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Updated June, 2005



Guggenheim Building

**General Information for the Major in Geography**

Geography makes an excellent major for the student interested in a broad, liberal education, one which integrates the study of human activity and the natural environment. The field’s unique spatial perspective on natural environment and human activity ties to other fields in the natural sciences, social sciences, and humanities. Geographers are interested in a wide range of phenomena and often work in interdisciplinary teams to focus on environmental change, global science and economic issues, and resource use in an increasingly complex and interdependent world.

The Department of Geography offers theoretical and practical work in:

- physical geography, including climatology, geomorphology and biogeography;
- conservation of natural resources, including environmental education:

- human geography, including urban, social, economic, political, cultural, and population geography;
- geographic information science (GIS), including spatial analysis using GIS, remote sensing, computer cartography, GIS and society and geography education;
- regional analysis, including mountains, natural hazards, and specific regional courses.

The diagram on the cover reflects the diversity of career opportunities for geographers as well as a way of understanding the curriculum in the department. We hope this booklet will help you make academic plans. We urge you to study this Guide and then to seek further information from the Geography Department’s staff and faculty.

**Caution: This Guide supplements, but does not supersede, the most recent *University of Colorado, Boulder Catalog*. General College and University requirements are given in the Catalog, but not in this Guide.**

**Advising** – Geography majors are advised by a professional, primary advisor in the Department. In addition to technical and Arts and Sciences core advising, the primary advisor is available to:

- work with students to assist in planning their academic career;
- discuss potential study abroad programs;

- refer students to campus resources for academic and personal assistance;
- determine if transfer credits can be applied toward geography major requirements;
- determine if an upper division human geography course should be taken in place of one of the lower division requirements;
- determine how to take courses on a P/F basis.
- Provide information on course offerings prior to schedule publications;
- provide recommendations and alert students to available positions in and outside the department.

Students are encouraged to meet with the primary advisor at least once each semester. Additionally, faculty members are available to mentor students throughout their academic career in the Geography Department.

*See Table 11 on page 13 for a list of Geography faculty members and their specializations.*

**Required Hours** -- For a major in geography, the student must complete a minimum of 32, but no more than 45, semester hours in geography. The student must have earned a grade of at least C- or better in all geography courses and a minimum grade point average of C in all CU work. No pass/fail grades in geography courses can be counted in the 32 hours of geography, but mandatory pass/fail grades in approved Study Abroad programs may be accepted if pre-approved by a geography faculty member. Eighteen hours of upper-division geography course work are required in the major, all with grades of C- or better. Twelve hours of upper-division geography course work for the major must be taken on the Boulder campus. "Same as" or "cross-listed" courses count for geography hours. Students will need to be aware of which courses fall into this category. Students may exceed the 45-hour limit for hours taken in the major, but anything over 45 hours will not count toward the A&S 120-hour requirement. Keep in mind that you may still need to take additional classes to meet this 120-hour requirement.

*See Table 1 on page 7 for a list of required courses for Geography majors.*

*See Table 2 on page 8 for a list of Geography courses in the core curriculum.*

**Undergraduate Degree** -- The College of Arts and Sciences, Department of Geography offers a bachelor of arts (B.A.) degree in geography. The geography B.A. degree emphasizes knowledge and awareness of:

- the unique contributions of the discipline to understanding the spatial components of problems and the diverse factors relating to human interaction with the environment;
- the spatial distributions of physical and human characteristics on the Earth surface, the general patterns these form, and the processes that have created and are changing these patterns;
- the major themes of geographical analysis, including absolute and relative location; human and physical characteristics of place; human and environmental relations; movement of people, ideas, and products; and regionalization; and
- the general geographical principles of human-environment interaction, global change, and human spatial organization.

**Basic Skills** -- Geography majors are expected to have or to achieve competence in clearly conveying their ideas and perceptions. Skills in communication methods are considered essential. In addition, students completing the degree in geography are expected to acquire proficiency in:

- one or more of the geographic skill areas of cartography, air photograph interpretation, remote sensing, and geographic information systems;
- writing, quantitative methods, computer literacy, and library and field methods of data collection; and
- identifying the geographic dimensions of a problem and analyzing, synthesizing, and evaluating relevant data, and applying geographic principles offering a geographic perspective on that problem.

Students exhibiting deficiencies in writing, speaking, mathematics, statistics, graphics, or computer literacy will be urged to take appropriate remedial action.

