

Proposal to Revise the Existing Geography Major

16 September 2008

Name of Major: Geography

Degrees: Bachelor of Science and Bachelor of Arts

Target Implementation Date: Autumn 2009

Rationale:

Established almost 100 years ago, the Department of Geography at Ohio State is one of the top-ranked departments in the discipline. Students majoring in Geography choose from among four specializations, two of which lead to a Bachelor of Arts and two to a Bachelor of Science. The BA specializations are "Urban and Regional Studies" and "People, Society and Environment;" the BS specializations are "Analytical Cartography and Geographic Information Systems" and "Climatic and Atmospheric Sciences."

Between WI07 and SP08 the department's Undergraduate Studies Committee undertook an extensive review of student curricula across the entire department. As part of this review, we solicited feedback from faculty, advising staff and current geography majors. The goal was to evaluate what we teach and how we teach it, in light of significant changes in our faculty, the discipline, and the job market for undergraduate majors. Our findings can be summarized as follows:

1. Due to a large number of hires, the composition of our faculty has changed dramatically over the past decade. Since 2001 we have hired 15 professors, out of a total faculty of 25. Most of these hires have been at the assistant level. Although this demographic shift allows us to teach material that is more in keeping with new directions in the discipline, the existing curricular structure limits our ability to take advantage of this strength.
2. Interdisciplinarity and the pace of real-world events have made Geography a much more dynamic discipline than it was twenty years ago. Geographers now regularly engage with scholars in a wide-range of fields (as diverse as Political Science, Geology, and Computer Science) and deal with a broad array of constantly changing subject matter, such as global warming and globalization. Our current curricular structure does not reflect the topical or conceptual complexity and dynamism of our discipline.
3. Students in Geography have a variety of career paths. Some go on to graduate school in the social and natural sciences. Many others go directly into the job market, in fields as diverse as regional planning, weather forecasting, international development, and retail location analysis. To remain competitive in both academic and non-academic fields, as well as to be effective citizens, our graduates must be conversant in always-changing technical and content-driven fields. Our current curricular structure requires both more flexibility and more cohesion to meet these challenges.

4. Departmental assessment of learning of outcomes (focus groups, exit surveys) and discussion with faculty indicate a need to address the overall cohesiveness of the curriculum. Students and faculty agree that we need to update content, reduce redundancy, and align more introductory with more advanced courses. At the same time, we need to streamline progress through the program by creating structure while retaining maximum flexibility and allowing for timely completion of the degree. Faculty also indicate that such changes will bring us in line with best teaching practices at peer institutions.
5. The names of our specializations need to be updated, as do the titles and descriptions of many individual courses. Updating names and descriptions will better reflect and communicate content, and will make them more similar to the terms used at peer institutions. Our proposals for name and description changes result from intensive faculty consultation.

In sum, Geography is currently a very dynamic and diverse discipline, and our department is also in the midst of a personnel shift that parallels the dynamism and diversity of the discipline. Our proposal updates the curriculum to better represent state of the art in each specialization, take advantage of expertise of current faculty, and provide a clear and comprehensive education to students with a range of interests and career plans.

Revised Major:

Based on our evaluation, we are proposing a substantial revision of the curriculum of all four specializations in the Geography major, as well as a suite of changes to individual courses. Together, these changes better represents what we do, and make it clearer to students how different parts of the curriculum fit together.

We are including course change proposals for 23 courses (see Appendix A for summary). The proposed changes include 18 new names, 21 new descriptions, two number changes, and several small changes in things such as distribution of contact time.

We are proposing five new courses (see Appendix B for summary). Because the new courses are designed to fill explicit gaps in the curriculum for each specialization, justifications for these new courses are included within our descriptions of revisions for each specialization.

What follows below are narrative descriptions of the proposed revisions to each of the specializations. Outlines of old and new curricula are provided in Appendices C-J. Sample four-year course plans for each specialization are provided in Appendix K.

[We have received letters of concurrence from xxx; these are included in Appendix M.]

Urban and Regional Studies

Students in this specialization focus on the spatial differentiation and organization of political, social, cultural and economic activity. The proposed changes respond primarily to student demand for a more integrated and up-to-date curriculum. They also derive from broad support

among faculty for course sequences and content which better reflect the state of teaching and research in Human Geography. Students enrolled in the specialization will become familiar with an array of geographical theories and theoretical controversies, develop strong quantitative and qualitative research skills, and engage with a wide range of up-to-date case studies. Upon completion of the degree, students will be able to link urban and regional politics and development to larger, global scale forces and trends. We propose four main revisions.

1. *Change the name to “Urban, Regional, and Global Studies.”* This name change builds on long-term strengths of OSU Geography while signaling the growing importance of the global-scale scholarship in Geography more generally. It also better represents the diversity of faculty strengths in this area.
2. *Repackaging and simplifying requirements.* Currently our courses are duplicated across a broad array of “Methods”, “Systematic”, “Regional” and “Elective” courses. This makes requirements for graduation difficult to follow, it allows little flexibility in some areas, and the progression of courses is unclear.
 - a. The existing structure has a) three required Methods courses, b) a choice of four Systematic courses from a given list, c) a choice of one Physical Geography course from a given list, d) one required Regional Geography course from a given list, and e) one elective course from a given list. See Appendix C.
 - b. The new curriculum streamlines this structure and provides more choices for the student. The proposed structure includes: a) a Methods sequence, with one required course and two electives, b) a new required introductory course in Human Geography (see below), c) choice of three more introductory courses (200/400-level), including a new 400-level course in Urban Geography (see below), d) choice of three advanced courses (500/600/700-level), and e) a new required Geographic Inquiry course (see below). See Appendix D.
3. *Addition of four new courses.* See Appendix B
 - a. Geog 205: Human Geography. Coming at the beginning of the curriculum, this course is designed to provide a coherent platform for students’ future studies in URGs. Our peer institutions across the country have a course similar to this one. This course will be required of all students in the specialization.
 - b. Geog 455: Cities in a Globalizing World. This course is designed to fill a 400-level gap in our current course offerings. We already teach a variety of 600-level courses on urban topics. This course would be included in the list of introductory courses from which students will choose three.
 - c. Geog 600: Geographic Inquiry. This course is intended to give students a theoretical retrospective at the end of their undergraduate career. Students have explicitly requested this sort of capstone course. Moreover, as with the proposed Geog 205, our peer institutions have courses similar to this one. This course will be required of all students in the specialization.

