Lake Tahoe clarity improves with drought

By Kathryn Reed

Drought is proving to be a good thing for the waters of Lake Tahoe, at least when it comes to clarity.

With less sediment reaching the lake mostly because the spring runoff was dismal, lake clarity is the best it has been in a decade. The Secchi disk – which resembles a white dinner plate – could be seen by the naked eye at a depth of 77.8 feet in 2014. The 2013 reading was 70.2 feet.

Those numbers come from averaging 28 readings during the year. Last year the deepest the 10-inch disk could be seen was 93.5 feet on July 7, while the shallowest was 57.4 on Sept. 16.

The data comes from the UC Davis Tahoe Environmental Research Center's "Tahoe: State of the Lake Report 2015" that was released today.

Scientists have discovered Lake Tahoe's clarity and blueness are not one in the same. Photo/LTN

"While these latest data are very reassuring, they should not

be interpreted as victory in our joint restoration efforts," Geoff Schladow, director of TERC, said in a statement. "Complete restoration is still decades away, and some of the greatest challenges still lie ahead of us. We are enduring drier and warmer conditions than we have ever encountered, and the restoration consequences of that are still far from understood."

Climate change is a concern for scientists as they study the health of the lake and try to analyze how various factors affect the ecosystem.

At 29, the winter 2013-14 had the least number of freezing days in the last century; precipitation was 61 percent of the long-term average; snowpack was the lowest in 100 years; the annual-averaged surface temperatures were at an all-time high in 2014 at 53 degrees.

"Other consequences of climate change could also be seen in the rising temperature of the deep waters of the lake. In the last 38 years bottom temperatures have increased by over 1 degree," the report says. "Lake Tahoe did not mix to its full depth in 2014, the third consecutive year in which this has not happened. Instead, the maximum depth of mixing was only 440 feet, reached in March. The lack of mixing was due to a third year of above average lake stability, driven by the generally warmer weather."

New in this year's annual document was a study about what factors make the lake blue. The conclusion is less algal concentration means a bluer Lake Tahoe.

The blue study was a collaboration between UC Davis postdoctoral researcher Shohei Watanabe and the NASA-Jet Propulsion Laboratory and Laval University. A blueness index was created using data from a NASA-JPL research buoy at the lake and hyperspectral radiometers that measure the amount of light leaving the lake at each waveband.

The conclusion was that blueness and clarity measurements went in opposite directions. In other words, when clarity improves, the blueness declines and vice versa.

“This does not mean that clarity should be dismissed,” Watanabe said in a statement. “Rather, it shows that algae concentrations and nutrient input should be managed more closely to truly keep Tahoe blue and clear.”

Evaporation is the main source of water loss. In 2014, 52 inches of water evaporated from the lake. One inch of evaporation is equal to 3.5 billion gallons of water.

It has just been in the last couple years that a concerted effort has been made to study water near the shoreline, aka the near shore. The study found that periphyton, or attached algae, on rocks decreased from 2013 to 2014.

“The two most urbanized sites, Tahoe City and Pineland, were one-half to one-sixth of their values in 2013. This decrease is not believed to be part of a long-term trend, but linked to the low water levels and the reduced nutrient input,” the report says.

TERC is creating a link between near shore water quality and measured meteorology, stream flow and storm water flow to provide a scientific basis for near shore restoration.

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Notes:

- Geoff Schladow will give a presentation about the report on July 23 at 6pm at TERC (on the campus of Sierra Nevada College in Incline Village).