

M.Sc. Remote Sensing and GIS

RT-203

**Remote Sensing in Environmental
Science**

Unit-IV

**4.1 Natural Disasters -
Introduction**

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Disasters

- Disasters are hazards that cause destruction or environmental changes.

The types are

- Natural disasters
- Man made disasters



Natural Disasters

A natural disaster is the effect of a natural hazard (e.g., flood, tornado, hurricane, volcanic eruption, earthquake, or landslide)



List of top 10 natural disasters

1. Cyclone
2. Earthquake
3. Tornado
4. Volcanic Eruption
5. Tsunami
6. Flood
7. Wildfire
8. Drought
9. Avalanche
10. Landslide



Cyclones

- A cyclone is an area of closed, circular fluid motion. It has low pressure on the inside and high pressure on the outside.
- The center of the storm is called the eye and it has the calmest water and the lowest pressure

India

Bangladesh

Bay of Bengal



Cyclones

- Cyclones turn counter-clockwise in the northern hemisphere and clockwise in the southern hemisphere. This is because it follows the rotational movement of the earth.
- The biggest cyclone recorded is the Bhola cyclone. It hit the coast of today's Bangladesh in 1970 with a death toll of around 500,000.



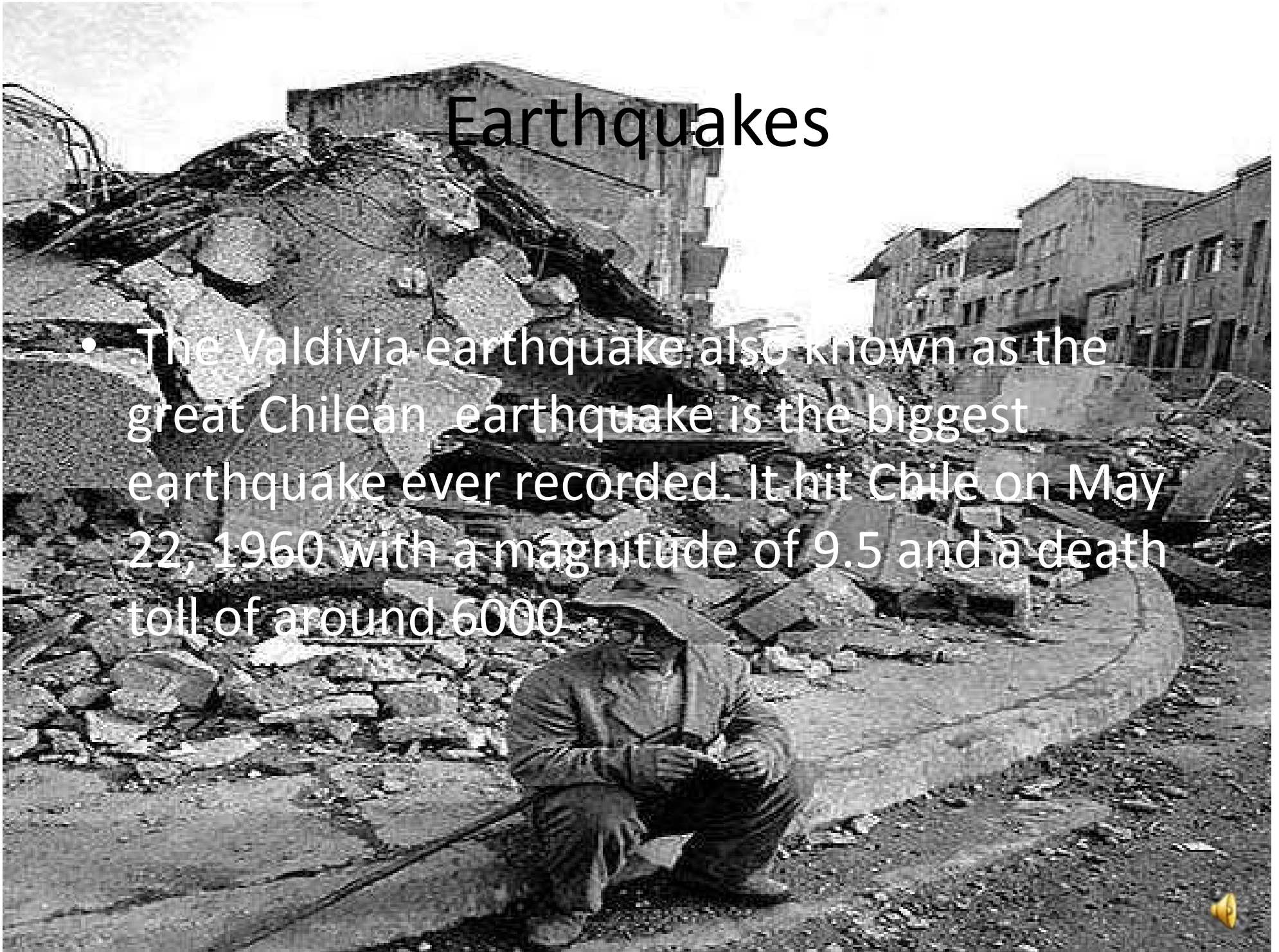
Earthquakes

- It is the result of a sudden release of energy from the earth's crust that creates seismic waves.
- They are measured using seismographs.



Earthquakes

- The Valdivia earthquake also known as the great Chilean earthquake is the biggest earthquake ever recorded. It hit Chile on May 22, 1960 with a magnitude of 9.5 and a death toll of around 6000



Tornados (Twisters)

- A tornado is a violently rotating column of air that is touching both the ground and a cumulonimbus cloud.
- Tornado conditions are caused when different temperatures and humidity meet to form thunder clouds
- “Twisters” can attain speeds up to 100 miles an hour

