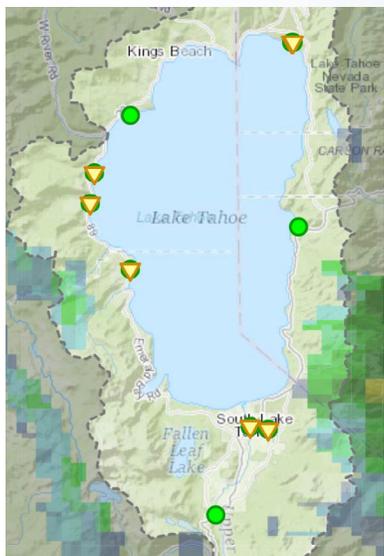


Lake Tahoe Water Monitoring and Research Activities

For decades, the USGS has been a leader in a wide range of scientific research and monitoring activities in the Lake Tahoe Basin. The USGS's monitoring and research programs help Lake Tahoe thrive, now and into the future.

Monitoring

Several decades ago, deteriorating water quality and clarity in Lake Tahoe prompted the initiation of environmental programs in the Lake Tahoe basin. Data on seasonal sediment loads from tributary streams, and nutrient loads from surrounding streams and groundwater aquifers, were needed to document the causes of this deterioration, the local and regional effectiveness of environmental programs, and to assure compliance with California and Nevada water-quality management programs.



[The Lake Tahoe Interagency Monitoring Program \(LTIMP\) >>](#)

USGS scientists are collecting streamflow and water-quality data at Lake Tahoe tributaries as part of LTIMP's commitment to providing long-term, consistent, reliable, and accessible streamflow and water-quality data. Together with the University of California, Davis, USGS has collected critical tributary nutrient and sediment data since 1988. Funding support: Tahoe Regional Planning Agency, Lahontan Regional Water Quality Control Board and California Tahoe Conservancy.

USGS streamgages (green circles) and water-quality stations (yellow triangles) at Lake Tahoe.

[Lake Tahoe Basin Data Visualization >>](#)

An intuitive and easy to use web application, the Lake Tahoe Hydro Mapper synthesizes, visualizes, and delivers USGS and interagency hydrologic data for the Tahoe Basin in real time. Funding support: US Forest Service.

[Volatile Organic Compounds and Fecal Coliform Sampling >>](#)

Sampling is conducted in the lake nearshore environment during high boat activity in the summer for gasoline-related compounds (BTEX, PAH) and fecal coliform (FIB). Funding support: Tahoe Regional Planning Agency.

Research

During the past twenty years, much of USGS research has focused on the clarity of Lake Tahoe. The USGS has made significant advances in understanding the sediment and nutrient sources contributing to water-quality problems. This has provided regulators with information needed to mitigate water-quality issues and with decision tools to manage aquifers in the Lake Tahoe Basin.



Water-quality sample with suspended sediment from Incline Creek, NV during a storm event.

Real-time Fine Sediment Tributary Loads

Fine sediment particles between 0.5 and 16 micrometers in size have been found to be a leading contributor to the decline in lake clarity. What are the annual tributary loadings of fine sediment to Lake Tahoe? Soon you'll be able to examine tributary fine sediment loads in real time via USGS online resources. Funding support: Tahoe Regional Planning Agency.

Data mining and machine learning to investigate fine sediment and nutrient loads

New methods are being applied by the USGS to better understand how watershed process such as snowmelt and runoff affect seasonal timing and loads of fine sediment and nutrients to Lake Tahoe. Funding support: US Forest Service.

Tahoe Science Advisory Council (TSAC) >>

The USGS is actively participating in the multi-agency, bi-state TSAC to address science questions such as:

- What are the causes of changing trends in summer and winter lake clarity?
- What changes need to be made to reduce uncertainty in the current Lake Tahoe clarity model?
- Do existing water-quality standards for Lake Tahoe overlap, and how can these standards be streamlined?

Aerial view of periphyton sampling along the nearshore of Lake Tahoe.



Assessment of Nutrient Sources using Stable Isotopes >>

High concentrations of phosphorus and nitrogen are responsible for excessive, or nuisance algal blooms in many ecosystems world-wide, and climate change is predicted to exacerbate the problem. Recent changes in periphyton biomass in the nearshore zone of Lake Tahoe may indicate changes in nutrient supply from human sources. Therefore, management actions that serve to limit external contributions of nutrients to the watershed will become even more important to Lake Tahoe in the future. The USGS is researching the sources of nitrogen and phosphorus nutrients in groundwater and in lake periphyton. Funding support: Lahontan Regional Water Quality Control Board.

Trends in Nitrogen, Phosphorus, and Sediment Concentrations and Loads In Streams

Lake Tahoe has 63 tributaries that are sources of nutrients and sediment to the lake. The lake's clarity has been diminishing due to algae and fine sediment, prompting development of management plans. To understand the relative importance of land use, climate, forest management, and other factors affecting trends in nutrient stream concentrations and loads, the USGS developed a Weighted Regression on Time Discharge and Season model to simulate trends over time.