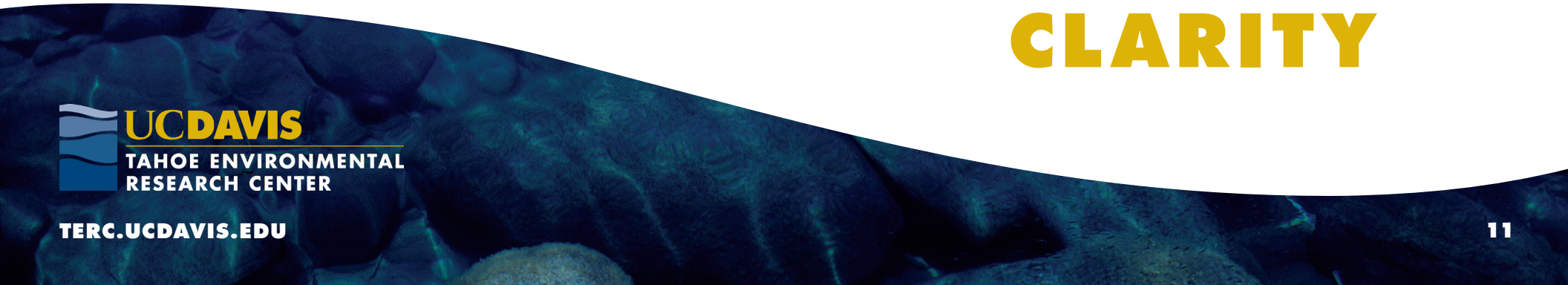
TAHOE: STATE OF THE LAKE REPORT 2015

CLARITY



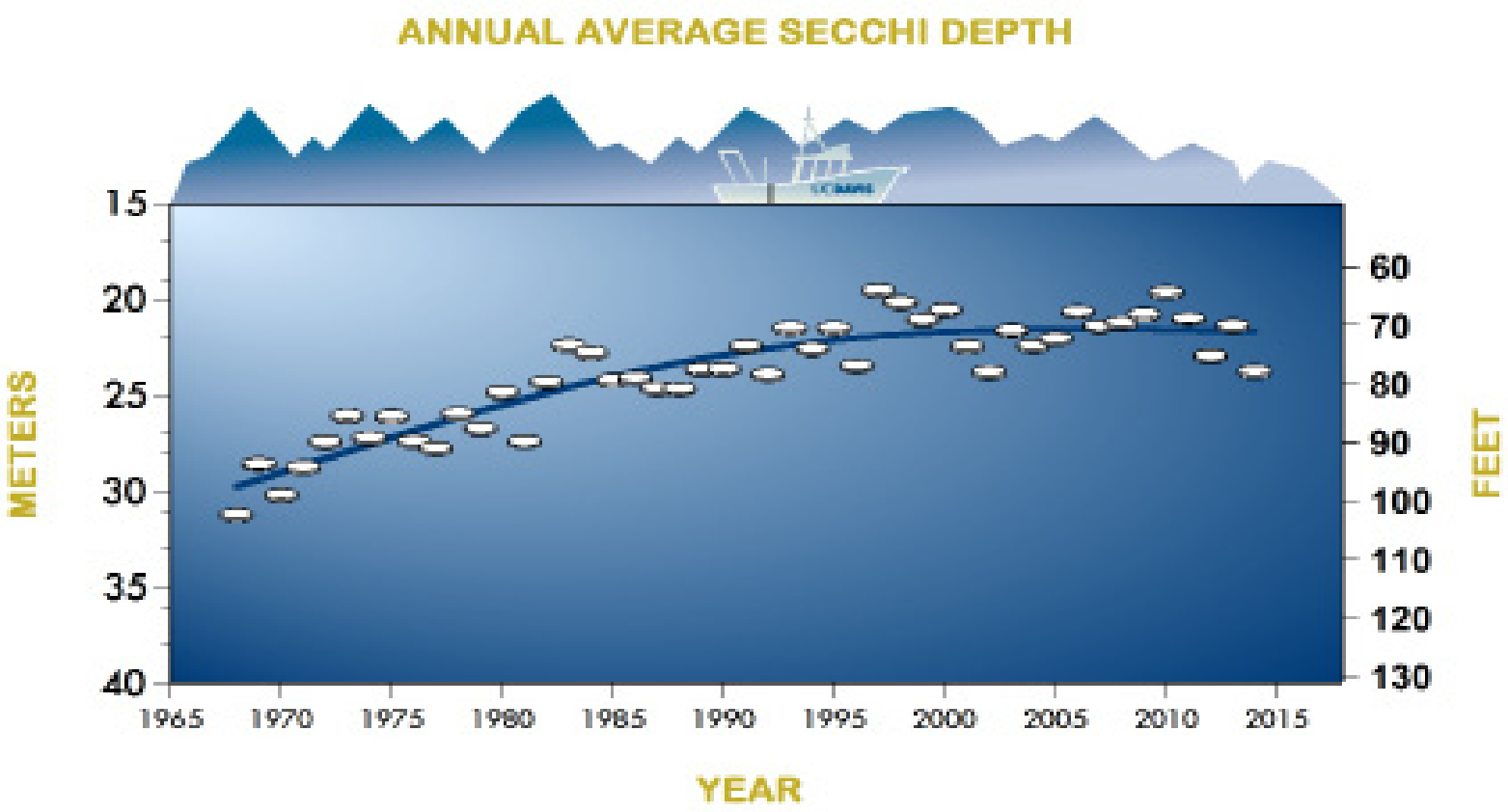
UCDAVIS
TAHOE ENVIRONMENTAL RESEARCH CENTER