4. *Standardize the total number of credit hours at 55.* In the previous structure, students took 50 credit hours. While we have added two new required courses (205 and 600), our revision of the rest of the curriculum means only five more credit hours of coursework.

People-Society-Environment

Students in this specialization focus on understanding the relationship between people and nature. Although this is a relatively new specialization in the department (started in 2002), so-called “human-environment interactions” or “nature-society relations” have been at the core of geographical thought since its inception as a discipline. Drawing on this history of geographic thought, the proposed curriculum better emphasizes the reciprocal relationship between social and environmental processes. It introduces relevant theories in human and physical geography, appropriate methods of inquiry, and case studies of environmental challenges. We propose three main revisions.

1. *Change the name to “Environment & Society.”* This name change better reflects disciplinary terminology and signals the diversity of faculty strengths in this area.
2. *Alter the main divisions within the curriculum and change which course count in each area..*
 - a. The current structure has a required core, and then provides options in three areas: synthetic and methodological electives, environmental electives, and social electives. See Appendix E.
 - b. The new curriculum replaces this structure with three substantive areas, each of which has a set of required courses and electives. These areas are: Human Geography, Physical Geography, and Methods. The courses formerly in the required core have been integrated into these three areas. See Appendix F.
 - c. In light of new courses that have been added over the past several years due to an influx of new faculty, the new curriculum also changes which courses count in each of these areas. Despite growing faculty expertise and student demand when this specialization was proposed in 2002, at that time the department offered a limited number of courses in these areas. Now, our faculty offers a full-complement of courses in these areas. These courses offer us the ability to teach disciplinary specific material that introduces key geographical concepts, provides continuity across courses, and allows us to alter the content of courses as disciplinary foci change. The course lists we propose reflect this major change in our ability to provide explicitly geographical course content to our students. Compare Appendix E and F.
3. *Standardize the total number of credit hours at 55.* Given the previous structure, students took a variable number of credit hours, ranging from 50-60. The new structure requires a consistent number of credit hours, while still maintaining student flexibility.

Analytical Cartography and Geographic Information Systems (Note that this proposal is contingent on approval of the proposed GIS major)

Students in this specialization focus on learning tools and methods for the management and analysis of geographic information while also receiving broad training in geographical principles. The geography department at Ohio State was among the pioneering institutions in the development of geospatial technologies, and has been a leader in the fields of cartography, spatial analysis, and geographic information technology. The proposed curriculum draws on these strengths by providing integrative training in geovisualization, spatial analysis, and geographic information systems, while also providing extensive training in technical skills. Further, the proposed curriculum allows students to develop expertise in non-technical substantive areas of human and/or physical geography. We propose five main revisions.

1. *Split the current specialization into two: a separate major, called Geographic Information Science (GIS; see separate new major proposal), and a remaining specialization within the Geography major.*
 - a. The following proposal for this specialization is contingent on approval of the separate GIS major. If that proposal is not approved by the Board of Regents, this specialization will need to be revisited, as it has been designed to be quite different from the GIS major.
 - b. This specialization within the Geography major has been designed to complement the GIS major, and is intended for students wishing to gain knowledge in substantive areas of Geography. The specialization has been designed to provide *general geography education alongside technical expertise in spatial analysis*. Students in this specialization will be introduced to a broader array of methods and applications courses from which they will be able to select.
2. *Change the name to “Spatial Analysis.”* This name will differentiate the specialization within the Geography major from the new major in Geographic Information Science. This name signals a greater diversity of geographic methods and applications, and better reflects current disciplinary terminology.
3. *Alter the main divisions within the curriculum, and which courses count in each area.*
 - a. The specialization currently consists of two fairly rigid paths, in Analytical Cartography and Geographic Information Systems (see Appendix G).
 - b. The new curriculum eliminates these paths, and also eliminates a separate human and/or physical geography elective. It maintains a required core and propose a larger set of combined electives that a) include a greater set of methods courses from which students can choose, thus offering greater flexibility, and b) allow students to choose a greater number of electives in human and/or physical geography. The proposed structure allows students with a variety of backgrounds and career aspirations to tailor the specialization to their specific needs, while assuring core competency in geographical methods. See Appendix H.

- c. CS&E 201 (Elementary Computer Programming) is moved from the pre-major required courses into the Electives, where students may choose this course, or other CS&E programming courses (214 or 240).
 - d. The number of credit hours in the required core is increased by 10 by adding Intermediate GIS (685) and Undergraduate Research and Professionalization Seminar (695).
 - e. Students choose four elective courses: one methods, one human or physical geography, and two of the students' choosing (i.e. these may include methods and human and physical geography courses).
4. *Addition of two new courses.* Both courses are included in the list of electives for the specialization. See Appendix B.
- a. Geog 684: Geographic Applications in Remote Sensing. This course is intended to cover a core knowledge area that is recommended by the University Consortium for GIS Body of Knowledge (UCGIS 2006). A course in this area has been requested by students, and also draws on the expertise of new faculty in the department.
 - b. Geog 688: Emerging Topics in GIS. Given the rapidly changing nature of GIS, this course is designed to keep students abreast of innovations and new technologies in the field. The course has been requested by students to provide additional training for undergraduates planning to work in GIS-related fields.
5. *Increase the total credit hours from 44/45 to 50.* Increasing the required credit hours is necessary to provide students with sufficient technical training while also providing them a broad-based geographical education. This number of credits is also comparable to those required by our peer institutions.

