

**Request for an Enhancement Position for the
Department of Earth, Environmental, and Geographical Sciences
December 5, 2011**

The EPC recommends that the following criteria be used, within existing processes, for prioritizing academic programs and for making decisions regarding the reallocation of resources to enhance or initiate new programs as well as for program eliminations.

1. Alignment with the mission and vision of Academic Affairs

- **Our department's mission statement**

The Department of Earth, Environmental, and Geographical Sciences is a student-centered department whose mission is to develop and expand students' critical thinking and science-based inquiry of the processes within Nature and Society, and resulting patterns of human impacts on the environment. The Department's faculty provide integrative, transdisciplinary training to foster the intellectual and professional growth of their students to prepare them for successful careers or graduate school. Field experiences, internship opportunities, and thoughtful advising/mentoring further help students graduate as critical thinkers and informed citizens capable of addressing challenges facing our planet.

- **Intellectual foundation**

This request aligns with the call in NMU's Road Map to 2015 for developing and expanding internationalization efforts and growth of international affairs at the university. Our new hire would contribute to global engagement and diverse learning experiences. We strive to attract a teacher-scholar who engages in socioeconomic aspects of the environment and timely issues such as effects of environmental change on society and the natural world, earth hazards, economic development, resource management, and environmental policy.

- **Active learning**

We facilitate active learning both in the classroom and on field excursions in the Marquette area, in the Upper Midwest, and abroad. We offer hands-on, practical learning about the environment, capitalizing on NMU's natural setting. Two of our faculty members will teach in the new active learning classroom in Winter 2012.

- **Career preparation**

Through our engaged student-centered teaching and learning, we prepare our students for internships, employment, and further study in a variety of fields. We encourage students to complete internships to gain professional experience related to their major, and we support our students as they arrange directed studies that fulfill degree requirements and also help students develop skills that they will need for their careers.

- Several students from the Department of Earth, Environmental, and Geographical Sciences (EEGS) are interning or working for various organizations around the region. Students are using their Geographic Information Systems (GIS), mapping, and other geographical skills to help with projects for Better Building for Michigan, the City of Marquette, Chocolay Township, Greenstone Mapping, the Marquette

County Conservation District, the Marquette County Planning Commission, the Michigan State Police, and the Superior Watershed Partnership. One student is currently mapping with LiDAR data as an intern at AeroMetric in Sheboygan, Wisconsin.

- A partnership with the Alger County Conservation District has supported internships for twelve EEGS students in 2011, with more internships planned for 2012 and 2013. Interns identified, mapped, removed, and monitored invasive plant and animal species; installed structures to control erosion; restored native vegetation; worked with federal and state governmental organizations and with private industrial forest managers to help implement conservation practices; and presented the status of projects at a countywide public board meeting.

- **Community engagement**

Many of our faculty members and students are involved in community projects, whether providing scholarly insights or volunteer assistance or technical skills. Examples of participation in the region include

- Workshop for local Boy Scouts to earn their badge in archeology;
- Wildcat Innovation Funding to work with North Star Academy to establish the "Community and Environmental Education Program." The new relationship between NMU's Department of Earth, Environmental, and Geographical Sciences and North Star Academy (NSA) will foster powerful learning experiences for students through hands-on classroom and field-based activities;
- Service as a U.S Delegate and the Co-Chair of the Ecosystem Committee on the Lake Superior Bi-national Forum;
- Service as Vice President on the Executive Committee of the Superior Watershed Partnership;
- Chair of the Marquette City Planning Commission and serving on its Sustainability Committee;
- Training session to help planning officials in AuTrain Township work with GIS; future workshops will provide training in Burt Township and Munising Township for planning officials, the road commission, and U.S. Forest Service and National Parks Service employees.

We anticipate that the new faculty member we hire through an enhancement position will also work closely with the community.

2. History, development, and expectations of the program

- **Why was the program established?**

Geography is one of the original subjects taught when the State Board of Education created Northern State Normal School in 1899. The Geography Department was founded in 1905. We continue to build on a strong foundation of preparing our students for their futures in the 21st Century.

