Short Title: Status and Fate of Great Basin Terminal Lakes

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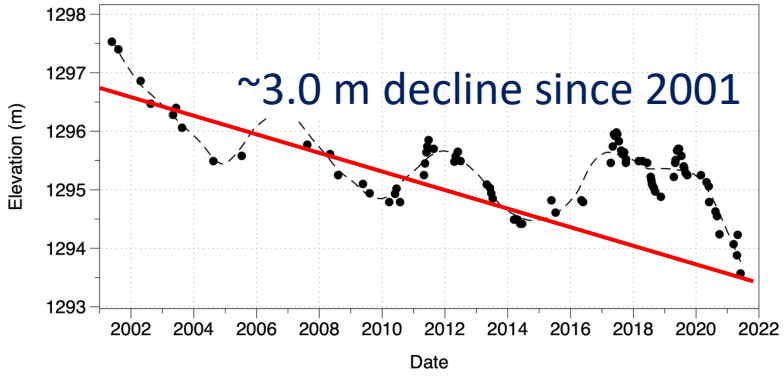
Student: Lara Jansen/PSU; Collaborators: Ron Larson/OLA & Crystal Schaaf/UMB

Project Description/Objective: To assess the hydrological and ecological status and sustainability of terminal lakes in the Great Basin

Terminal lakes are lifesaving stopovers for migratory birds, are of great cultural significance to tribal nations, and lead to hazardous air quality as they recede and desiccate

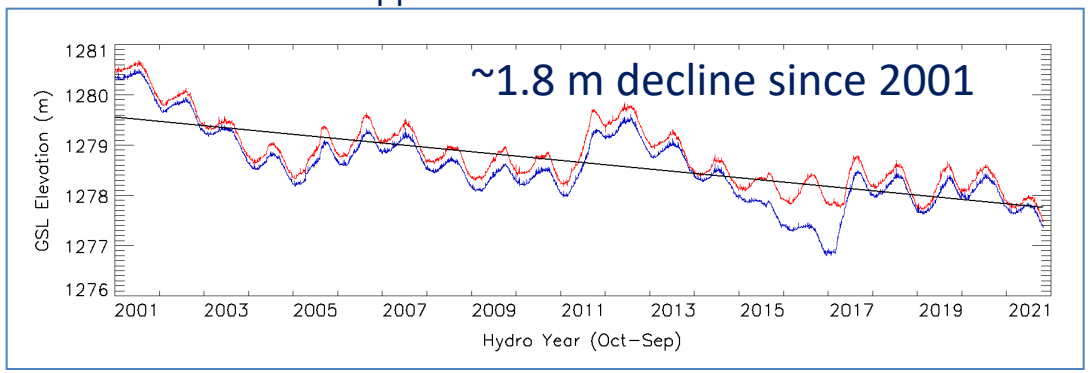
Photos: Ron Larson

Photo: D. Hall



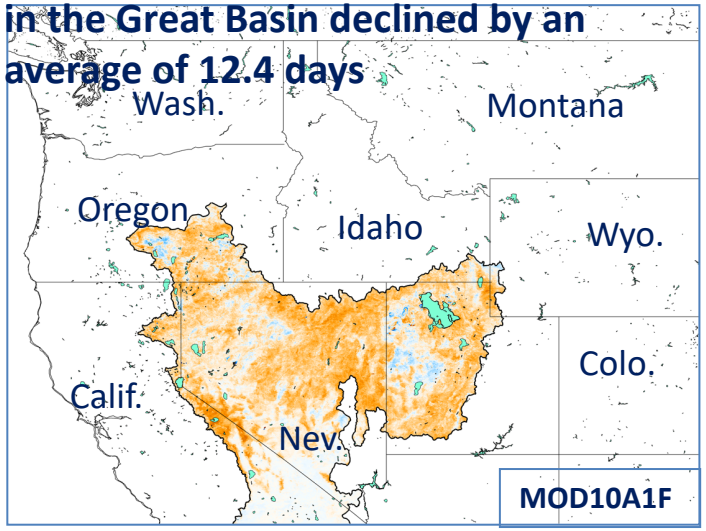
The surface-water elevations of all terminal lakes in the GB have declined during the MODIS era

Great Salt Lake dropped to its lowest recorded level in 2021



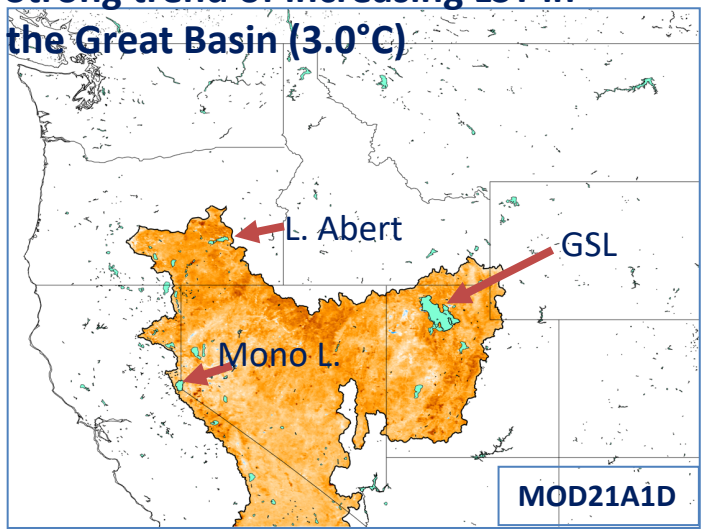
MODIS data products along with ancillary data help us to understand the reasons for the decline in the terminal lakes in the context of the ongoing megadrought

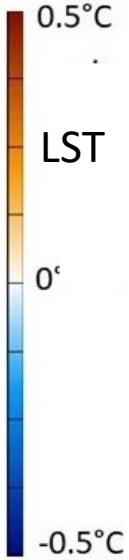
Trend map shows #days of snow cover in the Great Basin declined by an average of 12.4 days



Meltwater from snow in the mountains feeds the terminal lakes

Strong trend of increasing LST in the Great Basin (3.0°C)





Technical challenges/Milestones:

- USGS to collect water-quality samples of key lakes in the GB, spring/summer/fall 2022 – K. Casey
- R. Larson to collect samples from lakes in Oregon if there is sufficient water in the lakes, in 2022

Deliverables:

- Water samples will be sent to L. Jansen for analysis & results used to validate water quality algorithms that are under development (Chla/TSS/a_{cdom}(440)) - N. Pahlevan
- Planned conference presentations: Joint Aquatic Sciences Meeting (JASM), IGS & AGU

Near-term milestones:

- Complete trend analysis for the Great Basin and for individual lake basins (#days of snow, LST & ET)
- Start GRACE/GRACE-FO analysis with B. Loomis to study change in water storage in the GB