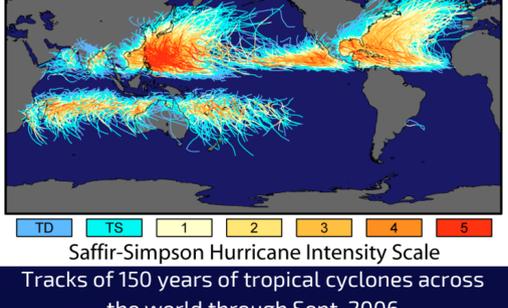


TROPICAL CYCLONES:

Hazard on the US East Coast

What are Tropical Cyclones?

Tropical cyclones, also known as hurricanes, are "intense, low-pressure disturbances that develop in the tropics and occasionally move poleward into the midlatitudes" (Hess 187). They consist of "low-pressure centers that are essentially circular" and strong winds spiraling inward that reach/exceed 119 km/hr (Hess 188).



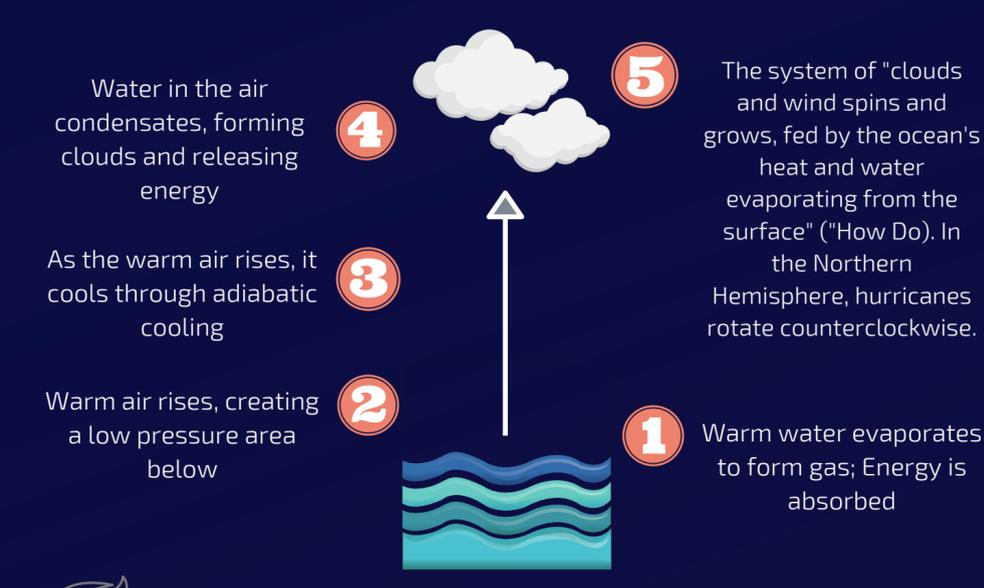
Hurricanes affect the east coast of the US because they tend to move "toward the west-northwest after they form in the tropical and subtropical latitudes" (Landsea).

The fuel that powers these cyclones are warm air and water, and the Gulf Stream along the east coast provides this source of warm water and air.



Major global cyclones focused on the southeast US coast from 1924-2014

Formation of Tropical Cyclones



Effects

- Massive damage to coastal cities and towns
- Damage to the natural environment along the coast, including ecosystems and animals
- Capable of killing thousands of people
- Strong winds that propel water toward the coast; can topple trees, destroy buildings, and throw debris
- Sea level rise to "as much as 20 or 30 feet" ("Hurricane Damage) and intense waves
 - Storm surge- the rapid seal level rise that occurs as a hurricane approaches the coast
- Heavy rainfall which can "cause rivers to flood their banks and mudslides to form" ("Hurricane Damage).
- Can result in tornadoes and rip tides
- Inland travel of storm after the hurricane hits the coastal area, further increasing damage
- Erosion of beaches



Aftermath of Hurricane Katrina in New Orleans



How to Mitigate the Hazard



Although we cannot control hurricanes, there are ways we can minimize the damage caused by these natural hazards

Know Your Risk

- Be educated about hurricanes:
 - Hurricane season: June to November in the Northern Hemisphere
 - Water must be at least 80°F to form
- Know the flood risks of your community and home

Protect Your Home

- Strengthen roof and garage doors so they can withstand strong winds- use nails or rope to hold them down
- If a hurricane is approaching, board up windows using plywood
- Clear the yard of possible debris (ex: grills, bikes, trash cans)



Create Emergency Kit

- Always keep kit accessible in case of emergency
- Include:
 - Non-perishable food and water (minimum 3-day supply)
 - Flashlight and matches
 - Medications and first aid supplies
 - Portable radio for hurricane updates
 - Sleeping bags or blankets
 - Toiletries
 - Clothing
 - Cooking supplies such as a small stove and can opener
 - Important documents

Evacuate/Take Shelter

- Determine whether or not you should evacuate
 - Do not evacuate when the hurricane is quickly approaching
 - Go to a FEMA approved storm shelter
- During high winds
 - take shelter on a low floor level that will not be affected by flooding
- During flooding
 - take shelter on a high floor level
- DO NOT wade in flood water or go outside during the storm
- Avoid the beach if hurricane is approaching



Current Attempts at Mitigation

- Statewide building codes have been implemented in certain states that require infrastructure to be able to withstand intense winds
- Improvement of coastal city infrastructure to protect against water and flooding
- Construction of seawalls to guard cities from storm waves
- "Overhauling city drainage systems, adding more stormwater pumps, and elevating new roads and homes" (Newkirk II)



What Could be Done to Improve Mitigation

- Rethink construction and layout of coastal cities
- Cities should be built within their boundaries to reduce hurricane threats and damage to infrastructure and homes
- Reverse the "existing degradation of wetlands," which can reduce the impact of a hurricane (Newkirk II)
- "Scale back roads and suburbs that are already built" (Newkirk II)
- Build coastal cities up rather than the wetlands, and maintain a substantial stretch of land along the coast to protect against tropical cyclones



THE BOTTOM LINE

Hurricanes are one of the most destructive and powerful natural hazards on Earth. Each hurricane that affects the east coast of the US claims thousands of lives, destroys and floods infrastructure, crushes homes to the ground, and demolishes the surrounding ecosystem. As the effects of climate change are increasing, the destruction caused by these tropical cyclones will only worsen. The US federal government, governments of coastal states, and individuals in local communities must take action to mitigate hurricane effects. We must be prepared and try to prevent future destruction by implementing new policies and ideas, as current policies have not been effective at minimizing hurricane damage.

Works Cited

Hess, Darrel, et al. *McKnight's Physical Geography A Landscape Appreciation*. Pearson, 2017.

"Historic Tropical Cyclone Tracks." *NASA Earth Observatory*, NASA, www.earthobservatory.nasa.gov.

"How Do Hurricanes Form?" *NASA*, 22 Oct. 2019, www.spaceplace.nasa.gov.

"Hurricane Damage." *UCAR Center for Science Education*, 2011, www.scied.ucar.edu.

"Hurricane Hazards Mitigation." *Natural Hazards Big Island*, University of Hawai'i at Hilo, 2019, www.hilo.hawaii.edu.

Landsea, Chris. "Why Do Hurricanes Hit the East Coast of the U.S., But Never the West Coast?" *Atlantic Oceanographic and Meteorological Laboratory*, National Oceanic & Atmospheric Administration, 1 June 2005, www.aoml.noaa.gov.

Newkirk II, Vann R. "How To Build Hurricane-Proof Cities." *The Atlantic*, 12 Sept. 2017, www.theatlantic.com.