



# Northeastern University

## Office of the Provost

### New Degree Proposal Routing Form

TITLE OF PROPOSED PROGRAM: <b>Masters in Environmental Science and Policy</b>	
THIS PROGRAM WILL BE DELIVERED: <input checked="" type="radio"/> ON CAMPUS <input type="radio"/> ONLINE <input type="radio"/> HYBRID	
DEPARTMENT(S) AND COLLEGE(S): <b>Marine &amp; Environmental Science (COS) School for Public Policy/Urban Affairs (CSSH)</b>	
(LEAD DEPARTMENT/COLLEGE IF APPROPRIATE): <b>COS &amp; CSSH</b>	DATE PREPARED: <b>10/17/2017</b>
NAME OF PRIMARY ACADEMIC CONTACT(S), CAMPUS ADDRESS, E-MAIL, AND PHONE NUMBER: Jon Grabowski; Marine Science Center; j.grabowski@northeastern.edu; 781/5817370 & Jennie Stephens; 310 RP; j.stephens@northeastern.edu; 617/373-8341	

### Preliminary Proposal - Authorization to Proceed with Planning

College Dean(s) – Please sign indicating that preliminary proposal has been discussed with Provost.

DATE PROPOSAL RECEIVED:	RECOMMENDATION(S) AND DATE:
SIGNATURE OF COLLEGE DEAN(S):	

### Formal Program Proposal

College Deans(s) – Please sign indicating that approval has been obtained from all appropriate committees and offices within your college.

DATE PROPOSAL RECEIVED:	DATE SUPPORTING OR NON-SUPPORTING MEMO FORWARDED TO PROVOST: The proposal was approved on September 26, by the COS Graduate Curriculum Committee vote 4-approved, 1-abstained, and 0-denied. CSSH Graduate Academic Advisory Committee approved this proposal with a vote of 3-approved, 0-abstained, and 0-denied on Tuesday, September 19, 2017. On October, 24, 2017, the <b>EEHB</b> approved this proposal with a vote of 18-approve, 0-denied. <b>10/27/17 SPPUA Vote: 15-0-8</b>
SIGNATURE OF COLLEGE DEAN(S): <i>Kenneth ...</i>	

### Vice Provost for Budget, Planning, and Administration

DATE PROPOSAL RECEIVED:	FINAL REVIEW AND DATE:
SIGNATURE OF VICE PROVOST:	

### Vice Provost for Undergraduate or for Graduate Education (as appropriate)

DATE PROPOSAL RECEIVED: <b>10/03/17</b>	DATE REFERRED TO GRADUATE COUNCIL OR UNDERGRADUATE CURRICULUM COMMITTEE (AS APPROPRIATE): <b>10/17/17</b>
ACTION TAKEN, DATE, AND VOTE: <b>Approved 10/25/17 8-0-0</b>	
SIGNATURE OF VICE PROVOST: <i>[Signature]</i>	

**Master of Science in Environmental Science and Policy**

**A Joint Program of the**

**College of Science**

**and the**

**College of Social Sciences and Humanities**

**Department of Marine and Environmental Sciences**

**and**

**School of Public Policy and Urban Affairs**

**Modified Proposal**

**Prepared by:**

**Jon Grabowski, COS**

**Jennie Stephens, CSSH**

**September 14, 2017**

## **I. Program Description**

### *Summary*

Human society is becoming increasingly aware of its reliance on natural ecosystems and the services they provide (e.g., food production, carbon sequestration, nutrient cycling) and yet human activities continue to compromise the delivery of these services at an accelerating rate. Achieving sustainability of these coupled human-natural ecosystems is perhaps the greatest challenge confronting our society because striving toward resilience mandates major shifts in the prevailing way of life and institutional systems, including production, consumption, transportation, urban and suburban development, governance, policy and regulation. Striving for a more sustainable and resilient future requires coordinated efforts of multiple sectors, many of which remain siloed (or segmented from one another). The Environmental Science and Policy program at Northeastern strives to overcome these barriers by providing interdisciplinary training and environmental problem-solving expertise to the next generation of environmental professionals.

