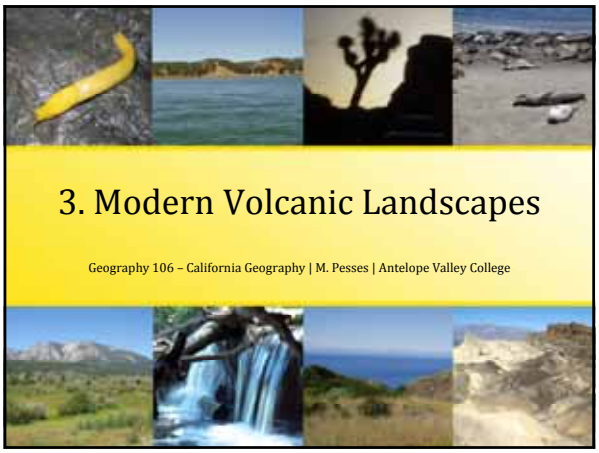
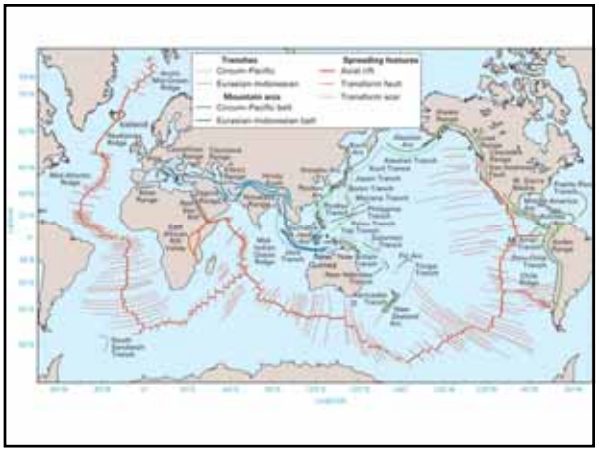
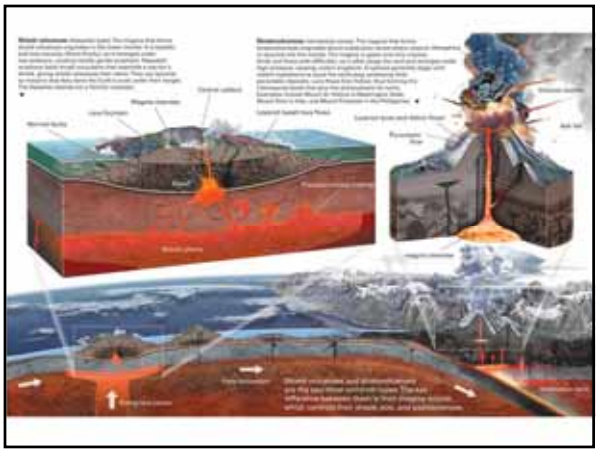


Today

- More on plate tectonics
- Modern volcanic landscapes





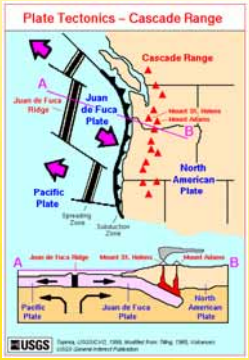
California Volcanism

4 regions

- Cascades & Modoc Plateau
- Basin & Range
- Imperial Valley south of Salton Sea
- Region north of Sonoma & Napa Valleys up to Clear Lake

The Cascades & Modoc Plateau

- Southern tip of Cascades reaches Northern Calif.



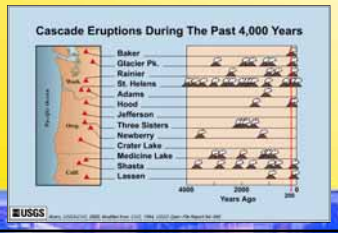
Mt. Shasta

- One of the largest in the range (14,162ft)
- Rises 10,000 feet from the surrounding topography

Mt. Shasta

"Recently" active

- erupted, on the average, at least once per 800 years during the last 10,000 years, and about once per 600 years during the last 4,500 years.



