristol-Myers Squibb.

Jennifer Small Griswold, CC'02 (meteorology), Assistant Professor and faculty member of the School of Ocean and Earth Science and Technology at the University of Hawaii at Manoa.

Kristina Mayberry Guttadora, CC'99 (plant science), program director of Farmers Against Hunger, a nonprofit organization of the NJ Agricultural Society.

George Hamilton, GSNB'85 (entomology and economic zoology), Chair, Department of Entomology and Director, Graduate Program in Entomology. Extension Specialist in Pest Management. USDA International IPM Award of Recognition for integrated pest management programs.

Jeanne Herb, CC'81 (environmental science), New Jersey Climate Adaptation Alliance, was awarded the 2016 Outstanding Floodplain Management Award.

Rich Heritage, CC'09 (environmental & business economics), Director of Marketing for Heritage Vineyards.

Julie Gluck Hirsch, GSNB '98 (food science), Systems Design & Measurement Director at Ingredion Incorporated, previously R&D Director at Johnson & Johnson.

Kent Hiteshew, CC'76 (landscape architecture), first Director of the U.S. Treasury Department's Office of State and Local Finance.

William Hlubik, CC'82, GSNB'88 (plant pathology), Rutgers Cooperative Extension agricultural agent for Middlesex County.

Jennie Hunter-Cevera, GSNB'78 (microbiology), Secretary of Higher Education for the State of Maryland, former founder of Biotic Network and Blue Sky Laboratories.

Bengt "Skip" Hyberg, AG'74, economist and scientist, designed the Farm Service Agency's Conservation Reserve Program, winner of 2013 USDA Economist of the Year.

Henry Indyk, AG'50 (agricultural education), Formed the New Jersey Turfgrass Association, inducted into NJ Turfgrass Hall of Fame, National Irrigation Association Man of the Year, consulted on reconstruction of Los Angeles Coliseum for the 1984 Olympics.

Hank Izzo, Jr., CC'89, GSNB'91, 93 (food science), vice president-U.S. Snack Innovation, Mars, Incorporated.

John Jengo, CC'80 (geology), principal hydrogeologist with MWH Americas, Inc.

Gerald Kauffman, RC'81 (civil engineering & environmental engineering), Director of Water Resource Agency at University of Delaware.

Kenneth Klipstein, CC'88 (environmental planning & design), Director of Watershed Protection Programs, New Jersey Water Supply Authority, president of the Board of Trustees of the New Jersey Conservation Foundation.

Dan Kluchinski, CC'85 (plant science), chair of Department of Agricultural and Resource Management Agents.

Don Knezick, CC'79 (forestry & wildlife biology), GSNB'84 (horticulture), president of Pinelands Nursery in Columbus, NJ, Farmer-Rancher Pollinator Award by the North American Pollinator Protection Campaign of the National Association of Conservation Districts.

Jonathan Kolby CC'03 (biological sciences), research scientist, U.S. Fish and Wildlife Service; staff herpetologist, the Conservation Agency; National Geographic Explorer.

John Kupcho, GSNB'74 (soil & crops), developed Master Gardener program, former Cooperative Extension county agent, Distinguished Service Citation to New Jersey Agriculture.

Devinn Lambert, SEBS'13 (biotechnology), Technology Manager for the US Department of Energy in Advanced Algal Systems.

Megan Linkin, CC'04 (meteorology), atmospheric perils specialist, Swiss Re global reinsurance corporation.

Roger Locandro, AG'60 (animal science), GSNB'73 (botany), Professor Emeritus in the Department of Ecology, Evolution and Natural Resources and the New Jersey Agricultural Experiment Station, Chairman of the New Jersey State Fish & Game Council.

Imran Majid CC'05 (environmental and business economics), senior vice president, Columbia Records.

Megan Malaska, CC'05 (natural resource management), Manager of education in the Bronx Zoo Education Department at the Wildlife Conservation Society.

Karyn Malinowski, AG'75 (animal science), GSNB'80 & '86 (animal science), founding Director of the Rutgers Equine Science Center, former director of Rutgers Cooperative Extension.

Elliott H. Margulies, CC'95 (biotechnology), Director of Scientific Research at Illumina Cambridge, Presidential Early Career Award for Scientists and Engineers in 2007 while working at the National Human Genome Research Institute.

E. Timothy Marshall, CC'83 (landscape architecture), principal and owner of ETM Associates, LLC, Council of Fellows by the American Society of Landscape Architects.

Christopher Martine, CC'96 (natural resource management), GSNB'01 (ecology), David Burpee Chair in Plant Genetics and Research at Bucknell University and director of the Manning Herbarium.

Brooke Maslo, GSNB'00 (ecology), assistant research professor in the Department of Ecology, Evolution and Natural Resources, and wildlife and research specialist at the Center for Urban Restoration Ecology.

Denise Mattes, CC'90, landscape architect in the NYC Parks Department Mayor's Community Initiative Program.

