The Strategic Plan of the Nicholas School of the Environment:
Changing With the Times
January 2010

Executive Summary

Adapting to changing times, building on core strengths, maintaining focus on our mission to create knowledge and leaders of consequence for a sustainable future, and responding to the economic crisis by aggressively seeking out new opportunities and revenues: these are the themes of the Nicholas School’s strategic plan. The plan is grounded on the premise that addressing complex environmental problems requires more than a knowledge of the natural sciences and social sciences; also needed is an understanding of the coupling, feedbacks and connections between the natural world and human institutions. The Nicholas School, and more generally Duke, with its broad faculty and multi-disciplinary culture, is ideally positioned to excel in this natural-social science arena.

We will leverage our multi-disciplinary strengths and the resources of Duke’s other schools and signature institutes, particularly those of the Nicholas Institute, to address four critical environmental issues: climate and sustainable energy systems, provision of ecosystems services, marine systems and governance, and protecting human and environmental health. In each case our work will emphasize the development of effective solutions as well as an understanding of the root causes and impacts of environmental change. To facilitate cross-disciplinary collaboration, the faculty will organize into cross-divisional research working groups for each of the four focus areas.

Our academic programs are thriving, indeed growing, but excellence demands continuing innovation. In our professional master programs, our flagship degrees, we will emphasize training a new kind of professional - the “hybrid environmental professional” with acumen and knowledge in business, law, public policy, and engineering as well as the environment. We will enhance the professional skill-sets of our graduates and we will grow our concurrent degree programs with Fuqua, Law, Pratt, and Sanford. A global presence is critical to any environmental program and we look forward to launching an international professional degree program.

We currently administer three Ph.D. programs and participate in three university doctoral programs. We will build greater connectivity for students across these programs and will enhance support and opportunities for students to pursue research opportunities during the summer months. In undergraduate education, we will contribute to the academic commitments of Duke’s Climate Action Plan by offering undergraduates a greater menu of courses and extra-curricula activities.

Through our initiatives in art and the environment we aim to forge new, non-traditional partnerships within and outside the Duke community. Our LEAF award, for Lifetime Environmental Achievement in the Fine Arts, will bring a renowned artist whose works feature the environment to the Duke campus each year. We look forward to working with Duke faculty to develop new courses and experiential opportunities for students interested in using the arts to explore environmental issues.

The Nicholas School is fortunate to be at a world-class university with a world-class faculty committed to excellence. - We are committed to our mission and look forward to making greater strides by integrating across our historical divisions, focusing on society’s most pressing environmental problems, and building educational programs that generate environmentally literate citizens, a cadre of professionals with the knowledge and skills to effectively manage environmental resources, and a new generation of scientists and academics to build and expand our understanding of how natural and social systems operate and interact.

1. The Planning Environment
The Nicholas School has continued to thrive and grow since its last strategic plan was completed three years ago, and yet much has changed in the interim. There is a growing demand for timely information and analysis of environmental processes and their related social institutions to address critical problems facing society. The level of competition among academic programs in the environment for resources and students is intensifying.

In response, the Nicholas School has undertaken a new assessment of its priorities, organization, and operating procedures. Key to this new assessment was a decision to use the anticipated losses in endowment revenues as an opportunity to aggressively seek additional revenues elsewhere rather than as an imperative for immediate cuts and retrenchment. This document reflects the fruits of that assessment and outlines a new vision for how the School intends to move forward in the coming years. This vision does not reflect a major departure from the Strategic Plan of 2006 but, rather, a re-focusing of those plans.

2. School Priorities

2.1. Enhance Multi-Disciplinary Strength to Address Major Environmental Issues

Increasingly universities are being called upon to address socially relevant issues. For example, of the 14 “Grand Challenges” identified for the coming century by the National Academy of Engineering, not a single one was disciplinary; all addressed problems facing society – and six were related to the environment. Similarly, Duke University has embraced the theme of “knowledge in the service of society.” The Nicholas School’s mission sounds a similar chord – we fulfill that mission by helping to resolve the major environmental issues facing society.

Like many contemporary problems, addressing environmental problems requires a multi-disciplinary approach. But what kind of multi-disciplinary approach? For many years environmental issues were studied through the lens of the natural sciences, and the term ‘multi-disciplinarity’ meant combining the physical and life sciences. Such multi-disciplinarity is important and is characteristic of the Nicholas School, but it omits what is arguably the greatest driver of environmental change on the planet – people and their social institutions. Addressing the environmental problems facing society demands a strong understanding of the coupling between the natural sciences and the social sciences and the feedbacks and connections between the natural system and human institutions. Indeed the importance of this approach is reflected in the fact that the National Academy of Sciences listed Institutions and Resource Use as one eight ‘Grand Challenges in Environmental Sciences.’

