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Graduate Faculty Meeting on Thursday, December 2, 2004
Multipurpose Room C
Cook College Campus Center
2:00 - 330 PM

AGENDA

1. Action on the Minutes of the Meeting of April 29, 2004
2. Report of the Dean of the Graduate School - New Brunswick: Holly Smith
3. Actions of the Executive Council: Harvey Waterman

Action items, subject to approval of the Executive Council, will be posted Monday, November 29 on the Graduate School web site: <http://gsnb.rutgers.edu/index.php3> and will be distributed to all Graduate Program Directors.

4. Discussion of possible change in reporting relation of
Graduate School - New Brunswick: Holly Smith
5. Update on international student visas and SEVIS: Marcy Cohen
6. Report on Graduate Admissions: Judy McCarthy
7. Update on Commencement Plans: Barbara Bender
8. Report of the Vice Dean: Jolie A. Cizewski
9. New Business

Minutes of the Meeting of the Graduate Faculty
April 29, 2004

Present: Susan Albin, Haim Baruh, Jolie A. Cizewski, Linda Costa, Martha Cotter, Jun-Yan Hong, Lisa Klein, John Krenos, Paul Leath, Michael J. Leibowitz, Judy McCarthy, Paul Panayotatos, John Pavlick, Nicholas Rennie, Loren Runnels, Harold Sackrowitz, Holly M. Smith, Bruce Tesar, Janet Walker, Harvey Waterman, Chuck Weibel, Phyllis Zatlin

Presiding: Dean Holly M. Smith

1. The minutes of the meeting of December 11, 2003 were approved.

2. Actions of the Executive Council

Of the courses presented to the faculty, four were withdrawn from consideration: two proposed by Spanish, Statistics 536, and one proposed by Women's and Gender Studies.

The Proposed new courses were approved.

3. Report of the Dean

Dean Smith told the faculty that the staff of the dean's office had begun a process of strategic planning, attempting to predict the environment in which we would be operating for the next few years, reviewing what we do now and what we might add, including responsibility for postdoctoral fellows. The staff is also looking at what we might be doing better and what we might de-emphasize.

Dr. Furmanski visited the Executive Council and spoke about the task force on undergraduate education and its implications for such things as the role of teaching assistants.

Dean Smith and Vice Dean Cizewski are formulating a "compelling case" for the infusion of significant resources for the support of graduate students. It will address the need for higher stipends and salaries, for more fellows and teaching assistants, for health insurance for fellows, for incentives to support students on grants, and for coherent packages of support that yield level stipends/salaries over time. We hope to persuade the university to make graduate student support a central focus of the next capital campaign. We are also compiling case histories of graduate students who have made important contributions to give some richness to case.

The university has already agreed to reduce the definition of full-time status for graduate students from 12 credits per semester to nine. We are now hoping to get adoption of mechanisms that will allow certain students, especially post-qualifying doctoral students, to be considered full-time with fewer credits.

The situation for international students, both applicants and those here who make visits home, remains very bad. We are doing what we can, in concert with the international center, to alleviate the problems created by new rules and procedures and new record-keeping requirements.

Cheating by graduate students seems to be increasing and remains an ongoing concern.

In response to requests that offices be more available to students, we have agreed to extend office hours at the Graduate School to 5:00 p.m. and to have someone available through the lunch hour.

Contract negotiations appear to be heading toward a conclusion that will be beneficial for graduate students and will help us to compete in the recruitment of new students.

Vice President Furmanski is revising the process of external reviews. We cannot now meet our nominal schedule and routine reviews may not in any case be the best way to take advantage of external visitors. Dr. Furmanski is proposing cluster reviews of related units (he plans to review the business schools first) as well as targeted reviews of programs that pose special problems or that are on the edge of excellence. He also is in favor of eliminating the "grades" that have been determined by CSPAD, but will ask that committee to assist in the design of new reviews.

All-funds budgeting is coming. It is intended that this will include opportunities for responding to particular incentives (startup, professional master's programs, etc.)

The NRC review of doctoral programs has been deferred pending identification of the necessary funding. It is expected to begin collection of data in 2005.

Professor Leath rose to note that the projected widening of Route 18 will require that everyone be careful making TA assignments so that students are not prevented from getting to graduate courses.

He noted as well that he hoped that postdoctoral fellows would be monitored by the Graduate School and perhaps issued certificates, pointing out that they are in a sense alumni of the University. Dean Smith responded that there are some 500 postdocs and research associates and that we will need to work on definitions of who should be included in this community.

Professor Leath also asked whether all-funds budgeting would include collection of tuition by the units. Dean Smith responded that it would and that this would give the deans some flexibility, more discretionary dollars and of course fewer occasions to have to make requests to the Vice President. One use of the money could be to encourage grant-getting.

Professor Cotter urged that steps be taken to introduce graduate students to Trenton and to the public. She reported that bargaining would extend at least to the end of May now that the university has asked for a mediator.

Professor Weibel noted that TAs are not covered by health benefits until September 1, though they are asked to report earlier. Dean Bender acknowledged the problem and said it had not yet been resolved. Professor Weibel was also concerned that students have only a short window to get into housing; Dean Bender said that that is being worked out.

4. Commencement (Associate Dean Bender)

Associate Dean Bender reported plans for commencement, which will be quite different and take place on the mall.

5. Report on Graduate Admissions (Dr. Judy McCarthy)

Dr. McCarthy distributed information about graduate admissions. Improvements are in progress that will provide sites for data and for status information, as well as email programs for reporting decisions. International admissions are down dramatically and quality indicators have fallen slightly in consequence. 77% of applicants now use the web-based form: the goal is 90%. New recruitment materials are being developed.

Associate Dean Waterman commented that while one or two engineering programs feel that they have lost some quality, the indicators don't indicate a general loss because the lower ratio of international students will naturally bring down mean GRE scores.

6. Report of the Vice Dean

Vice Dean Cizewski thanked Dean Bender for her work on commencement. She informed the faculty that she had agreed to serve on the undergraduate education task force. The RISE program has continued to be a success and is expecting the best contingent ever this summer. Our diversity applicant pool seems to also be the best we have had, although the take from that pool remains modest, perhaps because of the stiff stipend competition from some of our peers.