CLARITY

Annual average Secchi depth

Yearly since 1968

In 2014, the annual average Secchi depth was 77.8 feet (23.7 m), an increase of 7.6 feet over the previous year and well above the lowest value recorded in 1997 of 64.0 feet (19.5 m). The annual average clarity in the past decade has been better than the prior decade. The highest individual value recorded in 2014 was 93.5 feet on July 7, and the lowest was 57.4 feet on September 16. It is important to understand the causes behind clarity change and to evaluate past actions and future investments. Computer modeling tools have been developed to provide this information.

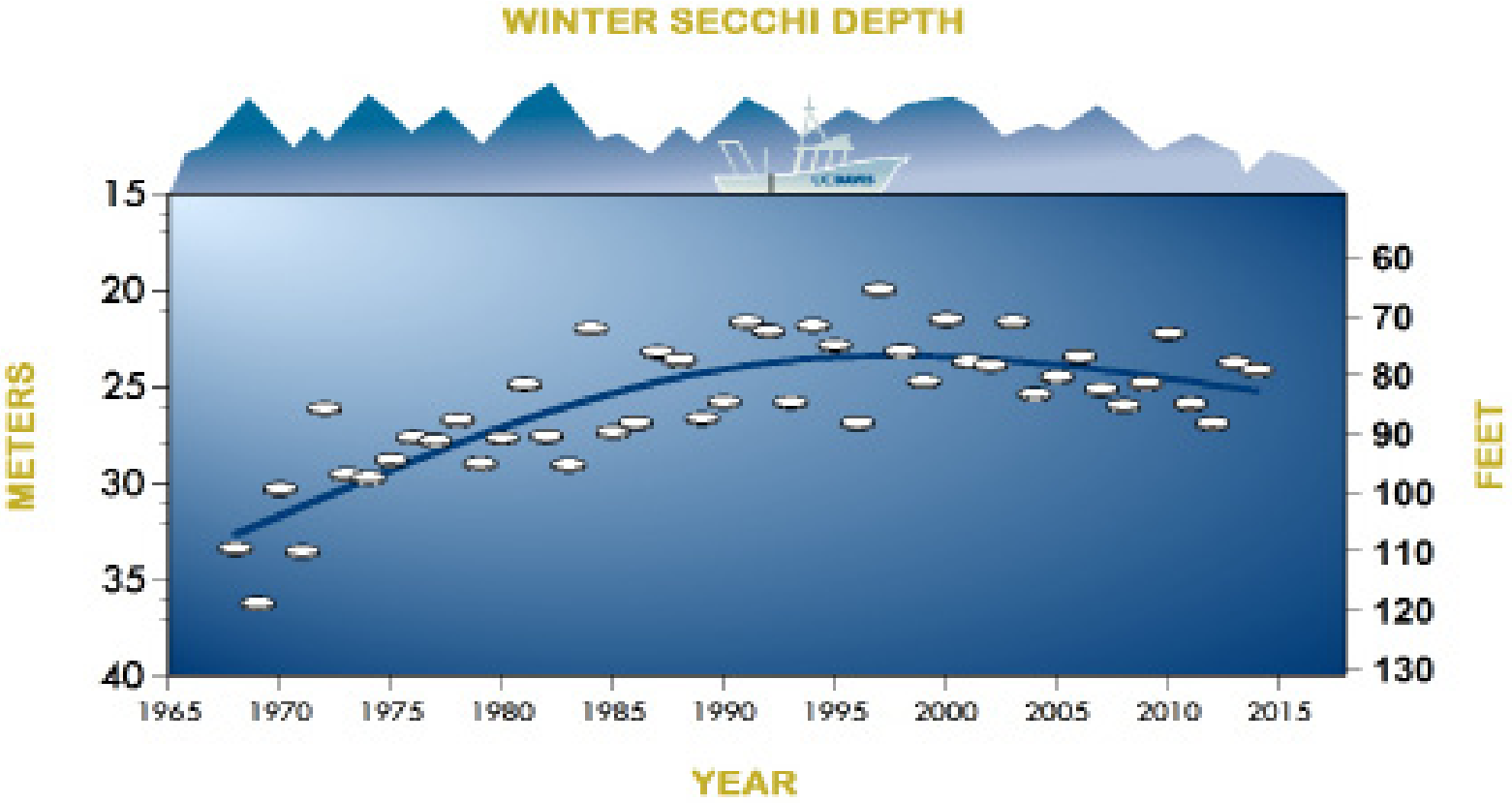


CLARITY

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 2014, winter clarity improved by one foot, continuing the long-term pattern of improvement since 1997. The