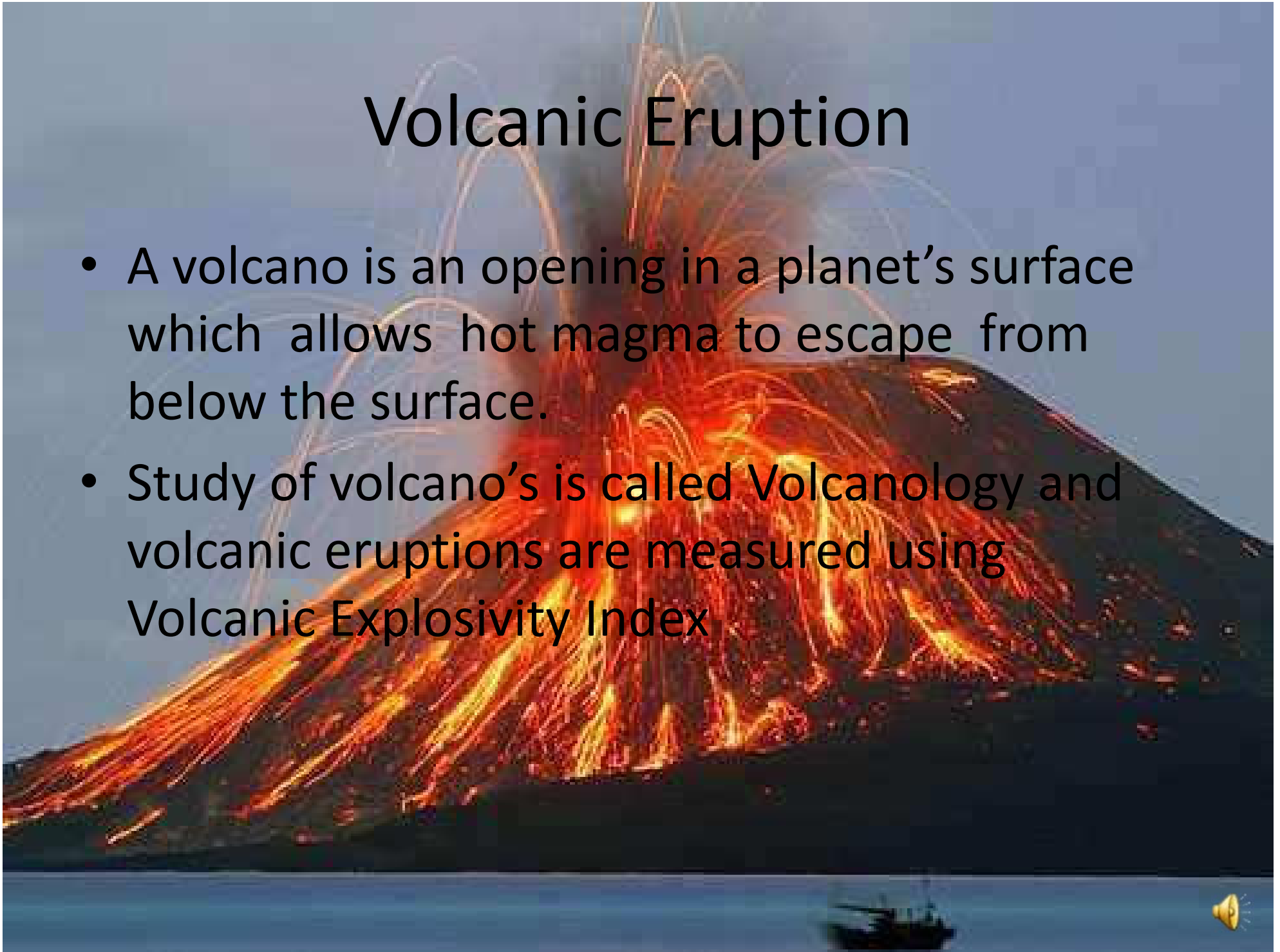


Tornados

- The biggest tornado recorded was the Hallam, Nebraska tornado on May 22, 2004. It was around 2.5 miles big and had a death toll of around 160.
- The deadliest tornado recorded occurred in Daultipur and Salturia, Bangladesh on April 26th, 1989. 1300 recorded dead and 12,000 injured.

Volcanic Eruption

- A volcano is an opening in a planet's surface which allows hot magma to escape from below the surface.
- Study of volcano's is called Volcanology and volcanic eruptions are measured using Volcanic Explosivity Index

