

**NEW DEGREE PROGRAM PLANNING NOTIFICATION OF INTENT  
(PLANNING NOI)**

**Program Information**

Program Name: **Professional Science Master's in Environmental Science**

Institution Name: **Western Washington University**

Degree Granting Unit: **Graduate School**

Degree: **Master of Environmental Science** Level: **Master's** Type: **Science**

Major: **Environmental Science** CIP Code: **03.0104**

Minor: **N/A**

Concentration(s): **Environmental Science; Environmental Planning and Policy**

Proposed Start Date: **Winter 2011**

Projected Enrollment (FTE) in Year One: **20** At Full Enrollment by Year: **2013: 20-30**

Proposed New Funding: **Self Support**

Funding Source:  State FTE  Self Support  Other

**Mode of Delivery**

Single Campus Delivery

*(enter locations)*

Off-site Peninsula College, Olympic College, Everett Center

*(enter locations)*

Distance Learning Combined face-to-face, ITV, and online

*(enter formats)*

**Substantive Statement of Need**

*See Attached*

**Contact Information (Academic Department Representative)**

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Endorsement of Chief Academic Officer

Date

*April 7 2010*

# NOI Submission: Professional Science Master's in Environmental Science

## I. Description and Rationale

For more than 40 years, the Huxley College of the Environment at Western Washington University has been educating leaders in a variety of environmental fields, and our students' skills, abilities, and actions have made a tangible difference in the environmental profession throughout Washington as well as across the nation. In conjunction with the WWU Graduate School, Huxley College of the Environment, College of Business and Economics, and Extended Education and Summer Programs, **we are proposing a new Professional Science Master's degree in Environmental Science with concentrations in Environmental Science as well as Environmental Planning and Policy.** This degree will provide students with the set of scientific and technical skills typically required of environmental science professionals, as well as the essential business skills that are highly valued by employers in industry, government, and nonprofits.

Recent advances in the pace of technological innovation and significant changes in the global marketplace have led leaders in industry and government to call for the development of new master's level degrees in science, technology, engineering, and mathematics (STEM) fields, which combine a strong background in the technical skills of the discipline with the practical business and management skills that can provide employees with the skills to contribute to operational effectiveness in their workplace from their first day of work. This combination has been termed a Professional Science Master's (PSM), which aims "to engage students with professional goals and help them become scientists uniquely suited to the 21st-century workplace, equipped with a deeper and broader scientific knowledge than that acquired with a Bachelor of Science degree and the skills to apply it."<sup>1</sup>

A recent series of reports by the National Academies,<sup>2</sup> the National Science Foundation,<sup>3</sup> the National Governor's Association,<sup>4</sup> and the Council of Graduate Schools,<sup>5</sup> as well as several commentary essays<sup>6</sup> in journals across the sciences (including *Science*, the world's most prestigious science journal), have highlighted the increasing disconnect between the skills universities are providing their graduates with the needs of industry. In essence, a PSM is for the STEM professions what MBAs are for business, or JDs are for law: a terminal degree meant to prepare students for the professional world, not for academia. Specifically, a PSM is meant to "provide:

- additional scientific knowledge beyond a four-year bachelor's degree;

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<sup>1</sup> [http://www.sciencemasters.com/portals/0/pdfs/Programs\\_Merit\\_Wider\\_Support.pdf](http://www.sciencemasters.com/portals/0/pdfs/Programs_Merit_Wider_Support.pdf) page 1676.

<sup>2</sup> [http://www.nap.edu/catalog.php?record\\_id=12064](http://www.nap.edu/catalog.php?record_id=12064)

<sup>3</sup> <http://www.nsf.gov/statistics/seind10/>

<sup>4</sup> <http://www.nga.org/Files/pdf/0707INNOVATIONPOSTSEC.PDF>

<sup>5</sup> [http://www.cgsnet.org/portals/0/pdf/GR\\_GradEdAmComp\\_0407.pdf](http://www.cgsnet.org/portals/0/pdf/GR_GradEdAmComp_0407.pdf)

<sup>6</sup> e.g., [http://www.sciencemasters.com/portals/0/pdfs/Programs\\_Merit\\_Wider\\_Support.pdf](http://www.sciencemasters.com/portals/0/pdfs/Programs_Merit_Wider_Support.pdf)

- more interdisciplinary training...which allows a student to bring relevant knowledge from a variety of fields to the workplace;
- focus on acquiring scientific and technical knowledge that can be applied in a variety of positions in business, government, or nonprofits rather than acquiring research skills...;
- perspective on business culture that values applied research and commercialization of scientific discovery; and
- job-relevant skills in teamwork, project management, communication, business administration, statistics, ethics, and legal/regulatory issues.”<sup>7</sup>

To date more than 170 PSM programs are available at 71 institutions of higher education across the United States.<sup>8</sup> Unfortunately, despite industry demand and student interest, there is currently only one PSM program in the entire Pacific Northwest (located at Oregon State University). Further, there are no environmental science PSM programs anywhere in the western U.S. that are designed to allow working professionals the flexibility to obtain this degree by utilizing intensive scheduling, weekend and evening courses, and/or distance learning.

