



## Course ID and Title: Geology 108, Crises of a Planet

Units: 4

Spring—MWF—11:00 to 11:50am:

NO field trip this semester. The claim in the catalog is outdated.

Location: SLH 200

Instructor: Prof. John Vidale

Office: 107 Zumberge Hall of Science

Office Hours: Monday noon to 1pm or any time by appointment

Contact Info: [jvidale@usc.edu](mailto:jvidale@usc.edu), 310-210-2131, responds within three hours during the day.

Teaching Assistant: Ruoyan Wang

### Course Description

We will examine the power and limitations of science to improve our lives through the example of geophysical natural hazards. Prof. Vidale's specialties, earthquakes, and volcanoes, will be emphasized. Landslides, flooding, wildfires, hurricanes, tornados, flooding, and other hazards will be explored.



Half the course presents the background geophysics - the science and history of the hazards. The other half will be discussion of case studies of individual disasters and actions to avert disasters across these topics. Exploration for oil and mitigation of nuclear weapons risk will be additional topics addressed with similar science and tools.

The objective is a greater understanding of science and case-

history knowledge of how we fight natural disasters. The intended audience is those who wish to understand the process of mitigating hazards more deeply through research, activism, legislation, and enforcement of improvements.

Geophysics is a particular strength of the Earth Sciences department at USC, and Los Angeles is the epicenter of the ~\$6B average annual earthquake risk in the US.



We'll discuss practical hazard mitigation, including discovery, denial, alarmism, and acquiring state and federal resources. Earthquake and volcano prophecies offer examples of social media rumors of "breakthroughs" and conspiracies. Short-term earthquake and volcano prediction does not yet work, but still there is hope at the cutting edge of current research. The more general issue of clarifying contentious science also is a recurrent theme, but the main theme is natural threats and how they are addressed.

## Learning Objectives

### Objectives

By the end of this course, students should be able to:

1. Understand the qualitative physical process responsible for a range of natural hazards and other societal problems that can be ameliorated through geophysical methods.
2. Remember cases studies of these disasters, their history, and the actions taken to mitigate them.
3. Extend the case history to interpret additional science and similar cases not addressed in class.
4. Analyze the outcomes in case studies to judge their societal impact.
5. Evaluate whether the measures taken have been sensible.

### Assignment/Assessment

This learning objective skill is measured by:

- Midterm, final exam, polls
- Midterm, final exam, polls
- Labs conducted in section
- Questions on final exam
- Questions on final exam

**Prerequisite(s):** none.

**Co-Requisite(s):** none.

**Concurrent Enrollment:** none.

**Recommended Preparation:** perusing the textbooks would be informative but not necessary.

## Course Notes

Grading type: letters, a curve will be applied.

Lecture PowerPoint PDFs will be posted on Blackboard before class.

## Technological Proficiency and Hardware/Software Required

We will use only the standard features of BrightHand and Poll Everywhere.

## Required Readings and Supplementary Materials

*The Big Ones* by Lucy Jones, 255 pages

- Sold by: Random House LLC, on Amazon
- Kindle - \$14, Paperback - \$15
- ISBN 0385542704

*Natural Hazards and Disaster* by Donald Hyndman and David Hyndman

- Any of the 4<sup>th</sup> (2013), 5<sup>th</sup> (2016), or 6<sup>th</sup> edition (2024) is fine.
- New, used, electronic, paper, buying, renting – any would work
- Choices range from ~\$0 to ~\$175 on Amazon
- Just needed for reading and reference – fancy extras unnecessary.



## Description and Assessment of Assignments

The midterm and final will be in-class Blackboard multiple choice tests. Polls and quizzes in class will be graded for participation but not correctness.

## Participation

Participation will be scored by answering Poll Everywhere questions and engaging with TA in section.

## Grading Breakdown

Assessment Tool (assignments)	% of Grade
Weekly lab assignments	35
Midterm exam	25
In-class polls and in-lab quizzes	10
Final exam	30
<b>TOTAL</b>	<b>100</b>



## Lecture Schedule

Topics	Readings/Preparation
Week 1	14 of 18 chapters in Hyndman's book and all chapters in Jones' short book will be assigned readings.
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	



## Tentative Lab Schedule

Topics	Quizzes
Week 1	Quiz 1
Week 2	
Week 3	
Week 4	
Week 5	Quiz 2
Week 6	
Week 7	Quiz 3
Week 8	
Week 9	Quiz 4
Week 10	
Week 11	Quiz 5
Week 12	
Week 13	Quiz 6
Week 14	
Week 15	Quiz 7
	Quiz 8
	Quiz 9
	Quiz 10
	Quiz 11





## Grading Scale

Class GPA average will be in the range 3.4 to 3.6.

## Assignment Submission Policy

Weekly lab assignments will be due in class by the corresponding lab time the following week.

## Grading Timeline

Grades and feedback will generally be within a week.

## Course Specific Policies

Late assignments lose 10% of the score each week, no more than two labs may be missed without arranging with us how the work will be covered ahead of time.

## Course Evaluations

Course evaluation will occur near the end of the semester.

Policies will adhere to the standard USC Academic and Support System guidelines:

<https://cet.usc.edu/teaching-resources/syllabus-template/>