The ES&P program emphasizes a broadly interdisciplinary and synthetic approach that integrates knowledge in the environmental sciences (conservation biology, climate change, fisheries science, ecosystem function, biodiversity, restoration ecology) with the social sciences (environmental sociology, economics, policy, and development) and humanities (environmental history, philosophy, and ethics). The goal of the program is to equip professionals with the substantive breadth in knowledge and skills necessary in this era of global change to think critically about the underlying causes of environmental problems, the reciprocal relationship between coupled human-natural ecosystems, and the range of potential solutions that decision makers will need to evaluate in policy debates on how best to achieve environmentally sustainable ways of life.

### *Program Structure*

The ES&P program is a 36 semester hour Master's degree whose curriculum includes the requirements listed below. Although courses may vary in semester hours awarded, a typical student would take 12 courses. Two points of strength that will characterize the curriculum, beyond its interdisciplinary orientation, are its emphasis on rigorous skills-based training and its stress on student engagement with real world issues and problems in part through experiential education. The acquisition of relevant skills will occur by requiring 4 courses in areas such as GIS, statistics, spatial planning, and experimental design. The emphasis on practical problem solving will be addressed by enabling students to tap into the problems facing organizations and practitioners in the field of environmental science and public policy.

Although the program will be initially offered using a conventional, on-campus modality, curricular development will work toward later on-line delivery of individual courses and ultimately of the whole program. This may meet the needs of students enrolling in the new graduate campuses in Seattle, Charlotte, and other campuses now being planned.

### Overview of Course Requirements:

- a. Environmental Science and Policy Seminar: Two courses to be taken in the fall and spring of the first year, one each semester. Creates a unifying cohort experience for students while providing foundational knowledge of central importance for the program as a whole. These two courses will be taught by faculty with expertise in the life and social sciences, who will coordinate and collaborate to design the curriculum, including selecting readings and creating projects and experiences that will resonate across disciplinary boundaries.
- b. Skills courses: Students will select four skills courses from variety of skills-based offerings including statistics, GIS, spatial planning, and experimental design. A list of skills courses will be regularly updated to included courses designed to foster competence in the use of various analytical techniques and skills (see list below).
- c. Electives: The remaining credits (typically six additional courses) will include elective courses that students will select based on their area of interest. Any of the courses listed below may be used toward this requirement. If a student takes more than 4 skills courses, any additional skills courses can count as electives. Students may petition for other graduate courses to satisfy this requirement, with the consent of the co-Directors.

## II. Educational Objectives and Curriculum

### *Educational Objectives*

As noted, the program will adopt an interdisciplinary approach toward environmental science and public policy. Implied here is a commitment to providing a diverse set of skills, knowledge, and expertise that are needed to address the complex, multi-stranded problems generated by human/environmental interaction. As noted, the program emphasizes the need for inter-disciplinary approaches that conjoin theoretical and conceptual knowledge drawn from several intellectual domains. Thus, the program encourages students to view environmental problems as the result of ongoing interactions between natural and human systems. This requires students not only to grasp the nature of ecological systems and environmental modeling, but also to situate environmental problems within the social, economic, and political contexts that give rise to them. Thus, the curriculum has been designed to equip students with the knowledge and expertise skills that environmental professionals need to be effective in bringing about social change. This requires that they gain a familiarity with ecological modeling, techniques for analyzing problems of air and water quality, and the nature of environmental economics. The program is also designed to enable students to view environmental problems in their historical context, thereby gaining an awareness of the institutional forces that impinge on transportation, energy, and housing systems and on efforts to regulate them. Equally important, the program will sensitize students to the sources of social disparities in exposure to environmental risks of various sorts.

### *Admission Criteria and Process*

This program is available either to those applying with an undergraduate degree in hand or those that complete their undergraduate degree before the start of the program. We anticipate adding a PlusOne option for current Northeastern University undergraduates in the College of Sciences and College of Social Sciences and Humanities.