- **How has the program evolved over time?**

The emphasis of the department has changed over time to provide our students with the solid background they need to succeed in life. In 2011, the renamed Earth,

Environmental, and Geographical Sciences Department launched a revised curriculum. The four new majors are Environmental Studies and Sustainability, Environmental Science, Earth Science, and Geomatics. The new curriculum is timely because it helps our students understand the biophysical environment and the environmental challenges that society faces and must address. True to the roots of the institution, students can still prepare for a career in teaching. The secondary education majors prepare students to teach geography and earth science. Our department submitted CUP proposals in October 2011 to revise the EEGS minors to further streamline the program for undergraduates. The suite of changes is intended to help students prepare better for a wide range of careers or for graduate school.

- **How has the program adapted to meet change, including demographic changes?**

The curriculum has changed to provide students with the background that they need for employment in earth, environmental, and geographical sciences. We have increased the number of sections that we offer in certain courses to accommodate our steady increase of majors. With the growth in our department and the rising interest in Environmental Studies and Sustainability comes the need for more help teaching and advising our students. We are now stretched beyond our capacity to provide enough seats in classes to keep up with demand. At last count a few weeks into Fall 2011, our undergraduates majoring in EEGS total more than 300, and we anticipate that our exciting new curriculum will attract more students. In the past ten years the number of students majoring in our department has increased from 192 to 297. About 140 of these students have declared an Environmental Conservation, Human Geography, or Environmental Studies and Sustainability major. Undergraduates minoring in our department and students satisfying liberal studies requirements also increase the demand for courses related to the myriad environmental issues of the 21st Century.

We work hard not only to recruit students to our department, but also to retain them. We mentor and advise our majors and minors to help increase the efficiency of students' undergraduate programs and the quality of the learning experience. Faculty and staff of EEGS host an advising party each semester before registration opens for the next semester. More than 50 students attended the session in October 2011 to learn about curricular changes, upcoming courses, internship opportunities, student organizations, and strategies for minimizing the number of semesters it takes to complete a degree at NMU.

3. External demand for the program

- **National**

Our students come to our program from increasingly far away. To give just two examples, we have an exchange student from South Korea taking our courses this year, and an undergraduate Environmental Conservation minor from Hawaii. National demand for our majors and their skill sets increases; recent graduates from our department are employed in New Orleans and Washington, D.C.

- **Regional**

We are an important regional institution for students interested in the natural environment, environmental science, environmental studies, computer cartography, and Geographic Information Systems. Students who are attracted to majors in our department come from the Chicago area, Milwaukee and Madison, northern Wisconsin, the Twin Cities, southern Lower Michigan, northern Lower Michigan, and across the Upper Peninsula.

4. Internal demand for the program

- **Does this program provide essential support for others in the University**

The Department of Earth, Environmental, and Geographical Sciences is committed to its service role of providing liberal studies and general elective courses to students from across the NMU campus. Some of our courses satisfy the Division III Foundations of Natural Science—Mathematics requirement (e.g., ENV 101 Introduction to Environmental Science, GC 100 Physical Geography, GC 210 Earth Hazards, GC 255 Physical Geology—DIV III with lab), while other courses fulfill the World Cultures (e.g., GC 164 Human Geography, GC 300 Regional Studies: World Cultures) and Upper Division (e.g., GC 300 Regional Studies: World Cultures, GC 360 Population Geography) liberal studies requirements. We need a new faculty member to contribute to the courses that NMU students require or may use, especially as electives toward the Environmental Studies and Sustainability major and the Environmental Science major.

5. Quality of the program inputs and resources

Most of the Earth, Environmental, and Geographical Sciences Department's classroom spaces, labs, and faculty offices are located in the two buildings that make up the Seaborg Science Complex: New Science Facility and West Science. This state-of-the-art, ESRI-licensed facility hosts computer labs with laptop docking stations, printers, a wide-format plotter and a mainframe enterprise server. Our department also houses a map collection.

To extend learning off campus, classes visit the Upper Peninsula's many rivers, streams, lakes, hills, plains, and NMU's Longyear Forest, a 120-acre woodland area located a few miles from campus. Students also actively learn along the shores of Lake Superior.

