25th Annual Tahoe-Truckee Snapshot Day

A Lake Tahoe & Truckee River Watershed Citizen Science Event

May 10, 2025

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California Water Boards Lahontan - R6
Keep Tahoe Blue
South Tahoe Public Utility District
Tahoe Water Suppliers Association
foriver Truckee River Watershed Council
UC Davis Tahoe Environmental Research Center

Table of Contents

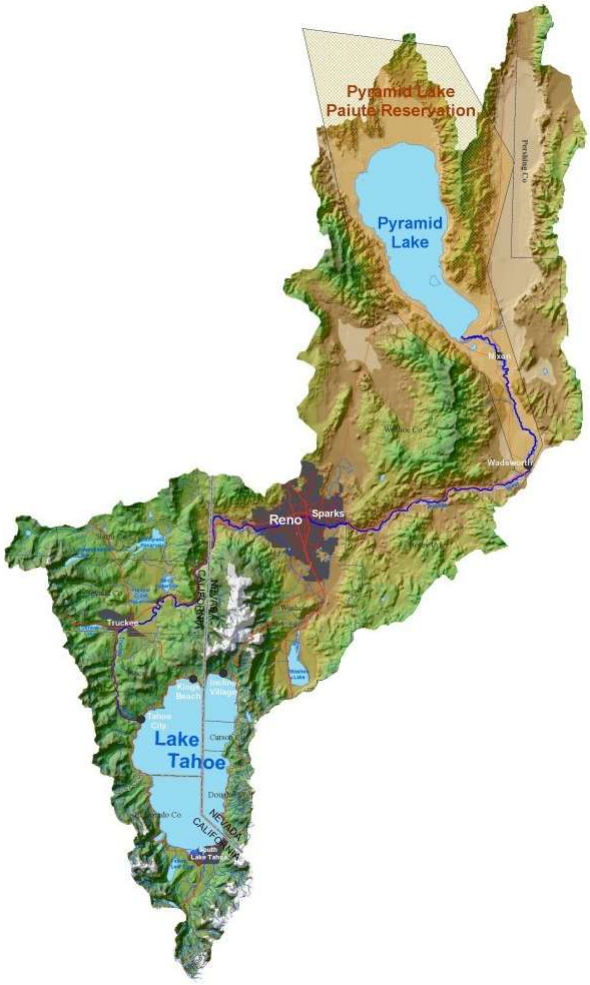

Figure 1: Truckee River Watershed from Lake Tahoe, CA to Pyramid Lake, NV

Introduction

What is Snapshot Day?

Snapshot Day is a one-day, volunteer-based event designed to assess the health of the Truckee River Watershed at a single point in time. Each year, teams of trained volunteers spread across sites throughout the watershed to measure water quality indicators, record visual observations, and collect water samples for lab analysis.

Snapshot Day 2025 was the 25th annual event, which remains one of the longest-running citizen watershed monitoring efforts on the West Coast of the United States. The program is sustained by dedicated support staff and engaged volunteers, with funding from grants and donations.

What are the objectives of Snapshot Day?

Snapshot Day has two primary goals:

1. Promote environmental education and stewardship, and
2. Collect valuable water quality information.

While there is a great deal of high-quality agency- and university-sponsored monitoring throughout the Truckee River Hydrologic Unit, including the Lake Tahoe Basin and Truckee River Watershed, information gaps remain. With proper training and quality assurance, community members can help fill these gaps by collecting data representing a snapshot of water quality conditions.

Specifically, this effort aims to:

- Screen for water quality problems, including sources of pollution and illegal activities (e.g., illicit discharges, destruction of stream environment zones),
- Provide water quality data that may be compared to standards set by the Tahoe Regional Planning Agency and the states of California and Nevada, and
- Provide water quality data that may be used for trend analyses or to evaluate the effectiveness of restoration activities.

Citizen science events like Snapshot Day are designed to supplement but not replace existing agency monitoring efforts. Snapshot Day data is provided to regulatory and resource management agencies upon request, and results indicating possible water quality issues are escalated and addressed accordingly.

Snapshot Day 2025

Snapshot Day provides an annual opportunity to engage citizen scientists in monitoring the environmental health of the Truckee River Watershed, including the Lake Tahoe Basin. Results from Snapshot Day 2025 demonstrate good water quality for the watershed and high volunteer engagement in the region.

Locations and participants

Snapshot Day 2025 was a collaborative effort between organizers and volunteers along the North and South Shores of Lake Tahoe and the Middle Truckee River. **Figure 2** displays the sites sampled in 2025 denoted by region.

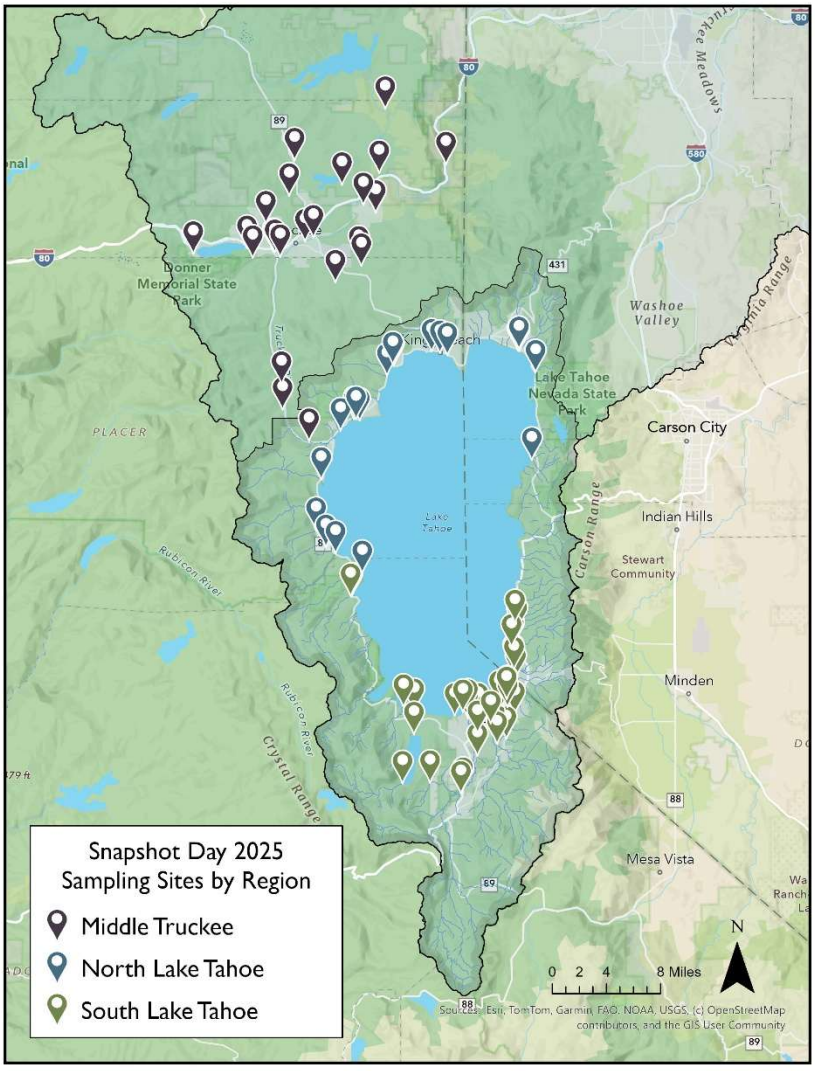

Figure 2: Sampling sites by region

In total, 159 participants collected data across 76 locations throughout the Truckee River Watershed. See **Table 1** for a summary of participant counts and sampling locations by region. Site names and codes can be found in **Appendix B**.

Table 1: Volunteer counts and monitoring site locations by region

Region	Participants	Locations
South Shore Lake Tahoe	105	33
North Shore Lake Tahoe	22	21
Middle Truckee River	32	22
Total	*159*	*76*

Snapshot Day 2025 was coordinated by Keep Tahoe Blue, the Tahoe Water Suppliers Association, and the Truckee River Watershed Council. Please see **Appendix A** for an expanded list of organizations involved, resource partners, and education partners.

Methods of data collection

Snapshot Day team leaders are trained each year before the event to collect water quality data using monitoring instruments provided by the event organizers. Measurements taken in the field include water temperature, pH, dissolved oxygen, total dissolved solids, and electrical conductivity. Team leaders are also trained to collect water samples for additional lab testing.

All Snapshot Day instruments are calibrated and tested at a quality control session before the event. Much of the equipment has been purchased through the years via grants or donations; the remainder is borrowed each year from partners. For additional information on the monitoring equipment used, see **Appendix C**.

Visual observations and photo documentation follow procedures developed by the California State Water Resources Control Board *Clean Water Team*. The standardized observation form, the *California Stream and Shore Walk Visual Assessment Form*, has been slightly revised to apply to the region accurately. At least three photos are taken at each sampling site: streambed conditions, view across the stream, and view upstream from the starting point of the stream walk. Volunteers are encouraged to photograph as much as possible, especially team members in the field.

Monitoring results are compiled and available upon request from the coordination committee. The data set includes the volunteer field measurements and nutrient and bacteria analyses conducted by designated laboratories.