The Nicholas School is ideally positioned to excel in this natural-social science arena. We have an unusually broad faculty with expertise ranging from the physical and life sciences to the social sciences; and there is significant diversity within each of the natural and social science areas. Moreover, we have one of the only professional master’s programs in environmental management that focuses on understanding the environment at the nexus of the natural and social sciences. Our strategic plan aims to build upon this strength: building a multi-disciplinary program that is strong and rigorous in both the natural and social sciences and in their interactions.

2.1.1 School Structure

The Nicholas School is a multi-faceted organization; it has a faculty governed by university rules with regard to hiring, promotion and tenure; disciplinary and multi-disciplinary Ph.D. programs; multidisciplinary professional master’s tracks underpinned by professors of the practice as well as tenure track faculty; disciplinary and multidisciplinary undergraduate majors and certificates, and wide-ranging disciplinary and interdisciplinary research programs aimed at addressing diverse environmental and earth science issues.

The current School structure supports these facets of the school, but can be improved to build upon its natural-social science capabilities. The 2006 strategic plan was based in large part on historical precedent and included three divisions, pursuing a menu of eight distinct focal areas, some at the natural-social science nexus but others not. For the Nicholas School to more
effectively fulfill its mission, and to maintain its pre-eminent position among similar programs in the world, a revised structure is needed: one that is more policy-relevant, more issues-oriented, and more multi-disciplinary; one that allows us to make significant contributions to the major environmental issues of our time and of future generations; and one that will attract and retain the best faculty and students to our program.

We will revise the School’s structure to maintain efficient faculty governance and Ph.D. program administration, while enhancing interaction and collaboration across divisions and disciplines. The faculty will remain organized in three divisions, each with responsibility for hiring, promotion and tenure decisions and for administering a Ph.D. program (as well as participating in university doctoral programs). However, unlike the present structure, each will cross the disciplines, with faculty from both natural and social sciences. The distinction between divisions will be in the nature and scale of the earth and environmental processes on which their faculty focus, rather than their disciplines:

1. The Division of Environmental Science and Policy: focusing on the study and management of terrestrial ecosystems, inland water resources, and their interactions with society/social institutions and administering the Environment (ENV) Ph.D. and participating in the University Ph.D. Programs in Ecology (UPE) and in Environmental Policy, and the Integrated Toxicology Ph.D. Certificate program.
2. The Division of Marine Science and Conservation: focusing on the study and management of marine and coastal ecosystems and their interactions with society/social institutions, administering the Marine Science and Conservation (MSC) Ph.D. and participating in the UPE and Integrated Toxicology Ph.D. programs;
3. The Division of Earth and Ocean Science: focusing earth processes that couple terrestrial, marine and human systems at regional and global scales and administering the Earth and Ocean Sciences (EOS) Ph.D. program. This reflects a new and broader agenda for the EOS Division that combines the social and natural sciences.

In addition to the divisions, there will be three Disciplinary Faculties in social sciences, physical sciences, and life sciences. The Disciplinary Faculties will assist the divisions in faculty recruitment, mentoring, promotion and tenure, and curriculum development within their disciplines, but appointment, promotion, and tenure will rest with the Divisions. Each of the Disciplinary Faculties will have a chair, elected to a two-year renewable term by the members of the group, who will serve as the point of contact.

Implementing these structural changes will require modest changes to the faculty bylaws and a broadening of the mission of the Division of the Earth and Ocean Sciences.

2.1.2. Research Initiatives
Using its natural-social science focus as a springboard, we intend to significantly increase the school’s external funding (~25% in total funding; ~75% increase in F&A) in three years’ time, in part to mitigate anticipated losses in endowment income. To reach this goal, our faculty will self-organize around multi-disciplinary research initiatives directed toward addressing society’s most serious problems. These initiatives will use an *ad hoc* matrix approach (see graphic) that seeks to:

1. Understand the causes and impacts of key and urgent environmental problems (the vertical direction in the graphic). The initial foci will be
   - Climate change
   - Scarcity of Clean Water
   - Degrading ecosystem function and biodiversity

2. Craft effective solutions to these problems (the horizontal direction). The initial foci will be (see detailed descriptions of each below):
   - Sustainable energy systems
   - Provision of ecosystem services
   - Marine systems and governance
Protecting human and environmental health

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<tr>
<th>WORKING GROUPS CRAFTING EFFECTIVE SOLUTIONS</th>
<th>THE MAJOR ENVIRONMENTAL PROBLEMS OF OUR GENERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable energy systems</td>
<td>Climate Change</td>
</tr>
<tr>
<td>Provision of ecosystem services</td>
<td>Scarcity of Clean Water</td>
</tr>
<tr>
<td>Marine systems and governance</td>
<td>Degradation of Ecosystem Function and Biodiversity</td>
</tr>
<tr>
<td>Protecting human and environmental health</td>
<td></td>
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The School’s faculty will organize around *ad hoc* Working Groups designed to help craft solutions to critical environmental problems.

