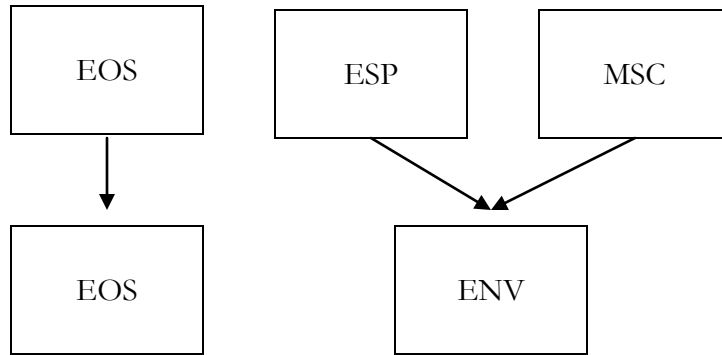


Proposal for a Ph.D. Program in Marine Science & Conservation

Revised January 9th 2008

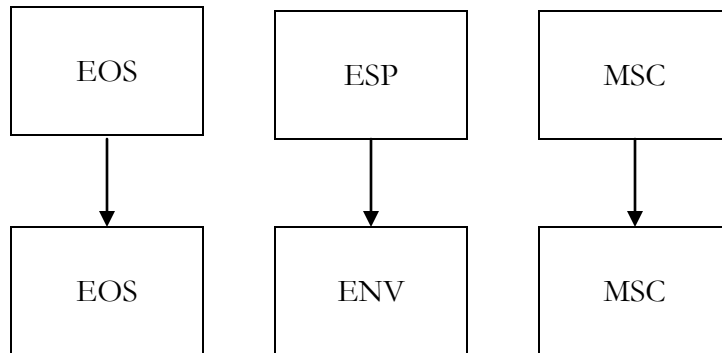
I. Background & Rationale

This proposal describes a Ph.D. program within the Marine Science & Conservation (MSC) Division of the Nicholas School of the Environment and Earth Sciences. The MSC Division is one of three academic units in the Nicholas School, together with Earth and Ocean Sciences (EOS) and Environmental Science and Policy (ESP). The EOS Division currently administers its own Ph.D. program and the MSC and ESP Divisions share a common program.



Current structure of Divisions and Ph.D. programs in the Nicholas School

The proposed MSC Ph.D. program is intended to better serve graduate students studying marine biology and marine conservation biology and policy. It is intended to replace the Nicholas School's Ph.D. Program in the Environment as the academic home for Ph.D. students whose advisors have primary appointments in the MSC Division. The Ph.D. program in the Environment has, until now, included faculty within the MSC Division, most of whom are resident at the Duke Marine Laboratory in Beaufort NC. This proposal would allow these faculty members to manage their own Ph.D. program, separate from the program housed in the Environmental Science and Policy (ESP) Division.



Proposed revision to structure of Ph.D. programs in the Nicholas School

The proposed MSC Ph.D. program is comprised of two related concentrations. The first concentration is in *Marine Biology*. These students work in a variety of fields, including the ecology, biochemistry, physiology and behavior of marine plants and animals. Training students in these areas will ensure that Duke continues to play a prominent national role in the training of future academic researchers working in the field of marine biology. A profile of two current students in this concentration is given in Appendix D.

The second concentration is designed to meet the needs of a growing number of faculty and students working in *Marine Conservation Biology & Policy* and to take advantage of the Duke Center for Marine Conservation (<http://marcons.env.duke.edu/>). The reports of the Pew Oceans Commission (2003) and the U.S. Commission on Ocean Policy (2004) both point to the many problems facing marine ecosystems and call for a new level of integration among researchers and managers engaged in marine science and policy. We wish to build on the recognition of these issues by policy makers and to harness the rapidly increasing interest in this field from prospective Ph.D. students. A profile of two current students in this concentration is given in Appendix D.

