**Samalas Unorganised Notes**

(Guillet et al., 2017)

* Largest Sulphur rich eruption of the common era
* Eruption magnitude and VEI of 7
* >40km3 of dense magma was expelled during the eruption
* Eruption column estimated to have reached altitudes of 43km
* But climate models tend to overpredict NH surface air cooling compared to proxy records
* Historical archives: Mediaeval texts attest to significant and widespread climate anomlalies over western Europe in the spring-autumn of 1258. Report cold, excessive rainfall, and cloudiness (impact on agriculture 🡪 Grape Harvest dates significantly delayed (1-2 weeks later than after Tambora). But doesn’t account for change in grape varieties/agricultural practices. In Germany *Annals of Speyer* refer to 1258 as *munkeliar* (dark year) suggesting dense dust veil. In England (Chronicle of John de Taxster) and Italy (Annales Ianuenses) a very dark lunar eclipse is also recorded for 1258. In Japan, *Mirror of the East* reports a wet, cold summer accompanied by heavy rainfall and strong winds. But contemporary sources limited beyond Europe.
* Use tree-ring network to show average surface cooling of -0.7C in 1258 and -1.2C in 1259.
* Use tree-ring network and ice core δ18O records to determine heterogeneity of NH summer cooling: cooling of -1.4 to -2C over Siberia and western Europe (associated with frost rings). In contrast in Quebec, Alaska, and Scandinavia cooling is limited – suggests internal climate variability outweighed volcanic forcing. Warm anomalies in Alaska (+0.3C) could be due to positive ENSO phase (El Nino likely to occur 1-2 years after an eruption). El Nino conditions inferred from tree-ring and sediment proxies for 1258/59.
* All sources agree on reduction in climate anomalies by 1260-61 (disagrees with models that exclude aerosol microphysics).
* Cooling is comparable to 1453, 1601, and 1816 – but Samalas released more sulphur? Cooling not linear with sulphur emissions.
* Aggravated ongoing famines in Western Europe and Japan

(Lavigne et al., 2013)