Application materials must be sent directly via the Apply Yourself website, and will be forwarded to the program's Admissions Committee with representatives from both COS and CSSH. Admissions standards will be based on an assessment of undergraduate academic record, relevant work experience, a written statement, and letters of reference. In general, we are seeking excellent students who will thrive in our program.

There will be two application deadlines because students will be admitted for either Spring or Fall enrollment.

All applicants must submit by the application deadline:

- (1) An online application form;
- (2) A one- to two-page personal statement describing their relevant academic and professional experiences;
- (3) Submit unofficial transcripts for all institutions attended;  
Official transcripts for all institutions attended are required of all enrolled students by the first day of the entry term.
- (4) Three letters of recommendation (at least two of which must be academic references)
- (5) Official Graduate Record Examination Scores
- (6) Proof of English Proficiency for all applicants (from one of the following):
  - Degree earned or in progress at an U.S. institution – or –
  - Degree earned or in progress at an institution where English is the only medium of instruction – or –
  - Official exam scores from either the TOEFL iBT, IELTS, or PTE exam

#### *Degree Requirements and Curriculum*

Below we outline the 36-SH credit (typically 12 courses) requirements built into the program's curriculum.

1. Environmental Science and Policy Seminar: This will be a two-course requirement (offered in both fall and spring). One seminar course will be taught by a COS faculty member and the other course will be taught by a CSSH faculty member. These two courses will be required of all entering students during their first year but the sequence is flexible (i.e., students entering the program in January can take the spring semester first). These courses will provide foundational content in

Environmental Science and Policy including natural science, social science, and policy. Students will be introduced to coupled social-ecological systems, with a focus on the complex interactions among human systems, natural ecosystems, and technological systems.

2. **Skills courses:** Students will be required to complete four skills based courses that could include research methods, statistics, GIS, spatial planning, experimental design, or skills used by environmental professionals. Below is a partial list of skills courses but students can petition for approval of other courses not offered on this list to count toward the skills requirement. Students must take one course from each list below and the remaining two courses can be from either list.

College of Science		
Course Number	Course Title	SH
EEMB 5130	Ecological Dynamics	4
EEMB 5522	Experimental Design Marine Ecology	4
EEMB 5530	Molecular Ecology and Evolution	4
EEMB 5500	Biostatistics	4
ENVR 5210	Environmental Planning	4
ENVR 5250	Geology and Land-Use Planning	4
ENVR 5260	Geographical Information Systems (GIS)	4
ENVR 5400	Marine Science Policy and Ethics	3
ENVR 6255	Introduction to Remote Sensing	4
College of Social Science and Humanities		
Course Number	Course Title	SH
CRIM 7204	Research and Evaluation Methods	3
POLS 7201	Research Design	3
SOCL 7211	Research Methods	3
SOCL 7210	Statistical Methods of Sociology	3
SOCL 7215	Advanced Quantitative Techniques	3
LPSC 7305	Research and Statistical Methods	3
LPSC 6313	Economic Analysis for Law, Policy and Planning	3
LPSC 7215	Advanced Quantitative Techniques	3
LPSC 7310	Research Design and Analysis	3
LPSC 7311	Strategizing Public Policy	3

PPUA 5260	Ecological Economics	3
PPUA 5261	Dynamic Modeling for Environmental Decision Making	3
PPUA 5263	Geographic Information System for Urban and Regional Policy	3
PPUA 5301	Intro to Computational Statistics	4
PPUA 6205	Research Design and Methodology in Urban and Regional Policy	3
PPUA 6206*	GIS	1
PPUA 6207*	Survey Techniques	1
PPUA 6208*	Qualitative Techniques	1
PPUA 6209*	Working with Datasets	1
PPUA 6210*	Cost/Benefit Analysis	1
PPUA 6211*	Using Stata	1
PPUA 6212*	Project Management	1
PPUA 6213*	Data Visualization	1
PPUA 6214*	Excel for Policy Research Analysis	1
PPUA 6216*	Grant Writing	1
PPUA 6502	Economic Institutions and Analysis	3
PPUA 6506	Techniques of Policy Analysis	3
PPUA 6509	Techniques of Program Evaluation	3
PPUA 6524	Case Studies in Policy Analysis	3
PPUA 6525	Institutions and Public Policy	3
PPUA 7237	Advanced Spatial Analysis of Urban Systems (requires passing grade in PPUA 5263 GIS)	3

