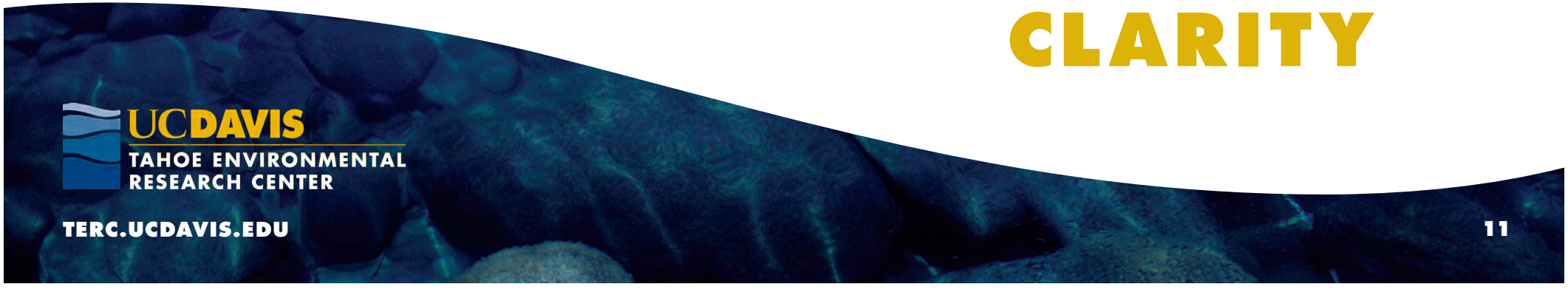
TAHOE: STATE OF THE LAKE REPORT 2016

CLARITY