Our proposed program is not meant to replace traditional master’s degrees, but instead will offer students who wish to develop both scientific and professional business management skills an alternative to the traditional research-based model. Our proposed PSM will consist of a set of core courses from WWU’s current MBA and Environmental Science programs, as well as a set of electives that can allow students to pursue either a science or a planning concentration. The science concentration will focus on deepening technical scientific and quantitative skills, while the planning concentration will provide additional training in law, regulations, and policy. In lieu of a thesis, an internship or professional project will be required, which will allow students to integrate the science and business skills they acquire in the program in a real-world setting. The program will be offered through a combination of distance learning modalities, such as evening and weekend courses, face-to-face, ITV, and online instruction, which will allow professionals to take the program on a full- or part-time basis.

The core requirements will consist of approximately 12 quarter credit hours of MBA classes in business management, economics, and business analytics designed for science majors (e.g., course case studies are exclusively from the environmental sciences), and approximately 20 credits in environmental science, including a science+policy project class in environmental impact assessment, two courses in quantitative analysis, and a course each in ethics, professional communication, and grant writing and management. Students will also be required to take two additional classes (~10 credits) based on their concentration; for example, a student in the science track could take courses such as Advanced Stream Ecology or Experimental Design while a student in the planning track could take courses such as Environmental Politics & Policy and Advanced Environmental Law. Finally, all students will be required to undertake a professional

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<sup>7</sup> [http://www.nap.edu/catalog.php?record\\_id=12064](http://www.nap.edu/catalog.php?record_id=12064) page 34

<sup>8</sup> <http://www.sciencemasters.com/>

internship or project, which will require a minimum of six credits. A minimum total of 48 credits will be required to complete the degree.

Note: “PSM” is trade-marked title owned by the Alfred P. Sloan Foundation. To use that title, a program must meet a number of criteria and must apply to the Council of Graduate Schools for recognition as a Professional Science Master’s program. The criteria include:

- “A professional skills component (often called the “plus” component of a “science-plus degree”) that may consist of a variety of relevant courses and activities developed in consultation with prospective employers.
- An active and engaged employer advisory board. Examples of board and/or individual-member functions include providing advice on the program curriculum, assisting with internships and placement, assisting with project identification, and/or interacting individually with students.”<sup>9</sup>

The program we propose to develop will be designed to meet the criteria in order to qualify for recognition by the Council of Graduate Schools as a PSM program, and a variety of environmental professionals from around Puget Sound have already agreed to serve in an advisory capacity.

## **II. The Need for the Degree**

### **Student Demand**

Current Huxley College students and program graduates as well as environmental professionals from around the Puget Sound have expressed interest in obtaining a PSM degree, particularly if they could obtain it while remaining in the workforce. A survey was sent to individuals who expressed interest or that may be potentially interested in the program. We received responses from 30, for a response rate of 70%. Of the 30 respondents, 19 were interested in Environmental Science and 11 in Environmental Planning. Twenty-three (77%) indicated that their current employer would help pay for the classes. All 30 indicated readiness to start the program between fall 2010 and spring 2011. It should be noted that this survey was not preceded by any marketing, so the potential demand could be significantly higher. In addition, because of their quicker employment payoffs (as compared with obtaining an MBA or a PhD to acquire those additional skills), a PSM degree can encourage more science majors to pursue graduate education,<sup>10</sup> which can in turn encourage more undergraduates to major in science, knowing that there is an alternative to the traditional research path, i.e., those “who feel the strictly-research approach does not appeal to them.”<sup>11</sup> This could increase student

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<sup>9</sup> [http://www.sciencemasters.com/portals/0/pdfs/Guidelines\\_for\\_PSM\\_Affiliation.pdf](http://www.sciencemasters.com/portals/0/pdfs/Guidelines_for_PSM_Affiliation.pdf)

<sup>10</sup> [http://www.nap.edu/catalog.php?record\\_id=12064](http://www.nap.edu/catalog.php?record_id=12064) page 32;

<http://www.nga.org/Files/pdf/0602PROFSCIENCE.PDF> page 4;

[http://www.sciencemasters.com/portals/0/pdfs/Programs\\_Merit\\_Wider\\_Support.pdf](http://www.sciencemasters.com/portals/0/pdfs/Programs_Merit_Wider_Support.pdf) page 1676-1677

<sup>11</sup> <http://www.nsf.gov/statistics/seind10/> page 2-22

demand considerably once the program is established and demonstrating those dividends.<sup>12</sup>

