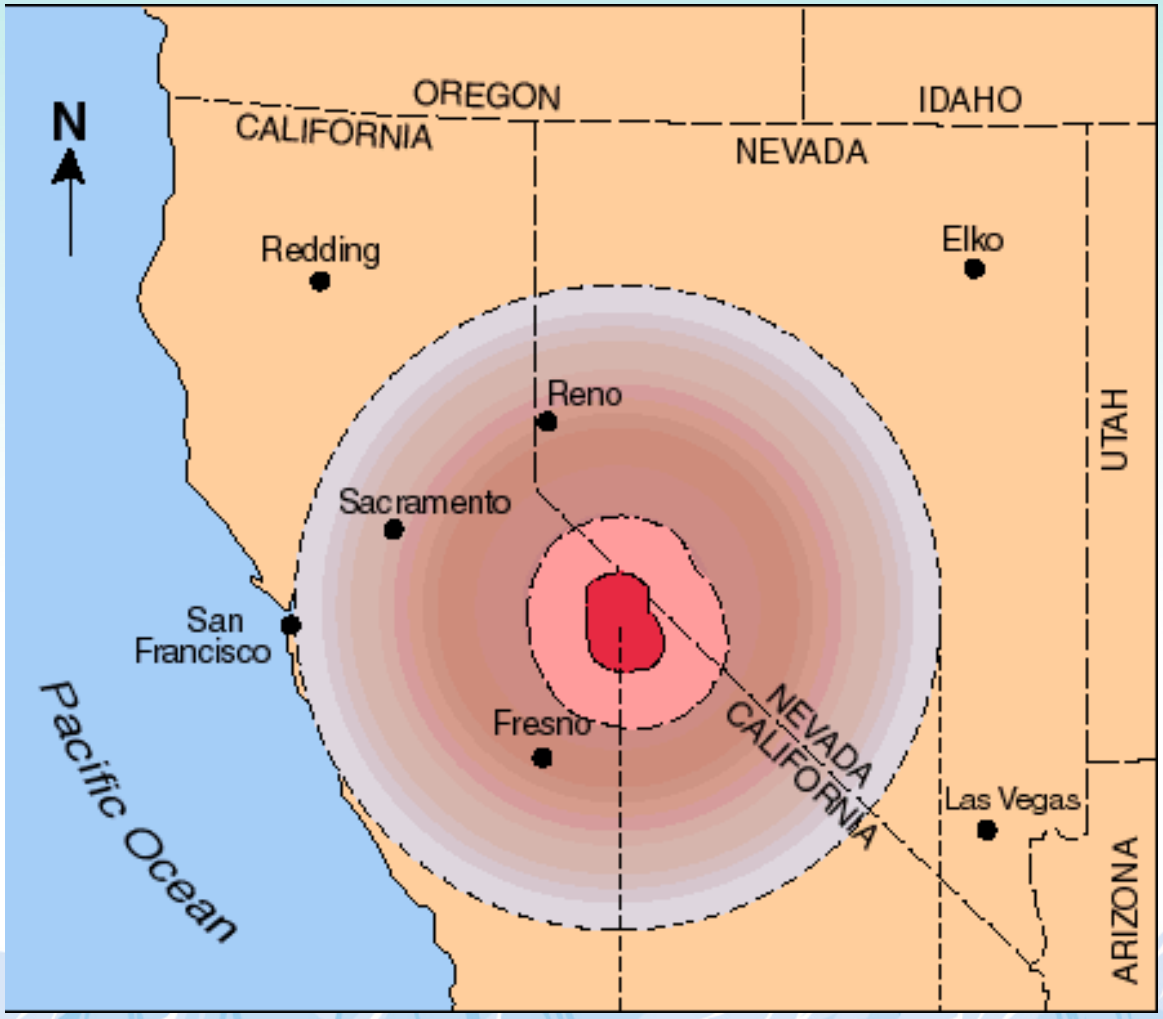
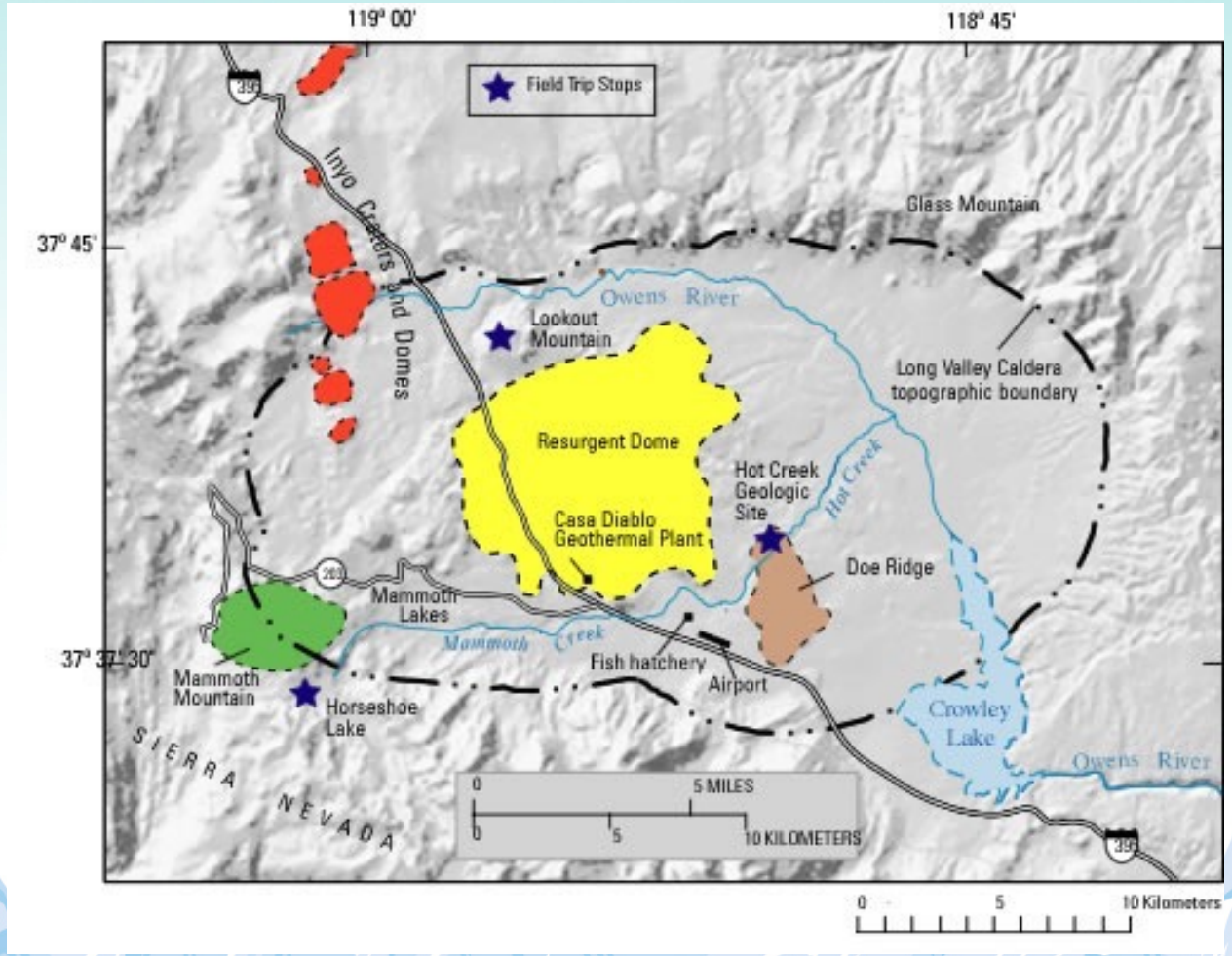
Magmatic Toxicity on the Ski Slopes? Carbon Dioxide levels across Mammoth Mountain, CA