We have discussed a Statement on Diversity designed to respond to any queries about our admissions policy.

The TA program for head TAs has had a good evaluation. We are enhancing ESL and have had fewer complaints in that area. We've asked that the funding for head TAs be made permanent.

The TA Project has used funding to video star teachers and this material is on the web.

The Graduate School hosted a session on academic integrity that produce some interesting discussion.

It also hosted a session on career and family life issues for women.

We've had a banner year for excellence, both in the entering class and in the numerous fellowships and awards won by our students. Rob Marlin (Anthropology) won the Northeastern Association of Graduate Schools Distinguished Dissertation Award. Several students won Fulbright fellowships and for the first time ever four new students brought Mellon fellowships. The annual awards ceremony will follow this meeting.

The meeting adjourned at 4:20.

New Courses June – December 2004

070 Anthropology

542 Frontiers (3) Hughes
561 Human Behavioral Ecology (3) Cronk

118 BIOMAPS

513 Molecular Simulations in Computational Biology (3)

125 Biomedical Engineering

581 Integrative Molecular and Cellular Bioengineering (3) Roth
582 Nano- and Micro-engineered Biointerfaces (3) Uhrich
583 Biointerfacial Characterization (3) Moghe

148 Cell and Developmental Biology

556 Systems Histology (2) Wilson
519 Cellular and Genetic Mechanisms (6) Newlon, Zehring, Wilson

180 Civil and Environmental Engineering

530 Maritime Transportation (3) Boile
579 Environmental Management of Maritime Infrastructure (3) Boile

332 Electrical and Computer Engineering

578 Deep Submicron VLSI Design (3) Bushnell

375 Environmental Sciences

527 Physiochemical Process Dynamics in Environmental Systems (3) Huang
553 Mechanisms of Past Climate Change (3) Broccoli

460 Geological Sciences

557 Seismic Acquisition (3) Mountain, Withjack
613 Seminar in Paleomagnetism (BA) Kent
614 Seminar in Seismic Stratigraphy (BA) Mountain
615 Seminar in Paleooceanography (BA) Wright/Miller/Rosenthal
616 Seminar in Volcanology (BA) Carr
617 Seminar in Geochronology (BA) Swisher
618 Seminar in Ocean Ridge Processes (BA) Rona

510 History

500 The Historian's Craft (3)
553 PDR in African-American History (3)
573 Seminar in African-American History (3)
680 Minor Field Preparation (3)
681 Major Field Preparation (3)
682 Dissertation Proposal Preparation (3)

350 Literatures in English

517 Introduction to Graduate Study (1.5) Kramnick

640 **Mathematics**

640 Experimental Mathematics (3) Zeilberger

709 Nutritional Sciences

530 Theories, Models and Concepts in Food and Nutrition (2) Lee

531 Nutritional Epidemiology (3) Hoffman

718 Pharmacology, Cellular and Molecular

600 Cancer Pharmacology (2) Jin, Liu

765 Plant Biology

621 Core Seminars in Plant Biology (2) Hillman, Jones, Bath

622 Core Seminars in Plant Biology II (2) Maliga, Kerstetter, Struwe, French

940 Spanish

575 Consecutive and Simultaneous Interpreting (3) Zatlin

669, 670 Practicum in Translation (BA) Zatlin

940 Women's & Gender Studies

587 Feminist Pedagogies (3) Gossy, Davidson

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**Proposal for an African-American History Graduate Major
Drafted by Professor Mia Bay, May 2004**

Proposal

That the African-American history graduate fields be expanded to include a major field as well as a minor one.

Rationale

Despite our stellar reputation and track record in African-American history our department currently offers no major field in African-American history. African-Americanist graduate students in this department have traditionally taken their major exams in American history and minored in African-American history. This proposal will not eliminate that option. Students who wish to take this combination of exams may continue to do.

However, we wish to expand the African-American history exam possibilities to better serve the needs of students who wish to train as African-Americanists, while also minoring in another field. Under the current arrangement, students who wish to train primarily in African-American history (and compete for jobs in that field), cannot minor in any non-US field, without adding an additional minor exam field to their Ph.D. requirements. Since we have no African-American history major field, they must take that field as their minor, and as Americanists, are also required to take the American history major.

The proposed new major would combine these two fields into one major, allowing students to major in African-American history, while minoring in another field. The new major would not change the way we have trained students in African-American history in the past—which has worked very well. They would still be required to take a combination of courses in both American and African-American history, and pass an exam in these fields (see suggested requirements). It would just be one exam rather than two.

One major impetus behind this proposal is the interest that a number of current and prospective students have expressed in majoring in African-American history, while pursuing a minor in our new Atlantic/Diaspora program—a combination impossible under our current arrangement. An African-American history major would allow this combination, while also facilitating other African-American history major and non-US/world/or gender history minor combinations.

These combinations are both attractive and practical choices for our African-Americanist graduate students, given the character of the historical profession's current job market and intellectual climate. At the moment African-American history remains a strong and vibrant field with many job openings: we need to continue to produce students

whose primary expertise is in this field. Yet at the same time some expertise in non-US fields is an increasingly important asset to all Americanists in today's world (given the profession's growing interest in incorporating global and comparative perspectives into historical research and pedagogy). Moreover, such interests and initiative are particularly strong in the field of African-American history.

Many jobs in this field are now being advertised as African-American history/diaspora jobs and seek faculty who can teach some combination of African-American and African diaspora history. Since African diaspora history is becoming an increasingly prominent field we expect this trend to continue and wish to prepare students for the changing realities of the job market. With our Atlantic/Diaspora program, Rutgers is in a perfect position to train students in African-American and African diaspora history. We believe that this change in our major will facilitate such training.

The new African-American major will offer students comprehensive training in African-American history while also recalibrating our program to better serve the needs of today's African-American history job market.

Implementation and Program Requirements

This proposal has been discussed by the African-American history caucus as well as members of the diaspora faculty and the Americanist caucus who have all agreed on the utility of this change. The graduate faculty of the history department voted to approve this proposal at their meeting on May 5, 2004.

