

**SSCI 214g, Human Populations and Natural Hazards**

*Syllabus*

**Units:** 4

**Term Day Time:** Spring 2020, Lecture: Tues/Thurs 9:30-10:50 am PT/ Discussions: See schedule

**Location:** WPH B27

**Instructor:** Laura C Loyola, PhD

**Office:** AHF B55A

**Regular Office Hours:** Tues 11 am-12 pm and Wed 2-3 pm PT. Also available most days and times by appointment via email.

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**Discussion Co-Instructor:** Avery Everhart

**Office:** AHF B55

**Office Hours:** Wednesdays 11 am-1 pm PT, and by appointment via email.

**Contact Info:** [everhart@usc.edu](mailto:everhart@usc.edu)

**Library Help:** Andy Rutkowski

**Office:** VKC 36B

**Office Hours:** Tue 10 am-12 pm and Thu 4:30-5:30 pm PT

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<http://bit.ly/andyhangout>

## **Course Scope and Purpose**

Human populations and natural hazards (earthquakes, hurricanes, floods, drought) are increasingly in conflict throughout the world, as witnessed with 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, they can also be human-induced processes or events. Problems arise when people live in regions of the world where hazards exist 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 environments and higher density areas 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? And, 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 sciences, environmental studies, human health, international relations, public policy, and spatial sciences, among others) and for students without an extensive background in science.

### ***Learning Outcomes***

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

- Discuss human populations and societies in the context of geographic location and exposure to the earth's natural hazards.
- Describe the underlying processes that give rise to natural hazards such as earthquakes, volcanic eruptions, hurricanes, landslides, and how these affect human populations.
- Explain how society evaluates and confronts the dangers posed by natural hazards from political, social, and ethical perspectives.

- Utilize geospatial technologies to visualize the locations and dangers of natural hazards to human populations.
- Discuss the consequences and outcomes of environmental hazards for human populations.
- Compare and contrast technological innovations used to monitor, predict, and warn society about natural hazards and impending disasters.

Students may vary in their competency levels on these abilities. You can expect to acquire these abilities only if you honor all course policies, attend classes regularly, complete all assigned work in good faith and on time, and meet all other course expectations of you as a student.

**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 to 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 a legitimate conflict, speak with a course instructor as soon as possible so we can make alternative arrangements.

## Technology Requirements

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 and Supplementary Materials

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*, 6<sup>th</sup> Edition. NY, NY: Routledge, 504 pp.
- IPCC. 2014. Climate Change 2014 Synthesis Report, Fifth Assessment Report. Intergovernmental Panel on Climate Change (IPCC). World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP).

## Description of Assessments

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

Homework Assignments (24%): 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 (16%): Students will be required to keep a journal of three significant natural hazard and/or disaster events that happened over the course of the semester that made media headlines. Working in pairs, students will report the Hazard & Disaster Log in the form of a digital Story Map (available through AGOL) and will be presented 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 discussion 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.

After Action Report (15%): Students will complete an After Action 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 5 pages in length (with 12-point font, 1 inch margins, single-spacing for text) and must include appropriate maps, tables, and/or other graphics as well as a list of references.

Final 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.

## Grading Breakdown

Assessment	Number	Points Each	Total Points
Homework Assignments	8	3	24
Hazard & Disaster Log	1	16	16
Discussions	15	1	15
Midterm	1	15	15
After Action Report	1	15	15
Final Exam	1	15	15
Total	44	-	100 points

## Assignment Submission Policy

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

## Additional Policies

Students are expected to attend and participate in two lecture sessions and one discussion section per week,

## Schedule

	Topic	Readings and Assignments	Deliverables/Due Dates
<b>Module 1: The Nature of Human Populations</b>			
<b>Week 1</b> 1/14 1/16	<b>Introduction to Human Populations, Natural Hazards and Disasters</b> Lectures: Introduction to human populations and the associated impacts of natural hazards.  Discussion: Discussions Sections do not meet		No deliverables.
<b>Week 2</b> 1/21 1/23* Monday 1/20 is a University Holiday	<b>Human Populations</b> Lectures: Human life, natural hazards, risk, disaster, and the evolution of environmental hazard paradigm perspectives.  Discussion: What do hazards have to do with human habitation, culture and values? What do hazard, risk, vulnerability, and disaster mean? How are these terms measured?	Reading: Smith (2013) Ch. 1; Greene (2004) Ch. 1; Flannery (2005) Ch. 1-2	No deliverables.

