

Catastrophic Events Impact on Ecosystems

Hurricanes



Hurricanes

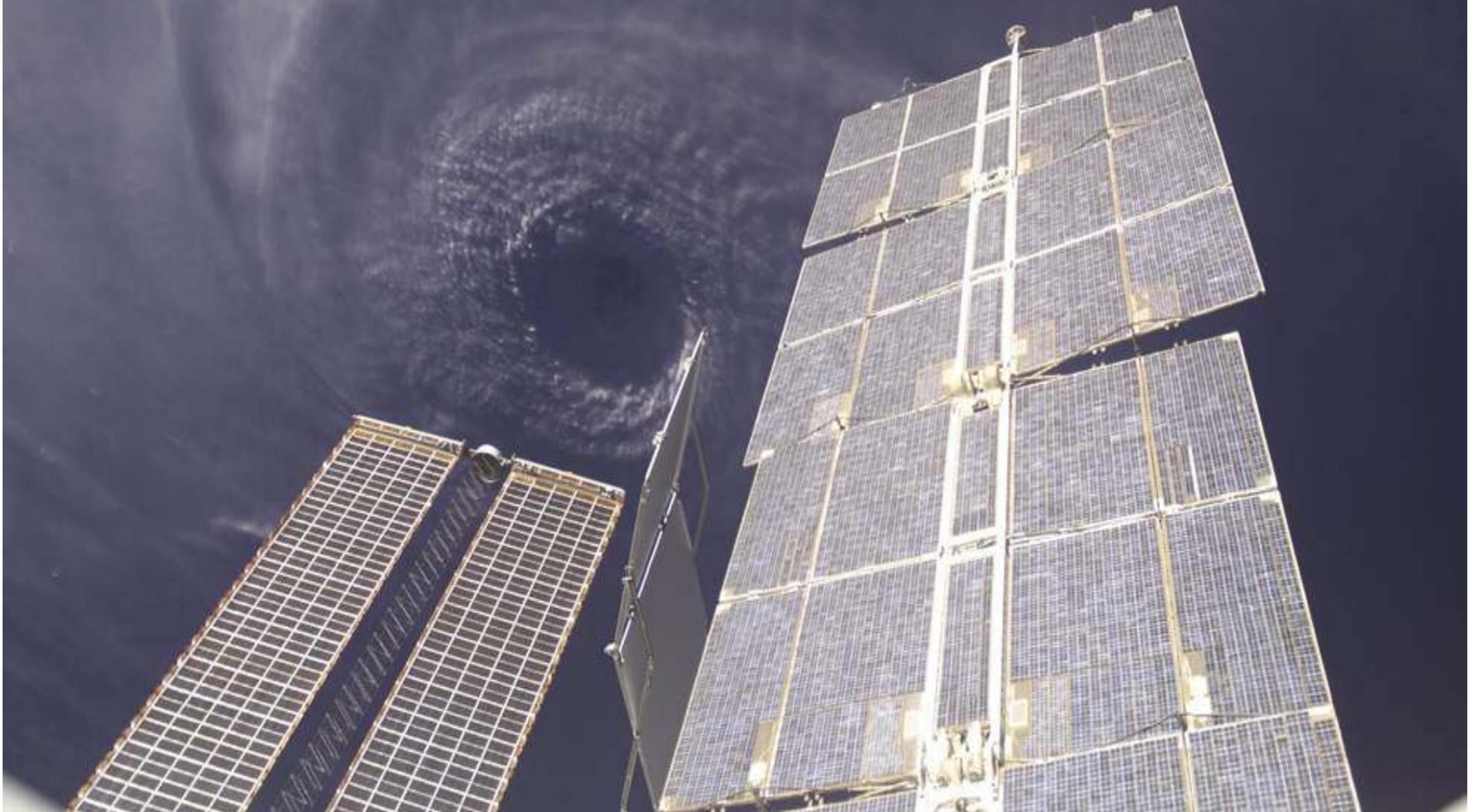
- An intense, rotating oceanic weather system with sustained winds of at least 74 mph and a well-defined eye
- Conditions for formation:
 - Warm water
 - Light upper-level winds
 - Pre-existing disturbance of thunderstorms
- Hurricanes produce damaging surface winds and storm surges



RallyRobin

- With your shoulder partner:
 - List ways you think the ecosystem will be affected by a hurricane.