Atmospheric and Climatic Studies (Note that this proposal is contingent on approval of the proposed Atmospheric Sciences major)

Students in this area focus on the interactions between the Earth's surface, at local and global scales, and the atmosphere. Geography at Ohio State has well-established expertise in climatology, which is one aspect of physical geography more broadly. Recent hires strengthen this emphasis and add expertise in other aspects of physical geography, such as biogeography and hydrology. The revised curriculum takes advantage of these strengths by allowing students to emphasize either climatology or physical geography. At the same time, the proposed curriculum provides an overarching framework for understanding connections between land and atmosphere. We propose four main revisions.

1. *Split the current specialization into two: a separate major, called Atmospheric Sciences (AS; see separate new major proposal), and a remaining specialization within the Geography major.*
 - a. The following proposal for this specialization is contingent on approval of the separate AS major. If that proposal is not approved by the Board of Regents, this specialization will need to be revisited.
 - b. This specialization within the Geography major has been designed to complement the proposed Atmospheric Sciences, and is intended for students wishing to gain knowledge substantive areas of Geography. The specialization is designed to provide *general geographic education* alongside *technical expertise in climate and physical geography*. Students in this specialization will be introduced to a broader array of methods and applications courses from which they will be able to select. Further, a specialization with emphasis on broad physical geography education is more common in the discipline than our current specialization, which focuses almost exclusively on atmospheric sciences.
2. *Change the name to “Climatology and Physical Geography (CPG).”* This name reflects now-mainstream recognition of the interconnection between the Earth’s surface and the atmosphere. It also reflects the expertise of new faculty in physical geography.
3. *Alter the main divisions within the curriculum.*
 - a. The current structure includes two paths, in Atmospheric Sciences and in Climatic Studies. The prerequisite courses are the same, except that the Atmospheric Sciences path include an additional 15 credit hours of Math. The core 28 credit hours are the same for both paths. Each path has a different set of electives, though both are 15 credit hours. See Appendix I.
 - b. The new curriculum includes two different paths, in Climatic Studies (CS) and in Physical Geography (PG). These paths reflect both student demand and current faculty expertise. Each path has a distinct set of prerequisite courses (30 hours for CS, 20 for PG), core requirements (28-30 for both paths), and electives (25 hours for both paths). The PG path includes the option of taking one Human Geography course. See Appendix J.
4. *The total number of credit hours is increased to 53-55.* The existing structure requires students to take 43 credit hours. The additional credit hours represent an increase in the number of electives, adding both rigor and flexibility to the specialization. This number of credits is also comparable to those required by our peer institutions.

Relationship to other programs:

We expect our relationship to other programs to be only modestly altered.

We expect no disturbance in terms of the ways in which our existing courses are used by other departments and programs (e.g. some of our courses are required for students enrolled in the

International Studies major). Likewise, none of the changes proposed in this document will affect courses currently categorized as GECs. In general, the proposed curricular changes seek only to formalize or extend existing course content, and do not represent any substantive shifts in terms of material covered.

In terms of changes in enrollment in other programs and departments at OSU, we predict a minimal impact. The proposed changes to the *Urban, Regional, and Global Studies* specialization do not alter the distribution of required credit hours between geography and other departments. Likewise, the proposed changes to the *Spatial Analysis* specialization are internal changes, with little impact on outside credit hours. We continue to include Computer Science and Engineering as well as Statistics courses as an important component of the curriculum.

The proposed changes to the *Climatology and Physical Geography* specialization may increase the number of our students taking courses other departments. Not only do we continue to include courses from the School of Earth Sciences in the curriculum, but we are now including one such course in the required core. Earth Sciences 550 (Geomorphology) is part of the *required core* for the physical geography path, and Earth Sci 410 (Water in the Basin Hydrologic Cycle) and 650 (Glaciers and Landscapes) are electives for this path.

The curricular changes made to the proposed *Environment & Society* specialization might be expected to have the most impact on enrollment numbers outside the department. This is because under the existing curriculum, students majoring in the specialization have the option of taking courses from a wide-variety of other departments and colleges. With this revision, we have removed this option for this specialization. However, we expect the impact of this change to be negligible for two reasons (see Appendix L). First, we have had an annual average of only 16 majors in this specialization since SP02, when it began. As a result, there are a very limited number of credit hours to be shared with other departments and colleges in the first place. Second, our data suggest that very few of our students have taken advantage of courses outside the department. The course with the highest enrollment of E&S students is Ecology (EEOB 413). Since 2002, the lecture portion of this course has enrolled an annual average of approximately three students; the lab portion has enrolled an annual average of two students. Similarly, an annual average of just over one E&S student has enrolled in Soil Science (taking both lecture and lab) (ENR 300) since 2002. Even more strikingly, since 2002 only ten E&S students have enrolled in the History courses in our curriculum (366.01 Environmental Issues in Historical Perspective and 366.02 (formerly 567) American Environmental History). Four have enrolled in the social science courses in ENR (367 Making and Meaning of the American Landscape and 400 Natural Resources Policy), while only one student has enrolled in Geomorphology (Earth Sci 550), and that was in 2005.

We also expect positive synergies between the existing Geography major and the proposed majors in Atmospheric Sciences and in Geographic Information Sciences. In particular, we anticipate that some students will elect to double major in Geography and either Atmospheric

Sciences or GIS, or major in Geography and minor in the latter. This is an especially exciting aspect of our proposed curriculum overhaul. Students who take advantage of this opportunity will receive a particularly well-rounded education that combines substantive knowledge in geographic concepts with an extensive quantitative and qualitative job-ready skills set.