Fumarole at Mammoth Mtn Ski Area

Regional Map: CA Eastern Sierra

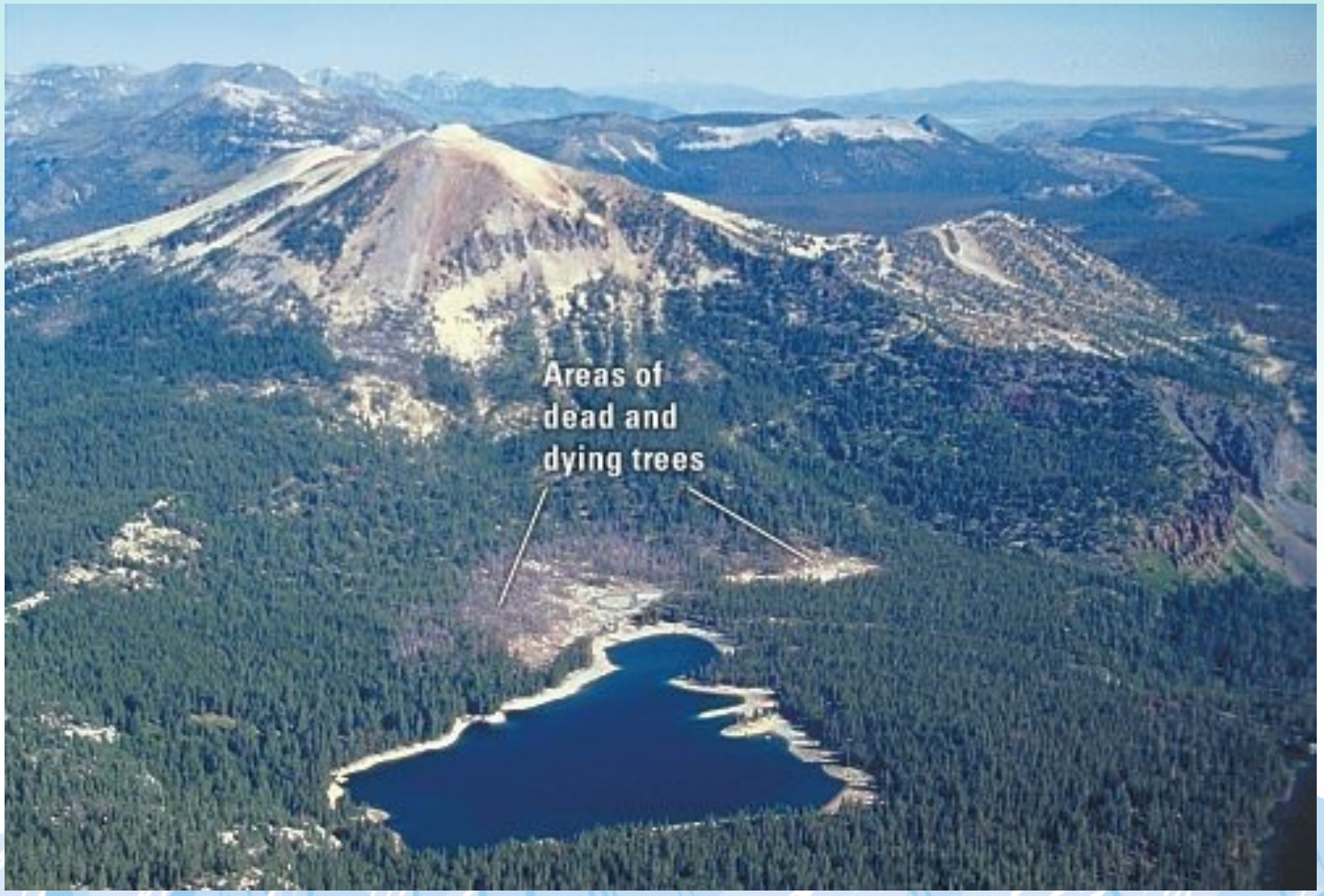


Long Valley Caldera Area

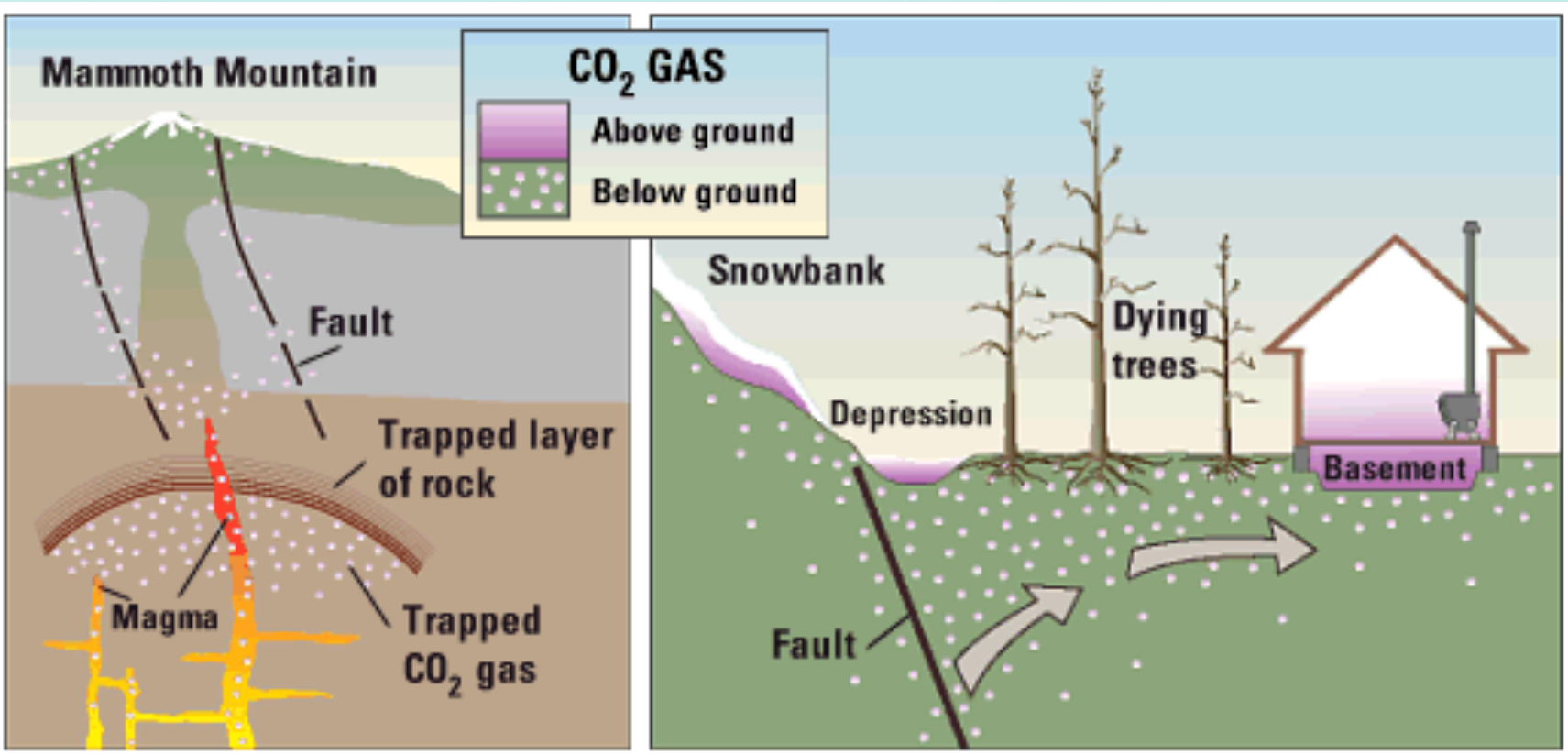


Mammoth Mountain Ski Area

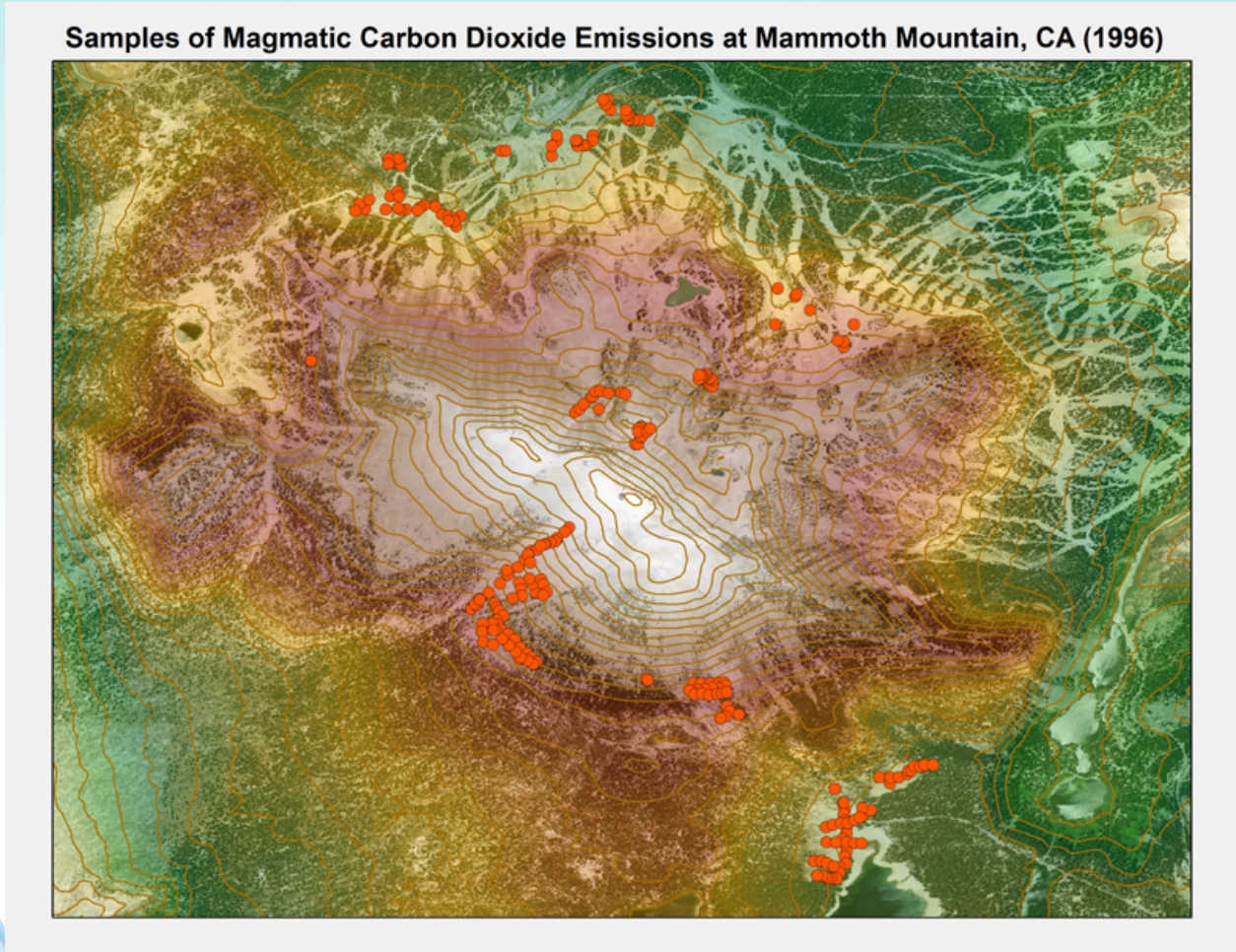
