VII. STANDING COMMITTEE

A. Academic and Student Affairs Committee

In Joint Session With

B. Finance, Audit and Facilities Committee

Proposed College of the Environment

Please see attached.

Proposal to the UW Board of Regents
to Establish a
College of the Environment
at the
University of Washington

June 2008

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Executive Summary

Earth's natural systems are beautifully complex, support a rich diversity of life, and sustain the human economy through natural resources and services. The interactions of humans with natural systems are also complex, are rapidly evolving and have significant scientific, societal, and political implications. Preserving the aesthetic and practical resources of our natural world, understanding and mitigating the impacts of a broad range of natural hazards, and effectively managing coupled human-natural systems are among the increasingly significant challenges we face as we look toward the future.

Higher education will be at the core of developing solutions to environmental challenges – providing the critical understanding of the planet and natural and human systems, informing effective policy and technology developments, and developing future leaders. For the University of Washington, it is a responsibility to serve. It is our intention to lead.

The administration of the UW is seeking approval from the Board of Regents to create a College of the Environment[1]. This college would bring together an unrivalled diversity of existing strength in environmental disciplines into one of the largest science-based, environment-focused academic organization in the world. With a modest additional investment and focus on engaging specialists and leaders from other fields and other sectors, our potential to contribute to fundamental understanding and effective solutions would be unmatched.

The Opportunity

Certainly, higher education in general has a responsibility to tackle challenges that threaten the well-being of the planet and social systems through research and education. However, for research-intensive institutions like the University of Washington, the opportunity to take a leadership position in defining emerging fields of research, to truly integrate approaches to understanding coupled physical, biological, and human systems, and to create innovative mechanisms to accelerate the impact of university research on the preservation, management, and enhancement of the environment is especially compelling. With great challenges comes great opportunity through new discoveries, technologies, and ideas.

The UW is strongly positioned to truly advance the contributions of academia to the very concrete problems of the world around us. We are unique in the breadth and scale of existing intellect and resources with a focus on the fundamental science to address environmental issues, but have not yet harnessed that talent as effectively as we might to collectively influence the dialogue beyond academia. The majority of the essential ingredients necessary for success are in place. This is our unique competitive advantage.

[1] Note: The term "environment" is used in very different ways by different constituencies. As such, the name "College of the Environment" is a continuing topic of discussion and is used in this document to represent a broad range of fields, including natural resources research and management, the geosciences, ecology, and environmental policy and affairs.

A New Model

The overarching objective of the College of the Environment is to strategically invest in our existing strengths and create an academic organization with the necessary scale and diversity of educational programs, research, and intellectual capacity to 1) fundamentally advance our understanding of natural systems and human influences on and interactions with those systems, and 2) positively influence the practice of interdisciplinary environmental research and discovery and the outcomes of complex environmental problems at the regional, national and global scales.

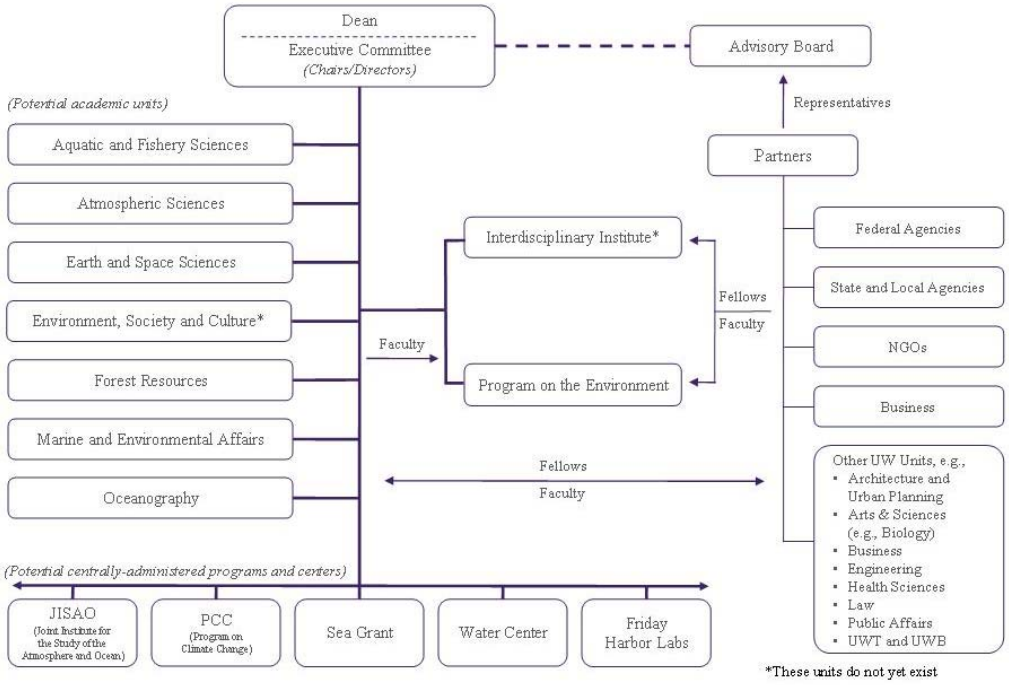
Several academic structures were assessed during the exploratory phase of this initiative. Given the scale, program breadth, and potential for transformative collaboration and partnerships, an effective model was determined to be a novel college structure made up of three key elements:

- Core degree-granting units organized around disciplines;
- Mechanisms and incentives for additional dedicated faculty, staff, and students from non-core units to participate in the research and educational missions of the College; and
- A central Institute to draw focus to particular issues that cross disciplinary boundaries and build partnerships with entities outside the UW.

This hybrid structure combines an operational academic framework for supporting fundamental education and research with a flexible institute model that forges innovative partnerships that initiate and define emerging areas of research needs and pragmatic solutions.

The University of Washington has many existing strengths in a wide array of environmental fields with many complementary research objectives and tools, educational goals, and external stakeholders. Yet these strengths are distributed across units that operate independently and without an overarching strategy or coordinated investment. The proposed College of the Environment would bring together a critical mass of the academic disciplines that are involved in environmental research and education at the UW into a single overarching organization so that resources are better leveraged, faculty and students have more opportunities and resources for interdisciplinary collaborations and interaction, and the university is identified by students and external partners as a leader across the broad field of the environment. In addition, the College would become home to a central institute that fosters innovative collaboration and partnerships from the very beginning of the research design process.

Diagram illustrating possible elements of a UW College of the Environment



The diagram above shows possible elements of a UW College of the Environment with some of the pathways for engagement indicated. The actual organization and rules of procedure will be determined by the faculty of the college in accordance with the Faculty Code (Sec. 23-45).

The proposed College of the Environment would bring together existing academic units as the foundation upon which to build. The existing units that would enter the College of the Environment or would be strongly linked to it are yet to be determined, but the example presented here indicates the potential of the College. This example brings together strong programs in the fundamental science of the Earth with strong programs in forest and fisheries resources that are important regionally and globally. Faculty in these units include four members of the National Academy of Sciences, twelve Fellows of the American Association for the Advancement of Science**,** and fourteen Fellows of the American Geophysical Union. In addition, faculty in these units have been awarded the 2005 Heinz Foundation Award for the Environment, the 2006 Volvo Environmental Prize, and five Fulbright Fellowships since 1998. The linkages among these units and the existing and potential linkages between these units and other organizations both inside and outside the university would make the college a vibrant, sustainable organization from the start. Together these units would form one of the strongest UW colleges with respect to human capital, research, and education capacities. The faculty are some of the most well-respected and productive within their respective fields and their work ranges from fundamental process studies to the implementation and evaluation of solutions.

Profile of Possible College of Environment Core Units already in Existence

Proposed Units	**Faculty FTE*** (supported by GOF/DOF)	**Total Student Majors**	**Annual Direct Research Expenditures ($millions)**
Aquatic and Fishery Sciences	14	220	$9.5
Atmospheric Sciences	11	107	$4.9
Earth and Space Sciences	21	166	$6.2
Forest Resources	30	322	$8.5
Marine Affairs	5	47	$0.2
Oceanography	16	150	$15.8
Program on the Environment	2	123	$0.0
JISAO	-	-	$11.7
Washington Sea Grant	-	-	$1.5
Friday Harbor Labs	-	-	$2.1
College of Ocean and Fishery Sciences (other)	5	-	$0.1
Total	**104**	**1135**	**$60.7**

*A faculty FTE in this table is the equivalent of one 12-month position funded by GOF/DOF. When all sources of faculty funding are included, the total faculty FTE count for this set of units is approximately 190. (The total headcount of state supported faculty is approximately 150.)

While size is only one metric, it is one indication of potential impact. Within the UW, a College of the Environment with a composition like this would be a well-sized, viable organization from its inception that would rank in the top five UW colleges in faculty, majors and research. With respect to other leading U.S. environmental colleges (i.e., degree-granting academic organizations at a university with FTE resources, the leadership of a Dean, and a broad environmental mandate), the UW College of the Environment would be unparalleled in its breadth and strengths.

Comparison to other environmental "Colleges" (FY2007 data)

College/School	Academic Faculty Headcount	Total Number of Students	Annual Direct Research Expenditures ($millions)
Proposed UW College of the Environment	**150**	**1135**	**$60.7**
Duke Nicholas School of the Environment and Earth Sciences	52	*335	$15.0
University of Michigan School of Natural Resources and Environment	45	**350	$11.5
Stanford School of Earth Sciences	50	**120	--
Yale School of Forestry and Environmental Studies	30	*214	--

*Undergraduate and graduate students only in School
**Graduate and professional students only in School
-- Data unknown

Benefits and Impact

The individual units that could make up the new College of the Environment are recognized as leaders in their respective fields. The benefits of the UW establishing a leadership position in the environmental sciences collectively would be significant to our students, faculty, staff and community, which is a primary reason that the UW administration supports additional investment in this area.

Discovery. Critical advances in understanding require treating the Earth as a system, including interactions between the physical environment and living systems. By bringing together wide-ranging disciplines and programs that have many existing and potential linkages and enhancing their resources, the College would accelerate this discovery process, resulting in:

- fundamental advances in environmental and earth sciences;
- new knowledge, technologies, and solutions to address complex issues; and
- the identification and development of unique methodological approaches and technical efficiencies across disciplinary boundaries.

Learning. The educational programs in a UW College of the Environment would be unique and highly regarded because they build on the strong foundation of existing educational programs in the possible core units. The combination of academic rigor and advanced learning methodologies and the extent to which students routinely work, both individually and on interdisciplinary teams, under the close guidance of faculty and other professionals to address significant real-world research and application problems are hallmarks of the programs currently in place. The integration of the undergraduate and graduate educational experience into the faculty research and public service functions would make the College of the Environment a highly desired place to be for students and faculty alike because of opportunities to learn from and collaborate with some of the most influential leaders in their fields. By bringing these quality programs together, the UW will be able to:

- ensure the most rigorous and effective degree programs possible across the spectrum of disciplinary and interdisciplinary curricula;

- maximize cooperation and synergy between academic units; and
- leverage resources for student recruitment, advising, curriculum development and delivery, and career services.

Development and Application. By advancing and building on our scientific foundations, a College would be positioned to address our greatest, most sobering environmental issues by translating research into solutions and practice through:

- its reputation as an authoritative, unbiased source of information and expertise;
- credible science-based tools and products for a broad range of stakeholders; and
- stronger collaborations with industry, government and NGOs throughout the entire spectrum of research, development and application through initiatives that target such partnerships.

Finally, a College of the Environment would provide a more accountable organizational model across a broad range of the environmental portfolio of the UW that would enable collective strategic planning and evaluation of return on investment, increasing the UW's ability to:

- more effectively compete for research and development support from a diverse resource pool;
- recruit and retain the best students, faculty and postdoctoral fellows from around the world through higher visibility and unique opportunities;
- attract a more diverse student population and increase the number of students with a rigorous education and training in science and technology fields; and
- promote basic environmental literacy across and beyond the campus.

Funding and Resources

The College of the Environment would be funded and sustained from federal, state, university and private sources. Research and development would continue to be derived from primarily federal sources and private funding is expected to play an increasingly important role over time. Units that join the college would carry their resources with them to support their operational and instructional obligations.

Current Revenue of Possible College of Environment Core Units ($millions, FY2007)

Academic Unit	Market Value of Endowments as of 1/1/08 (Endowment return is 5% of previous 3-year average value)	General and Designated Operating Funds	Research Cost Recovery Funds	Annual Direct Expenditures from External Sources	
				Total	Federal Source as %
Aquatic and Fishery Sciences	$17.5	$2.7	$0.7	$9.5	62%
Atmospheric Sciences	$0.9	$1.5	$0.5	$4.9	84%
Earth and Space Sciences	$4.5	$3.2	$0.5	$6.2	92%
Forest Resources	$32.7	$6.0	$0.4	$8.5	59%
Marine Affairs	$1.6	$0.8	$0.03	$0.2	39%
Oceanography	$4.2	$4.1	$0.8	$15.8	88%
Ocean, other	$3.8*				
JISAO, Washington Sea Grant, and the Friday Harbor Labs				$15.5	92%
Total	**$65.1**	**$18.3**	**$2.9**	**$60.7**	**81%**

*An additional $3.8 million has been endowed to support marine and ocean-related activities

Additional federal, state, and private resources will be sought to 1) increase the number of faculty within the College over five years by 20 FTE to fill critical gaps in the UW's research and development capacity, 2) fully develop the programming of the central Institute so that it has the resources to attract and support the highest caliber of participation and product development, and 3) increase student opportunities to become involved in significant, real-world research and application problems.

Organization and Evolution of the College

The academic units that form the core of the college will play a central role in developing the vision, culture, curriculum and strategies for the college, in crafting an administrative structure for the college, and in recruiting the dean. These decisions will sustain the excellent programs already in existence and also help the college promote a broad and integrated environmental research and teaching program across the whole of the University of Washington that also reaches out effectively to the state, the nation and the world.

If the Board of Regents approves the formation of a new College of the Environment, the faculty will undertake to refine the vision, priorities and governance of the college over the next six months. The units described in this plan as possible core units have all expressed an interest in continuing to discuss participation in the college, its mission, governance and benefits to the individual units, but none have formally committed to join the college at this time. Additional academic units, such as the Department of Biology, have also formally indicated their interest in being involved in the planning stages with the intent of becoming actively involved with the teaching, research, and administrative functions of the new College. An acting dean will be appointed and a dean's office established to represent the College and work with the provisional units and the Provost in defining the starting conditions for the College. Faculty in affected units will then be asked to vote on whether to become core units in the college or participate as cooperating units. The College will be formed following procedures specified in the Faculty Code and the final plan will be presented to the Board of Regents.

Recommendation and Conclusions

The global response to environment-related issues will transform industry, politics, and academia. New leaders will emerge. As the world begins to respond to the environmental challenges before us, the window of opportunity for the UW is now. With our considerable resources and science-based expertise to leverage, the UW is at competitive advantage to seize a leadership position. The benefits of succeeding are significant for UW's students, faculty and the region.

Introduction

The issues affecting the environment are complex and rapidly evolving with significant scientific, societal, and political implications. Preserving the aesthetic and practical resources of our natural world; monitoring, modeling and mitigating the impacts of a broad range of natural hazards; and effectively managing coupled human-natural systems are increasingly significant challenges we face as we look toward the future.

Certainly, higher education in general has a responsibility to tackle challenges that threaten the well-being of the planet and increase the resistance of social systems through cutting-edge research and education. However, for research-intensive institutions like the University of Washington, the opportunity to take a leadership position in defining emerging fields of research, truly integrate approaches to coupled human and natural systems, and create innovative mechanisms to accelerate the impact of the university is especially compelling. With great challenges comes great opportunity through new discoveries, technologies, and ideas.

The UW is strongly positioned to truly advance the contributions of academia to the very concrete problems of the world around us. We are unique in the breadth and scale of existing intellect and resources with a focus on environmental issues, but have not yet harnessed that talent to collectively influence the dialogue beyond academia. The essential ingredients necessary for success are in place.