## Special Notes

**Minor** -- A minor in geography is available. A handout is available in the department office.

**Honors** -- The department encourages qualified geography majors who wish to graduate with honors in geography to apply for admission to the department honors program. Information on honors is available in the department office.

**Distributed Studies** -- Students with a primary focus in geography must complete all of the courses required of the geography major. Check with Arts and Sciences in Old Main for details.

**Internship** -- The department's internship program (course GEOG 3930) is an important way to supplement your academic work. Internships are a great way to start building a resume, making connections, and gaining valuable experience. The Geography Department hosts an annual Career Night in the spring. This event provides an opportunity to hear from, and talk to, professionals in various occupations about career and internship opportunities available in the field of geography. Additional information is available in the department office.

**Independent Study** -- Undergraduate Independent Study (GEOG 3840) is available only by prior arrangement with a faculty member from whom the student has taken previous formal coursework. No more than 8 hours of geography independent study may be counted toward the major.

**Teaching Certificate** -- If you are a geography major planning to work for a Colorado teaching certificate, you should know that the Colorado State Department of Education considers the geography major suitable for certification in social studies but not science. You should work closely with an advisor in the School of Education.

**Four-Year Guarantee** -- For information on the 4-year guarantee program, see the University of Colorado, Boulder Catalog.

**Career Planning** -- The range of jobs in geography is astounding! Follow your intellectual passions, and you can be sure that there is a career in that area of geography. Do you love mapping? Hydrology? Urban planning? Fire ecology? Soil analysis? African development? Snow? Business? Travel? Environmental conservation? Teaching children? Somewhere there is a job in your area of interest.

The following sources are a great place to start looking for the ideal job:

- The Association of American Geographers website <http://www.aag.org/>.
- Oklahoma State University website <http://www.geog.okstate.edu>
- CU website <http://www.colorado.edu/geography/virtdept/resources/jobs/jobs.htm>
- Visit with a Geography professor who works in the area you most enjoy. *See Table 11 page 13 for a list of Geography faculty members and their specializations.*

**Graduate School** -- If you plan to pursue graduate studies in geography, you should take additional course work in your area of concentration and interest.



## Possible Concentrations Within The Geography Major

You may choose to follow a general geography major or choose to concentrate your studies in one of four optional tracks:

- Physical Geography
- Human Geography
- Environment-Society Relations
- Geographic Information Science

Each of these areas of concentration is described on the following pages.



Professor Tom Veblen

## Physical Geography

Physical geography integrates and inter-relates landforms, water, soils, climate, and vegetation as the major natural elements of the environment. The focus of physical geography is on the zone of the land, ocean, and atmosphere containing most of the world's organic life. Physical geography not only describes natural phenomena near the surface of the earth but, more importantly, seeks explanations of how and why the physical and biological processes act as they do. Physical geography includes processes studied in other physical and natural sciences such as meteorology, geology, biology, and soil science, however, physical geography is more than a mere composite of these other sciences. It takes a uniquely comprehensive approach to the processes of the natural environment, often with an emphasis on human modifications to the environment.

In emphasizing the study of physical geography in your undergraduate program, it makes most sense to take sequences of courses defined by their course numbers. GEOG 1001 and 1011 are prerequisites for all upper division (GEOG 3\*\*\* and 4\*\*\* course numbers) physical geography courses. Among upper division courses, the following sequences are suggested:

- Climatology: GEOG 3301; 3601; 4211; 4231; 4331
- Biogeography: GEOG 3351; 4351; 4371; 4401
- Hydrology and Geomorphology: GEOG 3511; 4241; 4321; 4401

In addition, you will find it important to complete one course in statistics at the time you commence upper division work in physical geography.

Students considering graduate school in physical geography are strongly encouraged to complete a year of coursework in general chemistry, physics, calculus, and statistics.

Geography provides a **Certificate Program in Hydrology and Water Resources**, designed for students who are either Geography majors or minors and who wish to specialize in hydrology-related themes. Course requirements are designed to provide students wishing to pursue the field of hydrology and other water-related resources beyond the undergraduate degree (graduate school, government employment, consulting jobs) with a broad-based background in this discipline. Upon completion of the required courses and graduation from the Geography Department, students receive a signed certificate of completion. Program details are available in the department office and on the web at <http://snobear.colorado.edu/IntroHydro/certificate.html>.

