

SSCI 214g, Human Populations and Natural Hazards

Syllabus

Units: 4

Term—Day—Time: Fall, 2017, Lectures: Tuesdays and Thursdays 9:30-10:50 a.m.; Discussions: Tuesdays and Thursdays 11:00-11:50 a.m.

Location: Lectures: VKC 252; Discussions: SOS B41 (Tuesdays) and THH 205 (Thursdays)

Instructor: Jennifer Swift, Ph.D. GISP

Office: AHF B57D

Office Hours: Tuesdays and Thursdays 1:00-2:00 p.m. PT, and by appointment

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Course Description

Human populations and natural hazards (earthquakes, hurricanes, floods, drought) are increasing in conflict throughout the world, as witnessed in the effects of rainfall variability on agriculture in semi-arid lands, or the destructive forces of hurricanes on coastal cities. While natural hazards represent ongoing processes and functions of the Earth as a living organism, problems arise when people live in regions of the world where hazards exist. Hazards are a naturally-occurring or human-induced process or event with the potential to cause loss (i.e., life, injury, property, or other). As the global population approaches eight billion inhabitants, increased competition for land and resources has driven people to live in more remote and higher density environments than ever before, resulting in increased human exposure and vulnerability to the risk of environmental hazards. While some individuals or communities are resilient, meaning they possess a high capacity to absorb impacts and recover from a hazardous event, others, such as poor residents living in inner-city slums or rural dwellers located on marginal land, struggle to cope, recover, or rebuild from a disaster.

This course examines the complex and coupled relationship between human development (population growth, urbanization) and environmental hazards by exploring a range of topics, such as: What do hazard, risk, vulnerability, and disaster mean, and how are these terms measured? What do hazards have to do with human values? How is exposure to environmental hazards different in developing and industrialized countries? What responsibility does the government have to protect individuals from risk? Students will utilize quantitative and qualitative methods – including geospatial technologies – to gain insight into these questions – where and why hazards occur – and the subsequent impacts disaster events have on the social world (such as mortality, displacement, property damage, or other losses). Students will reflect on how society evaluates and confronts the dangers posed by natural hazards, and how political, economic, and/or cultural settings can serve to attenuate or exacerbate human vulnerability before, during, or after a disaster occurs.

SSCI 214g fulfills the requirements of the USC General Education program, Social Analysis (Category C) and is designed to serve students of diverse backgrounds and academic interests (e.g., anthropology, earth systems, environmental studies, human health, international relations, public policy, and spatial sciences, among others) and for students without an extensive background in science.

Learning Objectives

Students who excel in SSCI 214g will be able to:

- Describe the underlying processes that give rise to natural hazards such as earthquakes, volcanic eruptions, hurricanes, landslides, and more.
- Explain how society evaluates and confronts the dangers posed by natural hazards from political, social, and ethical perspectives.
- Work with geospatial technologies to use maps that visualize the locations and dangers of natural hazards to human populations.

- Discuss consequences and outcomes of environmental hazards.
- Compare and contrast technological innovations used to monitor, predict, and warn society about natural hazards and impending disasters.

Prerequisite(s): None

Co-Requisite (s): None

Concurrent Enrollment: None

Recommended Preparation: None

Course Structure

This course aims to engage students in the dynamic processes underlying earth systems and natural hazards as well as the impacts that disaster events present to human populations. Student learning experiences are achieved through a combination of lectures, assignments, discussions, and course readings. Lectures complemented by readings will present core concepts, provide detailed explanations of assignments, and include activities such as individual and collaborative problem definition and problem solving experiences. Discussions will complement lectures with opportunities to interactively explore lecture topics in greater depth. For example, in discussions students will be encouraged ask questions and participate in group conversations that will allow a broader and deeper understanding of natural hazards and disasters to emerge. No make-up dates will be offered for missed quizzes or exams, so mark the appropriate dates on your calendars. If there is legitimate conflict, speak with a course instructor as soon as possible so we can make alternative arrangements.

Technological Proficiency and Hardware/Software Required

Students will be introduced to geospatial technologies by utilizing Esri services and products. This course will use ArcGIS Online (AGOL) to investigate human populations and natural hazards whereby students will locate and explore various spatial datasets that offer unique and innovative insights in hazards research.

The modeling software and geospatial data required for course assignments will be accessed using computing resources provided by the Spatial Sciences Institute.

Required Readings

The required textbooks for this course are:

- Flannery, Tim. 2005. *The Weather Makers*. NY, NY: Grove Press, 368 pp.
- Greene, R. W. 2004. *Confronting Catastrophe: A GIS Handbook*. Redlands, CA: Esri Press, 154 pp.
- Smith, Keith. 2013. *Environmental Hazards: Assessing Risk and Reducing Disaster, 6th Edition*. NY, NY: Routledge, 504 pp.
- Reisner, Marc. 1986. *Cadillac Desert, 1st Edition*. NY, NY: Viking Press, 582 pp.