Tree Kill @ Horseshoe Lake, Mammoth Mtn



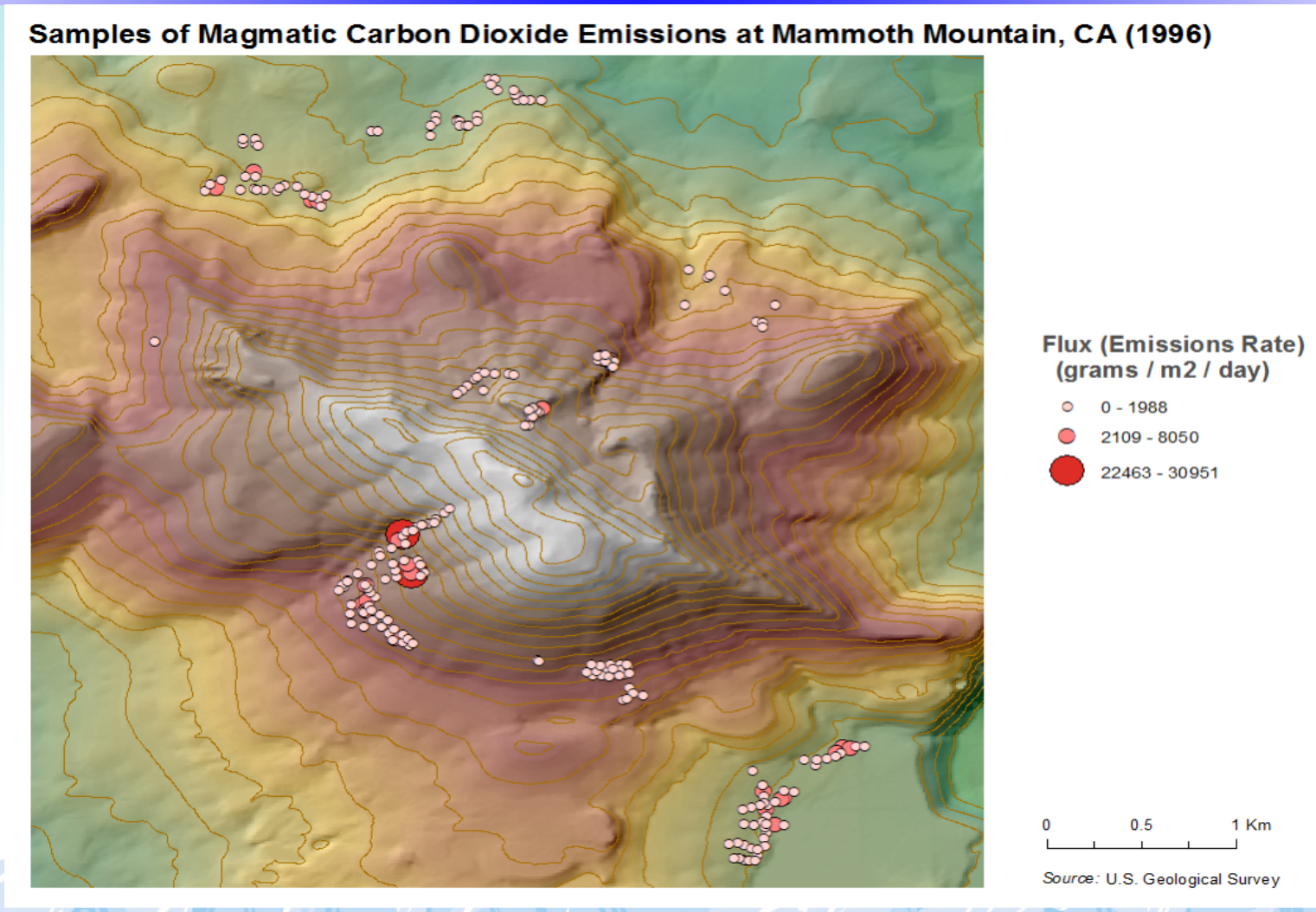
Carbon Dioxide Pathways, Mammoth Mtn



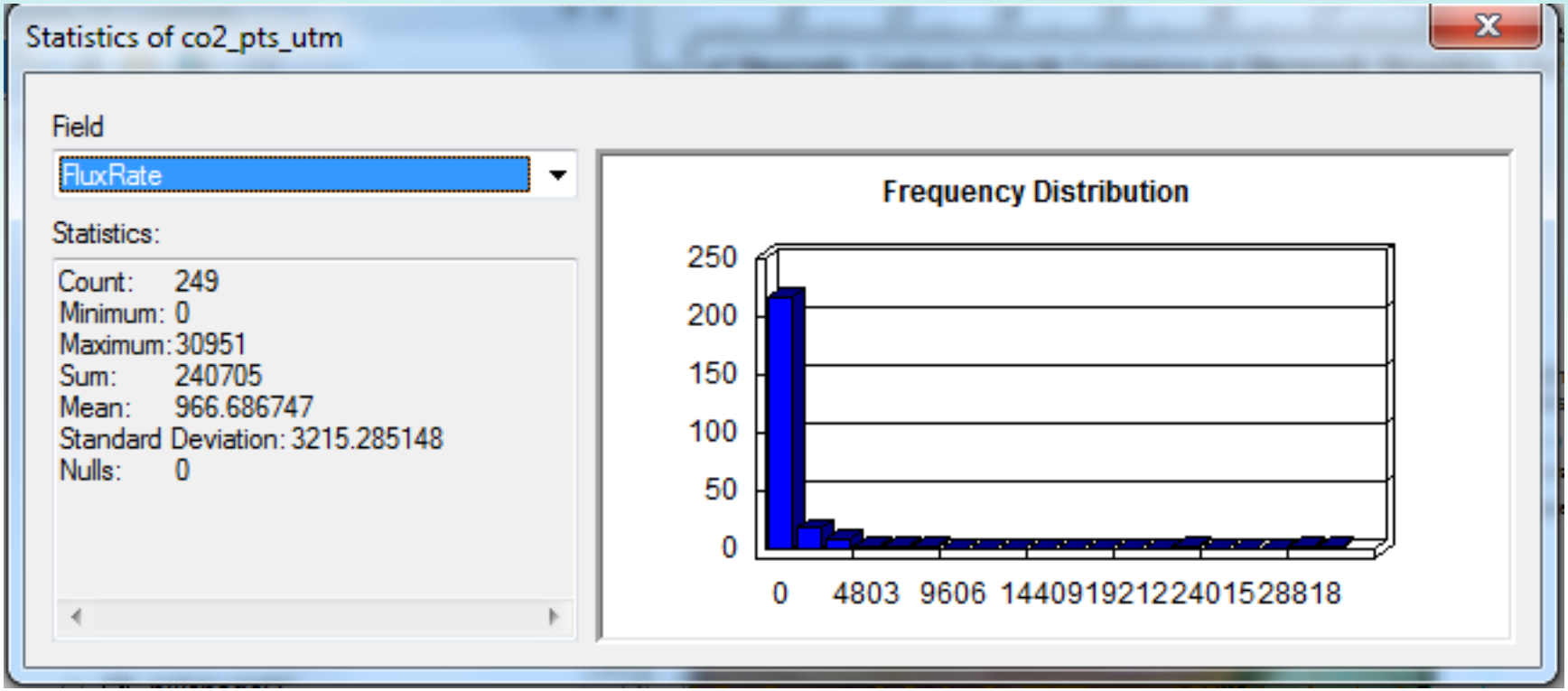
Map of Pt Samples over Elevation & Imagery