There are multiple connections between the environmental problems and the solutions in this matrix. For example, solutions to water resource problems can involve energy, ecosystems, marine systems, and/or human health protection. Similarly, design of a sustainable energy system would necessarily consider climate change, water, and ecosystems. For this reason, achieving our objective will require a highly interactive faculty and a decision-making process that considers the breadth and diversity of research and teaching demands in the school. To help implement these objectives: (i) A new administrative position – the Associate Dean for Research – will be created and given responsibility for facilitating these crosscutting research groups. (ii) We will form four Working Groups that will work with the Dean for Research on the preparation and submission of proposals and the development of hiring priorities; (iii) Representatives in the Disciplinary Faculties and Working Groups will serve as primary points of contact for input on priority setting; and (iv) A School Priorities Committee (see Section 2.3) will be formed to help coordinate the setting of priorities for hiring.

2.1.2.1. Sustainable Energy Systems

Climate change, along with concerns over the accessibility and costs of traditional energy resources, is driving a transformation in the energy production and delivery system that underpins our way of life. The Nicholas School, in collaboration with the Nicholas Institute, the Pratt School of Engineering, the Fuqua School of Business, and the Sanford School of Public Policy, is focusing on critical issues related to the design and implementation of an improved energy system that is both environmentally and economically sustainable.

1. *Carbon Capture and Sequestration*: Significant reductions in GHG emissions from energy use will likely require carbon capture and storage in biological reservoirs within terrestrial ecosystems and underground in geologic formations. Our research in this area will focus on both types of storage. Through experimental sites like those currently in the Duke Forest we will seek to understand the underlying biological and ecological processes that control carbon uptake by terrestrial forests and through geospatial analysis we will assess the design of a U.S. carbon capture and sequestration system that optimally connects carbon capture plants to...
sequestration sites and also accounts for the legal, technical, institutional, policy, and social barriers that may inhibit the implementation of such a system.

2. **Energy Generation & Transmission:** As the energy sector adapts to a carbon-constrained economy, power generation will increasingly draw upon non-hydro renewable energy resources. These tend to be intermittent and concentrated in regions that are often mismatched to demand centers and existing transmission lines. Our work in this area will focus on the cost and feasibility of bringing about significant market penetration of renewable energy through the use of different resources mixes, a “smart grid” for better power transmission and grid reliability, and energy storage to offset renewable energy intermittency.

3. **Carbon Market Design:** The effectiveness of different carbon market policies, regulations and incentives can be evaluated through the use of economically based energy modeling systems; in the U.S. the National Energy Modeling System (NEMS) is most commonly used. But the NEMS has limitations. We, in collaboration with the Nicholas Institute of Environmental Policy Solution, are in the process of assembling a research team to expand and improve the capabilities of NEMS and use it to better understand the impediments to market penetration of low-carbon alternatives under various market-based policies.

4. **Energy & Water:** New energy-related technologies such as carbon storage, biofuels, and oil production from shale will also require large amounts of water. With climate change predicted to bring increasingly dry conditions to large regions of the country, policymakers and electric utilities are being forced to develop economically viable options for addressing water shortages while ensuring a stable power supply. Important scientific and policy issues for investigation are at the intersection of power, water quality, climate, and drought.

- A few key, high profile hires could elevate the impact and breadth of Duke energy studies. Some of these are opportunities for joint hires; e.g., energy technology, finance, law, and international development; others are within the Nicholas School: e.g., climate prediction, watershed ecology, terrestrial ecology, biomass assessment, and life cycle analysis.

2.1.2.2. **Provision of Ecosystem Services**

Ecosystem services refer to those tangible products (food, water and fiber) and functions (watershed protection, shoreline protection, recreational opportunities) that ecosystems provide to humans. The value of ecosystems services to society is hard to calculate but is most certainly significant. By one estimate, some 60% of the world’s ecosystems are degraded. This makes the provisioning of ecosystem services an appropriate and fertile focus area for the school.

By definition, the term ‘ecosystem services’ connotes a coupling of natural systems and human institutions and invokes disciplinary expertise in ecology (the production of the services), economics (valuation of those services, including decision frameworks as well as monetization), and policy (implementation and governance of markets for the services). The Nicholas School, in active collaboration with the Nicholas Institute, the Sanford School of Public Policy, and the Law School (the Duke Environmental Law and Policy Clinic), is uniquely positioned to play a prominent role in all three components of ecosystem services.