Water quality standards

Waterbodies in the Truckee River Watershed are subject to federal and state water quality criteria as outlined by the U.S. Environmental Protection Agency and state regulatory bodies. Beyond these criteria, the Lake Tahoe Basin is subject to additional—and generally more stringent—water quality standards. These standards are defined and enforced by the states of Nevada and California, the Tahoe Regional Planning Agency, and other local regulatory agencies**. Table 2** lists some of these surface water standards, as defined by the Lahontan Regional Water Quality Control Board (Lahontan) *Basin Plan*.

Table 2: Lake Tahoe region water quality standards as defined in the Lahontan Basin Plan

Parameter	**Standard (Area subject to standard)**
pH	7.0 - 8.4 (Lake Tahoe); 6.5 - 8.5 (Lahontan Region)
Conductivity	Shall not exceed 95 µS/cm annual mean at 25°C (Lake Tahoe)
Turbidity	Shall not exceed 3 NTU in shallow waters near tributaries or 1 NTU in shallow waters not directly influenced by stream discharges (Lake Tahoe)
Dissolved oxygen	Shall not be depressed by more than 10 percent, below 80 percent saturation, or below 7.0 mg/L at anytime, whichever is more restrictive (Truckee River Hydrologic Unit)
Total dissolved solids	Shall not exceed an annual average value of 60 mg/L or 90th percentile value of 65 mg/L (Lake Tahoe)
Total nitrogen	Shall not exceed an annual average value of 0.15 mg/L (Lake Tahoe)
Total phosphorus	Shall not exceed an annual average value of 0.008 mg/L (Lake Tahoe)
E. coli	Statistical threshold value (STV) for single sampling event: 320 MPN/100mL (Lahontan Region)
Algae	Waters shall not contain bio-stimulatory substances (nutrients) that cause algae to become a nuisance or to affect the water's beneficial uses (Lahontan Region)
Color	Waters shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses (Lahontan Region)

For additional information on water quality standards in California, please refer to the Lahontan Regional Water Quality Control Board (Lahontan) *Basin Plan*. For additional

information on water quality standards in Nevada, please refer to the Nevada Administrative Code (NAC) 445A.11704 – 445A.2234.

While these water quality standards provide a helpful benchmark for comparison when evaluating Snapshot Day data, it's important to remember that Snapshot Day measurements reflect a single moment in time and do not necessarily represent average conditions.

Event context: Water Year 2025

Snapshot Day took place on May 10, 2025, just one day before peak flow conditions were measured along the Upper Truckee River in South Lake Tahoe (U.S. Geological Survey, 2025). Agency-sponsored precipitation and streamflow monitoring provides additional context on Snapshot Day conditions.

During Water Year 2025 (October 2024 through September 2025), drought conditions existed through California and Nevada, though the Lake Tahoe region experienced near normal levels of precipitation (National Integrated Drought Information System, 2025). On April 1, snowpack in the Sierra Nevada was roughly normal, with the Truckee River Watershed reporting 103% of its median snow water equivalent, 1991-2020 as shown in **Figure 3** (U.S. Department of Agriculture, 2025).

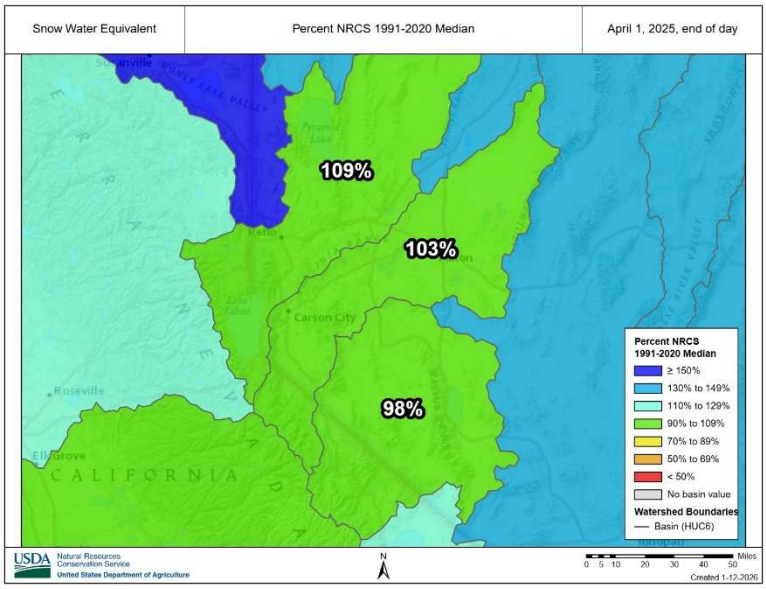

Figure 3: Snow water equivalent in Truckee River Watershed region on April 1, 2025
Source: USDA National Water and Climate Center

Streamflow measures the volume of flowing water in a system, typically reported in cubic feet per second. In the Western U.S., most streamflow originates as snow. During years with higher snowpack and above-average precipitation, streams are likely to flow at higher rates (U.S. Department of Agriculture, Natural Resources Conservation Service [NRCS], n.d.).

Streamflow can significantly impact water quality: Low flow conditions can contribute to elevated water temperatures, decreased dissolved oxygen availability, and increased likelihood of algal blooms. High flow conditions can contribute to erosion and excess sediment transfer. Streamflow conditions can also impact habitat for aquatic organisms, including fish, and may affect their ability to reproduce.

Figures 4-5 show streamflow data collected in May 2025 by the U.S. Geological Survey at two separate monitoring locations: along the Upper Truckee River in South Lake Tahoe, California and along the Truckee River near Truckee, California. The blue line represents measurements from May 2025, while the yellow triangles represent the median value from 50+ years of historical data at that site. The figures show that streamflow hovered near historical measurements in May.

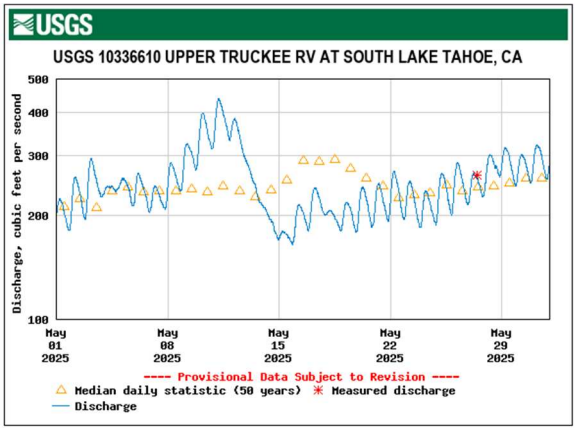

Figure 4: Streamflow along the Upper Truckee River, May 2025

Source: USGS National Water Information System

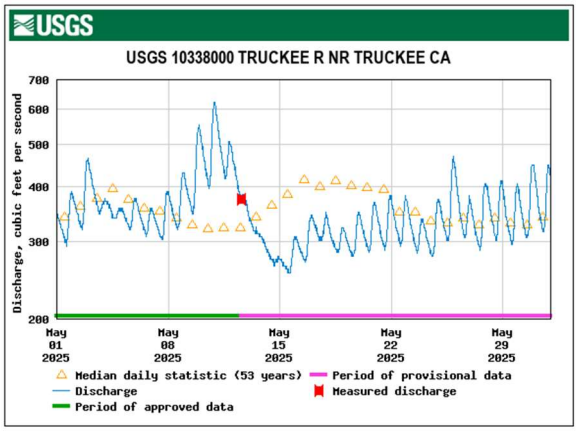

Figure 5: Streamflow along the Truckee River, May 2025

Source: USGS National Water Information System

Results

This section provides an overview of the data collected during Snapshot Day 2025, from in-field measurements and lab results. Where possible, the data are plotted by sampling region (Middle Truckee River, North Lake Tahoe, and South Lake Tahoe) with maximum and/or minimum values highlighted for each region. Relevant standards set in the Lahontan *Basin Plan* are provided where available.

Water temperature

Water temperature is a key indicator of aquatic ecosystem health. In mountain streams and lakes, cooler water is considered a better habitat for native aquatic life, as cooler temperatures are associated with more dissolved oxygen, an essential ingredient for fish and invertebrates. Higher temperatures can result in increased solubility of metals and other toxins and may promote algal blooms.

Factors that affect water temperature include flow conditions (where low-flow or shallow conditions result in higher temperatures) and surrounding vegetation (where canopy cover provides shade, reducing solar heating and resulting in lower temperatures).

In many Sierra streams, the propagation of cold-water fish (e.g., trout or salmon) is a designated “beneficial use” of the water. In such streams, water quality standards are set at levels that will support those species, typically requiring cooler temperatures and higher dissolved oxygen levels compared to habitats not designated for use as cold-water fisheries. As an example, one study found that the upper limit for survival and growth of Lahontan cutthroat trout—a federally threatened species native to the Truckee River—was between 22°C and 24°C, with complete mortality within two days at 28°C (Dickerson & Vinyard, 1999).

The Lahontan *Basin Plan* does not provide numerical water temperature objectives for surface waters of the Lake Tahoe Basin or Lahontan Region. Instead, Snapshot Day data is compared to the conservative upper limit for Lahontan cutthroat trout survival cited above, which is 22°C.

During Snapshot Day 2025, 76 sites were sampled for water temperature, all of which recorded temperatures below 22°C, the conservative upper limit for survival and growth of Lahontan cutthroat trout. The lowest recorded temperature was 3.2° C (38° F) at Bear Creek in the Middle Truckee River region. The highest was 18.7° C (66° F) recorded in a marsh-like area near Cold Creek in South Lake Tahoe. This sampling site was not a historical Snapshot Day site but was added this year in response to a community observation. **Figure 6** displays the

distribution of water temperature measurements across the three sampling regions, with the minimum and maximum values for each region noted by tributary name.