This new Ph.D. program in Marine Science and Conservation will allow us to build on our emerging strengths in marine conservation while retaining our traditional strengths in marine biology. Furthermore, the establishment of a separate Ph.D. program in the MSC Division will rationalize administrative responsibilities that are currently divided between the Durham and Beaufort campuses. The financial administrative work associated with Ph.D. students working with MSC faculty members is already based in Beaufort; we seek to gain a degree of administrative independence for this program commensurate with the other responsibilities of the Division.

Draft text for the Graduate Bulletin describing the two concentrations is included in this proposal as Appendix E.

II. Relationship to Existing Programs

1. Programs at Duke

As noted above, the new Ph.D. program is intended to provide a new academic home for students working in the areas of marine biology and marine conservation biology and policy. Faculty members within the MSC Division also participate in two University-wide Ph.D. programs – the University Program in Ecology (UPE) and the Integrated Toxicology Program (ITP). We anticipate that our level of commitment to these two programs will continue unchanged.

Ph.D. students conducting research in marine biology will likely take advantage of the expertise and courses offered by the Biology Department in the Trinity School. Faculty members in Biology have long served on the supervisory committees of our past and current Ph.D. students and we expect that this tradition will continue in the future. Many graduate level courses are cross-listed between Biology and the Nicholas School, reflecting the close relationship between these two academic units.

Some students whose research is in conservation biology and policy may require intensive training in economics, political science or another social science. Some of this expertise is available in the MSC Division and elsewhere in the Nicholas School, but these students may also wish to take course work elsewhere at Duke. In particular, students may take classes in Political Science, or Public Policy Studies and the School of Law. Specific academic requirements will be established by the student's committee, as described below.

2. Programs at Other Institutions

We compete for Ph.D. students with several other excellent U.S. graduate programs in marine biology. Foremost amongst these are the Scripps Institution of Oceanography, UC Santa Barbara, Stanford University and the University of Miami. Brief descriptions of these programs are provided in Appendix B. In general, the Duke program is smaller than these other programs, both in terms of the number of participating faculty and number of students. Perhaps the closest parallel to the Duke program is found at the Hopkins Marine Station, a field station of Stanford University. The intimate mentoring and research experience offered at Duke University Marine Laboratory is one of the primary features that attract Ph.D. students to study marine biology at Duke.

Duke is one of the international leaders in the emerging field of marine conservation biology & policy. Our primary competitor is the new program in marine biodiversity and conservation at Scripps. A brief description of this program is provided in Appendix B. Both the proposed MSC Ph.D. concentration and the Scripps program propose to train students to work directly at the interface of science and policy whilst, at the same time, ensuring a strong disciplinary training. The MSC concentration in marine conservation biology and policy will help us to compete more effectively with the Scripps program.

III. Resources Needed for the Program

No additional resources are required for the establishment of this Ph.D. program. The MSC Division has all the resources required to administer the program and to support Ph.D. students. A Director of Graduate Studies in the MSC Division currently administers the Ph.D. students in Environment who are advised by faculty members with primary appointments in MSC. The work of the Director is facilitated by the part-time assistance of several administrative staff members resident in Beaufort.

Current MSC Ph.D. students working in marine biology or marine conservation biology and policy are supported by research assistantships, teaching assistantships or endowed fellowships. We do not anticipate any change in the level or sources of support for Ph.D. students in the new MSC Ph.D. program.

IV. Students

Faculty members with primary appointments in the MSC Division currently advise 28 Ph.D. students. Of these students, nine are currently enrolled in the University Program in Ecology (UPE), two in the Integrated Toxicology Program and the remaining students are

in the Nicholas School's program in the Environment. We anticipate that the 17 students currently enrolled in the Environment program would participate in the proposed MSC program, perhaps with some additional students who are currently enrolled in UPE.

There is a large demand for these programs from potential Ph.D. students. Despite dissuading the vast majority of potential applicants, we receive 30-40 applicants for a very small (2-3) number of positions each year. The pool of potential students is deep for both concentrations in the proposed MSC program. For example, during the fall of 2005 we received more than 60 enquiries in response to an advertisement for two Ph.D. students to work on a project to examine the by-catch of sea birds, sea turtles and marine mammals.