*See Tables 3 and 4 on page 9 for lists of courses applicable to a concentration in Physical Geography.*



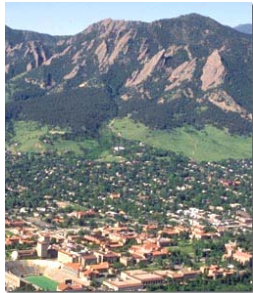
Naziko sisters from Soviet Republic of Georgia. Photo by Prof Elizabeth Dunn

## Human Geography

Human geography first and foremost involves the study of human beings--more specifically, of the organization of human activity and of spatial patterns as they affect and, in turn, respond to the world about us. The processes under study derive from distinct, but interactive, substructures: pursuit of livelihood (economic), social interaction (socio-political), and historical inertia and meaning (cultural). The products are change, conflict, diffusion, differentiation, and repetition in the human organization of the land. These same human processes will interact with biophysical processes, (e.g., air quality or plant introductions) to shape humanized landscapes and

regional character. Human geographers typically investigate problems associated with locational strategies and human decisions. Such problems cut through subjects as diverse as analysis of regional markets, racial segregation in cities, migration flows, hazardous sites, international development, medieval landscape patterns, or formulation of impact statements.

*See Tables 5 and 6 on page 10 for lists of courses applicable to a concentration in Human Geography.*



CU Campus and Flatirons

## Environment-Society Relations

From its earliest development as an academic field, geography has been concerned with the manifold relations between societies and their natural and built environments. Societies adapt and transform the environments they inhabit. They depend upon the use of resources and reduction of hazards for their survival and material well-being. They also assign meanings to the environment that vary over place and time, but that help define their identity and values within the world. Geographers tend to study these phenomena under the broad headings of resource use, natural hazards, sustainable development, landscape studies, cultural ecology, and environmental conservation. The University of Colorado has special strength in land and water resource issues in the American West, Africa, Latin America, and Asia. Students concentrating on environment-society relations are advised to take the introductory courses in human and physical geography and then, depending upon their academic interests and aims, to concentrate on specific topics and regions in the environment-society area.

*See Tables 7 and 8 on page 11 for lists of courses applicable to a concentration in Environment-Society Relations.*



Photo from [www.nasa.gov](http://www.nasa.gov)

## Geographic Information Science

Geographers have an ongoing concern with the acquisition, manipulation, and representation of spatial data. The widespread adoption of digital technology coupled with management of very large spatial data sets has led to the development of Geographic Information Science. Particularly with respect to digital information, the nature of geographical data that vary with scale, time, and spectral characteristics presents unique problems for geographers and environmental scientists. In our world of massive amounts of information, geographers use remote sensing methods for collecting and integrating geographical data. They utilize cartography and geographic information systems to uncover spatial patterns and trends, to reconstruct past environmental conditions and to predict future scenarios. The use of such methods requires expertise not covered in human and physical geography concentrations. Conceptually, the societal, political and ethical implications of geographic information in policy and decision-making are only beginning to be understood, and this forms an important component of study in geographic information science. The dissemination of geographic knowledge at all levels of education forms another important component of this concentration.

**Cartography:** the representation of geographical data in map form along with the methods for measuring such data on maps. Such cartographic products may be produced, transformed and analyzed by manual or automated methods. Cartography also includes an understanding of the perceptual and cognitive aspects of map communication. Additional emphasis is placed on the role that statistical analysis plays in protecting against the introduction of error and bias into map displays.

**Geographic Information Systems:** the construction and use of an information system and its data specifically designed for representing and manipulating geographical data. Modern geographic information systems include computer hardware/software with a collection of methods/procedures for recording, transforming, storing/retrieving, analyzing, and mapping geographic data. Coursework balances material on the mechanics of information systems with concepts underlying GIS database organization with use of information systems to build and interpret geographic modeling applications.

**Remote Sensing:** the science of collecting and analyzing information about a phenomena using sensing devices that are not in contact with (i.e., are remote) the phenomena under study. In the geography curriculum, the phenomena under study are earth resources (e.g., vegetation, land use/cover) and the sensing devices include optical (i.e., cameras) and electronic sensors recording imagery in visible and non-visible wavelengths. Analysis of such imagery may be manually/visibly or aided by automated image processing.

**Geography Education:** theory and practice of teaching and learning geography, translation of geographic knowledge into instructional media, evaluation of geographic learning, and communication of geographic knowledge and skills as practice for the roles of geography teacher and consultant.