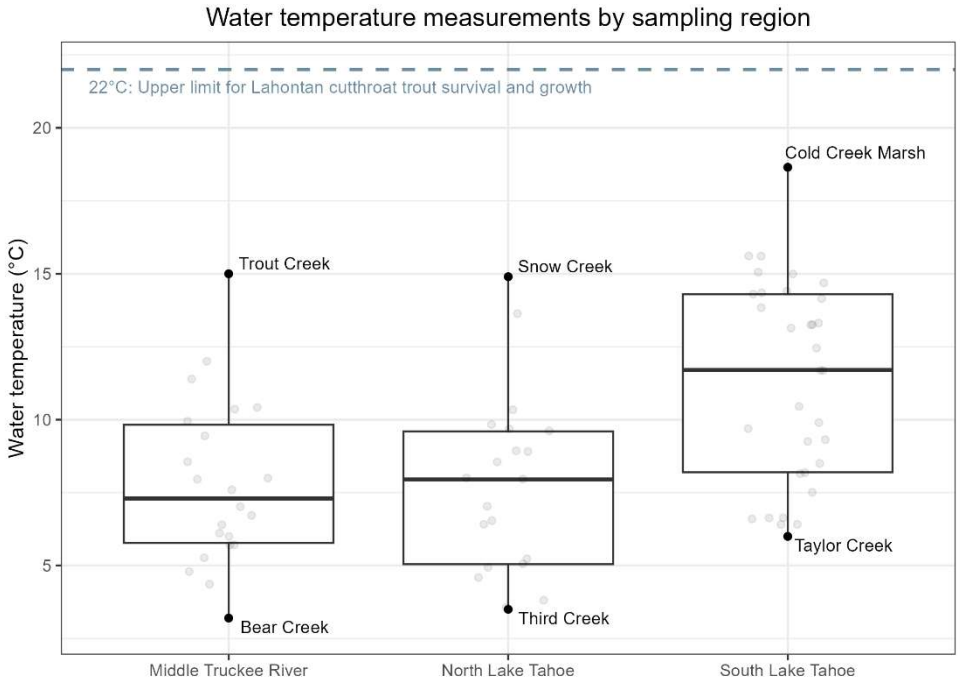

Figure 6: Water temperature measurements

pH

pH measures the degree to which a sample is acidic or basic. pH is measured on a scale from 0 (very acidic) to 14 (very basic), with 7 considered neutral. Most aquatic life prefers a pH close to 7. **Figure 7** displays the pH ranges that support aquatic life.

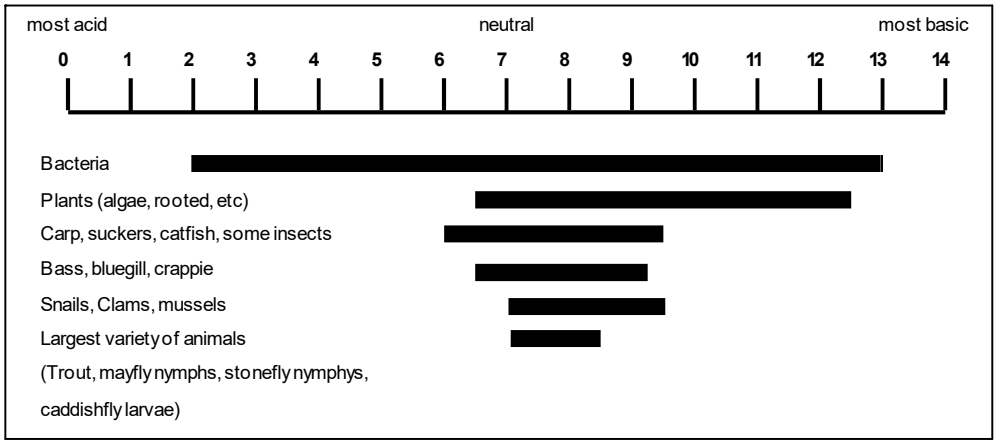

Figure 7: pH ranges that support aquatic life

According to the Lahontan *Basin Plan*, pH should fall between 6.5 - 8.5 for surface waters of the Truckee River Hydrologic Unit and 7.0 - 8.4 within Lake Tahoe. The Lahontan Water Board recognizes that some waters may have natural pH levels outside of that range.

During Snapshot Day 2025, 76 sites were sampled for pH. Of those measurements taken, 71 (93%) were within the Truckee Hydrologic Unit range of 6.5 - 8.5, and 68 (89%) were within the Lake Tahoe range of 7.0 - 8.4. The lowest recorded pH measurement was 5.6, recorded at Edgewood Creek in South Lake Tahoe. The highest measurement was 9.6, recorded at North Zephyr Creek in South Lake Tahoe. **Figure 8** displays the distribution of pH measurements by sampling region.

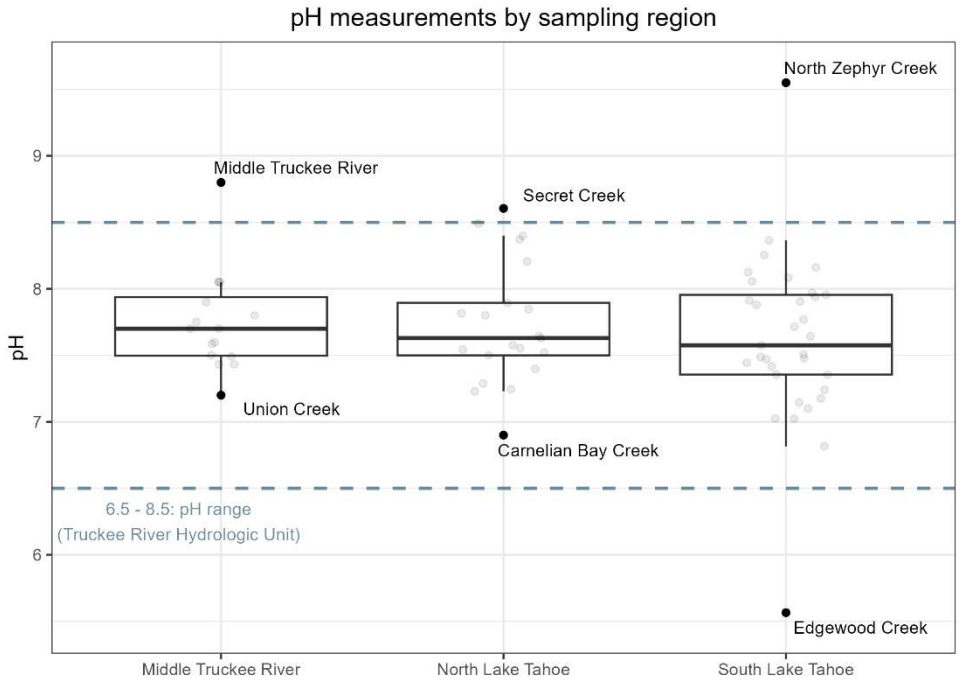

Figure 8: pH measurements

Dissolved oxygen

Dissolved oxygen is a measure of the amount of gaseous oxygen (O_2) dissolved in water, typically expressed in milligrams per liter (mg/L). Dissolved oxygen is required to support aquatic life; when dissolved oxygen levels drop, many aquatic species—particularly fish—can become stressed and unable to reproduce or perform other necessary functions.

Low dissolved oxygen concentrations can result from the following conditions:

- Excessively warm water: Warmer water dissolves and holds less oxygen than cooler water.

- Excess nutrients: Too many nutrients in the water can fuel algae and bacteria growth which consume dissolved oxygen as they decay.
- Slow or stagnant water: Movement allows oxygen and water to mix; slow or stagnant water therefore has less dissolved oxygen than water in motion.

Dissolved oxygen standards vary from region to region. Most waters within the Truckee River Hydrologic Unit are subject to a dissolved oxygen standard of at least 7.0 mg/L. In the Lake Tahoe Basin, waters designated "cold water habitat" should meet a 30-day average of at least 6.5 mg/L and an instantaneous concentration of at least 4.0 mg/L.

In 2025, 76 Snapshot Day sites were sampled for dissolved oxygen. Of the sites sampled, 67 (88%) recorded values at or above 7.0 mg/L, the Truckee River Hydrologic Unit standard. All sites sampled for dissolved oxygen recorded values above 4.0 mg/L, the 1-day sampling minimum for cold water habitat in the Lake Tahoe Basin. The lowest dissolved oxygen measurement was 4.5 mg/L, recorded at two sites in South Lake Tahoe: at the mouth of both Burke Creek and Tallac Creek. The highest was 12.0 mg/L, recorded at Fallen Leaf Lake in South Lake Tahoe. **Figure 9** displays the distribution of dissolved oxygen measurements by sampling region.