Ryan Matthews, SEBS'11 (plant science), vineyard manager at Renault Winery.

Ratemo Michieka, AG'74 (agriculture), GSNB'75 (agricultural education), former director general of the National Environmental Management Authority in Kenya, professor at University of Nairobi.

Thomas Montville, AG'75 (food science), Distinguished Professor Emeritus of Food Science, pioneered work on the antimicrobial peptides of lactic acid.

Tom Molnar, CC'00 (plant science), GSNB'06 (plant biology), associate professor, Department of Plant Biology, plant breeder.

Carolina Mueller, SEBS'13 (nutritional sciences), Outreach Coordinator for the New Brunswick Community Farmers Market.

Joe Musumeci, AG'67 (agricultural education), owner of Eastern Seed Services which helped bring back the Rutgers Ramapo Tomato seeds to commercial growers.

Peter Nitzsche, CC'87 (plant science), GSNB'89, head agricultural and resource management agent for the Cooperative Extension in Morris County, associate Rutgers professor who helped breed the Rutgers 250 Tomato.

Christopher Norton, CC'95 & '96 (exercise science & sports studies), member of the executive team of Defense Mobile Corporation.

Ari Novy, GSNB'12 (plant biology), Executive Director of US Botanic Garden.

Maureen Ogden, GSNB'77 (urban planning), former New Jersey State Assemblywoman, Northeast New Jersey Water Policy Advisory Committee.

Paul Orbe, CC'94 (biochemistry), Science Communication Fellow who sailed aboard Exploration Vessel *Nautilus* during its 2016 expedition of the Greater Farallones National Marine Sanctuary.

Doug Piekarz, CC'89 (animal science), President and CEO of the Akron Zoo.

Nicholas Polanin, CC'82 (natural resources management), GSNB'89 (horticulture), Rutgers NJAES Cooperative Extension county agriculture agent for Somerset County, writes "The Gardener State" column for mycentraljersey.com.

Tom Pluta, AG'64 (plant science), GSNB'76 (environmental science), former Jersey Department of Environmental Protection, World Environment Center in Europe & Asia, co-created Pollution Prevention Centers.

Peggy Policastro, GSNB'93 (home economics), '15 (interdisciplinary), director of behavioral nutrition, Institute for Food, Nutrition, and Health.

Kenneth Possenriede CC'82 (business economics), vice president, Lockheed Corporation.

Dana Price, CC'01 (biological sciences), GSNB'15 (entomology), associate research professor in the Department of Plant Biology and Pathology, published in *Proceedings of the National Academy of Sciences*.

Jack Rabin, CC'78 (biology), former associate director New Jersey Agricultural Experiment Station farm programs, NJ Farm Bureau Distinguished Service to Agriculture Award 2016.

Jennifer Rakeman, CC'94 (biotechnology), Assistant Commissioner-Public Health Laboratory in New York City Department of Health and Mental Hygiene, Chief of New York City's Zika Testing Lab.

Sonny Ramaswamy, GSNB'80 (entomology), Director of the National Institute of Food and Agriculture, U.S. Department of Agriculture.

Arlene Ramos-Szatmary, CC'98 (nutritional sciences), Coordinator of School Nutrition Programs in the Division of Food and Nutrition at the New Jersey Department of Agriculture.

Elizabeth Ravit, GSNB'01 & '05 (environmental science), Assistant Research Professor in the Department of Environmental Sciences.

David Rich, CC'94 (public health), associate professor at the University of Rochester Medical Center, a pioneer in respiratory epidemiology.

Jennifer Robertson, CC'97 (animal science), zookeeper at the Philadelphia Zoo.

Mark Robson, CC'77 (agriculture), GSNB'79 & '88 (horticulture), Board of Governors Distinguished Service Professor, former deputy director of the NJ Dept. of Agriculture-Division of Rural Resources.

Patricia Robson, GSNB'79 (horticulture), Manager of Regulatory Affairs Novo Nordisk Bioindustrials, Inc.

Bethany Rocque-Romaine, CC'83 (political science), senior legal specialist in the Energy Division of the New Jersey Board of Public Utilities.

Cynthia Rosenzweig, CC'80 (agriculture & environmental sciences), GSNB'83 (soils & crops), senior research scientist at the NASA Goddard Institute for Space Studies, recipient of a Guggenheim Fellowship.

Francine Rotella, CC'92 (communication), coordinating producer in studio production at ESPN on *NFL Primetime*, *NFL Live*, *NFL Insiders*, and *SportsCenter*.

Amy Rowe, GSNB'06 (environmental science), Environmental and resource management agent, RCE Essex and Passaic Counties from the Agricultural and Resource Management Agents Department.

Scott Ruhren, CC'87 (plant science), GSNB'98 (ecology), Director of Conservation at the Audubon Society of Rhode Island, 2014 Professional Conservationist of the Year.

