

## **Request for Authorization to Establish a Master of Climate Change and Society at NC State University**

NC State University requests authorization to establish a Master of Climate Change and Society degree program (CIP 03.0103).

### **Program Description**

The proposed Professional Science Masters (PSM) Master of Climate Change and Society program is designed to equip professionals to make planning and policy decisions informed by their understanding of the effects of global climate change. To underscore the relevance of the program, the Securities Exchange Commission (SEC) adopted a regulation in 2010 that requires virtually every publicly traded company to provide investors with risk analyses of the effects of global climate change as related to their business. All PSM degree programs are developed in concert with industry and are designed to dovetail into present and future professional career opportunities.

It is expected that students entering the PSM in Climate Change and Society will have completed an undergraduate major in a non-science (or liberal arts) area. The program is structured to provide students with sufficient background in climate science and the implications of global climate change to allow informed decision making. Course subject areas include fundamentals of climate change, climate risk analysis, statistics for biological sciences, introduction to geographic information systems, environmental and resource policy, and environmental communications. The program requires 31 graduate semester credit hours to complete, including a summer internship in collaboration with the National Center for Climatological Data (NCDC) in Asheville or other local government, non-profit, or private organizations.

### **UNC Tomorrow Relevance**

This proposed program would address several Recommendations within the UNC Tomorrow Report including the components to enhance Our Global Readiness (Recommendation 4.1), Our Citizens and Their Future: Access to Higher Education (Recommendation 4.2), Our Communities and Their Economic Transformation (Recommendation 4.4), Our Environment (Recommendation 4.6), and Our University's Outreach and Engagement (Recommendation 4.7).

### **Highlights from UNC-GA Data Template**

No other public or private college or university in North Carolina or in the southeast region of the United States offers a similar degree. In the past three years, NC State University has established seven masters and two baccalaureate programs, and has discontinued eighteen masters and one baccalaureate program.

### **Outcome of Consultation with Disciplinary Panels**

The panel included three faculty members from ECU, three from NC A&T State, and one from UNC Chapel Hill, in addition to the NCSU faculty presenters. Panel members requested clarity on the intent of the program. NCSU explained the program's purpose is to better prepare individuals working in policy and planning with a foundational knowledge of climate science and climate risk

analysis. While some participants wanted to see more science content and others more social science content, panelists and NCSU presenters acknowledged the careful balance that PSM programs must strike between science and other professional skills (communication, etc.). Panelists discussed whether the non-science (liberal arts) majors targeted for this program may be challenged in some of the proposed courses (statistics, hydrology electives) and in use of large, complex GIS databases, and recommended the consideration of some additional means to assess math skills and abilities. The panel also encouraged NCSU to expand the options for elective coursework. There was consensus favoring the offering of this degree program.

### **Student Demand**

Interest surveys conducted in 2008, one across North Carolina and another at a professional conference, indicated that student demand would exceed the target enrollment of 15 students in Year 1. NC State currently offers two climate change courses for non-science majors that close at the maximum enrollment of 100 students each year. One new course being developed for the proposed PSM was piloted with 14 liberal arts students at UNCA in 2010, and 23 students are currently enrolled in the course at NC State. NC State projects full enrollment of the PSM Climate Change and Society program in its fourth year will be 20 full-time and 15 part-time students.

### **Opportunities for Graduates of the Program**

NCSU notes this program will satisfy the gap between individuals who generate information on climate science and its impacts and those who use the information at local, state, and national levels. Nationally, there is one other program focused on training planners and policymakers in climate science. Graduates of that program hold positions in a variety of sectors – private, government, and non-profit. That program has also proven to prepare students for entry into Ph.D. programs.

### **Resource Implications**

**Resource needs:** No new faculty, facilities, equipment, library resources, or information technology services are needed to implement the proposed degree program.

**Resources allocated:** The NCSU Department of Marine, Earth, and Atmospheric Science will administer the proposed program. Two new required courses have been developed. The NCSU Provost's Office will provide funding to buy out time of an existing faculty member to teach two new courses for the PSM, as well as to pay partial summer salary for the summer course and to buy out time for program coordination. NCSU has developed and implemented a campus-wide plan for evaluating the "productivity and efficiency" of all new and existing degree programs, including PSM programs, which will be used to make funding decisions on this new program.

**Estimated cost to the State:** Based on the University funding formula, when the program reaches full enrollment, NCSU would receive additional state appropriations of approximately \$305,000 if fully funded by the General Assembly.

### **Recommendation**

It is recommended that the Board of Governors approve NC State University's request to establish a Professional Science Masters (PSM) Master of Climate Change and Society degree program (CIP 03.0103) subject to the availability of funding.

## General Information Template for Academic Program Review

### ***Degree Area and Level:***

Masters of Climate Change and Society (CIP 03.0103) at NCSU

### ***Addressing UNC Tomorrow:***

This proposed program would address several Recommendations within the UNC Tomorrow Report including the components to enhance our Global Readiness (Recommendation 4.1), Our Citizens and Their Future: Access to Higher Education (Recommendation 4.2), and Our Communities and Their Economic Transformation (Recommendation 4.4), Our Environment (Recommendation 4.6), and Our University's Outreach and Engagement (Recommendation 4.7).

