

# **Developing a Professional Science Master's (PSM) Degree in Environmental Management & Sustainability in Northwest Florida**

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## **ABSTRACT**

Professional Science Master's (PSM) degrees have been in existence in the USA for well over a decade. The PSM is a degree equivalent to the MBA for the sciences, and the idea is to integrate studies of natural sciences, math, management, and law to prepare students for professional positions outside academia. There are 128 PSM programs in the USA, mostly in the sciences, especially biosciences, and mostly online. In the environmental sciences, there are PSM programs at CSU/Chico, CSU/San Bernardino, American University, SIU/Edwardsville, Oregon State, North Texas, and Utah. The development of many of these PSM degree programs has been supported by grants over the past decade from the Alfred P. Sloan Foundation. PSMs have also been included in the stimulus bill also known as the American Recovery and Reinvestment Act of 2009.

In Florida, a Sloan Foundation seed grant was received in 2009 to investigate the feasibility of developing a series of PSM degrees across the state. Five science sectors were selected to pilot the PSM degrees: Biotechnology, Forensics/Homeland Security, Healthcare, Simulation/Aviation, and Environmental Science/Sustainability. The University of West Florida, as one of eleven public Florida universities, was approached about assisting, and several departments—including Environmental Studies—responded.

The creation of a PSM in Northwest Florida is still a work in progress. A meeting of the Northwest Chapter of the Florida Association of Environmental Professionals (NWFAEP) in Pensacola in August 2009 was dedicated to discussion of creating a PSM degree and formulating a curriculum. A draft curriculum was developed in early 2010. A meeting of the Environmental Studies Advisory Board in April 2010 was to further refine the curriculum and perhaps establish a PSM advisory subgroup. Once a finalized curriculum is established, program approval and course development will be required before a Professional Science Master's in Environmental Management & Sustainability becomes reality.

## **BACKGROUND**

Professional Science Master's (PSM) degrees have been in existence in the USA for well over a decade. The PSM is a degree equivalent to the MBA for the sciences, and the idea is to integrate studies of natural sciences, math, management, and law to prepare students for professional positions outside academia. Several years ago, the Council of Graduate Schools (CGS) identified PSMs as the fastest growing master's programs in the country. PSMs have been written up in *Science*, and since 2003 there has been an annual national Professional Science Master's conference. In March 2009 there were 128 PSM programs in the USA, spread across 60 universities, and mostly in assorted sciences, especially biosciences, and producing around 600 graduates/year (Colwell 2009). Most of these were overwhelmingly online in their delivery systems. In the environmental sciences, there are PSM programs at CSU/Chico, CSU/San Bernardino, American University, SIU/Edwardsville, Oregon State, North Texas, and Utah. The development of many of these PSM degree programs has been supported by grants over the past decade from the Alfred P. Sloan Foundation. PSMs have also been included in the stimulus bill also known as the American Recovery and Reinvestment Act of 2009. The National Science Foundation plans to provide grants that will expand the number of PSMs to 200 (Colwell 2009). Also, see [www.sciencemasters.com](http://www.sciencemasters.com) and [www.npsma.org](http://www.npsma.org).

## **THE FLORIDA INITIATIVE**

In Florida, a Sloan Foundation seed grant was applied for—and received-- in 2008-09 to investigate the feasibility of developing a series of PSM degrees across the state. This effort was spearheaded by a group of graduate school deans and directors, notably Dr. Patricia Bishop at the University of Central Florida in Orlando. Five science sectors were selected to pilot the PSM degrees: Biotechnology, Forensics/Homeland Security, Healthcare, Simulation/Aviation, and Environmental Science/Sustainability. The University of West Florida, as one of eleven public Florida universities, agreed to assist, and several units—including Health & Life Sciences, Engineering Technology, and Environmental Studies—responded. The UWF initiative was led by Dr. Richard Podemski, Dean of Graduate Studies and also Vice-President for Research.