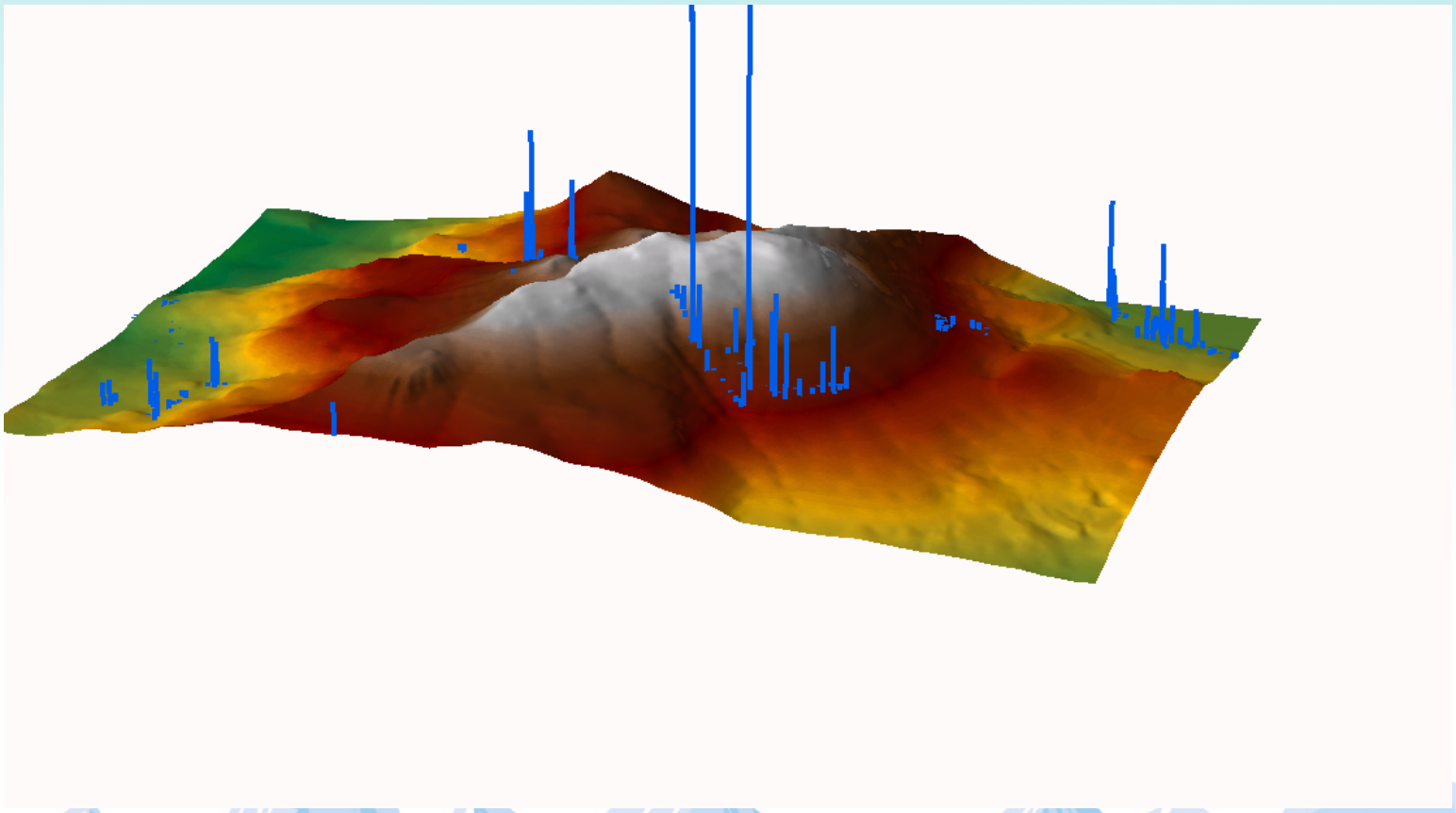
Classified Map of Mammoth CO2 Samples



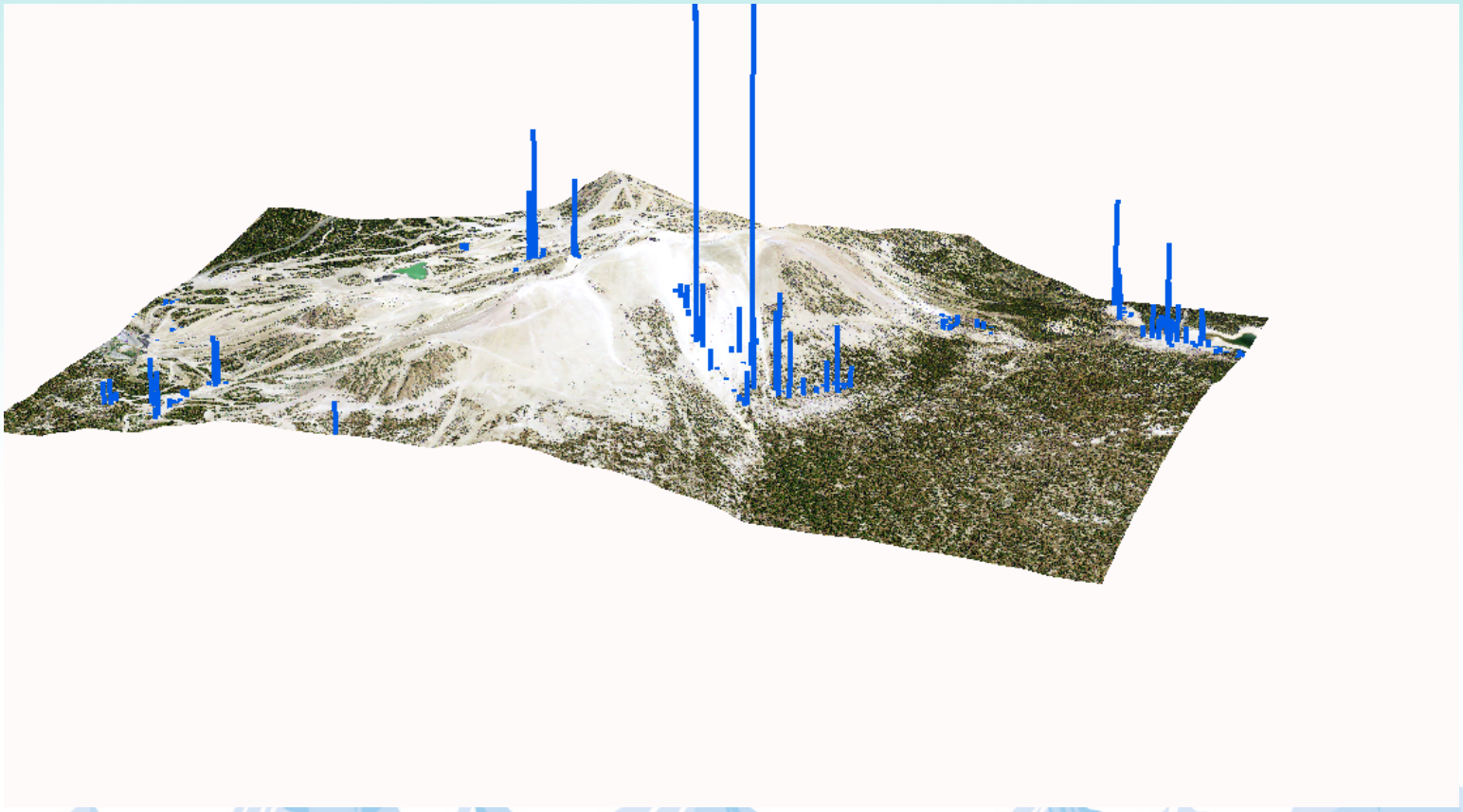
Summary Stats of Mammoth CO2 Samples



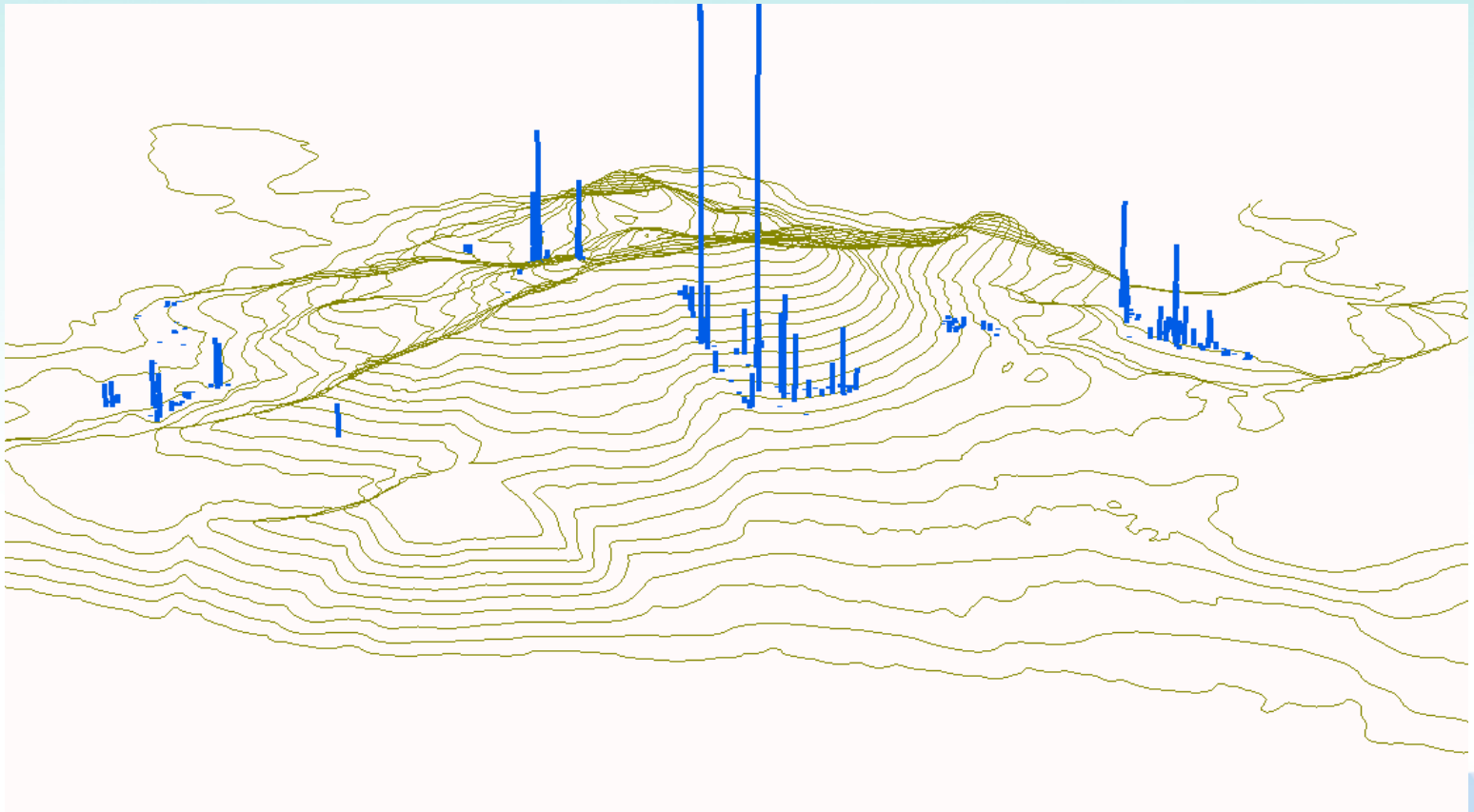
ArcScene Extruded CO2 Values over Elevation



