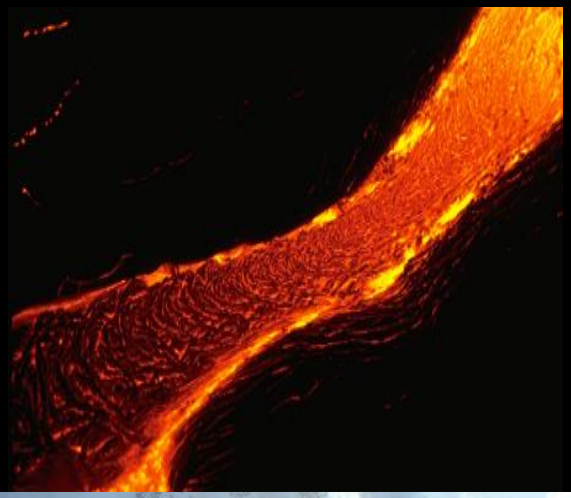
Effusive vs. Explosive

What makes them blow up or ooze?

Two types of lava:



Runny lava: Basalt

- **Covers 10's of km**
- **Travels up to 40km/hr!**

Sticky lava: Silica

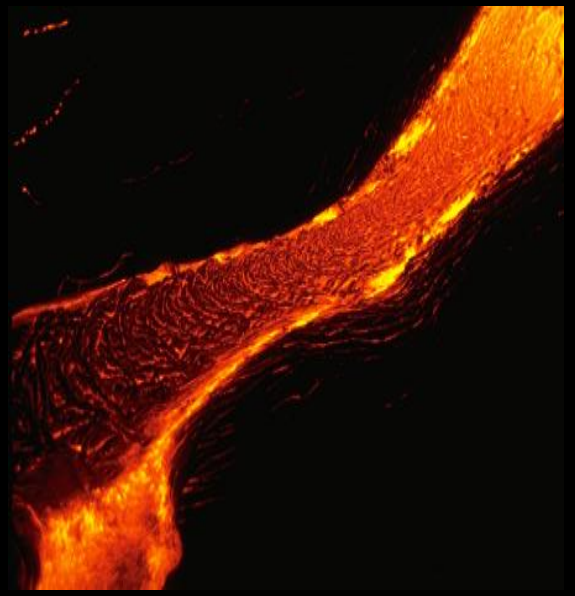
- **Covers <1km**
- **Travels <<1km/hr**

Flow Speed Depends On:

viscosity **(runny or sticky)**

topography **(steep or flat)**

geometry **(channelized/tube or broad flow)**



Effusive Volcanoes

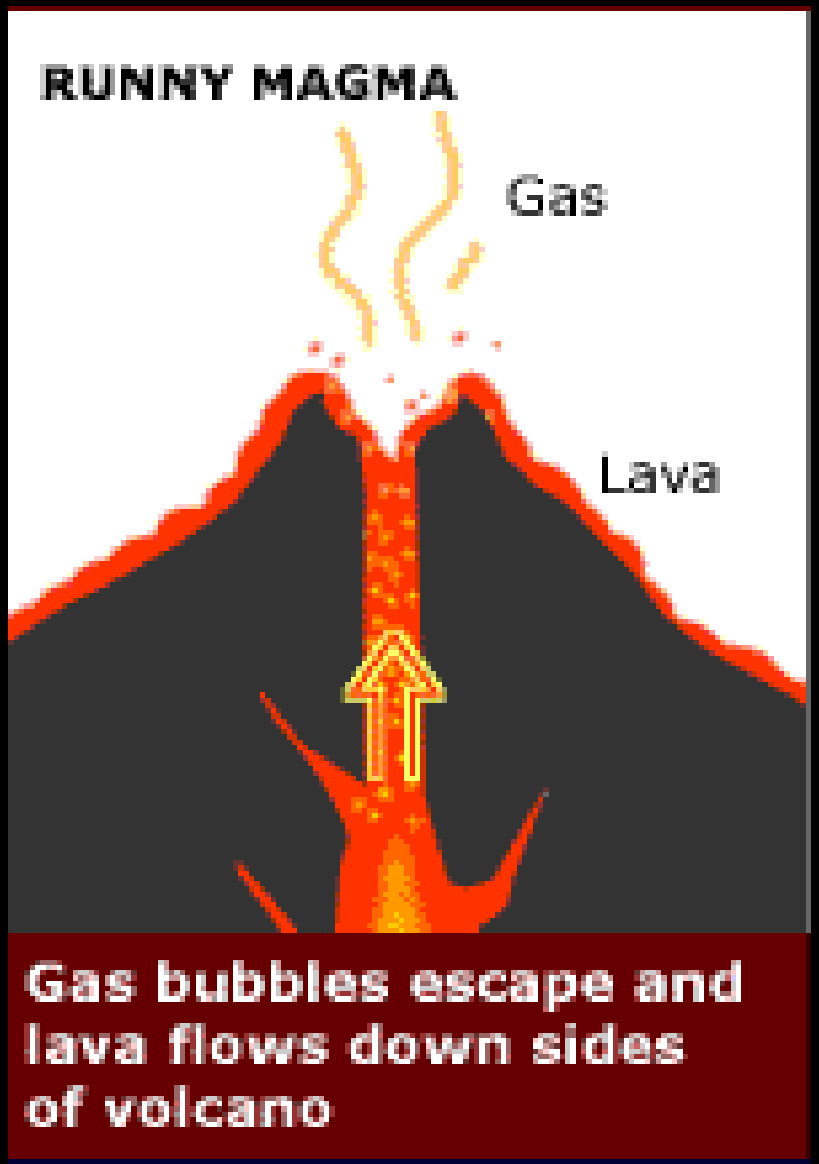
- Also known as non-explosive
- Runny lava (low in silica) allows gas to escape
- Gas can escape so no pressure builds up
- Lava runs down the sides