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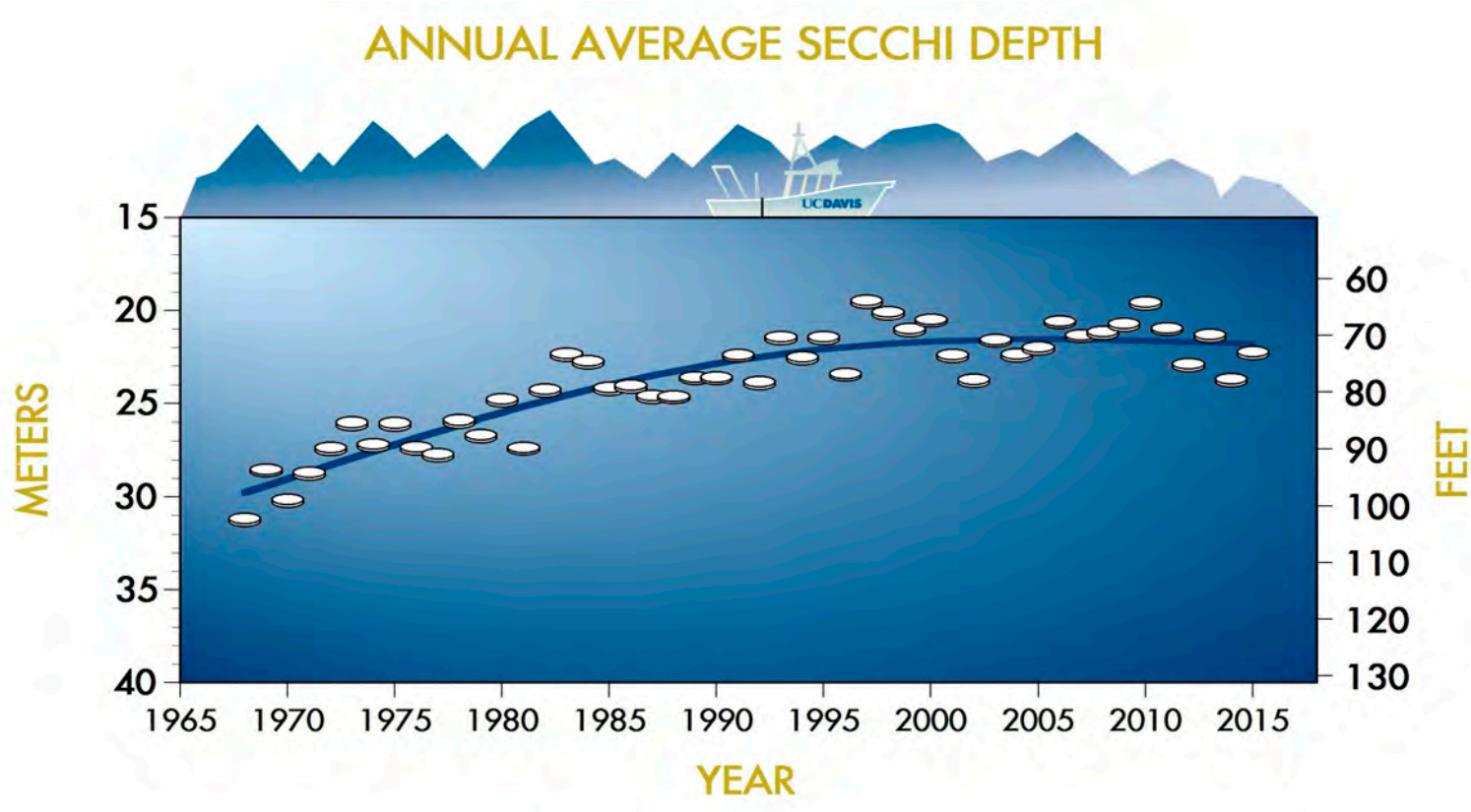
TAHOE ENVIRONMENTAL RESEARCH CENTER

