



NATURAL DISASTERS

Outline

Mr. Ling, Ballston Spa High School
Ballston Spa, NY 12020

This is an elective, non-Regents, half-year (one semester) science course which meets four hours per week. The course is open to all High School students who have completed Earth Science. There are no math or other prerequisites, but collaborative group work on projects, research and writing are required. Also, collaboration with computers is a major component of the course, so maintaining access to school computers is required.

This course will explore the nature of science, gamma ray bursts and supernovae, solar flares, NEOs (near Earth objects - asteroid / comet impacts), geomagnetic reversal, volcanism, earthquakes, tsunamis, mass wasting, climate change, heat waves and drought, floods, hurricanes, tornadoes, wildfires, risk assessment, and government planning and response.

I. The Nature of Science

- A. The purpose of scientific inquiry
- B. How are philosophy and religion different from science?
- C. Scientific methodology
- D. Why is science important?

II. Extraterrestrial Threats

- A. gamma ray bursts and supernovae
- B. coronal holes and solar flares (txt 574-6)
- C. NEOs (near Earth objects - asteroid / comet impacts)
 - 1. NEO Impact Crater Investigation

III. Geologic Hazards

- A. geomagnetic reversal
- B. volcanism
 - 1. U.S.G.S. Mt. Rainier Lab
 - 2. Aerial Photographs (lm 89, 165-8, 191, 193, 227, 243)
- C. earthquakes
 - 1. Analyzing Hazards Using Maps and Aerial Stereograms
 - 2. Earthquake Hazards and Human Risk Lab
 - 3. Shake Table Project
- D. tsunamis
- E. floods
 - 1. Flood Hazard Mapping Lab
 - 2. Local Flood Hazard Mapping
- F. mass wasting
 - 1. landslides
 - 2. rockslides
 - 3. debris flows

4. earth flows
5. lahars
6. slumping, creep and solifluction

IV. Severe Weather and Climate Change

A. Storms

1. Thunderstorms and hail
2. Lightning
3. Wind, dust and sand storms
4. Fog

B. Tornadoes, Blizzards and Ice Storms

C. Heat waves, drought and desertification

1. Dryland Hazards and Risks in Nebraska Lab

D. Coastal hazards and hurricanes

1. Coastal Processes, Landforms, Hazards and Risks Lab
2. The Threat of Rising Seas Lab

E. wildfires

F. climate change

1. Glacier National Park, Nisqually Glacier Labs
2. Latest Data Review
3. National Academies of Science Report
4. IPCC 4th Assessment Report
5. Mitigations

V. Managing Natural Disasters

A. Risk Assessment

B. Planning

C. Response

D. Village of Ballston Spa Disaster Plan