1. **Provision of Water:** By far, the ecosystem service most valued by citizens is the provision of adequate clean water, and thus this service will be a major focus of our ecosystem services research activity. This in turn will require expertise in a wide-range of disciplines including hydrology and climate change, coupled carbon and water cycles, wetland mitigation and restoration, watershed management aimed at high water quality, and emerging issues in markets for carbon, surface water quality, and habitats. To excel in this work the School needs to add expertise in surface hydrology (i.e., the routing of water over land) as well as in the large-scale hydrological cycle and its response to climate change.

2. **Land use** practices affect the provision of ecosystem services as much as any other single factor, and thus will be another area of emphasis. This area also links to parallel efforts related to land use change and its implications for populations and communities. Excelling in this area requires expertise in the social science perspective on land use and land use change.
2.1.2.3. Marine Systems and Governance

Current and developing strengths of the School in marine themes include marine spatial planning, the impact of climate change on marine systems, watershed health and coastal communities, and marine technology development.

1. **Marine Spatial Planning** calls for strategic and forward-looking planning for regulating, protecting, and managing the marine environment. The faculty is well positioned to respond to developing national ocean policies in this area. They already contribute substantively to developing visions for national and state coastal and ocean policies through briefings and testimonies, working papers, policy papers, and service on advisory committees to Congress and the President. There are opportunities to work with the Nicholas Institute and others on campus to maintain and expand our leadership in this arena. The School would increase its profile and be able to contribute to more global needs were it to have on its faculty a leader in international governance in marine systems.

2. **The impacts of climate change on marine systems** include sea level rise, ocean acidification, melting ice sheets, and degraded habitats. This is a broad area of research with numerous funding opportunities. A new ad hoc working group focusing on climate change and marine mammals has formed and is exploring avenues for new funding as well as international partnerships. An important opportunity for growth is in the study of the consequences of ocean acidification from the perspective of coupled human and natural systems. The Nicholas School and Nicholas Institute have many of the elements of social and natural science expertise that would contribute to such an enterprise, but there is need for a senior scientist who can develop this frontier of cross-disciplinary research.

3. **Watershed health and coastal communities** have long been themes of sponsored research programs in the School. Probably one of the most pressing watershed problems related to coastal communities is the appearance of ocean dead zones from river runoff pollution. Strengthening the school’s expertise in watershed science would enhance our ability to address this issue in a comprehensive way.

4. **Marine technology** is one of the prime limitations to progress in a wide array of marine science problems. Strong links to the Pratt School of Engineering and to the Institute for Genome Sciences and Policy help to position the School as a leader in finding technology solutions for ocean science research and conservation issues.

2.1.2.4. Protecting Human and Environmental Health

Duke, by virtue of the Nicholas School’s Ecotoxicology and Environmental Health program, its ties to the Pratt School of Engineering, and its collaboration with various Medical Center programs such as the Comprehensive Cancer Center and the Duke Global Health Institute has a remarkably strong program in human health and the environment. Evidence of such is Duke’s Center for Environmental Impacts of Nanotechnology, sponsored by NSF and EPA. Important areas for renewed emphasis lie in cancer and the environment, nanoparticles, persistent and emerging pollutants, the exacerbation of water-borne diseases from climate and land use change, community health, and interconnections between human health and ecosystem integrity. Given the broad array of expertise in this area and the presence of the Nicholas Institute, Duke is positioned to develop a comprehensive “pollution to solution” program that tracks pollutants from their source to specific health endpoints and then develops policies to mitigate the health impacts. To facilitate this initiative we will need to build much stronger collaborations with the Medical Center, as well as hire new faculty to provide expertise in environmental epidemiology, disease ecology, risk assessment, molecular population biology, and measurement of water contaminants.

2.2 Academic Programs

The Nicholas School administers four undergraduate degree programs for students enrolled in Trinity College - an AB and BS in Environmental Sciences and an AB and BS in Earth and Ocean Sciences; and co-hosts two undergraduate certificate programs (Energy and Environment,
and Marine Conservation Leadership). We offer three Ph.D. degrees, in Environment, Earth and Ocean Sciences, and Marine Science and Conservation, and participate in university Ph.D. programs in Ecology and in Environmental Policy, and the certificate program in Integrated Toxicology. The Nicholas School’s professional masters program awards Master of Environmental Management and Master of Forestry degrees, with dual degree programs partnering with the Fuqua School of Business, the Law School, the Sanford School of Public Policy, the Pratt School of Engineering and the Masters of Arts in Teaching program. We offer the distance-learning Duke Environmental Leadership Master of Environmental Management program for practicing environmental professionals.