CLARITY

Annual average Secchi depth

Yearly since 1968

The Secchi depth is the depth at which a 10-inch white disk, called a Secchi disk, remains visible when lowered into the water. In 2015, the annual average Secchi depth was 73.1 feet (22.3 m), a 4.8 foot decrease from the previous year but still over 9 feet greater than the lowest average of 64.1 feet (19.5 m) recorded in 1997. The annual average clarity in the past decade has been better than the prior decade. The highest individual value recorded in 2015 was 86.6 feet on April 22, and the lowest was 59.9 feet on February 3. The decline this year is part of the year-to-year variability that has always characterized conditions at the lake. While the average annual clarity is now better than in preceding decades, it is still short of the clarity restoration target of 97.4 feet set by federal and state regulators, a goal agencies and the Tahoe Basin community continue to work toward.

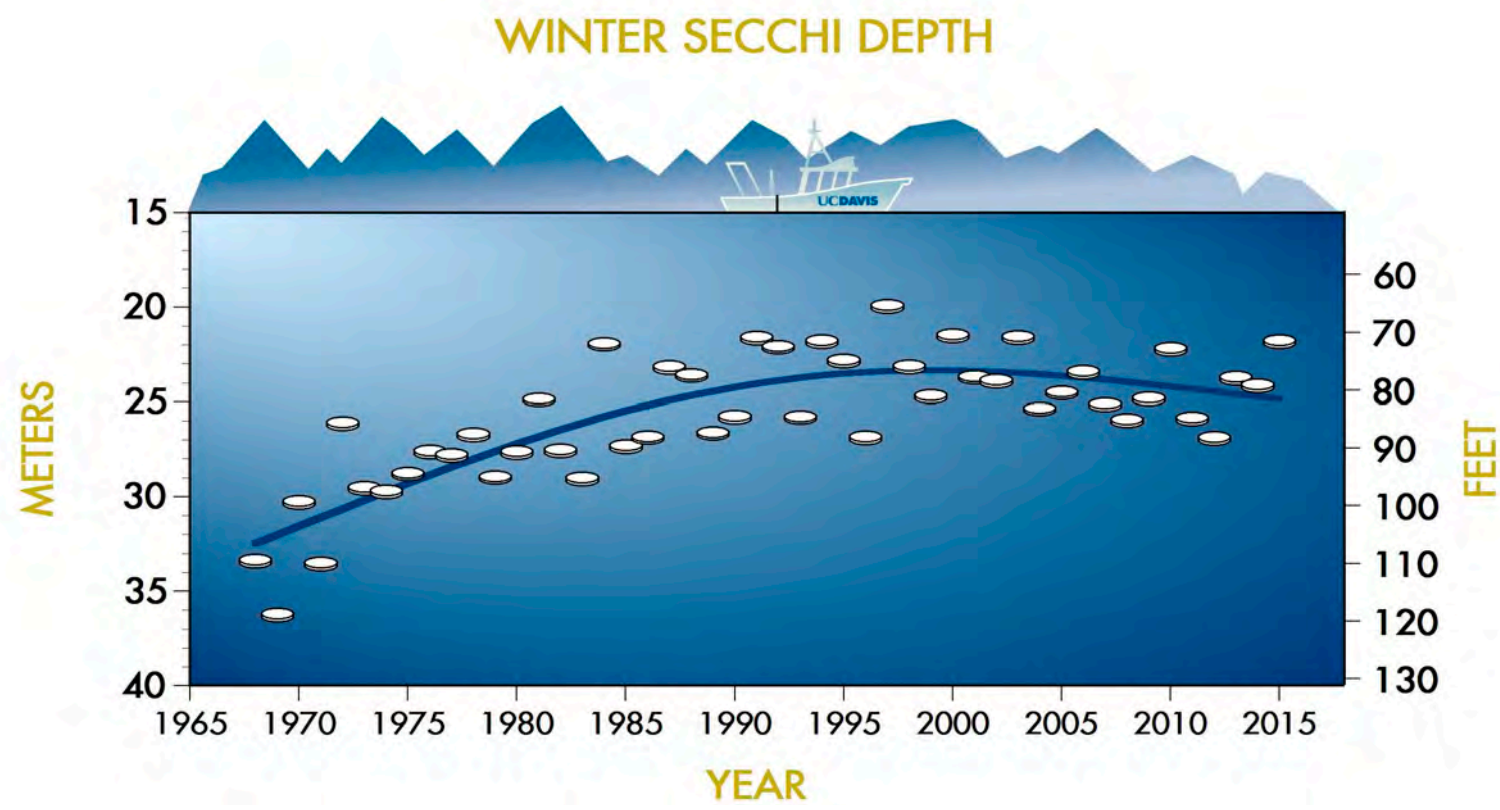


CLARITY

Winter Secchi depth

Yearly since 1968

Annual winter (December-March) Secchi depth measurements from 1968 to the present indicate that winter clarity at Lake Tahoe is showing definite improvement. In 2015, winter clarity declined by 7.6 feet. The winter average of 71.5 feet (21.8 m) was still well above the worst winter average, 65.6 feet (20.0 m), seen in 1997. The low level of snowfall compared to rain this year caused the water entering the lake to be warmer in 2015, and this introduced fine particles closer to the surface impacting clarity.