winter average of 79.1 feet (24.1 m) was well above the worst winter average, 65.6 feet (20.0 m), seen in 1997. The below average stream inflows on account of the drought were a significant factor in the improvement. However, there are other factors behind the overall improvement in winter clarity that are not fully understood.

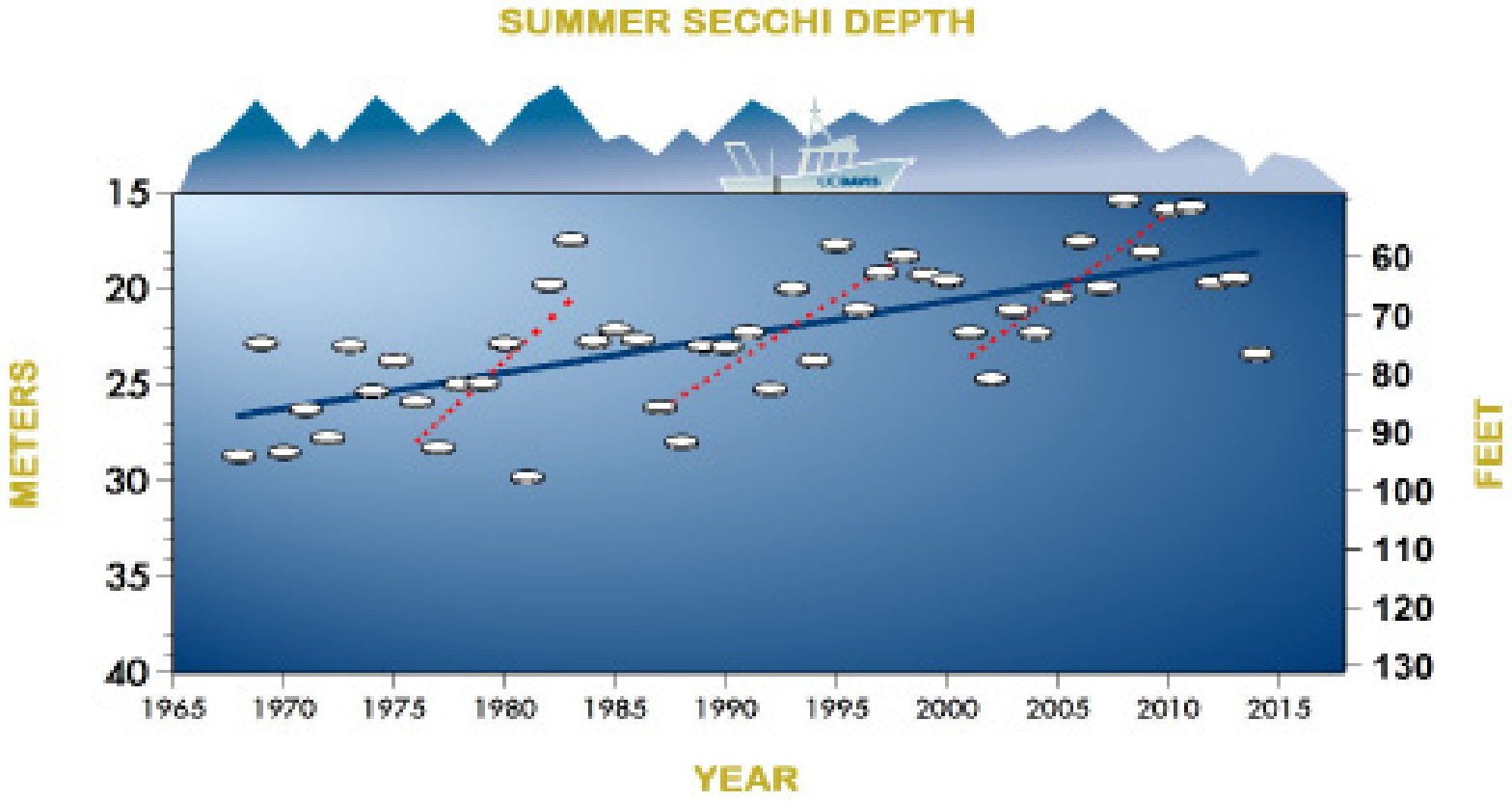


CLARITY

Summer Secchi depth

Yearly since 1968

Summer (June-September) clarity in Lake Tahoe in 2014 was 76.8 feet (23.4 m), almost a 13.1 foot improvement from 2013. This coincided with a continued decline in the concentration of small algal cells in 2014, as well as sharply lower stream inflows. Another contributing factor was the shallow depth to which the lake mixed to during the previous winter. 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.



