



Types of Volcanoes



Volcanoes: Introduction

Volcanism:

- When magma reaches surface
- Eruptions of lava flows or pyroclastic materials



Volcanoes: General Description

Volcano:

- Cone-shaped mountain around a vent
- Where lava, pyroclastics, gases erupt



Volcano:

Magma: Molten rock ***below*** Earth's surface

Lava: Molten rock ***on*** Earth's surface

Tephra: Material ejected from a volcano

Ash: particles less than 2mm

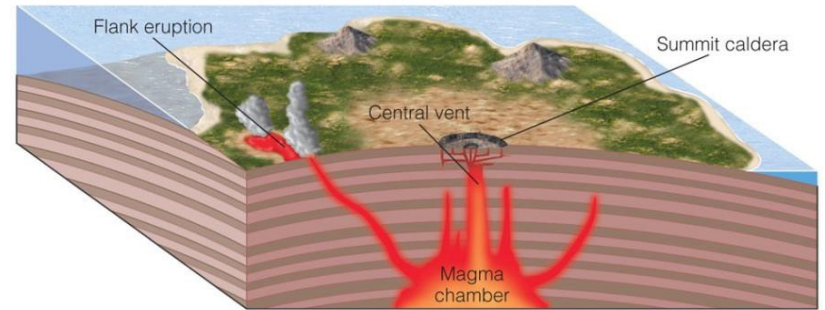
Bombs: Extremely hot, partially melted
large rocks – can explode on
impact w/ground

Volcano Types:

Shield Volcano

- Large, gently sloped volcanoes ($5\text{-}10^\circ$)
- Mostly lava flows; very little pyroclastics
- Low viscosity lavas
- Largest volcanoes on Earth

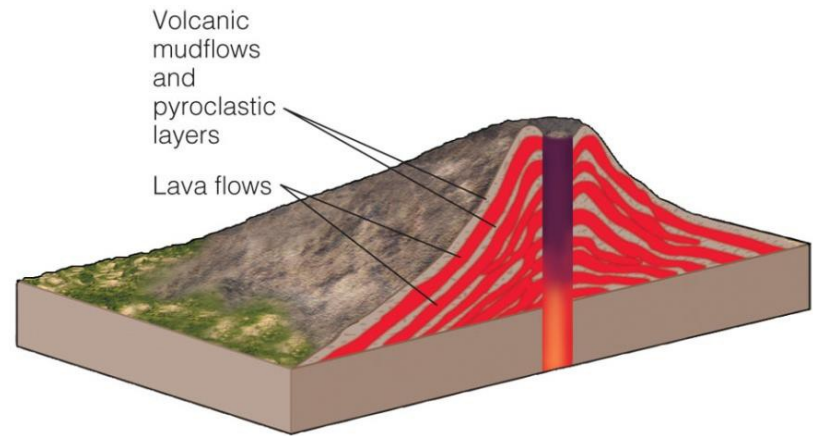
Ex: Mt. Kilauea



Volcano Types:

Composite Volcanoes (Stratovolcanoes)

- Smaller & steeper than shields; larger and gentler than cinder cones
- Volcanic eruptions are usually explosive.
- Alternating layers of ash and lava create a composite volcano
- Composite volcanoes mostly occur at convergent boundaries (subduction zones)