Description and Assessment of Assignments

Your grade in this class will be determined on the basis of several different assessments:

Homework Assignments (20%): Students will be required to complete eight homework assignments comprised of quantitative and/or qualitative analysis to gain insight on the physical processes underlying natural hazards and disasters as well as examine the impact these events have on human populations.

Hazard & Disaster Log (15%): Students will be required to keep a journal of five significant natural hazard and/or disaster events that happened over the course of the semester that made media headlines. Students will report the Hazard & Disaster Log in the form of digital Story Maps (available through AGOL) which will be showcased in group presentations in class at the end of the semester. This assignment will require students to locate and evaluate technical information from online agency sites such as the U.S. Geological Survey and the National Oceanic and Atmospheric Administration (NOAA).

Discussions (15%): Structured weekly in discussions sections are highly interactive and will focus on combinations of theory and practice to promote deeper learning of core concepts. Every student must participate in discussions about each week's assignments. Discussions will include activities such as addressing outstanding questions that emerge from lectures, assignments, group activities, and group and individual presentations.

Mid-term Exam (15%): The mid-term exam will consist of multiple choice, short answer, and simple problem questions, and a short essay. Students will be expected to take the exam at the indicated time.

Intelligence Report (15%): Students will complete an Intelligence Report on one specific disaster event of their choice. The report will draw upon course lectures, discussions, readings, and outside sources to organize and deliver a summary of the disaster event and its associated impacts on the affected human population. The report is limited to 10 pages in length (with 12-point font, 1 inch margins, single-spacing for text) and will mostly comprise maps, tables, and other graphics as well as a list of references.

Final Exam (20%): The cumulative final exam will consist of an in-class essay and will require students to reflect on all aspects of the course, which includes lectures, weekly discussions, readings, and the field experience. Students will be expected to take the final exam at the indicated time.

Grading Breakdown

Assessment	Number	Points Each	Total Points
Homework Assignments	8	2.5	20
Hazard & Disaster Log	1	15	15
Discussions	15	1	15
Mid-term Exam	1	15	15
Intelligence Report	1	15	15
Final Exam	1	20	20
Total	27	-	100

Assignment Submission Policy

Assignments will be submitted for grading via Blackboard by the due dates specified in the Course Schedule below.

Additional Policies

Students are expected to attend and participate in two lecture sessions and one discussion section per week, and to complete and upload all assignments before the deadlines detailed in the Course Schedule. It is each student's responsibility to sign in on a class roster sheet for every lecture and discussion. Late work will be assessed a penalty of 10% per day and zero grades will be assigned for work that is more than seven days late.

Course Schedule: A Weekly Breakdown

	Topic	Readings and Assignments	Deliverables/Due Dates
Module 1: The Nature of Hazard			
Week 1 8/22 8/24	Introduction to Natural Hazards and Disasters Lecture: Introduction to natural hazards and associated impacts on society. Discussion: What do hazards have to do with human values?		No deliverables
Week 2 8/29 8/31	Hazard in the Environment Lecture: Introduction to environmental hazards. Discussion: What do hazard, risk, vulnerability, and disaster mean? How are these terms measured?	Reading: Smith (2013) Ch. 1; Greene (2004) Ch. 1	No deliverables
Week 3 9/5 9/7	Dimensions of Disaster Lecture: Disaster – archives, time periods, and spatial patterns. Discussion: What are some problems with disaster data and measurement?	Reading: Smith (2013) Ch. 2 Assigned: Homework Assignment 1	No deliverables
Week 4 9/12 9/14	Complexity, Sustainability, and Vulnerability Lecture: Complexity science; drivers of vulnerability and sustainability. Discussion: What is meant by “behavioral approaches” to hazards research?	Reading: Smith (2013) Ch. 3; Greene (2004) Ch. 2 Assigned: Homework Assignment 2	Submit Homework Assignment 1
Week 5 9/19 9/21	Risk Assessment and Management Lecture: Risk perception. Discussion: Why is perception important and what factors influence perception? How is risk different from hazard and vulnerability?	Reading: Smith (2013) Ch. 4 Assigned: Homework Assignment 3	Submit Homework Assignment 2