\*Research Toolkits – 1 credit module-like courses offered currently in Summer 1 only.

3. Electives: Students must complete six elective courses. Below we list some of the courses that will satisfy this requirement; if a student elects to enroll in more than 4 skills courses, the additional courses will count as electives. Students will be required to complete three courses from each list below. Students may petition to enroll in other relevant graduate courses offered by other schools at Northeastern University.

College of Science		
Course Number	Course Title	SH
EEMB 5548	Sociobiology	4
EEMB 5528	Marine Conservation Biology	3

EEMB 5536	Ocean and Coastal Sustainability	3
EEMB 5518	Ocean and Coastal Processes	2
ENVR 5210	Environmental Planning	4
ENVR 5250	Geology and Land Use Planning	4
ENVR XXXX	Sustainable Development	
ENVR 5XXX	Environmental Pollution	
ENVR 5XXX	Environmental Science	
ENVR 5XXX	Global Climate Change	
ENVR5XXX	Global Oceanic Change	
ENVR 5XXX	Conservation Biology	
ENVR 5XXX	The New England Environment and Economy	
ENVR 5976	Directed Study	
College of Social Science and Humanities		
Course Number	Course Title	SH
LPSC XXXX	Protecting the Public: Environmental and Consumer Product Safety Law	
LPSC 7211	Strategizing Public Policy	
PHIL 5003	Ethics, Justice, and Global Climate Change	
PHTH 5214	Environmental Health	
PHTH 5230	Global Health	
PHTH 5440	Community-Based Participatory Research: Environmental Health	
POLS 7203	Techniques of Policy Analysis	3
POLS 7308	Nonprofit Organizations and Social Change	3
POLS 7309	The Nonprofit Sector in Civil Society and Public Affairs	3
PPUA 5260	Ecological Economics	3
PPUA 5265	Urban and Regional Policy in Developing Countries	3
PPUA 5275	Philanthropy and Civil Society	3
PPUA 7230	Housing Policy	3
PPUA 5264	Energy Transitions and Climate Resilience: Technology, Policy, and Social Change	3
PPUA 6508	Capstone Seminar in Public Policy and Public Management	
PPUA 7673	Capstone Seminar in Public Policy and Urban Affairs	3
SOCL 4522	Political Ecology and Environmental Justice (To be change to 5000 level)	3
SOCL 7230	The Political Ecology of Global Capitalism	3
SOCL 7235	Urban Sociology	
SOCL 7243	Sociology of Health and Illness	3
SOCL 7257	Environment, Health, and Society	3

SOCL 7267	Environment, Health, and Society	3
SOCL 7287	Health Social Movements	3
LPSC 7312	Cities, Sustainability and Climate Change	
PPUA 5262	Big Data for Cities	
PPUA 5265	Urban and Regional Policy in Developing Countries	
PPUA 5266	Urban Theory and Science	
PPUA 5270	Food Systems and Public Policy	
PPUA 5302	Information Design and Visual Analytics	4
PPUA 5390	Special Topics (topic dependent)	
PPUA 6201	The 21 <sup>st</sup> -Century City: Urban Opportunities and Challenges in a Global Context	
PPUA 6204	Urban Development and Politics	
PPUA 6505	Public Budgeting and Financial Management	
PPUA 6522	Administrative Ethics and Public Management	
PPUA 6862	Internship with Research	3
PPUA 6966	Research Practicum	
PPUA 7225	The Open Classroom (topic dependent)	
PPUA 7321	Transportation Policy	
PPUA 7234	Land Use and Urban Growth Policy	
PPUA 7238	Climate Change and Urbanization in Developing Countries	
PPUA 7239	Problems in Metropolitan Policymaking	
PPUA 7249	Urban Coastal Sustainability	
PPUA 7336	Social Capital and Resilience	
PPUA 7346	Resilient Cities	
PPUA 7673	Capstone in Public Policy and Urban Affairs	

NOTE: The courses above is not a complete listing of all that will be offered.