UW Competitive Advantage

The University of Washington is uniquely positioned to take advantage of this opportunity and forge a leadership position within academia. UW's competitive advantage is significant and multifaceted:

> ***Unrivalled Expertise***: With over 400 faculty involved in environment-related research and education, the UW is home to one of the strongest collections of environmental intellectual talent in the world.
>
> ***Large Program Breadth***: More than 50 independent environmental programs, from degree-granting units to collaborative research centers, are supported at the UW. No other university in the country has the breadth and depth of environmental science (including natural resources and the geosciences), engineering, policy, and management expertise. (Table 1)
>
> ***Respect***: Individual programs have built strong reputations in their fields through demonstrated success with a total of over $140 million annually in environmentally-related research, the majority of which comes through the competitive federal proposal process.

World-class Complimentary Strengths: UW possesses the ability to leverage considerable resources and rich expertise in complementary disciplines, such as global health and e-science, that will magnify the impact of strength in environmental fields.

Location: UW's location in the Pacific Northwest provides the University with tremendous access to major global influencers as well as beneficial proximity to the rapidly developing Pacific Rim countries.

	Total	Environmental Engineering	Geology / Geophysics	Ecology	Hydrology / Watersheds	Climate Dynamics	Atmospheric Science	Environmental & Natural Resource Economics	Environmental Policy	Environmental Health Sciences	Environmental Law	Landscape Architecture / Urban Planning	Geography	Oceanography	Fishery Sciences	Forestry Sciences	Marine Affairs	Polar Sciences	Environmental Anthropology
University of Washington	18	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
University of Maryland	14	●	●	●	●	●	●	●	●		●	●	●	●	●				●
Oregon State University	14	●	●	●	●	●	●	●		●	●		●	●	●	●	●		
Penn State University	14	●	●	●	●	●	●	●	●		●	●	●		●	●		●	
University of Wisconsin - Madison	14	●	●	●	●	●	●	●	●	●	●	●	●	●		●			
UC Berkeley	13	●	●	●	●	●	●	●		●	●	●	●		●	●			
UC Davis	12	●		●	●	●	●	●	●	●	●	●	●		●				
Duke University	12	●	●	●	●			●	●	●	●			●	●	●	●		
University of Miami	12	●	●	●	●	●	●	●		●	●		●	●			●		
UC Irvine	11	●	●	●	●	●	●	●	●	●		●		●					
Columbia University	10	●	●			●	●		●	●	●	●		●				●	
University of Michigan	10	●	●	●	●	●			●	●	●	●				●			
Yale University	10	●	●	●	●	●		●	●	●	●					●			
UC Los Angeles	9	●		●	●	●	●			●	●	●	●						
Cornell University	9	●	●	●	●		●	●	●			●			●				
MIT	9	●	●		●	●	●		●	●		●		●					
Stanford University	9	●		●			●	●	●	●	●	●	●						
Arizona State University	8	●	●	●	●			●	●			●	●						
Harvard University	8		●			●	●	●	●	●	●	●							
UC Santa Barbara	6		●	●	●			●	●				●						
California Institute of Technology	5	●	●	●		●	●												
UC San Diego	5		●	●		●						●		●					

Universities with three (3) or more faculty in a field are considered to have expertise in that area.

Table 1. Program breadth of UW environmental expertise as compared with that of other universities

Competitive Landscape

Environmental leadership within higher education has yet to be established. A handful of universities possess the resources and breadth to effectively assert leadership. No one school has yet been able to demonstrate critical mass in terms of committed resources, breadth of knowledge and in research funding.

Yet the window of opportunity for staking leadership is limited. Many have begun adding new environment-focused programs. Academic leaders will be established within the next few years. Some are committing substantial resources, launching environment-focused institutes and centers including:

Duke University – focus on environmental policy
The Nicholas Institute for Environmental Policy Solutions at Duke University was founded in 2005 to engage with decision makers in government, the private sector, and the nonprofit community to develop proposals that address critical environmental challenges. It seeks to act as an "honest broker" in policy debates by fostering dialogue between stakeholders on all sides of the issues and policy-relevant analysis based on academic research. The Institute's staff leverages the broad expertise of Duke University as well as public and private partners nationwide. The Nicholas Institute is a university-wide initiative that operates in conjunction with the Nicholas School of the Environment and Earth Sciences at Duke University.

Stanford University – focus on solutions
The Ward W. and Priscilla B. Woods Institute for the Environment harnesses the expertise and imagination of Stanford University scholars to develop practical solutions to the environmental challenges facing the planet-from climate change to sustainable agriculture to conservation. To achieve these goals, the Institute brings together prominent scholars and leaders from business, government and the non-profit sector through a series of Uncommon Dialogues and Strategic Collaborations designed to produce pragmatic results that inform decision makers.

University of Michigan – focus on environmental sustainability
The Graham Environmental Sustainability Institute is a jointly funded effort by the University of Michigan and the Graham Foundation for encouraging multidisciplinary research and education in environmental sustainability. The Graham Institute seeks out new opportunities in sustainability research and education, provides incentive research funding, and encourages graduate students to continue their studies in the environmental sustainability field. The Institute also works with companies, NGOs, and communities to leverage U-M assets in a strong outreach program dedicated to extending the knowledge of and solving problems related to sustainability. It serves as an information focal point and ambassador for sustainability within U-M using a web portal, and its

relationships with schools, colleges, and various institutes and centers dealing with sustainability.

Arizona State University – focus on sustainability in urban environments
The Global Institute of Sustainability at Arizona State University conducts research, education, and problem-solving related to sustainability, with a special focus on urban environments. The Institute initiates and nurtures work on issues of sustainability across many departments on the four campuses of ASU, and collaborates with other academic institutions, governments, businesses and industries, and community groups locally, nationally, and globally.

A New College Model

The momentum toward fundamentally changing the way the UW manages and leverages its tremendous resources related to the environment has been building for years. Though it is true that an unusually large number of environmental disciplines are present across the UW, efforts across these units often have complementary goals and objectives and collaborations could be strengthened and increased.

The discussion focused on the establishment of a new college started in earnest in June 2007 at a charrette hosted by Provost Wise. Present at this brainstorming session were representatives from industry, government, UW leadership and faculty. A variety of topics were discussed, including the need for university environmental research and education to evolve as a field and to feed more directly into the needs of society, the competitive landscape, and several conceptual models of how a university like the UW could organize itself to the benefit of faculty, students and external stakeholders. Following this charrette, Provost Wise met with more than 125 faculty, department chairs and deans to discuss the concept of creating a structure within the UW that has clear-cut authority, responsibility and resources (i.e., a college). Building on the resulting sense of general interest, enthusiasm and support, the Provost initiated more formal planning efforts that drew on volunteers for specific working groups to help lay the groundwork for a new college. These included:

- Working Group on Vision (Appendix B)
- Working Group on Organization and Structure (Appendix C)
- Working Group on Education and Learning Goals (Appendix D)

Model Analysis

We are learning from the experiences of other universities and our own history at the University of Washington as we seek to construct a model that will truly add value over

and above what is possible given the current organization of environmental research and education at the UW.

The Working Group on Organization and Structure explored several models during the early planning stages (Appendix E) with the goal of defining a model that will facilitate deep and broad interdisciplinary collaboration between the natural sciences, social sciences, policy and law, engineering, and the humanities. They also looked for mechanisms to facilitate meaningful cooperation between the University and other regional and global environmental stakeholders. Finally, the Working Group looked for structures that would leverage and build the existing rigorous degree programs in the environmental sciences as well as facilitate the general education mission of the University to ensure that every graduate has the opportunity and incentive to become an informed environmental citizen.

The Working Group quickly realized that on their own, neither a traditional college model, created by reorganizing and uniting existing disciplinary academic units, nor a virtual institute meets the needs of the UW. As a result of their analysis and deliberations, the recommendations from the Working Group on Organization and Structure describe a new model for a College of the Environment[2] – a hybrid of the traditional college and virtual institute structures, blending the positive attributes of both and emphasizing porous boundaries for maximum impact. (Appendix F)

Proposed Structure

The structure of proposed College of the Environment, outlined below, was designed with the following essential elements in mind:

1) a mandate for broad environmental education to encourage significant student participation in the college curriculum;
2) core degree-granting units for organizational strength and vibrancy;
3) a central interdisciplinary institute that catalyzes new interactions and collaborations; and
4) facilitation of better engagement with external stakeholders, driving the translation of research and scholarship into practical solutions.

Figure 1 is a graphic representation of the structure recommended by the Organization and Structure Working Group as refined by Chairs and Directors of possible core academic departments and the Office of the Provost. It shows possible elements of a UW College of the Environment. The actual organization and rules of procedure would be

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[2] Note: The term "environment" is used in very different ways by different constituencies. As such, the name "College of the Environment" is a continuing topic of discussion and is used in this document to represent a broad range of fields, including natural resources research and management, the geosciences, ecology, and environmental policy and affairs.

determined by the faculty of the college in accordance with the Faculty Code (Sec. 23-45).

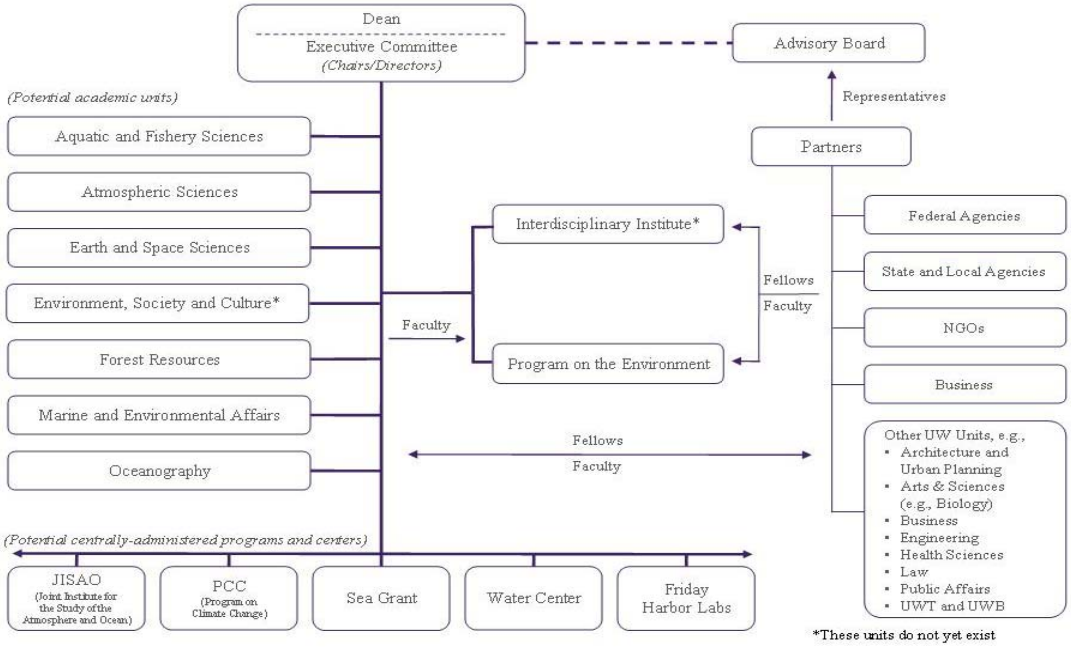


Figure 1. Diagram illustrating possible elements of a UW College of the Environment.

The collection of academic units, focused centers, interdisciplinary institute and a deliberate focus on porosity creates a very powerful structure within the University of Washington. The college structure with an integrated institute approach is unique. This blended model provides the benefits of the stability and credibility of a college and disciplinary units with the flexibility and intellectual invigoration of an interdisciplinary institute.

In addition to the world-class core units, the UW has many additional faculty, students, and staff across all three of our campuses in such areas as public affairs, public health, engineering, economics, architecture, history, and anthropology, who work specifically on environmentally related topics within their current academic units. These individuals could both add value to and benefit from the new College. Mechanisms to enable and encourage their participation will be important to ensuring that the full breadth of the UW's expertise in the environment can be tapped into for research and product development as well as curriculum development and delivery. These include:

- Joint appointments –permanent and temporary
- Institute sabbaticals
- Faculty buy-outs
- Student project mentorships
- Co-teaching
- Graduate fellowships
- Undergraduate research opportunities

Many of these mechanisms would also be employed to bring in expertise from outside of the University in addition to visiting and affiliate professorships, externships, and Institute Fellowships.

Possible Core Academic Units

The proposed College would bring together existing units as the foundation upon which to build so that the college is a vibrant, sustainable organization with immediate credibility and strength. These are the departments, schools and colleges with an overwhelming majority of their faculty working within the natural sciences and environmental fields, whose missions are focused on research and education in earth and ecological sciences, natural resource science and management, and environmental affairs. The list of potential foundational units includes:

- School of Aquatic and Fishery Sciences
- Department of Atmospheric Sciences
- Department of Earth and Space Sciences
- College of Forest Resources
- School of Marine Affairs
- School of Oceanography
- Program on the Environment

Together these units would form one of the strongest colleges within the University with respect to human capital, research, and educational capacities. (Table 2) The faculty in the proposed core academic units are some of the most well-respected and productive within their respective fields. Specifically, these units boast four members of the National Academy of Sciences, twelve Fellows of the American Association for the Advancement of Science**,** thirteen Fellows of the American Geophysical Union, ten Fellows of the American Meteorological Society, seven Fellows of the Geological Society of America and one Fellow in both the Society of American Foresters and the American Statistical Association. In addition, faculty in these units have been awarded the 2005 Heinz Foundation Award for the Environment, the 2006 Volvo Environmental Prize, and five Fulbright Fellowships since 1998. (Appendix H) Finally, dozens of scientists and students in these units contributed as authors and reviewers in the Intergovernmental Panel on Climate Change that was awarded the 2007 Nobel Peace Prize along with former Vice President Al Gore for his work on climate change.

UW College	Faculty FTE (supported by GOF/DOF)	Total Majors Count (Undergraduate and Graduate)	Direct Expenditures ($M)
Arts & Sciences	646	13915	$72.4
Medicine	250	1822	$392.1
Engineering	161	3050	$70.1
College of the Environment	**104**	***1135***	***$60.7***
Public Health & Community Medicine	36	*728*	$62.8

Table 2. Profile of the proposed College of the Environment with respect to other UW colleges based on FY2007 data. (Details of the College of the Environment totals can be found in the Resources, Costs, and Funding Section of the proposal.)

The creation of an additional academic unit is also proposed as a way to bring critical competency in the social sciences into the College so that the natural and social sciences may be more effectively integrated. Recognizing that there are no existing social science departments that could be incorporated in their entirety into the new College, the Working Group on Organization and Structure proposed that a new academic unit be created to house teaching and research in the area of Environment, Society, and Culture. In addition to the social scientists present in several of the other Schools or Departments that might become the core academic units, this new unit would ensure that social science expertise has a critical mass within the College.

Brief descriptions of the proposed core academic units can be found in Table 3.