The new graduate major will establish one new course: an African-American history PDR that has already been taught once. In addition, it would also replace the existing two-semester seminar in African-American history (taught by David Lewis), with a one semester Seminar in American and African-American history. The combined effect of these changes would add no additional courses to our current graduate curriculum while offering an additional seminar open to all students wishing to write research papers in American history.

Suggested Requirements for the Major

(The requirements listed below are tentative and open to discussion and revision. They combine the current required curriculum in the American major and African-American minors.)

- Problems and Directed Readings in African-American History (TBA)
- Seminar in American and African-American History (TBA)
- Colloquium in African-American History (510:563)

- Two of the three American History PDR's
(510:555 PDR I: North America from the Era of European Expansion to the United States; 510:557 PDR II: Nineteenth-Century America; 510:559 PDR III: Modern America)
- One other Seminar in American, African-American, or Atlantic/Diaspora History—although this last option should be open only to students not minoring in the Atlantic/Diaspora History field, as this course is required for that minor.

The research papers students in the major write for in their seminars must include one research paper on African-American history

African-American History Major Exam

The African-American History Major exam would combine requirements in American and African American History. Students would be required to answer a total of three questions, one each from three sections. One set of questions will focus on American history during a period covered by two of the three American history PDRs; another will require students to answer a question on African-American history drawing on the bibliography contained in the current African-American history minor field list, which covers all of African-American history; and the third set of questions will combine these two fields and likewise focus on a period covered by two of the three American history PDRs.

Proposal to Establish a Graduate Program in Atmospheric Science (GPAS)

1) Introduction

Atmospheric science is an active area of graduate education and research at Rutgers University. Graduate education in atmospheric science takes place primarily as an option within the Graduate Program in Environmental Sciences (GPES), and a core of atmospheric scientists is housed in the Department of Environmental Sciences (DES). There are also several other faculty members in the Departments of Marine and Coastal Science (DMCS) and Geography with strong interests in atmospheric science.

As an academic discipline, atmospheric science has a long history at Rutgers. A small agricultural meteorology and climatology group developed in the 1940s, and grew with the establishment of an undergraduate program in meteorology in the 1960s. From that time through 1995, atmospheric science activities were housed in the Department of Meteorology (later Meteorology and Physical Oceanography) in what is now Cook College. In addition to the undergraduate program in meteorology, the M.S. degree was offered through the Graduate Program in Meteorology.

Beginning in the early 1990s, students with interests in atmospheric science began to pursue graduate degrees (M.S. and Ph.D.) through GPES. This transition accelerated when a departmental reorganization at Cook College merged most of the faculty from the Department of Meteorology and Physical Oceanography into DES. A formal option in atmospheric science was developed within GPES, and 9 M.S. and 10 Ph.D. degrees have been awarded to students in this option. Twelve students are currently pursuing advanced degrees through the atmospheric science option.

As a point of clarification, there is no formal distinction between the terms “atmospheric science” and “meteorology.” “Meteorology” comes from the Greek, meaning study of any observable phenomena in the atmosphere, so it is synonymous with “atmospheric science.” In recent years, the traditional “meteorology” has been thought by some to indicate a focus on weather forecasting. In adopting a name for the proposed graduate program, “atmospheric science” has been chosen to signify the inclusion of all branches of the study of the atmosphere.

2) Justification

The formation of a graduate program in atmospheric science is motivated by several issues. Five atmospheric scientists have been added to the DES faculty in the past six years, all of whom have active, externally funded research programs. Their arrival at Rutgers has sharply increased the demand for quality graduate students. Recruitment of atmospheric science graduate students is hampered by the decreased visibility that results from the option being embedded within GPES. We believe that many students seeking to study atmospheric science may not be aware of the opportunities at Rutgers because of the existing organizational structure. Almost all of the universities with which Rutgers competes for such students have graduate programs in meteorology or atmospheric

science. A more visible graduate program will lead to increased quality and quantity of applicants.

The recent growth in graduate education and research in atmospheric science at Rutgers has already had tangible effects. Rutgers is now a member of the University Corporation for Atmospheric Research (UCAR), a National Science Foundation-sponsored consortium of educational institutions engaged in atmospheric research. The criteria for membership include the requirement that an institution has "...made a definitive, substantial, and continuing commitment to progress in the atmospheric sciences or related fields as evidenced by scholarly works of significance by its faculty in the atmospheric sciences or related fields..." UCAR membership indicates that the atmospheric science activities that take place at Rutgers are recognized by other atmospheric scientists as significant.

In addition, research in atmospheric science is well-funded, both at Rutgers and elsewhere (Table 1). With only a small number of atmospheric science faculty, Rutgers is receiving \$1.5 million a year in external funding. These faculty also support a large undergraduate program and the GPES option in atmospheric science, including teaching most of the courses. Having a high-visibility, high-quality graduate program will enable Rutgers to become even more effective in receiving external funding. Good graduate programs mean good and productive research, and with atmospheric sciences having access to robust funding sources, strengthening graduate activities in atmospheric science would be a great investment for the university.

A graduate program in atmospheric science will also enhance the educational experience for graduate students. The existing core requirements of GPES require each student to take at least one graduate-level course in each of four areas: environmental physics, environmental chemistry, environmental biology and environmental policy. This curriculum reflects the desire for students to be well-rounded, which is a valuable asset in traditional environmental science. Because atmospheric science is not as multidisciplinary as environmental science, atmospheric science students would be better served by a more focused curriculum. The experience with the existing GPES curriculum is that students in the atmospheric science option, whose backgrounds typically include more physics and calculus and less chemistry and biology than other GPES students, have difficulty finding courses that satisfy all four of the core requirements and that are appropriate to their backgrounds and interests.

3) Size and projected growth

Initially the GPAS will have a core membership of approximately 10 faculty members, including research faculty. According to the growth plan developed by DES, five new atmospheric science faculty members would be hired by the end of the decade. The targeted specialties for these hires are atmospheric dynamics, synoptic meteorology, atmospheric chemistry, air-sea interactions, and boundary-layer dynamics. The addition of faculty with these specialties would allow an expansion of the GPAS course offerings, and bring the total number of graduate faculty members to a level comparable with other leading atmospheric science programs in the country. As seen in Table 1, the typical size

of successful programs in atmospheric science is 10-15 full-time equivalent (FTE) faculty members. Further growth to 20 members is projected over the next 10 years.