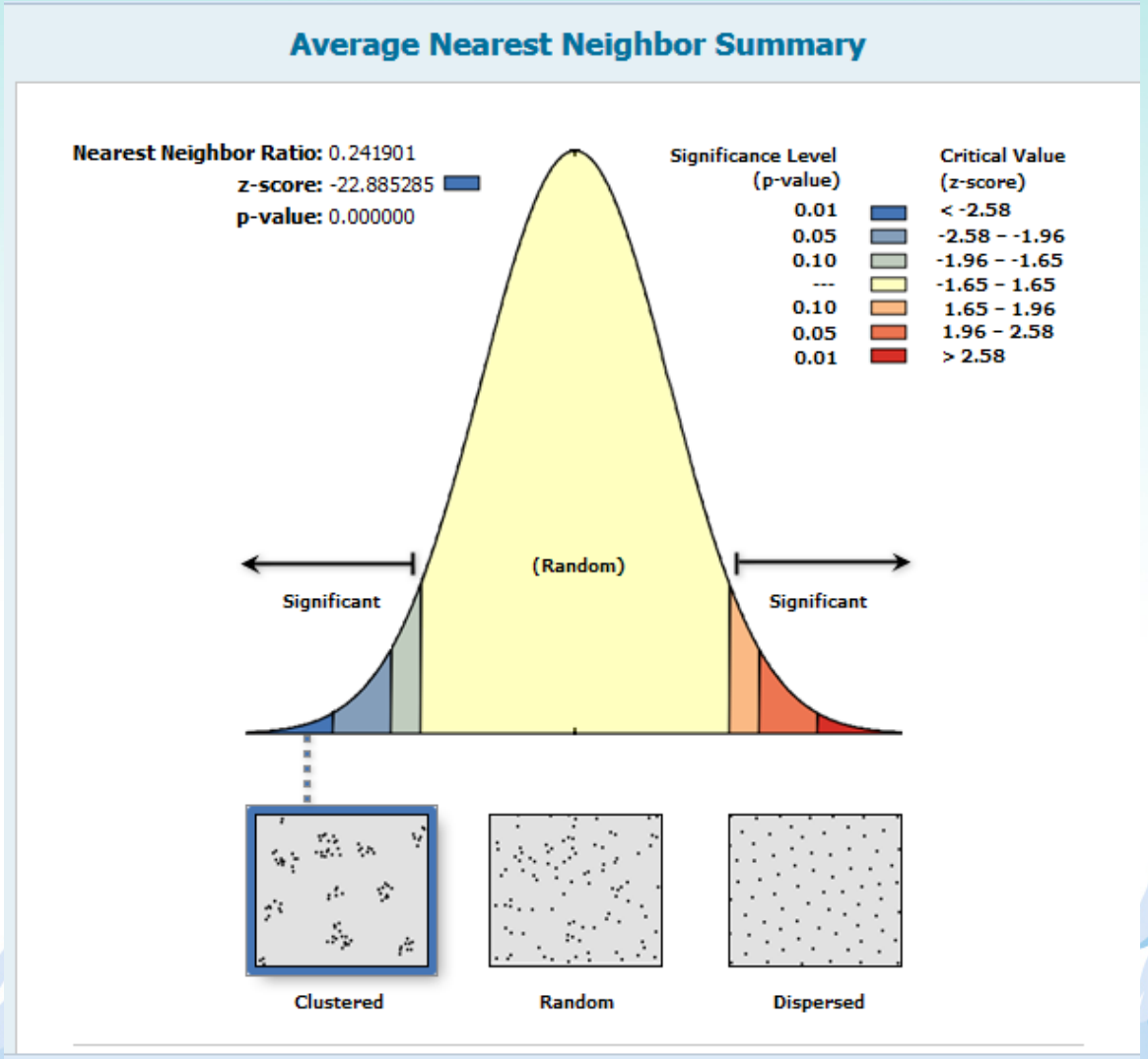
ArcScene Extruded CO2 Values over Imagery



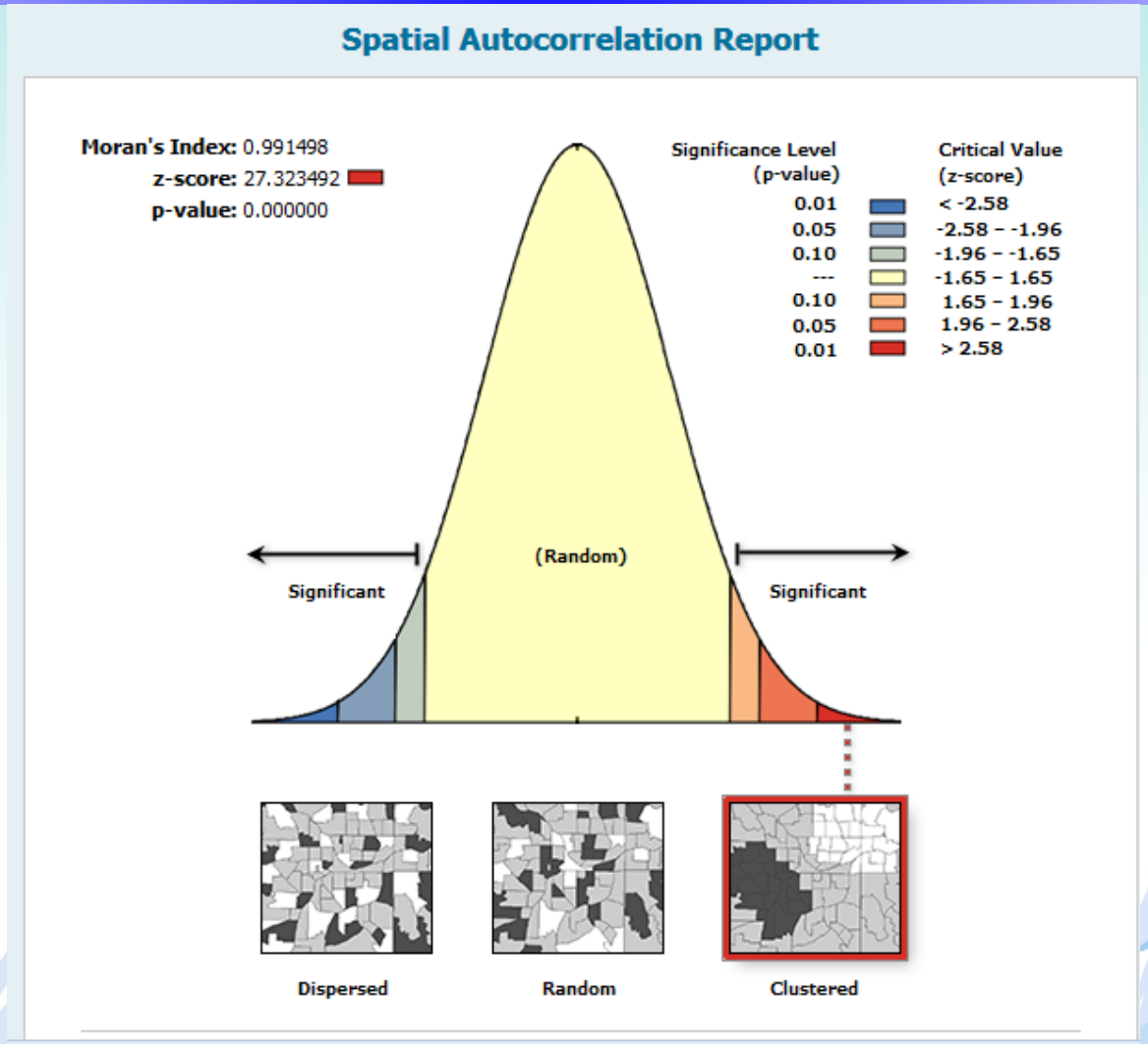
ArcScene Extruded CO2 Values over Contours



