REMINDERS

- Two required essays are still due by April 17, 2020.
- A late penalty will be applied.
- A third essay may be used for extra credit in place of a “Think Geographically” essay.

ESSAY TOPICS (choose any two):
- Contributions of a noted geographer, earth scientist or explorer (ch. 1)
- Relationship of climate change to a listed current event topic (ch. 2)
- Discuss a natural process that is deemed a natural hazard (ch. 3)

Extra Credit: “Think Geographically” Essays from any five of the textbook’s chapters 4-12.
- Last day to submit as of now is May 12 but it is best to do them as you finish reading a chapter.

Any essay may be handed in before the deadline.
- Don’t wait for the night before to write them!

PART II: People and their Physical Environment

- Introduction to the Physical Environment
- Earth-Sun Relationship
- Earth Systems
  - A. The Hydrosphere: Oceans
  - B. The Atmosphere: Weather and Climate
  - C. The Lithosphere: Geologic Influences
- Earth Habitat
  - A. Biosphere
  - B. Natural Controls and Cycles
    - C. Human Impact
    - D. Natural Hazards
  - E. Earth Resources

GEOG 101 Part II
People and their Physical Environment

17: Earth Habitat
Human Impact and Natural Processes (aka Hazards)

Natural Processes and Humans

- Throughout human history, people have had to cope with their surroundings (natural landscapes) and deal with natural processes.
- The natural processes that are harmful to us are called "hazards."

Natural process + people = natural hazard.

Natural processes and humans: Despite of our technological advancements, we cannot control the natural processes that adversely affect us and we will continue to be subservient to those forces.
- That is why when a natural process happens, we deem the process “bad” and “harmful,” and label it: NATURAL HAZARD.
- When it is extremely destructive and deadly, it is termed a NATURAL DISASTER.

Natural process/natural hazard

We must learn to live with the “hazards.”
- Learn to avoid them
- Have selective land use
- Predict their occurrences
- Develop technology to protect ourselves
- Try to prevent them from becoming disasters
NATURAL PROCESS/NATURAL HAZARD

The chief natural process killers of people over the last 100 years are ... ?
1. drought (10 million people)
2. floods (6.8 mil)
3. earthquakes (1.8 mil)
4. wind (1.2 mil)
5. volcanoes (0.9 mil)
6. mass movements – land and snow (0.5 mil)

Heat waves and cold spells are silent killers.

When Natural Processes turn into Disasters

New York Times video record of select natural disasters

Where Disaster Strikes Again and Again in the USA

Losses in each ZIP code from major natural disasters, 2002-17

Sites of Major Natural Disasters in the US: 2006-2017

2017’s Billion-dollar disasters in the US

HUMAN IMPACT

- As natural processes affect people, the actions of people impinge on nature and can be disruptive to nature:
  - pollution
  - agricultural methods
  - importing non-native plants, insects and animals
  - killing/extinction of species

- People must be aware of their actions and anticipate the consequences.
- At the same time they must be cognizant on ways to protect the environment.
Humans have had an impact on the natural environment from the beginning of their existence: harnessing fire and cutting down vegetation.
- We have interfered with natural cycles.
- We have disrupted natural controls.
- We have altered the equilibrium of some planetary sequences of events.
- We have amplified natural occurrences.

**Focus of Human Impact**

A major focus of human impact is the earth’s ability to retain heat -- **Greenhouse Effect** -- and thus climate change. This began with the Industrial Revolution and the use of coal to produce power.

[https://www.youtube.com/watch?v=6VUPIX7yEOM Greenhouse Effect, 4 min]
[https://www.youtube.com/watch?v=G4H1N_yXBiA Climate Change and People, 4 min]

**HUMAN IMPACT: Protecting an area from Flooding**

The junction of the Missouri and Mississippi Rivers is prone to flooding, a natural process. “Great flood” of 1993 at St. Louis, Missouri. How did this happen?

**NORMAL CONDITIONS**

But people do not like to be flooded.