- **Equipment**

Our lab spaces are well equipped with scanners (wide-format, film, regular), GPS units (Trimble Geo XM and 30 recreational grade devices), plotters (up to 42" format for printing posters and maps), an enterprise server for GIS and remote sensing data, rock crushers and a rock saw, and ESRI GIS software for students to use on college-supplied laptops.

- **Facilities**

Facilities include laboratories for GIS and remote sensing, advanced geospatial research, biogeography, geology research, paleo-environment research, soil science research, environmental science research, planning research, human geography, advanced GIS and spatial modeling, and geography teaching; a student resource and study room; rock storage; and greenhouse space.

- **Faculty**

We have seven full-time faculty and one Academic Department Head who teach regularly in our department. Dean Michael Broadway is a geographer who is not currently teaching because of other professional duties. We regularly rely on two or three adjunct instructors to teach for us, and still we do not have enough colleagues to cover all of the courses that students need to graduate in a timely fashion.

- **Students**

We are here to help our students develop their passion for earth, environmental, and geographical subjects. We value our students, and they graduate ready to attend graduate school or gain employment. Some of our students conduct research with faculty members through opportunities such as the Honors Program, Freshman Fellowships, McNair Scholars mentorships, and the Charles C. Spooner Research Program. Recently four of our students presented their research at a geography conference in Chicago, and one of the students placed second in the poster competition.

6. Quality of program outcomes

- **Job placement**

We do not monitor job placement, but we estimate that about 80% of our students graduate and find jobs in environmental fields related to their major.

- **National certification results** (pass rate for certifications, etc.)

N/A; our field does not have a national certification.

- **Faculty productivity**

- Teaching effectiveness: Our faculty are dedicated to excellence in teaching;
- Scholarship: Our faculty members balance their teaching with scholarship and service. From July 2010–June 2011 seven faculty members presented 17 papers or posters at scholarly conferences and workshops; published six scholarly articles, one book chapter, and two technical reports; participated in five conferences; reviewed books and journal manuscripts in a variety of professional journals; received funding on three grant proposals (National Science Foundation, Great Lakes Integrated Sciences Assessments, and Wildcat Innovation Funding); co-organized and hosted at NMU a second regional GIS User Group Conference; directed a Faculty Led Study Abroad trip to Scotland; and chaired various national- and regional-level professional committees. We are pleased with our scholarly accomplishments, considering that our department is moderate in size, has no graduate program, and has relatively large teaching assignments including full responsibility for laboratory classes.

- **Impact on the regional community**

Faculty members contribute their expertise to the community. In addition to the outreach activities listed in the Community Engagement section in Criteria 1, we also volunteer our time writing, proctoring, and grading exams for the Region I Science Olympiad Tournament, hosted by the Glenn T. Seaborg Center for Teaching and Learning Science and Mathematics at NMU.

- **Learning outcomes assessment**

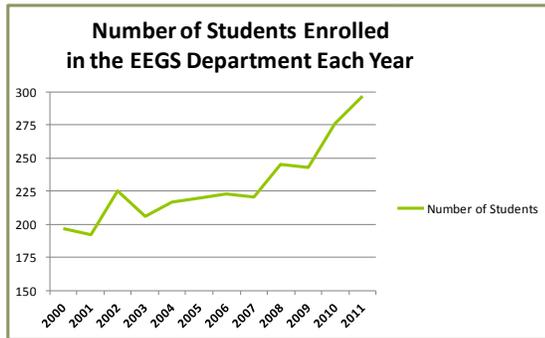
We are in the process of developing new goals for our learning outcomes. In November 2011 we submitted new assessment objectives and rubrics that are currently under review by the Outcomes Assessment Committee.