## **DEVELOPING A PSM AT THE UNIVERSITY OF WEST FLORIDA**

The UWF Department of Environmental Studies felt it was in a good position to the university's—and the state's—request in investigate the feasibility of developing a Professional Science Master's degree program. First, the University of West Florida is considered to be a regional comprehensive university, drawing most (80%+) of its students from a 100-mile radius (including southern Alabama, with which it has a tuition agreement). A majority of the graduates stay in the region and fill the professional positions, e.g., teachers, accountants, and environmental professionals. Second, a master's degree is typically the highest degree earned at a regional comprehensive university, and—with the exception of an Ed.D. degree—such is the case at UWF. Environmental Studies, rooted in Geography and Geology at UWF (since 1970), developed into a B.S.-degree-granting program in the 1980s and into a B.S.-degree granting department in 1997. (The senior author was hired as chair in 1998.) In 2004, after authority for establishing graduate degree programs shifted from central control in Tallahassee to individual university Boards of Trustees, the Department of Environmental Studies made a pitch to

establish a Master's in Environmental Science program. Part of the rationale was to meet the local demand for master's degrees by UWF graduates with only B.S. degrees working the environmental arena (public and private) who wish to advance their careers. From 2004-2008, perhaps 12 such students were enrolled in the program, although not all finished. It was difficult for the department to offer sufficient classes at convenient times, i.e. after normal working hours or on Saturdays. Students found it hard to work full-time while working on a master's degree. Many felt that if an online degree program were offered, their higher education goals would be more easily fulfilled.

According to the Florida PSM guidelines, the elements of a PSM include the following:

1. an industry advisory board
2. in-depth study in a science-driven field
3. industry internship; and
4. professional development courses intended to emphasize written and oral communication, leadership, business, and team-building skills

The University of West Florida and the Department of Environmental Studies were well positioned to develop PSM degrees in the targeted fields. The university had only recently modified its older Master in Public Administration (MPA) degree into a Master of Science in Administration (MSA) degree (<http://uwf.edu/catalog/>). This degree consists of a core suite of administration courses (12 semester hours, or sh) and the remaining 21-24 sh in a specific specialization, e.g., Biomedical/Pharmaceutical, Criminal Justice Administration, Educational Leadership, Healthcare Administration, and Public Administration. In other words, the framework had been established to create additional professional administration master's degrees. As for the four elements of a PSM, the Department of Environmental Studies had already established an effective Advisory Board, offered a science-driven curriculum (with both science and policy track options), had an established internship program, and emphasized project management as well as excellent written and oral communications skills.

The first step in actually developing curriculum for a PSM was to gauge both the need as well as the content of such a degree program. As a member of the Northwest chapter of the Florida Association of Environmental Professionals (FAEP) since he arrived in Florida in 1998, the senior author immediately thought of the local FAEP membership as an appropriate sounding board. Junior author Paul Looney, a founding member of the local chapter and current vice-president of the national organization (NAEP) AND a long-term supporter of environmental higher education, quickly agreed with the importance of such a degree program. Chapter president Ms. Barbara Albrecht, who was working on an academic program to support a proposed Watershed Studies center at UWF, arranged that the August 2009 regular monthly FAEP chapter meeting be dedicated to this topic.

The August 21, 2009 local-chapter FAEP meeting was quite successful, and the groundwork for a PSM (actually two) was laid. There were 30 people in attendance, and lunch was paid for by the University of West Florida. There was much discussion of curriculum, and the consensus was that most, if not all, of the program should be delivered online. Some participants felt that a short (1 to 2 weeks) capstone field course would be ideal, whereas others thought that might be too much of a hardship for full-time professionals. Most agreed, however,

that a PSM degree program would be of great benefit to the region and that a focus upon environmental sustainability would be best.

One topic under discussion was the role Geographic Information Science (GIS) would play in such a PSM curriculum. The reason the senior author was most interested in this was because the department had developed (in 2007) a successful online GIS certificate program. This program, available at both the undergraduate as well as graduate levels, consists of 24 sh of instruction, all online. (The certificate program has been most successful, and for a while it was the top Google hit for “GIS certificate”!) Many of the students enrolled at the graduate level expressed interest in a master’s degree program. The results of the August 2009 meeting showed that an introductory course in GIS would be fine, but detailed GIS coursework would be too specialized. As a result, our department is now also working on developing a stand-alone PSM in GIS.