Table 3. ***(on Page 9)*** **Proposed core academic units within the College of the Environment. In addition to becoming one of the strongest colleges within the UW, the proposed College of the Environment would match up favorably to peer institutions with respect to size, faculty and research expenditures, with several examples shown in Table 4.**

Proposed Core Academic Units	Brief Description
Aquatic and Fishery Sciences	The breadth and scope of the School of Aquatic and Fishery Sciences encompasses programs for undergraduate and graduate teaching, research and service in basic and applied aquatic sciences with an emphasis on fisheries management and aquatic resource conservation. Faculty, staff and students have access to myriad aquatic habitats and rich biological resources, and they are involved in interdisciplinary partnerships with other academic programs, as well as public and private organizations and environmental and regulatory agencies.
Atmospheric Sciences	The Department of Atmospheric Sciences centers on a fundamental understanding of the physics, chemistry and motions of the atmosphere of Earth and other planets. It considers problems that are both scientifically challenging and critical for the welfare of modern society. This knowledge is central to important themes of environmental research such as global climate change, air pollution and weather events. Quantitative methods are applied to develop observing and predictive tools that can provide benefits to human decision making from short-term weather or air quality forecasts to projections of the climate a century into the future. These same methods can be used to understand past variations in the global environment.
Earth and Space Sciences	The Department of Earth and Space Sciences furthers the understanding of Earth, the solar system, and their histories. The department's scope extends from the center of Earth to the rim of the solar system, and its activities cut across traditional disciplines of physics, chemistry, biology, geology, and mathematics. Faculty, students, and staff examine Earth's interior structure, chemistry, motion, and dynamics; geologic hazards; processes affecting the surface environment; the surrounding space environment; planetary processes; and geobiology.
Environment, Society and Culture	The social sciences broadly conceived, including social sciences proper, law, policy, and humanities, seek to understand the human institutions, practices, perceptions, and motives that shape human-environment interactions across time and space. Both natural and social sciences offer descriptions, explanations, and differentiations. Although the distinction between the terms “natural” and “social” sciences are used as convenient shorthand, there are many similarities of approach. Progress toward the mission of the College will require building on these similarities, together with respectful appraisal of differences. (Appendix G)
Forest Resources	The vision of Forest Resources is to provide world class, internationally recognized knowledge and leadership for environmental and natural resource issues. The programs focus on the integrating theme of sustainability in environments that include wilderness and park-like ecosystems, intensively managed planted forests, and urban environments. Forest Resources educates the next generation of leaders in natural resources and public and private land management throughout the state, the region, and the nation and contribute to the solution of natural resources and environmental challenges throughout the world.
Marine Affairs	The strength of the School of Marine Affairs is both in its rigorous academic program and its faculty research in current marine and coastal issues. Students at the School learn creative approaches to resolving marine problems and conflicts and may concentrate in a variety of subject areas from coastal zone management to marine environmental protection to port and marine transportation management. Faculty and students are breaking new ground in such fields as climate change impacts, waste management, salmon and habitat recovery, ecosystem management, risk analysis, and international collaborations.
Oceanography	The School of Oceanography enables continued advancement of the ocean sciences by being at the forefront of creating knowledge and understanding about the ocean–through observation, theory, modeling and technological innovation; by providing students with knowledge and insights, scholarly methods, scientific tools and communication skills; and as an operator of national research facilities. As a respected leader in ocean sciences, our unique attributes include our many, varied collaborations within UW's broad academic environment, a special emphasis on excellence in teaching and mentoring, a heritage of engagement with undergraduates, and close coupling of our research and teaching.
Program on the Environment	The Program on the Environment (PoE) is not a traditional academic department and does not have a faculty of its own. This allows PoE to work with faculty across disciplines and campuses to achieve a genuine integration of natural and social sciences, and the humanities and the professional**.** PoE is overseen by an Advisory Board consisting of faculty, staff, and students representing a wide range of departments, colleges, and service units from all three campuses.

College/School	Faculty Headcount	Total Number of Students	Annual Direct Research Expenditures ($millions)
Proposed UW College of the Environment	**150**	**1135**	**$60.7**
Duke Nicholas School of the Environment and Earth Sciences	52	*335	$15.0
University of Michigan School of Natural Resources and Environment	45	**350	$11.5
Stanford School of Earth Sciences	50	*120	--
Yale School of Forestry and Environmental Studies	30	*214	--

* Graduate and professional students only in college
** Undergraduate and graduate students only in college
-- Data unknown

Table 4. Comparison of proposed UW College of the Environment with leading U.S. environmental colleges. (Most data from FY2007 or 07-08 academic year)

Institute

One of the most transformational aspects of the new College would be the interdisciplinary institute that sits at the nexus of the core academic units. The Institute would be an enabling entity that takes advantage of the collective strengths of the academic units that surround it and catalyzes collaboration and innovative approaches to interdisciplinary research and development.

The College of the Environment is intended to be a model of a porous structure within an academic institution and the development of the Institute is key to this porosity. In addition to drawing heavily from the faculty in the core academic units, the Institute would bring in faculty from outside of the College and other universities, leaders in businesses, government, and NGOs together with undergraduate and graduate students and postdoctoral fellows for intense analysis and communication of specific challenges.

Unlike traditional academic departments, where the emphasis is on the creation of foundational knowledge and discovery and the training of students, the Institute's unique role and structure within the College provides leverage for quick resource deployment to high priority and emerging challenges.

Specific components envisioned to be part of the institute include:

- Series of seminars, symposia, workshops, and other public programs (both on- and off-campus) that draw from expertise in and outside of the College.
- Responsive, focused attacks on critical research and application problems that require deep expertise in diverse fields.
- A competitive post-doctoral program that would attract individuals of outstanding talent and promise to provide them with the opportunity to pursue their research and at the UW.

- High-level professional staff dedicated to partnerships with a broad range of constituents in the use, evaluation, and application of science-based environmental information.
- Development of products for non-academic stakeholders (e.g., research syntheses, science briefs, policy analyses, legislative briefings, etc.) that are relevant to ongoing regional, national and international priorities.
- Integration of new information technologies and advanced interfaces to promote the communication of science-based environmental information.
- Visiting professors or leaders from NGOs, industry, government agencies for short-term collaborative interactions.
- Externships and research opportunities for students to work with university researchers, government agencies, corporations, and NGOs for hands-on experience in emerging fields of research and application.

Anticipated Benefits and Impact

Given that many of the various disciplines being considered for the College of the Environment already exist across the university, why go through the disruption, expense and risk to build a new college?

For UW Students

The educational programs in a UW College of the Environment would be unique and highly regarded because they build on the strong foundation of existing educational programs in the possible core units. The combination of academic rigor and advanced learning methodologies and the extent to which students routinely work, both individually and on interdisciplinary teams, under the close guidance of faculty and other professionals to address significant real-world research and application problems are hallmarks of the programs currently in place. The integration of the undergraduate and graduate educational experience into the faculty research and public service functions would make the College of the Environment a highly desired place to be for students and faculty alike because of opportunities to learn from and collaborate with some of the most influential leaders in their fields. By bringing these quality programs together, the UW would be able to:

- ensure the most rigorous and effective degree programs possible across the spectrum of disciplinary and interdisciplinary curricula;
- maximize cooperation and synergy between academic units;
- leverage resources for student recruitment, advising, curriculum development and delivery, and career services;
- produce graduates who would be highly sought-after for a broad range of academic, public and private sector positions;
- effectively promote the most comprehensive education available in a broad range of environmental fields; and
- increase environmental literacy across and beyond the campus.

For the UW

The prominence and structure of a College would allow us to become more organized and strategic about building and leveraging our unparalleled research and educational strengths in environmental fields in ways that are not currently possible as a more diffuse organization. The College would provide a more accountable organizational model that enables more strategic planning and evaluation of return on investment, increasing the UW's ability to:

- compete for research and development support from a more diverse resource pool in the face of a changing funding environment;
- recruit and retain the best students, faculty and postdoctoral fellows from around the world through higher visibility and unique opportunities;
- attract a more diverse student population and increase the number of students with a rigorous education and training in science and technology fields;
- attract the best and brightest students;
- attract and retain an increased number of world-class faculty in areas that complement current strengths;
- advance new models of interdisciplinary engagement and success;
- identify and develop technical efficiencies across disciplinary boundaries;
- inform global, national, and regional public policy; and
- elevate the reputation and awareness of the UW worldwide.

For the State, Region, and the Nation

Future advances will require treating the Earth as a system, including interactions between the physical environment and living systems. By bringing together wide-ranging academic disciplines that have many existing and potential linkages and enhancing their resources, the College would accelerate this discovery process. By building on our scientific foundations, the College would be positioned to address our greatest, most sobering environmental issues by translating research into solutions and practice through:

- an increased number of students with solid education and training in science and technology;
- new knowledge, technologies, and solutions to address complex issues;
- credible, science-based tools and products for a broad range of stakeholders;
- stronger collaborations between academia and industry, government and NGOs throughout the entire spectrum of research and development to application;
- increased impact and leveraging of publicly-supported research and development.

Resources, Costs and Funding

Core Resources

As shown in Figure 1, the proposed College of the Environment would bring together existing academic units, research centers, and programs in addition to establishing a new academic unit and a central interdisciplinary institute. A summary of the current resources each of the existing entities has responsibility for is shown in Table 5 and Table 6.

Proposed College of the Environment Unit	FTE (12-month)		Majors		
	Faculty	Staff	UG	Grad	Total
Aquatic and Fishery Sciences	14	30	123	97	220
Atmospheric Sciences	11	11	49	58	107
Earth and Space Sciences	21	25	94	72	166
Forest Resources	30	50	182	140	322
Joint Institute for the Study of the Ocean and Atmosphere	0				0
Marine Affairs	5	4	0	47	47
Oceanography	16	22	77	73	150
Program on the Environment	2	5	123	0	123
Sea Grant	0				0
Totals	**104***	**142**	**648**	**487**	**1135**

Table 5. Summary of theFY2007 human capital within the proposed College of the Environment units. (*Total includes 5 additional FTE in College of Ocean and Fishery Sciences)

($millions) Unit	Market Value of Endowments as of 1/1/08 (Endowment return is 5% of previous 3-year average value)	General and Designated Operating Funds	Research Cost Recovery Funds	Direct Expenditures From External Sources (FY2007)	
				Total	Federal Source as %
Aquatic and Fishery Sciences	$17.5	$2.7	$0.7	$9.5	62%
Atmospheric Sciences	$0.9	$1.5	$0.5	$4.9	84%
Earth and Space Sciences	$4.5	$3.2	$0.5	$6.2	92%
Forest Resources	$32.7	$6.0	$0.4	$8.5	59%
Marine Affairs	$1.6	$0.8	$0.03	$0.2	39%
Oceanography	$4.2	$4.1	$0.8	$15.8	88%
Ocean, other	$3.8*				
JISAO, Washington Sea Grant, and the Friday Harbor Labs				$15.5	92%
Total	**$65.1**	**$18.3**	**$2.9**	**$60.7**	**81%**

*An additional $3.8 million has been endowed to support marine and ocean-related activities

Table 6. Current sources of revenue of proposed College of Environment core units. (FY2007)

Faculty

Together the existing seven proposed core units are the primary home to approximately 100 faculty FTE supported by GOF/DOF (or approximately 150 individual academic faculty). (Table 5) As described above, these faculty and their peers supported by other funding sources are some of the most well-respected and productive within their respective fields.

In comparison, the Nicholas School of the Environment and Earth Sciences at Duke University includes a total of 52 core faculty and 58 affiliated faculty. The University of

Michigan's School of Natural Resources and Environment has approximately 45 core faculty and 48 affiliate faculty.

At approximately 100 faculty FTE supported by GOF/DOF, the College would become one of the larger colleges within the UW (Table 7), but is still small enough where interactions among faculty, staff, and students across academic units and beyond the college are possible and are as important as those within academic units. This approximately 100 FTE grows to almost 190 if all sources of funding are considered (including grants and contracts) and both academic and research faculty are included.

UW College	Total Faculty FTE supported by GOF/DOF	Total Faculty FTE supported by all sources
Arts & Sciences	682	893
Medicine	250	2587
Engineering	161	310
College of the Environment	**104**	**188**
Business	84	110

Table 7. UW colleges with more than 75 FTE (supported by GOF/DOF) in FY2007 if proposed College of the Environment is created. (See Appendix G for the full university faculty FTE distribution across colleges.)

Students

The proposed College of the Environment would also bring together an impressive number of students with diverse skills and interests. Together the seven proposed core units were the primary home to more than 1100 students in the 2006-07 academic year. This total includes approximately 650 undergraduates and just under 500 graduate students. (Table 5) The majority of these students are in rigorous science degree programs that fulfill the State's need for trained STEM (Science, Technology, Engineering, and Mathematics) students.

With more than 1100 students, the new college would be one of only five colleges within the UW with more than 1000 majors (Table 7). This is a significant throughput and responsibility, but is at a scale that still provides for individual guidance and mentoring within the distinct degree programs.

UW College	2007-08 Total Majors Count (Undergraduate and Graduate)
Arts & Sciences	13915
Engineering	3050
Business	2972
Medicine	1822
College of the Environment	***1135***

Table 8. Colleges with more than 1000 majors if proposed College of the Environment is created. (See Appendix J for the full university majors distribution across colleges.)

In comparison, in the 2006-07 academic year the Nicholas School of the Environment and Earth Sciences at Duke University currently had about 225 professional graduate students and 110 doctoral students. The Stanford School of Earth Sciences had about 120 total undergraduate and graduate students.

Research Activities

In FY2007 the seven existing proposed core academic units and centrally-administered units were responsible for more than $60 million in direct expenditures from external sources. At this level of productivity, the proposed College of the Environment would be one of only five colleges within the UW to conduct more than $20 million in research and development annually. (Table 9)

College	FY2007 Direct Expenditures	Percent of Total UW Grants and Contracts
Medicine	$392,079,082	48%
Arts & Sciences	$72,428,322	8%
Engineering	$70,140,925	8%
Public Health & Community	$62,776,572	8%
College of the Environment	**$60,716,177**	**7%**

Table 9. Colleges with more than $20 million in direct expenditures from external sources if proposed College of the Environment is created. (See Appendix K and Appendix L for information on the university's complete FY2007 direct expenditures and new awards.)

Costs

It is the collective strength of the proposed core academic units that can be built upon, both intellectually and organizationally. The costs described below assume all of the proposed units are in the new College and a growth rate of 20% over five years.

Salaries

A growth rate in faculty of 20% over five years, or the equivalent of an additional twenty faculty FTE, is proposed to fill key research gaps, build the capacity of the College to provide new curriculum, and leverage hires across the university. This growth would bring the total number of faculty FTE supported by GOF/DOF within the College to just over 120 (and the headcount of academic faculty to approximately 170). To ensure growth that takes advantage of our strengths in the natural sciences and builds significant capacity within the human dimensions, the new positions are expected to be split evenly between the two areas.

Over five years (FY09-13), twenty new faculty FTE would be hired to supplement the faculty in the core academic units, including the development of the new unit on Environment, Society and Culture. The new faculty hires (including four (4) full professors, six (6) associate professors, and ten (10) assistant professors) are expected to be split evenly between the natural sciences and the social sciences. The additional amount of salary and benefits support needed from FY2009 to FY2013 to support the new faculty hires is $2.95 million. (Table 10)

	Additional Faculty FTE	Additional Salary and Benefits Required
FY2009	4	$600,000
FY2010	4	$600,000
FY2011	4	$600,000
FY2012	4	$600,000
FY2013	4	$550,000
Totals	**20**	**$2,950,000**

Table 10. New resources required for additional faculty hires. Details can be found in Appendix M.

Ten new professional staff positions are also proposed to be added to this new College over five years. These staff positions are expected to be high level staff who would establish and deliver technical support to faculty, students and external partners. They would be responsible for university knowledge and technology transfer to a wide range of university partners, product and tool development, and developing core in-house expertise that is of benefit to multiple academic units. These positions are projected to require an additional $1.25 million in salary and benefits support from FY2009 to FY2013. (Table 11)

	Additional Staff FTE	Additional Salary and Benefits Required
FY2009	2	$250,000
FY2010	2	$250,000
FY2011	2	$250,000
FY2012	2	$250,000
FY2013	2	$250,000
Totals	**10**	**$1,250,000**

Table 11. Resources required for additional staff hires.

Start-up packages

Start-up packages would be offered to new faculty hires to provide them with the tools they need to succeed at the UW. Start-up packages can range from $50K to $1.5 million or more, depending on the individual's area of research expertise and position. To project total expenses, an average of $375K/FTE or $1.5 million/year in start-up costs is assumed for a total of $7.5 million over five years.

Teaching Assistantships

To match the expected growth in enrollment within the College and the development of environmental literacy curriculum that reaches a much broader student base, additional teaching assistantships (TAs) would be made available to the College of the

Environment. New TAs are expected to require an additional $100K/year over the first five years.