	Topic	Readings and Assignments	Deliverables/Due Dates
<b>Week 3</b> 1/28 1/30	<b>Human Dimensions</b> Lectures: Disaster archives, time periods, and spatial patterns in the context of impacts on human populations.  Discussion: What are some problems with disaster data and measurement in terms of impacts on human populations?	Reading: Smith (2013) Ch. 2; Flannery (2005) Ch. 3-4  Homework Assignment 1	No deliverables.
<b>Week 4</b> 2/4 2/6	<b>Complexity Science, Sustainability Science, and Human Vulnerability</b> Lectures: Global links - complexity science and sustainability science - between physical and socio economic systems.  Discussion: How do maps allow us to illustrate disaster outcomes as interactions between humans natural system? How can we use maps to visualize and understand complexity science, human vulnerability, and sustainability?	Reading: Smith (2013) Ch. 3; Greene (2004) Ch. 2; Flannery (2005) Ch. 5-6  Homework Assignment 2	Homework Assignment 1: 2/6
<b>Week 5</b> 2/11 2/13	<b>Risk Assessment and Management</b> Lectures: Human risk perception. 2/11 – Guest Lecture: Dr. Robert Vos, Concepts of Risk, Resilience, and Technology  Discussion: Why is perception important to human populations and what factors influence perception? How is risk different from hazard and vulnerability?	Reading: Smith (2013) Ch. 4; Flannery (2005) Ch. 7-8  Homework Assignment 3	Homework Assignment 2: 2/13
<b>Module 2: Human Populations and Climate Change</b>			
<b>Week 6</b> 2/18 2/20* *Monday, 2/17 is university holiday	<b>Reducing the Impacts of Climate Change</b> Lectures: Mitigation and adaptation strategies to reduce the impacts of disasters induced by climate change.  Discussion: What is climate change? What are the arguments for and against? 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; Flannery (2005) Ch. 9-13	Homework Assignment 3: 2/20
<b>Module 3: Natural Hazards and Impacts on Humans</b>			

	Topic	Readings and Assignments	Deliverables/Due Dates
<b>Week 7</b> 2/25 2/27	<b>Tectonic Hazards: Earthquakes and Tsunamis</b> Lectures: Plate tectonics and the impacts of earthquakes and tsunamis on human populations. Midterm Review  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. 14-19  Homework Assignment 4	<b>Mid-Term Exam: 2/27</b>
<b>Week 8</b> 3/3 3/5	<b>Tectonic Hazards: Volcanoes</b> Lectures: The processes that produce volcanoes and how volcanoes impact society. 3/5 – Guest Lecture: Andy Rutkowski, Data Visualization Specialist  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. 20-24  Homework Assignment 5	Homework Assignment 4: 3/5
<b>Week 9</b> 3/10 3/12	<b>Mass Movement Hazards</b> Lectures: Landslide and avalanche hazards; the increasing number of people affected by them, and reasons for this increase.  Discussion: Practice Building Story Maps in the context of the impact of natural hazards on human populations.	Reading: Smith (2013) Ch. 8; Flannery (2005) Ch. 25-30  Homework Assignment 6	Homework Assignment 5: 3/12
<b>3/16*</b>  *3/16-3/22 is Spring Recess			
<b>Week 10</b> 3/24 3/26	<b>Severe Storm Hazards</b> Lectures: Tropical cyclones – formation, classification, human populations at risk, and mitigating resulting storm damage.  Discussion: Presentations of story map project depicting the impact of natural hazards and disasters on a human population	Reading: Smith (2013) Ch. 9; Greene (2004) Ch. 5 Flannery (2005) Ch. 31-35  Homework Assignment 7 After Action Report	Homework Assignment 6: 3/26

	Topic	Readings and Assignments	Deliverables/Due Dates
<b>Week 11</b> 3/31 4/2	<b>Weather Extremes, Disease Epidemics, and Wildfires</b> Lectures: An introduction to extreme weather events and related outcomes – heat waves, wildfires, and human 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; IPCC (2014) Summary Report  Homework Assignment 8	Homework Assignment 7: 4/2
<b>Week 12</b> 4/7 4/9	<b>Hydrological Hazards: Floods</b> Lectures: 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; IPCC (2014) Ch. 11	Homework Assignment 8: 4/9
<b>Week 13</b> 4/14 4/16	<b>Hydrological Hazards: Droughts</b> Lectures: Drivers and impacts of drought. 4/16 – Guest Lecture: Dr. Kenan Li, Population Impacts of Coastal Sea Level Rise  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, IPCC (2014) Ch. 21-30	
<b>Week 14</b> 4/21 4/23	<b>Technological &amp; Environmental Hazards</b> Lectures: “Man-made accidents”, the third industrial revolution, case studies showing societal impacts, and options for the future.  Discussion: What people are particularly vulnerable to technological hazards and why? What can we learn from current research to help address the third industrial revolution challenges?	Reading: Smith (2013) Ch. 13-14	Submit After Action Report: 4/23
<b>Module 4: Overview</b>			
<b>Week 15</b> 4/28 4/30* Friday, 5/1 is the last day of class	<b>Hazard &amp; Disaster Log</b> Lectures: Final exam review.  Discussion: Present Hazard and Disaster Logs. Reflective Discussion Post		Hazard & Disaster Logs – Presentation in Discussion Sections; Reflection: 5/1



	Topic	Readings and Assignments	Deliverables/Due Dates
Final Exams	Final Exam, Tuesday, May 12, 8:00-10:00 am		

## 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 Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

### **Support Systems**

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*  
[studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*  
[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention and Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*  
[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298*  
[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following *protected characteristics*: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations. The university also prohibits sexual assault, non-consensual sexual contact, sexual misconduct, intimate partner violence, stalking, malicious dissuasion, retaliation, and violation of interim measures.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*  
[usc-advocate.symplicity.com/care\\_report](http://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](http://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Support and Advocacy - (213) 821-4710*

[uscsa.usc.edu](http://uscsa.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.