### ***Role of Program in Relation to State and Regional Needs:***

According to the proposal, "Climate change has been recognized as a critical factor in planning. Climate change will bring changes in sea level that will dramatically affect coastal areas, changes in precipitation that will affect agriculture and water resources for our cities, changes in ecology that will affect fisheries and wildlife and changes in energy requirements that will affect the entire population and the industrial sector. Each of these areas, agriculture, sea level rise, water resources and coastal ecology are critical for North Carolina, hence there is a need for planners trained in the implications of climate change in these areas."

### ***Availability of Program Statewide (Enrollment and Degrees Awarded in Last 3 Years):***

- *Public universities* – Not available.
- *Private universities* – Not available.

### ***Available or not from Academic Common Market:***

Not available.

### ***NCSU Campus enrollment and degrees awarded in similar programs at the Masters level:***

*(Based on two CIP digits – 03 CIP is the summary group for Natural Resources and Conservation under which Climate Change and Society is a program)*

Enrollment			Academic Year						
			Fall 07	Spr 08	Fall 08	Spr 09	Fall 09	Spr 10	Fall 10
NCSU	Natural Resources/Conservation, General	M	0	0	0	0	5	5	3
		MS	33	36	40	37	28	26	29
	Environmental Science	M	N/A	N/A	N/A	N/A	N/A	N/A	16
	Natural Resources Management and Policy	M	0	0	0	0	23	28	24
		MS	31	32	39	44	33	31	37
	Forestry, General	M	0	0	0	0	4	4	1
		MS	22	23	25	23	20	20	24
	Wood Science and Wood Products/Pulp and Paper Technology	M	0	0	0	0	13	14	13
		MS	18	22	23	23	13	10	7

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Number of Degrees Awarded			Academic Year		
			2007-2008	2008-2009	2009-2010
NCSU	Natural Resources/Conservation, General	M	1	1	0
		MS	4	13	8
	Environmental Science	M	Program approved in 2010 - no graduates yet		
	Natural Resources Management and Policy	M	3	5	3
		MS	10	6	8
	Forestry, General	M	2	0	5
		MS	7	8	6
	Wood Science and Wood Products/Pulp and Paper Technology	M	0	4	2
		MS	1	5	4

***Campus Average of enrollment and degrees awarded per degree program in this area at the Masters level over the over the last 3 Academic Years, Fall 2007-Fall 2010:***

*(Based on two CIP digits – 03 CIP is the summary group for Natural Resources and Conservation under which Climate Change and Society is a program)*

Campus Average			
	Number of Active Programs	Enrollment per Semester	Degrees Awarded per Year
NCSU	5	29	9
UNC-CH	1	66	28
UNCW	1	33	10
Campus Average:		43	16

***NCSU Campus Degree Programs added in the past three years:***

- Bachelor
  - BS Genetics (11/13/2009)
  - BS Soil and Land Development (04/09/2010)
- Master
  - Master Environmental Assessment (02/12/2012)
  - MA Foreign Language and Literature (02/11/2011)
  - Master of Environmental Engineering (04/09/2010)
  - MS Environmental Engineering (04/09/2010)
  - Master Geospatial Information Science and Technology (02/12/2010)
  - MAT - Master of Arts in Teaching (10/17/2008)
  - MGIM - Master of Global Innovation Management (01/11/2008)
- Doctoral
  - N/A

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### *NCSU Campus Degree Programs discontinued in past three years:*

- *Bachelor*
  - BS Health Occupations Education (03/20/2009)
- *Master*
  - MEd Middle Grades (02/11/2011)
  - MS Middle Grades (02/11/2011)
  - MEd Curriculum and Instruction, English Education (02/11/2011)
  - MS Curriculum and Instruction, English Education (02/11/2011)
  - MEd Curriculum and Instruction, Reading (02/11/2011)
  - MS Curriculum and Instruction, Reading (02/11/2011)
  - MEd Curriculum and Instruction, Social Studies Education (02/11/2011)
  - MS Curriculum and Instruction, Social Studies Education (02/11/2011)
  - MA French Language and Literature (02/11/2011)
  - MA Spanish Language and Literature (02/11/2011)
  - Master Chemistry (08/13/2010)
  - MS Agricultural and Resource Economics (03/20/2009)
  - MEd in Special Education, Behavior Disorders (03/20/2009)
  - MS Behaviorally/Emotionally Handicapped (03/20/2009)
  - MEd Mentally Handicapped (03/20/2009)
  - MS Mentally Handicapped (03/20/2009)
  - MEd Specific Learning Disabilities (03/20/2009)
  - MS Specific Learning Disabilities (03/20/2009)
- *Doctoral*
  - N/A