Most current Ph.D. students in the MSC Division are U.S. citizens, although we also have students from Canada (4), Latin America (2), and the Caribbean (1). We would like to increase the diversity and international representation of our graduate student population by using Keohane Fellowships and external sources of support to achieve this goal.

Our past Ph.D. students have gone on to careers in academia, government and non-governmental agencies. A list of Ph.D. graduates since 2001 is provided in Appendix C, together with their current affiliations. We expect to see a continued strong demand for the graduates of this program.

V. Structure of the Program

1. Faculty

Participating faculty in both concentrations will consist of members of the graduate faculty having appointments in the MSC Division. Only faculty with primary appointments in the MSC Division may chair Ph.D. student supervisory committees. Appointments of new graduate faculty will be made by the Dean of the Graduate school upon recommendation of the Director of Graduate Studies. A list of current faculty members whose primary appointments are in the MSC Division is provided in Appendix A.

2. Admissions

Financial responsibility for all admitted students is the responsibility of the MSC Division. Students must identify a potential faculty advisor prior to admission; admission is predicated on the approval of the faculty advisor. Therefore, student applicants will be strongly encouraged to contact potential faculty sponsors prior to submitting an application.

3. Program Description

This Ph.D. program is a research-intensive degree. The information below is intended to supplement the requirements of the Graduate School

The basic requirements for the program are prescribed by the Graduate School:

1. Payment of six semesters of full-time tuition
2. A supervisory committee that oversees the student's program of study

3. Preliminary examination
4. Completion of at least one academic year in residence
5. Training in the responsible conduct of research
6. Completion of a dissertation and presentation of a final seminar
7. Final Examination

There are two tracks within this proposed Ph.D. program that reflect two related areas of research emphasis. Nevertheless, these two concentrations share many commonalities; both are research-intensive degrees, both train for teaching and research, the admissions and administrative processes for both are identical and students may take classes from both concentration areas.

Concentration in Marine Biology

The concentration in Marine Biology is designed to prepare students for careers in university teaching and research. Students working in this field will concentrate their study and research within a well-defined subject area. The academic requirements for this course of study will vary depending on the subject area, background of the student and availability of resources.

The required curriculum of students in the Ph.D. concentration in Marine Biology is determined by the student's supervisory committee, but all students will be required to take two core courses: *Advanced Topics in Marine Biology* and *Advanced Quantitative Approaches to the Analysis of Marine Ecological Data*. Doctoral students in marine biology emphasize research as the major part of their degree programs. The committee, chaired by the student's faculty advisor, will recommend required any additional required course work and help to shape the student's research program.

Doctoral students in Marine Biology often spend one or two semesters taking graduate level classes on the Durham campus before moving to Beaufort to complete their research; however, residence in Durham is not a requirement.

Curriculum in Marine Conservation Biology & Policy

This concentration in marine conservation biology and policy is designed to ensure that students receive detailed training in a particular discipline of marine natural or social science, while at the same time are exposed to sufficient inter-disciplinary knowledge that they are able to synthesize information from both the social and natural sciences and apply that information to policy-making. These students will be prepared for careers either in university teaching or research, or outside of the university involving the application of science to policy-making.

Students working in Conservation Biology and Policy must complete two courses from among three core courses offered by Program Faculty: *Interdisciplinary Approaches to the Study of Marine Ecosystems*; *Marine Conservation Biology and Policy*; and *Human Dimensions to Marine Conservation*. We expect that students will choose amongst these courses depending on their background and area of primary interest in either the natural or social sciences.

Additional interdisciplinary competency will be ensured by requiring that students show competency in a second field relevant to the interdisciplinary aspects of their thesis research. This additional breadth would be identified by the student's advisory committee.