Lava flows

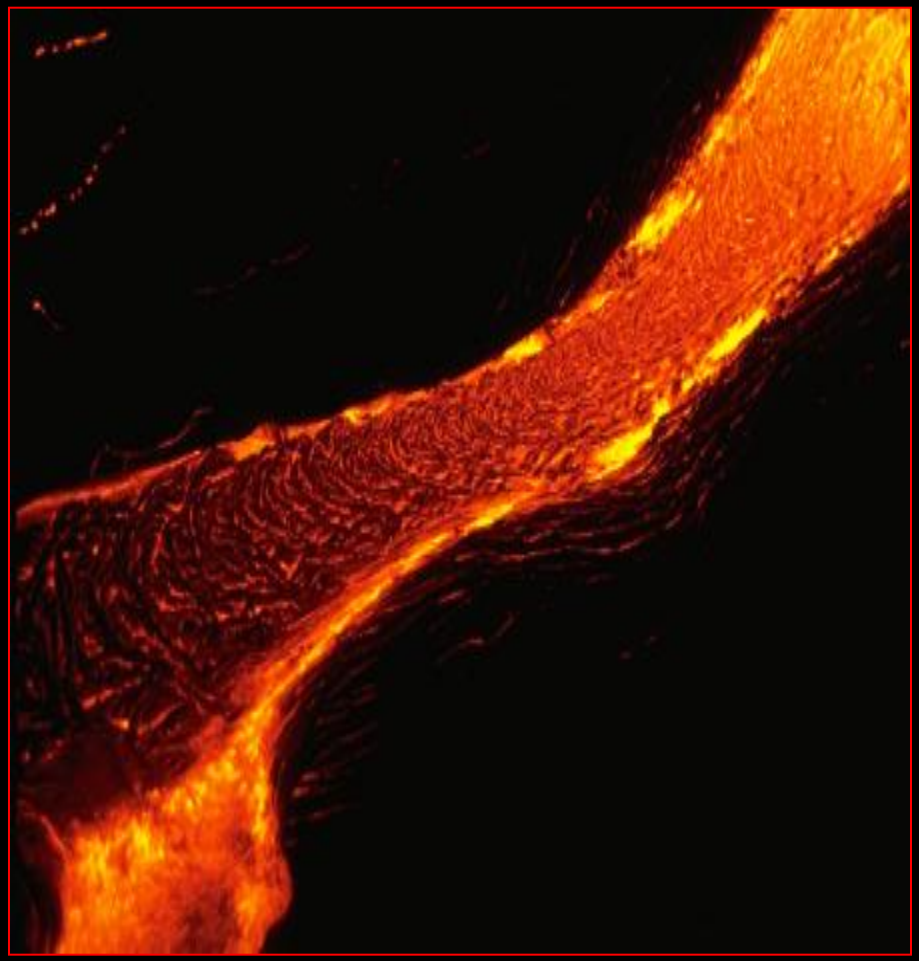
Impact of: Lava Flows

Video Clip

Effusive Volcanoes



Basalt Lava



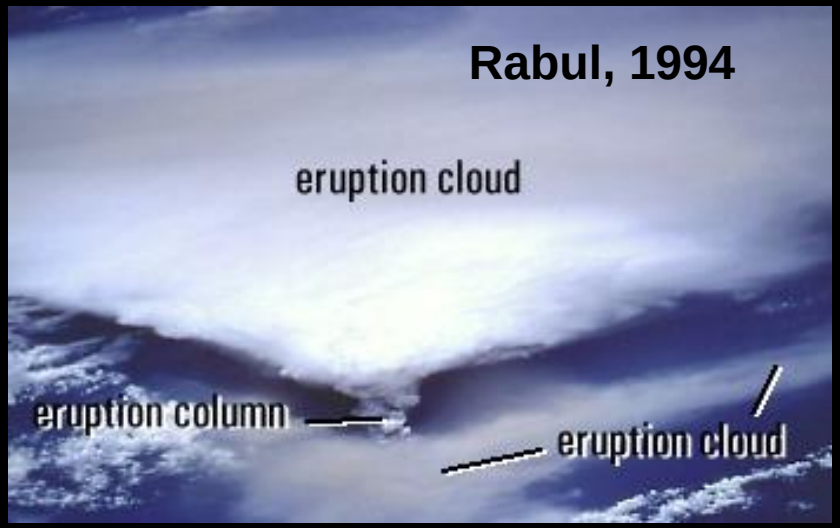
Explosive Volcanoes

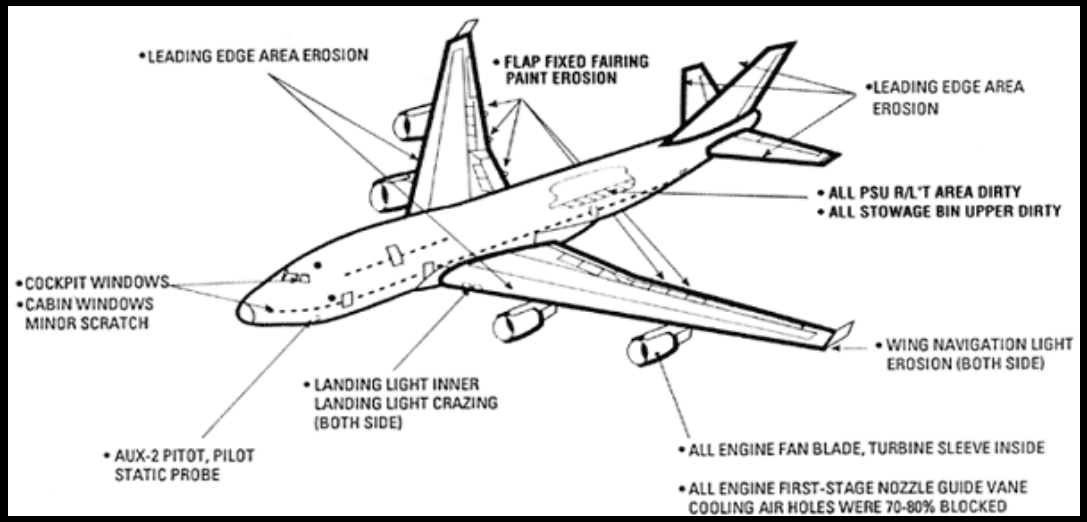
- Has sticky lava (high in silica) which holds the gas in
- Gas cannot escape so pressure builds up
- Once the pressure is too great, the top explodes ejecting rock fragments, ash, and lava into the air