How Hurricanes Affect the Ecosystem



Wind

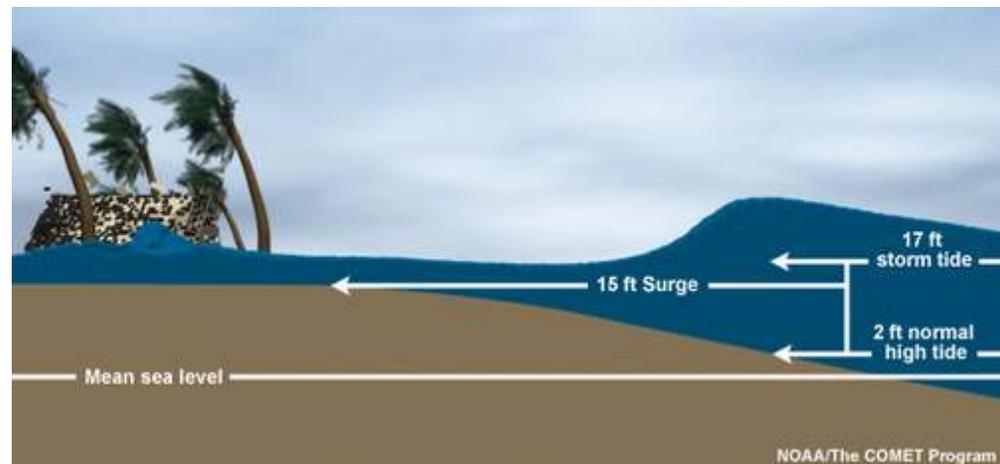
- Trees damaged, snapped, or uprooted

<http://www.nhc.noaa.gov/aboutsshws.php>



Storm Surge

- A storm surge is an abnormal rise of water generated by a storm, over and above the predicted tides.
- The storm surge causes sediment to erode and shift.
 - Coastal wetlands and barrier islands take the brunt of the storm surge.
 - Sediment erosion and deposition often affect
 - Oyster beds
 - Coral reefs
 - Sea grass beds



RoundRobin

- If there is a lot of saltwater coming onto the land, what might the saltwater harm or damage?

Salt Water Invasion!



- Saltwater intrusion in lakes, streams, and wetlands change ecosystems (e.g. causes massive fish kills)
- The storm surge kills tree species that are not tolerant of salt water.

Flooding Moves Contaminants



- Contaminants (e.g. chemicals used to treat crops or solid and liquid wastes) are transported into groundwater
 - Phytoplankton blooms lead to a decrease in dissolved oxygen

Taking Care of Your Notes

- During this time create questions for your Cornell Notes for the section we created over Hurricanes.





- Occur during heavy rains, when rivers overflow, when ocean waves come onshore, when snow melts too fast, or when dams or levees break.
- Most common of all natural hazards.

Environmental Impact of Floods

- Floods are important in maintaining ecosystem habitats and soil fertility
 - Nutrients carried by floodwaters can benefit ecosystems and crops
 - Expand habitats for fish, birds
- Recharge groundwater