Building on the above requirements, the remainder of the curriculum for each student will be determined by the student's supervisory committee. Doctoral students in marine conservation biology and policy typically spend one or two semesters in Durham taking graduate level classes on the Durham campus before moving to Beaufort to conduct their research; however, residence in Durham is not a requirement.

Committee Membership

The committee should consist of at least three members of the Nicholas School and, typically, one representative from outside the Nicholas School, as approved by the Graduate School. The requirement for three School faculty members can be satisfied by committee members with primary, secondary, or adjunct appointments. Additional committee members can be appointed, but the committee should not exceed five individuals. Once formed, the committee should meet at least once a year to review the student's academic progress.

Certification

After appointment of the Ph.D. committee, a certification meeting is held, at which time the initial program of study is approved. This certification meeting should be held no later than the student's third semester, unless agreed to by the committee and approved by the Director of Graduate Studies.

Preliminary Examination

Each student must pass an oral preliminary examination that is intended to demonstrate the student's readiness to conduct original research. This exam should be taken no later than the student's fifth semester. At least one week prior to this examination, the student should provide each committee member with a brief (10 to 15 page) proposal, describing the research to be conducted. The proposal should be approved by the faculty advisor before it is distributed to the committee. The proposal should serve as the starting point for the oral exam, but the content of the exam is unrestricted. The oral examination is conducted by the entire supervisory committee; successful completion of the exam requires the affirmative vote of the committee chair (the student's supervisor) and not more than one negative vote. If the student fails the oral examination, the committee may recommend to the Graduate School that the student be offered a second examination, to be taken no sooner than three months after the date of the first exam. The vote of the committee at a second exam must be unanimous. Failure of the second exam terminates eligibility for further work on the Ph.D. degree. Upon successful completion of the exam, the student advances to Ph.D. candidacy. The committee may require separate written examinations, to be taken in addition to the oral examination.

Teaching Requirement

All Ph.D. students are expected to serve at least one semester as a teaching assistant, seminar leader or lecturer. Students who are supported by teaching assistantships will satisfy this requirement as part of their financial aid responsibilities. Other students must still fulfill this requirement.

Foreign Language Requirement

There is no formal requirement for proficiency in a foreign language. A student may be required to demonstrate such proficiency by their committee if it is required for their research program.

Dissertation

Each student must submit a dissertation, describing the results of original research and conforming to the requirements of the Graduate School. Each member of the supervisory committee should be given a draft of the dissertation at least one week prior to its submission to the Graduate School. The final copies of the dissertation must be submitted to the Graduate School one week prior to the final oral examination. It is the responsibility of the student to ensure that all appropriate forms are submitted to the Graduate School. A copy of the 'Guide for Preparation of Theses and Dissertations' is available from the Director of Graduate Studies.

Final Seminar

Each student is required to present a public seminar prior to their final examination. It is recommended that this seminar is scheduled on the same day as the Final Examination, to ensure that all committee members have an opportunity to see the results of the students research first-hand.

Final Examination

The final examination allows each Ph.D. student an opportunity to defend their dissertation at an oral examination conducted by their supervisory committee. The student should contact the Director of Graduate Studies to schedule this exam at least two weeks in advance of its proposed date. Successful defense of the dissertation requires the affirmative vote of the committee chair and not more than one negative vote. If the student fails the final examination, he or she may be permitted a re-examination, pursuant to the approval of the committee, the Director of Graduate Studies and the Dean of the Graduate School. The second examination may not be taken sooner than six months from the date of the first. Failure in the second examination bars the candidate from further work towards the Ph.D. degree.

4. Student Support

Financial support of Ph.D. students in the MSC Ph.D. program will be the responsibility of the MSC Division. Students will be supported with teaching assistantships

(with Divisional funds), research assistantships (with support from external grants), external fellowships (NSF, NIH, etc.) or by endowed fellowships. Students in their final year of study will be given priority for endowed fellowship support to facilitate completion of their dissertation. It is *expected* that students will complete their programs of study in *no more than five years*. Students who are supported by MSC funds (teaching assistantships or endowed fellowships) will *not* continue to receive MSC funding after their fifth year of study. Assignment of teaching assistantships and endowed fellowships will be made by the Director of Graduate Studies, following consultation with the Chair and faculty of the Division.