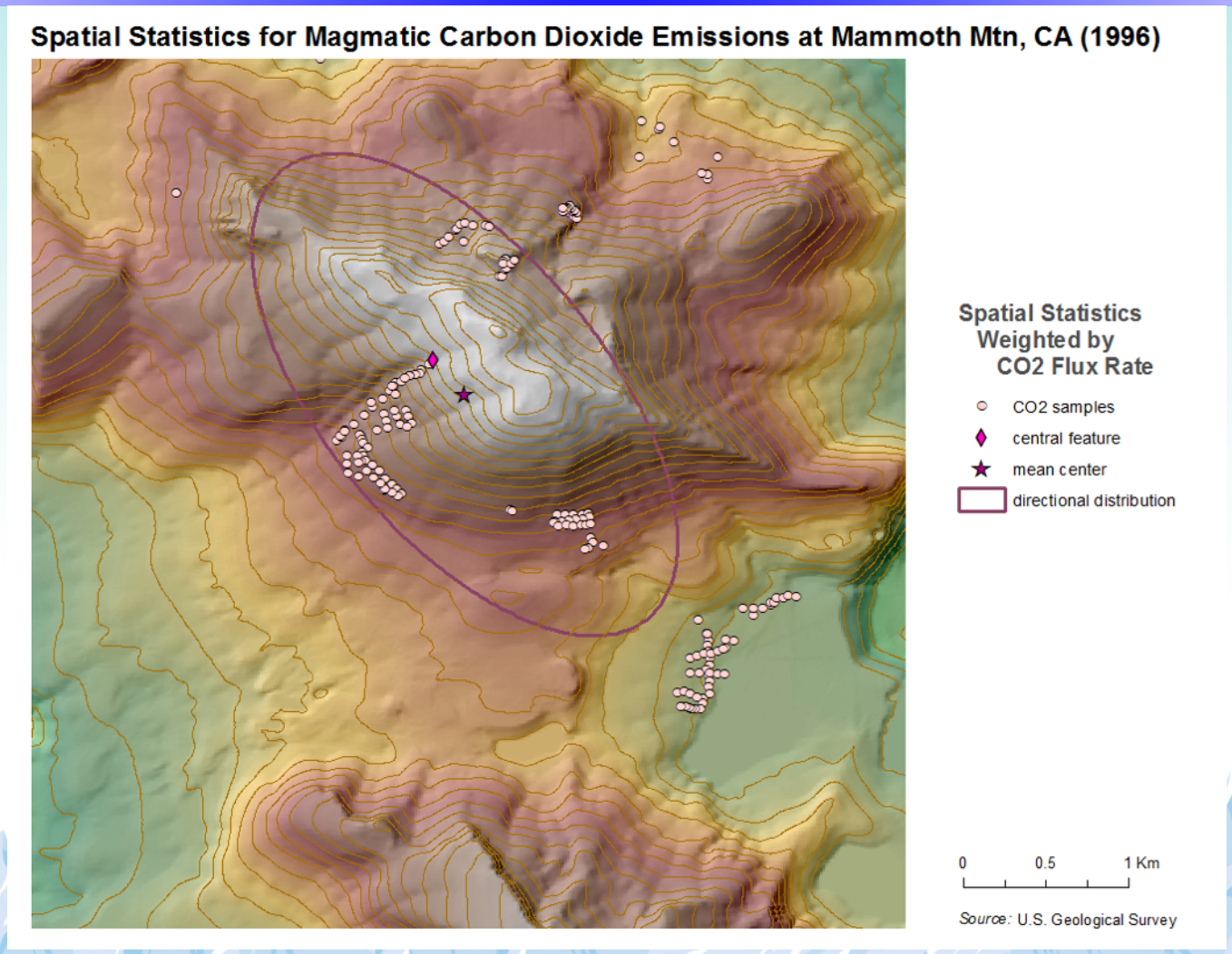
Clustered C02 Pt Dataset confirmed by ANN