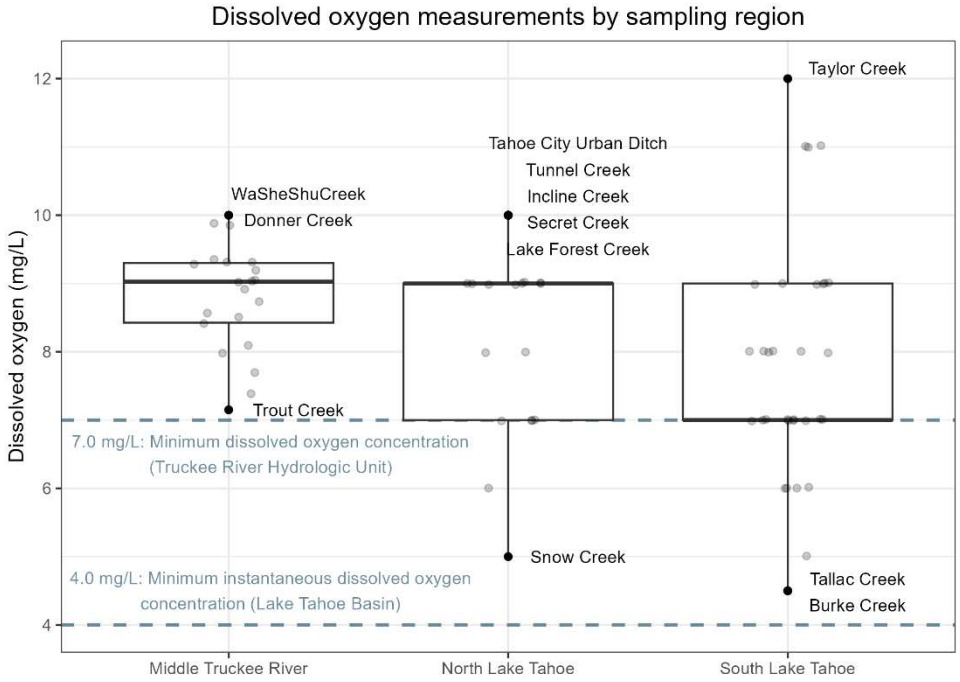

Figure 9: Dissolved oxygen measurements

Conductivity

Conductivity is a measure of the ability of water to pass an electric current, often expressed as microsiemens per centimeter (µS/cm). In water, conductivity is affected by the presence of inorganic dissolved solids such as chloride, nitrate, calcium, sulfate, and others. In rivers and streams, a key factor that affects conductivity is the geology through which the water flows. Conductivity is also sensitive to flow rates: At high flows, the charged particles that facilitate electrical current are diluted, so conductivity measurements may drop. At low flows, charged particles are more concentrated, so conductivity measurements are often higher.

Abrupt or significant changes in conductivity can be an indicator of new discharges into the water, like wastewater or other inputs. In the Truckee River Watershed, primary sources of charged particles include road sands, road deicers, and natural sources. Typically, sampling sites in urban areas or adjacent to high-traffic roads show higher electrical conductivity readings. Acceptable ranges for water conductivity are dependent on the water type. **Table 4** displays acceptable conductivity ranges for several water types. In Lake Tahoe, the maximum conductivity standard is 95 µS/cm, evaluated as an annual mean.

Table 4: Acceptable conductivity ranges for different water types

Water type	**Conductivity (µS/cm)**
Distilled water	0.5-3.0
Melted snow	2.0-42
Potable water	30-1500
Irrigation supply water	< 750

In 2025, electrical conductivity was measured at 76 Snapshot Day sites. Of the sites measured, 52 (68%) recorded values below 95 µS/cm, the maximum standard for waters in Lake Tahoe, evaluated as an annual mean. The lowest conductivity measurement was 2.5 µS/cm, recorded at General Creek in North Lake Tahoe. The highest measurement 340 µS/cm, recorded at Bijou Creek in South Lake Tahoe (Note: Volunteers reported that the water at this sampling site was

not connected to the nearby creek and that they sampled stagnant water). **Figure 10** displays the distribution of conductivity measurements by sampling region.

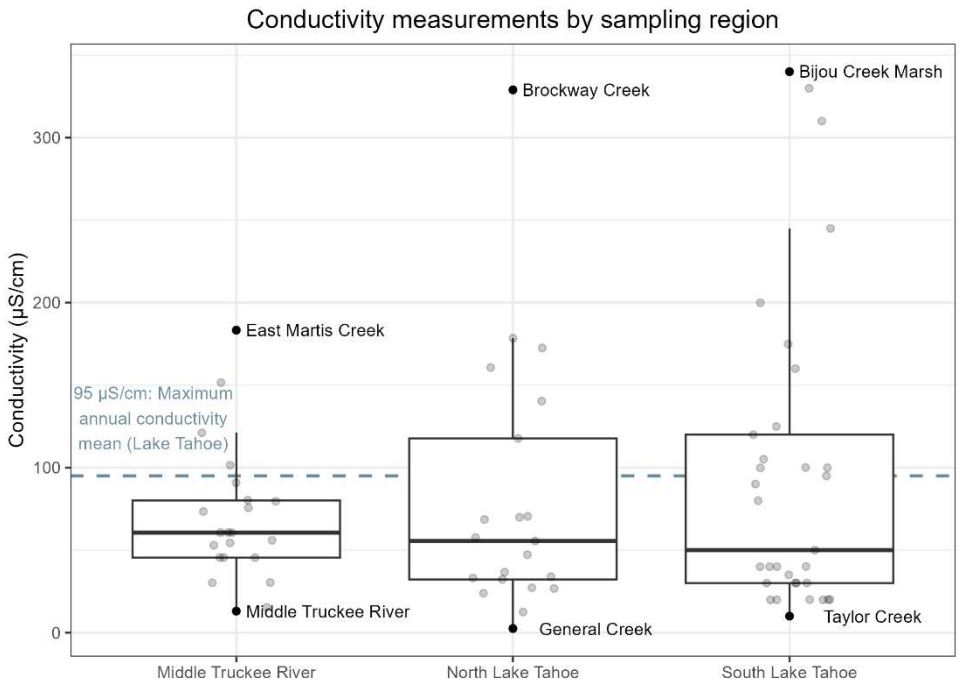

Figure 10: Conductivity measurements

Turbidity

Turbidity is a measure of suspended particles in the water column—one way to express water clarity and sediment loading. Turbidity is measured in nephelometric turbidity units (NTU), where lower values indicate clearer water, and higher values indicate cloudier water. Besides visually clouding the water, high sediment loads can clog the gills of fish, negatively affect gravel beds, and smother fish eggs and benthic invertebrates. The sediment can also carry pathogens, pollutants, and nutrients that affect water quality.

Turbidity standards vary throughout the Truckee River Watershed. The California portion of the watershed is in the U.S. EPA's Eco-Region II (forested mountains in the western U.S.). According to the EPA's recommended criteria, turbidity for streams in this region should be at or below 1.3 NTU. Eco-Region II does not include the region of Nevada just outside of the Tahoe Basin. Within the Tahoe Basin, the Tahoe Regional Planning Agency and Lahontan Water Board use a nearshore turbidity standard of 1-3 NTU (evaluated with monthly mean values). Outside of the Basin, the Lower Truckee River and associated tributaries in Nevada have a turbidity standard of 10 NTU.

At Snapshot Day 2025, turbidity was measured at 76 sites. Of the sites measured, 59 (78%) recorded values at or below 3 NTU, the maximum standard within the Lake Tahoe Basin. The lowest recorded measurement was 0.11 NTU at Tunnel Creek in North Lake Tahoe. The highest measurement was 37.4 NTU recorded at Bijou Creek in South Lake Tahoe (Note: Volunteers reported that the water at this sampling site was not connected to the nearby creek and that they sampled stagnant water). **Figure 11** displays the distribution of turbidity measurements by sampling region.

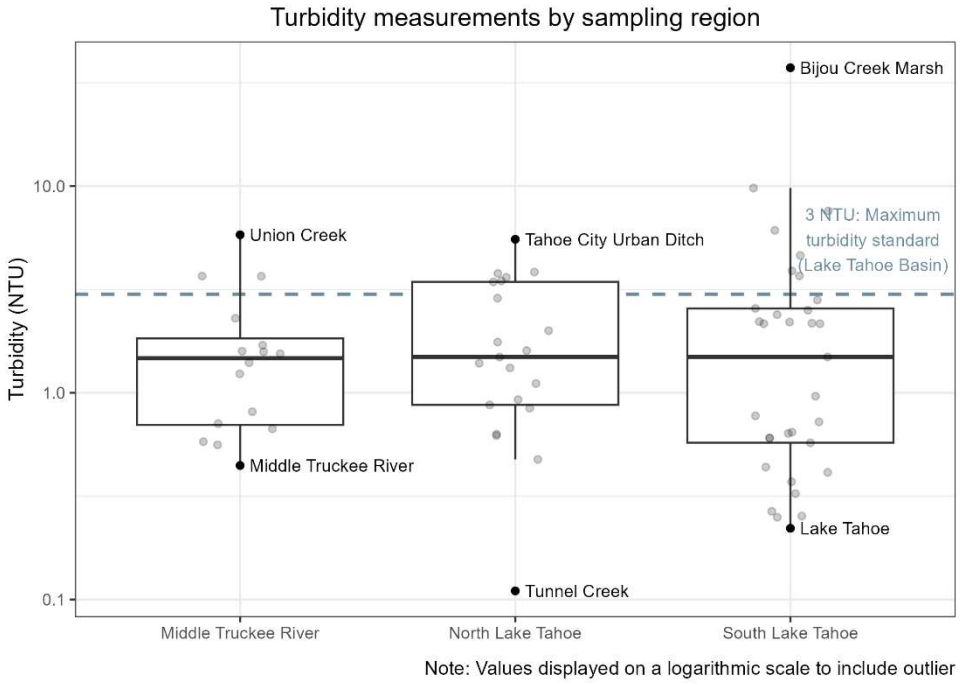

Figure 11: Turbidity measurements

Nutrients

Nutrients are an essential part of aquatic systems. At stable levels, nutrients support the growth of plants and algae that form the base of the aquatic food web. At elevated levels, nutrients can become a problem for aquatic systems. Through a process called eutrophication, excess nutrients can cause harmful levels of biological growth, sometimes leading to diminished oxygen supplies and the appearance of harmful algal blooms.