5. Administration

The Ph.D. concentrations in Marine Science and Conservation will be administered by the Director of Graduate Studies (DGS) for the MSC Division, appointed by the Dean of the Graduate School. Administrative support to the Director of Graduate Studies will be provided by the MSC Division. An executive committee, consisting of the DGS and one member from each concentration will serve as the admissions committee.

Appendix A. Faculty with Primary Appointments in the MSC Division

Richard T. Barber

PhD, Stanford, 1967. Thermal dynamics and ocean basin productivity.

Celia Bonaventura

PhD, Texas, 1968. Structure-function relationships of macromolecules; biotechnology.

Joseph Bonaventura

PhD, Texas, 1968. Marine biomedicine, protein structure-function relationships.

Lisa M. Campbell

PhD, Cambridge University. Coastal zone management, marine fisheries management.

Larry B. Crowder

PhD, Michigan State, 1978. Marine ecology and fisheries oceanography.

Karen Eckert

PhD, University of Georgia, 1988. Sea turtle biology and management.

Scott Eckert

PhD, University of Georgia, 1989. Endangered species research and management.

Richard B. Forward, Jr.

PhD, California, Santa Barbara, 1969. Physiological ecology of marine animals.

Patrick N. Halpin,

PhD, Virginia, 1995. Marine geospatial analysis.

William W. Kirby-Smith

PhD, Duke, 1970. Ecology of marine-freshwater systems.

Michael K. Orbach

PhD, California, San Diego, 1975. Coastal and ocean policy and management.

Joseph S. Ramus

PhD, Berkeley, 1968. Algal ecological physiology; estuarine dynamics; biotechnology.

Andrew J. Read

PhD, Guelph, 1989. Conservation biology of long-lived marine vertebrates.

Daniel Rittschof

PhD, Michigan, 1975. Chemical ecology of marine organisms.

Appendix B. Similar Ph.D. Programs Elsewhere

1. Marine Biology

Scripps Institution of Oceanography

Approximately 35 faculty members participate in the Scripps Graduate Marine Biology curricular program. A graduate department of the University of California at San Diego, This program concentrates on the interactions of marine organisms with the physical and chemical environment, as well as molecular biology, biochemistry, physiology, biomechanics, biotechnology, biomedicine, genetics, ecology, and evolutionary biology. Scripps biologists investigate the fundamental processes affecting life and energy flow in marine ecosystems. They examine biodiversity at multiple levels, and explore most marine habitats, including coral reefs, the deep sea, polar regions, the nearshore, and coastlines.

UC Santa Barbara

The Department of Ecology, Evolution, and Marine Biology (EEMB) at the University of California, Santa Barbara is comprised of approximately 35 faculty research groups and supports approximately 100 graduate students. Approximately 15 faculty participate in the graduate program in Marine Biology and Biological Oceanography EEMB offers a broad array of research in these areas ranging from marine pharmacology and physiology to coral reef, coastal, deep sea, and open ocean ecology.

Stanford University

Marine Biology is one of four focal graduate research areas in the Department of Biological Sciences at Stanford. Much of this work is conducted at the Hopkins Marine Station, a facility that operates as a branch of the Department of Biological Sciences. The Station is a permanent home to nine faculty members, and approximately forty graduate students and postdoctoral fellows. Research at Hopkins addresses fundamental questions in biology with particular focus on marine organisms and the marine environment. Both field and laboratory studies emphasize the unique adaptations of marine organisms in studies of basic molecular, cellular and physiological functions. Graduate students may either conduct a rotation at Hopkins or choose to complete their graduate work in one of the laboratories located there.