Elizabeth Ryan, CC'82 (political science), president and CEO of the New Jersey Hospital Association of Princeton, a member of the New Jersey Board of Medical Examiners, the Clinton-Gore Transition Team, and the Clinton National Healthcare Task Force.

Carl Safina, GSNB'82, '87 (ecology), president and co-founder, Blue Ocean Institute, author, environmental activist.

William Sansalone, AG'53 (animal science), GSNB'61 (nutrition), former National Institutes of Health staff member for 25 years, former Associate Director for research development at Georgetown University Medical Center.

Phil Scarpa, CC'83 (biology), RWJMS'88, president of the Aerospace Medical Association.

David Scarr, AG'42 (agriculture), former Chief of the FDA Food Animal Branch in Surveillance.

Albert Schatz, AG'42 (agriculture) and AG'45 (Agriculture), co-discoverer of the antibiotic streptomycin.

Daniela Sharma, GSNB'99 (animal science), director of the Rutgers Animal Science Undergraduate Program.

Brian Schilling, CC'92 (natural resource management), GSNB'94 (agricultural economics), assistant extension specialist in agricultural policy in the Department of Agricultural, Food, and Resource Economics.

Lee Schneider, AG'70 (agricultural economics), GSNB'88 (education), Executive Director of the Rutgers Parents Association, former Dean of Students at Cook College.

Rod Sharp, GSNB'67 (botany), former Dean of Research of Cook College.

Kate Sweeney, CC'79 (natural resources management), senior vice president, Morgan Stanley.

Peter Tabbot, CC'91 (journalism & mass media), UMDNJ'97 (public health), teaches several courses at SEBS and the Edward J. Bloustein School of Planning and Public Policy, health officer for the Rockaway Township Division of Health.

Donald L. Thompson, Jr., AG'73 (animal science), endowed professor of Animal Sciences at Louisiana State University.

Amy Tuininga, GSNB'00 (ecology & evolution), director of the PSEG Institute for Sustainability Studies at Montclair State University.

Marc Valitutto, CC'02 (animal science), wildlife veterinary medical officer, Smithsonian Institute.

Daniel Van Abs, CC'77, winner 2016 Governor's Environmental Excellence Award, associate professor for Water, Society & Environment in the Department of Human Ecology.

Jeffrey Vega, CC'90 (international environmental studies) and GSNB'91 (Political Science), President and CEO of the Princeton Area Community Foundation.

Patricia Verduin, GSNB '91 (food science), chief technology officer of Colgate-Palmolive Company.

Nicholi Vorsa, CC'76, GSNB'85 (horticulture), director of the Philip E. Marucci Center for Blueberry and Cranberry Research and Extension, began Rutgers cranberry breeding program.

Jessica Ware, GSNB'08 (entomology), associate professor in the department of Biological Sciences, NSF Early CAREER Award winner.

Chris Watkins, GSNB'85 (horticulture), Director of Cornell Cooperative Extension.

Sarah Waxman, SEBS'16 (food science), associate scientist Mondelez International.

Selman Waksman, RC 1915 (agriculture), RC 1916 (agriculture), 1952 laureate, Nobel Prize for Physiology or Medicine.

Sue Wicks, CC'88 (environmental & business economics), SEBS'04 (environmental & business economics), retired professional basketball player for the New York Liberty, inducted into the Women's Basketball Hall of Fame in 2013. Co-founder of Fight 2B Fit, Inc.

Scott Willens, CC'92 (animal science), member of the U.S. Army Veterinary Corps, Doctor of Veterinary Medicine, currently works in the Army's Chemical and Biological Defense Program.

Terrie Williams, DC'76 (pre-med, dental, vet), GSNB'79 & '81 (physiology), comparative ecophysiolgist at the University of California-Santa Cruz, Director of the Center for Marine Mammal Research and Conservation.

Richard Wolff, CC'89 (environmental & business economics), RBSG'90 (business administration), managing director and head of the U.S. Investment Grade Syndicate Desk at Societe Generale.

H. Boyd Woodruff, AG'39 (agricultural education) and GSNB'42 (Agricultural Education), discovered the first antibiotic in Rutgers history: actinomycin.

George Wulster, GSNB'79 (horticulture), GSNB'81 (horticulture), professor and extension specialist in floriculture in the Department of Plant Biology and Pathology at Rutgers.

Mark Zarillo AG'70 (landscape architecture), principal and director, Architect 31 LLC, American Society of Landscape Architects Fellow.

Xin Zhou, GSNB'07 (entomology), head of the National Bio-resource Bank of Beijing Genomics Institute (BGI) in China.

Heather Zichal, CC'99 (environmental policy, institutions, and behavior), energy consultant, former deputy assistant to President Obama for energy and climate change.

Jan Zientek, CC'82 (forestry & wildlife biology), Environmental Resource Management Agent for Rutgers Cooperative Extension of Essex County, training director for Rutgers VETS Program.