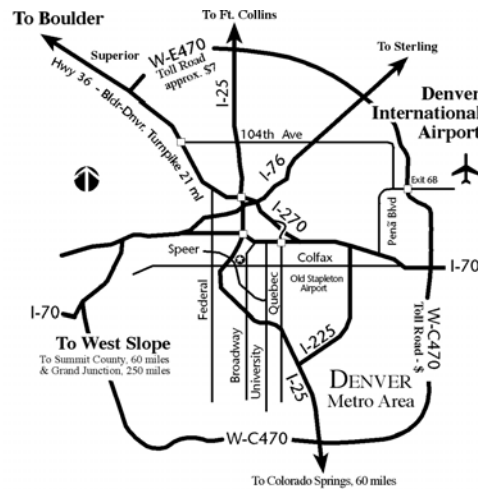
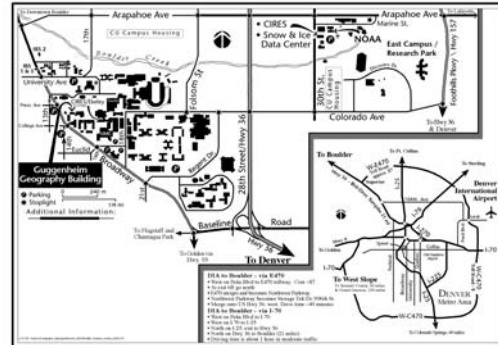
Geographic information science is closely tied to the fundamental areas of geography--biophysical, human, and environment/society relations. A geography major may choose to specialize in geographic information science, but he/she must also complete several courses in the other areas of geography.

See Tables 9 and 10 on page 12 for lists of courses applicable to a concentration in GIS.



**Directions to the Geography Department**

Visit the Geography Department website ([www.colorado.edu/geography](http://www.colorado.edu/geography)) for detailed directions to the department.



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|---|---|
| <p><b>DIA to Boulder - via E470</b></p> <ul style="list-style-type: none"> <li>• West on Peña Blvd to E470 tollway. Cost ~\$7</li> <li>• At exit 6B go north</li> <li>• E470 merges and becomes Northwest Parkway</li> <li>• Northwest Parkway becomes Storage Tek Dr./S96th St.</li> <li>• Merge onto US Hwy 36, west. Drive time ~40 minutes</li> </ul> | <p><b>DIA to Boulder - via I-70</b></p> <ul style="list-style-type: none"> <li>• West on Peña Blvd to I-70</li> <li>• West on I-70 to I-25</li> <li>• North on I-25, exit to Hwy 36</li> <li>• North on Hwy 36 to Boulder (21 miles)</li> <li>• Driving time is about 1 hour in moderate traffic</li> </ul> |
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## Table 1. Six (6) Courses Required for All Geography Majors

1. & 2. Both of the following:

GEOG 1001 (4)	Environmental Systems I: Climate and Vegetation
GEOG 1011 (4)	Environmental Systems II: Landscapes and Water

3. & 4. Two of the following:

GEOG 1982 (3)	World Regional Geography
GEOG 1992 (3)	Human Geographies
GEOG 2002 (3)	Geographies of Global Change
GEOG 2412 (3)	Environment and Culture
GEOG **** (3)	Upper Division Human course (GEOG 3*** or GEOG 4***)

5. One of the following:

GEOG 2043 (3)	Special Topics in Geography
GEOG 2053 (4)	Mapping a Changing World
GEOG 3053 (4)	Cartography I: Visualization and Information Design

6. One of the following:

GEOG 3023 (4)	Statistics for Earth Sciences
GEOG 3093 (3)	Geographic Interpretation of Aerial Photographs
GEOG 4023 (3)	Introduction to Quantitative Methods in Human Geography (Prereq: GEOG 3023)
GEOG 4043 (4)	Cartography 2: Interactive and Multimedia Mapping (Prereq: GEOG 3053)
GEOG 4083 (4)	Mapping from Remotely Sensed Imagery (Prereq: GEOG 3093, 4093 or equivalent)
GEOG 4093 (4)	Remote Sensing of the Environment
GEOG 4103 (4)	Introduction to Geographic Information Science (Prereq: GEOG 2053, 3053 or equivalent)
GEOG 4173 (3)	Research Seminar (Restricted to Sr GEOG and ENVS majors)
GEOG 4203 (4)	Geographic Information Science: Modeling Applications
GEOG 4383 (3)	Methods of Vegetation Analysis (Prereq or Coreq: GEOG 4371)
GEOG 4411 (3)	Methods of Soil Analysis (Prereq: GEOG 1001 or 1011; Prereq/Coreq GEOG 4401/5401)
ANTH 4000 (3)	Quantitative Methods in Anthropology*
ECON 3818 (4)	Introduction to Statistics w/Computer Applications*
MATH 2510 (3)	Introduction to Statistics*
PSCI 2074 (3)	Quantitative Research Methods*
PSYC 3101 (4)	Statistics and Research Methods in Psychology*
SOCY 2061 (3)	Introduction to Social Statistics*
SOCY 4061 (3)	Social Statistics*

\*Statistics in other departments may be used, but are not counted in the 32 hours of geography, unless it is GEOG 3023 Stats.