7. Size, scope, and productivity of the program

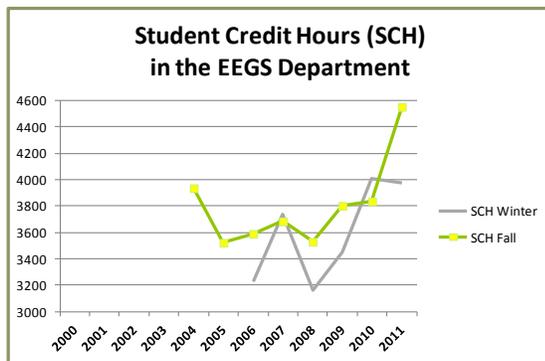
- **Program data provided by Institutional Research** (see <http://webb.nmu.edu/InstitutionalResearch/SiteSections/AcademicDepartmentalMeasures/EnrollmentReports/EnrollmentReports.shtml>)

- **Provide data, preferably time series.**

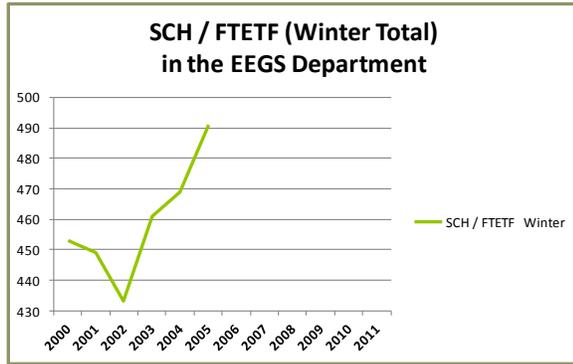
- FYES/FTETF: Data not available on the Institutional Research website;
- Major enrollment: See graph of increasing enrollment over the past decade; 305 students had declared a GC major as their first or second major in Fall 2011;



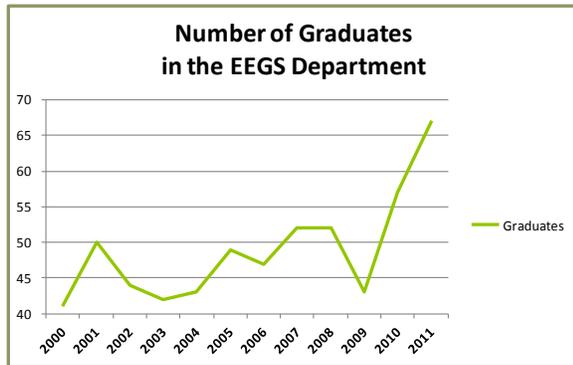
- SCH: See graph of increasing student credit hours over time;



- SCH/FTETF: See graph of increasing ratio of SCH/FTETF over time;



- Majors/FTETF: Data not found on the Institutional Research website;
- Number of graduates: See graph of increasing number of graduates over time;



- Class size:
 100-level lecture classes have approximately 85 students;
 200-level and 300-level classes have approximately 20–60 students;
 400-level classes have approximately 20–30 students.

8. Revenue and other resources generated by the program

- **Enrollment/tuition:** Data not available.
- **Grants:** Approximately \$45,000 in grant funds were garnered by EEGS faculty in 2011.
- **Fund raising (current and potential)**
 - \$993 was donated in 2011 to the department through the NMU Foundation;
 - Endowed scholarships, including the Farrell Cartography Scholarship, Fillmore C. F. Earney Scholarship, John S. Presensky Endowed Scholarship Fund, Henry S. Heimonen Award for Excellence, Ishpeming Rock and Mineral Club Scholarship, and National Council for Geographic Education Excellence of Scholarship Award, contribute funds regularly to support students in our department.

9. Costs and other expenses associated with the program

• **Instructional costs**

The department covers the cost of vans for taking students on field trips. We offset the travel expenses of students attending conferences and presenting their research.

• **New support needed for enhancement position**

- Equipment: Some computer equipment will be needed to conduct research;
- Travel: Expenses to present research at conferences and attend professional development seminars;
- Library resources: No additional support anticipated beyond what other faculty members receive;
- Instructional software: No additional support anticipated beyond what other faculty members receive.

• **Efficiencies – cost cutting**

A new faculty member hired to fill an enhancement position will actually help us deliver our program more efficiently. An additional faculty member would help us to offer more of the courses that NMU students need for their majors and minors, and to fulfill requirements for liberal studies and general electives.

10. Impact, justification, and overall essentiality of the program

• **Illustration of program's impact**

Our increase in majors from 197 in 2000 to 297 in 2011 indicates that our program resonates well with the students who gravitate to NMU. Students are responding well to our revised curriculum. Our majors are excelling in their internships, and we continue to work with them to secure gainful employment after they graduate from NMU.