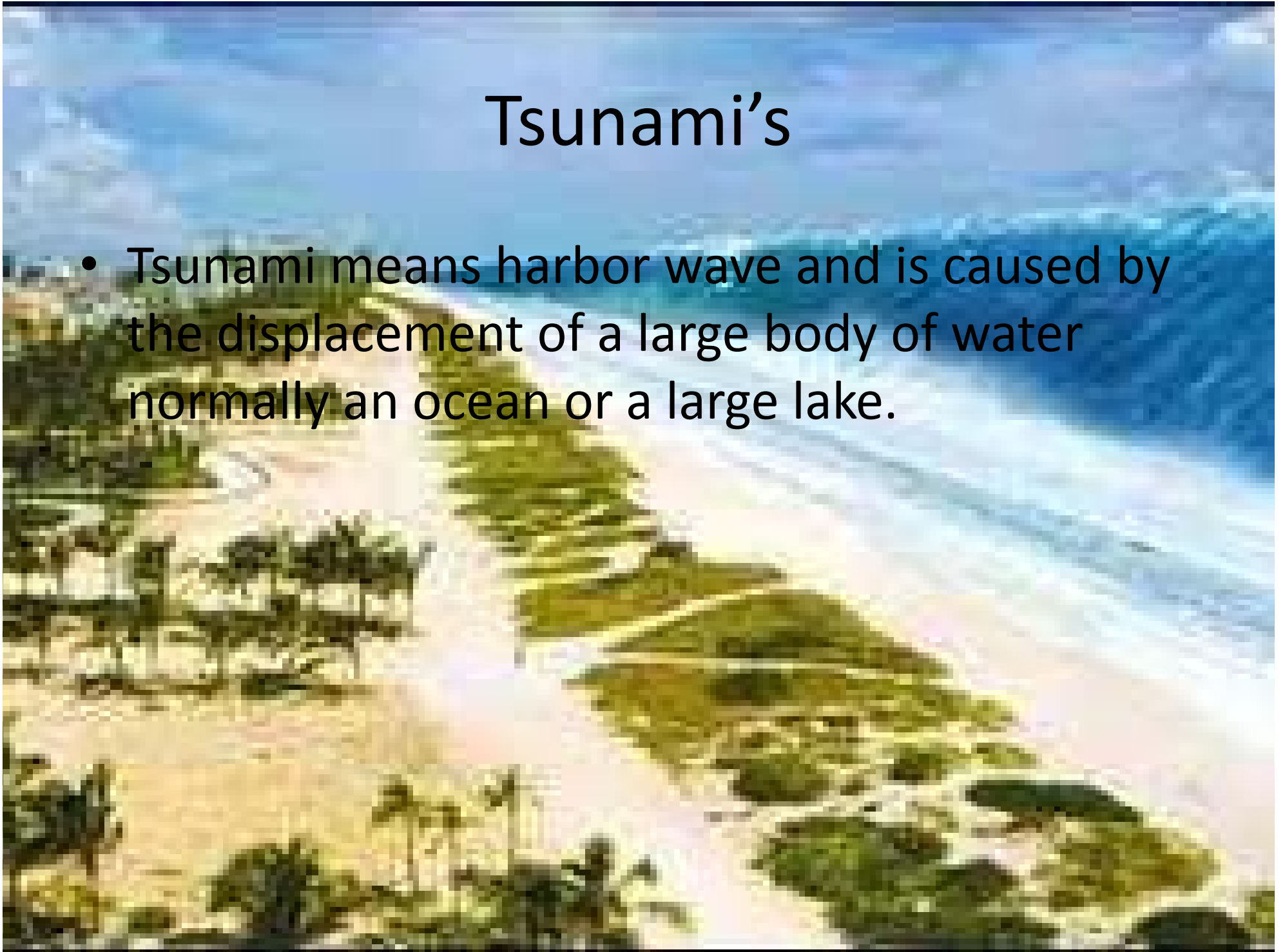


Volcanic Eruption

- The biggest volcanic eruption was Mount Tambora on April 10, 1815, it heard over 2000 km away and had a death toll of around 71,000. Due to the explosion 1816 became known as “The Year Without Summer”.