**HUMAN IMPACT**

Levees (at A) constrict stream flow and prevent water from spreading laterally, so it backs up further upstream (at B). The constricted stream channel now accelerates the flow of water moving past the protected areas. It creates a more powerful current downstream (at C), eroding levees and river banks.


**HUMAN IMPACT**

The building of levees to protect St. Louis, MO and East St. Louis, IL increased flooding and flood damage both upstream and downstream of the protected areas… including flooding areas behind broken levees!

**UNALTERED STATE**

**Analyzing and Dealing with Change**

1. **Identify the problem.**
2. **Assess the situation.**
3. **Give advice/set priorities.**
HURRICANE

Wind, rain and storm surge

Hurricane Katrina, 2005


Severe weather ABC News coverage – Hurricane Michael, 2018

Hurricane damage categories:

https://www.nhc.noaa.gov/aboutsshws.php

Hurricane storm surge demo (1 min)

https://www.youtube.com/watch?v=b4ZhjwbNTXk

Katrina 28 ft storm surge in Mississippi (2.5 min)

https://www.youtube.com/watch?v=gd8WiiXNxho

Urban Flooding Potential

Flood in the NYC area

Flood in Houston, TX


Flooding of a Houston Suburb during Hurricane Harvey

Barker Reservoir is a flood control project built to contain excess water, yet housing was allowed along the perimeter outside of "historic flood levels."

Areas flooded by Harvey:
Up to 31.5 feet above the lowest point of the reservoir.

DAM

Houston

Maximum flood pool: 38 feet above. Government property line: 25 feet above

TORNADO

3 min Birth of a Tornado

VOLCANIC ERUPTION

Before

After

Mt. St. Helens, Washington

https://www.youtube.com/watch?v=7KDz6dGQ5RE

https://www.youtube.com/watch?v=Cvjwt9nnwXY

Pyroclastic flow, Mt Unzen, Japan (1 min)

RIVER FLOODING

2019 flooding in Nebraska: both a natural process and a natural hazard
**RIVER ICE JAMS**


**DROUGHT**

[Map of Drought](http://droughtmonitor.unl.edu/)

**EARTHQUAKE DAMAGE**

- Taiwan earthquake 2018, panic and fear as first deadly quake hits Hualien
  - Hualien, Taiwan
  - [Video](https://www.youtube.com/watch?v=2EC63nqzAFs)
  - 1.5 min

**EARTHQUAKE DAMAGE**

- Hualien, Taiwan
  - [Video](https://www.youtube.com/watch?v=VSgB1IWr6O4)
  - 2.5 min
  - [Video](https://www.youtube.com/watch?v=0Djg5z2FHoI)
  - 50 sec
  - [Video](https://www.youtube.com/watch?v=e7ho6z32yyo)
  - 3 min

**TSUNAMI**

- Japan
  - March, 2011
  - [Video](https://www.youtube.com/watch?v=oWzdgBNfhQ)
  - Earthquake plus tsunami
  - 3.5 min

**COASTAL STORMS**

- Breach of a barrier island by waves at Westhampton Beach, NY
  - [Map](https://www.youtube.com/watch?v=1DxgfHk0xM)
  - Review the “Coasts in Crisis” slides from Lecture 15.
Plum Island, MA
(March 2013)

LIDAR Image of Barrier Island Breach
Hatteras Island, NC, September 2003

NOTE CHANGES >>

PART II Exam Topics:
I. Intro. to the Physical Environment
II. Earth-Sun Relationship
III. Earth Systems
   - The Hydrosphere: Oceans
   - The Atmosphere: Weather and Climate
   - The Lithosphere: Geologic Influences
IV. Earth Habitat and Environmental Protection
   - The Biosphere: Zones of Life
   - Natural Controls and Cycles
   - Human Impact
   - Natural Hazards
   - Earth Resources

NEW DATE
EXAM 2 is now
Tuesday, April 21 on BlackBoard
Be sure you know how to enter BlackBoard and access the timed exam which starts and stops automatically

Exam 2 will cover all the topics in Part II.
See Study Guide II on the course home page for definitions and place names for North America, South America and Antarctica.