Student enrollment:

As of Autumn 2008, the Geography undergraduate program consists of approximately 200 majors. Geography majors tend to declare the major very late in their undergraduate career; we estimate that at least half of our students declare Geography as a major sometime during their third year. We expect that updating the major to reflect current disciplinary trends, with more recognizable and relevant titles and course descriptions, will increase visibility and attraction to the Geography major. Revising the major for greater strength and relevance should have several effects on enrollment of majors. First, it will help students find their way to Geography sooner in their time at OSU. Second, we expect that retention of students in Geography will be improved. Third, we expect some growth in the number of majors by attracting students to OSU who might otherwise enroll elsewhere. In addition to effects on majors, we expect to enroll more students in Geography courses from across the college and the university. For example, the revision of the GIS specialization will better represent the suite of tools, applications and techniques that are of broad utility to many students across the university, while the revision of the Environment and Society specialization will better represent the contribution of geography to anyone interested in environmental topics.

Administration:

The Geography major will continue to be housed in the Department of Geography, within the College of Social and Behavioral Sciences (SBS).

Advising:

We do not expect our reorganization of the Geography undergraduate curriculum to result in any major changes to advising. Our primary advising contact for students will continue to be Rick McClish, our Undergraduate Advisor, who reports to our departmental chair, Professor Morton O’Kelly. Honors students will continue to be advised by our designated Undergraduate Studies Committee chair, currently Professor Becky Mansfield.

Assessment Plan:

Current Assessment Plan The Department of Geography has an assessment plan that includes a suite of outcome monitoring methods that allows us to gauge whether or not we are meeting pedagogical goals, and then to make necessary corrections. The plan is reviewed annually by the College of Social and Behavioral Sciences, and is overseen by our undergraduate advisor. The current plan consists of two indirect assessment methods and one direct method. The feedback we received from these forms of assessment was important in our development of the current proposal, including both new courses and the overall curricular structure. Our current assessment methods include:

- Embedded questions in one regularly offered and popular upper division course

- Informal focus groups with students in the major. In the 2007-2008 school year we conducted four such groups, one for each specialization.
- An exit survey of graduating seniors, which includes questions about the major regarding their overall educational experience, classroom experience, research and internship participation, and placement in jobs and graduate school.

Future Assessment Plan Our assessment will be multidimensional and ongoing. We will refine our methods of assessment as we gain more experience with them and as the needs of the department change. We expect our assessment strategy to result in geography majors who are better prepared for graduate studies, the job market, and as citizens. Our future assessment plan consists of:

- Continued use of focus groups with students and exit surveys with graduating seniors.
- Expanded use of embedded testing.
 1. There is no one class that all majors in geography are required to take. However, with this revision the Undergraduate Research and Professionalization Seminar (Geog 695) will be required of all majors in the Urban, Regional, and Global Studies; Environment and Society; and Spatial Analysis specializations. It also will be an elective for majors in the Climate and Physical Geography specialization. We expect that 80% or more of our majors will be taking this class, largely in their junior and senior years. This class is ideal for embedded testing because it not only teaches methods and skills, but requires students to express their general knowledge about geographic concepts and methods. The Undergraduate Studies Committee, which represents all four specializations, is currently developing a set of embedded questions for this class that will assess the department's success in teaching students core concepts, methods, and professional skills.
 2. To assess knowledge of those students in the CPG specialization who do not take Geog 695, we are developing embedded questions in Climatology (Geog 520), which is required of all students in the specialization, regardless of their path (either Climatology or Physical Geography). The Undergraduate Studies Committee is overseeing this process.
- The data gathered through this variety of assessment methods will be reviewed and discussed by the faculty and changes to the major will be considered as appropriate.

Appendix A Course Change Proposals

Summary of proposed changes to courses. Formal course change request forms, with syllabi, are being submitted separately.

| Course number | Current Name | Name change | Description change | Number change | Other |
|---------------|-------------------------------------------------------------|-------------|--------------------|---------------|-------|
| 200 | World Regional Geography | | ✓ | | |
| 240 | Economic and Social Geography | | ✓ | | |
| 280 | Map Reading and Interpretation | | ✓ | ✓ | |
| 400 | Geography of the United States and Canada | ✓ | ✓ | | |
| 430 | Geographical Perspectives on Environment and Society | ✓ | ✓ | | ✓ |
| 445 | The Geography of Transportation Security | ✓ | | | |
| 460 | Political Geography | ✓ | ✓ | | |
| 490 | Introduction to Biogeography | ✓ | | | |
| 505 | South America | ✓ | ✓ | | ✓ |
| 510 | Geography of Western Europe | ✓ | ✓ | | |
| 605 | Special Problems in the Geography of Latin America | ✓ | ✓ | | |
| 630 | Conservation of Natural Resources | ✓ | ✓ | | |
| 640 | Economies, Space, and Society | | ✓ | | |
| 642 | Geography of Development | | ✓ | | |
| 650 | Urban Geography | ✓ | ✓ | | |
| 652 | Cities, Cultures, and the Political Geography of Difference | ✓ | ✓ | | |
| 655 | Theories and Methods of Regional Geography | ✓ | ✓ | | ✓ |
| 670 | Population Geography | ✓ | ✓ | ✓ | ✓ |
| 680 | Numerical Cartography | ✓ | ✓ | | |
| 683 | Introduction to Geographic Analysis | ✓ | ✓ | | |
| 686 | GIS in Social Science and Business Research | ✓ | ✓ | | |
| 687 | Design and Implementation in Geographic Information | ✓ | ✓ | | |
| 695 | Undergraduate Seminar in Applied Geography | ✓ | ✓ | | |
| TOTAL | | 18 | 21 | 2 | 4 |

Appendix B
New course proposals

Summary of new course proposals. Individual course proposal forms with syllabi are being submitted separately.

| Course number | Name | Specialization proposal within which course justification provided |
|----------------------|-------------------------------------------|---------------------------------------------------------------------------|
| 205 | Human Geography | Urban, Regional, and Global Studies |
| 455 | Cities in a Globalizing World | Urban, Regional, and Global Studies |
| 600 | Geographic Inquiry | Urban, Regional, and Global Studies |
| 684 | Geographic Applications in Remote Sensing | Spatial Analysis |
| 688 | Emerging Topics In GIS | Spatial Analysis |