2.2.1. Undergraduate Programs

The School’s undergraduate programs are healthy and functioning well. Over the past four years, overall undergraduate enrollments have doubled (to ~1600 students per year); the number of declared ENV and EOS majors has doubled (currently, ~130 declared majors, and an additional 55 minors); and the undergraduate certificate programs continue to grow (59 students enrolled in Energy and Environment; 19 enrolled in Marine Conservation Leadership).

The Nicholas School offers also an exceptional undergraduate experience at the Marine Lab, where students can spend a semester in Beaufort taking environmental science courses and core undergraduate requirements – many unique to the Marine Lab. Student enrollment is short of capacity and the School is engaged in initiatives that have reinvigorated the program and increased student enrollment. These include publicizing the program to Duke students through a variety of avenues and a revised curriculum. The results of the initiative are encouraging but further increases in enrollment are needed.

There is a growing interest in sustainability among undergraduate students. The university is adopting a Climate Action Plan as part of the President’s Climate Commitment, and the School expects to play a significant role in the educational goals of the Plan (described in Section 4.1). In addition, a campus-wide initiative in energy and environment is underway.

2.2.2. Professional Master’s Programs

The signature degrees of the Nicholas School are its Master of Environmental Management and Master of Forestry programs, designed to train environmental professionals to solve environmental problems and manage natural resources. Graduates of these programs are expected to understand the fundamental natural environmental sciences, as well as the social, political, and economic factors that determine effective policy solutions, and to have the skills to be successful in the workplace. The Nicholas School’s professional program, both its on-campus and distance learning (DEL) components, has been enormously successful. It has produced thousands of graduates who currently work in the public, non-profit, and private sector making important contributions, and it has served as a model for other environmental programs around the nation. This past year has been one of the Nicholas School’s most successful student recruitment years.

Nevertheless, the time is again ripe for innovation to: (i) provide additional workplace-relevant skills to our graduates; (ii) expand their multidisciplinary, multi-professional opportunities; and (iii) add an international component; while also (iv) streamlining the course offerings to make more efficient use of faculty resources. At the same time, we envision increasing our enrollment over 2008-09 numbers by about 40% for the next 3 – 5 years to meet the increased demand for professional training in environmental management during the economic downturn.

2.2.2.1. Enhancing Professional Leadership Skills

The Nicholas School’s diverse master curricula produce professionals with the academic knowledge to understand and address a changing array of environmental issues. We do not want to lose that characteristic, but we also want to provide our graduates with the professional management and leadership skills they need to be effective in the workplace. We have begun and will continue to modify the program to enhance our students’ command of professional skills (e.g., communication, project management, financial management) through a combination of
formal coursework, group project experiences, and nonacademic internship placements and mentoring by practicing professionals. We piloted a new case-study based course on management skills during the Fall 09 semester and are considering teaching core subjects in environmental social science and analytical methods as a series of several-week modules that students take in varying sequences, depending upon their interests and backgrounds. In the Spring ‘10 we will form a Nicholas Professional Visiting Committee consisting of successful environmental practitioners and other leaders in the private and public sectors to review our program’s effectiveness in training our students to succeed as environmental leaders in the workplace.

2.2.2.2. The Hybrid Environmental Professional

More and more environmental managers are called upon to have multiple skill sets; in addition to environmental expertise, acumen and knowledge in business, law, public policy, and engineering is critical. It is our aspiration that Duke will be the leader in training these kinds of practitioners - the hybrid environmental professionals. Toward that end, Duke has developed dual degree programs between Nicholas and its other professional schools. To increase enrollment and attract the highest quality students, we are raising an endowment fund specifically to provide financial aid for hybrid professional students at Nicholas. We are also working with the other Duke schools to simplify and streamline the application process, provide a one-stop shop for student advising, and be more proactive in student recruitment. The staff and faculty of Fuqua and Nicholas have made significant progress in this regard over the past year and we have seen a significant increase in enrollment. We are now working with Pratt to make similar improvements and envision doing the same with the other schools in the out-years of the plan.

2.2.2.3. Internationalization of Nicholas Professional Master’s Programs

Many of the environmental problems our graduates will face in their careers will have global dimensions and so the School must have a global reach. To some extent we can accomplish this with more financial aid for international students, international internships for U.S. students, and coursework with international dimensions. Perhaps more significant will be the development of master’s programs located outside the United States. Plans for such a program are discussed in Section 5.