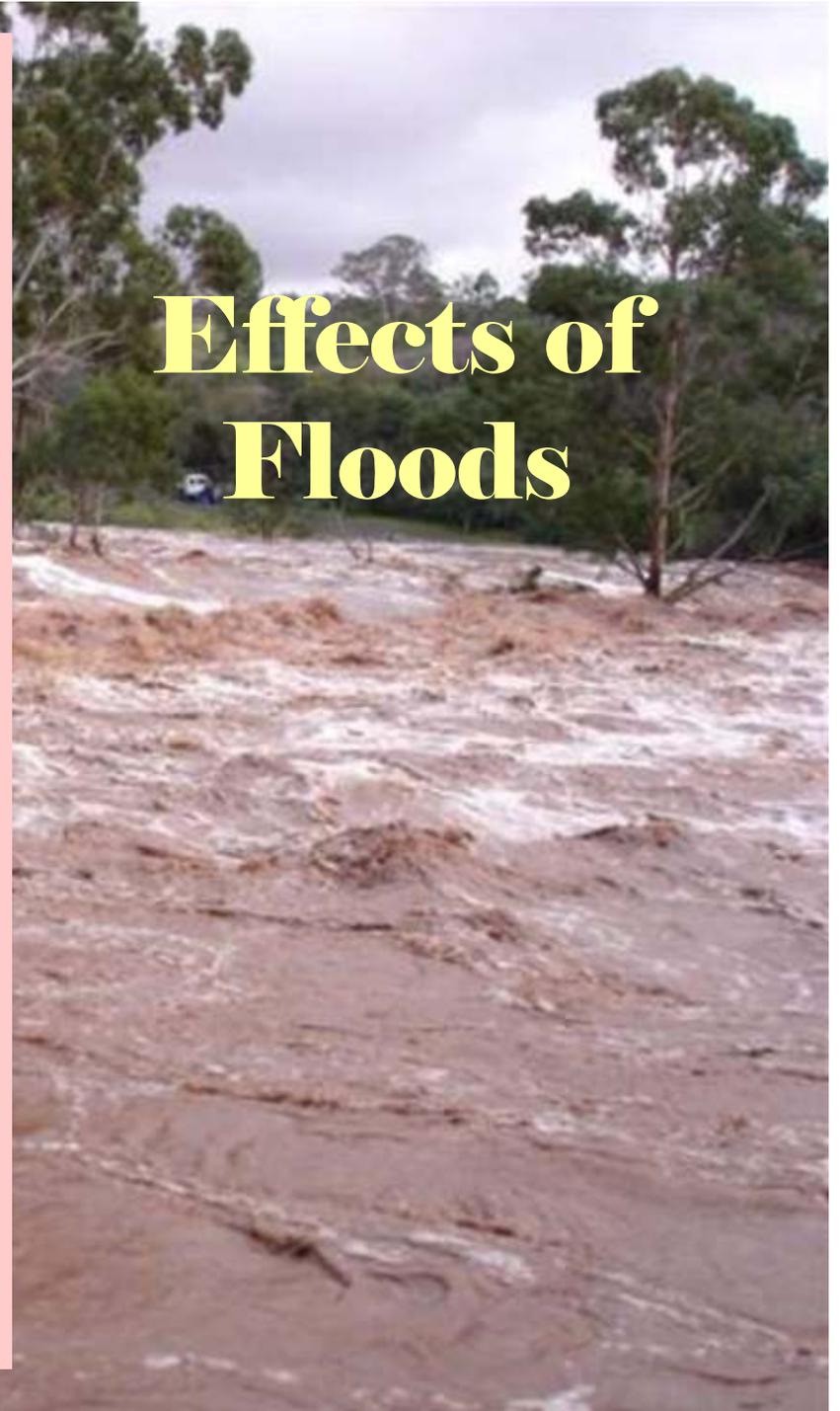
Environmental Impact of Floods

- Flood-management practices have affected floodplains and the nature of flooding
 - Wetlands drained
 - Land cleared for farming
 - Upstream development that replaces natural vegetation with paved asphalt
 - Construction of channels, levees, reservoirs



- Destruction of riparian habitat (habitat on the banks of a river)
- Significant erosion can lead to more frequent flooding if not repaired
- Water pollution
 - Damaged drainage systems release raw sewage
 - Damaged buildings can be a source of toxic materials (e.g. paint, pesticide, gasoline)