Atmospheric science is a relatively broad discipline, involving the diagnosis and prediction of atmospheric processes, including large-scale weather systems, severe storms, climate change, and air-sea interactions. Although the core faculty members of the proposed graduate program are active in all of these areas, a majority are engaged in climate-related research. To develop a graduate program of national prominence, the proposed graduate program in atmospheric science will have a disciplinary focus on developing an integrated understanding of climate dynamics, including climate processes from global to regional scales and climate-chemistry-aerosol interactions. Basic and applied research problems will be addressed through observation, modeling, and applications. This focus on climate dynamics will capitalize on existing collaborative relationships with the National Oceanic and Atmospheric Administration's Geophysical Fluid Dynamics Laboratory in Princeton, and the National Aeronautics and Space Administration's Goddard Institute for Space Studies in New York, which are two of the leading climate modeling centers in the United States.

4) Entrance requirements and curriculum

Any prospective student with a Bachelor's Degree or higher in a mathematical or scientific discipline (e.g., physics, mathematics, meteorology, computer science, engineering, chemistry) is a candidate for the program. Previous education in atmospheric sciences is not required for acceptance. A successful applicant is expected to have at least a 3.0 undergraduate GPA, a verbal GRE score of at least 500, and a mathematics GRE score of at least 600. For non-USA applicants, the minimum TOEFL score required for acceptance is 243 (computer version) and 590 (paper version). The following undergraduate courses, or their equivalents, are required for all students in the option. Ideally they should be completed before the student enrolls; otherwise, they should be taken as soon as possible. (No more than 12 credits of 300- and 400-level courses may be counted toward a graduate degree.)

Calculus through differential equations (usually 4 semesters) [does not count toward degree credits]

Two semesters of physics for the sciences, including laboratory.

One semester of atmospheric thermodynamics, for example:

11:670:323 Thermodynamics of the Atmosphere

One semester of atmospheric fluid dynamics, for example:

11:670:324 Dynamics of the Oceans and Atmosphere

Competence in computer programming in one or more high-level programming languages

All graduate students must take each of the following courses; Ph.D. students must fulfill this requirement before taking the qualifying exam. [Note: All courses in this section are listed with the current curriculum codes and course numbers.]

16:712:502 Large Scale Dynamics (3)

16:375:532 Atmospheric Physics (3)

16:375:537 Large-Scale Weather Systems (3)
16:375:539 Introduction to Radiative Transfer in the Atmosphere and Ocean (3)
16:375:545 Physical Climatology (3)
16:712:615 Geophysical Data Analysis (3)

In addition, all graduate students must take any two of the following courses.

16:375:540 Atmospheric Chemistry (3)
16:375:544 Modeling of Climatic Change (3)
16:375:547 Atmospheric Boundary Layer Dynamics (3)
16:375:553 Mechanisms of Past Climate Change (3)
16:712:552 Remote Sensing of the Ocean & Atmosphere (3)
16:712:603 Numerical Modeling of the Atmosphere and Ocean I (3)
16:712:604 Numerical Modeling of the Atmosphere and Ocean II (3)

The remaining courses should be chosen in consultation with the student's advisor, and may include additional courses from the above list. The following list provides some other recommendations.

16:375:542 Aerosol Sciences (3)
16:180:563 Advanced Hydrology
16:198 510 Numerical Analysis (3)
16:198:525 Advanced Numerical Analysis I (3)
16:198:526 Advanced Numerical Analysis II (3)
16:198:527 Computer Methods for Partial Differential Equations (3)
16:712:501 Physical Oceanography (3)
16:960:563 Regression Analysis (3)
16:960:567 Applied Multivariate Analysis (3)
16:960:580 Basic Probability (3)
16:960:582 Introduction to Methods and Theory of Probability (3)
16:960:590 Design of Experiments (3)

The following courses offered at Princeton University can be taken for Rutgers credit by Rutgers students via the Princeton Cooperative Exchange Program.

AOS 527 Atmospheric Radiative Transfer
AOS 571 Introduction to Geophysical Fluid Dynamics
AOS 572 Atmospheric and Oceanic Wave Dynamics
AOS 575 Numerical Prediction of the Atmosphere and Ocean
AOS 577 Weather and Climate Dynamics

Additionally, all M.S. students must take at least 1 credit of seminar, and all Ph.D. students must take at least two 1-credit seminars.

16:375:613 Seminar in Environmental Science (1)
16:375:612 Seminar in Environmental Science (1), or
16:375:671 Seminar in Meteorology (1)

Undergraduate Courses

In many cases 300 or 400 level undergraduate courses are appropriate and accepted for credit (G prefix) toward a graduate degree with advisor approval; however, the number of undergraduate credits associated with the degree must not exceed 12.

Transfer of Credit from Other Institutions

After completing 12 credits within the Program, students may petition to transfer up to 12 course credits towards an M.S. degree or up to 18-24 course credits (a maximum of half) towards a Ph.D. from graduate work completed at other institutions.

Grades

Students must maintain a minimum GPA of 3.0 for all coursework taken at Rutgers toward a graduate degree. No more than one course with a grade of C or C+ may be counted toward the degree.

Degree Requirements

The M.S. degree with thesis (Plan A) requires a minimum of 24 course credits, 6 research credits, a thesis, and an oral examination on the thesis conducted by a committee of four associate members or members of the graduate program. The M.S. non-thesis option (Plan B) requires 30 course credits, an expository essay, and the M.S. Final Examination.

For the Ph.D. degree, students must complete at least 30 course credits and 24 research credits. Eighteen additional credits must also be taken in either course credits or research credits (for a total of at least 72 credits). The Ph.D. Qualifying Examination must be passed before admission to candidacy, and completion and successful public defense of a thesis (dissertation) is also required.