Institute

In addition to a significant portion of the staff salaries described above that would grow over time and enable the continuous activities of the Institute in research translation and technical support, the major resources envisioned for the proposed institute are for the director, a visiting faculty fellowship program and a post-doctoral fellowship program:

Part-time director ($100K) – Under the leadership of the director, the Institute would prioritize thematic areas of investment, recruit and support participants, and manage the activities of the institute.

Visiting Faculty Fellowships ($20K/fellow) – A core strategy for the interdisciplinary institute is to bring together groups of experts with the right set of skills and experience to solve complex environmental research and application problems. Problems in the natural world can be addressed by natural scientists, but the solutions of the most vexing of these problems will require fundamental contributions from engineers, social scientists and policy experts. These experts must be drawn from a wide range of sources: from within the College, the UW, other universities, corporations, government and non-governmental organizations.

Post-doctoral Fellowships ($100K/fellowship year) – Post-doctoral fellowships would foster basic, translational, and applied research by scientists at the beginning of their careers in an environmental field. Because new thinking and ideas are so vital to the future of both basic and applied environmental research, the post-doctoral fellowships would identify, recognize, and support exceptional post-doctoral researchers engaged in innovative environmental research. The objective of this program is to stimulate and support creative research undertaken by promising researchers who have the potential to make a profound impact on their research disciplines. Fellowships would support the salary and benefits of the Fellow, with partial funds permitted to be designated to direct research expenses.

Funding

Federal

The federal funding situation is complex and is of great significance to the UW because of the extremely high proportion of federal funds within the overall University R&D funding profile. (Appendix N) The federal government has an irreplaceable role in funding basic research and is the primary source of funding for environmental research and development. Within the federal government, there are many agencies that support significant environmental research as part of their portfolio (Appendix O) and they would continue be a source of funding for the proposed core academic units.

Federal sources of support for academic R&D has increased fairly continuously in absolute dollar terms since 1972, even after adjusting for inflation. Support from the federal government decreased in 2006, however, as funding growth failed to outpace

inflation for the first time since 1982 (Science and Engineering Indicators 2008, National Science Board) and small declines in federal support for research are anticipated to continue into the foreseeable future. In FY2008 the National Science Foundation (NSF), Department of Energy (DoE) and National Institutes of Health (NIH) funding was nearly flat from FY2007. Specifically, the approved FY2008 federal budget provides for only a 1.1% increase for NSF, 5.3% for the DoE Office of Science (with the majority of the increase going to earmarks), 0.9% for NIH, and a decline of 6.9% for the basic research portion of the Department of Defense budget.

A description of the current research profile of the proposed College of the Environment core units is found in Table 6. Within this profile, 81% of the total $60.7 million of direct expenditures in FY2007 was funded by federal grants and contracts. In order to continue to support its breadth and strength of environmental research, the UW must ensure that its faculty and programs continue to be successful within the increasingly competitive federal funding environment through strategic hires, broad dissemination of opportunities, proposal assistance, etc. In addition, the UW will need to increase the opportunities for faculty and programs to compete for non-federal funding and partnerships.

State

As one of its top priorities, the UW will continue to emphasize the need for state support to improve the educational experience of UW students through new strategies and opportunities to promote educational excellence. As stated previously, the educational programs in the new College would be unique and highly regarded because of the combination of academic rigor and advanced learning methodologies and the extent to which students routinely work, both individually and on interdisciplinary teams, under the close guidance of faculty and other professionals to address significant real-world research and application problems. Because of the rigorous degree programs that exist within the proposed core academic units and the possibility of developing new collaborative programs, establishing the new College would also provide opportunities to recruit a more diverse and larger student body into environmentally-related Science, Technology, Engineering and Mathematics (STEM) fields.

In addition to creating new opportunities for students, the UW would also work with the legislature and the Governor to promote cutting-edge interdisciplinary research of direct relevance to the needs of the state and the region within the College of the Environment. It is our strength in research that makes the UW unique among the world's leading higher education institutions and provides our students with a distinctive education. The recruitment of a few small groups of faculty with expertise in critical competencies and emerging areas of interdisciplinary research and the investment in specific collaborative initiatives would ensure that the state is positioned to take advantage of federal and private R&D investments in the environment.

Finally, to accommodate and plan for future growth, the UW will continue to work with the legislature and the Governor to maintain existing campus facilities while expanding and modernizing facilities to meet state needs for enrollment and program growth. In the

short term, the restoration of Anderson Hall and the pre-design and design of a new Life Sciences Building that would be dedicated in part to the College of the Environment will be the highest priorities with respect to the development of the new College.

The UW's 2009-11 state request will include funding for the College of the Environment as it is a high-priority initiative for the university with high impact for the region. The request will leverage existing resources and be at a funding level that recognizes the overall demand and constraints on the state budget.

Private

While federal and state funding would be the primary sources of revenue for the new college, private funding is expected to become more important as the competitive funding environment evolves.

Foundations direct significant resources toward environmental research and application. In 2006 alone, grants from the top fifty U.S. foundations that operate in the area of the environment totaled just under $800 million. (Appendix P) Foundations in the western United States are especially active in this area, with grants totally over $350 million in 2006, representing about 5.9% of their total giving. (Appendix Q) In line with their shareholder expectations, corporations also contribute in-kind gifts, furnishing laboratories with state-of-the-art equipment or software; sponsor scholarships; and support specific projects, from student and diversity programs to specific research endeavors.

In addition to programmatic, current use funds, endowments are a way to combine a donor's vision with the University's needs and objectives. Collectively the seven academic units manage endowments that were valued at just over $65 million on January 1, 2008, generating approximately $3.25 million annually in support (Table 6). Approximately half of this total ($32 million) is directed toward student support and $21 million supports faculty. The remainder supports specific programs and other specific items, such as awards and travel. (Appendix R) As per university policy, these endowments will continue to reflect the priorities and intent of the donors.

Endowing (naming) the college will provide a mix of immediate use and sustained funding for initiatives and priorities of the college as a whole. A gift of this size would dramatically accelerate the growth and impact of both the core academic units and the institute. In addition, it would provide partial funding for a building that will house the central activities of the College and enable both short-term and long-term interactions between the many constituents of the College.

An endowed dean and endowed chairs and professorships are among the most important resources any university can have in assembling and maintaining a distinguished faculty. These positions not only provide recognition of excellence for the faculty who hold them, but they also provide a dependable source of income for special teaching and research materials, library acquisitions, salary supplements, and travel assistance. In recent years, competition for the most talented teachers and researchers has intensified as universities

seek to distinguish themselves. The additional support and recognition that accompanies an endowed chair or professorship can make the difference in the College's ability to recruit a distinguished scholar, or retain that scholar in the face of lures form other institutions and potential employers.

Endowed support for undergraduate, graduate and postdoctoral scholarships is also critical to enabling students to become increasingly involved in research, international study, and field-based learning. The UW seeks to offer educational access to all talented and deserving individuals to help us attract and retain the best undergraduate and graduate students. In addition we want to increase the support available for students who are involved in research and application projects, especially those that emphasize collaboration and partnership with external organizations.

Private resources will be critical to enabling faculty and students to pursue non-traditional activities and push innovation in the College of the Environment. The scale of the new college will justify a redirection of existing university development resources to the new College to ensure success.

Organization and Evolution of the College

The academic units that form the core of the college will play a central role in developing the vision, culture, curriculum and strategies for the college, in crafting an administrative structure for the college, and in recruiting the dean. These decisions will sustain the excellent programs already in existence and also help the college promote a broad and integrated environmental research and teaching program across the whole of the University of Washington that also reaches out effectively to the state, the nation and the world.

If the Board of Regents approves the formation of a new College of the Environment, the faculty will undertake to refine the vision, priorities and governance of the college over the next six months. The units described in this plan as possible core units have all expressed an interest in continuing to discuss participation in the college, its mission, governance and benefits to the individual units, but none have formally committed to join the college at this time. Additional academic units, such as the Department of Biology, have also formally indicated their interest in being involved in the planning stages with the intent of becoming actively involved with the teaching, research, and administrative functions of the new College. An acting dean will be appointed and a dean's office established to represent the College and work with the provisional units and the Provost in defining the starting conditions for the College. Faculty in affected units will then be asked to vote on whether to become core units in the college or participate as cooperating units. The College will be formed following procedures specified in the Faculty Code and the final plan will be presented to the Board of Regents.

Appendix A. UW Environment A-Z

See below for a listing of colleges, schools departments, programs and centers at the UW with investments in environmental research and scholarship.

Colleges, Schools and Departments

College of Architecture and Urban Planning
- Architecture
- Landscape Architecture
- Urban Design and Planning

College of Arts and Sciences
- Anthropology
- Applied Mathematics
- Atmospheric Sciences
- Biology
- Chemistry
- Earth and Space Sciences
- Economics
- Geography
- History
- Jackson School of International Studies
- Philosophy
- Political Science
- Statistics

College of Engineering
- Department of Chemical Engineering
- Department of Civil and Environmental Engineering
- Department of Electrical Engineering
- Department of Mechanical Engineering

College of Forest Resources

School of Law

College of Ocean and Fishery Sciences
- Aquatic and Fishery Sciences
- Oceanography
- School of Marine Affairs

Daniel J. Evans School of Public Affairs

School of Public Health and Community Medicine
- Environmental and Occupational Health Sciences

School of Social Work

UW Bothell, Interdisciplinary Arts & Sciences

UW Tacoma, Interdisciplinary Arts & Sciences

UW Environmental Centers and Programs

Air Pollution Training Center - Providing training opportunities for air pollution professionals.

Alaska Salmon Program - Research and teaching on Alaska salmon since the mid-1940s.

Applied Physics Laboratory - Research, development, and advanced education in: marine acoustic and remote sensing, ocean physics and engineering, polar science, medical and industrial ultrasound, and environmental information and electronic systems.

Berman Environmental Law Clinic - Familiarizing students with emerging issues in environmental law.

Center for American Politics and Public Policy - Collaborative research on American politics and public policy, including environmental management and natural hazards policy.

Center for Child Environmental Health Risks Research - aims to define children's susceptibility to pesticides and to partner with communities to translate our findings into risk communication, risk management and prevention strategies.

Center for Conservation Biology - Developing tools to monitor human and other environmental impacts on threatened and endangered species throughout the world.

Center for Ecogenetics and Environmental Health - Identifying ways that genetic and environmental factors combine to affect susceptibility to diseases and disorders.

Center for Environmental Visualization - Combining environmental modeling with applied technologies such as scientific visualization, virtual reality, interactive multimedia and Web development.

Center for Quantitative Science in Forestry, Fisheries and Wildlife - Providing high quality instruction in mathematical and applied statistical methods in the biological sciences, renewable resources management, and environmental studies.

Center for Science in the Earth System - Integrated research on the impacts of climate on the U.S. Pacific Northwest and the application of climate information in regional decision-making processes. This center includes the following groups:

- Climate Dynamics Group - Studying the physical dynamics of climate variability and climate change over the Pacific.
- Climate Impacts Group - Studying the impacts of natural climate variability and global climate change ("global warming") on the Pacific Northwest.
- Office of the Washington State Climatologist - Collecting, disseminating, and interpreting climate data for the state of Washington.

Center for Sustainable Forestry at Pack Forest - Discovering, teaching and demonstrating the concepts of sustainable forestry.

Center for Water and Watershed Studies - A source of comprehensive aquatic resources and water management information.

Center for Studies in Demography and Ecology - Supporting education, research, and scholarly exchange in population studies.

Center for Urban Horticulture - Applying horticulture to natural and human-altered landscapes to sustain natural resources and the human spirit.

Columbia Basin Research Group - Investigating issues surrounding salmon biology in the Columbia and Snake River basins.

Design for Environment Laboratory - Life cycle assessments and management of environmental design information.

UW Environmental Centers and Programs (cont'd)

Fire and Mountain Ecology Laboratory - Investigating climatic change, fire, and forest ecology in mountain ecosystems of western North America.

Forest Systems and Bioenergy Program - Finding alternative uses for low value, overly abundant forest materials through emerging technologies in the renewable-energy sector.

Geophysical Fluid Dynamics Laboratory - Studying real fluids in the laboratory as scale models of the globally circulating ocean and atmosphere.

Herbarium - Houses over half a million dried specimens of vascular plants, mosses, liverworts, algae, lichens, and fungi.

Institute for Hazards Mitigation Planning and Research - Exploring ways to integrate hazards mitigation principles into a wide range of crisis, disaster, and risk management opportunities.

Joint Institute for the Study of the Atmosphere and Ocean - A cooperative institute between NOAA and the UW that complements the research at the Pacific Marine

Environmental Laboratory in climate variability, environmental chemistry, estuarine processes and interannual variability of fisheries recruitment.

Laboratory for Energy and Environmental Combustion - Specializing in both fundamental and applied combustion research.

Marine Molecular Biotechnology Laboratory - Using molecular/genetic techniques to address ecological questions in freshwater and marine ecosystems.

Marine Population Assessment and Management Group - Applying a multi-disciplinary approach to develop quantitative methods for use in marine resource management.

NEPTUNE - A regional ocean observatory in the northeast Pacific Ocean that will enable regional-scale, long-term, real-time observations and experiments with the ocean, seafloor, and subseafloor.

Northwest Center for Particulate Matter and Health - Studying the effects of particulate air pollution on human health.

Northwest Environmental Forum - A collaborative meeting and work space to bring together decision makers and stakeholders to apply scientific and policy information to address critical environmental and natural resource management issues.

Olympic Natural Resources Center - Conducting research and education on natural resource management practices which integrate ecological and economic values.

Pacific Northwest Seismic Network - Operating a network of seismograph stations and providing information on PNW earthquake and volcanic activity and hazards.

Polar Science Center - Observing and modeling the physical processes that control the polar environment.

Program on Climate Change - Understanding physical climate variability and how humans influence climate, climate change, and climate impacts.

Program on the Environment - Fostering and promoting interdisciplinary environmental education at the UW.

Puget Sound Regional Synthesis Model (PRISM) - Creating a virtual reality version of Puget Sound to help provide integrated solutions to well-known environmental problems and to identify emerging issues.

Quaternary Research Center - Interdisciplinary research on the last two million years of the global environment.

UW Environmental Centers and Programs (cont'd)

Rare Plant Care and Conservation Program - Conserving Washington's native rare plants through methods including conservation, rare plant monitoring, reintroduction, and education.

Restoration Ecology Network - Advancing higher education in restoration while helping the Pacific Northwest region meet the growing needs and challenges of ecological restoration.

River Systems Research Group - Exploring the processes that ultimately control the role of rivers in the global cycles of water, carbon, and nutrients.

Rural Technology Initiative - Promoting better technology in rural areas for managing forests for increased product and environmental values in support of local communities.

Stand Management Cooperative - A source of high-quality information on the long-term effects of silvicultural treatments and treatment regimes on stand and tree growth and development and on wood and product quality.

Urban Ecology Project - Seeking to better understand the ways in which humans interact with their environment and apply that knowledge effectively.

Washington Cooperative Fish and Wildlife Research Unit - Improving the management of the nation's fish and wildlife.

Washington Sea Grant Program - Serving communities, industries and the people of Washington State, the Pacific Northwest and the nation through research, education and outreach in the marine environment.

Wind River Canopy Crane - Providing access for scientists to gather samples, install instruments and conduct experiments in the canopies of trees as tall as 220 feet.

Appendix B. Volunteer Participants in the College of the Environment Working Group on Vision (October-November, 2007)

- Tom Ackerman (Atmospheric Sciences)
- Marina Alberti (Urban Design and Planning)
- John Booker (Earth and Space Sciences)
- Patrick Christie (Marine Affairs and International Studies)
- Sara Curran (Public Affairs and International Studies)
- Richard Fenske (Environmental Health)
- Kevin Laverty (UWB – Business)
- Joshua Lawler (Forest Resources)
- Parker MacCready (Oceanography)
- Jan Newton (Applied Physics Lab)
- Julia Parrish (Aquatic and Fishery Sciences)
- Sarah Reichard (Forest Resources)
- Josh Tewksbury (Biology)
- Craig Thomas (Public Affairs)
- Anne Vernez Moudon (Architecture)
- Sam Wasser (Biology)

(Participation in a Working Group does not imply an individual's full support of the products of the Working Group.)