Two of the most important nutrients monitored in aquatic systems are nitrogen and phosphorus. Nitrogen and phosphorus occur in aquatic environments in a variety of forms described below, typically measured in milligrams per liter (mg/L).

Nitrogen

Total nitrogen

Total nitrogen is a measure of all forms of nitrogen in a system. Total nitrogen was measured at 70 Snapshot Day sites. Of the sites measured, 47 (67%) recorded values below 0.15 mg/L, the maximum standard for Lake Tahoe, evaluated as an annual mean. The highest measurement was 4.2 mg/L, recorded at Bijou Creek in South Lake Tahoe (Note: Volunteers reported that the water at this sampling site was not connected to the nearby creek and that they sampled stagnant water). The lowest measurement was 0.1 mg/L, recorded at three sites along the shores of Lake Tahoe in South Lake Tahoe, and one site along the Truckee River in the Middle Truckee River region. **Figure 12** displays the distribution of total nitrogen measurements by sampling region.

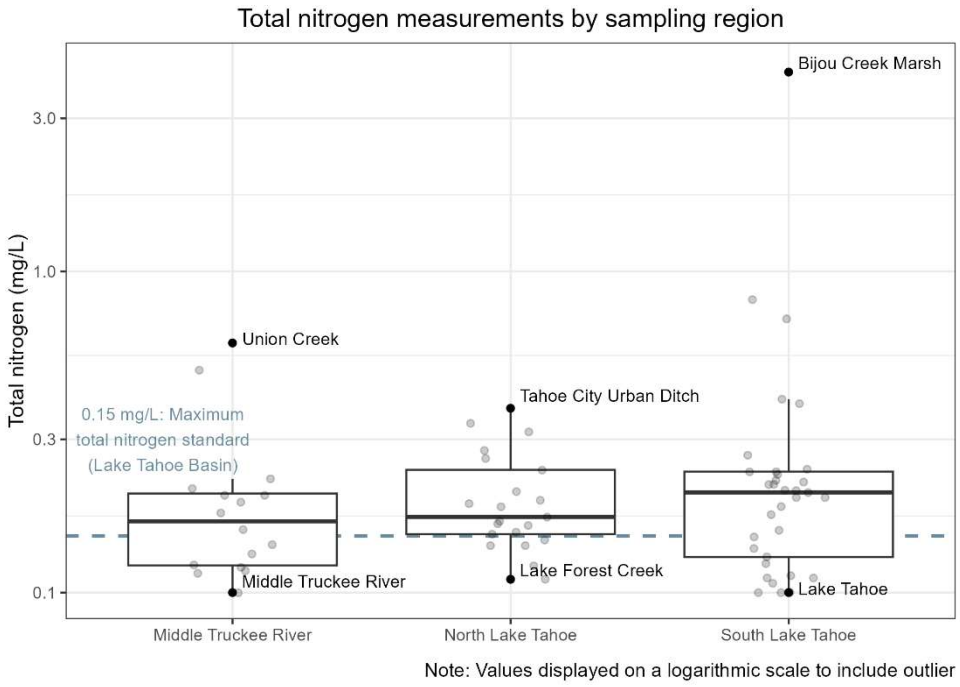

Figure 12: Total nitrogen measurements

Nitrate and nitrite

Nitrate and nitrite are both measures of inorganic nitrogen. They can be used to monitor inputs to water systems, including urban and agricultural runoff.

Nitrate was measured at 70 Snapshot Day sites in 2025. The maximum measurement was 0.228 mg/L as N, recorded at Bijou Park Drainage in South Lake Tahoe. The minimum

detection limit, <0.02 mg/L as N, was recorded at 56 sites. **Figure 13** displays the distribution of nitrate measurements by sampling region.

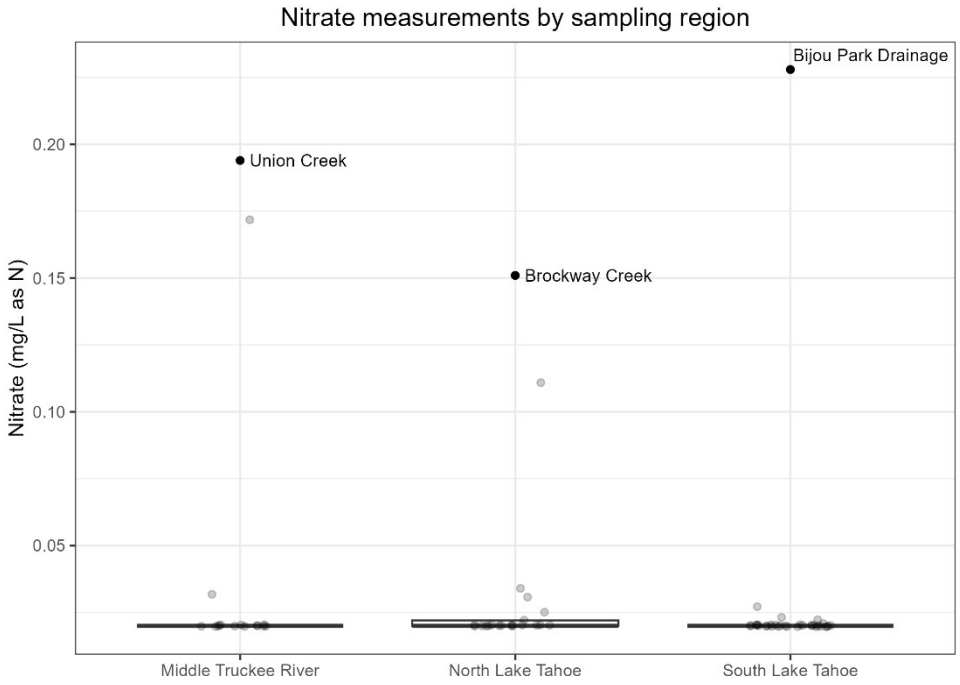

Figure 13: Nitrate measurements

Nitrite was measured at 70 Snapshot Day sites in 2025. All sites sampled for nitrite measured <0.02 mg/L, the minimum detection level for this indicator.

Total Kjeldahl nitrogen

Total Kjeldahl nitrogen is a measure of ammonia plus organic nitrogen. It can be used to measure organic nitrogen inputs from sources like urban runoff and septic systems.

Total Kjeldahl nitrogen was measured at 70 Snapshot Day sites in 2025. The highest measurement was 4.2 mg/L, recorded at Bijou Creek in South Lake Tahoe (Note: Volunteers reported that the water at this sampling site was not connected to the nearby creek and that they sampled stagnant water). The lowest was 0.086 mg/L at Glen Alpine Creek in South Lake

Tahoe. **Figure 14** displays the distribution of total Kjeldahl nitrogen measurements by sampling region.

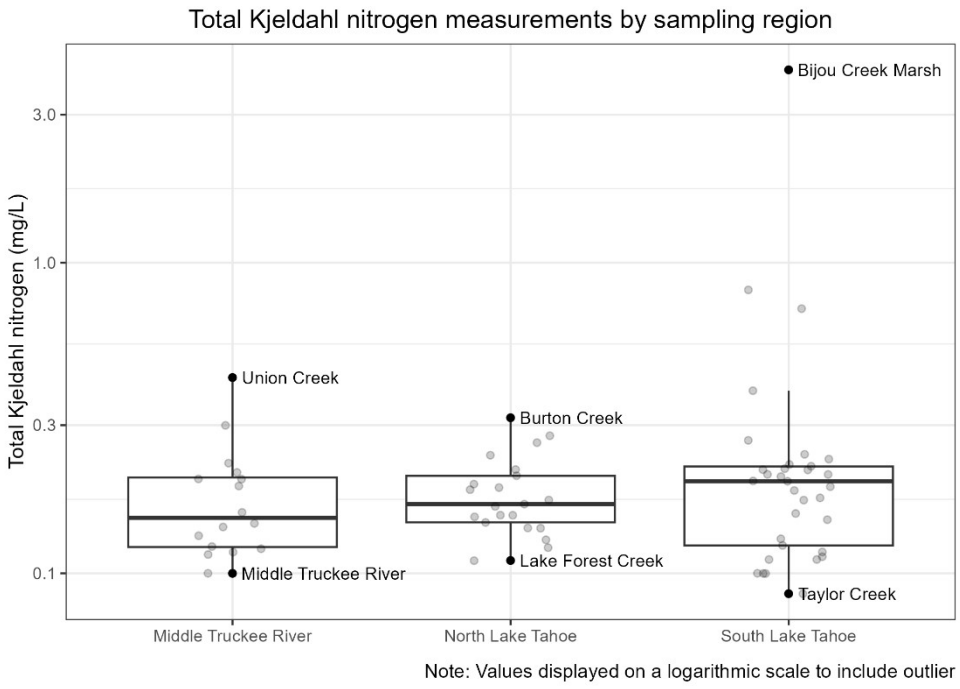

Figure 14: Total Kjeldahl nitrogen

Phosphorus

Ortho phosphorus

Ortho phosphorus is a measure of inorganic phosphorus, useful for monitoring inputs including urban and agricultural runoff.

