



A TERC diver experiencing the green water in Lake Tahoe: Photo Credit UC Davis

The Annual Clarity Report is right around the corner, so here is your Lake Tahoe Clarity Primer

And an introduction to a potential new focus for clarity research

It is that time of year again, Lake Tahoe lovers. Yes, it is time for the annual clarity report, produced by our dedicated team of researchers. It is fairly well known that we take monthly clarity measurements around the lake and have done so for over 50 years. These measurements are taken with the well-known Secchi Disk (see picture below) and various high-tech instruments (check our Instagram feed) that measure the density and size of particles in the lake. But why do particles impact clarity, and what kind of particles are we talking about?

The first one is easy. Particles in the water impact clarity by scattering and absorbing light, making the water appear cloudy or murky, and reducing the amount of light that can penetrate the water column. Researchers from TERC and DRI, looking at you Alan Heyvaert, have found that particles smaller than two microns (about the width of a human hair) cause the most damage to water clarity because they stay suspended in the water column for so long and can scatter light so effectively. But what kinds of particles are floating in the water column in Lake Tahoe?

Sediment, Plastic, and Plankton

Sediment from erosion and roadways (especially in the winter) can enter Lake Tahoe and impact clarity. The Tahoe Regional Planning Agency has made great efforts to reduce the amount of fine sediment entering the lake from urban areas by implementing erosion controls and water catchments as part of its Total Maximum Daily Load (TMDL) program. These efforts have significantly reduced the amount of fine sediment entering the lake. In 2023, California and Nevada agencies estimated **that 553,000 pounds of fine sediment** were kept from washing into the lake—a vital and valiant effort to protect and improve lake clarity.

Plastic, in the form of microplastics, has been documented in Lake Tahoe by many agencies and organizations in recent years, including TERC. Microplastics in Lake Tahoe are tiny plastic particles, less than 5 millimeters in size, that originate from the breakdown of larger plastic items. In TERC's study of microplastics on the surface of Lake Tahoe, our team estimated that the **average density was around 306,000 particles per square kilometer**. We believe that plastic particles can have the same impact on clarity as sediment.

Plankton, in this case, phytoplankton, are single-cell, drifting, plant-like organisms that are the basis of the food web in Lake Tahoe. The various types of algae found in Lake Tahoe are all part of the phytoplankton family, and it is not hard to get a mental image of how algae can impact clarity.

Our researchers have studied algae and the potential for algae growth in the lake for decades. We know that the presence of algae can impact clarity in that “green water” sort of way. But there is a potential new focus area of study on the horizon for the lake: picoplankton. Picoplankton, as the name implies, are tiny. The cells are between 0.2 and 2 microns. Just like with sediment, the size of plankton will determine how long it stays floating in the water column. Because the picoplankton are so tiny, they will not settle quickly and remain in shallow waters, scattering light and impacting clarity. Isolating the percentage of picoplankton in the lake’s overall algae totals has not been something researchers have focused on over the decades. But, in the context of warming air and water temperatures, which encourage picoplankton to stay in the shallow waters, this is rapidly becoming an area of great interest.

So, stay tuned, friends. Lake Tahoe science is ever-evolving. Look for the Clarity report towards the end of April.

Do you love learning about what TERC is up to? Then make sure you stay up to date on our events! Join us on April 17th, 4-6 pm, for a very special **North Tahoe Chamber Mixer**. There will be food, drinks, and some seriously fun science demonstrations. On April 24th from 5:30 to 7:00 pm, you can meet TERC’s new director, Stephanie Hampton, and hear about her experience and research around the world at her talk titled, “**Freshwater on a Changing Planet.**” Both events will be held at the Tahoe Center for Environmental Sciences in Incline Village. The details and registration can be found here: <https://tahoe.ucdavis.edu/events>

Be sure to follow us on Instagram (@ucdavistahoe) or LinkedIn (search for UC Davis Tahoe Environmental Research Center) for a sneak peek at life and work behind the scenes at TERC!

Learn how you can support TERC, especially in these uncertain times by visiting <https://tahoe.ucdavis.edu/giving>



The secchi disk being lowered to check clarity in Lake Tahoe by research associate Katie Senft. Photo Credit: UC Davis



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