Appendix C. Volunteer Participants in the College of the Environment Working Group on Organization and Structure (October-December, 2007)

Over 50 faculty from at least seven existing colleges and over 20 departments and schools participated in a volunteer CoEnv Working Group on Organization and Structure.

(Participation in a Working Group does not imply that individual's full support of the products of the Working Group.)

- David Armstrong (SAFS)
- David Battisti (ATM)
- Cecilia Bitz (ATM)
- Dee Boersma (Bio)
- Patrick Christie (SMA/IS)
- Sara Curran (Evans/IS)
- Janice DeCosmo (UAA)
- Steven Emerson (Ocean)
- Richard Fenske (Env. Health)
- David Fluharty (SMA)
- Jerry Franklin (co-convener) (CFR)
- Peter Guttorp (Stat)
- Mark Handcock (Stat)
- Gary Handwerk (Eng/CompLit)
- Stevan Harrell (Anthro)
- Stephanie Harrington (OR)
- Robert Harrison (CFR)
- Dennis Hartmann (ATM)
- Kevin Hodgson (CFR)
- Alexander Horner-Devine (CEE)
- Bruce Howe (APL)
- Patricia Huling (Provost)
- Terrie Klinger (SMA)
- Randy Kyes (Psych)
- Ellen Lettvin (APL)
- David Mabberley (CFR)
- Marc Miller (SMA)
- David Montgomery (ESS)
- Richard Moritz (APL)
- James Murray (Ocean)
- Jan Newton (APL)
- Arthur Nowell (COFS)
- Julia Parrish (co-convener) (SAFS)
- Devon Pena (Anthro)
- Ignatius Rigor (APL)
- Gerard Roe (ESS)
- Dennis Ryan (UDP)_
- John Schaufelberger (Const. Man.)
- Julian Sachs (Ocean)
- Kenneth Sebens (Bio/FHL)
- Stuart Strand (CFR)
- Werner Stuetzle (Stat)
- Daniel Vogt (CFR)
- Pat Wahl (CPHM)
- Mike Wallace (ATM)
- Steve West (CFR)
- William Wilcock (Ocean)
- Rebecca Woodgate (APL)

Appendix D. Volunteer Participants in the College of the Environment Working Group on Education and Learning Goals (January-March, 2008)

Over forty people voluntarily participated in the College of the Environment Working Group on Education and Learning Goals, the majority of which were faculty from units from across the UW-Seattle campus. Staff from the libraries, educational assessment offices, academic advising, and research and training centers also participated.
(Participation in a Working Group does not imply an individual's full support of the products of the Working Group.)

- Julie Beschta (Global Health)
- Miriam Betram (Program on Climate Change)
- Cathy Beyer (Office of Educational Assessment)
- Aaron Bidelspach (International Outreach)
- Penny Dalton (WA Sea Grant)
- Bob Edmonds (CFR)
- Sarah Elwood (Geography)
- Kern Ewing (CFR)
- Jerry Franklin (CFR)
- Jim Fridley (CFR)
- Katie Frevert (Env and Occ Health Sciences)
- Richard Gammon (Chem, Ocean)
- Vince Gallucci (SAFS)
- Martha Groom (Bothell, Interdisciplinary A&S)
- Michelle Hall (POE)
- Stephanie Harrington (Office of Research)
- Rob Harrison (CFR)
- Tom Hinckley (CFR)
- Wayne Jacobson (CIDR)
- Mike Kaplan (Education)
- Mitsuhiro Kawase (Oceanography)
- Randy Kyes (Psychology/Primate Center)
- Nana Lowell (Office of Educational Assessment)
- Doug Mercer (Geography)
- Steve Muench (CoE-C&Env)
- Marc Miller (SMA)
- Linda Nash (History)
- Bruce Nelson (Earth & Space Sciences)
- Julia Parrish (SAFS, Biology)
- Michael Reese (POE)
- Gabrielle Rocap (Oceanography)
- Clare Ryan (CFR)
- John Sahr (UAA/EE)
- Josh Tewksbury (Biology)
- LuAnne Thompson (Oceanography)
- Michelle Trudeau (CFR)
- Mike Wallace (Atmospheric Sciences)
- Thaisa Way (Landscape Architecture)
- William Wilcock (Oceanography)
- Don Wulff (CIDR)
- Victor Yagi (POE)
- Anne Zald (Libraries)
- Craig Zumbrunnen (Geography)

Appendix E. Evaluation of College Model Strengths and Weaknesses

(Analysis done by Working Group on Organization and Structure, Nov. 2, 2007)

Whole Unit Model: A collection of existing programs, departments, schools, and colleges become the College of the Environment. All units retain their original structure, including undergraduate and graduate programs.

Strengths

- Number of college will not increase, so ultimately for financial reasons this will be a primary piece.
- Guarantees faculty involvement.
- Economically provides immediate underpinning.
- Group of faculty with primary appointment gets strength and leverage.
- Reserves the strength of existing units (but don't want to do this without the opportunity to build more programs).
- Model accommodates students who want both disciplinary and interdisciplinary training.
- Responds to problems identified by provost and faculty about being too diffuse.
- New dean could have a strong influence on pulling in departments.
- Places recognized quality together for a big bang.
- Brings together units from different colleges that have similar interests.
- Together units would become a significant force at the university and gain collective political strength.
- Conserves existing strengths and provides a future for CFR.

Weaknesses

- In its pure form, it severely disadvantages units not completely devoted to environment.
- Challenge will be to retain individual undergrad and grad programs in addition to an overarching program (could be great redundancy).
- Unit a strength for units wholly in, but perhaps a repellent to others.
- Don't grand challenges need more than just units that are fully in?
- No place for the humanities in this model.
- Most familiar and comfortable for people to think about, but perhaps not unique enough to provide innovative reputation? Too traditional?
- Some deans would be very opposed to this.
- Leaves out individuals interested in environment.
- Worry about ability to move from basic towards more applied work.
- Need a really strong dean to encourage/enable/force interdisciplinarity or will not change individuals behavior.
- Sounds like what we have now with an additional layer of bureaucracy.
- Equal weight for four challenges could be very unwieldy.
- Combine units that have a common weakness – a relatively small undergraduate enrollment.
- Most inflexible of all four models.
- Alone, this wouldn't be enough of a change to make worthwhile.

Nurse Log Model: An existing college is used as the basis for the new College of the Environment, created by adding faculty lines that significantly augment the mission and responsibilities of the original college.

Strengths

- Potentially greatest model with a slight twist – Think of nurse log**s** as any environmentally strong units – start with the strengths. Resources then get distributed across the "logs." Doesn't necessarily retain the current structure.
- Multiple log scenario makes sense.
- If one college doesn't want to play, could still move forward.
- Attitude that name implies is exactly right.

Weaknesses

- Need to start with a weak unit to do this because no strong college will stand for being told to change – single nurse log is not feasible.
- Don't see how one could back into something that is cutting edge with this model.
- Could be slow to reach the pinnacle of success and develop profile.
- We're past the point of being able to use this model at the UW.
- Doesn't build on strengths across the UW.
- Similar to branch campus model – isn't effective.
- Would create an identity crisis – would be seen as window dressing.
- Only feasible nurse log is COFS, and they would not be advantaged by this.
- No one college is sufficiently broad enough to allow us to meet our goals.
- Perception would be that it is more of the same (of whichever unit is chosen).
- Would more effective to "combine logs" than focus on one log.

Other comments

- Has happened here in the past. Example - Fisheries becoming School of Aquatic and Fishery Sciences.
- Jackson School is another model where this was a success

Interdisciplinary Merger (aka Cherry picking): Faculty with a wide range of research interests collectively move from their home department to form the new college, where all participants are tied by a shared interest in interdisciplinary research and scholarship. New hires augment the core. (Note: For the purposes of this discussion, faculty appointments in this model are primarily within the College of the Environment.)

Strengths

- New faculty lines mean college has resources to develop curriculum, etc.
- There are many people in humanities and other units who would love to do this – energy comes from this.
- Potentially gets to what provost is looking for in really being able to address environmental challenges.
- People who are most motivated are most likely to contribute/participate.
- 100% commitment from people actually doing the work and others aren't dragged along.
- Participants are fully committed.
- Terrific way to innovate and be adaptive.
- Would solve promotion and tenure issues because it is taken care of within the colleges.
- Social sciences, humanities and arts needs to cherry pick since whole units there will not go in.
- In one way, this is one of the most exciting way to go – as long as faculty want to go. Strong departments will see people leave for new horizons, but people from marginal units will have a great opportunity.
- Resulting turmoil may actually be good for us.

Weaknesses

- Faculty have to leave their departments.
- Would never capture all strengths.
- Potentially weakens existing programs.
- Appointments across two colleges very challenging.
- Deconstructive – weakens existing programs.
- Cherry picking could weaken other departments.
- Could be risky for new faculty to go into – especially junior faculty.
- Isolation from colleagues in disciplines.
- 40 people isn't enough.
- Doesn't build off of existing strengths.
- Would gut existing programs.
- Creates a faculty that is environmental and others who "are not."
- There isn't going to be an extra college, so this isn't realistic.
- Difficult to design curriculum because of separation of units.
- Disastrous for some and advantageous for others.
- May not get the right people if self-selecting.
- Most difficult to implement – especially for disciplines.

Other comments

- We need to think outside of individual disciplines.
- Institute of advanced studies would fit this model.

Virtual College: A collection of faculty, all with partial appointments in College of the Environment, and corresponding appointments in relevant disciplinary units across campus. Appointments may be permanent (that is, constant through time) or temporary (e.g., fulltime for 2 years, one quarter for 5 years, etc.). Existing faculty can participate by being partially 'bought out' of their units. As faculty participating in College decide to migrate more completely into disciplinary effort, they would be replaced by other/new faculty, by arrangement between relevant unit heads and deans.

Strengths

- Split appointments is a good idea, especially if departments are compensated.
- In and out notion (on periods of time) is appealing and this model has more revolutionary potential.
- Has nimbleness to respond to changing research initiatives and priorities (see Columbia's EI for model).
- Most able to respond to outside initiatives and connections (that are not on an academic schedule).
- There may be very good people who are not ready to jump in all the way and can participate this way.
- Nimble.
- Insufficient, but does foster (more than the whole college model) the participation of units not fully environmental.
- Allows equal ownership from organizations that aren't fully in.
- If joint appointment issues on research faculty side can be overcome, this is good idea.

Weaknesses

- High administrative costs to manage the negotiations – potentially a managerial nightmare.
- Least chance of achieving goals – if you want to do something striking and bold, need a core group of people who are not distracted by dual appointments and duties.
- Hard to have a coherent curriculum.
- Speaking from experience – it is a managerial "challenge."
- Hard to develop curriculum with changing faculty.
- Good for research, but degrees and curriculum much more challenging; no base here.
- Doesn't deserve the stature of an existing college.
- Has some features that will be required, but is not sufficient.
- Loyalties are split.
- Forces the least change in existing colleges.
- Unstable and creams the existing units.
- As sole model it is not sufficient.
- Joint appointments foster communications between departments.
- With split allegiances, this might not develop into world-class college.

Appendix F. Draft Report of the College of the Environment Structure Working Group

January 3, 2008

Summary

Assuming the mandate to devise a structure that met the announced goals of the University in establishing a College of the Environment, the Structure Working Group held 5 meetings involving over 50 interested faculty, in which there emerged general consensus that the should have three components:

1) A curricular structure to promote environmental education and literacy campus-wide, including general courses in environmental literacy for all undergraduates, as well as specialized B.A. degrees in Environmental Studies (and perhaps B.S. in Environmental Sciences).

2) Degree-granting units that would have their own full-time and joint faculty appointments. Some of these would be existing units transferred in from other colleges; some would be created out of faculty from other units. Some would report dually to the College of the Environment and to another college.

3) An Institute for Advanced Environmental Studies, focused on research about environmental problems, and including as fellows faculty from CoE and other colleges, people from government, private, and NGO sectors, and post-doctoral fellows.

Background

The purpose of the Structure Working Group was to assume the mandate created by the Provost and refined by the Vision and Mission Working Group, to devise a structure for the College of the Environment that would maximize the UW's strength in research and teaching about the environment, and facilitate cooperation between the University and the community in a three stage approach to environmental problems: Discovery of basic knowledge, development of solutions to particular problems, and application of these solutions in the real world.

The Working Group, with Julia Parrish and Jerry Franklin as co-chairs and Stephanie Harrington as Facilitator, met 5 times in November and December, 2005. Over 50 faculty from at least 7 existing colleges and over 20 departments and schools participated in these meetings. The group considered the existing and potential strengths of the UW in environmental research, education, and public partnerships, the currently-existing structural obstacles to realization of the UW's full potential, and the lessons that might be learned from other major research universities who have established major interdisciplinary environmental units in the last few years.

Despite minor disagreements over details, by the end of the meeting process there was a remarkable degree of general consensus on the outlines of the structure that would best promote the goals of the College of the Environment stated above. The remainder of this report sets out the details of the recommendations of the Structure Working Group.

Components of a College

It is the consensus of the Working Group that any structure for a College of the Environment must provide value-added over and above what is possible given the current organization of environmental research and education at the UW. Just moving departments around and placing them under a new dean would not justify the transaction costs embodied in the establishment of a new College. With this in mind, the Working Group considered that a College must be structured to facilitate deep and broad interdisciplinary collaboration between natural sciences, social sciences, policy and law, engineering, and the humanities. It should also facilitate meaningful cooperation between the University and other regional and global environmental stakeholders, including the government, corporate, and NGO sectors, as well as public interest groups. Finally, the structure should facilitate the general education mission of the University to assure that every graduate has the opportunity and incentive to become an informed environmental citizen. The 3-part structure of a proposed College, outlined below, was designed with these goals in mind.

Curriculum in Environmental Literacy and Citizenship

The College should be the locus of campus-wide environmental education. This should include:

1) General coursework designed for all students, whether this is part of an environmental literacy requirement (favored by some members) or simply made widely available as part of general education offerings.
2) Interdisciplinary majors within the college and/or jointly between the college and other units, including a B.A. successor to the current Environmental Studies major, and possibly a new B.S. major in Environmental Science.
3) Interdisciplinary master's-level and graduate certificate programs, including to begin with the proposed programs in Conservation of Living Systems.
4) Research experiences for undergraduate and master's level students connected to the Institute for Advanced Environmental Studies.

To coordinate and facilitate these programs, the College should have a modest education and advising office, with a half-time faculty director of educational programs and suitable professional staffing.

Degree-Granting Units

The College should include schools and departments that have the ability to grant degrees and to hire both tenure-line and research faculty; i.e. departments and schools like those in any other college. These departments need to include not only those focused on natural science disciplines, but also those focused on social science, engineering, law, policy, and the humanities. In order to achieve this balance and cross-fertilization between the natural sciences and other disciplines, it was agreed that the College will have to include schools and departments of different sorts, some of them currently existing and some of them to be newly created. The units would primarily be of two types:

1) Existing schools or departments moved into the College of the Environment, or placed in dual-reporting structures between the College of the Environment and other colleges. Such a structure would apply to units all of whose faculty are engaged in environmental research and teaching. As examples only, the Working Group members proposed such units as the College of Forest Resources, the Department of Earth and Space Sciences, or the School of Aquatic and Fisheries Science. These units would continue to offer the same undergraduate and graduate degrees as they do now. Whether these particular units would join the College or not is not a recommendation of the Working Group; these units are offered only as examples.