Ortho phosphorus was measured at 70 Snapshot Day sites. All but three sites measured <0.02 mg/L as P, the minimum detection level for this indicator. The three sites above minimum detection were Bijou Creek in South Lake Tahoe (where volunteers sampled stagnant water disconnected from the creek, recording 0.036 mg/L as P), Barton Creek in North Lake Tahoe (0.029 mg/L as P) and Lake Forest Creek in North Lake Tahoe (0.022 mg/L as P).

Bacteria

Total coliform

Total coliform is a measure of a collection of different bacteria. These bacteria are commonly found in the natural environment and are typically harmless, but elevated levels may indicate contamination. Fecal coliform is a subgroup of total coliform and was not measured at Snapshot Day 2025.

Total coliform was measured at 70 Snapshot Day sites and reported using the Most Probable Number (MPN) per 100mL. The highest measurement was >2419 MPN/100mL, the maximum detection level for this indicator, recorded at the two marsh-like sampling sites in South Lake Tahoe along Cold Creek and Bijou Creek. The lowest measurement was 1.0 MPN/100mL at Carnelian Bay Creek in North Lake Tahoe. **Figure 16** displays the distribution of total coliform measurements by sampling region.

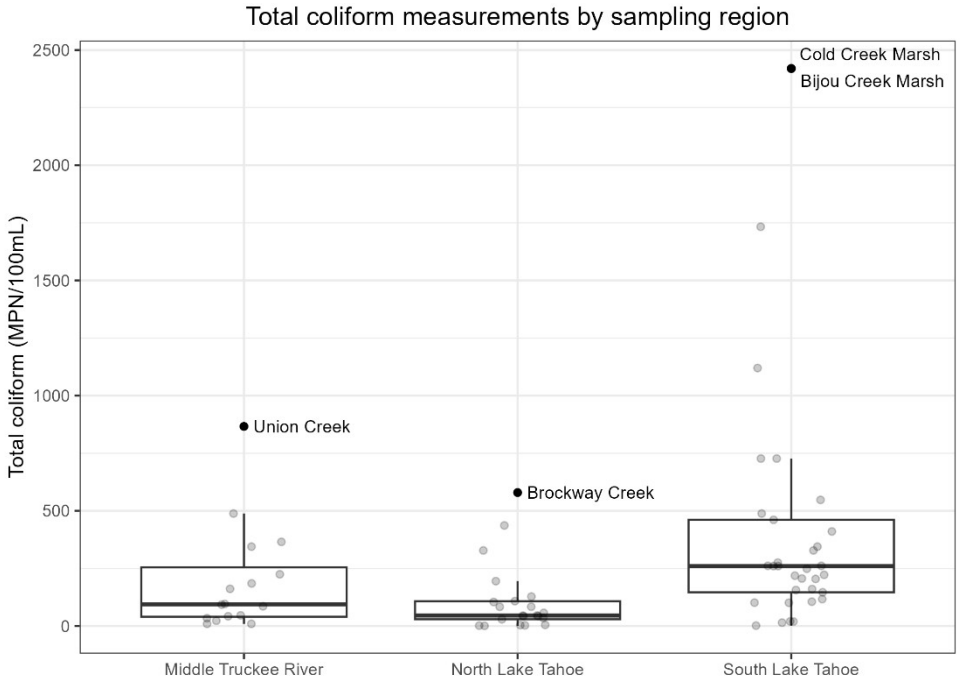

Figure 16: Total coliform

E. coli

E. coli is a bacteria found in the intestines of animals and humans. Elevated levels of *E. coli* in a water body can indicate fecal contamination.

E. coli was measured at 67 Snapshot Day sites and reported using the Most Probable Number (MPN) per 100mL. All sites measured for *E. coli* recorded values less than 320 MPN/100mL, the statistical threshold for single sampling events set by the Lahontan Water Board. The highest measurement was 142.1 MPN/100mL, recorded at Brockway Creek in North Lake Tahoe. The

lowest *E. coli* measurement was 1 MPN/100mL, recorded at 14 sites across all sampling regions. **Figure 17** displays the distribution of *E. coli* measurements by sampling region.

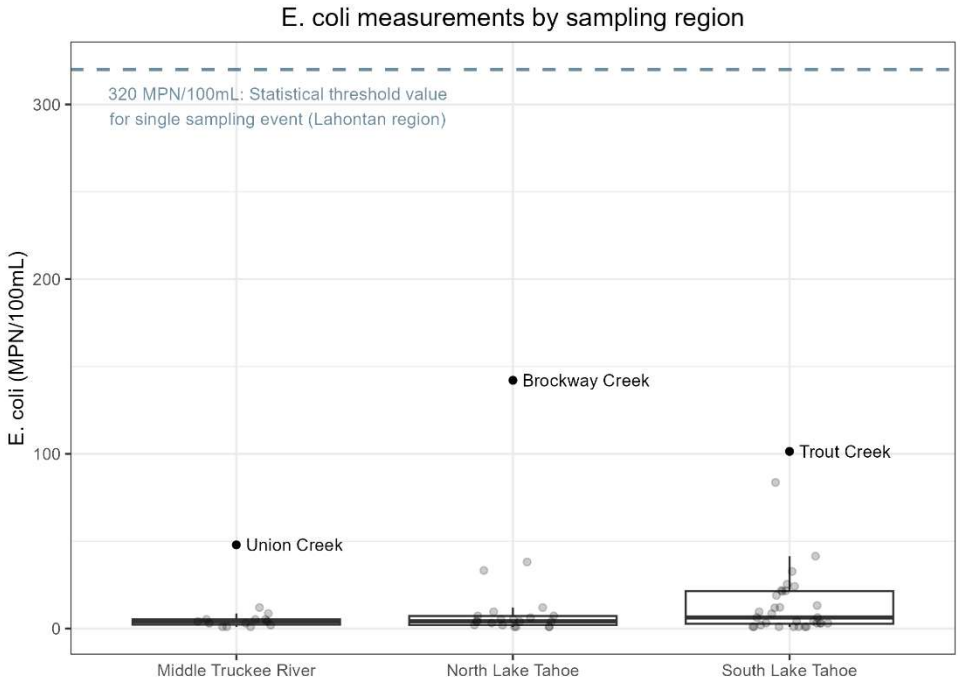

Figure 17: E. coli

Visual observations

In addition to taking in-field measurements and collecting samples for further analysis, volunteers also record visual observations at Snapshot Day sampling sites. Visual observations include evaluations of cloud cover, precipitation, wind, water clarity, sample color, sample odor, in-stream flow, and other indicators. These observations help provide context for the quantitative measures taken, offering possible causes of degraded and/or improved water quality (e.g., new inputs and discharges, restoration activities, etc.).

Across all three sampling regions, the visual observations showed continuity. **Figures 18-25** summarize visual observations by region.

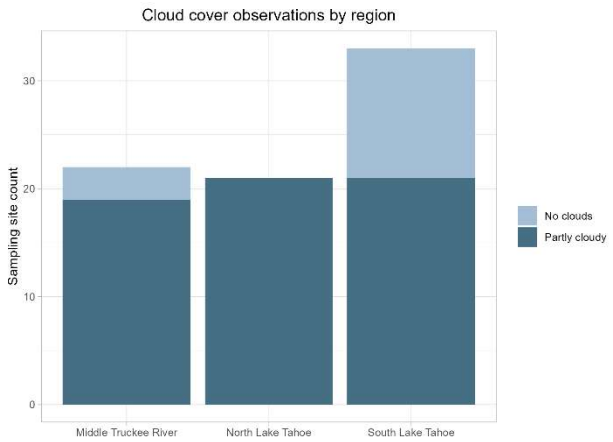

Figure 18: Cloud cover

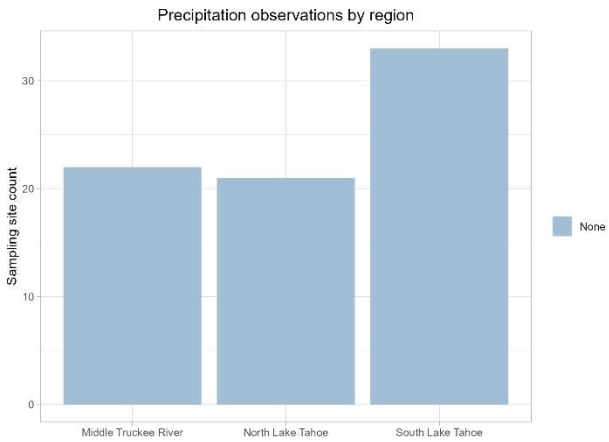

Figure 19: Precipitation

- **Cloud cover:** 80% of responding sites reported partly cloudy conditions; 20% reported no clouds.
- **Precipitation:** 100% of responding sites reported no precipitation.