After the August 2009 scoping meeting, the next step was to develop an official advisory board for the proposed PSM in Environmental Management & Sustainability. A meeting of the Environmental Studies Advisory Board was called for April 1, 2010 to discuss the PSM and determine whether a stand-alone PSM advisory board was needed or where a PSM subgroup could be formed from the Environmental Studies Advisory Board. Since the existing Board was comprised of environmental professionals in private, regulatory, and academic sectors, we felt the latter option might suffice. In response to the meeting invitation, one long-term board member regretfully announced he could no longer serve on the board. This convenient opening allowed junior author Paul Looney to accept board membership and help spearhead curriculum issues associated with the PSM. Results of the Advisory Board meeting will be summarized at the NAEP annual conference in late April 2010.

In the meantime, the state of Florida proceeded to develop its statewide PSM network. Of the targeted subject areas, environmental science was initially selected for PSM development by four Florida institutions. However, not all have followed through with their development plans. To compare notes of what the institutions are all individually working on, a statewide PSM meeting is to be held in Orlando, perhaps in 2010. The University of Central Florida has developed a brochure template ([http://www.flpsm.org/resources\\_BrochureTemplates.html](http://www.flpsm.org/resources_BrochureTemplates.html)) to be used by all universities for their PSM degrees. The UCF PSM clearinghouse has requested an outline of proposed PSM degrees in Florida. The UWF Department of Environmental Studies submitted two: one for GIS and one for Environmental Management & Sustainability.

In response to the state of Florida request, a draft curriculum was developed in early 2010 (Table 1). This curriculum was based largely upon comments made at the August 2009 scoping meeting but has not yet been approved or modified by either UWF Environmental Studies faculty or the UWF Environmental Studies Advisory Board. While the “management core”, i.e., the “professional content” as listed on Table 1, is fixed, the “technical content” courses still need to be finalized. Most of the courses with xxx are those that need to be developed for online delivery. The Coastal Morphology course is an existent online course taught by the senior author, but whether it is appropriate for this degree has yet to be decided. Also, no graduate-level GIS or statistics courses are on the list, and we suspect that faculty and the advisory board will insist on the inclusion of statistics and GIS to some degree.

Table 1. Proposed Curriculum for PSM in Environmental Management & Sustainability.

<b>Curriculum for PSM in Environmental Management &amp; Sustainability</b>			
Course ID	Name of Course	SCH	University
Technical Content			
EVS5xxxC	Environmental Soil Science	3	UWF
EVS5xxx	Issues in Air & Water Quality	3	UWF
GEO5xx1	Global Agricultural Sustainability	3	UWF
EVR5xxx	Environmental Law and Ethics	3	UWF
GEO5225/L	Coastal Morphology/Lab	4	UWF
EVS6940	Internship	3	UWF
PHC6300	Survey of Environmental Problems	3	UWF
Professional Content			
EME6358	Evaluation for MSA Professionals	1.5	UWF
GEB5870	e-Business Systems	1.5	UWF
GEB5871	Managerial Economics	1.5	UWF
GEB5872	Financial Management I	1.5	UWF
GEB5875	Management Skills and Applications	1.5	UWF
GEB5876	Marketing Management	1.5	UWF
MAN6156	Management and Organizational Behavior	3	UWF
Total Number of Credits for Program		34 SCH	

## **FUTURE WORK**

Although much progress has been made in creating a science-based Professional Science Master's degree program in Environmental Management & Sustainability, there is still much to be done if this program is to be inaugurated as envisioned in Fall 2011. We want to utilize the knowledge bases of various groups (UWF Environmental Studies faculty, UWF Environmental Studies Advisory Board, NWFAEP members) to create a professional and relevant program that will appeal to environmental professionals currently holding B.S. degrees and recent graduates with interests in professional environmental careers and not in entering academia. There will be time, effort, and funding required developing the courses and the curriculum. Once established, a PSM program such as this should be self-sustaining (provided the tuition dollars flow back into the running of the program.)

## **REFERENCES**

Colwell, R.R., 2009, Professional Science Master's Programs Merit Wider Support, *Science* 323: 1676-1677. (27 March)