2.2.2.4. More Efficient Program

Meeting the needs of our students, and the diversity of concentration areas they may choose from, competes for faculty time with our other educational programs and with faculty research. Given the increased enrollment we foresee in the coming years, our current model may not be sustainable. The challenge is to develop a more efficient model for our professional programs without sacrificing the pedagogical experience of our students. Planned modifications include:

1. **Program Tracks:** The School currently has eight program tracks in its professional programs; some are highly subscribed, others have but a handful of students. Carrying undersubscribed tracks can create inefficiencies and provides a less than ideal experience for the students enrolled in those programs. However, each program track represents an important area that we do not want to abandon. We are developing alternatives to the current track alignment; for example retaining the elements of the undersubscribed program tracks but rearranging those elements into new or existing program tracks that are more marketable.

2. **Core Courses:** Program tracks are highly specialized, requiring many small classes. To provide a base of core knowledge for all students we will develop a key set of courses that all professional students will take (a pilot course was offered in the Fall ‘09 - Environmental Program Management; team-taught, case-study based; and a professional communications course, to be paired with the management course, is being developed for Fall ‘10).

3. **Master’s Projects (MP):** The program currently requires each student to complete an MP. However, individual MPs require a large faculty commitment and are not well-suited to all our students or their career goals. We began to offer client-based group Masters projects in Fall 2009, and held a retreat in January 2010 to determine how to expand this further. Roll-
out of this alternative will likely require a full-time staff member to steward relationships with corporate, government and non-profit organizations and shepherd the projects through completion. A third MP alternative is capstone integrative courses; a capstone focused on forest ecosystems is planned for Fall ‘11.

4. Maintaining Quality: As we seek to become more efficient we must never lose sight of our number one priority – providing our students with a high quality educational experience. Toward this end we will put in place more formal procedures (e.g., annual surveys) to monitor student satisfaction.

2.2.3. Ph.D. Programs

An external review committee recently evaluated the School’s doctoral programs. While noting no major problems, they did make some recommendations for improvement. These recommendations and our responses are outlined below:

1. More faculty resources should be devoted to the Ph.D. programs relative to the professional master’s programs. We are addressing this as described in Section 2.2.2.4.

2. The admission and advisor policies should be changed to allow more time for new students to choose their area of concentration. We admit mature, entrepreneurial, self-motivated students ready to pursue their research projects and assist in educational program soon after matriculation, and analysis shows that our graduation rate is in line with similar programs and the percentage of our graduates in academic positions is relatively high (46% for ENV and 50% for EOS). The recommended change is not needed.

3. Graduate students should all be provided 12-months’ support. This past summer, we instituted a policy that leads to at least 11 months of support (only 10% of our doctoral students were without 12 months of support).

4. Steps should be taken to provide the students a greater sense of school community. A number of new initiatives, including funds specifically earmarked for Nicholas Ph.D. student organizations and an all-school seminar series are being instituted this year.

5. Teaching assistantships should be decoupled from the advisors. This has now been adopted.

2.3. Faculty Development

The Nicholas School’s status as a leading research and professional school poses both opportunities and tensions in balancing research and education, particularly with respect to faculty development. At the doctoral level, research and education usually align. At the masters and, to some extent, undergraduate levels, research and education sometimes align but sometimes do not. Moreover, quality professional education requires teaching and mentoring outside the usual scope of environmental science and policy research.

Meeting these diverse educational needs requires a creative mix of teachers - tenure track faculty with a major commitment to research; professors of the practice who have applied research/practice experience; non-faculty instructors and lecturers for professional development topics; contract instructors and mentors drawn from professionals. Because demands for these different kinds of faculty compete for limited resources, the School needs a process for setting faculty development priorities that balances these competing demands. Toward that end, the Dean will form a School Priorities Committee composed of the associate deans, the division chairs, and the chairs of the Faculty Council and Education Committee to develop hiring priorities.

2.3.1. Faculty Demographics

Another key issue in faculty development is the desire for a diverse faculty. An examination of the school’s key faculty demographic features suggests that demographics is an issue for the school to consider in the coming years.

2.3.1.1 Gender

The school has made some progress in increasing its gender diversity over the past 10 years. Since 1999, we have increased the tenured/tenure track faculty by 12 with 5 of those being female, resulting in almost doubling our female faculty in the tenure/tenure track category. In the non-tenure track category we have added two faculty members, both female. However, with a
female regular rank faculty contingent of just under 30% we are by no means where we want to be. Continued efforts to attract high quality female candidates will be needed.

2.3.1.2 Racial Diversity

Unlike that of gender, the school has not progressed significantly in the area of racial diversity and thus continued efforts similar to what we have already tried will not suffice; we need to explore new strategies for indentifying and hiring a more diverse racial mix of faculty and especially persons of color. Strategies being considered include holding an annual national environmental justice symposium on campus and joining and becoming active in organizations such as the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) http://www.sacnas.org/. We have recently pursued NSF funding to increase diversity of the professional masters student population, and this effort is synergistic with increased diversity among the NS faculty.

