VESUVIUS - AD79

- Precursors
- Phase I - plinian fall
- Phase II - surge and flow
- Geologic record
- Volcanic cycles
- Current risk

Precursor

- Major earthquake
  - February 5, 62 AD
- Little other evidence
- Inhabitants did not know this was a volcano
- Revolt of the slaves
  - Encampment in the caldera area

Phase I - plinian fall

- Local fine crystal-rich ash
- Large black cloud, 1:00 PM Aug. 24
  - rose to 20 km
- Initial composition highly-evolved (white)
- Later composition more basic (grey)
- ~ 3.0 km³ erupted (mostly grey)

Phase II - surge and flow

- Column begins to collapse
- Surges begin to arrive ~1:00 am Aug. 24
- Surges continue to arrive until ~ 8:00 am
- Surges increase in intensity with time
- Many accretionary lapilli horizons
- Most people killed by the surges and flows
Archeological Record

- Pompeii
- Herculaneum
- Other sites
  - Oplontis
  - Bosco Reale

Pompeii

Oplontis
Geologic record

- Basal fine ash
- Pumice fall
  - white pumice
  - gray pumice
- Surge and flow deposits
- Lahars?

Interpretations

- Initial small hydromagmatic event
- Major plinian column
- Emptying of zoned magma chamber
  - 3 to 5 km deep
- Major hydromagmatic event
  - Implosion of chamber walls
- Collapse of summit (caldera formation)
Volcanic cycles

- Definition of a cycle
- Cycles at Vesuvius
- Short term activity
- Medium term activity
- Long term activity
- Significance for prediction

Current risk

- Currently in a state of repose since 1944
- Recent earthquakes detected
- Forecast of next event
  - intermediate (100s of years repose)
  - catastrophic (1000s of years repose)
- Risk (500,000 to 2,000,000 people)
- Mitigation