Appendix C
Current Urban and Regional Studies Curriculum

Part A. Required Prerequisites or Supplements to the Major

- NA

Part B. Core Requirements

1. Three required methods courses:
 - Elements of Cartography 580
 - Fundamentals in Geographic Information Systems 607
 - Introduction to Geographic Analysis 683

2. Choice of four required systematic courses:
 - Making the Modern World 450
 - Political Geography 460
 - Conservation of Natural Resources 630 or Globalization and the Environment 635
 - Economic Geography 640 or Geography and Development 642
 - Geography of Transportation 645
 - Urban Geography 650 or Urban Political Geography 660
 - Locational Analysis 647 or Theory and Methods of Regional Analysis 655
 - Population Geography 670

3. Choice of one required physical geography course:
 - Physical Geography and Environmental Issues 210
 - Climatology 520
 - Integrated Earth Systems: Confronting Global Change 597.02

4. Choice of one required regional geography course:
 - Geography of the US and Canada 400
 - Geography of Western Europe 510
 - Geography of Eastern Europe 511
 - Geography of the Soviet Union 512
 - South Asia: Ecology, Economy and Polity 513
 - Special Problems in the Geography of Latin America 605
 - South Africa: Society and Space 608
 - Special Problems in the Geography of the Former USSR 612
 - Globalization and the Environment 635

Part C. Electives within the Major

1. Any Geography course 400-799 not already used in the major (excludes 520 and 597.02)

Appendix D
Proposed Urban, Regional and Global Studies Curriculum

Part A. Required Prerequisites or Supplements to the Major

- NA

Part B. Core Requirements

1. Human Geography 205
2. Undergraduate Research and Professionalization Seminar 695
3. Choice of two of the following methods courses:
 - Map Reading and Interpretation 480
 - Elements of Cartography 580
 - Fundamentals of Geographic Information Systems 607
 - Computer Cartography and Geographical Visualization 680
 - Quantitative Geographical Methods 683
 - Intermediate Geographic Information Systems 685
4. Choice of three more introductory courses:
 - Economic and Social 240
 - Geography of North America 400
 - Geography of Ohio 401
 - Transportation Security 445
 - Making the Modern World 450
 - Cities in a Globalizing World 455
 - Space, Power, and Political Geography 460
 - Modern Geopolitical Imagination 465
 - Life and Death Geographies: Global Population Dynamics 470
5. Choice of three advanced courses:
 - Geography of Latin America 505
 - Geography of the European Union 510
 - Geography of Eastern Europe 511
 - Geography of the Former Soviet Union 512
 - South Asia: Ecology, Economy, Polity 513
 - World Urbanization 597.01
 - New Worlds of Latin America 605
 - South Africa: Society and Space 608
 - Economies, Space and Society 640
 - Geographies of Governmentalities 643
 - Geography of Transportation 645
 - Urban Spaces in the Global Economy 650
 - Social Cities 652

- Land Use Geography 655
- Conflict, Power, and Politics in the City 660

6. Geographic Inquiry 600

Part C. Electives within the Major

- NA

Part D. Internship

1. After students have completed 20 hours of coursework in Geography, they are eligible for an internship and receive credit for it through the department.

Appendix E
Current People, Society and Environment Curriculum

Part A. Required Prerequisites or Supplements to the Major

- NA

Part B. Core Requirements (Five Courses)

1. Physical Geography and Environmental Issues 210
2. Geographic Perspectives on the Environment and Society 430
3. Fundamentals of Geographic Information Systems 607
4. Undergraduate Seminar in Applied Geography 695
5. Introduction to Geographic Analysis 683

Part C. Electives within the Major

1. Synthetic and Methodological Electives (Choose one course)
 - Map Reading and Interpretation Geog 280
 - Elements of Cartography Geog 580
 - Numerical Cartography Geog 680
 - Intermediate Geographic Information Systems Geog 685
 - Demographic Analysis Soc 754
 - Remote Sensing CEE 603
 - Terrain Analysis CEE 604
 - Natural Resources Photo Interpretation ENR 324
 - Magazine Writing J 602
2. Environmental Electives (Choose one *group*)
 - Synoptic Meteorology Laboratory Geog 620 AND Integrated Earth Systems: Confronting Global Change Geog 597.02
 - Ecology EEOB 413.01 (lecture) AND 413.02 (lab)
 - Field Botany EEOB 510 AND Plants and People EEOB 502
 - Soil Science ENR 300.01 (lecture) AND 300.02 (lab)
 - Geomorphology Earth Sci 550 OR Hydrogeology Earth Sci 651
 - Applied Hydrology CE 613
3. Social Electives (Choose three courses, at least one must be in Geography)
 - South Asia: Ecology, Economy, and Polity Geog 513
 - Latin America Geog 605
 - Conservation of Natural Resources Geog 630
 - Globalization and Environment Geog 635
 - Geography of Development Geog 642
 - Population Geography Geog 670
 - Energy, Mineral Resources, and Society Earth Sci 210
 - Environmental Archaeology Anth 602.03
 - Ethnobotany Anth 610
 - Cultural Ecology Anth 620.05

- Women in Rural Society Rur Soc 678
- Environment and Natural Resources Ag Econ 531
- Economics of Growth/Sprawl in America's Countryside Ag Econ 680
- The Making and Meaning of the American Landscape ENR 367
- Natural Resources Policy ENR 400
- Environmental Issues in Historical Perspective Hist 366
- American Environmental History Hist 567
- Science and Society Comp St. 272
- Gender and Science Comp St. 535

Appendix F
Proposed Environment & Society Curriculum

Part A. Required Prerequisites or Supplements to the Major

- NA

Part B. Core Requirements (Students have to fulfill requirements of all three areas: human, physical, methods)

