GEOG415/615

Land-Use, Climate Change, and Sustainability

University of Maryland
Spring 2018

OVERVIEW

The evidence is now overwhelming that human activity has significantly altered basic element cycles (e.g. of carbon and nitrogen), the water cycle, and the land surface (e.g. vegetation cover, albedo) at regional, continental, and planetary scales, and that these alterations are influencing the regional and global environment, including the Earth's climate system. During the last 300 years, >50% of the land surface has been affected by land-use activities, >25% of forests have been permanently cleared, agriculture occupies >30% of the land surface, and globally there are 10–44 10^6 km^2 of land that are recovering from previous human land-use activities. Cumulatively, land-use emissions of carbon to date are comparable to fossil fuel emissions. Land-use changes have altered the surface albedo, surface aerodynamic roughness, and rooting depth and terrestrial carbon balance, with resulting effects on regional-global weather, hydrology and climate. Habitat loss is the primary cause of species extinctions. Looking ahead, population and the demand for energy, food, fiber, and water are all expected to increase, placing even greater pressure on the Earth system. What do we know about global land-use and land-cover change and its consequences past, present, and future, and how well do we know it. What are the prospects for a sustainable future?

INSTRUCTOR

Dr. George C. Hurtt Office: LeFrak 1149
Phone: 301-405-8541
Email: gchurtt@umd.edu
Office Hours: Thursdays 3:30-4:30PM

TIME AND ROOM

Class meets: T/Th 2:00-3:15, LeFrak 1158
Class will meet in alternate locations when opportunities exist for improved learning.

LEARNING OBJECTIVES

1. Understand key concepts, approaches, and techniques in land-use/land-cover change modeling and monitoring, as well as the key drivers, and impacts. (knowledge)
2. Improve quantitative skills and their application to scientific issues. (skills, application)
3. Identify, read, and synthesize relevant papers from the scientific literature. (synthesis)
4. Assess how and how well relevant phenomena are understood, and identify key scientific questions that remain. (synthesis, evaluation)
5. Develop question driven research project and the effective communication of scientific information. (skills)

READINGS

Scientific literature and current events will be compiled and will be made available to students via the UMD online system ELMSs.

GRADING

Your course grade will be determined as follows.

Participation:	20%
Research Project:	30%
Exam 1:	25%
Exam 2:	25%
Total:	100%

PARTICIPATION

There is a shared responsibility for meeting the learning objectives of this course. Active participation by all participants is essential. Participation will be graded by attendance, and active contribution to all discussions, assignments, class leadership, and other activities. All participants will be expected to be the primary and/or secondary lead for one or more class discussions during the semester.

RESEARCH PROJECTS

Students and/or student teams will be formed to identify and address important topics involving land-use and land cover change in the context of CMIP6, IPCC, IPBES, and other international assessments. Novel studies of land-use and land-cover change and its drivers and consequences, broadly defined including at local and regional scales, are encouraged. Projects will be presented in the form of oral, PowerPoint, and poster presentations following AGU meeting guidelines. A written report on each project is also required.

EXAMS

Two exams will be given. Additional information on exams will be given in class.

GRADUATE STUDENTS (615)

Students taking 615 will be expected to produce additional material and efforts in several areas on which they will be graded accordingly. This includes leadership of class discussions, additional essay question(s) on the two exams, and increased expectations for research projects. Writing for independent projects will be considered relevant for inclusion in GEOG grad student portfolios.

DISABILITY

Students with disabilities are encouraged to contact the instructor, and register with Disability Support Service in Shoemaker Hall. Arrangements will be made to accommodate students with disabilities.

HONOR CODE

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://shc.umd.edu/SHC/Default.aspx
Please keep the following pledge in mind when you are writing papers or submitting exam material: "I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination."

STUDENT CONDUCT

Students are expected to treat each other with respect. Disruptive behavior of any kind will not be tolerated. Students who are unable to show civility with one another, the teaching assistants, or the instructor will be subject to being referred to the Office of Student Conduct or to Campus Police. You are expected to adhere to the Code of Student Conduct.

ATTENDANCE

Attendance in class is expected. While class attendance is not mandatory, failure to attend will impact your grade due to missed course content and participation points. The instructor understands that sometimes issues come up that are out of your control that will cause you to miss class. If you are aware of such an issue, talk with the instructor *in advance* to obtain an excused absence. Sometimes it is not possible to plan potentially excusable absences in advance (e.g., medical emergency). If this happens to you, inform the instructor as soon as reasonably possible.

MEDICAL ABSENCES

Campus policy requires students who are absent due to illness/injury to furnish documentary support to the instructor. For this course, I require students to contact me by email or by phone *prior to* class time in which you indicate that you have an illness or an injury, or as soon as possible if the treatment by medical personnel conflicts with this requirement. You must provide written documentation verifying your illness/injury immediately upon your return to class.

ADDITIONAL INFORMATION

Additional course information, assignment details, supplementary material, and updates to this syllabus will be conveyed in class and posted on the UMD Electronic Learning Management System (ELMS).

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