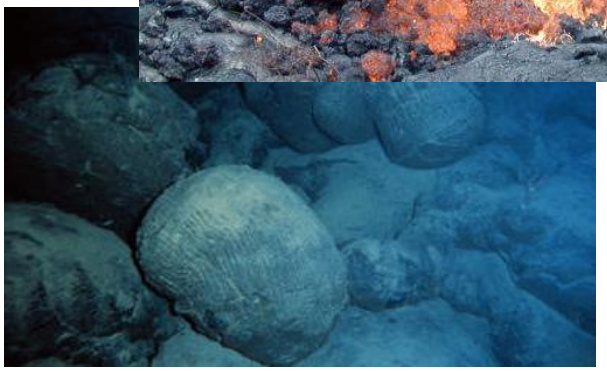
Volcanic Materials: Lava

Lava ("the liquid") is mostly molten rock:

- **Pahoehoe lava -**
  basaltic lava, low viscosity (flows easily), allows gases to escape.

- **Aa lava** (pronounced "aa-aa") **-**
  basaltic lava, higher viscosity; solidifies flowing, forms angular pieces.



- **Pillow lava -**
  lava extruded *underwater*; cools and contracts, forms spherical masses; found at the ocean floor.

***Viscosity* of lava is mostly determined by the *amount of silica* in it.**

Volcanic Materials: Solid

Ash and pyroclastic material ("the solid") is airborne material ejected by a volcano:

- **Volcanic ash**
  < 0.06 mm to 2 mm; composed of rock, mineral, and volcanic glass

- **Cinders**
  2 mm to 64 mm; composition same as ash hazardous when falling!

- **Bombs**
  > 64 mm, shapes vary; formed by molten rock solidifying in the air

Volcanic Materials: Gases

Significance?
Determines violence of an eruption:

High gas = violent eruptions!

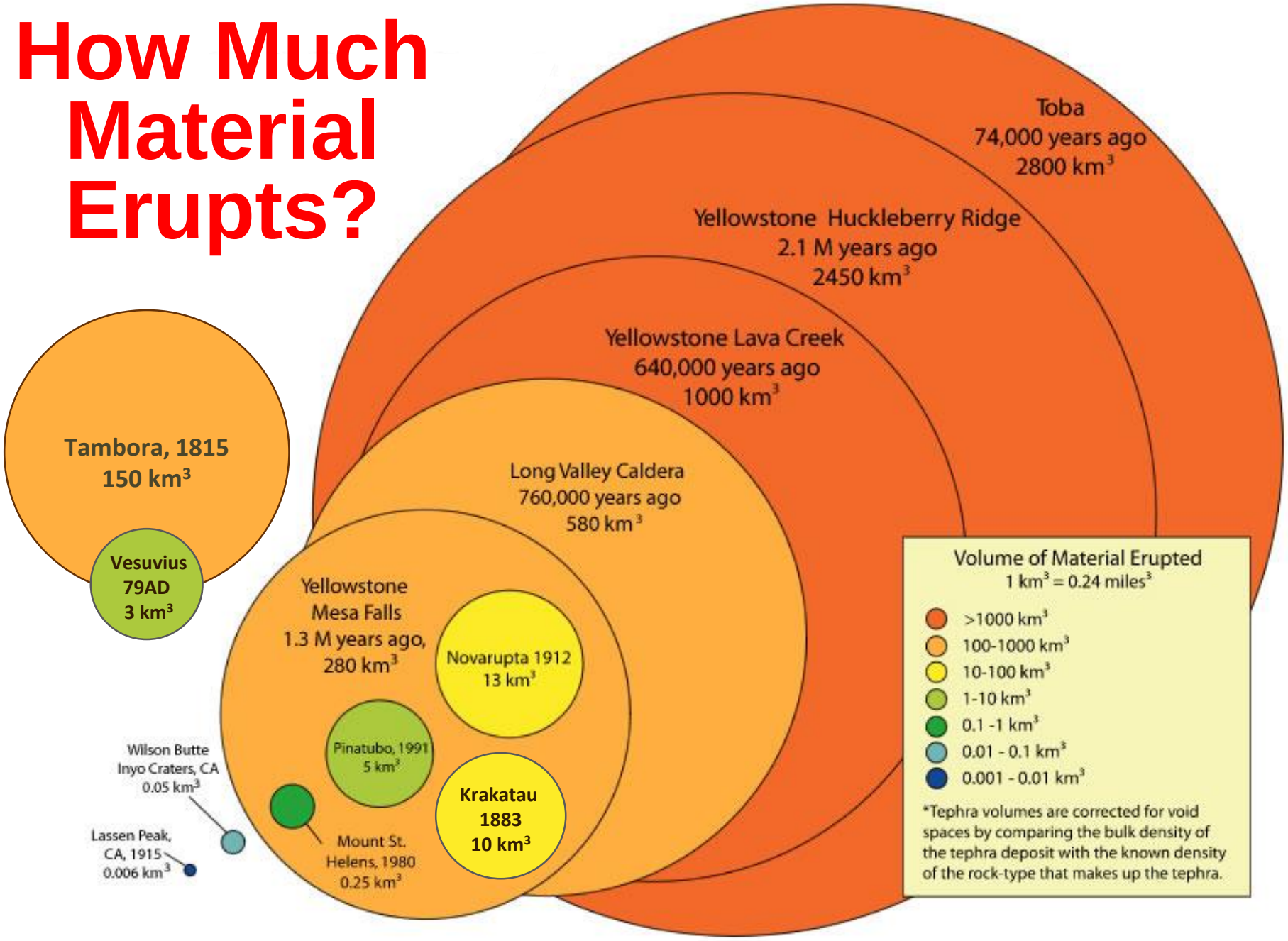
- **Volatiles** (substances that easily boil and evaporate)

H_2S – Hydrogen sulfide
H_2O – Water vapor
SO_2 – Sulfur dioxide
CO_2 – Carbon dioxide
N_2 – Nitrogen
HCl – Hydrochloric Acid

Effect on global climate

← block sunlight
← greenhouse gas

How Much Material Erupts?



Dangerous volcanoes are constantly being monitored by volcanologists using the following methods:

- **Measuring small quakes**
  - **increase in number & intensity before eruption.**
- **Measuring slope**
  - **bulges may form with magma pushing up.**
- **Measuring volcanic gases**
  - **outflow of volcanic gases (*sulfur dioxide, carbon dioxide*) may precede eruption.**
- **Measuring temperature from orbit**
  - **monitoring changes in temperature over time.**