2) Composite, interdisciplinary schools created by moving individual faculty full- or part- time from existing units. Such a structure would apply to faculty from units where currently only a minority of faculty are engaged in environmental education and research, so that the unit as a whole would not be suitable for inclusion in the college of the environment. These units would have the possibility of offering new degrees, either by themselves or jointly with existing departments, at any level from bachelor's to doctoral; new degrees would of course have to go through the regular process of University Approval. As examples only, Working Group members proposed a School of Environment, Society, and Culture, which would have faculty members drawn from units in social science, policy, law, and the humanities; and a school of Environment, Engineering, and Design, which would draw faculty members from various departments in the colleges of Engineering and of Architecture and Urban Planning. Again, the particulars would have to be worked out by negotiation.

To mandate which specific units be moved or created at present is probably premature; there was strong agreement that incentives to join the College should be specific to particular units or individuals, and that the final question of who is in and who is not in should be decided by negotiation and mutual consensus between the Provost's office, heads of units, and individual faculty.

Institute for Advanced Environmental Studies
There was unanimous agreement among Working Group members that the component that would increase the value-added of the College the most would be the Institute for Advanced Environmental Studies. This Institute would have a permanent director but no permanent Fellows; Fellows would be drawn from UW faculty both inside and outside the College of the Environment, from members of the government, corporate, and NGO sectors, and from applicants to a competitive post-doctoral program. Fellows to the institute would be selected as members of working groups organized for the purpose of addressing particular environmental problems. These groups would apply as groups to the Director of the Institute, with or without external funding, for a certain number of Institute fellowship positions. The duration of Fellowship positions would be determined by the amount of time needed for the group to complete its particular project, but 5 years would be an absolute maximum, with most Fellowships shorter in duration. Fellows should be full-time in most cases, but half-time appointments might be considered in particular cases. Whether the Institute should include individual appointments of fellows not part of working groups (a professor or a senator writing a book, for example), was not agreed upon by the Working Group.

The Institute would also be a primary means by which the College communicated on environmental issues with the University and with the larger society. As such, it should be actively involved in sponsoring seminars, symposia, and other public programs both on- and off-campus.

Other components
In addition to the basic, 3-part structure of the College, it was agreed by the Working Group that the College would also have two other minor components:

1) Existing inter-college or inter-departmental centers and institutes working on environmental problems. As examples, these would be such units as JISAO, The
Water Center, or the Program on Climate Change.
2) Professional support staff to meet technical needs of college faculty and students and of Institute Fellows. Examples might include professional grant/proposal writer, GIS specialist, statistician-envirometrician, etc.

Concluding Thoughts
The Working Group discussed the question of whether the three main components of the College structure might be independent enough of each other to be phased in over a period of several years. The answer was no; so much of the effectiveness and value-added of the College depends on the synergy and cross-fertilization of the three components that every effort ought to be made to establish the entire organization at once. This report represents the outcome of careful, detailed, and remarkably unselfish deliberations among a wide variety of

faculty and staff closely concerned with and committed to expanding and deepening the UW's role in environmental education, research, and problem solving for the next few decades. We hope that it will be useful in the ongoing process leading to the establishment of a College of the Environment in the very near future.

Appendix G. Society, Culture, and Institutions in the College of the Environment

March 11, 2008

WHITE PAPER
SOCIETY, CULTURE, AND INSTITUTIONS IN THE COLLEGE OF THE ENVIRONMENT

John Muir famously said that "When we try to pick out anything by itself, we find it hitched to everything else in the universe." So too with UW social, cultural, economic, and legal research and teaching on the environment— all our social science is hitched to our natural science. The College of the Environment provides us with an opportunity to harness those connections, so that we can take advantage of the remarkable synergies available here at the University of Washington. In doing so, we are better able to understand how human and social interactions with our myriad environments shape our conceptions of social and environmental change and approaches to environmental problems. Ultimately, we gain both theoretical and practical knowledge about how environmental phenomena are perceived and understood, how responses to environmental degradation are conceived and implemented, and with what sorts of beneficial and negative effects.

I. Introduction

The natural sciences seek to understand the functioning of natural systems (including the physical and biological impacts of human actions on those systems, and technical approaches to mitigate specific impacts). The social sciences broadly conceived, including social sciences proper, law, policy, and humanities, seek to understand the human institutions, practices, perceptions, and motives that shape human-environment interactions across time and space. Both natural and social sciences offer descriptions, explanations, and differentiations. An intellectual partnership between social and natural sciences is crucial to enacting the mission of the College of the Environment. Although we use the distinction between the terms “natural” and “social” sciences as a convenient shorthand in the text that follows, we attempt also to demonstrate that there are many similarities of approach. Progress toward the mission of the College will require building on these similarities, together with respectful appraisal of differences.

In this White Paper we articulate our vision of a social, cultural, economic, and legal contribution to the College of the Environment. We address this document to a wide audience that includes the Provost, the organizers of the Working Groups on the College of the Environment and others who are helping to design the new College. We intend this document to serve also as a core vision for the establishment of a School of Environment, Society and Culture, a social science unit within the College of the Environment.

This document was prepared by a voluntary group of faculty, primarily in the Division of Social Sciences in the College of Arts & Sciences, but including also faculty from the Division of Humanities in A&S, the Evans School of Public Affairs, the College of Forest Resources, the College of Ocean and Fishery Sciences, and the Law School.

II. Proposed Structure for Social Sciences in the College of the Environment

The Structure and Organization Working Group has proposed a three-tier structure for the College of the Environment: an educational base of campus-wide environmental literacy, a core of degree-granting departments, and a research Institute for Advanced Environmental Studies. The social sciences make critical contributions to each of these three tiers.

At the base, campus-wide environmental literacy depends on students understanding the social and cultural context of why we see and treat the environment the way we do, and how we can mobilize our citizenry to thoughtful dialogue and action about the future in which our current students will live. Environmental literacy courses developed as part of the College's mission can and should incorporate social and cultural dimensions, and we look forward to working together with our natural scientist colleagues to develop exciting, integrated courses for the entire University community.

At the core, the Structure and Organization Working Group has already addressed how best to include social sciences into the structure of the College's degree-granting departments. Recognizing that there are no existing social science departments that could be incorporated in their entirety into the new College, the Working Group proposed that a new academic unit be created to house teaching and research in the area of Environment, Society, and Culture. We agree; this new unit will ensure that social science expertise has a critical mass within the College. We therefore propose that the new unit be given the working title, reflecting its interdisciplinary nature, of School of Environment, Society, and Culture (SESC). Moreover, we anticipate that there will be social scientists present as faculty in most, if not all, of the other Schools or Departments that will form the core units of the College of the Environment. This will ensure College-level dialog among natural and social scientists, a dialog necessary to the effective enactment of the College’s mission.

The School would offer appointments to environmentally-focused faculty from existing departments in the College of Arts and Sciences and other appropriate UW schools and colleges. Most of these appointments would be part-time, but full-time appointments would not be precluded. We may want to consider rotating multi-year temporary appointments as well, to ensure broad multi-disciplinary participation. The new academic unit would, like any other such unit, be fully able to grant undergraduate and graduate degrees, serve as a faculty member's home department for promotion, tenure, and merit review, and otherwise perform the functions of a regular academic unit. We also anticipate that the administration will allocate some of the new faculty and staff FTEs to this unit, some of these for new appointments and some as compensation to departments that lose portions of faculty appointments in the process of transfer. We do recognize that losses of partial faculty lines to the College of the Environment may not be a zero-sum game for existing units; some of the courses taught and degrees offered could be jointly managed by existing departments and the new School. Assessment of appropriate levels of compensation will require careful and individualized attention.

Turning to the Institute, we expect that Environment, Society, and Culture researchers will play a central role in the proposed Institute for Advanced Environmental Studies.

SESC researchers will be particularly appropriate collaborators with visiting fellows from government, NGO and private sectors who are invited to become fellows of the Institute.

In sum, the participation of educators and researchers from the fields of Environment, Society, and Culture is central to the proposed structure of the College of the Environment, and will enrich both the College itself and the connections between the College and the rest of the University.

III. Basic and Applied Research: What we do in the environment? Why? What we ought to do about the environment?

How do we study these questions?

In this section we chart UW social science scholarship on the environment, recognizing that our work includes both basic and applied research. We organize this description of our expertise in terms of three dimensions: research content, research process, and research scale. We conclude by summarizing the methodologies we use to address social science research questions. We have prepared several more extended examples of the scholarship we bring to the grand challenges of environmental concerns: climate, global environmental health, conservation, and urbanization. The human dimension cuts across these challenges, and the human dimension, of course, is what social sciences address. These are included in Appendix A.

A. Content

UW social scientists' research and teaching about what we do in the environment and why – basic research—and what we ought to do about the environment—applied research—cover a wide range of human-environment interactions, best conveyed in three units of analysis: institutions, behavior, and values.

Institutions. From the Russian state energy bureaucracy to the U.S. Forest Service; from UN commissions to activist NGOs; from ancient Chinese armies cutting forests for fuel to modern oil and wind-energy companies competing for profits, institutions shape and limit the ways in which we act on and about the environment. Institutions have particular cultures and function within complex governance systems. UW anthropologists, geographers, historians, sociologists, political scientists, legal scholars and economists all study the environmental role of institutions in a variety of times and places.

Behavior. Why and how do people interact within their environments as they pursue their livelihoods, seek spiritual inspiration or spend their leisure time? How are these interactions shaped by historic processes such as development, colonization, or globalization? The UW faculty adopt a variety of disciplinary approaches that, taken in combination, provide a diversity of analyses and explanations of how humans interact with their environment, shape landscapes, and conserve or degrade ecosystems. Prominent among these are demographic, economic, geographic, psychological, and anthropological approaches. Economists attempt to determine the evaluation of environmental assets and to understand the structures of preferences and incentives that shape people's environmentally relevant behavior. Geographers assess how behavior shapes and is shaped by space, place and environment. Demographers track population growth, the movement of people, and their mortality as both drivers of environmental

degradation and the result of environmental change. Psychologists deal with the motivations for environmental behavior. Sociologists describe how societal organizations are shaped by and shape human behavior. Anthropologists address the way structures of culture, customs, and social institutions influence behavior in and about the environment.

Values. "Values" encompass a broad array of concepts including beliefs, ethics, and culture. Everything we do in and about the environment is influenced by our values, whether they are consciously articulated ethical, political, religious, and philosophical systems, or whether they are unconsciously held cultural beliefs. The values held by the people who populate the institutions we study—bureaucracies, religious establishments, NGOs, environmental activists—shape their environmental behaviors. So, too, do the values that natural and social scientists hold in our own work shape our behavior. UW's new Science Studies Network studies the values and behaviors of environmental scientists. UW's environmental philosophers, historians, anthropologists, geographers, and literary critics study environmental values both as ethical systems in themselves and as aspects of past and present societies and cultures.

B. Process

Social sciences make critical contributions to understanding the social processes through which we have effects in our environment, the how and why of environmental phenomena. Processes of change, processes of response, and processes of understanding are all involved in environmental behaviors.

Processes of change. To understand the current environmental predicament, we must understand how human institutions, behaviors and values have had impacts in the environment in the past, and continue to have impacts in the present. Natural science understandings of environmental processes usually emphasize description, systematization, and prediction. Social science approaches to institutions, behaviors, and values can supply the missing how and why. Particularly important in understanding these processes of environmental change are: historical approaches, which can expand our time scale; economic and psychological approaches, which can unravel motivations; and sociological, political scientific, anthropological, geographic, legal and communication approaches, which explain the institutions, politics and values that shape these behaviors.

Processes of response. People do not simply create environmental problems; they recognize, debate, and act in response to the problems they perceive. Natural scientists studying environmental processes are often frustrated by the failure of social actors to respond in what scientists see as rational ways that would ameliorate perceived environmental problems. But if what we do about the environment is embedded in political, economic, and social institutions and values, we cannot expect our responses to be rational in a straightforward manner. Legal, political scientific, economic, psychological, anthropological, and geographic approaches are necessary to understand why different people and institutions define and react to environmental change in the ways that they do, and who benefits and who loses when we define and react to environmental change in these different ways.

Processes of understanding. Understandings of environmental impacts are embedded in laws, cultural beliefs, journalistic discourses, political campaigns, literary

works, religious proscriptions, and other cultural phenomena. Rigorous scrutiny and critique of the ways in which people produce knowledge about and establish meanings of environmental change are also critical to understanding those changes and responses to them Social scientists ask how processes of understanding are shaped by axes of human difference such as gender, race, ethnicity, class, religion, and citizenship. We ask how and why knowledge and meaning-making are legitimated or discounted. We explore how understanding and meaning of environmental processes and solutions change when traditional or indigenous knowledges are regarded as legitimate or illegitimate. We develop new research methodologies, such as participant research, to accomplish these goals.

C. Scale

Social scientists, like natural scientists, are concerned with identifying the scales at which environmental phenomena occur, how the characteristics of these phenomena depend on the scale at which they are observed, and how phenomena at various scales interact in complex systems.

Temporal scales. Even though the current "Crisis of the Earth" is relatively recent at the global scale (perhaps 50 years old), it is the result of processes at a long time scale—thousands of years—studied by archaeologists, historians, and literary scholars, and of course by glaciologists, geologists, and paleontologists. In addition, these long-scale phenomena contain within them local crises of shorter duration. The fact, insignificant in itself, that if world fertility were to decline to the current Italian level and stay there for a thousand years—not long on a geologic or even human scale—the entire population of the earth in 3000 would not fill Husky Stadium, points to the importance of temporal scale in understanding and reacting to environmental changes and challenges.

Spatial scales. Like our natural science colleagues, we recognize that phenomena occur very differently at different spatial scales, from the farm or local watershed to the regional drainage basin or climate zone, from the urban block to the metropolitan area, from the water control district to the nation-state. The social science disciplines themselves focus on different scales— law, political science, sociology, and some economics typically address large scales, whereas anthropology addresses small scales. As a discipline of spatial scales, geography is a core contributor to spatial analyses.

Scales of complexity. There are levels of social complexity involved in solving any problem, complexities parallel to those in the natural sciences. Scales of complexity therefore entail both social and natural aspects, and interactions among them. The economics and hydrology of hydroelectric dams, the biology and culture of salmon fishing, the chemical and social justice problems of garbage dumps, all add scales of complexity that interrelate with temporal and spatial scales.

D. Applications of social science

Research content, research process, and research scales define broad dimensions of basic research questions. Many social scientists extend their basic research into applied dimensions to inform the development of responsible policy. Success requires an understanding of the diversity of social patterns and institutions at various scales and how individual and group incentives operate to motivate behavior that may, on the one hand,

advance societal objectives, or on the other hand, impede the accomplishment of those objectives. These environmental management frameworks and tools are informed by both basic theory and applied research. Successful biodiversity conservation must take account of physical, biological and ecological variability, human subsistence needs at the local level, transnational political-economic forces, and powerful cultural proclivities (NIMBY conflicts). Conflicts among farmers, people who fish for sport, tribes, biologists, electrical power producers, and timber harvesters over salmon habitat in the Pacific Northwest are a prime local example. To meet its mission, the College of the Environment will need the perspective of each of these branches of scholarship to develop and implement prospective solutions to socially embedded environmental challenges.

E. Research methodologies

As is the case in all scientific investigations, the choice of research methods must be tailored to the particular foci of the research questions. Social science methodologies are broad in scope, with both distinctive disciplinary approaches and significant overlap in methodologies across the disciplines of Anthropology, Communications, Economics, Geography, History, Philosophy, Political Science, Psychology, and Sociology. Research designs may be inductive, deductive, comparative, historical, or experimental.

Social sciences also draw on numerous forms of measurement and data collection: common tools include lab experiments, sampling, census and survey design, archival retrieval, remote sensing and interpretation, mapping, interviewing, and participant observation, to name but a few. Resulting databases range from large-scale public sources to those generated at the micro-level, often in the form of case studies. A growing number of databases include geo-referenced identifiers locating humans in relation to particular natural resources and land covers or land uses. Increasingly, social and natural scientists collaborate to develop socio-ecological methods and data sets that describe how context, behavior and institutions shape and are shaped by human interactions with the environment.