University of Miami

The Rosenstiel School of Marine and Atmospheric Science at the University of Miami is one of the largest marine biology programs in the United States. The School supports more than 100 faculty members and 190 graduate students. Within the School, the Division of Marine Biology and Fisheries (MBF) focuses on various fields, including: biochemistry of marine toxins, coral reef studies, biological oceanography and marine biology, fisheries biology and aquaculture, and the biology and behavior of marine vertebrates. Ph.D. students in MBF may choose from a diversity of subject areas for their research and courses.

2. Marine Conservation Biology & Policy

Scripps Institution of Oceanography

Research and graduate education in marine conservation biology and policy at Scripps are housed in the Center for Marine Biodiversity and Conservation. Approximately 20 faculty and adjunct scientists participate in this program, although the number of core faculty resident at Scripps is quite small. The program recently received an Integrative Graduate Education and Research Traineeship (IGERT) from the National Science Foundation (NSF) to link natural, social and informatic sciences in this area. The program is designed to train the next generation of scholars capable of confronting important biological and societal issues with respect to the health of the world's oceans.

Appendix C. Recent (2001-2006) Ph.D. Graduates Supervised by MSC Faculty

James Abbott (2005)

Advisor: Lisa Campbell
Lecturer, Temple University

Tara Cox (2003)

Advisor: Andrew Read
Assistant Professor, Savannah State University

Jonathan Cohen (2004)

Advisor: Richard Forward
Assistant Professor, University of South Florida

Kevin Craig (2001)

Advisor: Larry Crowder
Assistant Professor, Florida State University

Caterina D'Agrosa (2003)

Advisor: Andrew Read
Post-doctoral Fellow, Arizona State University

Lisa Eby (2001)

Advisor: Larry Crowder
Assistant Professor, University of Montana

Ari Friedlaender (2006)

Advisor: Andrew Read
Post-doctoral Fellow, Marine Geospatial Laboratory, Duke University

Will Figueira (2002)

Advisor: Larry Crowder
Post-doctoral Fellow, University of Technology, Sydney, Australia

Damon Gannon (2003)

Advisor: Andrew Read
Assistant Scientist, Bowdoin College

Kristen Hart (2005)

Advisor: Larry Crowder
Research Scientist, U.S. Fish & Wildlife Service, St. Petersburg, FL

Marshall Hayes (2001)

Advisor: Richard Barber
Post-doctoral Fellow, Observatoire Océanologique Européen, Centre Scientifique de Monaco

Michael Hiscock (2004)

Advisor: Richard Barber

Post-doctoral Fellow, Princeton University

Hsin-Drow Huang (2004)

Advisor: Daniel Rittschof

Postdoctoral Fellow, Biology Department, Duke University

Lakelia Jenkins (2006)

Advisors: Larry Crowder & Mike Orbach

AAAS Fellow, National Oceanic and Atmospheric Administration

David Johnston (2004)

Advisor: Andrew Read

Research Scientist, Pacific Islands Fisheries Science Center, NOAA

Jennifer Keller (2002)

Advisor: Pat McClellan-Green

Research Scientist, National Institute of Standards and Technology, Charleston SC

Heather Koopman (2001)

Advisor: Andrew Read

Assistant Professor, University of North Carolina at Wilmington

Sean Lyman (2002)

Advisor: Bill Kirby-Smith

Student, University of North Carolina Medical School

Robert Meyer (2004)

Advisor: Richard Forward

Assistant Professor, University of Puerto Rico

Greg Piniak (2001)

Advisor: Bill Kirby-Smith

Research Scientist, Southeast Fisheries Science Center, NOAA

Melissa Snover (2002)

Advisor: Larry Crowder

Research Scientist, Pacific Islands Fisheries Science Center, NOAA

Andrew Westgate (2005)