M.S. and Ph.D. Examination Procedures

Near the end of each Spring Semester, the GPAS will conduct a comprehensive examination, based on required coursework, that will serve as the Final Examination for non-thesis M.S. and the first part of the Qualifying Examination for the Ph.D. Students may pass at the M.S. level or at the Ph.D. level. Ph.D. students, upon passing the examination at the Ph.D. level, will receive an M.S. degree with no additional work, assuming they have satisfied the course work requirements. Students will typically take the comprehensive examination at the end of their second year of graduate work.

The Ph.D. Qualifying Examination will consist of two parts. The first part will be the comprehensive examination described above. The student must pass the comprehensive examination at the Ph.D. level before being admitted to the second part of the examination. The second part will consist of a dissertation proposal, which will be defended before the student's Ph.D. committee, to consist of three associate or regular members of the graduate program and an external member. The dissertation proposal examination will normally be taken at the end of the first semester of the student's third year as a graduate student. Upon having the dissertation proposal approved, the student will be admitted to Ph.D. candidacy.

5) Participating faculty

The core faculty members of the GPAS would consist of the atmospheric scientists that are housed in DES, along with other atmospheric scientists within the Rutgers community. Membership in the program would also be open to any additional Rutgers faculty with interests in atmospheric science, subject to the approval of the GPAS faculty. The core faculty members are listed below, along with brief summaries of their research interests.

Anthony J. Broccoli, Associate Professor (Ph.D., Rutgers Univ.): Dr. Broccoli's research focuses on climate modeling, with particular emphasis on the simulation of past climates and climate change, and the use of such simulations to evaluate the reliability of climate models. His current research projects include simulation of the climate of the past century, climate variations during the last glacial cycle, extratropical forcing of tropical climate change, and diagnosis of climate model feedbacks and sensitivity.

Jennifer Francis, Associate Research Professor (Ph.D., Univ. of Washington): Dr. Francis's research involves satellite remote sensing of the polar regions, Arctic climate change, and energy transfer among the atmosphere, sea ice and ocean.

Dale Haidvogel, Professor II (Ph.D., MIT/Woods Hole Oceanographic Institution): Dr. Haidvogel's research focuses on the development and application of multi-scale ocean circulation models used to simulate ocean currents and regional climate impacts. These models are employed world-wide for the study of fundamental oceanographic processes and as the building blocks of data-assimilative regional forecasting systems. Dr. Haidvogel is currently Chair of the U.S. GLOBEC program, a NOAA- and NSF-funded multidisciplinary research program designed to determine the potential impact of global climate change on ocean ecosystems.

Robert P. Harnack, Professor (Ph.D., Univ. of Maryland): Dr. Harnack's research focus is the investigation of the nature, causes, and prediction of storms on the large-scale to mesoscale. These storms include convective systems occurring on the mesoscale and extratropical cyclones occurring on the large mesoscale and lower end of the large-scale.

James R. Miller, Professor (Ph.D., Univ. of Maryland): Dr. Miller's research uses global climate models to obtain a better understanding of the climate system and how it might change in the future as atmospheric greenhouse gases increase. A particular focus is on the hydrologic cycle and feedbacks between water and other components of the climate system with a regional emphasis on the Arctic Ocean and surrounding land mass. Another emphasis is on river flow and water resources and how they might be affected by climate change.

David A. Robinson, Professor (Ph.D., Columbia Univ.): Dr. Robinson's research involves climate and climate change; in particular, state and regional climate and climate

change issues, hemispheric snow cover kinematics and dynamics, and the collection and archiving of accurate climatic data.

Alan Robock, Professor II (Ph.D., Massachusetts Institute of Technology): Dr. Robock's research involves many aspects of climate change: the greenhouse effect, impacts of climate change, and satellite observations. He conducts both observational analyses and climate model simulations. His current research focuses on soil moisture variations, the effects of volcanic eruptions on climate, and detection of human effects on the climate system.

Georgiy L. Stenchikov, Research Professor (Ph.D., Moscow Physical Technical Institute): Dr. Stenchikov's research is in the area of mathematical modeling of multi-scale dynamic and physical processes in the climate system. It is aimed at better understanding nonlinear mechanisms that govern climate variability and climate change. The research topics include studies on distribution and optical properties of volcanic aerosols in the stratosphere after major volcanic eruptions, their radiative effect on climate, and forcing of stratosphere-troposphere dynamic interaction. Dr. Stenchikov is also interested in chemistry-climate interaction, transport of pollutants on different spatial scales, from convective mixing of the boundary layer pollution in the troposphere to continental and global-scale transport of aerosols and chemical tracers, as well as effect of aerosol and ozone on regional and global-scale climate processes.

Barbara Turpin, Associate Professor (Ph.D., Oregon Graduate Institute of Oregon Health Sciences Univ.): Dr. Turpin's research focuses on understanding the atmospheric transformations of aerosols, which are important in urban and regional air quality, visibility and climate, and studying the effects of human exposure to these airborne particles. Her research works toward the development of effective pollution control strategies

Dana E. Veron, Assistant Professor (Ph.D., Univ. of California-San Diego): Dr. Veron's research focuses on the cloud-aerosol radiation processes, their impact on climate and their sensitivity to climate change. Currently, Dr. Veron has several projects that investigate improving the representation of cloud field inhomogeneity in atmospheric general circulation models. This includes several projects involving a stochastic cloud-radiation model, observational climatologies of cloud properties, and improved representation of cloud microphysical properties.

Christopher Weaver, Research Assistant Professor (Ph.D., Univ. of California-San Diego): Dr. Weaver's main scientific interests fall currently within two broad themes: Improving our understanding of the interactions between land and atmospheric processes over a range of spatial scales, but especially those of watersheds, ecosystems, and human communities; Improving our understanding of clouds - their radiative effects, their role in the global climate system, and their control by atmospheric dynamics and thermodynamics.

6) Impact on other graduate programs

Programs at Rutgers

GPES would be most directly affected by the establishment of a graduate program in atmospheric science. Because the proposed program would take the place of the atmospheric science option that currently exists within GPES, most students with interests in atmospheric science would no longer apply to or enter GPES. Based on present application and enrollment statistics, a reduction in admitted students of approximately 15% would occur, assuming no other changes.