**NOTE:** All courses, schedules, and instructors are subject to change without notice. Courses offered may be changed or limited because of the availability of instructors and/or funds. Please refer to the Course Descriptions in the University Catalog ([www.colorado.edu/catalog](http://www.colorado.edu/catalog)), the department's syllabus file and/or course instructor for more details and possible prerequisites for any course listed.

## Table 2. Geography Courses in the Core Curriculum and for MAPS

### Natural Science:

#### *Two-Semester Sequence:*

- GEOG 1001 Environmental Systems 1 (Climate and Vegetation)  
GEOG 1011 Environmental Systems 2 (Landscapes and Water)

#### *Non-Sequence Courses:*

- GEOG 3301 Analysis of the Climate and Weather Observations  
(Prereq: GEOG 1001, ATOC 1050/1060, or 3600 and a statistics course)  
GEOG 3601 Principles of Climate (Prereq: 1 sem calculus or instructor consent)  
GEOG 3511 Introduction to Hydrology\*\* (Prereq: GEOG 1001 and 1011)  
GEOG 4241 Principles of Geomorphology  
(Prereq: GEOG 1001 and 1011 or any 1000-level sequence in geological sciences)  
(Restricted to Jr/Sr GEOG/GEOL/ENVS majors)

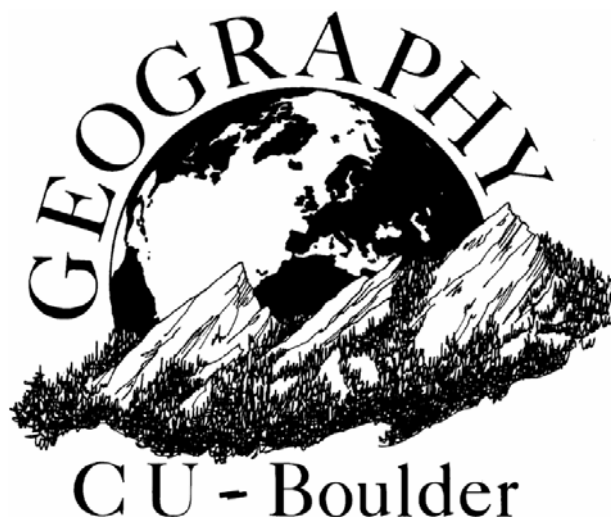
### Critical Thinking:

- GEOG 4173 Research Seminar (Restricted to Sr GEOG or ENVS majors)  
GEOG 4430 Seminar: Conservation Trends (Restricted to Jr/Sr GEOG or ENVS majors)  
GEOG 4622 City Life (Prereq: GEOG 1982, 1992, 2002, or 2412)  
GEOG 4742 Environments and Peoples (Prereq: GEOG 1982, 1992, 2002, or 2412)  
GEOG 4812 Environment and Development in South America  
(Prereq: GEOG 1982, 1992, 2002, 2412, ANTH 3110 or PSCI 3032)  
GEOG 4822 Environment and Development in China  
(Recommended prereq GEOG 1982, 1992 and HIST 1608)  
GEOG 4892 Geography of Western Europe (Prereq: GEOG 1982, 1992, 2002, or 2412)

### Cultural and Gender Diversity:

- GEOG 3672 Gender and the Global Economy  
(Recommended prereq GEOG 1982, 1992, 2002, 2412, WMST 2000 or 2050)  
GEOG 3822 Geography of China  
(Recommended prereq GEOG 1982)

The Minimum Academic Preparation Standards (MAPS) deficiency in geography may be satisfied by passing GEOG 1982, 1992, 2002, or 2412. The course used for MAPS may be applied towards the geography major requirement. The geography courses taken to satisfy the Core Curriculum may also be applied towards the geography major. These are listed above.



