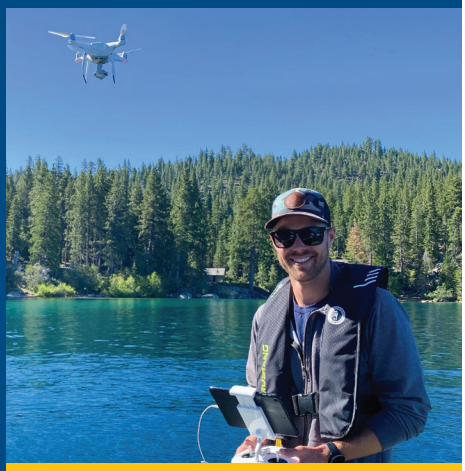
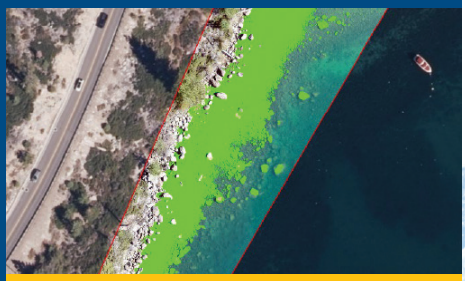


Brandon Berry with the current drone during the Lake Tahoe algae monitoring project.



Lake Tahoe shoreline captured by drone.

"Supporting an investment in a new drone will not only help this algae monitoring program, but new imaging technology could help the drone program expand and open new areas of research."

- **BRANDON BERRY, TERC RESEARCH ASSOCIATE**

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Mapping Lake Tahoe's algae by drone

Dear <<Informal Salutation>>,

Lake Tahoe is famous for many things, including its size. With a surface area of nearly 191 square miles and 72 miles of shoreline, monitoring the entire lake is a challenge, but monitoring algae is especially tricky. Algae grow all year in Lake Tahoe. Periphyton, the fuzzy algae that attach to rocks, thrives in winter. Metaphyton, the unattached green algae that appears to float on the sandy lake shore, prefers the warmer waters.

With different types of algae growing in different seasons in a lake as big as Tahoe, how do researchers at the UC Davis Tahoe Environmental Research Center (TERC) keep track? Their new algae monitoring program, which utilizes high-resolution imagery captured by drone, is specifically designed to address this challenge.

The drone captures images with a resolution of 1 to 3 cm, which are then analyzed using machine-learning techniques that classify each pixel based on visible color, distinguishing between algae and non-algae. They can then calculate the percentage of each site that is covered in algae. With this, they can capture how spatial coverage can change in an area throughout the year.

"By adding high-resolution imagery from drones and utilizing machine learning to identify algae, you can get an aerial estimate of algae cover, and then you compare that with in-water sampling to get actual estimates of biomass at each site and how it changes throughout the seasons and the year," says TERC research associate Brandon Berry.

This unique program makes algae monitoring efficient and accurate; however, the current drone is aging, and with technological upgrades, the program can be further expanded to deliver even more value to the Tahoe Basin.

Your gift of any size supports cutting-edge research and technology to keep Lake Tahoe healthy and beautiful. You also support education that benefits the public and develops the next generation of science leaders. Join us by making a gift today!

P.S. Help support the science and research behind TERC's annual State of the Lake Report and the Algae Monitoring Project by making a gift today at give.ucdavis.edu.