Without atmospheric science students, GPES would be less constrained in defining a core curriculum that better suits the multidisciplinary nature of environmental science. Biology and chemistry could figure more prominently in the core curriculum, as students interested in traditional environmental science typically have stronger backgrounds in these areas than those interested in atmospheric science.

The proposed program would complement the existing Graduate Program in Oceanography (GPO). The atmosphere and ocean are both fluids, and similar physical and dynamical processes are involved in their behavior. Thus there is a very natural connection between atmospheric science and physical oceanography, which is one of the major activities within GPO. Many of the faculty participants in the proposed GPAS are members of the graduate faculty of GPO, and a strong synergy between these two programs will develop.

The formation of the GPAS would also strengthen graduate education in the earth sciences at Rutgers. A substantial fraction of earth science research involves interactions among the atmosphere, ocean and solid earth. The establishment of a program in atmospheric science would allow each of three major earth science disciplines to have equal visibility, and thus make Rutgers more attractive to students who may be interested in multidisciplinary research topics in the earth sciences. Preliminary discussions about joint recruitment efforts have already taken place. Such efforts would be facilitated by the existence of the GPAS.

Other programs in New Jersey

The only other graduate program in atmospheric science in New Jersey is the Program in Atmospheric and Oceanic Sciences (PAOS) at Princeton University. PAOS is a relatively small program, with typically fewer than 10 students, some of whom are interested in physical and chemical oceanography. PAOS has traditionally focused on more theoretical aspects of the atmospheric and oceanic sciences.

The existence of graduate activities in atmospheric science at both Rutgers and Princeton should be mutually beneficial. The Rutgers-Princeton exchange program, which allows students at one university to receive credit for courses taken at the other, expands the course offerings available to students at both institutions. The close geographic proximity

of these two programs creates a strong pool of faculty candidates to serve as external members of students' committees.

7) Sources of student support

Students in GPAS will be supported by three sources: externally funded research grants, externally funded fellowships, and assistantships and fellowships from internal sources. Many of the students in the atmospheric science option of GPES are currently supported by externally funded research grants. Atmospheric science is a well-funded discipline, with average external funding at major research universities approaching \$400,000 per FTE faculty member (Table 1). Most Ph.D. students in GPAS will ultimately be supported by external research grants.

A substantial number of current atmospheric science students have been supported on externally funded fellowships through the GAANN (Graduate Assistance in Areas of National Need) program sponsored by the United States Department of Education. GPAS will also seek external support for fellowships, using the knowledge gained through its experience with the GAANN process.

A modest amount of internal support will help GPAS in its efforts to recruit high quality graduate students. The addition of two Excellence Fellowships per year to the pool available to graduate programs at Cook College would greatly aid such efforts. Two Teaching Assistantships per year are also sought for students who have not yet made the transition to external funding. These assistantships would also benefit the undergraduate teaching efforts of the meteorology program, and help to give teaching experience to potential future professors.

8) Library needs

To ensure the excellence of the proposed GPAS, the students and faculty need easy access to a variety of library resources. The Chang library is the closest library branch to the Environmental Sciences department, home of the proposed program. The interests of students in the proposed GPAS would be best served by consolidating all of the atmospheric science textbooks currently in the Rutgers–NB catalog at the Chang library, including those currently remaining in the Douglass library. In addition, to support both the teaching and research aspects of the new program, easy access to numerous professional journals should be granted. A number of atmospheric science journals, particularly those published by the American Meteorological Society, are already located at Chang. A more serious problem involves the journals published by the American Geophysical Union (AGU) such as the *Journal of Geophysical Research* and *Geophysical Research Letters*, which are shelved at the Library of Science and Medicine. Because these journals are of interest to many disciplines, including some located on the Busch Campus, there would be others adversely affected by their relocation to Chang. Online access to the AGU journals, which is not currently available, would serve the needs of the GPAS and other programs by ensuring the campus-wide availability of these journals.

The above changes, although highly desirable, are not essential to the formation of the proposed GPAS, and thus do not require an immediate resolution. We will work with the university librarian toward solutions that will improve access to atmospheric science textbooks and journals for students in the proposed GPAS.

9) Requested resources

The resources requested for the proposed GPAS are relatively modest. They include a part-time administrative assistant, student fellowships/assistantships, partial salary support for the graduate program director, and an operating budget.

Support for a part time administrative assistant is being negotiated among the Cook Dean's office, the Department of Environmental Sciences, and the Institute for Marine and Coastal Sciences, but it will likely take some time to finalize an arrangement. We expect this negotiation to reach a conclusion before the proposed GPAS would begin to accept students.

As discussed previously, internal support in the form of two Excellence Fellowships per year and two Teaching Assistantships per year will help GPAS in its efforts to recruit high quality graduate students. Substantial amounts of external funding should be available to students once they and their advisors have identified an appropriate research project, but modest internal support is valuable in allowing students to make the transition to external funding.

The graduate program director would require fractional summer salary support in an amount determined by the prevailing formula, and an operating budget commensurate with the size of the program.

A letter from Dr. Jerome J. Kukor, Associate Dean for Graduate Programs, describing the resource commitment from Cook College is attached to this proposal.