### **Table 3. Geography Courses Applicable to a Concentration in Physical Geography**

GEOG 1001	Environmental Systems: Climate and Vegetation**
GEOG 1011	Environmental Systems 2: Landscapes and Water**
GEOG 3301	Analysis of Climate and Weather Observations** (Prereq: GEOG 1001 or ATOC 1050/1060, 3600 and a statistics course)
GEOG 3601	Principles of Climate** (Prereq: 1 semester calculus or instructor approval)
GEOG 3351	Biogeography (Prereq: GEOG 1001)
GEOG 3511	Introduction to Hydrology** (Prereq: GEOG 1011)
GEOG 4211	Physical Climatology - Principles (Prereq: GEOG 1001)
GEOG 4231	Physical Climatology/Field Methods (Prereq: GEOG 1001 and 4211 or 5211)
GEOG 4241	Principles of Geomorphology** (Prereq: GEOG 1011) (Restricted to Jr/Sr GEOG/GEOL/ENVS majors)
GEOG 4311	Watershed Biogeochemistry (Prereq: GEOG 1011, 3511)
GEOG 4321	Snow Hydrology (Prereq: GEOG 1001 and 1011; any statistics course)
GEOG 4331	Mountain Climatology (Prereq GEOG 1001 or ATOC 1050/1060)
GEOG 4371	Forest Geography: Principles and Dynamics (Prereq: GEOG 1001)
GEOG 4383	Methods of Vegetation Analysis (Prereq or Coreq GEOG 4371)
GEOG 4401	Soils Geography (Prereq 1011; Recommended Prereq inorganic chemistry)
GEOG 4411	Methods of Soil Analysis (Prereq: GEOG 1001 or 1011; Prereq/Coreq GEOG 4401/5401)

\*\*core curriculum course

### **Table 4. Courses in other Departments Related to Physical Geography**

Caution: These courses do not count as hours in the Geography Major.  
Check with the appropriate department for the prerequisites for these courses.

ATOC 1050	Weather and the Atmosphere (and 1070 lab)**
ATOC 1060	Our Changing Environment: El Nino, Ozone, and Climate**
CHEM 1111	General Chemistry 1**
CHEM 1131	General Chemistry 2**
EBIO 1210	General Biology 1**
EBIO 1220	General Biology 2**
EBIO 2040	Principles of Ecology
EBIO 3040	Conservation Biology
EBIO 3160	Paleoecology
EBIO 3180	Global Ecology**
EBIO 4060	Landscape Ecology
GEOL 3030	Introduction to Hydrogeology
GEOL 3040	Global Change: The Recent Geological Record**
GEOL 3520	Environmental Issues in Geosciences
GEOL 4360	Glacial Geology
MATH 1300	Analytic Geometry & Calculus 1**
MATH 2300	Analytic Geometry & Calculus 2
MATH 2510	Introduction to Statistics
PHYS 1110	General Physics 1**
PHYS 1120	General Physics 2**
PHYS 1140	Experimental Physics 1**

\*\*core curriculum course

## **Table 5. Geography Courses Applicable to a Concentration in Human Geography**

One of the following four courses -- GEOG 1982, 1992, 2002, 2412 -- are prerequisites to all upper division courses listed below. Additional prerequisites are listed.

GEOG 1982 World Regional Geography  
 GEOG 1992 Human Geographies  
 GEOG 2002 Geographies of Global Change  
 GEOG 2412 Environment and Culture  
 GEOG 3672 Gender and Global Economy\*\*  
 GEOG 3682 Geography of International Development  
 GEOG 3812 Mexico, Central America, and the Caribbean\*\*\*  
 GEOG 3822 Geography of China  
 GEOG 3862 Geography of Africa  
 GEOG 4023 Introduction to Quantitative Methods in Human Geography (Prereq: GEOG 3023)  
 GEOG 4292 Migration, Urbanization, and Development  
 GEOG 4622 City Life\*\*  
 GEOG 4712 Political Geography  
 GEOG 4722 Field Methods in Human Geography\*\*\*  
     (Prereq. 15 credit hours in human geography)  
 GEOG 4732 Population Geography  
 GEOG 4742 Environment and Peoples\*\*  
 GEOG 4812 Environment and Development in South America\*\* \*\*\*  
     (Recommended Prereq: GEOG 3812 or 3422)  
 GEOG 4822 Environment & Development in China\*\*  
 GEOG 4892 Geography of Western Europe\*\*

\*\*core curriculum course

\*\*\*course not scheduled academic years 05/06, 06/07, 07/08

## **Table 6. Courses in other Departments Related to Human Geography**

Caution: These courses do not count as hours in the Geography Major.  
 Check with the appropriate department for the prerequisites for these courses.