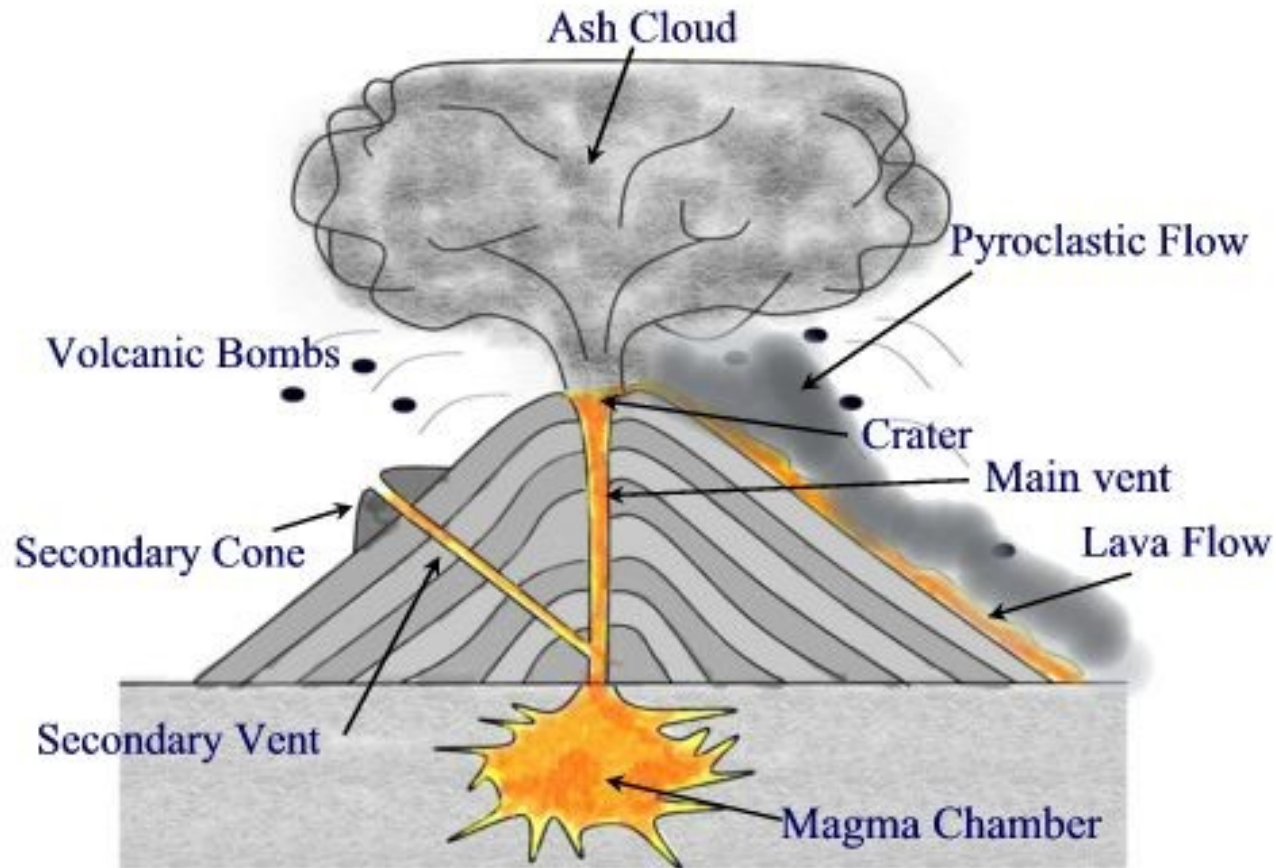


Ex: Mt. Rainier (all Cascade volcanos)



Volcano Types:

Composite Volcano - Eruption



Main Features of a Volcano

Volcano Types: **Composite** **Volcano - Lahars**

- Volcanic mudflows
- Muddy slurry; rain fall or snowmelt mixes with tephra



Volcano Types:

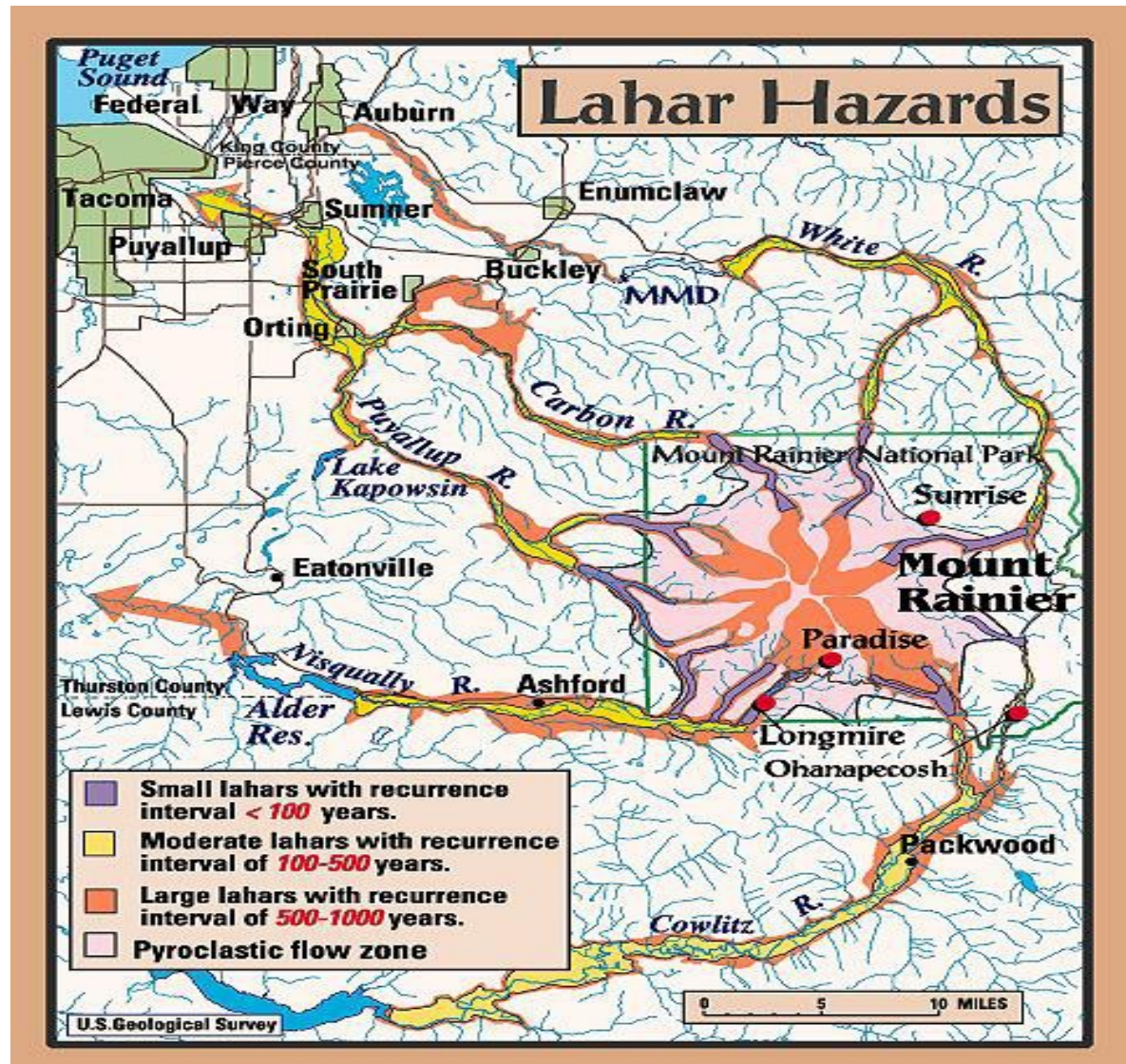
Composite Volcano - Lahars



Volcano Types:

Composite Volcano - Lahars

Mt. Rainier Lahar Hazard Map



Volcano Types:

Composite Volcano — Pyroclastic Flow

- Hot ash, embers, and poisonous gas
- Up to 1000 degrees Celsius (1830 Fahrenheit)
- Moves very fast up to 450 mph



Volcano Types:

Composite Volcano — **Pyroclastic Flow**

- Has the ability to knock down trees and small buildings
- Buries, burns, and destroys everything in its path on impact.
- In 1902, Mount Pelee's pyro-flow killed 30,000 people



Volcano Types:

Composite Volcano – St. Helens



Photo taken early 1980



Present day



**Eruption could be felt
and seen hundreds of
miles away**

Volcano Types:

Composite Volcano – St. Helens



Car buried in mud 17 miles away from Mt. St. Helens

This photo was taken 2 years after the eruption, this once great forest was still trying to recover



Escaping the ash on a beautiful afternoon in May

Hot ash covered everything and traveled hundreds of miles



Volcano Types:

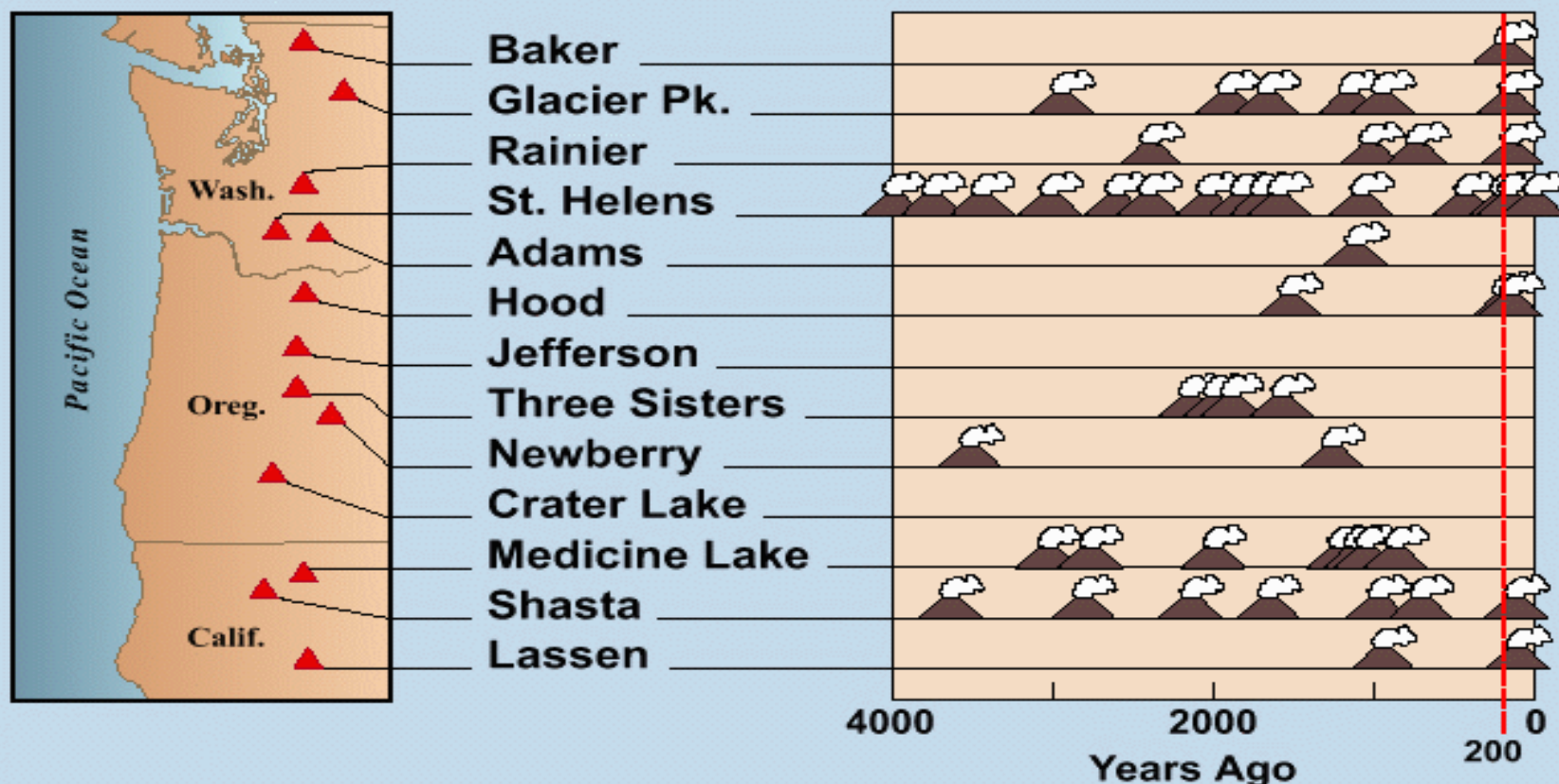
Composite Volcano – St. Helens



Volcano Types:

Composite Volcano - Cascades

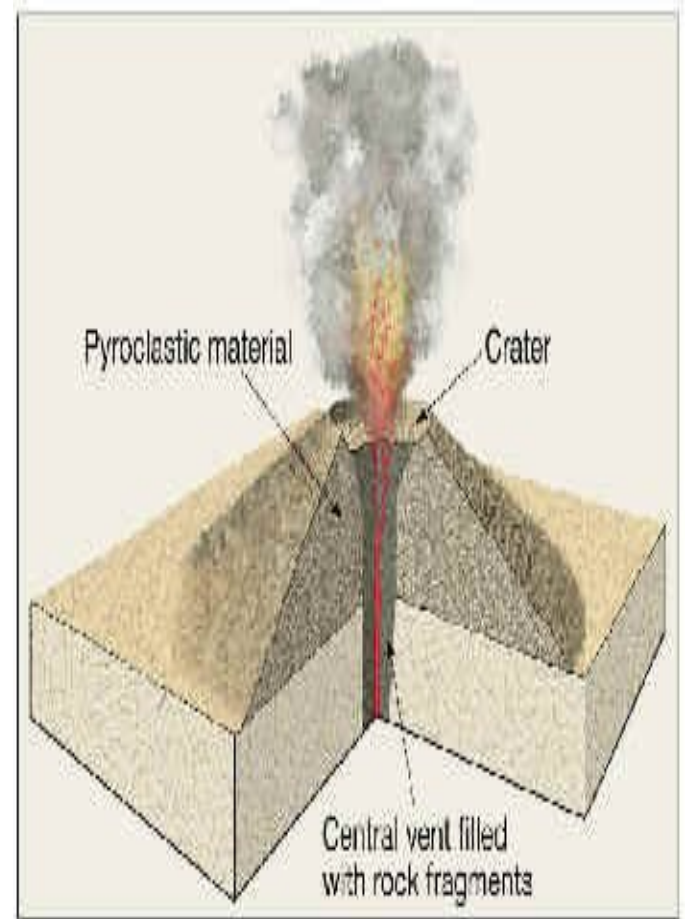
Cascade Eruptions During The Past 4,000 Years



Volcano Types:

Cinder Cone Volcano

- Smallest. Has steep sides (30 degree slope) and is loosely packed
- Explosive eruptions throw lava and bits of rock high into the air
- Bits of rock or solidified lava dropped from the air are called cinders which range in size from ash to large rocks



Volcano Types:

Cinder Cone Volcano - Sunset Crater



Volcano Types:

Cinder Cone Volcano - Paricutin



- On February 20, 1943, Paricutin, a cinder cone volcano, formed from the crevasse in a cornfield and grew to be several hundred meters tall in just a few days. This volcano continued to erupt for 9 years and grew to be over 1300 feet tall.
- This gave modern scientists the opportunity to witness the birth of a volcano