Mt. Shasta

Stratovolcano (composite)

- Combination of lava flow & pyroclastics
- Youngest lava flow – 9,200 years old

Lassen Peak

- Started forming 11,000 years ago on top of destroyed Mt. Tehama
- Considered active and monitored by USGS

The Cascades & Modoc Plateau

- Andesite (extrusive, continental basalt-like rock), Basalt, Rhyolite, Obsidian

Lassen Peak

- Had explosive eruption in 1915
  - Ash cloud seen from Sacramento
- Some smaller eruptions in 1920s

Modoc Plateau

- Modoc's volcanic landscapes
  - Built up from lava flows since the Miocene (25 million years ago)
  - Lava Beds National Monument

Columbia Plateau

Modoc's volcanic landscapes

- Plateau really SW edge of Columbia Plateau

Columbia Plateau

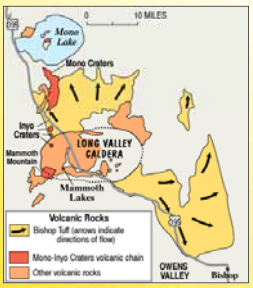
Eastern Sierra Nevada/Basin & Range

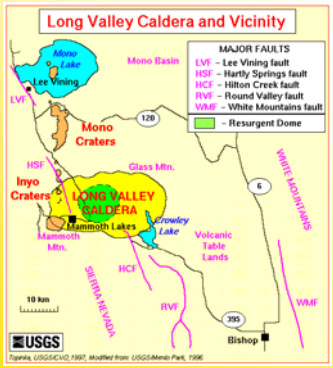
Mammoth Area

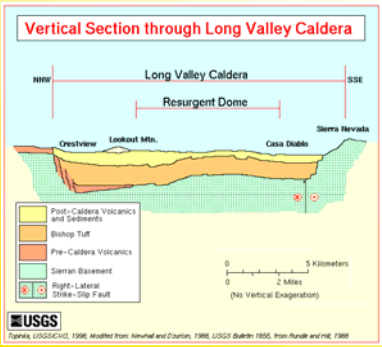
- 730,000 years ago, Long Valley Caldera formed after huge explosion

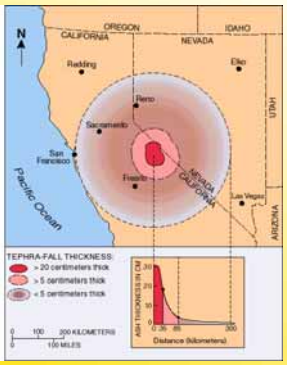
Long Valley, California

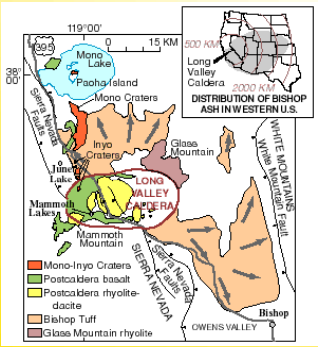
- Huge explosion
  - 2000x > Mt. St. Helens
- Early 1980s
  - Many quakes, building?
- Monitored by USGS











Devil's Postpile National Monument

600,000 years ago

Panum Crater

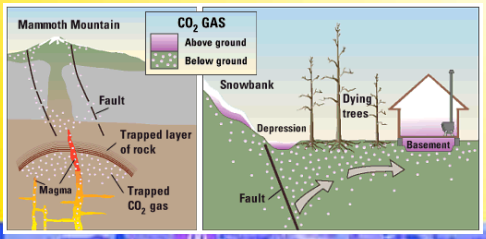
600 years old ash deposits

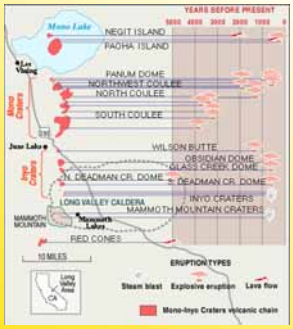
Carbon Dioxide

- CO_2 emissions
  - 1200 tons coming up each day
  - Result of moving magma
  - Killing trees

Carbon Dioxide

- Breathing air with more than 30% CO_2 can very quickly cause unconsciousness and death





Ubehebe Crater

Cinder Cones

- Composed of *pyroclastic* materials
  - Ejected into atmosphere then returned to cone
  - Forms steep sides
- Often short-lived
- Moderate explosive eruptions

Imperial Valley, South of Salton Sea

Where transform San Andreas runs into diverging plates

- Stretching & thinning of Imperial Valley Crust

Imperial Valley, South of Salton Sea

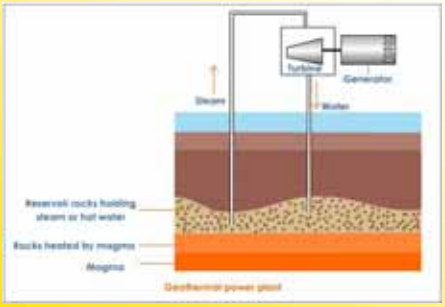
Mud pots

- Hot muddy "volcanoes" from geothermal activity

Sonoma to Clear Lake

Big area for geothermal energy

- Water pumped through pipes into magma heated ground
- Steam returns to surface to turn energy turbine



Next Time

- California's tectonic landscapes