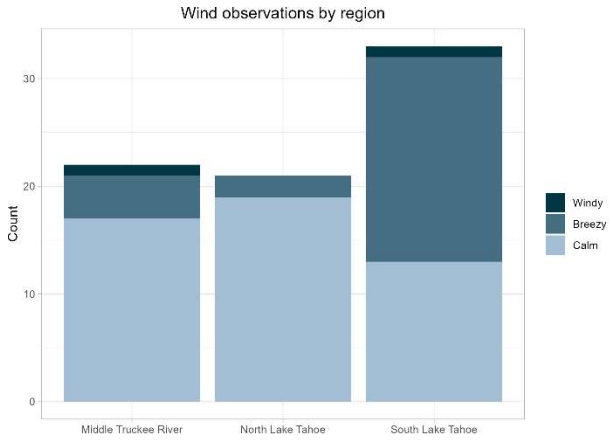

Figure 20: Wind

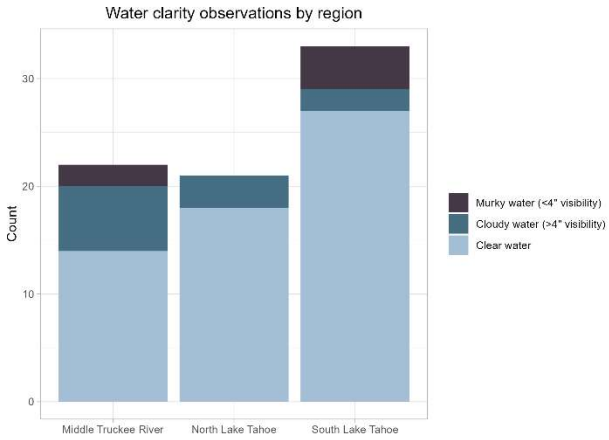

Figure 21: Water clarity

- **Wind:** 97% of responding sites reported calm or breezy conditions; 3% reported windy conditions.
- **Water clarity:** 78% of sites reported clear water; 14% reported cloudy water (>4" visibility); 8% reported murky water (<4" visibility).

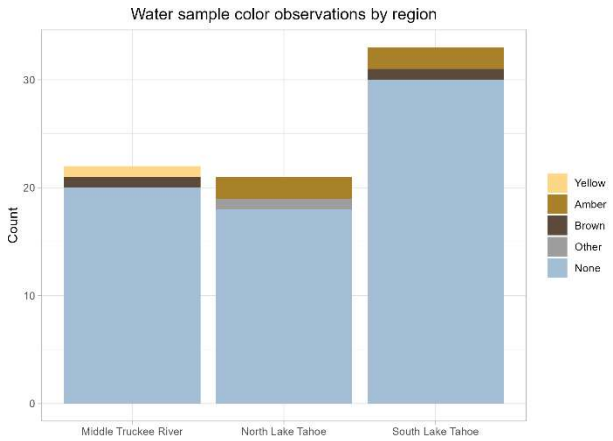

Figure 22: Sample color

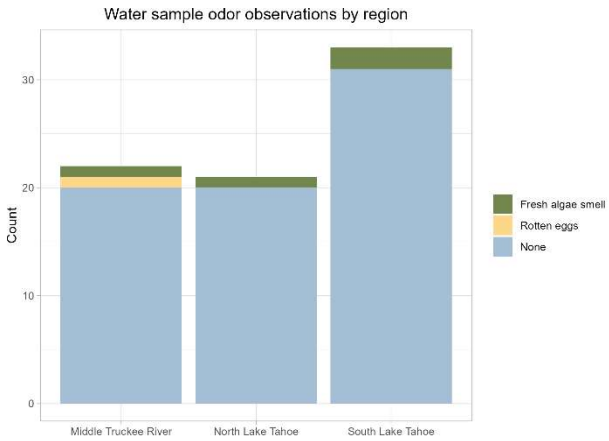

Figure 23: Sample odor

- **Sample color:** 90% of responding sites reported no sample color; 5% reported amber color; 3% reported brown color; 1% each reported yellow color or "other".
- **Sample odor:** 94% of responding sites reported no sample odor; 5% reported a fresh algae smell; 1% reported a rotten egg smell.

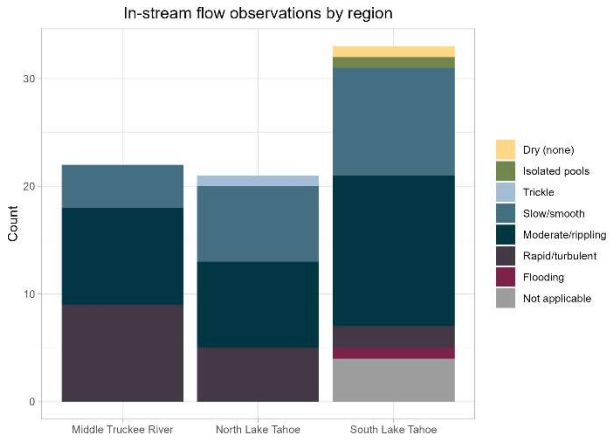

Figure 24: In-stream flow

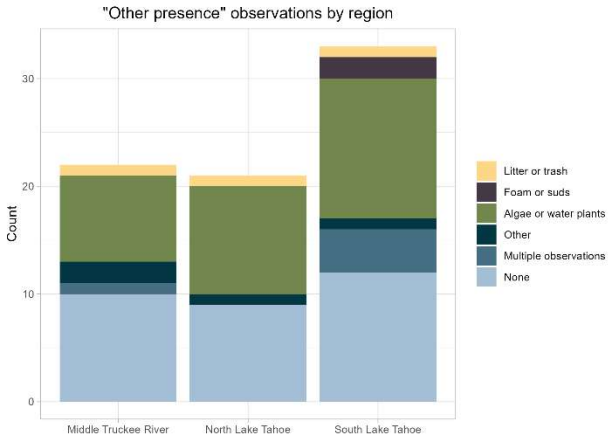

Figure 25: "Other presence"

- **In-stream flow:** 69% of responding sites reported either moderate/rippling or slow/smooth flow conditions; 21% reported rapid/turbulent conditions; 1% each reported isolated pools, dry, trickling, or flood conditions; 5% of responding sites reported "not applicable" for in-stream flow, all of which were at South Lake Tahoe sites that sample within Lake Tahoe or Fallen Leaf Lake, rather than a creek or stream.
- **"Other presence":** 41% of sites reported no other concerns at their site; 41% reported algae or water plants; 4% reported litter or trash; 3% reported foam or suds; 6% reported multiple observations; 5% reported "other".

Discussion

The Truckee River Watershed encompasses diverse land uses, from heavily forested areas in the upper region near Lake Tahoe to dense urban areas near Reno and Sparks. Urban development throughout the watershed has created impervious surfaces—including roads, parking lots, and other structures—that can negatively impact water quality. However, compared to many other watersheds in the nation, data collected within the Truckee River Watershed typically indicates good overall water quality. The results from Snapshot Day 2025 reflect this pattern.

Because Snapshot Day captures a moment in time rather than monthly or annual averages, results can be particularly sensitive to snowmelt conditions determined by snow levels during the prior winter. One indicator that shows the impact of snowpack on spring runoff is turbidity: in 2023, following the snowiest year on record in the Sierra Nevada, 64% of sites measured for turbidity reported values above 3 NTU, the Lake Tahoe Basin standard. In 2025—a more typical snow year—that percentage dropped to 22%.

May 10, 2025 marked the 25th annual Tahoe-Truckee Snapshot Day. The collaboration and continued dedication of those involved—from staff to engaged volunteers—make Snapshot Day a success each year. It has been funded primarily through local, state, and private sources. The ongoing success of this event exemplifies the value of citizen science and demonstrates how community members can contribute invaluable data while learning about their watershed.

For more information about how to get involved with water quality monitoring activities in the Truckee River Watershed, contact the following agencies and organizations:

- **North Lake Tahoe:** Sarah Vidra, Tahoe Water Suppliers Association; (775)-832-1284
- **South Lake Tahoe:** Courtney Baumann, Keep Tahoe Blue; (530)-541-5388 ext. 212
- **Middle Truckee River (Tahoe City to Nevada State Line):** Rachel Robin, Truckee River Watershed Council; (530)-550-8760 ext. 2

References

American Public Health Association, American Water Works Association, & Water Environment Federation. (2007). *Standard methods for the examination of water and wastewater* (21st ed.). Retrieved from https://www.standardmethods.org/doi/book/10.2105/SMWW.2882

California Regional Water Quality Control Board, Lahontan Region. (1993). *Water quality control plan for the Lahontan region*. Retrieved from https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/

California State Water Resources Control Board. (2001, September). *The California Streamside Biosurvey: An introduction to using aquatic invertebrates as water quality indicators*. Retrieved from https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/351.pdf

California State Water Resources Control Board. (n.d.). *Clean Water Team*. Retrieved from http://www.swrcb.ca.gov/water_issues/programs/swamp/cwt_volunteer.shtml

Dickerson, B. R., & Vinyard, G. L. (1999). Effects of high chronic temperatures and diel temperature cycles on the survival and growth of Lahontan cutthroat trout. *Transactions of the American Fisheries Society*, *128*(3), 516–521. https://doi.org/10.1577/1548-8659(1999)128<0516:eohcta>2.0.co;2

National Integrated Drought Information System (NIDIS). (2025, August 5). *Drought status update for California-Nevada*. Retrieved from https://www.drought.gov/drought-status-updates/drought-status-update-california-nevada-2025-08-05

Nevada Division of Environmental Protection. (1995). *Nevada Administrative Code (NAC), Chapter 445A*. Retrieved from https://www.leg.state.nv.us/NAC/NAC-445A.html