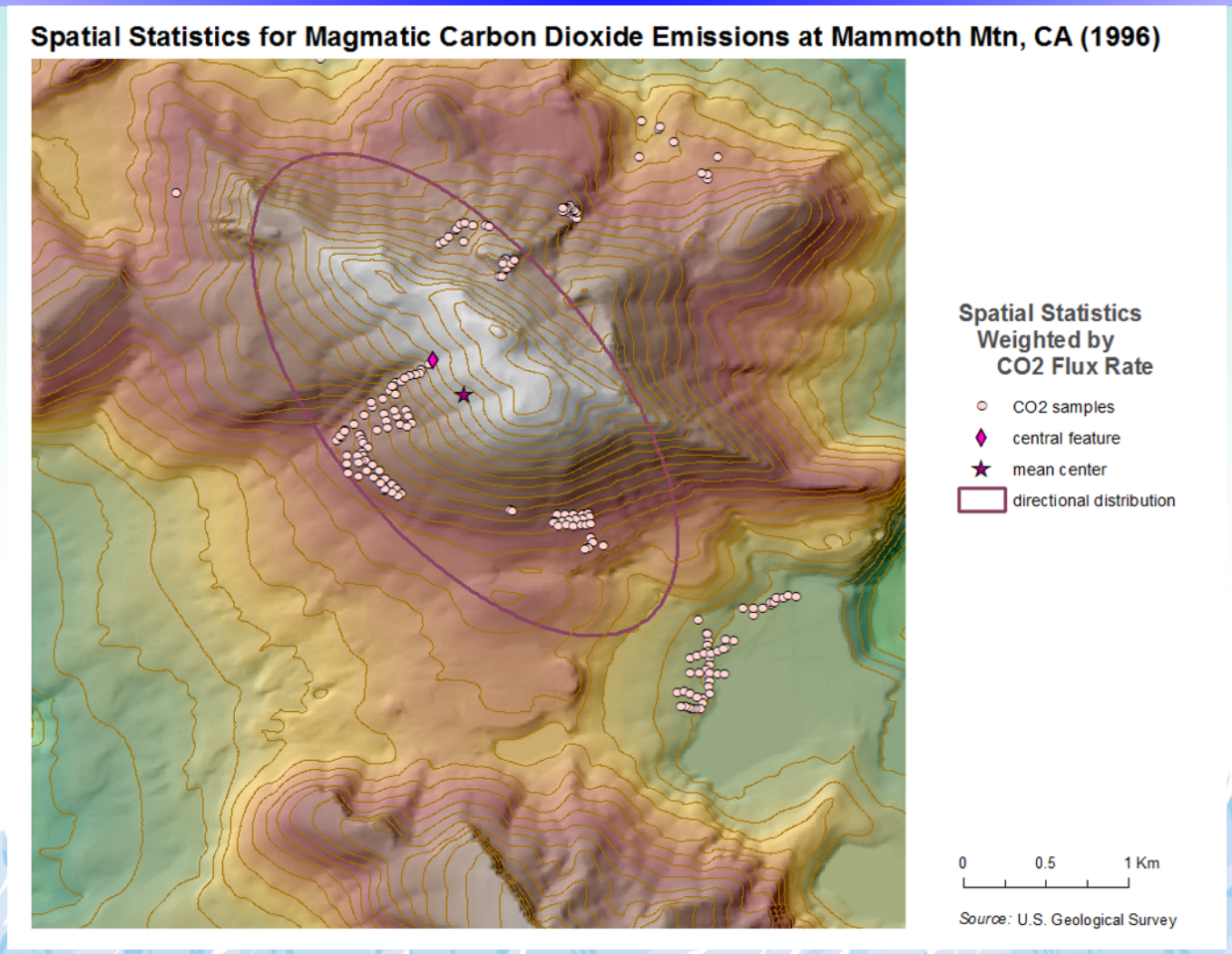
Clustering also confirmed by Morans I



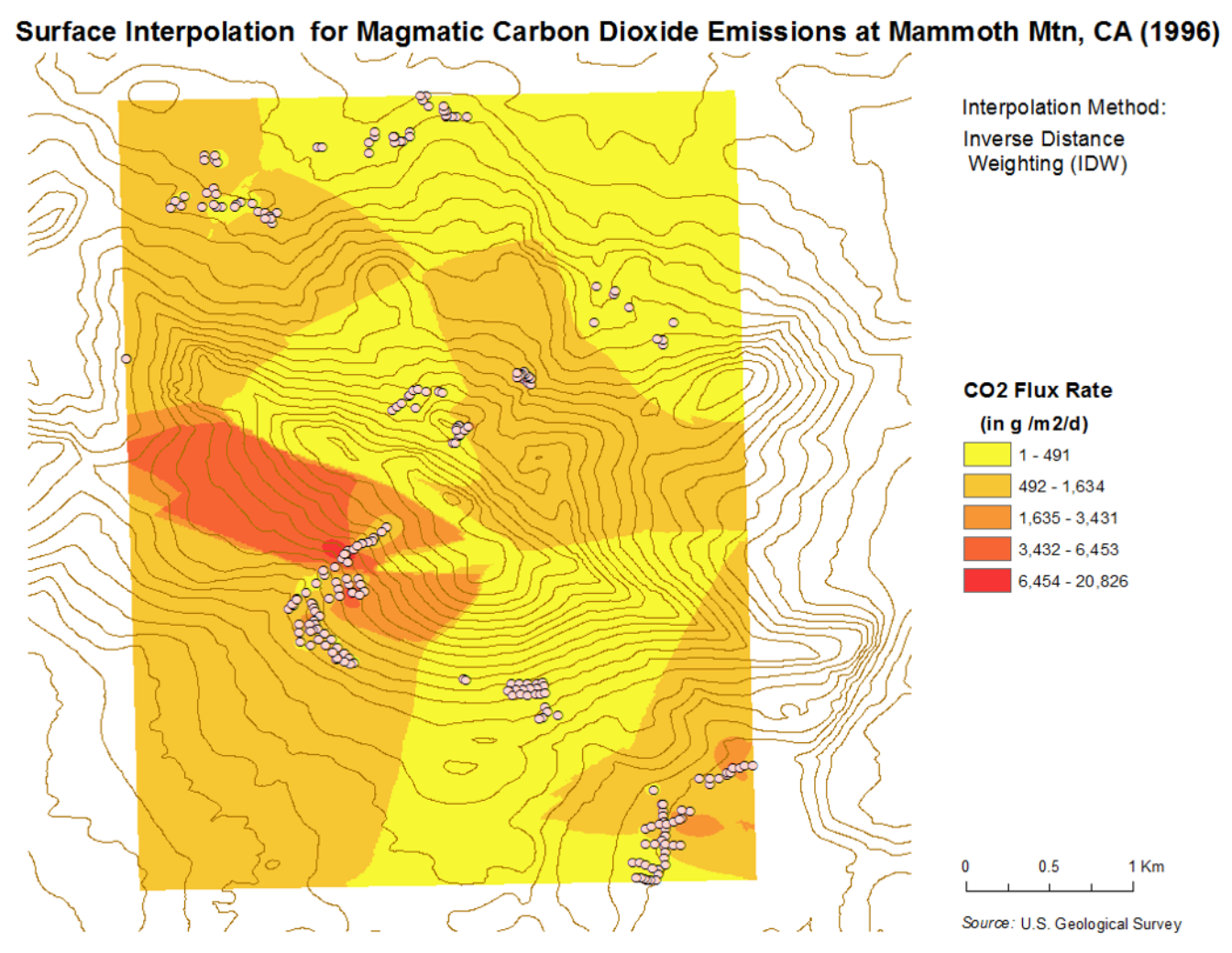
Spatial Statistics Weighted by CO2 Flux Rate



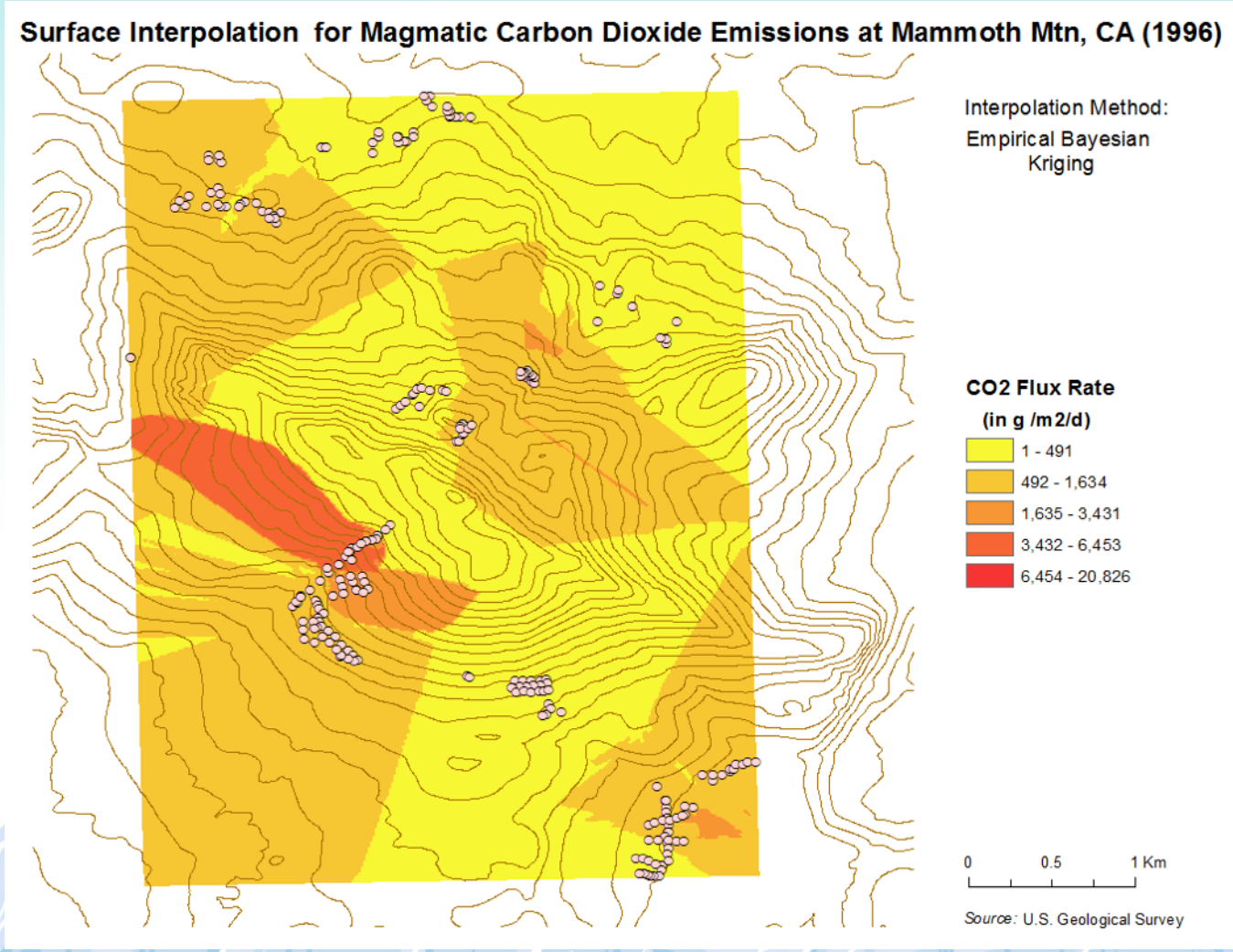
Spatial Statistics Weighted by CO2 Flux Rate



Stat Surface - CO2 Flux - IDW



Stat Surface - CO2 Flux – Bayesian Kriging



Conclusions

> Moderately-elevated flux rates of CO2 emissions exist on some areas of Mammoth Mtn – esp near Chair 12 and the Fumerole area.

> Highest rates of C02 flux exist on the “back side” of Mammoth Mtn (not in-bounds) at high elevations.

> C02 emissions phenomenon difficult to model (clustered data samples, high mutli-factor variability)

Further Research

- Use CO_2 soil concentration data from USGS to produce probability maps that show where levels exceed the 10% mark that is potentially fatal to humans.