ANTH 1030 Principles of Anthropology 1  
 ANTH 1040 Principles of Anthropology 2  
 ANTH 2100 Frontiers of Cultural Anthropology  
 ANTH 4510 Applied Cultural Anthropology  
 ANTH 4520 Symbolic Anthropology\*\*  
 ECON 4514 Economic History of Europe\*\*  
 ECON 4524 Economic History of the United States\*\*  
 HIST \*\*\*\* Any course related to a geographic area  
 PSCI 2012 Intro. to Comparative Politics \*\*  
 PSCI 3143 Problems in International Relations  
 PSCI 3163 American Foreign Policy\*\*  
 PSCI 4183 International Law  
 PSCI 4703 Alternative World Futures\*\*  
 PSCI 4272 Capitalist Democracies in a Global World Economy\*\*  
 PSYC 2606 Social Psychology \*\*  
 SOCY 2001 Introduction to Sociological Theory  
 SOCY 3002 Population and Society  
 SOCY 4022 Population Studies: Fertility & Mortality

\*\*core curriculum course

## **Table 7. Geography Courses Applicable to a Concentration in Environment-Society Relations**

Two of the following four courses --GEOG 1982, 1992, 2002, 2412 -- are prerequisites to all upper-division courses listed below. Additional prerequisites may be listed.

GEOG 1001	Environmental Systems 1: Climate & Vegetation**
GEOG 1011	Environmental Systems 2: Landscapes & Water**
GEOG 1982	World Regional Geography
GEOG 1992	Human Geographies
GEOG 2002	Geographies of Global Change
GEOG 2412	Environment and Culture
GEOG 3251	Mountain Geography
GEOG 3301	Analysis of Climate and Weather Observations**
GEOG 3351	Biogeography
GEOG 3402	Natural Hazards
GEOG 3412	Conservation Practice and Resource Management
GEOG 3422	Conservation Thought
GEOG 3511	Introduction to Hydrology**
GEOG 3601	Principles of Climate**
GEOG 3682	Geography of International Development
GEOG 3812	Mexico, Central America, and the Caribbean
GEOG 3822	Geography of China**
GEOG 3862	Geography of Africa
GEOG 4401	Soils Geography (Prereq: GEOG 1011; Recommended Prereq: inorganic chemistry)
GEOG 4430	Seminar: Conservation Trends**
GEOG 4501	Water Resources and Water Management in the Western US
GEOG 4742	Environments and Peoples**
GEOG 4812	Environment and Development in South America**
GEOG 4822	Environment and Development in China**

\*\*core curriculum course

## **Table 8. Courses in other Departments Related to Environment-Society Relations**

Caution: These courses do not count as hours in the Geography Major. Check with the appropriate department for the prerequisites for these courses.

CHEM 1011	Environmental Chemistry 1**
CHEM 1031	Environmental Chemistry 2**
ECON 2010	Principles of Microeconomics**
ECON 2020	Principles of Macroeconomics**
ECON 3535	Natural Resource Economics**
ECON 3545	Environmental Economics**
EBIO 1210	General Biology 1**
EBIO 1220	General Biology 2**
EBIO 2040	Principles of Ecology**
EBIO 3040	Conservation Biology
EBIO 3180	Global Ecology**
GEOL 3040	Global Change: The Recent Geological Record**
GEOL 3520	Environmental Issues in Geosciences**
PHIL 3140	Environmental Ethics**
PHYS 3070	Energy and the Environment**
PSCI 3201	The Environment and Public Policy

\*\*core curriculum course

## Table 9. Geography Courses Applicable to a Concentration in Geographic Information Science

1000- and 2000-level courses in physical and human geography are prerequisites to all upper-division courses listed below.

Additional prerequisites may be listed or permission of instructor required.

GEOG 2053 Mapping a Changing World  
 GEOG 3023 Statistics for Earth Sciences  
 GEOG 3053 Cartography: Visualization and Information Design (Restricted to Jr/Sr GEOG/ENVS major)  
 GEOG 3093 Geographic Interpretation of Aerial Photographs  
 GEOG 4023 Intro to Quantitative Methods in Human Geography (Prereq: GEOG 3023 or equivalent)  
 GEOG 4043 Cartography 2: Interactive and Multimedia Mapping (Prereq: GEOG 3053)  
 GEOG 4083 Mapping from Remotely Sensed Imagery (Prereq: GEOG 3093, 4093 or equivalent)  
 GEOG 4093 Remote Sensing of the Environment  
 GEOG 4103 Introduction to Geographic Information Science (Prereq: GEOG 2053, 3053 or equivalent)  
 GEOG 4160 Teaching Geography  
 GEOG 4203 Geographic Information Science: Modeling Applications 2 (Prereq: GEOG 4103/5103)  
 GEOG 4173 Research Seminar\*\* (Restricted to Sr GEOG/ENVS major)  
 GEOG 4303 Geographic Information Science: Programming (Prereq: 4103 or 5103)  
 GEOG 4383 Methods of Vegetation Analysis (Prereq or Coreq: GEOG 4371)  
 GEOG 4983 Field Problems (Restricted to Jr/Sr Geography major)

\*\*core curriculum course

## Table 10. Courses in other Departments Related to Geographic Information Science

Caution: These courses do not count as hours in the Geography Major.