- The largest volcano known to humans is Olympus Mons on Mars. Olympus Mons means Mount Olympus and is bigger than Mount Everest.

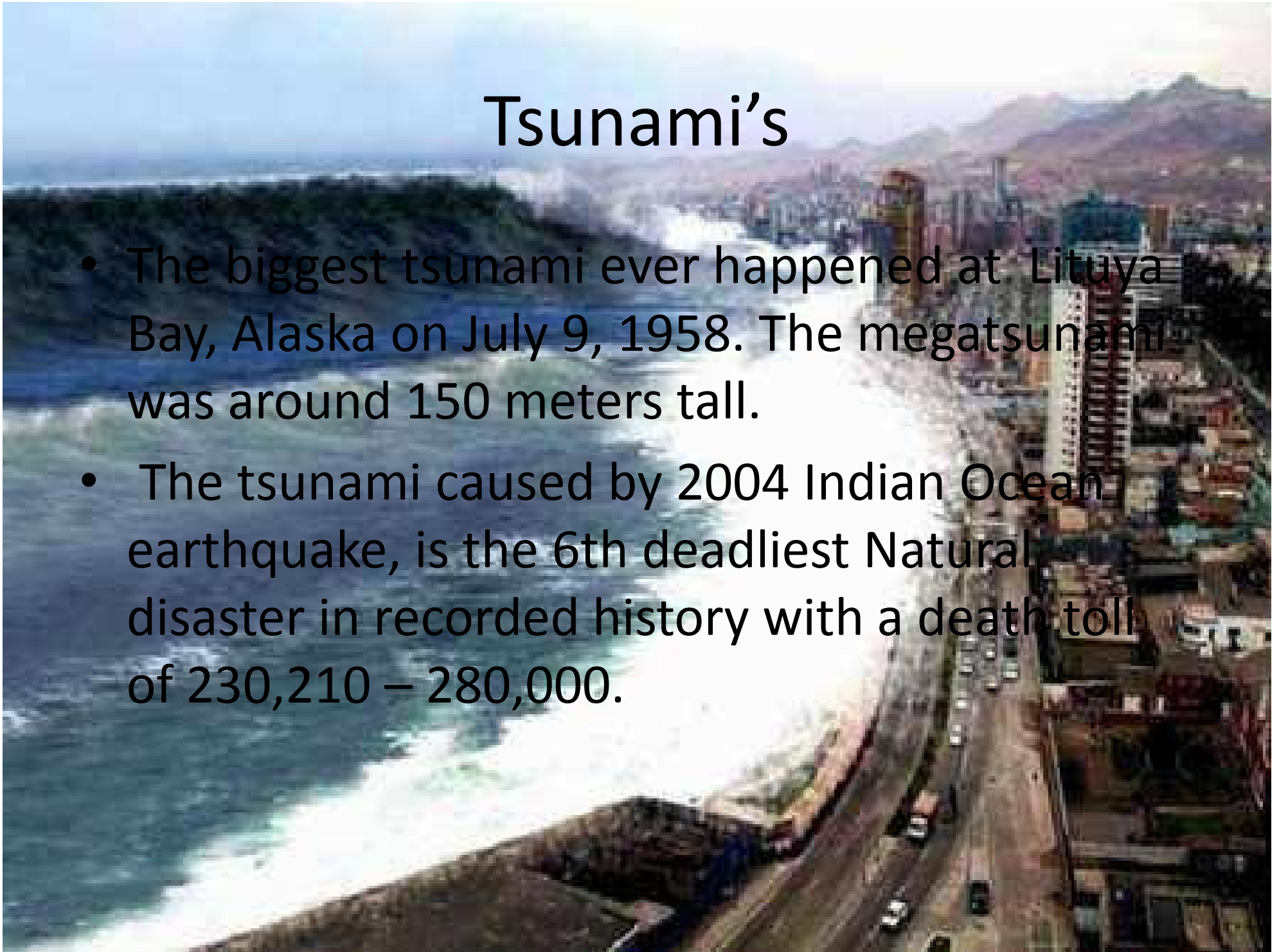
Tsunami's

- Tsunami means harbor wave and is caused by the displacement of a large body of water normally an ocean or a large lake.



