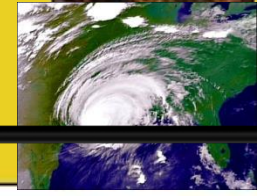


What effects do catastrophic events have on TEXAS ecosystems?



What is a catastrophic event?

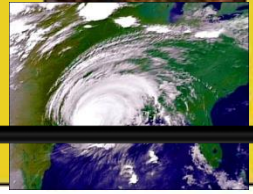


- **Catastrophic events are natural occurrences that generally have a negative effect on people and/or the environment.**

- **These changes are so great they may cause damage to the shape of the land or to the lives of people and other living organisms.**



Catastrophic events...



- Those caused by weather:

- ~ floods

- ~ hurricanes

- ~ tornadoes

- ~ drought



- Fires



- Those caused by geological forces:

- ~ volcanoes

- ~ earthquakes

- ~ tsunami



HURRICANES...



Effect on Texas coastal ecosystems:

- **Sand dunes** in the area hit by Hurricanes are already eroding at a rate of several feet per year.
- The natural mending of washed-out beaches might not be possible because of the many structures and non-native landscapes maintained there, blocking dune re-establishment.



Floods...



- The problems start when flooding occurs in areas of large-scale human development.
- In areas largely inhabited by people, there are both positive and negative environmental effects of flooding.



Floods...



- **Floods can distribute large amounts of water and suspended river sediment over vast areas. In many areas, this sediment helps replenish valuable topsoil components to agricultural lands and can keep the elevation of a land mass above sea level.**



Tornadoes...



- Tornadoes are the most violent storms on Earth; intense rotating columns of air exceed 100 mph and can reach up to 300 mph.
- Tornadoes are an iconic symbol of the North American Great Plains.



Tornadoes...



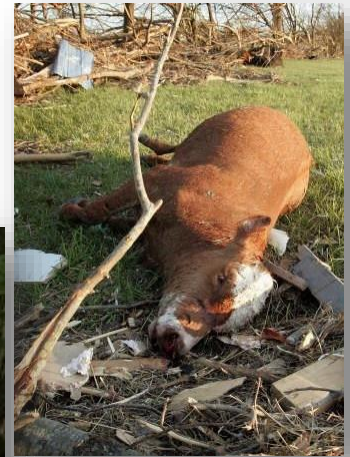
- Tornadoes and other catastrophic wind storms affect structure and composition of plant communities in forested areas, particularly in the Midwest.
- Tornadoes increase coarse woody debris and the number of snags, and they kill larger trees.



Tornadoes...



- Tornadoes destroy animal habitats, take away their food, or kill them right away, so they either don't have a place to live, don't have food, or die.
- Trees can fall and destroy their home.



Drought...



- A combination of record-high heat and record-low rainfall caused south and central Texas to be the region's deepest drought in a half century in 2009, with \$3.6 billion of crop and livestock losses piling up during the nine months.
- In late April 2009, the USDA designated 70 Texas counties as primary natural-disaster areas because of drought, above-normal temperatures and associated wildfires.



Drought...



- **At Lake Travis, a popular boating and fishing spot, officials closed the last of the lake's 12 public boat ramps in 2009 because of the lake's receding waters.**



Drought...



- During times of drought, trees and landscape plants often show the effects of the hot, dry weather.
- The 1999 and 2000 drought had an impact on plants in Texas.
- Drought is very harmful to trees, and it contributes to extreme conditions for forest and range fires.



Volcanoes...



- There are at least two extinct volcanoes in the Davis mountains of West Texas.
- There is an extinct volcano southeast of Austin; "Pilot Knob".
- The University Of Texas at El Paso sits on a volcano.
- Ash deposits from eruptions of the Yellowstone Caldera have been mapped in Iowa, Missouri, Texas, and northern Mexico.



Volcanoes...



- As lava, heat, and ash cover the landscape, trees and other plants are burned, buried, and destroyed; so volcanoes and plants don't mix.
- Short-term impact on plant life is death; the long term effect is positive.
- Eruptions bring magma from the Earth's core containing rich nutrients that plants need to survive.
- When volcanoes explode, the ash acts as a fertilizer, enriching the soil.



Fire...



- Damage caused by fire in the Gulf Coast Area has been minimal because prescribed fire is used as a tool for range management for cattle operations and wildlife management.
- Controlled fires in open areas have benefited the area by clearing up surface fuels.
- Tree mortality after a wildfire is minimal because fires in this region are mostly wind-driven with rapid rates of spread.



Fire...



- Many fires are started by lightning strikes, which are common during the summer storms, and may burn large areas of grassland.
- These fires have helped control juniper and oak trees in the higher, wet and cool areas, and keep desert shrubs controlled in the lower, dry and hot areas.



Fire...



- Due to human population growth in the High Plains, fire is no longer allowed to burn. As a result, the panhandle has seen a dramatic increase in the number of juniper and mesquite trees.
- Fires that occur today are much harder to control, because of overgrowth of grass fuel types.



Fire...



- Forest fires have many implications for biological diversity:
 - On the global scale, they are a significant source of emitted carbon, contributing to “global warming”.
 - At the regional and local level, they lead to change in biomass levels; alter the hydrological cycle with subsequent effects for marine systems such as coral reefs; and impact the functioning of plant and animal species.
 - Smoke from fires can significantly reduce photosynthetic activity and can be detrimental to health of humans and animals.



Earthquakes...



- Earthquakes do occur in Texas.
- During the twentieth century, there were more than 100 earthquakes large enough to be felt; their epicenters occur in 40 of the State's 257 counties.
- Four of these earthquakes have had magnitudes between 5 and 6, making them large enough to be felt over a wide area, and produce significant damage near their epicenters.



Earthquakes...



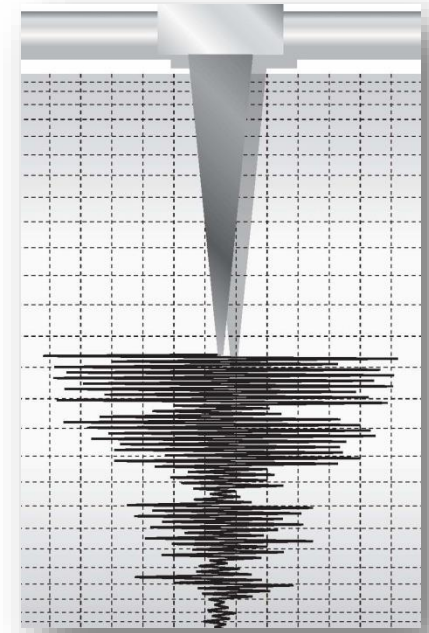
- There are four regions within Texas where earthquakes have occurred:
 - Two regions, near El Paso and in the Panhandle, should expect earthquakes with magnitudes of about 5.5-6.0 to occur every 50-100 years, and even larger earthquakes are possible.
 - In northeastern Texas the greatest hazard is from very large earthquakes (magnitude 7 or above) which might occur outside of Texas, particularly in Oklahoma or Missouri-Tennessee.



Earthquakes...



- In south-central Texas the hazard is generally low, but residents should be aware that small earthquakes can occur there, including some which are triggered by oil or gas production.
- Elsewhere in Texas, earthquakes are exceedingly rare. However, the hazard level is not zero anywhere in Texas; small earthquakes are possible almost anywhere, and all regions face possible ill effects from very large, distant earthquakes.



Catastrophic Events