2.3.1.3 Age

The Nicholas School faculty are aging. Ten years ago a little over 10% of the faculty were over 60. Today 27% are over 60 and 13% are over 65. Moreover the age distribution is uneven across disciplinary foci, with the faculty of the Life Sciences being disproportionately older. This suggests that the School can look forward to a window of new hires as faculty retire, on the one hand, but it also suggests that the emphasis on new hires in the coming years needs to be on hiring at the assistant and associate professor level. If we sit back and wait for older faculty to retire, however, we are in danger of losing our competitive edge in key areas of strength within the School.

With these issues in mind, we have developed near-term and long-term hiring plans.

2.3.2. Near-Term Hiring Plan

Resources are always an issue in considering faculty hires, and they are especially critical in the current economic environment. However, because we are an aging faculty with some approaching retirement age, there is an opportunity to make a limited number of hires in the near term. Given resource limitations, the choice of what kinds of faculty must be particularly strategic.

With these issues in mind, we have identified water resources, and more specifically ecohydrology, as a target for new hires in the near term. This area combines the disciplines of ecology, hydrology, geology, climate and atmospheric physics, soil science, and plant physiology, and perhaps most importantly, is relevant to all four of the research Working Groups identified above; the need for expertise in water-related areas is a recurrent theme in the discussion in Section 2.1.2. Moreover, it will help provide the glue we need to build bridges across the divisions and make us more competitive in issues-oriented research. (It is also an area endorsed by the external review committee for future hires for the School.) We will undertake a two-year search for as many as four new faculty hires in ecohydrology, with at least one of these hires at the senior level. We are in active discussions with Duke’s Pratt School of Engineering, as well as with scientists at a national laboratory in the region, to expand the search to include joint and complementary hires as the basis for launching a larger collaborative program in water resources.

2.3.3. Longer-Term Hiring Priorities

In addition to ecohydrology there are other areas where new hires are needed as outlined in Section 2.1.2. These hires will be considered as resources become available and sequenced using the newly formed Priorities Committee.

3. The Nicholas School and the Signature Institutes

As a multi-disciplinary program, the Nicholas School finds much resonance with the missions and goals of the Duke’s signature institutes. Of particular note are those listed below:

3.1. Nicholas Institute for Environmental Policy Solutions (NIEPS)
Of all the institutes, we are most closely aligned with NIEPS. Institute staff share joint appointments and teach in the School and many of the School’s faculty work on projects in collaboration with NIEPS. We envision close integration of the School’s new research Working Groups with the initiatives and staff of the Institute:

- In the area of sustainable energy systems, our faculty already work closely with Institute staff on all three of the four foci areas highlighted in section 2.1.2.1 – carbon capture and sequestration; electricity generation and transmission, and carbon markets. Discussions on collaborative projects in water and energy are also underway.

- In the area of ecosystem services (2.1.2.2), a joint working group involving School faculty and Institute staff has already formed, meets regularly, and has developed joint proposals. This group will provide the kernel for the Working Group in ecosystem services called for in Section 2.

- In the area of marine systems (2.1.2.3) we have already formed a strong joint program in the area of marine spatial planning with the Institute’s Office of the Director of Ocean and Coastal Policy housed in Beaufort on the campus of the Duke Marine Lab.

The Institute also affords multiple opportunities for our students to gain hands-on experience in the policy arena – working as research assistants, as summer interns, and as fellows in the institute following graduation. This summer we plan to institute a new summer internship program in Washington, D.C. with two or more students working in the Institute’s DC office on projects that can lead to Master Projects under the tutelage of the Institute staff.

The School and the Institute also work together on issues related to sustainability. Along with the Fuqua School of Business we jointly administer the Corporate Sustainability Initiative. And our students and faculty have worked closely and continue to collaborate on the development and implementation of Duke’s Campus Sustainability Plan.

3.2. Duke Global Health Institute (DGHI)

The Nicholas School is working with the DGHI in developing a program in global environmental health, which seeks to understand the linkage between environmental degradation and health outcomes in the developing world. In fact, Randy Kramer of the Nicholas School is now heading this effort and we are searching currently for a joint hire in this area.

3.3. Institute of Genome Sciences and Policy (IGSP)

Microbial ecology and metagenomics involves the application of genomic techniques to elucidate the characteristics of ecological communities and populations and is fertile ground for collaboration between the Nicholas School and IGSP. In addition to existing collaborations, we anticipate making a joint hire in this area this coming academic year.

3.4. Kenan Institute of Ethics (KIE)

Ethics has an important place in the environment, both as an intellectual pursuit seeking to understand humanity’s place in the world and as a practical tool for establishing priorities to address environmental issues. However, the Nicholas School does not have an environmental ethics program. Collaboration with the KIE, for example with a joint hire, could help us better address these issues.