### **Workforce Needs**

Demand for PSM graduates is very high worldwide,<sup>13</sup> and they tend to have higher starting salaries than graduates from traditional MS programs.<sup>14</sup> Further, PSM graduates “tend to stay near the institutions where they study, producing a regional brain-gain.”<sup>15</sup>

An email survey was sent to regional environmental professionals. Ninety-three percent of respondents thought that having a graduate with a PSM degree would be an asset to their organization, and 80% thought the degree would be “highly valuable” in today’s marketplace. One respondent said that the initial description of our proposed “PSM identifies business, environmental, and policy components that are critical” to the regional environmental profession. More than half (53%) of the respondents would offer their employees tuition reimbursement or other financial support, and 73% of these employers would allow work-release or flex-time to employees working on this degree. These results, combined with national and international trends in post secondary professional science education, speak strongly to the need for this degree by the environmental profession.

### **III. Relationship to Other Institutions**

No institutions in the state of Washington offer PSM degrees. The only institution in the Northwest that offers PSM degrees is Oregon State University, which only offers an environmental science PSM in a traditional (daytime/on-campus) format. No institution in the western US offers a distance learning-based PSM in environmental science.

### **IV. Relationship to HECB Master Plan**

#### **HECB Master Plan**

The proposed PSM degree will increase the number of MS degrees awarded appropriately representing the intellectual and professional value added by students’ two years of rigorous academic study and professional internship. Students in PSM degree programs at other institutions tend to have considerably higher levels of underrepresented

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<sup>12</sup> <http://www.nga.org/Files/pdf/0602PROFSCIENCE.PDF> page 2

<sup>13</sup> [http://www.sciencemasters.com/portals/0/pdfs/Programs\\_Merit\\_Wider\\_Support.pdf](http://www.sciencemasters.com/portals/0/pdfs/Programs_Merit_Wider_Support.pdf) page 1677

<sup>14</sup> [http://www.nap.edu/catalog.php?record\\_id=12064](http://www.nap.edu/catalog.php?record_id=12064) page 56

<sup>15</sup> <http://www.nga.org/Files/pdf/0602PROFSCIENCE.PDF> page 1

groups, as well as higher numbers of U.S. citizens, as compared with traditional STEM-field MS degree programs.<sup>16</sup>

### **State and Regional Needs Assessment**

This is a new degree program, and thus need for this degree (specifically) across the state and region are not clear. However, the PSM web site lists the following as some of the companies and organizations that have hired Environmental Sciences PSM graduates: Alameda County Water District, Cold Regions Research and Engineering Laboratory, Conservation Biology Institute, Institute of Pollution Control, Tech. Development, Minerals Management Service, MODIS Rapid Response Team, NASA, Natural Resources Conservation Service, Patrick Engineering, STS Consultants Ltd., U.S. Environmental Protection Agency, and Vestra Inc. Several regional employers, including the Lower Elwha Klallam Tribe and Clallam County have already expressed interest in having PSM graduates on their staff. Others, such as Parametrix, Inc., have expressed willingness to help finance the cost of employees enrolling in the program. Both of these facts indicate value to regional employers for PSM-trained personnel. Further, it would be offered in a variety of locations, particularly in areas with little to no access to graduate education (e.g., Clallam County), increasing state-wide access to post-secondary education.

The State and Regional Needs Assessment states that “institutions in the state need to increase the numbers of students enrolled in graduate and professional programs to meet employer needs.”<sup>17</sup> The proposed degree also addresses the need to reverse the declining trend in graduate degrees awarded in Washington, in part by providing both a new, in-demand program as well as showing potential students that they have more options.<sup>18</sup> Further, “the market is becoming increasingly competitive, resulting in consolidation and increased attention to efficiency. In response, employers report that they have become more selective in the hiring process. Workers with a deeper and more sophisticated skill set are at a distinct advantage in this environment. Ideally, workers would develop a mix of technical skills and management, communication, and team work skills,”<sup>19</sup> which is exactly what this proposed PSM would provide for the environmental profession.

### **Uniqueness of Program**

The PSM in Environmental Science is a unique resource and a unique educational opportunity in the state of Washington.

### **No Duplication**

There are no similar programs in the state of Washington.

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<sup>16</sup> [http://www.nap.edu/catalog.php?record\\_id=12064](http://www.nap.edu/catalog.php?record_id=12064) page 33

<sup>17</sup> <http://www.hecb.wa.gov/research/issues/documents/AnalysisandRecommendations.pdf> page 112

<sup>18</sup> <http://www.hecb.wa.gov/research/issues/documents/StatewideResults.pdf> page 29

<sup>19</sup> <http://www.hecb.wa.gov/research/issues/documents/StatewideResults.pdf> page 32