WIDESPREAD VOLCANIC ASH COMPONENT IN SOILS OF EASTERN CALIFORNIA AND THE ANCIENT BRISTLECONE PINE FOREST

Emily Keefer, Juliana Poletti, Katlin Howard, Devika Chawla, Suzanne Fleishman, Ryan Jepson, Sarah Mazza, Elizabeth Rodenbough, and Allen Glazner
Geological Sciences, Univ. of North Carolina, Chapel Hill, NC 27599-3315, ekeefer@email.unc.edu

The nutrients available in a region's soil directly affect its ability to sustain various levels of biodiversity, including crops needed to support human life. In the White Mountains of eastern California, important plant communities, including stands of bristlecone pine trees (*Pinus longaeva*), grow in soils developed on rocks such as dolomite and quartzite that provide few nutrients. A previous study (Mazza, this meeting, 2009) found that rhyolitic volcanic ash, a source of nutrients, forms a significant proportion of the soil developed on Campito Formation quartzite in two places. We have undertaken a regional study of soils in and around Owens Valley in order to assess the prevalence of an ash component.

We collected 19 soil samples from ~2 cm below the surface in the region from Mono Lake to south of Bishop and into the Sierra Nevada and White Mts., and examined grain mounts by SEM. Fifteen of the samples contained at least 10% rhyolitic ash. Soils from Tuolumne Meadows and two Sierran streams feeding Mono Lake contained no recognizable ash particles, as did two samples from the White Mts. Three other samples from the White Mts., however, contained over 20% ash. X-ray fluorescence analyses of 6 soils from bristlecone stands on Reed Dolomite fall on a crude mixing line between dolomite and rhyolite, consistent with a large ash component in those soils, some of which are clay-rich. Loess analyses from the literature fall off the trend, indicating that windblown silicate dust is not an important component. We conclude that soils in the bristlecone pine area likely contain a significant ash component that has been concentrated by dissolution of dolomite. This component could supply nutrients for bristlecone growth; if so, then periodicity of eruptions could mediate such growth.