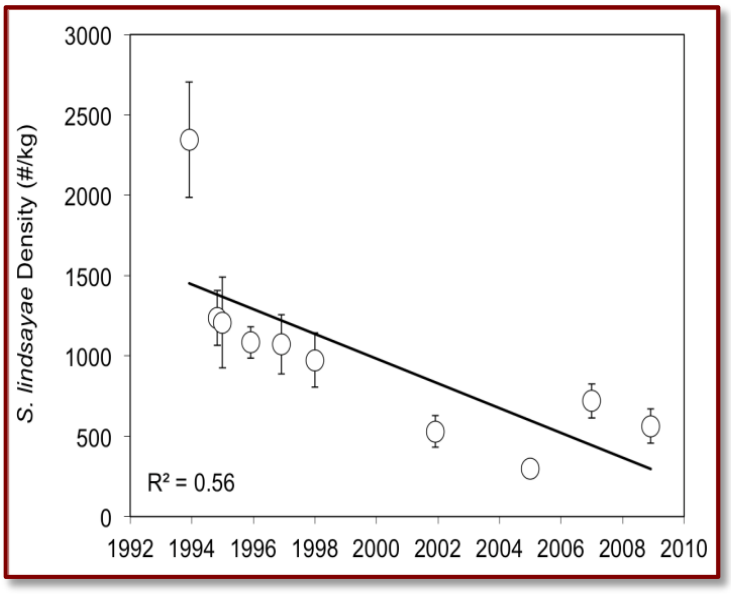
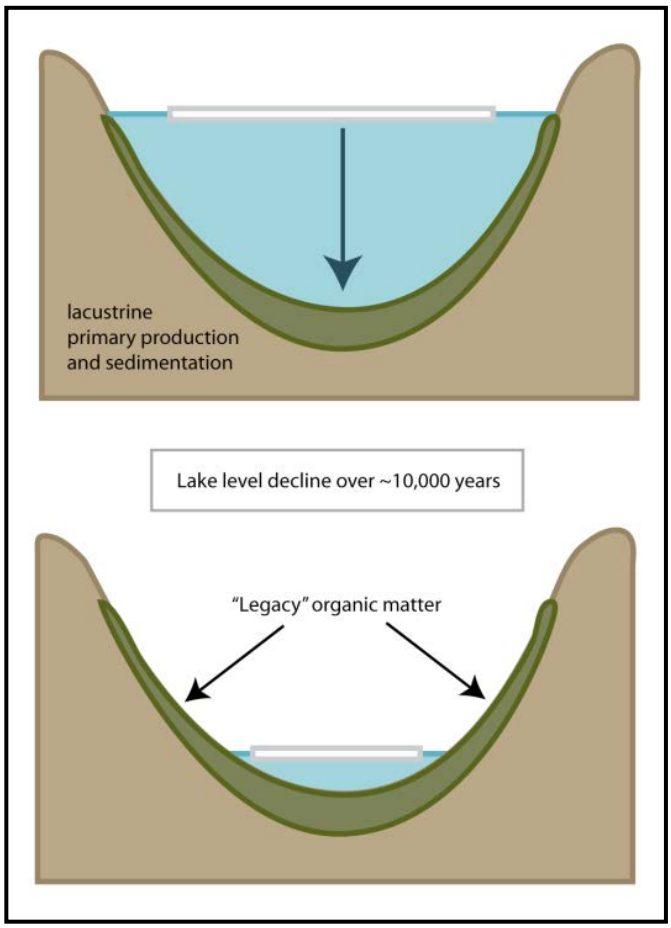
Climate and Resource Legacies in Taylor Valley: The Influence of Paleolake Washburn on Soil Biogeochemistry and Biodiversity – Ross Virginia

Climate driven variations in lake levels since the Last Glacial Maximum have created "resource legacies" seen today as gradients of biogeochemical properties in soils and lakes. Associated with these gradients in organic matter, limiting nutrients, and salts are contemporary organism abundances and biodiversity.

Scottnema lindsayae is the dominant soil nematode in dry soils where its population distribution defines the limits of habitat suitability (function of organic matter, salinity, moisture) and its population variation is an indicator of environmental change.





Long-term soil studies along an elevation transect (ET) in Taylor Valley (1994-) and newly established long term plots in Miers and Garwood Valleys (MCM3) allow assessment of changes in soil habitat suitability and soil biota associated with changing hydrologic connectivity in the dry valleys. *Scottnema* abundance has declined in the ET and in control plots from other multi-year experiments from 1993 to the present.

An example of a soil legacy from lake level variation is the high spatial variation in soil salinity observed at lower elevations (25-100m elev.) near existing lakes. Soil invertebrate biodiversity and abundance are closely associated with salinity and soil water content, both of which are changing in response to recent pulse warming events in summer.