John Melack Presentation Summary

Mono Lake's algal (*phytoplankton*) and brine shrimp (*Artemia monica*) populations help support large populations of migratory birds. During periods of meromixis, which is the persistent chemical stratification of the lake, vertical mixing of nutrients and algal abundance are reduced, and deep waters contain no dissolved oxygen, which influences *Artemia monica.* Since 1981, periods with large snowmelt runoff, followed by periods with low runoff and continued water diversions, have led to six episodes of strong year-round meromixis followed by eventual winter mixing. Long-term observations reveal marked inter-annual variation and multi-year trends. Adult *Artemia* abundance has large interannual variability and can include a large second generation associated with a very low spring hatch, years of high abundance associated with the breakdown of long periods of stratification, and a long-term trend resulting in a 42% decline in abundance-weighted fecundity. Recent high phytoplankton abundance throughout summer, not previously observed, indicates a significant shift in the balance between growth and loss of phytoplankton. The variations in stratification of varying duration have compounded ecological variability due to climatic variation and changing management regimes. Mono Lake is currently vulnerable to entering a meromictic state due to its current lake level. At higher lake levels the lake's volume would be larger and its salinity lower, making it less prone to entering a meromictic state.