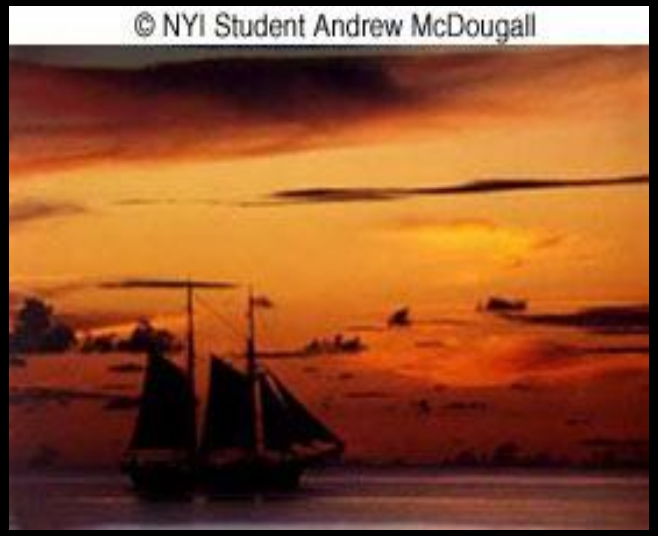
Explosive Volcanoes

Silica Lava

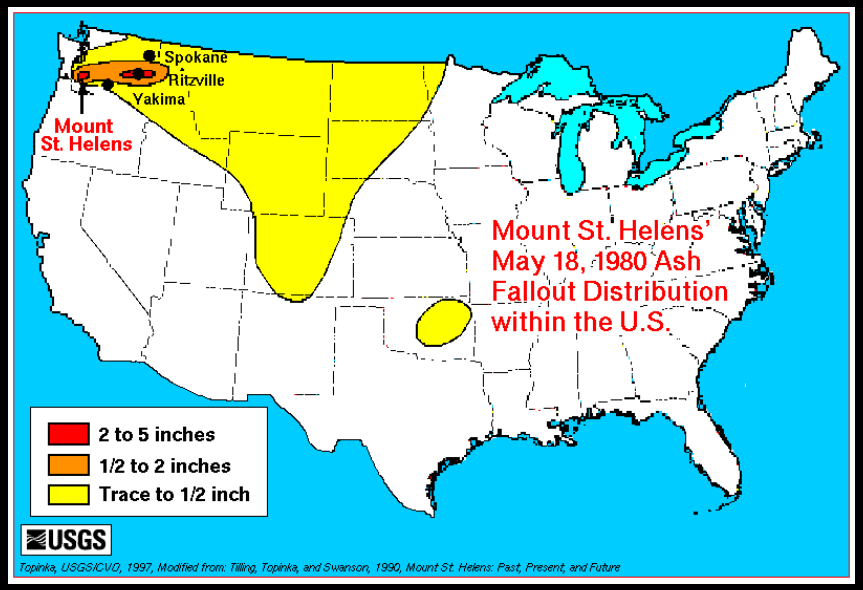
Impact of: Ash clouds







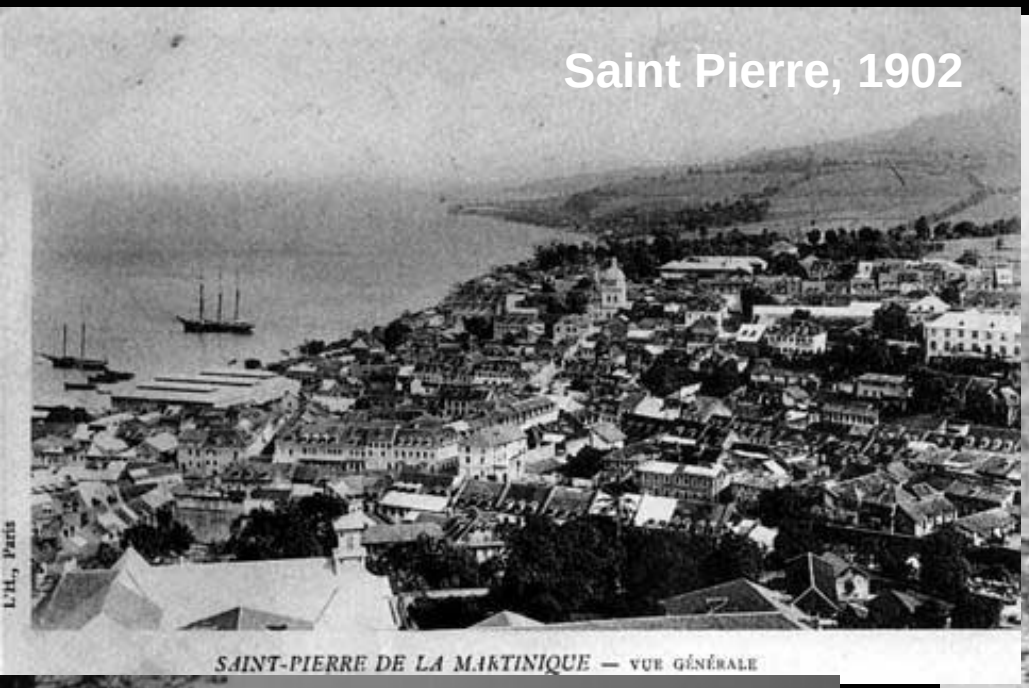
Impact of: Ash fall



Video Clip

Pyroclastic flows

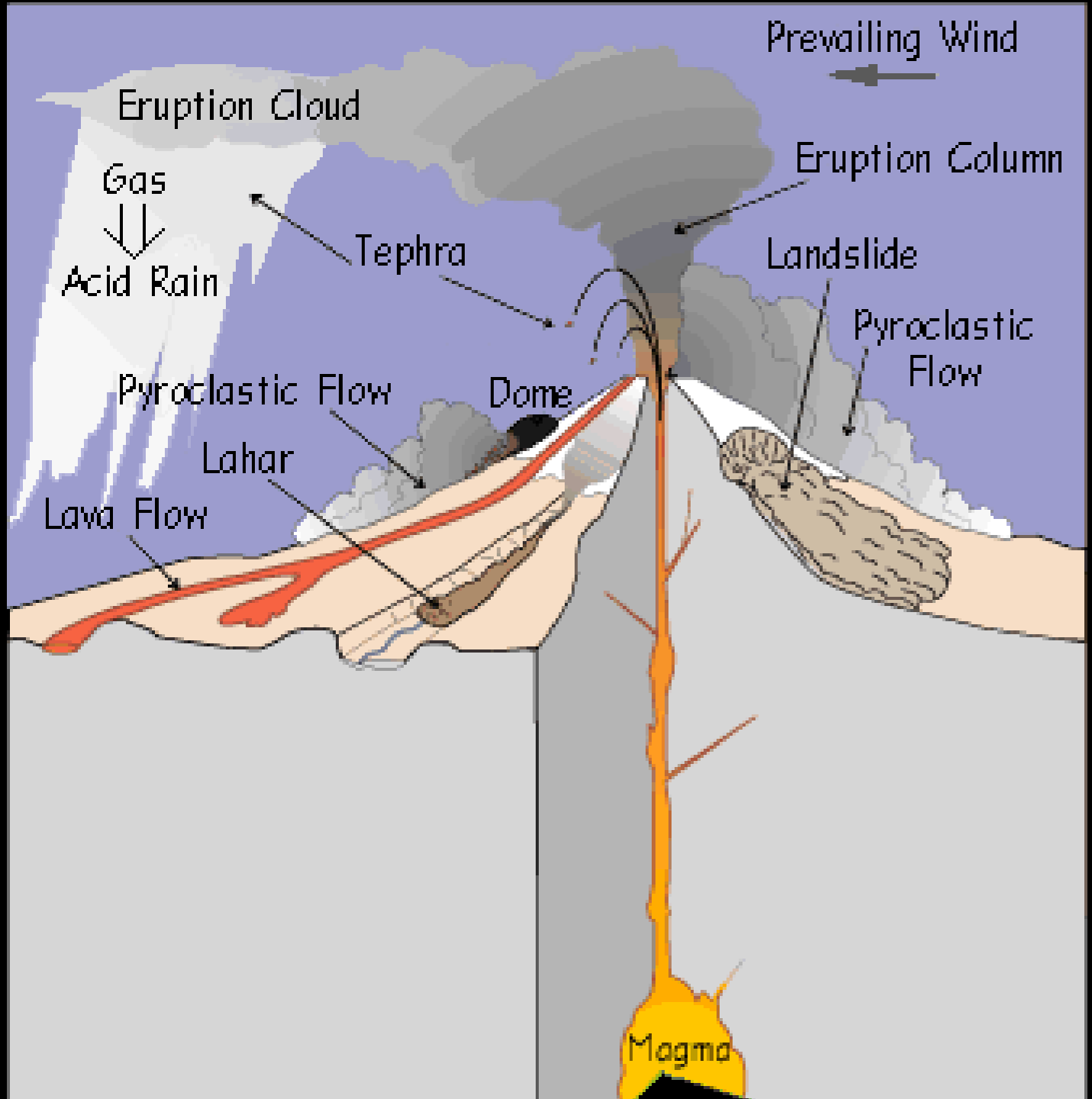
Impact of: pryoclastic flows



Impact of: Mud flows

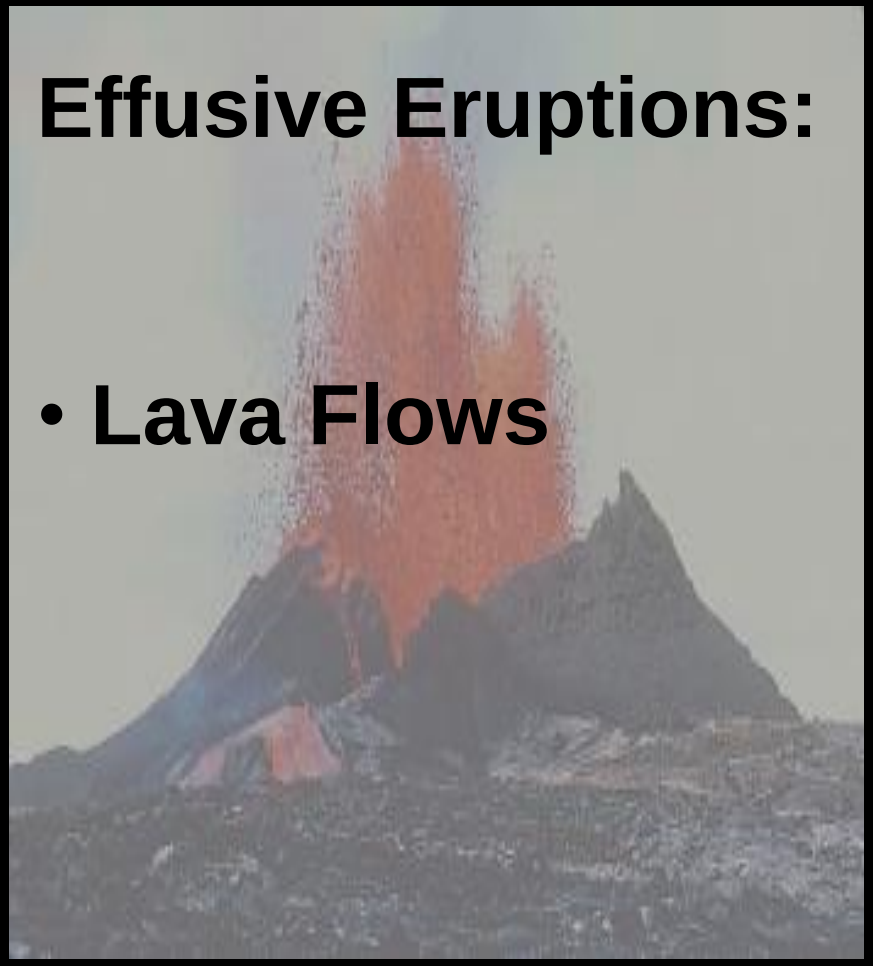
Nevada del Ruiz, 1985: 23,000 deaths

Video Clip


Prevailing Wind
Eruption Cloud
Eruption Column
Gas
Acid Rain
Tephra
Landslide
Pyroclastic Flow
Pyroclastic Flow
Dome
Lahar
Lava Flow
Magma

Volcanic Hazards

Effusive Eruptions:



- Lava Flows

Explosive Eruptions:

- ash clouds/falling
- pyroclastic flows
- lahars/mud flows

All Volcanoes: Volcanic gas, landslides, local earthquakes

Living with volcanoes: Reducing volcanic risk

- Establish observatories to monitor volcanic behavior
  - Cascades volcano observatory
  - Alaska volcano observatory
  - Hawaii volcano observatory
  - Long Valley observatory
  - Yellowstone volcano observatory
- Emergency Planning
- Warning schemes

Volcano-Monitoring Techniques