Check with the appropriate department for the prerequisites for these courses.

### Cartography:

CSCI 1200 Introduction. to Programming 1  
 ENVD 4152 Computer Graphic Applications  
 MATH 4270 Computer Geometry

### Geographical Information Systems:

CSCI 1200 Introduction. to Programming 1  
 CSCI 3287 Database & Information. Systems

### Remote Sensing:

CSCI 1200 Introduction. to Programming  
 CVEN 3032 Photogrammetry  
 MATH 1300 Analytic Geometry and Calculus 1\*\*  
 MATH 2300 Analytic Geometry and Calculus 2\*\*  
 MATH 2400 Analytic Geometry and Calculus 3\*\*

### Geography Education:

COMM 1300 Public Speaking  
 CSCI 1200 Introduction to Programming  
 EDUC \*\*\*\* Courses for elementary and secondary social studies certification

\*\*core curriculum course

**Table 11. Geography Faculty Members and their Specializations** (September, 2009)

<b>WALEED ABDALADI</b> .....	remote sensing of Earth's ice cover
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<b>SUZANNE ANDERSON</b> .....	geomorphology, hydrology
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<b>ROGER G. BARRY</b> .....	climatology (mountain and polar regions, synoptic, climate change), snow and ice
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<b>SUSAN W. BEATTY</b> .....	plant ecology, biogeography, soils, disturbance effects on landscapes
susan.beatty@colorado.edu	
<b>PETER D. BLANKEN</b> .....	climatology, biometeorology
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<b>JOE BRYAN</b> .....	indigenous politics in the Americas, human rights, critical cartography
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<b>BARBARA P. BUTTENFIELD</b> .....	geographic information science, scale dependent geometry, map animation
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<b>ELIZABETH DUNN</b> .....	post socialism, industrial management, development, cultural anthropology, Eastern Europe
elizabeth.dunn@colorado.edu	
<b>KENNETH E. FOOTE</b> .....	American and European landscape history, geographic information science and internet techniques, geography in higher education
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<b>MARA GOLDMAN</b> .....	political ecology, science and technology studies, indigenous knowledge, nature-society relations, wildlife ecology and conservation, pastoralism, Africa
mara.goldman@colorado.edu	
<b>NAJEEB JAN</b> .....	South Asian & modern Middle Eastern history, Islamic studies: modern Islam, contemporary culture and politics, post colonialism, cultural studies
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<b>STEFAN LEYK</b> .....	spatial agent models, uncertainty in GIScience, fuzzy sets in GIS, pattern recognition in maps
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<b>NOAH MOLOTCH</b> .....	surface water and snow hydrology, remote sensing, ecohydrology
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<b>TIMOTHY OAKES</b> .....	cultural politics, economic and social change, China
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<b>JOHN V. O'LOUGHLIN</b> .....	political, former Soviet Union, post communist societies, nationalism
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<b>JOHN PITLICK</b> .....	geomorphology, water resources, natural hazards
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<b>FERNANDO RIOSMENA</b> .....	international migration, the informal economy and population dynamics, social demography, Latin America
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<b>ELISABETH ROOT</b> .....	medical geography, spatial epidemiology, quantitative methods
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<b>MARK SERREZE</b> .....	arctic climate variability and change, high latitude atmospheric circulation, numerical weather prediction in high latitudes, arctic atmosphere-ocean-ice interactions, the hydrologic cycle, paleoclimate
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<b>KONRAD STEFFEN</b> .....	climatology, remote sensing
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<b>WILLIAM E. TRAVIS</b> .....	natural resource conservation, environment and society
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<b>THOMAS T. VEBLER</b> .....	biogeography, conservation
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<b>MARK W. WILLIAMS</b> .....	alpine environments, hydrology, biogeochemistry
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<b>EMILY YEH</b> .....	critical nature/society geography, political ecology, identity, Tibet, China
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