1. Human Geography (Four courses)
 - Environment and Society 430
 - Choose three of the following courses:
 - Life and Death Geographies: Global Population Dynamics 470
 - Geography of Latin America 505
 - New Worlds of Latin America 605
 - Environmental Conservation 630
 - Globalization and Environment 635
 - Geography of Development 642
 - Land Use Geography 655
2. Physical Geography (Three courses):
 - Physical Geography and Environmental Issues 210 OR Introduction to Physical Geography 220
 - Biogeography: An Introduction to Life on Earth 490
 - Global Climate and Environmental Change H410 OR Global Climate Change: Causes and Consequences 420 OR Climatology 520 OR Integrated Earth Systems: Confronting Global Change 597.02
3. Methods (Three courses)
 - Undergraduate Research and Professionalization Seminar 695
 - Choose two of the following courses:
 - Map Reading and Interpretation 480
 - Elements of Cartography 580
 - Fundamentals of Geographic Information Systems 607
 - Computer Cartography and Geographical Visualization 680
 - Quantitative Geographical Methods 683
 - Intermediate Geographic Information Systems 685

Part C. Electives within the Major

- NA

Part D. Internship

- After students have completed 20 hours of coursework in Geography, they are eligible for an internship and receive credit for it through the department.

Appendix G
Current Analytical Cartography (AC)/Geographic Information Sciences (GIS) Curriculum

Part A. Required Prerequisites or Supplements to the Major

1. CS&E 201
2. Statistics 245

Part B. Core Requirements

1. Required core for both paths:
 - Elements of Cartography 580
 - Fundamentals in Geographic Information Systems 607
 - Numerical Cartography 680
 - Introduction to Geographic Analysis 683
2. Analytical Cartography required core:
 - Undergraduate Seminar in Applied Geography 695
 - Analytical Cartography 780
 - Seminar in Geography 795
3. Geographic Information Sciences required core:
 - Intermediate Geographic Information Systems 685
 - GIS in Social Science and Business Research 686 OR Design and Implementation of Geographic Information 687
 - CS&E 214 OR CS&E 240

Part C. Electives within the Major

1. Any human geography course at the 600 level
2. Physical Geography and Environmental Issues 210 OR Climatology 520 OR Integrated Earth Systems: Confronting Global Change 597.02

Appendix H
Proposed Spatial Analysis Curriculum

Part A. Required Prerequisites or Supplements to the Major

1. Statistics 245

Part B. Core Requirements

1. Elements of Cartography 580
2. Fundamentals in Geographic Information Systems 607
3. Computer Cartography and Geographic Visualization 680
4. Quantitative Geographical Methods 683
5. Intermediate Geographic Information Systems 685
6. Undergraduate Research and Professionalization Seminar 695

Part C. Electives within the Major. Choose four of the following courses. At least one must be a methods course, one must be a physical OR human geography course, and the other two are of the students choosing.

1. Any 400, 500 or 600 –level human geography course
2. Any 400, 500 or 600 –level physical geography course
3. Map Reading and Interpretation 480
4. Geographic Applications in Remote Sensing 684
5. GIS Applications in Social Science and Business 686
6. GIS Design and Implementation 687
7. Emerging Topics in GIS 688
8. Advanced Applications in Geographic Information Systems 787
9. Geography of Transportation 645
10. Locational Analysis 647
11. Land Use Geography 655
12. CS&E 201 OR CS&E 214 OR CS&E 240

Part D. Internship

1. After students have completed 20 hours of coursework in Geography, they are eligible for an internship and receive credit for it through the department.

Appendix I
Current Atmospheric and Climatic Studies Curriculum

Part A. Required Prerequisites or Supplements to the Major

1. Atmospheric Sciences path
 - Math 151, 152, 153, 254, 415
 - Physics 131, 132
 - Statistics 245
2. Climatic Studies path
 - Math 151, 152
 - Physics 131, 132
 - Statistics 245

Part B. Core Requirements

1. For both Atmospheric Science and Climatic Studies paths
 - Basic Meteorology AS 230 OR Climatology Geog 520
 - Synoptic Meteorology Laboratory AS/Geog 620
 - Boundary Layer Climatology Geog 622.01
 - Microclimatological Measurements Geog 622.02
 - Synoptic Analysis and Forecasting Geog 623.01
 - Severe Storm Forecasting 623.02
2. Additional for the Atmospheric Science path
 - Atmospheric Thermodynamics AS 631
 - Dynamic Meteorology I AS 637
 - Dynamic Meteorology II AS 638
3. Additional for the Climatic Studies path
 - Introduction to Cartography Geog 580
 - Undergraduate Seminar in Applied Geography Geog 695 OR Seminar in Geography Geog 795
 - Any Human Geography course 600-level or higher

Part C. Electives within the Major

- NA

Appendix J
Proposed Climatology and Physical Geography Curriculum

Part A. Required Prerequisites or Supplements to the Major

1. For Climatic Studies path
 - Math 151, 152, 153
 - Physics 131, 132
 - Statistics 245
2. For the Physical Geography path
 - Math 151, 152
 - Physics 131
 - Statistics 245

Part B. Core Requirements

1. For Climatic Studies path
 - Basic Meteorology AS 230 OR Climatology Geog 520
 - Synoptic Meteorology Laboratory AS/Geog 620
 - Boundary Layer Climatology Geog 622.01
 - Microclimatological Measurements Geog 622.02
 - Synoptic Analysis and Forecasting Geog 623.01
 - Severe Storm Forecasting 623.02
2. For Physical Geography path
 - Introduction to Physical Geography Geog 220
 - Global Climate Change: Causes and Consequences Geog 420
 - Biogeography: An Introduction to Life on Earth Geog 490
 - Basic Meteorology AS 230 OR Climatology Geog 520
 - Integrated Earth Systems: Confronting Global Change Geog 597.02
 - Geomorphology Earth Sci 550