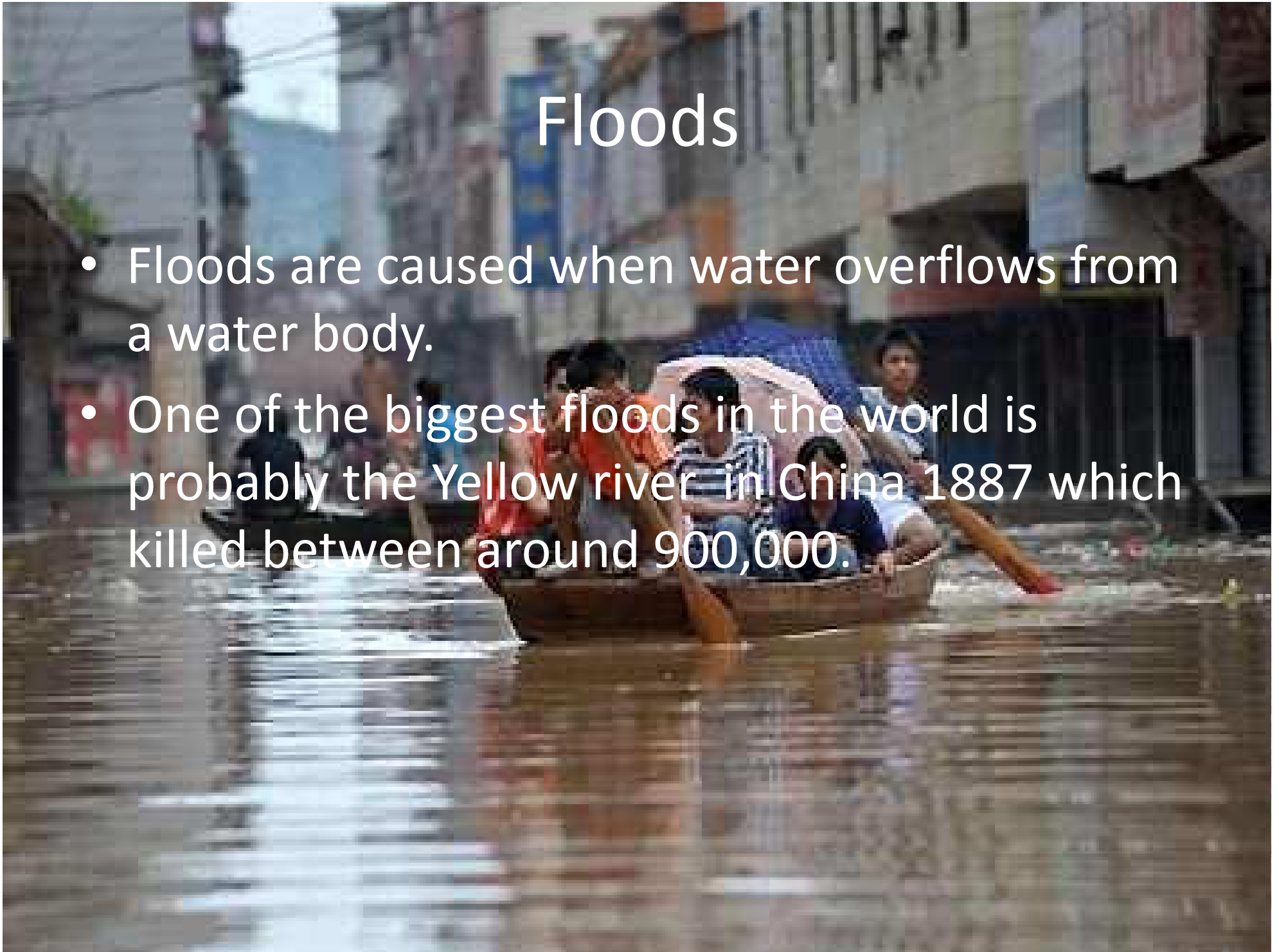
Tsunami's

- The biggest tsunami ever happened at Lituya Bay, Alaska on July 9, 1958. The megatsunami was around 150 meters tall.
- The tsunami caused by 2004 Indian Ocean earthquake, is the 6th deadliest Natural disaster in recorded history with a death toll of 230,210 – 280,000.