4. The Nicholas School as a Citizen of Duke Community

The Nicholas School is highly committed to the Duke theme of knowledge in the service of society. As a confirmation of this commitment we have adopted a new aspirational mission that echoes the university theme: creating knowledge and leaders of consequence for a sustainable future. The academic and research priorities discussed in Section 2 outline some of the steps we will take in the coming years to make good on that aspiration. Other steps are outlined here.

4.1 Undergraduate Education and Environmental Literacy

In 2007 President Brodhead signed the American College & University Presidents’ Climate Commitment to prepare a Climate Action Plan that, among other things, takes “actions to make climate neutrality and sustainability a part of the curriculum and other educational experience for
all students.” The Nicholas School bears the lion’s share of the burden to meet this aspect of the climate commitment. Toward that end we are working with the Dean of Undergraduate Education and the Vice President for Student Affairs to increase and diversify the learning opportunities for Duke students. Plans include the development of a Certificate in Sustainability and a new Focus Program cluster in Sustainability for first-year students. We have also instituted extra-curricular programs to raise environmental awareness. These include environmental video and photography contests, and a new lecture series called the Environment and Society Lectureship that will bring international leaders to Duke to interact with students. Nicholas School faculty, partnering with the NIEPS, also helped to develop the first Winter Forum for undergraduates on “Making the Green Economy Work.”

4.2 Initiatives in the Arts

The environment has long been a theme in artistic expression and the Nicholas School is committed to helping the Duke community to explore the role of the arts in enhancing our understanding and appreciation for the natural world. In this regard we will continue to work with Trinity faculty to develop and offer arts and humanities courses both in Durham and at the Marine Lab. In Fall ’09, for example, we partnered with Documentary Studies to offer a course in environmental photography in Durham, and with the English Department to offer a course in nature writing at the Marine Lab. Last year we instituted the Duke LEAF for Lifetime Achievement in the Fine Arts awarded annually to an environmental artist.

4.3. Environment and Society Lectureship

To facilitate a campus-wide discussion on the interactions between the environment and society and their role in crafting better and more effective solutions to the major problems of our generation, the School will bring an innovative thinker to campus each year as a Distinguished Lecturer. The first lectureship was held in the Fall 09 and featured Dr. Amory Lovins, a world leader in sustainable energy.

5. International Partnerships

Internationalization is a central and enduring theme at Duke, articulated most recently in the University strategic plan ‘Making a Difference.’ Environmental issues are central to many of the problems facing our global society and the Nicholas School is committed to increasing environmental understanding globally, and especially in regions of the world where economic development and environmental degradation are occurring at a breath-taking pace.

One aspect of this commitment will be to provide international opportunities for study to our students. We have established a Dean’s International Internship Fund to supplement other funds in support of international internships for our professional master students, and we have targeted India as special focus for the program. Toward that end we will have a visiting professor from IIT-Bombay at the school next year and will use that opportunity to develop a more formal internship and student exchange program with IIT-Bombay and other Indian institutions.

Longer term, there is the possibility of partnering with other Schools and Institutes at Duke to develop new joint degree programs in China that combine business, engineering, and environmental management training in an integrated curriculum.

6. Timeline for Implementation

The strategic plan outlined here calls for significant changes and adjustments in the way the school’s faculty is organized, the way priorities are set, and the functionality and content of the school’s academic programs, as well as for undertaking new initiatives in both research and education. It is unrealistic to expect that we can move forward on all of these fronts immediately. Instead a phased approach has been developed that calls for rapid implementation of those aspects of the plan that are more mature (e.g., collaborative programs with the Nicholas Institute of Environmental Policy Solutions) and slower, more measured steps for those that are less mature.
or require extended discussion and testing (e.g., revisions to our professional master programs).

7. Recap of Strategic Ambitions

The Nicholas School is at a watershed moment. For the past two decades Duke has led in the development of innovative academic environmental programs; for example, through the integration of the physical and social sciences and the implementation of a professional master’s program in environmental management. But times are changing. Other universities are now replicating the Duke model. At the same time, addressing environmental issues is becoming increasingly complex – more global and fundamentally tied to the economy and the social institutions that govern our lives. The time has come for the Nicholas School to evolve to meet these challenges. This evolution will involve a greater integration across our historical divisions, a greater emphasis on addressing society’s most pressing environmental problems, and building educational programs that generate environmentally literate citizens, a cadre of professionals with the knowledge and skills to effectively manage environmental resources, and a new generation of scientists and academics to build and expand our understanding of how natural and social systems operate and interact. Implementation of this Strategic Plan will be a significant step in Duke’s efforts to meet this challenge.