

### Paleoclimatology

the study and reconstruction of climate records over the history of the Earth, typically focusing on time and locations without direct human observation and records

The bulk of paleoclimate research is devoted to...

Quaternary Period and the Holocene

### Oscillations

Natural ranges and shifts in climate from one extreme to another

### Proxy

A preserved record of something where changes in the record are controlled by the weather

### Inner Earth Structure

-Solid metal inner core

-Molten metal outer core

-Taffy-like mantle of rock

Thickest layer

High temperatures & pressure  
make rocks flow slowly

-Thin crust

0.38% of radius of the earth

### Plate Tectonics

Mechanism describing movement of landmasses over time and space

1912: Alfred Wegener proposed continental drift

Not accepted until 1950's & 1960's with advent of seafloor spreading and plate tectonics

## Pangea

"Super Continent" 225 Million years ago

## How can we tell continental drift exists?

Matching mountain ranges across oceans

Appalachians & Anti-atlas in North Africa

## Orogenesis

(Oros = mountain, genesis = start)

Simple crumpling & folding of upper plate

Rocky Mountains, Alps

Volcanic arc

Andes, Japan, Indones

## Convergent Boundary

Two plates colliding

*One plate goes under the other*

-Subduction zone

## Subduction Zone Hazards

-Most dangerous boundary

-Volcanic dangers

## Divergent Boundary

Two plates separating or 'rifting'

Magma from mantle 'fills in gap'

Sea-floor spreading

Birth of seas and oceans

Red Sea & Great Rift Valley of Africa are young rifts

## Transform Boundary

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Two plates sliding past each other

San Andreas fault

No volcanoes, but earthquakes

Plates get stuck, then finally the stress overcomes the friction and the plates move = earthquake

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### Volcanoes

Found along subduction zones

As one plate dives into mantle, magma rises through crust and makes volcanoes

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### Pacific Ring of Fire

Pacific plate nearly surrounded by subduction zones

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### Cinder Cone

Comprised mostly of ash and tephra

Steep, symmetrical slopes (~35°)

Not very tall or long-lived

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### Stratovolcano

Steep conical volcano

Built by calm & explosive eruptions

Quite dangerous

Slope of mountain = ~20-30° at top, less on flanks

Mt. Rainier, Mt. Fuji, Mt. Saint Helens

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### Shield Volcano

Very large, but rather 'flat'