

Attached algae or “periphyton” growth peaks in spring at Lake Tahoe

This time of year the UC Davis Tahoe Environmental Research Center (TERC) receives many phone calls and emails from locals and visitors with concerns about the algae growth they see.

Spring, with its increasing solar radiation, is the time when growth of attached algae (periphyton) is usually the heaviest. During this period of often abundant growth, this algae appears in multiple colors (whitish, tan or green) and can take the form of slimy, feathery or stringy growths on rocks in the shallow nearshore zone. It also actively grows on pier pilings, surface sediments, boat hulls and other available surfaces. The amount of growth is not uniform around the lake. Periphyton growth depends on the availability of the nutrients nitrogen and phosphorus that drain into the nearshore from the surrounding landscape. During wet winters, the lake receives higher amounts of nitrogen and phosphorus from groundwater and surface runoff sources. We would expect this to favor heavier periphyton growth this year. Spring growth of periphyton is often heaviest in the northwest portion of the lake.

Following a spring bloom, we often see aggregations or mats of periphyton—which have broken free or “sloughed” from rocks or other surfaces—floating on the surface or washed up along the shore. This is particularly common in the area from Pineland to Dollar Point but can be seen anywhere in the lake.

The algae seen in the accompanying photographs are diatoms (*Gomphoneis herculeana*)—they are small algal cells which affixes to the rock or bottom surfaces by means of a vegetative “stalk.” It is the accumulation of large amounts of the stalk material that creates the unsightly mats. A large amount of algae mass develops into a mat and in some places a carpet-like structure. This algae undergoes an annual cycle of growth-death-decay. This is a very normal process and does not imply unhealthy water quality. However, while all lakes experience periphyton growth, heavy growth is a sign of excessive nutrient loading. When this algae begins to die off, the biomass loses its ability to remain attached and begins to slough off. The algae may also grow loosely attached to bottom sediments during calmer periods and be easily sloughed during windy periods.

As the dead algae begin to decay, gas is trapped in the mat causing it to float and wash up along shore. Much also remains submerged gradually dispersing in the water column and along the bottom. Although there may be live cells in the sloughed material, the mats on the

surface don't usually proliferate further into a larger bloom, rather they typically break apart, sink or wash up along shore where it can cause a particularly bad odor as it bakes in the sun.

Residents and visitors alike are equally concerned about these unsightly mats that they see floating in this usually pristine lake.

For further information on the nearshore algae, you can use the 2010 Water Quality Investigations Report - Periphyton Section which provides background information on the periphyton and patterns of growth researchers are observing around the lake (visit http://terc.ucdavis.edu/publications/2010_LakeTahoeWaterQualityInvestigations.pdf).

There is also a range of other information on the UC Davis TERC website at <http://terc.ucdavis.edu/>.

Contact (775) 881-7566 or tercinfo@ucdavis.edu with additional questions or stop by the UC Davis TERC science education center in Incline Village (open Tuesday through Friday, 1-5pm).



Attached algae or "periphyton" blankets the rocks underwater in certain locations during the spring months



UC Davis researchers collect samples of the periphyton and compare growth from year-to-year and in various locations around the lake



As the dead algae begins to decay, gas is trapped causing it to float to the surface



Mats of dead periphyton floating on the surface of Lake Tahoe (Photo by Bob Zimmerman, 2011)



Dead algae floats to the surface and washes up along the north shore of Lake Tahoe



Algae mats in Tahoe City Marina after floating up from the bottom in spring 1983 (Photo by Bob Richards, 1983)