Part C. Electives within the Major

1. For Climatic Studies path. Choose five of the following courses:
 - Climate System Modeling: Basics and Applications AS 629
 - Atmospheric Thermodynamics AS 631
 - Dynamic Meteorology I AS 637
 - Dynamic Meteorology II AS 638
 - Physical Geography and Environmental Issues Geog 210
 - Global Climate Change: Causes and Consequences Geog 420
 - Biogeography: An Introduction to Life on Earth Geog 490
 - Introduction to Cartography Geog 580
 - Integrated Earth Systems: Confronting Global Change Geog 597.02
 - Fundamentals of Geographic Information Systems Geog 607

- Undergraduate Research and Professionalization Seminar Geog 695 OR Seminar in Geography Geog 795
2. For Physical Geography path. Choose five of the following courses (at most one may be from Earth Sciences):
- Physical Geography and Environmental Issues Geog 210
 - Introduction to Cartography Geog 580
 - Computer Cartography and Geographic Visualization 680
 - Fundamentals of Geographic Information Systems Geog 607
 - Intermediate Geographic Information Systems Geog 685
 - Undergraduate Research and Professionalization Seminar Geog 695 OR Seminar in Geography Geog 795
 - One Human Geography course 600-level or higher
 - Synoptic Meteorology Laboratory AS/Geog 620
 - Boundary Layer Climatology Geog 622.01 (note: has prerequisite of Physics 132, which has a prerequisite of Math 153)
 - Microclimatological Measurements Geog 622.02 (note: has prerequisite of Physics 132, which has a prerequisite of Math 153)
 - Synoptic Analysis and Forecasting Geog 623.01 (note: has prerequisite of Physics 132, which has a prerequisite of Math 153)
 - Severe Storm Forecasting 623.02 (note: has prerequisite of Physics 132, which has a prerequisite of Math 153)
 - Climate System Modeling: Basics and Applications AS 629
 - Atmospheric Thermodynamics AS 631 (note: has a prerequisite of Math 153)
 - Dynamic Meteorology I AS 637 (note: has prerequisite of Math 255)
 - Dynamic Meteorology II AS 638
 - Principles of Oceanography Earth Sci 206
 - Water in the Basin Hydrologic Cycle Earth Sci 410
 - Glaciers and Landscapes Earth Sci 650

Part D. Internship

1. After students have completed 20 hours of coursework in Geography, they are eligible for an internship and receive credit for it through the department.

Appendix K
Four-year course plans for each specialization
(charts starting on the following page)

Sample four year plan B.A. Geography - Urban, Regional, and Global Studies specialization

| Year 1 | | | |
|----------------------------------|-------------------------------|---------------------------|---------------|
| Autumn | Winter | Spring | Summer |
| English 110 | Math (Dependent on placement) | First Natural Science | |
| First Foreign Language | Second Foreign Language | Third Foreign Language | |
| Geography 200 (GEC) | Geography 205 (Major) | First Arts and Humanities | |
| | | | |
| | | | |
| Year 2 | | | |
| Autumn | Winter | Spring | Summer |
| Fourth Foreign Language | Geography 450 | Stats 145 | |
| Geography 580 | Second Writing | Second Natural Science | |
| First Historical Study | Second Historical Study | Geography 460 | |
| | | | |
| | | | |
| Year 3 | | | |
| Autumn | Winter | Spring | Summer |
| Geography 470 | Geography 645 | Geography 695 | |
| Second Arts and Humanities | Geography 655 | Second Social Science | |
| General Elective or Minor | Third Natural Science | General Elective or Minor | |
| | | | |
| | | | |
| Year 4 | | | |
| Autumn | Winter | Spring | Summer |
| General Elective or Minor | Geography 660 | Geography 607 | |
| Issues of the Contemporary World | Internship Credit | General Elective or Minor | |
| General Elective or Minor | General Elective or Minor | Internship Credit | |
| | | | |
| | | | |

Sample four year plan B.A. Geography - Environment and Society specialization

| Year 1 | | | |
|----------------------------------|-------------------------------|---------------------------|---------------|
| Autumn | Winter | Spring | Summer |
| English 110 | Math (Dependent on placement) | First Natural Science | |
| First Foreign Language | Second Foreign Language | Third Foreign Language | |
| Geography 200 or 240 (GEC) | Geography 210 (Major) | First Arts and Humanities | |
| | | | |
| | | | |
| | | | |
| Year 2 | | | |
| Autumn | Winter | Spring | Summer |
| Fourth Foreign Language | Geography 580 | Stats 145 | |
| Geography 430 | Second Writing | Second Natural Science | |
| First Historical Study | Second Historical Study | Geography 420 | |
| | | | |
| | | | |
| | | | |
| Year 3 | | | |
| Autumn | Winter | Spring | Summer |
| Geography 490 | Geography 605 | Geography 695 | |
| Second Arts and Humanities | Geography 635 | Second Social Science | |
| General Elective or Minor | Third Natural Science | General Elective or Minor | |
| | | | |
| | | | |
| | | | |
| Year 4 | | | |
| Autumn | Winter | Spring | Summer |
| General Elective or Minor | Geography 642 | Geography 607 | |
| Issues of the Contemporary World | Internship Credit | General Elective or Minor | |
| General Elective or Minor | General Elective or Minor | Internship Credit | |
| | | | |
| | | | |

Sample four year plan B.S. Geography - Spatial Analysis specialization

| Year 1 | | | |
|--------------------------------------------------------|--------------------------------------|-------------------------------------|---------------|
| Autumn | Winter | Spring | Summer |
| English 110 | Math 151 | Math 152 | |
| Math 150 | First GEC Natural Science course | Second Foreign Language course | |
| Geography 200 or 240 (GEC Social Science course) | First Foreign Language course | First GEC Arts and Humanities | |
| University Survey course (1hour) | | | |
| | | | |
| Year 2 | | | |
| Autumn | Winter | Spring | Summer |
| Geography 605 | Geography 580 | Geography 607 | |
| Geography 460 | GEC Second Writing course (367's) | Statistics 245 | |
| Third GEC Foreign Language | Fourth GEC Foreign Language | First GEC Historical Study course | |
| | | | |
| | | | |
| | | | |
| Year 3 | | | |
| Autumn | Winter | Spring | Summer |
| Geography 683 | Geography 680 | Geography 695 | |
| Second GEC Historical Study | Geography 685 | Third GEC Natural Science course | |
| Second GEC Natural Science | Second GEC Arts and Humanities | General Elective or Minor course | |
| | | | |
| | | | |
| | | | |
| Year 4 | | | |
| Autumn | Winter | Spring | Summer |
| Geography 640 | Geography 520 | Fourth GEC Natural Science | |
| General Elective or Minor course | General Elective or Minor course | General Elective or Minor course | |
| Second GEC Social Science | General Elective or Minor course | General Elective or Minor course | |
| | | | |
| | | | |