Week 6 9/26 9/28	Reducing the Impacts of Disaster Lecture: Mitigation and adaptation strategies to reduce the impacts of disaster. Discussion: What is meant by “coping” and how is coping related to livelihoods? Why is the sequence of coping strategies important for disaster management?	Reading: Smith (2013) Ch. 5; Greene (2004) Ch. 3 Assigned: Homework Assignment 4	Submit Homework Assignment 3
Module 2: The Experience and Reduction of Hazard			
Week 7 10/3 10/5	Tectonic Hazards: Earthquakes and Tsunamis Lecture: Plate tectonics and the impacts of earthquakes and tsunamis. Discussion: To what extent is earthquake preparedness a public or private concern? How does the frequency and magnitude of earthquake damage affect risk perceptions, behavior, and policy?	Reading: Smith (2013) Ch. 6; Flannery (2005) Ch. 1-15	Submit Homework Assignment 4
Week 8 10/10 10/12	Tectonic Hazards: Volcanoes Lecture: The processes that produce volcanoes and how volcanoes impact society. Discussion: What are the phases of disaster reconstruction and how long does each phase take? What are the different ways societies adjust to risk?	Reading: Smith (2013) Ch. 7; Greene (2004) Ch. 4; Flannery (2005) Ch. 16-25 Assigned: Homework Assignment 5	Mid-term exam; Reflection
Week 9 10/17 10/19	Mass Movement Hazards Lecture: Landslide and avalanche hazards; the increasing number of people affected by them, and reasons for this increase. Discussion: What are some of the physical and social factors contributing to landslide risk? How is the exposure to landslides different in developing and industrialized country contexts?	Reading: Smith (2013) Ch. 8; Flannery (2005) Ch. 26-36 Assigned: Homework Assignment 6	Submit Homework Assignment 5
Week 10 10/24 10/26	Severe Storm Hazards Lecture: Tropical cyclones – formation, classification, areas of risk, storm damage. Discussion: What are some of the structural causes of the Katrina disaster? What is the “safe development paradox”?	Reading: Smith (2013) Ch. 9; Greene (2004) Ch. 5 Assigned: Homework Assignment 7	Submit Homework Assignment 6
Week 11 10/31 11/2	Weather Extremes, Disease Epidemics, and Wildfires Lecture: An introduction to extreme weather events and related outcomes – heat waves, wildfires, and disease epidemics. Discussion: What is the wildland-urban interface (WUI)? How does the WUI make controlling fire hazards particularly difficult? How is vulnerability to wildfire related to human values and desires?	Reading: Smith (2013) Ch. 10 Assigned: Homework Assignment 8	Submit Homework Assignment 7

Week 12 11/7 11/9	Hydrological Hazards: Floods Lecture: An introduction to thunderstorms and the feedback loop between human development and flooding. Discussion: What social processes increase human exposure to flooding and coastal storm impacts? What responsibility does the government (taxpayer) have to protect individuals from flood risk?	Reading: Smith (2013) Ch. 11; Reisner (1986) Ch. 1-3 Assigned: Intelligence Report	Submit Homework Assignment 8; Reflection
Week 13 11/14 11/16	Hydrological Hazards: Droughts Lecture: Drivers and impacts of drought. Discussion: Why does the definition of a drought vary according to geography and economic activity? What are some direct and indirect impacts of drought hazards?	Reading: Smith (2013) Ch. 12; Reisner (1986) Ch. 4-5	No deliverables.
Week 14 11/21* *11/22- 11/26 is a university holiday	Technological & Environmental Hazards Lecture: "Man-made accidents", case studies showing societal impacts, and options for the future. Discussion: In what ways are biological and/or chemical hazards different from other hazards? What people are particularly vulnerable to technological hazards and why? Why is climate change a "complex hazard"? What can we learn from hazards research to help address climate change?	Reading: Smith (2013) Ch. 13-14; Reisner (1986) Ch. 6-9	Submit Intelligence Report; Reflection
Module 3: Hazard & Disaster Projects			
Week 15 11/28 11/30	Hazard & Disaster Log Presentations Students complete and present their Hazard & Disaster Log presentations.		Submit Hazard & Disaster Log; Students present their online log to the class
FINAL 12/7	Final Exam Students complete in-class final exam on schedule: 12/7, 11:00 a.m.-1:00 p.m., in THH 205		Final Exam

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://policy.usc.edu/student/scampus/part-b/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity*

<http://equity.usc.edu> or to the *Department of Public Safety* <http://adminopsnet.usc.edu/department/department-public-safety>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Relationship and Sexual Violence Prevention Services* <http://engemannshc.usc.edu/rsvp/> provides 24/7 confidential support, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Academic Accommodations

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP and it should be delivered to me early in the semester. DSP is located in STU 301 and is open from 8:30am to 5:00pm, Monday through Friday (213-740-0776; study@usc.edu).