Floods

- Floods are caused when water overflows from a water body.
- One of the biggest floods in the world is probably the Yellow river in China 1887 which killed between around 900,000.

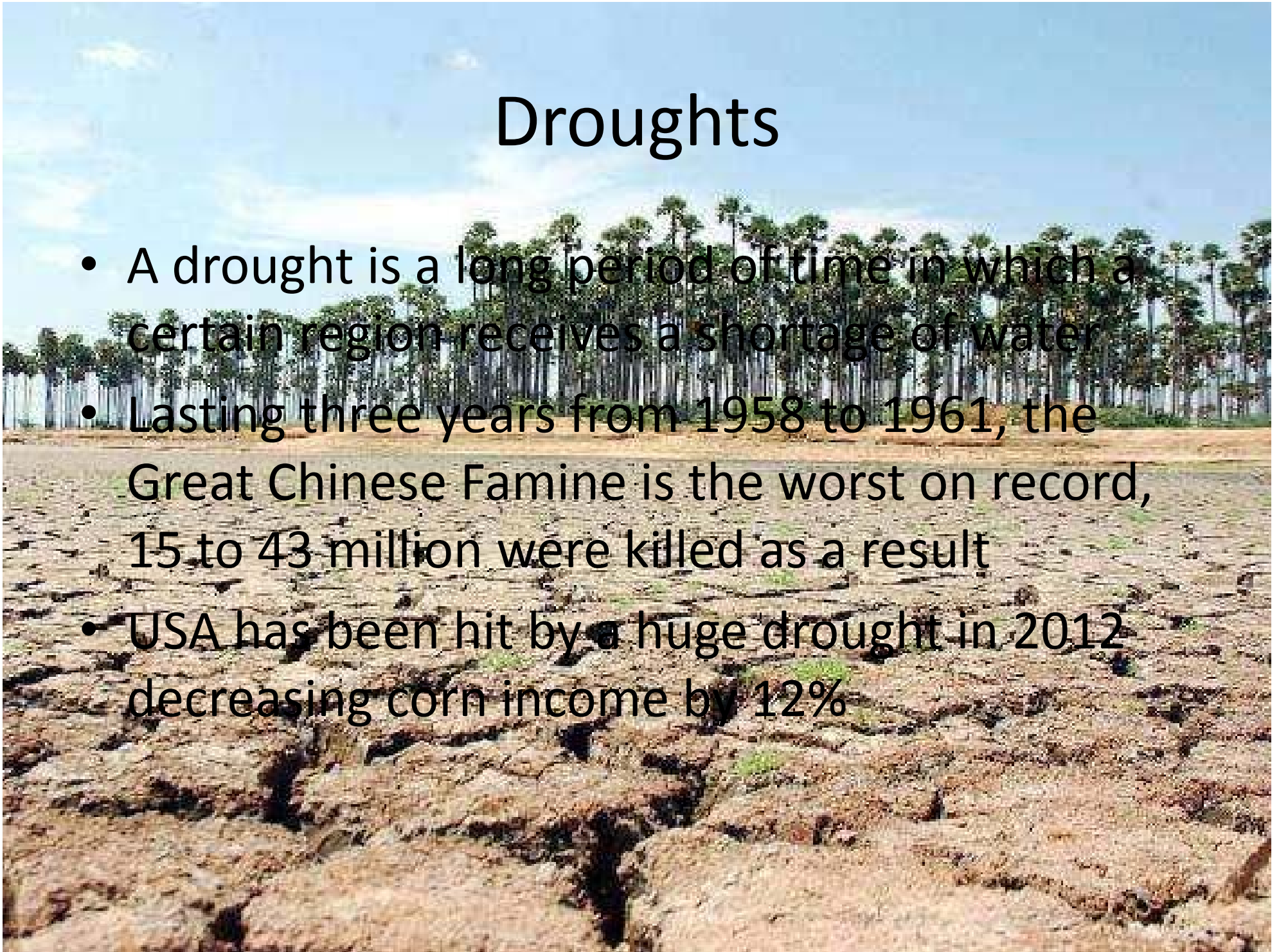


Wildfire

- A wildfire is any uncontrolled fire in the countryside or wilderness.
- Other names for a wildfire are brush fire, bushfire, forest fire, desert fire, grass fire, hill fire, peat fire, vegetation fire, and veldfire.
- One of the largest wildfire is the 1910 wildfire

Droughts

- A drought is a long period of time in which a certain region receives a shortage of water
- Lasting three years from 1958 to 1961, the Great Chinese Famine is the worst on record, 15 to 43 million were killed as a result
- USA has been hit by a huge drought in 2012 decreasing corn income by 12%