U.S. Department of Agriculture (USDA). (2025). *National Water and Climate Center (NWCC)*. Retrieved from https://nwcc-apps.sc.egov.usda.gov/

U.S. Department of Agriculture, Natural Resources Conservation Service. (n.d.). Water supply. Retrieved from https://www.nrcs.usda.gov/programs-initiatives/sswsf-snow-survey-and-watersupply-forecasting-program/water-supply

U.S. Environmental Protection Agency. (2000, December). *Ambient water quality criteria recommendations: Rivers and streams in nutrient ecoregion II*. Retrieved from https://www.epa.gov/sites/default/files/documents/rivers2.pdf

U.S. Environmental Protection Agency. (n.d.). *Ambient water monitoring and assessment: Resources and tools*. Retrieved from https://www.epa.gov/awma

U.S. Environmental Protection Agency. (n.d.). *Draft volunteer stream monitoring: A methods manual*. Retrieved from https://www.epa.gov/sites/default/files/2015-04/documents/volunteer_stream_monitoring_a_methods_manual.pdf

U.S. Geological Survey (USGS). (2025). *Monitoring locations 10336610 and 10338000*. Retrieved from https://waterdata.usgs.gov

Appendices

Appendix A: Resource partners

Snapshot Day 2025 Event Sponsors

- California State Water Resource Control Board
- Keep Tahoe Blue
- Lahontan Regional Water Quality Control Board
- South Tahoe Public Utility District
- Tahoe Environmental Research Center
- Tahoe Water Suppliers Association
- Truckee River Watershed Council
- Waste Not, Incline Village General Improvement District

Snapshot Day 2025 Planning Committee

- Courtney Baumann, Deirdre Francks (Keep Tahoe Blue)
- Sarah Vidra, Mark Helleckson (Tahoe Water Suppliers Association)
- Michele Prestowitz (Truckee River Watershed Council)

Snapshot Day 2025 Host Organizations

- Keep Tahoe Blue
- Tahoe Water Suppliers Association
- Truckee River Watershed Council

Laboratory Analyses

- South Tahoe Public Utility District
- Lahontan Regional Water Quality Control Board Laboratory

Equipment and Contact

- Keep Tahoe Blue, Courtney Baumann
- Tahoe Water Suppliers Association, Sarah Vidra
- Truckee River Watershed Council, Michele Prestowitz

Special thanks to

- Kelly Huck and Sabrina Rice, Lahontan Regional Water Quality Control Board, for bacteria and turbidity analysis.
- Anne Liston, Tahoe Environmental Research Center, for hosting equipment calibration.
- Dan Arce and laboratory staff, South Tahoe Public Utility District, for nutrient analyses.
- And all of the volunteers that make Snapshot Day possible!

Appendix B: Site names and codes

Region	Site code	Site name
Middle Truckee River (22 sites in 2025)	MTR-ALDR	Alder Creek
	MTR-BEAR-00	Bear Creek near mouth
	MTR-BOCA-00	Little Truckee below Boca Dam
	MTR-BOCA-01	Little Truckee at Boyington Mill
	MTR-COLD-00	Cold Creek
	MTR-DONN-00	Donner Creek near mouth
	MTR-DONN-01	Donner Creek at Highway 89
	MTR-DONN-02	Donner Creek at USGS Gage
	MTR-DONN-03	Donner Creek below dam
	MTR-EMAR	East Martis Creek
	MTR-GLEN-00	Union Creek below Glenshire
	MTR-GLEN-02	Union Creek at Glenshire Pond
	MTR-I80C	Truckee River in I-80 corridor
	MTR-MART-00	Martis near mouth
	MTR-MART-01	Martis at USACE boundary
	MTR-PROS-01	Prosser Creek below dam
	MTR-PROS-02	Prosser Creek at Highway 89
	MTR-SUMM-02	Summit Creek at TDLT
	MTR-TOWN-99	Truckee River in town corridor
	MTR-TR01-99	Truckee River near Tahoe City
	MTR-TROU-02	Trout Creek in Tahoe Donner
	MTR-WASH-00	WaSheShu Creek
North Lake Tahoe (21 sites in 2025)	NLT-BART-01	Barton Creek at Star Harbor
	NLT-BROC-00	Brockway Creek at mouth
	NLT-BRTN-01	Burton Creek at Star Harbor
	NLT-CACN-03	Carnelian Canyon Creek at minigolf course
	NLT-CBCR-01	Carnelian Bay Creek at Hwy 28

	NLT-GNRL-00	General Creek at mouth
	NLT-GRIF-00	Griff Creek at mouth
	NLT-INCL-00	Incline Creek at mouth
	NLT-LKFC-00	Lake Forest Creek at mouth
	NLT-MADC-01	Madden Creek at Highway 89
	NLT-MKNY-01	McKinney Creek at Highway 89
	NLT-QULC-00	Quail Creek at mouth
	NLT-RSWD-01	Rosewood Creek above Third Creek
	NLT-SCRT-01	Secret Creek at mouth
	NLT-SNOW-00	Snow Creek at mouth
	NLT-TCUD-00	Tahoe City Urban Ditch at mouth
	NLT-THRD-00	Third Creek at mouth
	NLT-THRD-01	Third Creek above Rosewood Creek
	NLT-TUNN-00	Tunnel Creek at mouth
	NLT-WARD-01	Ward Creek at Highway 89
	NLT-WATS-00	Watson Creek at mouth
South Lake Tahoe (33 sites in 2025)	SLT-ANG1-02	Angora Creek upstream of Lake Tahoe Boulevard
	SLT-ANG3-00	Angora Creek at Upper Truckee River confluence
	SLT-BJCR-01	Bijou Creek downstream of Fairway Drive
	SLT-BPDR-00	Bijou Park Drainage at mouth
	SLT-BPDR-01	Bijou Park Drainage downstream of Werner Salas Drive
	SLT-BPDR-02	Bijou Park Drainage downstream of Hansen's Resort
	SLT-BURK-00	Burke Creek at mouth
	SLT-COLDM-00	Cold Creek Marsh
	SLT-EDGE-00	Edgewood Creek at mouth
	SLT-FLLF-01	Fallen Leaf Lake near dam
	SLT-GLEN-00	Glen Alpine Creek at Fallen Leaf Lake
	SLT-HEAV-00	Heavenly Valley Creek at Trout Creek confluence
	SLT-HEAV-01	Heavenly Valley Creek downstream of Pioneer Trail
	SLT-KEYM-00	Tahoe Keys East Channel
	SLT-KEYS-00	Tahoe Keys West Channel
	SLT-MCFA-00	McFaul Creek at mouth
	SLT-MCFA-01	McFaul Creek downstream of Highway 50
	SLT-MEEK-00	Meeks Creek at mouth
	SLT-MEEK-01	Meeks Creek upstream of Highway 89
	SLT-NZHR-00	North Zephyr Creek at mouth
	SLT-SZHR-00	South Zephyr Creek at mouth
	SLT-TALL-00	Tallac Creek at mouth
	SLT-TALR-00	Taylor Creek at mouth

	SLT-TR10-01	Upper Truckee River upstream of Lake Tahoe Boulevard
	SLT-TR15-02	Upper Truckee River at airport
	SLT-TR20-01	Upper Truckee River downstream of Elks Club Drive
	SLT-TRMO-00	Upper Truckee River at mouth
	SLT-TROU-00	Trout Creek at mouth
	SLT-TROU-01	Trout Creek at Bellevue Avenue
	SLT-TROU-02	Trout Creek at Grinding Stone
	TAH-SLAKE-01	Lake Tahoe at Ski Run Marina
	TAH-SLAKE-03	Lake Tahoe at Timber Cove
	TAH-SLAKE-06	Lake Tahoe at Kahle Beach

Appendix C: Monitoring equipment

Most monitoring teams are assigned a combination of the following field instruments:

- Armored Envirosafe thermometers (alcohol-filled, 0.5° C resolution);
- Standard pH indicator strips (0.5 pH unit resolution) or Hanna Combo pH/Conductivity/TDS Tester (0.01 pH unit resolution)
- Handheld Oakton TDS Tester Conductivity meters (10 µS/cm resolution) or Oakton Conductivity Low+ meters (1 µS/cm resolution) or Hanna Combo pH/Conductivity/TDS Tester (10 µS/cm resolution); and
- Chemetrics dissolved oxygen kits (colorimetric, indigo-carmine dye reaction, 1 mg/L resolution below 6 mg/L and 2 mg/L resolution above 6 mg/L)

Bacteria, nutrient, and turbidity samples are collected in sterile sample bottles. Nutrient and bacteria samples are kept chilled with ice or blue ice in coolers from the point of collection until arrival at the lab for analysis.

In 2025, bacteria and turbidity samples were transported to Lahontan Water Quality Control Board Lab in South Lake Tahoe. Bacteria samples were run using Standard Methods for the Examination of Water and Wastewater (SM 9223 B).

In 2025, nutrient samples were collected and transported to South Tahoe Public Utility District. Unfortunately, due to the high sample load, NO3-N, NO2-N & Ortho Phosphorous were analyzed past 48-hr Hold Time on 2025-05-12. South Tahoe Public Utility District uses an indirect method for TKN which was approved by the Lahontan Regional Water Quality Control Board. They use Total-Nitrogen USGS Method 03-04174. They then subtract Nitrate-N and Nitrite-N measured using EPA Method 300.0. The result is TKN. For O-P they use Ion Chromatography, EPA Method 300.0.