Social scientists also have a sophisticated array of analytic tools. These tools include, among others, inferential and descriptive statistics, mathematical modeling for projections and forecasts, statistical modeling approaches (including agent-based, network, longitudinal, and multilevel), econometrics, geographical information systems, psychometrics, textual and discourse analysis, and participatory-action research. This array of social science methods, design approaches, measurement and analytic tools is a critical contribution of our presence in the College of the Environment.

Underpinning social science methods of inquiry is the assumption that societies socially and cognitively construct the environment in ways that shape both human behavior and environmental change. Through systematic and iterative analysis and interpretation of empirical evidence, social scientists, like their natural science counterparts, build and test theories that elaborate the dynamic relationship of people and their environments and explain the societal and cultural mechanisms contributing to environmental change, degradation and recovery. These research practices describe, explain, and ultimately enable more accurate predictions of human responses to environmental policies and robust explanations of the social, cultural and historic processes that drive environmental change across geographic scales.

IV. Resources: CSDE, CSSS, Environmental Curriculum

In joining the College of the Environment, the prospective School of Environment, Society, and Culture will bring to the College as a whole very significant resources for grant support, statistical and other methodological training and consultation, and interdisciplinary collaboration represented by two current research Centers housed in the College of Arts and Sciences.

CSDE: the Center for Studies in Demography and Ecology is one of ten population centers in the U.S. that has both research and training center grants funded by the National Institutes of Health. CSDE brings together more than 75 affiliate faculty and scholars from the U.W. and other Pacific Northwest institutions in disciplines ranging from sociology and economics to public health. CSDE models the power of collaborations among natural and social scientists, exemplified in the fact that it includes one of just three biodemography laboratories in the U.S. , that it has close connections with the UW's Department of Global Health and the UW's Center for AIDS Research, as well as the Center for Statistics and the Social Sciences. CSDE faculty generated approximately $17 million in grant activity in 2006.

CSSS: The Center for Statistics and the Social Sciences is the first center in the nation devoted to the interface between statistics and the social sciences through interdisciplinary research and teaching at both undergraduate and graduate levels. CSSS has 6 core faculty and 56 faculty affiliates. It models the power of interdisciplinary networks, with all of its core faculty holding joint appointments in both social science and natural science units. The faculty develop new statistical methodologies for the social sciences and address a host of research themes related to the environment, including major projects on assessing and communicating uncertainty in weather forecasts, estimating the size of whale populations, and analyzing social networks to help understand the spread of infectious diseases.

Curricular Resources

Units that currently offer courses on social, political, and institutional topics related to the environment include American Ethnic Studies, American Indian Studies, Anthropology, Economics, English, Geography, History, Philosophy, Political Science, Sociology, the Jackson School of International Studies, the Evans School of Public Affairs, Urban Planning, Architecture, the School of Law, the School of Business, the College of Forest Resources, the School of Marine Affairs, the School of Ocean and Fisheries Sciences, the Program on the Environment, the Honors Program, and undoubtedly others that we may have missed. There are at least sixty such classes that focus centrally on the environment, and fifty or more additional classes that include significant environmental content, or teach methods that can be applied to environmental themes. We envision that many of these courses could be cross-listed with the new School of Environment, Society, and Culture. In addition, the School would work with these and other units to develop new courses and tracks. A partial but extensive list of existing courses is provided in Appendix D. In addition, tracks and specializations currently offered in social science units, such as the Ph.D. option in Environmental Anthropology, could be considered for joint administration by the existing unit and the School of Environment, Society, and Culture.

The learning goals of our current environmental curricula are to train students to describe, explain and differentiate environmental perspectives and evaluate information. We deliver the critical thinking skills needed to achieve these learning goals through courses with environmental *content* – choices ranging from Scandinavia to China, from urban to rural, from local to global - in combination with courses covering *methods* of analysis. When examining the whole of our environmental curricula it is important to keep in mind that many classes not nominally identified as "environmental" do provide considerable relevant content. This is especially true for the methods courses in which students often apply a general method to an environmental question.
Some methods courses provide skills that are commonly associated with professional environmental analysis and decision support, e.g., courses on economic valuation of resources. Methods aimed at decision support include Geographical Information System courses that wed demographic and environmental data. Courses on environmental accounting in the business school support decision-making in the private sector. Methods for structuring institutions to process environmental information are taught by social scientists in several UW Colleges.

Long established in the social sciences and humanities curricula and increasingly used in professional settings are methods used to describe, explain and differentiate values at individual, institutional and cultural scales. Students learn to conduct interviews, participate in action research, analyze discourse, and receive training in research. Techniques for charting changing values, attitudes and behaviors include historical methods, literary analysis, and ethical analysis. We also provide training in quantitative techniques such as public attitude and behavioral surveying. We synthesize these methods to analyze environmental justice.

What we teach is the primary purpose of this section, but we are equally enthusiastic about *how* we teach. Faculty have experimented with a variety of active learning pedagogies and technologies to enhance learning and increase students' engagement with each other and their communities on matters crucial to environmental understanding. Major support for pedagogical innovation is provided by the Center for Instructional Development and Research and the Carlson Center, which coordinates student service learning projects. Students in our courses analyze data for clients, observe and participate in political deliberations, do field work locally, nationally and internationally, write for popular and scholarly publications, and much more. Collaborative group work skill building has become ubiquitous in the social sciences and the humanities. Students don't just learn content and methods, they learn *how* to learn and how to make it matter to themselves and their communities.

In sum, our curricula prepare students to apply their critical thinking skills to their future professional and citizenship responsibilities. Our graduates go on to become effective in formal institutional decision-making, and as citizen-consumers actively evaluating their everyday contributions to environmental culture and politics.

V. Summary

We have sought in this report to articulate our vision of a broadly defined social science contribution to the College of the Environment. The extended process of developing this vision has accomplished something more. Through the many conversations and debates

we have had about our mission, our research, our curricula, our outreach, our values, we have laid the groundwork for a remarkable collaboration across the traditional social science disciplines, extending to colleagues in the humanities, in public affairs, in law, in ocean and fishery sciences, in marine affairs, and in other sectors of the UW. We are united by our conviction that our central presence in the College of the Environment will promote critical collaborations with natural scientists of the environment as well as with each other, collaborations that are vital to understanding our complex environments, and to effective solutions to the environmental crises we face today.

Appendix H. Faculty Accomplishments

Elected Fellows

National Academy of Sciences Members
Jody Deming (Oceanography)
Edward Miles (Marine Affairs)
Peter Rhines (Atmospheric Sciences and Oceanography)
John M. Wallace (Atmospheric Sciences)

Fellows, American Association for the Advancement of Science
Thomas Ackerman (Atmospheric Sciences)
Jerry Franklin (Forest Resources)
Bruce Frost (Oceanography)
Michael Gregg (Oceanography)
Dennis Hartmann (Atmospheric Sciences)
G. Ross Heath (Oceanography)
Edward Miles (Marine Affairs)
James W. Murray (Oceanography)
Theodore Pietsch (Aquatic and Fishery Sciences)
Edward Sarachik (Atmospheric Sciences)
Charles Simenstad (Aquatic and Fishery Sciences)
Stephen G. Warren (Atmospheric Sciences and Earth and Space Sciences)

Fellows, American Geophysical Union
Knut Aagaard (Oceanography)
J. Michael Brown (Earth and Space Sciences)
John R. Delaney (Oceanography)
Steven R. Emerson (Oceanography)
Michael C. Gregg (Oceanography)
Bernard Hallet (Earth and Space Sciences)
Dennis L. Hartmann (Atmospheric Sciences)
G. Ross Heath (Oceanography)
David R. Montgomery (Earth and Space Sciences)
Paul Quay (Oceanography)
Peter B. Rhines (Atmospheric Sciences and Oceanography)
Thomas B. Sanford (Oceanography)
Edward S. Sarachik (Atmospheric Sciences)

Fellows, American Meteorological Society
David S. Battisti (Atmospheric Sciences)
Christopher Bretherton (Atmospheric Sciences)
Dale Durran (Atmospheric Sciences)
Michael C. Gregg (Oceanography)
Dennis L. Hartmann (Atmospheric Sciences)
Robert A. Houze (Atmospheric Sciences)
Clifford F. Mass (Atmospheric Sciences)
Peter Rhines (Atmospheric Sciences and Oceanography)
John M. Wallace (Atmospheric Sciences)
Stephen G. Warren (Atmospheric Sciences and Earth and Space Sciences)

Fellow, American Statistical Association
Loveday Conquest (Aquatic and Fishery Sciences)

Fellow, Geological Society of America
George W. Bergantz (Earth and Space Sciences)
Michael Brown (Earth and Space Sciences)
Darrel S. Cowan (Earth and Space Sciences)
Alan R. Gillespie (Earth and Space Sciences)
James Mercer (Applied Physics Laboratory and Earth and Space Sciences)
David R. Montgomery (Earth and Space Sciences)
Charles A. Nittrouer (Oceanography and Earth and Space Sciences)

Fellow, Royal Society of Canada
Ray Hilborn (Aquatic and Fishery Sciences)

Fellow, Society of American Foresters
B. Bruce Bare (Forest Resources)

Awards

Heinz Foundation, Award for the Environment
Jerry F. Franklin (2005)

Volvo Environmental Prize
Ray Hilborn (2006)

Fulbright Scholars (1998-current)
Dorothy Paun (2004-5)
Kevin Hodgson (2003-04)
James W. Murray (2002-03)
Robert Gara (1999-2000)
Tom Quinn (1999-2000)

Appendix I. UW 2007 Faculty Data by College*

Faculty FTE distribution across colleges supported by GOF/DOF

College	Existing Units	w/ proposed College
Arts & Sciences	714.04	682.28
Medicine	250.32	250.32
Engineering	161.07	161.07
College of the Environment		**104.27**
Business School	84.38	84.38
Dentistry	61.06	61.06
Nursing	53.81	53.81
Architecture and Urban Planning	49.63	49.63
Education	46.02	46.02
Ocean & Fishery Sciences	42.53	
Law	41.05	41.05
Public Health & Community Medicine	36.15	36.15
Social Work	35.83	35.83
Pharmacy	31.11	31.11
Forest Resources	30.12	
Information School	17.75	17.75
Public Affairs	16.49	16.49
Totals	**1,671.36**	**1,671.22**

Total faculty FTE distribution across colleges

College	Existing Units	w/ proposed College
Medicine	2587.24	2587.24
Arts & Sciences	952.55	892.50
Engineering	309.55	309.55
College of the Environment		**188.06**
Public Health & Community Medicine	152.17	152.17
Dentistry	119.94	119.94
Business School	109.89	109.89
Ocean & Fishery Sciences	94	
Nursing	90.84	90.84
Pharmacy	82.42	82.42
Education	64.95	64.95
Social Work	63.65	63.65
Architecture and Urban Planning	57.44	57.44
Law	54.74	54.74
Forest Resources	42.74	
Public Affairs	31.69	31.69
Information School	21.03	21.03
Totals	**4834.84**	**4826.11**

Faculty FTE in this table are based on faculty salary paid from an object of expenditure 0110 or 0120. These FTE are calculated regardless of fund source (including grants and contracts) and include academic and research faculty. The Applied Physics Laboratory in the College of Ocean and Fishery Sciences has 8.73 Faculty FTE and is not included in the College of the Environment in this table. This accounts for the difference between totals in the two columns.

* Data from UW Office of Institutional Studies

Appendix J. UW 2007-08 Total Major Counts by College*

Total Major Counts	Existing Units	w/ proposed College
Arts & Sciences	14188	13915
Engineering	3050	3050
Business	2972	2972
Medicine	1822	1822
College of the Environment		***1135***
Public Health & Community Medicine	728	728
Education	703	703
Law	668	668
Architecture and Urban Planning	660	660
Nursing	610	610
I-School	570	570
Social Work	521	521
Pharmacy	423	423
Ocean and Fishery Sciences	417	
Public Affairs	345	345
Forest Resources	322	
Dentistry	300	300

Undergraduate	Existing Units	w/ proposed College
Arts & Sciences	11519	11376
Business	2109	2109
Engineering	1805	1805
College of the Environment		***648***
Medicine	477	477
Architecture and Urban Planning	305	305
Ocean and Fishery Sciences	200	
Nursing	197	197
Forest Resources	182	
Social Work	108	108
I-School	101	101
Public Health & Community Medicine	94	94

Graduate	Existing Units	w/ proposed College
Arts & Sciences	2669	2539
Engineering	1245	1245
Business	863	863
Education	698	698
Medicine	667	667
Public Health & Community Medicine	634	634
College of the Environment		***487***
I-School	469	469
Nursing	413	413
Social Work	413	413
Architecture and Urban Planning	355	355
Pubic Affairs	345	345
Ocean and Fishery Sciences	217	
Law	176	176
Forest Resources	140	
Dentistry	80	80
Pharmacy	57	57

* Data from UW Office of Institutional Studies

Appendix K. FY2007 Direct Expenditures from External Support*

UW College	Direct Expenditures
Medicine	$392,079,082
Arts & Sciences	$83,605,608
Engineering	$70,140,925
Ocean & Fishery Sciences	$65,797,333
Public Health & Community Medicine	$62,776,572
Nursing	$15,986,714
Social Work	$15,771,431
Pharmacy	$12,399,877
Education	$11,602,148
Dentistry	$11,104,520
Public Affairs	$8,973,580
Forest Resources	$8,453,748
Graduate School	$6,439,113
Business School	$5,692,418
Law	$2,921,039
UWB/UWT	$2,307,016
Architecture and Urban Planning	$1,945,337
Information School	$1,728,985
Undergrad Ed.	$676,534
Office of Research	$15,451,040
Health Sciences Special Programs	$31,965,015
Other Special Programs	$133,665,172
Total	**$961,483,207**

w/ proposed College	Direct Expenditures
Medicine	$392,079,082
Arts & Sciences	$72,428,322
Engineering	$70,140,925
Public Health & Community	$62,776,572
College of the Environment	**$60,716,177**
Nursing	$15,986,714
Social Work	$15,771,431
Pharmacy	$12,399,877
Education	$11,602,148
Dentistry	$11,104,520
Public Affairs	$8,973,580
Graduate School	$6,439,113
Business School	$5,692,418
Law	$2,921,039
UWB/UWT	$2,307,016
Architecture and Urban Planning	$1,945,337
Information School	$1,728,985
Undergrad Ed.	$676,534
Office of Research	$1,644,849
Health Sciences Special Programs	$31,965,015
Applied Physics Laboratory	$38,518,381
Other Special Programs	$133,665,172
Total	**$961,483,207**

* Data from Office of Research FY2006 Annual Report

Appendix L. FY2007 Grant and Contract Awards*

College/Unit	Grant and Contract Awards	% of Total
Medicine	$494,086,081	48.5%
Arts & Sciences	$99,394,609	9.7%
Ocean & Fishery Sciences	$89,468,286	8.8%
Public Health & Community Medicine	$83,301,628	8.2%
Engineering	$79,393,761	7.8%
Social Work	$16,657,687	1.6%
Education	$16,474,007	1.6%
Nursing	$14,830,863	1.5%
Pharmacy	$13,175,785	1.3%
Dentistry	$10,270,646	1.0%
Public Affairs	$6,616,071	0.6%
Forest Resources	$5,619,586	0.6%
Graduate School	$4,964,821	0.5%
Law	$2,069,680	0.2%
Information School	$1,788,301	0.2%
Undergrad Ed.	$1,250,161	0.1%
Architecture and Urban Planning	$967,374	0.1%
UWB/UWT	$913,119	0.1%
Business School	$113,418	0.0%
Office of Research	$19,742,658	1.9%
Health Sciences Special Programs	$25,542,716	2.5%
Other Special Programs	$32,847,354	3.2%
Total	**$1,019,488,612**	**100.0%**

If the proposed College had been in existence, the distribution would have been as follows:

College/Unit	Grant and Contract Awards	% of Total
Medicine	$494,086,081	48%
Arts & Sciences	$84,835,762	8%
Public Health & Community Medicine	$83,301,628	8%
Engineering	$79,393,761	8%
College of the Environment	**$67,185,163**	**7%**
Social Work	$16,657,687	2%
Education	$16,474,007	2%
Nursing	$14,830,863	1%
Pharmacy	$13,175,785	1%
Dentistry	$10,270,646	1%
Public Affairs	$6,616,071	1%
Graduate School	$4,964,821	0%
Law	$2,069,680	0%
Information School	$1,788,301	0%
Undergrad Ed.	$1,250,161	0%
Architecture and Urban Planning	$967,374	0%
UWB/UWT	$913,119	0%
Business School	$113,418	0%
Office of Research	$4,383,462	0%
Health Sciences Special Programs	$25,542,716	3%
Other Special Programs	$32,847,354	3%
Applied Physics Laboratory	$57,820,752	6%
Total	$1,019,488,612	100.0%

* Data from Office of Research FY2007 Annual Report

Appendix M. Permanent Funding Required for 20 New Faculty FTE

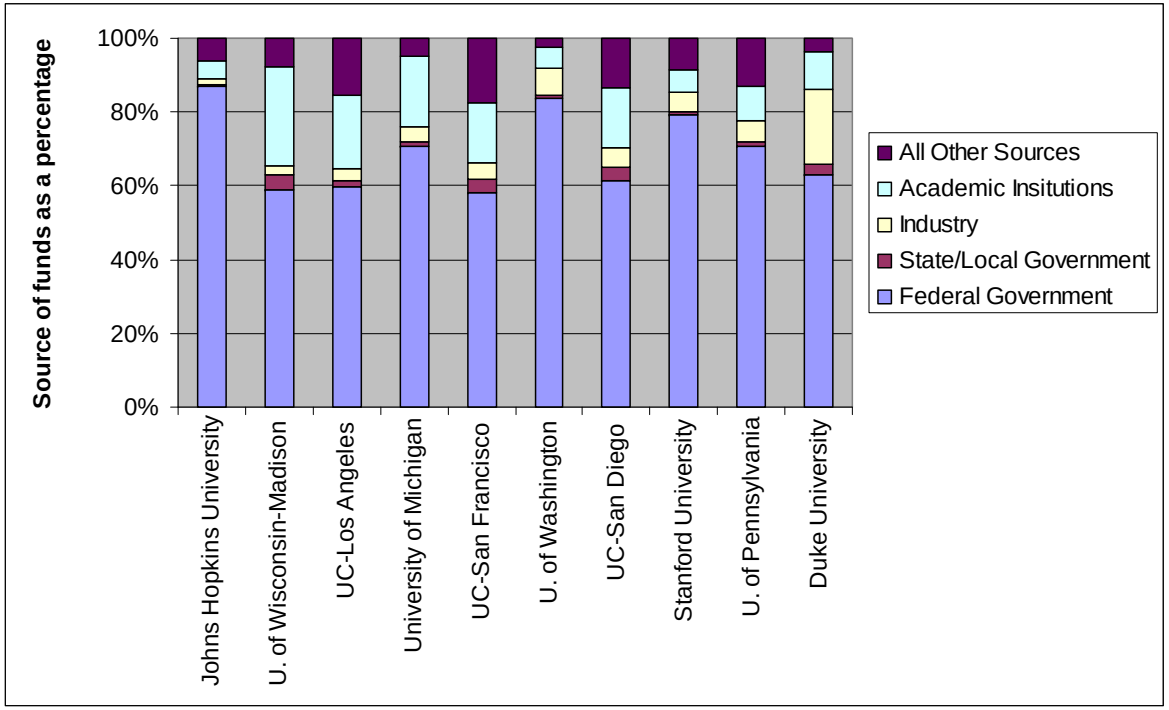
Position Description	*FY09*	*FY10*	*FY11*	*FY12*	*FY13*	*FY09-13*
Assistant Professor	$125,000					
Assistant Professor	$125,000					
Assistant Professor		$125,000				
Assistant Professor		$125,000				
Assistant Professor			$125,000			
Assistant Professor			$125,000			
Assistant Professor				$125,000		
Assistant Professor				$125,000		
Assistant Professor					$125,000	
Assistant Professor					$125,000	
Associate Professor	$150,000					
Associate Professor		$150,000				
Associate Professor			$150,000			
Associate Professor				$150,000		
Associate Professor					$150,000	
Associate Professor					$150,000	
Full Professor	$200,000					
Full Professor		$200,000				
Full Professor			$200,000			
Full Professor				$200,000		
Total New Permanent Faculty Positions	**$600,000**	**$600,000**	**$600,000**	**$600,000**	**$550,000**	**$2,950,000**

Average Salaries (including benefits), FY09-13

Assistant Professor	$125,000
Associate Professor	$150,000
Full Professor	$200,000

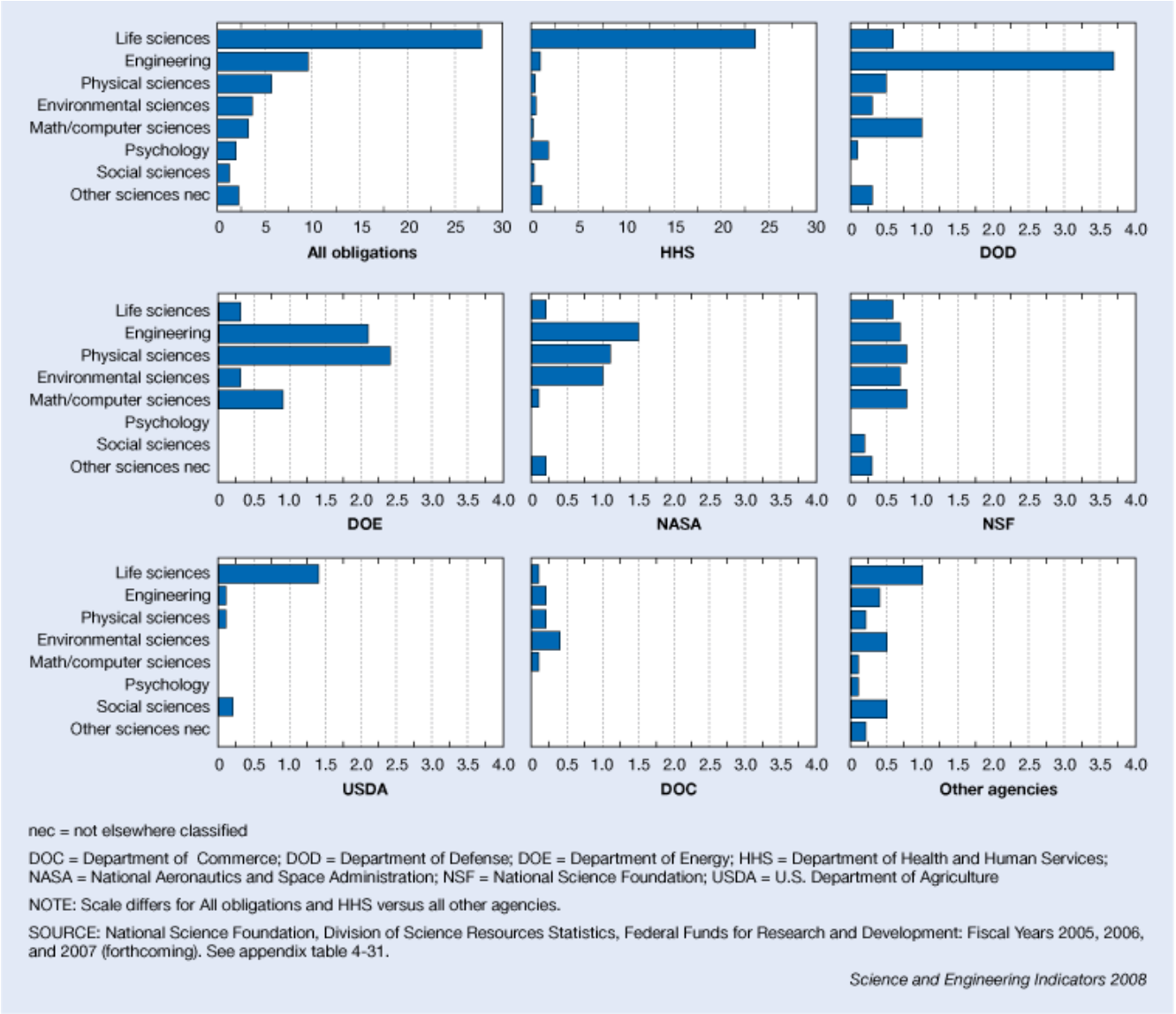
Appendix N. Top 10 academic institutions in R&D expenditures, by source of funds: 2006

Institution	Total	Federal Government	State/Local Government	Industry	Academic Institutions	All Other Sources	Institution Type
Johns Hopkins University	1,500	1,307	6	25	70	92	private
University of Wisconsin-Madison	832	492	31	20	224	65	public
UC-Los Angeles	811	484	15	24	162	126	public
University of Michigan	801	566	10	32	153	40	public
UC-San Francisco	798	465	27	36	130	140	public
University of Washington	778	650	9	57	43	19	public
UC-San Diego	755	464	26	40	125	100	public
Stanford University	680	540	5	35	41	59	private
University of Pennsylvania	676	479	7	38	64	88	private
Duke University	657	414	18	133	69	23	private



Data from Science and Engineering Indicators 2008, published by the National Science Board

Appendix O. Estimated federal obligations for research, by agency and major science & engineering field: FY2007*



nec = not elsewhere classified

DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = U.S. Department of Agriculture

NOTE: Scale differs for All obligations and HHS versus all other agencies.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Federal Funds for Research and Development: Fiscal Years 2005, 2006, and 2007 (forthcoming). See appendix table 4-31.

Science and Engineering Indicators 2008

* In billions, current dollars

Appendix P. Top 50 U.S. Foundations Awarding Grants for the Environment, circa 2006

Foundation Name	State	Dollar Amount	No. of Grants
1. Gordon and Betty Moore Foundation	CA	$104,467,517	120
2. The David and Lucile Packard Foundation	CA	55,351,002	175
3. The William and Flora Hewlett Foundation	CA	52,744,200	137
4. Bill & Melinda Gates Foundation	WA	51,107,783	8
5. The Ford Foundation	NY	31,215,073	152
6. John D. and Catherine T. MacArthur Foundation	IL	31,109,720	58
7. The Robert W. Wilson Charitable Trust	NY	28,657,034	3
8. Energy Foundation	CA	26,488,229	289
9. Charles Stewart Mott Foundation	MI	21,052,483	86
10. Doris Duke Charitable Foundation	NY	19,480,243	9
11. Richard King Mellon Foundation	PA	18,074,500	31
12. The Andrew W. Mellon Foundation	NY	15,631,800	41
13. The Kresge Foundation	MI	14,890,000	22
14. Longwood Foundation, Inc.	DE	14,745,559	5
15. The Marisla Foundation	CA	13,837,200	167
16. Robert W. Woodruff Foundation, Inc.	GA	13,495,000	6
17. The William Penn Foundation	PA	12,123,040	48
18. The Joyce Foundation	IL	11,825,444	46
19. The McKnight Foundation	MN	10,623,200	66
20. Richard and Rhoda Goldman Fund	CA	10,586,000	87
21. Community Foundation for Greater Atlanta, Inc.	GA	10,328,062	35
22. Peninsula Community Foundation	CA	9,758,793	100
23. The Heinz Endowments	PA	9,429,843	67
24. Surdna Foundation, Inc.	NY	9,390,000	80
25. Mote Scientific Foundation, Inc.	FL	9,254,506	1
26. Rockefeller Brothers Fund, Inc.	NY	9,008,400	62
27. The Arthur M. Blank Family Foundation	GA	8,984,875	14
28. The Wilburforce Foundation	WA	8,753,607	142
29. The New York Community Trust	NY	8,545,150	160
30. W. K. Kellogg Foundation	MI	8,395,068	39
31. The Lenfest Foundation, Inc.	PA	8,000,000	3
32. Walton Family Foundation, Inc.	AR	7,995,430	20
33. Beldon Fund	NY	7,973,000	65
34. Alcoa Foundation	PA	7,884,848	110
35. The Henry P. Kendall Foundation	MA	7,718,348	47
36. The Wyss Foundation	DC	7,637,307	64
37. Community Foundation for Southeast Michigan	MI	6,309,947	37
38. The McConnell Foundation	CA	6,279,501	11
39. The Starr Foundation	NY	6,110,000	9
40. The Brown Foundation, Inc.	TX	5,598,850	23
41. The John Merck Fund	MA	5,528,000	86
42. The Oak Foundation U.S.A.	ME	5,368,907	36
43. The California Endowment	CA	5,294,995	27
44. The New Hampshire Charitable Foundation	NH	4,828,959	115
45. V. Kann Rasmussen Foundation	NY	4,796,500	25
46. Geraldine R. Dodge Foundation, Inc.	NJ	4,781,000	82
47. Barr Foundation	MA	4,691,937	41
48. Marin Community Foundation	CA	4,658,636	52
49. Keith Campbell Foundation for the Environment, Inc.	MD	4,655,454	75
50. Turner Foundation, Inc.	GA	4,602,000	79
Total		**$770,066,950**	**3,263**

Source: The Foundation Center, 2008. Based on all grants of $10,000 or more awarded by a national sample of 1,263 larger U.S. foundations (including 800 of the 1,000 largest ranked by total giving and the top ten foundations in each state). For community foundations, only discretionary grants are included. Grants to individuals are not included in the file. The search set includes all grants to recipient organizations classified in this topic area and grants to other recipient types for activities classified in this topic area. Grants may therefore be included in more than one topic table, e.g., a grant to a university for its arts program is included in Education, Higher Education, and Arts.

Appendix Q. Distribution of Environmental Grants from Foundations[1]

Distribution of Environmental Grants from Foundations by Funders' Region, circa 2006
(Dollar figures in thousands, % of total grants in region)

Northeast		Midwest		South		West	
Amount	%	Amount	%	Amount	%	Amount	%
$260,937	4.5	$168,731	4.6	$111,151	1.7	$364,338	5.9

Distribution of Foundation Grants by Subject Categories 1998-2006, Environment Only

Year	Dollar Amount of Grants Awarded	% of Total Grants Awarded	No. of Grants Awarded	% of Total Grants Awarded
1998	$455,063	4.7	4,864	5.0
1999	$614,863	5.3	5,170	4.8
2000	$806,279	5.4	5,907	4.9
2001	$886,331	5.3	6,063	4.9
2002	$772,780	5.0	6,284	4.9
2003	$740,501	5.2	6,016	5.0
2004	$675,518	4.4	5,961	4.7
2005	$822,808	5.0	6,560	5.0
2006	$923,541	4.8	6,978	5.0

[1] Source: The Foundation Center, 2008. 2006 is most recent year for which data is available. Due to rounding, figures may not add up. Based on all grants of $10,000 or more awarded by a national sample of 1,263 larger U.S. foundations. For community foundations, only discretionary grants are included. Grants to individuals are not included in this file.

Appendix R. Market Value of Endowments for Proposed Core Academic Units (as of 1/1/2008)

Unit	Faculty Support	Program Support	Student Support	Other	Total
Aquatic and Fishery Sciences	$8,189,282	$377,393	$8,621,098	$278,893	$17,466,666
Atmospheric Sciences	$240,752	$0	$645,120	$0	$885,872
Earth and Space Sciences	$689,380	$49,144	$3,713,433	$0	$4,451,958
Forest Resources	$8,582,421	$8,224,295	$13,905,945	$2,021,763	$32,734,423
Marine Affairs	$0	$1,188,820	$412,043	$0	$1,600,863
Oceanography	$142,707	$250,936	$3,713,379	$105,204	$4,212,226
Ocean and Fishery Sciences	$3,157,081	$0	$631,436	$0	$3,788,517
Totals	**$21,001,624**	**$10,090,587**	**$31,642,454**	**$2,405,860**	**$65,140,524**