

## 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

- ✓ I. Introduction to the Physical Environment
- ✓ II. Earth-Sun Relationship
- ✓ III. Earth Systems
  - ✓ A. The Hydrosphere: Oceans
  - ✓ B. The Atmosphere: Weather and Climate
  - ✓ C. The Lithosphere: Geologic Influences
- ✓ IV. 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)**

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150th ANNIVERSARY  
 HUNTER

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## 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.**"


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

- They are atmospheric, geologic and oceanic in nature.
  - The list is long.
- Every continent has them.
- They become **hazards** when **people** are **adversely affected** by them.



Natural process + people = natural hazard.

## 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.**

7

## When Natural Processes turn into Disasters

*New York Times* video record of select natural disasters

<https://www.nytimes.com/video/world/asia/10000006765501typhoon-hagibis-japan.html?searchResultPosition=3>

8

## Where Disaster Strikes Again and Again in the USA

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

<https://www.nytimes.com/interactive/2018/05/24/us/disasters-hurricanes-wildfires-storms.html>

9

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

10

## 2017's Billion-dollar disasters in the US

Disaster	Loss
California flooding	\$1.9B
Northern California fires	\$9.4B
Western wildfires	\$2.5B
ND, SD, and MT drought	\$2.5B
Upper Midwest severe weather	\$2.5B
Midwest severe weather	\$1.2B
Missouri and Arkansas flooding	\$2.2B
Midwest tornado outbreak	\$2.1B
Central tornado outbreak	\$1.8B
Missouri and Arkansas flooding	\$1.7B
Southern tornado outbreak	\$1.1B
Southeast severe weather	\$2.1B
Southeast freeze	\$1.1B
Hurricane Irma	\$2.1B
Hurricane Harvey	\$19.8B
Hurricane Maria	\$10.9B

Sources: NOAA, Ball State University Center for Business and Economic Research (for Harvey), Reuters (for Maria), and CoreLogic (for Irma)

<https://www.vox.com/energy-and-environment/2017/12/28/16795490/natural-disasters-2017-hurricanes-wildfires-heat-climate-change-cost-deaths>

11

## 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.

<https://www.nytimes.com/2019/11/04/climate/invasive-grasses-wildfires.html>

<https://www.nytimes.com/2019/11/04/climate/india-pollution-new-delhi.html>

12

## HUMAN IMPACT

**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.

13

## 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=8VUPIK7YEOM> Greenhouse Effect, 4 min

[https://www.youtube.com/watch?v=64H1N\\_vXBIA](https://www.youtube.com/watch?v=64H1N_vXBIA) Climate Change and People, 4 min

14

## HUMAN IMPACT: Protecting an area from Flooding


The junction of the Missouri and Mississippi Rivers is prone to flooding, a natural process.



NORMAL CONDITIONS

But people do not like to be flooded.


"Great flood" of 1993 at St. Louis, Missouri. How did this happen?



15

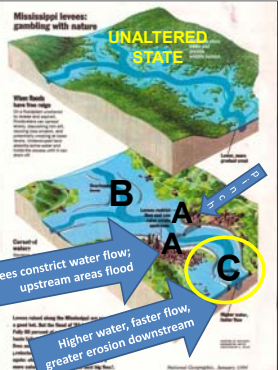
## HUMAN IMPACT

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!



16

## 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.

Levees constrict water flow; upstream areas flood

Higher water, faster flow, greater erosion downstream

<https://www.pbs.org/video/june-18-2018-26uwn/>  
27 min program: 1993 flood 25 years later

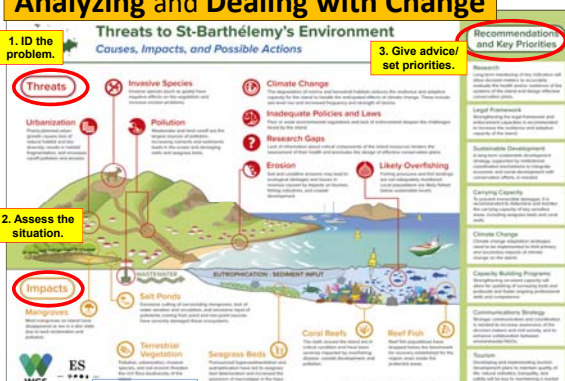
17

## Analyzing and Dealing with Change

### Threats to St-Barthélemy's Environment

Causes, Impacts, and Possible Actions

1. ID the problem. (Threats)
2. Assess the situation. (Impacts)
3. Give advice/ set priorities. (Recommendations and Key Priorities)



WCS and WWF have geographers on staff to help them study environmental change and educate the public.