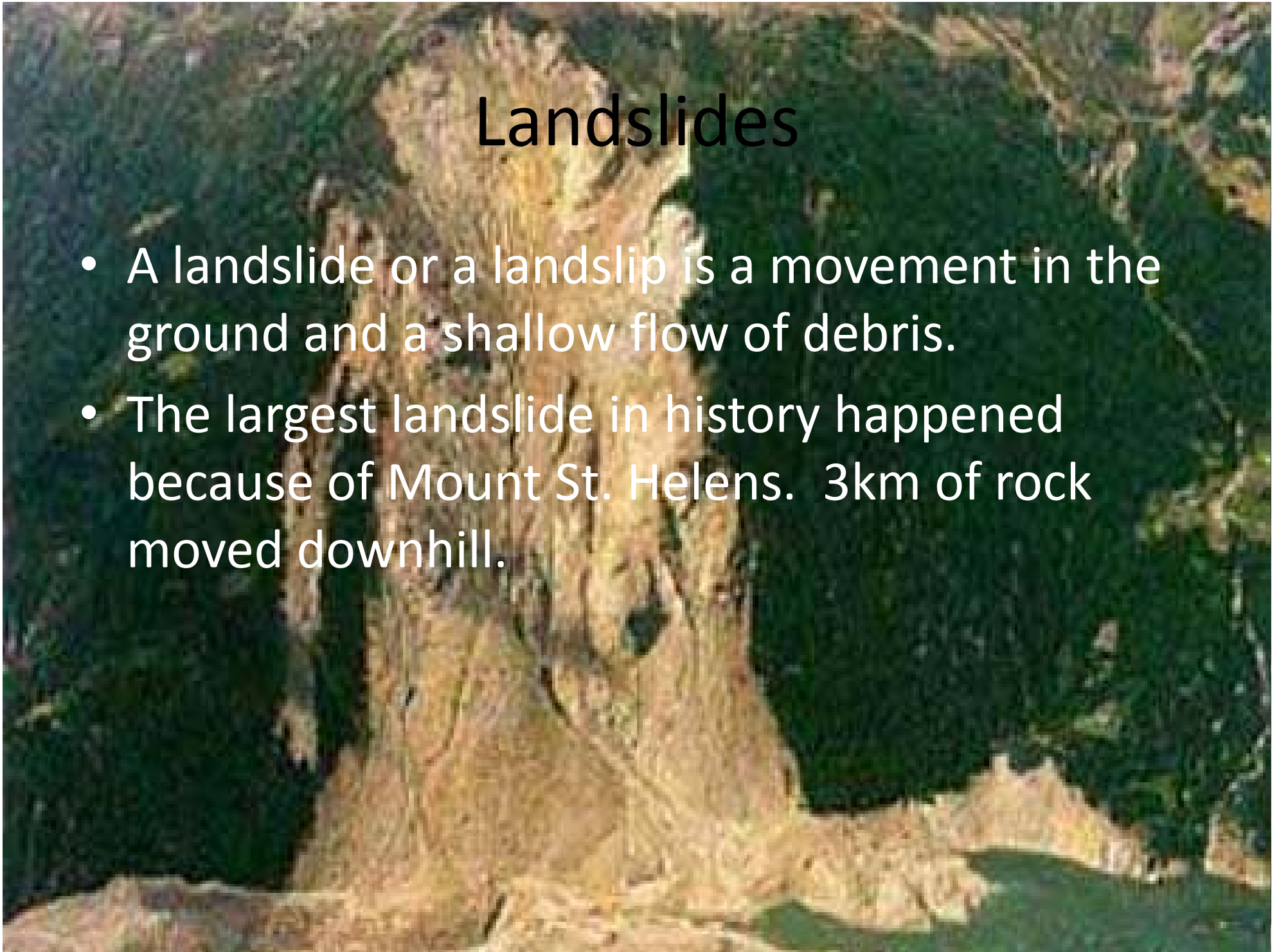


Avalanches

- An avalanche is a sudden and drastic drop of snow
- The biggest avalanche happened on Mt. Huascarán killing 20,000

Landslides

- A landslide or a landslip is a movement in the ground and a shallow flow of debris.
- The largest landslide in history happened because of Mount St. Helens. 3km of rock moved downhill.