Advisor: Andrew Read

Research Associate, University of North Carolina at Wilmington

Appendix D. Profiles of Current Students

Students in Marine Biology

Joshua Osterberg

B.S. Biology, 2001, College of William & Mary

Dissertation Topic: Ecophysiology of Hydrothermal Vent Organisms

Advisor: Dan Rittschoff

Expected Graduation: 2008

Ph.D. Course Work at Duke:

Tropical Ecology

Applied Regression

Statistical Analysis of Ecological Data

Ecology of Chemical Signals

Environmental Biochemistry

Sensory Physiology and Behavior of Marine Animals

Light and Life

Urban Tropical Ecology



Grants and Awards:

Duke University Graduate Award for International Research

Tracy Ziegler

M.S., 2002, Florida Institute of Technology

B.S., 1999, University of Maryland

Dissertation Topic: Larval release rhythms and larval behaviors of spiny lobsters

Advisor: Richard Forward

Expected Graduation: 2008

Ph.D. Course Work at Duke:

Experimental Statistics for Biology

Applied Data Analysis for Environmental Science

Photobiology and Visual Ecology

Introduction to Research SCUBA Diving

Introduction to Scientific Writing

Light and Life



Grants and Awards

Mary Derrickson McCurdy Fellowship

Duke University Preparing Future Faculty Fellowship

Duke University Teaching Mini-Grant

Duke University Graduate School International Travel Grant

National Science Foundation Graduate Research Fellowship

National Science Foundation K-12 Teaching Fellowship

Students in Marine Conservation Biology & Policy

Janna Shackeroff

B.A. Earth and Environmental Sciences, 2001, Wesleyan University.

Dissertation Topic: Traditional Ecological Knowledge of Native Hawaiian Elder Fishermen

Advisor: Larry Crowder

Expected Graduation: 2008

Ph.D. Course Work at Duke:

Social Science Survey Methods

Biological Statistics

Environmental Management

Marine Research Design

Marine Ecology



Grants and Awards:

Mia Tegner Memorial Grant in Historical Ecology

NSF K-12 Teaching Fellowship

Catherine McClellan

M.S. Environment, 2001, Duke University

B.S. Zoology & French, 1993, University of Wisconsin

Dissertation Topic: Spatial Ecology of Sea Turtle Movements in the North Atlantic

Advisor: Andrew Read

Expected Graduation: 2008

Ph.D. Course Work at Duke:

Geospatial Analysis in Marine & Coastal Environments

Spatial Analysis in Ecology

Animal Movement Tools

Bayesian Analysis of Animal Telemetry

Grants and Awards:

Archie Carr Award, Best Conservation Paper, International Sea Turtle Symposium



Appendix E. Draft Text for Graduate Bulletin

Marine Science & Conservation

Professor Van Dover (Chair); Associate Professor Read, Director of Graduate Studies; Professors Barber, Bonaventura, Bonaventura, Corliss, Crowder, DiGiulio, Forward, Hinton, Kramer, Linney, Lozier, McClay, Pimm, Ramus, Richardson, Rittschof; Associate Professors Murray, Pratson; Assistant Professors Campbell, Smith; Professor of the Practice Orbach; Associate Professors of the Practice Halpin, Kirby-Smith.

The Division of Marine Science and Conservation, one of three academic units in the Nicholas School of the Environment and Earth Sciences, offers graduate study for students wishing to earn the Ph.D. degree. The Division offers two Ph.D. concentrations: Marine Biology; and Marine Conservation Biology and Policy. Doctoral students in both concentrations emphasize research as a major part of their degree programs. The concentration in Marine Biology is designed to prepare students for careers in university teaching and research. This concentration requires students to concentrate their study and research within a well-defined subject area in marine biology and ecology. The concentration in Marine Conservation Biology and Policy is designed to ensure that students receive detailed training in either natural or social science while, at the same time, are able to synthesize information from both fields. Students in this concentration will be prepared for careers either in university teaching or research, or outside of the university involving the application of science to policy-making. Applicants are strongly encouraged to contact individual faculty members with whom they wish to work prior to applying to the Graduate School.