Effects of Floods



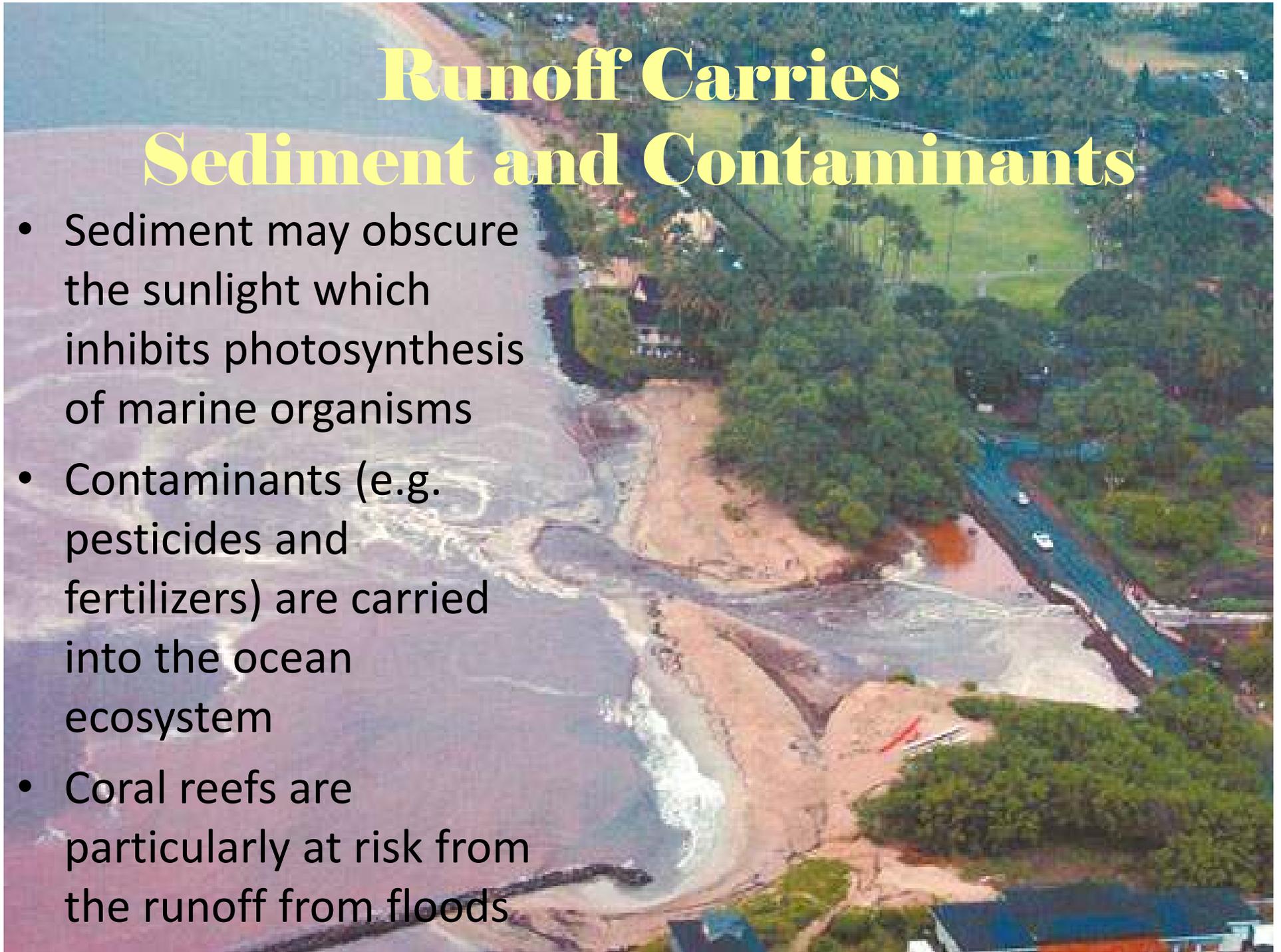
Animals

- Flooding forces many wild animals from their natural habitats.
- Domestic animals are also left without homes after floods.
- The large amounts of pooled water lead to an increase in mosquito populations.



Runoff Carries Sediment and Contaminants

- Sediment may obscure the sunlight which inhibits photosynthesis of marine organisms
- Contaminants (e.g. pesticides and fertilizers) are carried into the ocean ecosystem
- Coral reefs are particularly at risk from the runoff from floods



Runoff Flushes Away Contaminants



- The sudden appearance of an overflow of water can wash away
 - Unneeded salt
 - Contaminants like chemical waste
 - Debris

Taking Care of Your Notes

- During this time create questions for your Cornell Notes for the section we created over Flooding.

Tornadoes



NSSL Photo



Tornadoes

- A rotating column of air reaching from a thunderstorm to the ground.
- The most violent tornadoes can have winds up to 300 mph.



RallyRobin

- With your shoulder partner:
 - List ways tornadoes affect the environment.

Tornadoes Effect on Ecosystems

- Trees are damaged, stripped, or uprooted
 - Open forest canopies to sunlight
 - Fallen trees offer shelter for small animals
- Potential destruction of waste storage or treatment facilities or chemical plants



Taking Care of Your Notes

- During this time create questions for your Cornell Notes for the section we created over Tornadoes.

Tornado in a Bottle



What you'll need:

- Water
- A clear plastic bottle with a cap (that won't leak)
- Glitter
- Dish washing liquid
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Instructions:

- Fill the plastic bottle with water until it reaches around three quarters full.
- Add a few drops of dish washing liquid.
- Sprinkle in a few pinches of glitter (this will make your tornado easier to see).
- Put the cap on tightly.
- Turn the bottle upside down and hold it by the neck. Quickly spin the bottle in a circular motion for a few seconds, stop and look inside to see if you can see a mini tornado forming in the water. You might need to try it a few times before you get it working properly.

Tornado in a Bottle

What's happening?



- Spinning the bottle in a circular motion creates a water vortex that looks like a mini tornado. The water is rapidly spinning around the center of the vortex due to centripetal force (an inward force directing an object or fluid such as water towards the center of its circular path). Vortexes found in nature include tornadoes, hurricanes and waterspouts (a tornado that forms over water).

Closing Question:

- Describe the effect catastrophic events have on living systems.