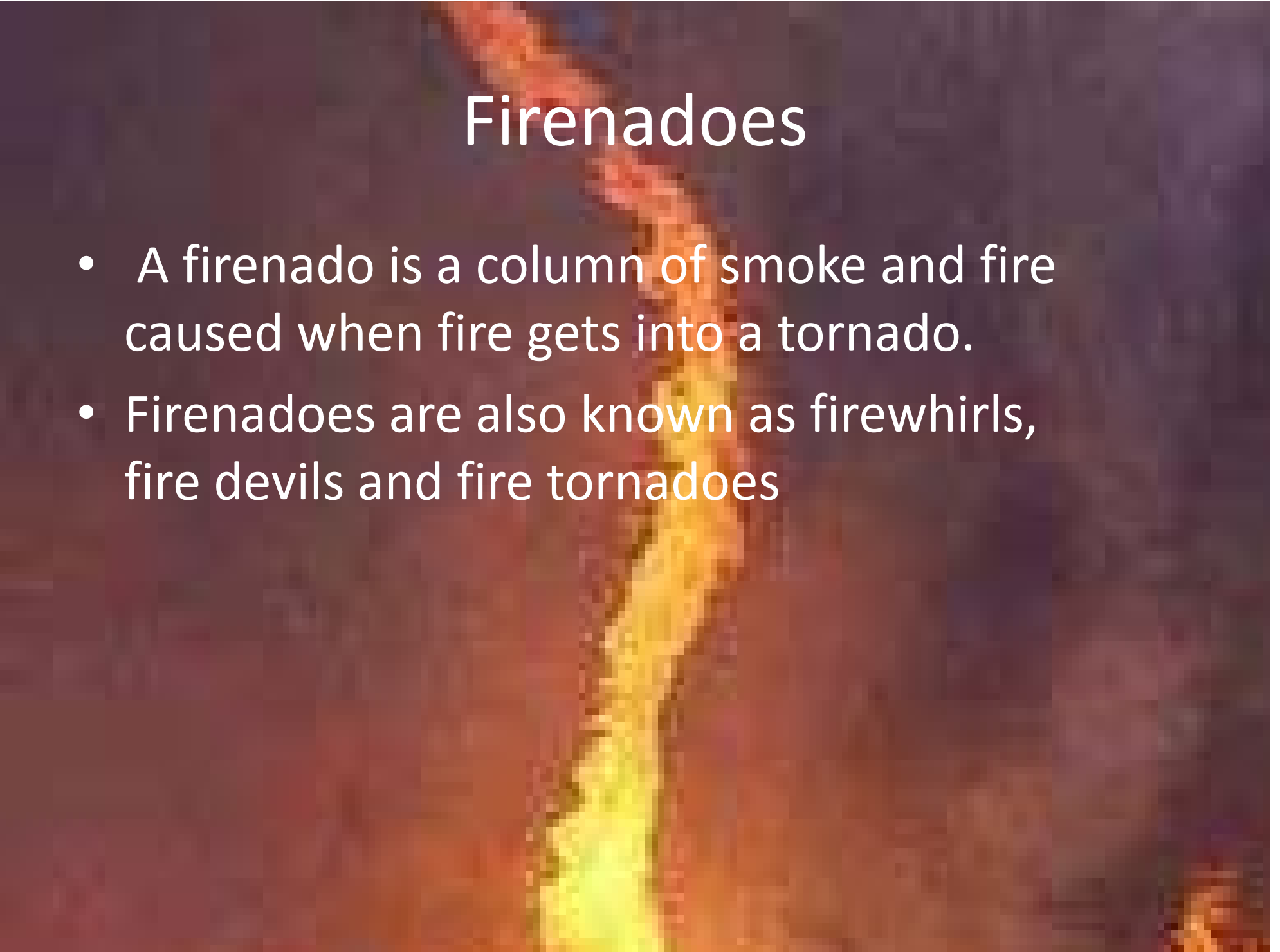
Unusual Natural Disasters

- Firenadoes
- Limnic Eruptions



Firenadoes

- A firenado is a column of smoke and fire caused when fire gets into a tornado.
- Firenadoes are also known as firewhirls, fire devils and fire tornadoes





Limnic Eruptions

- A limnic explosion is also called a lake overturn and is caused by an explosion of gas from the lake (normally carbon dioxide) erupting and suffocating people.
- There are only three exploding lakes. They are Lake Menoun, Lake Nyos and Lake Kivu

Limnic Eruptions

- The biggest eruption ever recorded is Lake Nyos killing 1800 people and many animals.
- The biggest danger is Lake Kivu which would cause a methane explosion and kill around 2 million.
- Interestingly all these lakes are in Africa and both Menoun and Nyos are in Cameroon.