<u>University</u>	<u>FTE</u>	<u>External Funding</u>	<u>Per FTE</u>	<u>Source (from Dept. Chairs or their staff)</u>
<u>Universities with Undergraduate Meteorology Programs</u>				
Penn State	25	\$6,250,000	\$250,000	Bill Brune, 3/16/04
Oklahoma	18	15,050,000	836,111	Fred Carr, 3/4/04, 8/9/04
Florida State	15	6,000,000	400,000	Bob Ellingson, 3/9/04
Georgia Tech	14	7,320,740	522,910	Judy Curry, 3/4/04, 7/14/04
Texas A&M	14	4,500,000	321,429	Richard Orville, 3/2/04
MIT	13	11,000,000	846,154	Maria Zuber, 3/5/04
Washington	13	6,500,000	500,000	Dennis Hartmann, 3/2/04
Illinois	12	2,719,000	226,583	Don Wuebbles, 4/1/04
UCLA	12	6,642,000	553,500	Kuo Nan Liou, 3/22/04
Wisconsin	10	1,857,381	185,738	Jan Richmond, 3/19/04
UC Davis	9.75	2,850,000	292,308	Mary McNally, 3/16/04
Utah	9	2,300,000	255,556	Ed Zipser, 3/4/04
Purdue	9	1,200,370	133,374	Harshvardhan, 3/18/04
Wyoming	8	3,470,000	433,750	Terry Deshler, 9/3/04
SUNY Stony Brook	7.5	1,700,000	226,667	Minghua Zhang, 3/3/04
SUNY Albany	7	1,416,075	202,296	Sally Marsh, 3/11/04
Arizona	6	2,700,000	450,000	Steve Mullen, 3/3/04
Ohio State	6	1,324,699	220,783	Morton O'Kelly, 3/24/04
Iowa State	5	1,125,000	225,000	Carl Jacobson, 3/3/04
Nebraska	5			Ken Dewey, 3/1/5/04 - cannot do, as they are currently merging two programs
Indiana	4	1,575,000	393,750	Sue Grimmond, 3/18/04
Rutgers	4	1,580,471	395,118	Melissa Arnesen, 3/13/04
Missouri	3	50,000	16,667	Anthony Lupo, 3/3/04 - program has too many teaching demands, cannot find time for research
Kansas	2			did not ask - program too small
<u>Universities Without Undergraduate Programs</u>				
Maryland	13	9,000,000	692,308	Russ Dickerson, 3/4/04
Colorado State	11.67	11,000,000	942,857	Steve Rutledge, 3/3/04 - each faculty member only supported for 7 months from state
Colorado	10	6,869,824	686,982	Brian Toon, 3/4/04
Total	258.92	\$116,000,560		
Average External Funding			\$448,023	

Table 1. Average annual external funding for Atmospheric Science/Meteorology programs in the U.S. that responded to my survey. Two AAU departments did not respond to several emails. FTE is full time equivalent tenure-track faculty members. Average funding is the total funding divided by the total number of FTEs (excluding Nebraska and Missouri). Dates are in format month/day/year.

The State University of New Jersey

RUTGERS

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20 October 2004

Dean Holly M. Smith
Graduate School – New Brunswick
25 Bishop Place
College Avenue Campus

Dear Dean Smith:

This letter is written to indicate Cook College's support for the proposal to establish a Graduate Program in Atmospheric Science. Given the core faculty and curriculum that are proposed for this program, investment in this graduate program over the next few years should result in Rutgers and Cook College becoming a nationally recognized center of excellence for research and training in atmospheric science.

In support of this program, Cook College will ensure that outstanding graduate student applicants to the program will be considered for Excellence Fellowships, in accordance with the review processes in place for all Cook-affiliated graduate programs. In addition, the Director of the Atmospheric Science Graduate Program will be eligible (consistent with the Director having an Academic Year appointment) for partial summer salary support, based on the current formula that calculates summer salary from the size of the graduate program. Support for a part time Administrative Assistant is being negotiated among the Cook Dean's office, the Department of Environmental Sciences, and the Institute for Marine and Coastal Sciences. It will likely take some time to finalize an arrangement, however we expect this negotiation to reach a conclusion before the proposed Graduate Program in Atmospheric Science would begin to accept students.

Sincerely,

Jerome J. Kukor
Associate Professor
Associate Dean for Graduate Programs

cc: Keith Cooper, Acting Dean, Cook College
Peggy Brennan, Acting Director, Office of Research & Graduate Programs

Proposal for an Applied and Community Nutrition Option for the Doctor of Philosophy in Nutritional Sciences

The Nutritional Sciences Graduate Program (NSGP) proposes to offer an Applied Nutrition option to complement the existing option in Basic Nutritional Sciences. To receive a Ph.D. in this option of the NSGP, students must satisfactorily complete 33 credits of course work in nutrition, health, research design, and related areas as well as 39 credits of research. Like the existing Nutritional Biochemistry Option, there will be no language requirement and residency requirements will be the same.

Introduction

During the last 30 years, the link between diet and some chronic diseases, such as heart disease, hypertension, and certain types of cancer, has become well-recognized. Additionally, diet has been identified as a major contributor to four of the ten leading causes of death in the U.S. The Surgeon General succinctly described the impact of diet on health outcomes: “For the two out of three adult Americans who do not smoke or drink excessively, one personal choice seems to influence long-term health prospects more than any other: what we eat”. In the late 1970s, government and health organizations began issuing dietary intake recommendations for reducing the risk of chronic disease that were based on scientific evidence. The recommendations common to many of these reports are: maintain a healthful body weight; limit fat, saturated fat, cholesterol, sugar, and sodium intake; increase fiber intake by eating more grains and produce; and consume alcohol only in moderation.

Experts in applied and community nutrition blend the findings from the basic sciences, biomedical sciences, and social sciences to create interventions, develop policy, and make discoveries that help individuals and communities improve their dietary practices and change their lifestyles to enhance their quality of life so as to move toward a state of optimal health (wellness) and avoid premature death, disability, and disease. The work of applied and community nutritionists spans from individual clients to international organizations.

The proposed doctoral option is designed to prepare applied and community nutrition scholars who, as recognized leaders in the field, create viable solutions to pressing applied and community nutrition-related problems and improve the nutritional health and quality of life of individuals and communities. The proposed doctoral option will equip graduates to successfully pursue high-level, leadership positions in social, government, health-care, and corporate organizations as well as in university and college teaching, research, and administration. By committing resources to the option, RU will help to meet the social, economic, health, and wellness needs of the citizens supporting the institution.

The proposed doctoral option in applied and community nutrition builds directly upon existing strengths of the NSGP and the Nutritional Sciences Department. The NSGP has several doctoral-trained faculty with internationally recognized expertise in applied and

community nutrition who already are teaching a variety of applied and community nutrition courses. Although these faculty, along with the Nutritional Sciences Department faculty, serve a large number of undergraduate students and a growing number of master's students in applied and community nutrition, their expertise in mentoring RU doctoral students is currently underutilized. The proposed doctoral option will enhance the undergraduate and graduate Nutritional Sciences programs and complement them by clearly and formally illustrating the inter-connectedness of nutrition. In addition, the proposed doctoral option will contribute to the NSGP's programmatic diversity.