18



## HURRICANE

Wind, rain and storm surge

Hurricane damage categories:  
<https://www.nhc.noaa.gov/aboutshel.html>

**Hurricane Katrina, 2005**

<https://www.nytimes.com/interactive/2019/08/29/opinion/hurricane-dorian-forecast-map.html>

<https://www.youtube.com/watch?v=gd8W1X2Nsho>  
 Katrina 28 ft storm surge in Mississippi (2.5 min)

<https://www.youtube.com/watch?v=b4Zjw6N7Xk>  
 Hurricane storm surge demo (1 min)

[https://www.youtube.com/watch?v=CNHM\\_AJNly4](https://www.youtube.com/watch?v=CNHM_AJNly4)  
 Severe weather ABC News coverage -- Hurricane Michael, 2018

## Urban Flooding Potential

**Flood risk in the NYC area**

**Flood risk in Houston, TX**

**Flood risk in Tampa, FL**

<https://youtu.be/y3FgAJUs1s8>  
 Baton Rouge, LA flooding

<https://www.click2houston.com/news/water-to-be-released-from-addicks-barker-reservoirs>  
 2017 before and after photos Houston, TX

## Flooding of a Houston Suburb during Hurricane Harvey

<https://www.nytimes.com/interactive/2019/03/22/us/houston-harvey-flooding-reservoir.html>

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

Maximum flood pool: 38 feet above.

Government property line: 25 feet above.

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

**Houston**

## TORNADO

<https://www.youtube.com/watch?v=7KDx6dGG5RE>  
 3 min Birth of a Tornado

## VOLCANIC ERUPTION

Mt. St. Helens, Washington

**Before**      **After**

<https://www.youtube.com/watch?v=IhU6jm6NY4>  
 Mt St Helens 1980 (2.5 min)

<https://www.youtube.com/watch?v=Cvjw19nmwXY>  
 Pyroclastic flow, Mt Unzen, Japan (1 min)

## RIVER FLOODING

<https://www.vox.com/energy-and-environment/2019/3/18/18271181/nebraska-flooding-photos>  
 Spring 2019 flooding in Nebraska: both a natural process and a natural hazard

### RIVER ICE JAMS

Related topic: heavy snowfall at Donner Pass  
<https://www.yahoo.com/news/snow-cornmeal-spack-stony-nevada-23202463.html>

<https://www.3newsnow.com/news/local-news/warm-weather-melting-platte-river-ice-jam>

### DROUGHT

<http://droughtmonitor.unl.edu/>

### EARTHQUAKE DAMAGE

Taiwan earthquake 2018; panic and fear as first deadly quake hit Hualien

A second earthquake measuring 5.7 in magnitude hit Hualien almost 24 hours later

Hualien, Taiwan 2018  
<https://www.youtube.com/watch?v=2EC8nqAFs> 1.5 min

### EARTHQUAKE DAMAGE

<https://www.youtube.com/watch?v=7he6c2Qy2s> 3 min  
<https://www.youtube.com/watch?v=0Djg5zFHq> 50 sec  
<https://www.youtube.com/watch?v=V5qB1Ww6D4> 2.5 min

### TSUNAMI

Japan March, 2011

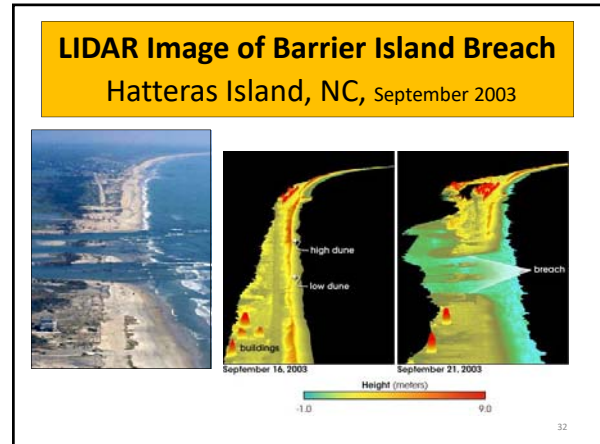
<https://www.youtube.com/watch?v=oWzdgBNhQU> Earthquake plus tsunami 3.5 min

### COASTAL STORMS

Review the "Coasts In Crisis" slides from Lecture 15

Breach of a barrier island by waves at Westhampton Beach, NY

LOCATION OF THE WESTHAMPTON BEACH DISASTER



**NEXT:**  
**Earth Resources**

The number 33 is in the bottom right corner.

**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.