### *Program Assessment*

Faculty affiliated with the MS Program recognize the significance of assessment in contemporary higher education, and take a broad view of the subject. A program committee will be formed that will conduct an annual assessment of the graduate program, using exit interviews and a portfolio assessment method based on committee readings of students' final MS projects. A bi-annual survey of alumni/ae will be conducted that tracks our students after graduation to understand the program's role in their careers and how that might be adjusted or improved. Findings from these sources will be used to reflexively evaluate the appropriateness of each graduate course taught by the faculty. This will include a review of syllabi in order to determine whether the courses meet the intended goals. Program faculty will assist with and provide oversight for the assessment.

The program will also seek to maintain contact with former students through maintenance of a webpage, regular mailings of newsletters and information brochures and executive programs. We believe we can keep the program relevant in the lives of graduates through a variety of communications strategies that provide continuous feedback to help assess and revise the program as needed. After review of the exit interviews, portfolio analysis, and alumni surveys, results will be summarized and presented to the appropriate institutional entities. Faculty will then incorporate the feedback into program.

### *Program Governance*

Key to the program's success will be its ability to draw as inclusively as possible on faculty expertise that spans multiple colleges at our university. While the program will be administered jointly by COS and CSSH, faculty from other colleges – particularly Bouve, COE and CAMD – will be an important resource to the program and we will engage with them regularly.

As such, the program's governance will require a robust program committee composed of core faculty who are committed to the success of the program and who will regularly teach its courses. The committee's tasks will include admissions and curricular decisions. The program will require co-directors (1 each from COS and CSSH) and administrative support. Such arrangements will be spelled out in an agreement to be approved by the Deans of COS and CSSH. Key will be sustaining a broadly ecumenical view of the program as a shared university resource. The flow of tuition dollars, the handling of program costs, and the governance of program operations will all be outlined in an agreement.

### **III. Resource Needs**

The program will have needs that fall into several categories.

- *Program co-Directors.* Each college will determine if a course release or stipend is appropriate for this role.
- *Administrative Staff Support.* The College of Science will provide support for the application process, student services and policy and procedure. Admissions decisions will be rendered by a committee comprised of program faculty from both Colleges. Both colleges will monitor the growth and need for additional support.
- *Course development.* One of the virtues of this program is that a substantial proportion of the coursework already exists and is offered with regularity. Still, the program may need to development new courses. Development of new courses may entail some cost sharing (the cost of course releases, for example), to be negotiated by COS and CSSH Deans.
- *Faculty teaching power.* Offering any new courses may require some reassignment of faculty who would otherwise be teaching undergraduate classes. This may entail a modest expansion of part-time allocation for this and will need to be approved by the Deans of the Colleges.

- *P/t allocation.* Developing a small retinue of engaged practitioners in the field may require perhaps 2-4 courses annually once the program is up and running. This will enrich the offering of timely program electives. This will need to be approved by the Deans of the Colleges.
- *Support for the development of on-line course offerings.* As noted, we anticipate introducing the program in a conventional modality initially, and then introducing on-line offerings (which may provide a source of growth, especially with respect to the graduate campuses in Seattle, Charlotte and elsewhere).
- *Space.* The School of Public Policy and Urban Affairs, provides communal space for MS in ESP students.
- *Marketing.* We anticipate working closely with EMSA for this purpose. The cost of brochure and web design, advertising, and other marketing activities will be determined by the COS and CSSH Associate Deans of Finance