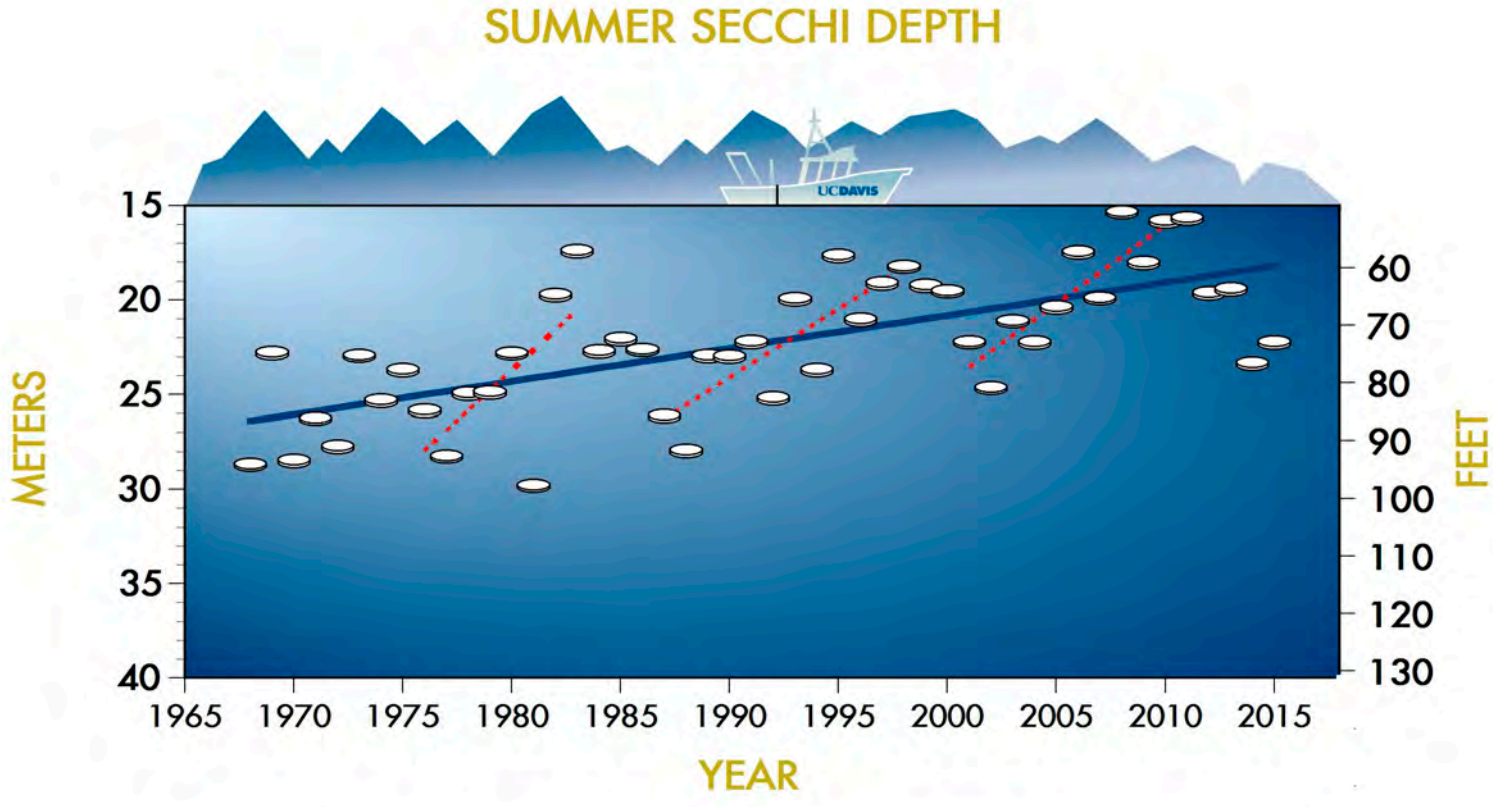


CLARITY

Summer Secchi depth

Yearly since 1968

Summer (June-September) clarity in Lake Tahoe in 2015 was 73.0 feet (22.3 m), a 3.7 foot decline from 2014. A contributing factor may have been the very low water levels in the lake, which exposed muddy shelves around the periphery of the lake. The summer trend is dominated by a consistent long-term degradation but with a noticeable 10-15 year cyclic pattern. The red dashed lines are linear regressions for the periods: a) 1976 to 1983, b) 1987-1998, and c) 2001 to 2011. The most recent improvement may be a continuation of this cyclical trend. The reasons behind this periodicity are being investigated.



