

### Volcanoes

#### Shield Volcanoes

low angle profile; large successive basaltic flows

#### Non-explosive (mafic) eruptions

Low viscosity flow produces various morphologies (lava flow, fissure eruptions, pillow basalts, etc)

#### Stratovolcanoes

steep-sloped, built up from *tephra*; layered pyroclastics + viscous lava

#### Explosive (intermediate/felsic) eruptions

Higher viscosity flow produces composite or stratovolcanoes, domes, and calderas (crater-like volcanoes)

**Tephra** - Volcanic rock fragments from explosion including ashfall, lapilli, bombs, and blocks

### Earthquake Hazards

**Liquifaction** - When water-saturated, unstable sediments are transformed into substance that acts like liquid

**Tsunamis** - Seismic sea waves that occur when earthquakes change the seafloor; Tsunamis can harm multiple countries.

### Earthquakes

An earthquake occurs from a sudden displacement of rocks along a fault. The released energy radiates out as *seismic waves*. Body waves turn into surface waves when they encounter earth's surface

#### Body waves:

**P-wave** - The fastest seismic wave and are the first signal from an earthquake to arrive and produce a push pull motion in the direction of travel (shaking).

**S-wave** - Perpendicular to P-waves, S-waves produce a side to side motion and are more destructive.

#### Surface waves:

**Love waves** - Move horizontally and cause horizontal shifting side to side

**Surface R-waves** - Last to arrive, land surface behaves like water rotating in an up and down motion.

**Seismic waves** - The energy from an earthquake that travels through earth in vibrations