• **Connection to mission**

Through our teaching in the classroom, on the Web, in the field, and abroad we encourage our students to think independently and critically about what they are learning. We work closely with our students to develop technological and communication skills for the 21st Century. We strive to prepare our students for the workplace and to become lifelong learners, whether or not they attend graduate school. We train students to continue to learn about their changing world so that they will be able to solve the challenges society faces.

• **Centrality to the core values of our curriculum**

Our department supports the values of giving to the community, leading by example, internationalizing the curriculum, and teaching and learning about the great outdoor setting that is a unique feature of the NMU campus.

• **Relation to the success of other programs**

The Department of Earth, Environmental, and Geographical Sciences welcomes students with other majors and minors—including Biology, Criminal Justice, Outdoor Recreation, Sociology and Social Work, and the School of Education—to enroll in our classes.

11. Opportunity analysis of the program – what new possibilities will this program present?

- **Articulation of new ideas that have not been considered by the University**

We are prepared to contribute to new curricular initiatives, whether they include exchange programs with universities from other countries and continents, or developing new interdisciplinary programs at NMU.

- **Re-purposing a program to meet newly identified possibilities**

An enhancement position in the Department of Earth, Environmental, and Geographical Sciences would enable us to develop and teach exciting new courses that fit with the administration's goals for the growth of NMU.

- **Collaborative relationships with internal or external programs**

We welcome collaborative relationships with internal and external programs, especially regarding ways to showcase the natural setting of NMU. We already teach courses about the trees and water of the Upper Peninsula. We look forward to working with President Wong, the new provost of academic affairs, other members of the administration, and faculty and staff on campus to contribute toward rebuilding NMU.

Request and rationale for enhancement position

The Department of Earth, Environmental, and Geographical Sciences (EEGS) requests a tenure-track position to hire an Environmental Geographer at the assistant professor level with a salary range of \$47,176–\$52,176. This enhancement faculty member will fill in gaps in the new Earth, Environmental, and Geographical Sciences curriculum, cover required and elective courses that the department currently does not have enough faculty members to teach, and also teach some courses that are taught regularly by faculty members who would then be freed up to teach other essential classes. This request supports the call in NMU's Road Map to 2015 for developing and expanding internationalization efforts and growth of international affairs at the university. Our new hire would contribute to global engagement and diverse learning experiences.

Within our department we are stretched beyond our capacity to provide enough seats in classes to keep up with demand. We have worked diligently to increase enrollments, and now we need to add a faculty member to help support the growing interest in the Environmental Studies and Sustainability major and related courses. At last count our students majoring in EEGS total more than 300, and we anticipate that our exciting new curriculum will attract more students.

We need a new faculty member to contribute to some of the following courses:

GC 164 Human Geography

GC 200 North America

GC 220 Economic Geography*

GC 269 Introduction to Sustainability

GC 300 Regional Studies*

GC 310 Urban Geography*

GC 316 Geography of Tourism†

GC 317 Geography of Food Systems†
GC 320 Environmental Policy and Regulation*
GC 360 Population Geography
GC 475 Environmental Impact Assessment*
GC 470 Environmental Ethics

* Indicates course for which student demand cannot be met regularly

† Indicates course that is in the Bulletin but cannot be taught because we are short handed

A new faculty member might also contribute to one or more of the following new courses, or teach existing classes so that current faculty could develop new courses with these themes:

Transportation Geography
Geography of the Developing World
Rural and Regional Development
Geography of the Great Lakes Region
Water Resources and Watershed Management
Forest Resources
Air Quality
Environmental Restoration
Geography of Outdoor Recreation

In conclusion, we are pleased with the growing interest in our courses and the new curriculum that will prepare our students for employment and further study in a variety of environmental fields. Developing the environmental curriculum was an important goal of former Provost Koch, who recognized the advantages of capitalizing on NMU's natural setting, and is part of President Wong's vision for growth at NMU. We already teach courses that engage students in hands-on, practical learning about the vegetation, water, soils, landforms, rocks, and other natural resources of the Upper Peninsula, and we are excited about the possibility of increasing our capacity to meet the needs of our majors and other NMU students who enroll in our classes.