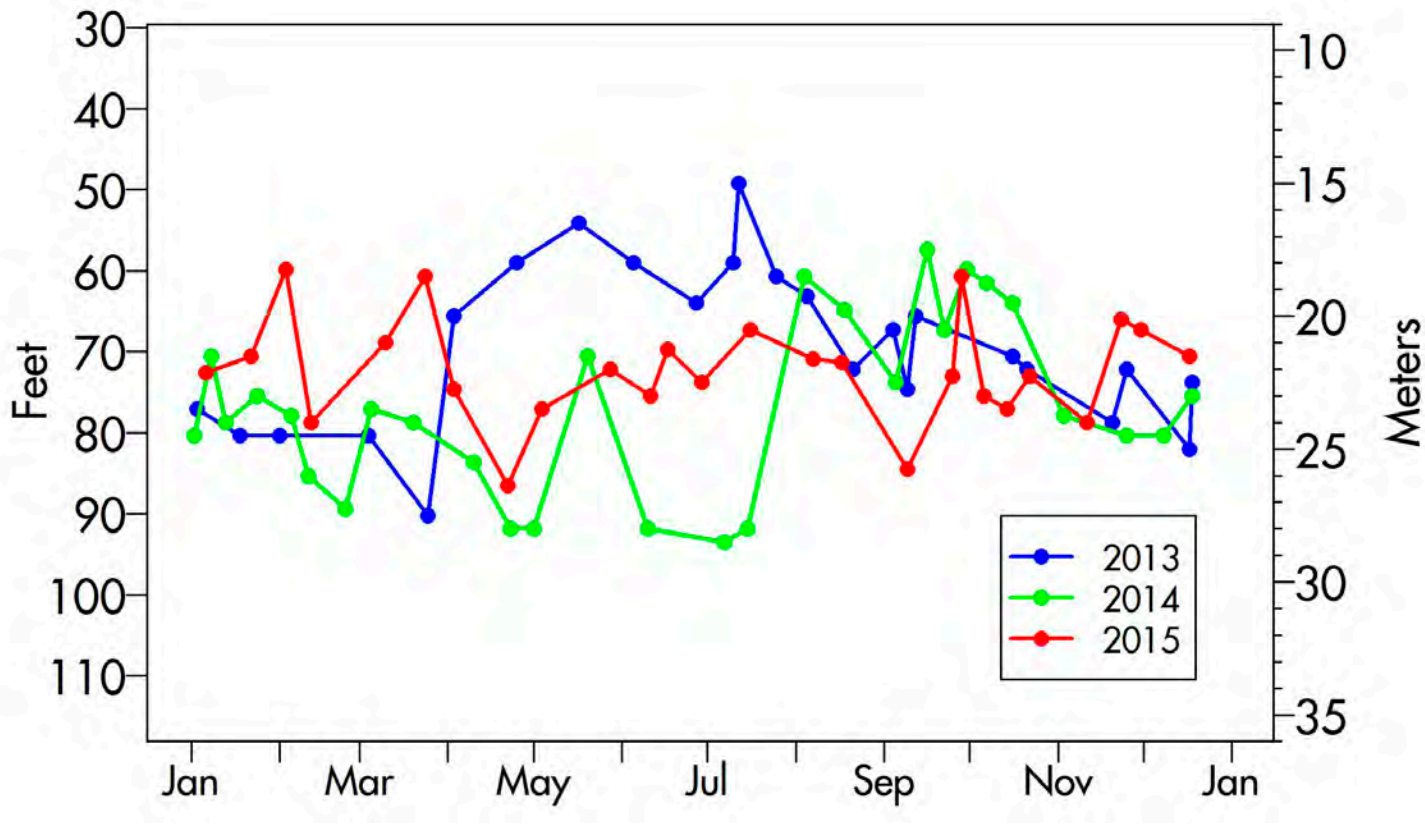
CLARITY

Individual Secchi depths

2013, 2014, 2015

Here, the individual Secchi depth reading from the Index station on the west side of the lake for 2013, 2014 and 2015 are plotted. For 2013, there is a distinct seasonality – Secchi depth is generally higher in the fall and winter months, and lowest in the spring and summer. The maximum Secchi depth often occurs around the time of deepest mixing (March). 2014 and 2015 represented a departure from this long established pattern. In 2015 some of the lowest Secchi depths occurred in winter.

Secchi values can be seen to sometimes vary considerably over short time intervals. This is evident in February and October, 2015, where Secchi depth changed 19.5 feet and 15 feet respectively between consecutive readings. Such short-term variability is common in lakes. In these cases the sudden change is due to episodes of strong wind.



CLARITY

Light transmission

In 2015

A light transmissometer instrument emits a specific wavelength of light and measures the percentage of that light transmitted over a 10 inch path. Clearer water results in a higher percentage of light transmission. Here, the light transmission measured at every depth in the lake is shown at three times in 2015. The first two panels, taken either side of the time of maximum vertical mixing, indicate that the lake has not fully mixed. In all three panels the less clear water (lower percent transmission) is toward the surface, whereas the deeper water is much clearer (higher percent transmission). The reason for the high light transmission in deep water is that fine particles aggregate into larger particles that rapidly settle out in the deep water. Large particles do not scatter light as much as fine particles.