Need for This Option Within the Geographic Region

The proposed doctoral option is unique within the geographic region. Currently, no other institution, private or public, in New Jersey has such a program. The geographically closest university offering a similar program is Pennsylvania State University in University Park, Pennsylvania. In fact, nationally there is a dearth of doctoral programs of the type proposed here. Both the value and need for a larger cadre of professionals possessing the scholarship of the proposed doctoral option are great.

Prospective Student Interest in the Option

Graduate students have expressed a clear interest in the proposed option. Results from a survey of master's level students in New Jersey (n~150) revealed that approximately half were interested in pursuing a doctoral degree in the proposed area. In addition, one-third of the NJ health professionals (n=1000) surveyed indicated an interest in a doctoral program of the type proposed. NSGP faculty also have received numerous unsolicited requests from potential students expressing a desire to pursue doctoral work in applied and community nutrition. There is no doubt that there is a need and demand for the proposed doctoral option.

Requirements

Admission: Admission criteria will be the same as the current PhD in Nutritional Sciences. The prerequisites for admission will be the same as those currently in place for doctoral study in the NSGP.

Requirements for the PhD Degree Applied Nutrition Option:

The requirements for this option differ from the existing Ph.D. in Nutritional Sciences only in the specific coursework requirements. Doctoral candidates are required to take a total of 72 credits (i.e., 33 course credits and 39 research credits). In addition to completing courses required for the Master's degree [i.e., 30 credits consisting of Nutrition: A Biochemical and Physiological Basis (4,4 credits), Nutrition Seminar (2 credits), and Statistics (3 credits), and additional related courses to total 24 credits, and 6 research credits], the specific coursework requirements for applied and community nutrition doctoral students include completion of courses in:

- a) 16:709:521 *Community Nutrition* (3 credits),
- b) 16:709:XXX (new course) *Theories, Models, and Concepts in Applied & Community Nutrition* (2 credits),

- c) two of these three selections: 16:709:503 *Introduction to Applied Nutrition Research*, HEBS 5563 *Survey Design*, 16:709:XXX (new course) *Nutrition Epidemiology* (3,3 credits),
- d) 16:709:504 *Seminar in Nutrition Education* (to be revised to be variable credit; 1-3 credits, to be taken twice for a minimum of 2 credits),
- e) *Statistics through regression* (6 credits; may be completed prior to admission), and
- f) additional relevant courses (up to a total of 39 credits) in consultation with their advisor and the Curriculum Committee.

All students must pass a written qualifying exam (usually at the end of their second year of residence in graduate school) that will be administered by the program curriculum committee. Admittance to candidacy by an oral defense of a thesis proposal to the student's mentoring committee will be completed within 6 months of the qualifying exam. The doctoral thesis involves completion of original research in an area relevant to applied and community nutrition, under the guidance of a faculty member and mentoring committee as for the PhD option in Basic Nutritional Sciences. The thesis will be presented in a public seminar, defended orally to the mentoring committee, and submitted to the Graduate School prior to the award of the Ph.D. degree. Typical time for completion of all doctoral work is five years.

Proposed Curriculum for the Applied and Community Nutrition Option in the NSGP Doctoral Program

16:709:503. Introduction to Applied Nutrition Research (3 credits)*

16:709:521. Community Nutrition (3 credits)

NEW COURSE: 16:709:5XX. Theories, Models, and Concepts in Applied & Community Nutrition (2 credits) Course outline is attached.

NEW COURSE: 16:709:5XX. Nutrition Epidemiology (3 credits)* Course outline is attached.

16:709:504. Seminar in Nutrition Education (1 to 3 credits) Must be taken at least twice for a minimum of 2 credits.

(Topic Ideas for Seminar in Nutrition Education: Ethical and legal issues in applied & community nutrition; Global trends in applied & community nutrition; Multicultural issues in applied & community nutrition; Governmental roles in applied & community nutrition; Health promotion and change of human behavior; Cost: Benefit determinants and their impact on applied & community nutrition; Nutrition politics and policy; Applied & community nutrition and the media; Health & Nutrition disparities among gender, race, ethnic, and SES groups; Studying Minority Populations: Why, What, and How?; Environmental Impacts of Food & Nutrition; Infant nutrition, growth and development; Eating disorders and nutritional outcomes; Psycho-socio-cultural determinants of childhood obesity)

HEBS 5563 Survey Research Methods (3 credits)*

Statistics through regression (may be completed prior to admission) (6 credits)

Specialization Electives (selected by student in consultation with advisor and Supervisory Committee) (enough to result in a total of 39 course credits) Potential specialization areas include: Anthropology/Culture, Communication, Educational Program Planning & Evaluation, Epidemiology, Food Science, Nutrition, Health Policy, Psychology, Sociology, Statistics, and Urban Health & Nutrition.

16:709:701,702 Research in Nutritional Sciences (33 credits)

** Students must complete 2 of these 3 courses.*

Instructors

The NSGP faculty listed below have agreed to participate in the applied and community nutrition courses for the proposed option and mentor doctoral students in this option. In addition, the Department of Nutritional Sciences is currently in the process of hiring a senior (Full Professor) faculty member in Community Nutrition who will add considerable expertise to the teaching and research of the program. Similarly, many other existing members of the Graduate Program in Nutritional Sciences have expressed an interest in supervising student research for this option and we will seek to identify and contact other Rutgers faculty with appropriate expertise to participate in the proposed option.

Daniel Hoffman, Assistant Professor of Nutrition, Department of Nutritional Sciences, New Brunswick

Soo-Kyung Lee, Assistant Professor of Nutrition, Department of Nutritional Sciences, New Brunswick

John Worobey, Professor of Nutrition, Department of Nutritional Sciences, New Brunswick

Debra Palmer Keenan, Associate Extension Specialist (Associate Professor), Department of Extension Specialists and Nutritional Sciences, New Brunswick

Carol Byrd-Bredbenner, Extension Specialist (Professor), Department of Extension Specialists, New Brunswick

Elisa Bandera, Assistant Professor, UMDNJ