**Sample four year plan B.S. Geography - Climatology & Physical Geography specialization
Climatic Studies path**

| Year 1 | | | |
|----------------------------------|-------------------------------|-----------------------------------|---------------|
| Autumn | Winter | Spring | Summer |
| English 110 | First Arts and Humanities | Physics 131(GEC and m. prereq) | |
| Math 150 | Math 151 | Math 152 | |
| Geography 200 (First Social Sci) | First Natural Science | Second Arts and Humanities | |
| | | | |
| | | | |
| Year 2 | | | |
| Autumn | Winter | Spring | Summer |
| Physics 132 (GEC and m. prereq) | Second Writing Course | Atmospheric Sciences 230 (m.core) | |
| Math 153 (major prereq) | Statistics 245 (major prereq) | Geography 210 (major elective) | |
| Second Social Science | First Foreign Language | Second Foreign Language | |
| | | | |
| | | | |
| Year 3 | | | |
| Autumn | Winter | Spring | Summer |
| Geography 620 (major core) | Geography 622.01 (major core) | Geography 695 (major elective) | |
| Geography 420 (major elective) | Geography 623.01 (major core) | Geography 623.02 (major core) | |
| Third Foreign Language | Fourth Foreign Language | Internship credit | |
| | | | |
| | | | |
| Year 4 | | | |
| Autumn | Winter | Spring | Summer |
| Geography 622.02 (major core) | Fourth Natural Science | Geography 607 (major elective) | |
| Geography 490 (major elective) | First Historical Study | Second Historical Study | |
| Internship Credit | General Elective or Minor | General Elective or Minor | |
| | | | |
| | | | |

Sample four year plan B.S. Geography - Climatology & Physical Geography specialization
Physical Geography path

| Year 1 | | | |
|----------------------------------|---------------------------------|-------------------------------------|---------------|
| Autumn | Winter | Spring | Summer |
| English 110 | First Arts and Humanities | Physics 131(GEC and m. prereq) | |
| Math 150 | Math 151 | Math 152 | |
| Geography 200 (First Social Sci) | First Natural Science | Second Arts and Humanities | |
| | | | |
| | | | |
| | | | |
| Year 2 | | | |
| Autumn | Winter | Spring | Summer |
| Third Natural Science | Second Writing Course | Second Foreign Language | |
| Geography 220 (major core) | Statistics 245 (major prereq) | Geography 210 (major elective) | |
| Second Social Science | First Foreign Language | General Elective or Minor | |
| | | | |
| | | | |
| | | | |
| Year 3 | | | |
| Autumn | Winter | Spring | Summer |
| Geography 580 (major elective) | Geography 520 (major core) | Geography 695 (major elective) | |
| Geography 420 (major core) | Earth Sciences 550 (major core) | Earth Sciences 650 (major elective) | |
| Third Foreign Language | Fourth Foreign Language | First Historical Study | |
| | | | |
| | | | |
| | | | |
| Year 4 | | | |
| Autumn | Winter | Spring | Summer |
| Second Historical Studay | Fourth Natural Science | Geography 607 (major elective) | |
| Geography 490 (major core) | General Elective or Minor | Individual Study | |
| Internship Credit | General Elective or Minor | General Elective or Minor | |
| | | | |
| | | | |

Appendix L
People, Society, and Environment (PSE) majors
and Enrollment of PSE Majors in Courses Outside Geography

| | | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | (Wi-Sp) 2008 | Total | Average |
|---------------------------------------------------------------------|----------------------------------------------|------|------|------|------|------|------|-----------------|-----------|------------|
| Geography majors with PSE specialization (spring term count) | | 0 | 1 | 13 | 14 | 26 | 20 | 22 | NA | 16 |
| PSE enrollments in outside courses | | | | | | | | | | |
| EARTHSCI 550 | Geomorphology | | | | 1 | | | | 1 | 0.1 |
| EEOB 413.01 | Ecology | | | 4 | | 8 | 6 | 3 | 21 | 3.0 |
| EEOB 413.02 | Ecology Lab | | | 4 | | 5 | 4 | 2 | 15 | 2.1 |
| ENR 300.01 | Soil Science | 1 | | 2 | | 3 | 1 | 1 | 8 | 1.1 |
| ENR 300.02 | Soil Science Lab | 1 | | 2 | | 3 | 2 | 1 | 9 | 1.3 |
| ENR 367 | Making and Meaning of the American Landscape | | | | | | 2 | 1 | 3 | 0.4 |
| ENR 400 | Natural Resources Policy | | | | | | 1 | | 1 | 0.1 |
| HIST 366.01 | Global Environmental History | | 1 | | 2 | | 1 | 2 | 6 | 0.9 |
| HIST 366.02 (formerly 567) | American Environmental History | | | 1 | | 3 | | | 4 | 0.6 |

Appendix M Concurrences

We are sending the proposal (with the course requests and appropriate new major proposals) to the following schools/departments, and will add concurrence letters as they arrive:

City and Regional Planning
Civil & Environmental Engineering & Geodetic Sciences
Computer Science and Engineering
Evolution, Ecology, and Organismal Biology
School of Earth Sciences
School of Environment and Natural Resources