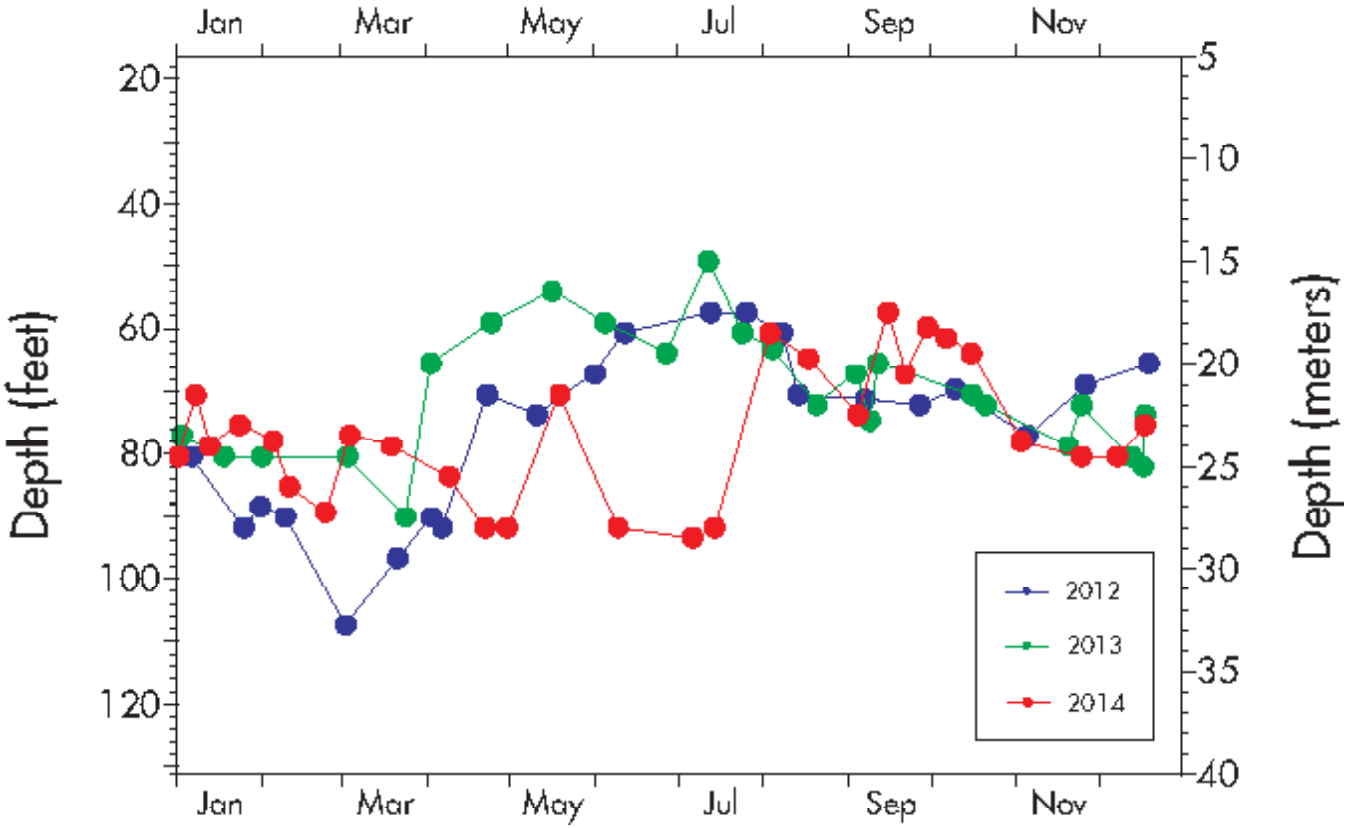
CLARITY

Individual Secchi depths

2012, 2013, 2014

Here, the individual Secchi depth reading from the Index station on the west side of the lake for 2012, 2013 and 2014 are plotted. For 2012 and 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 represented a departure from this long established pattern. This year some of the largest Secchi depths occurred in spring and summer.

Secchi values can be seen to sometimes vary considerably over short time intervals. This is evident in May 2014, where Secchi depth decreased from 92.0 feet (28.0 m)to 70.5 feet (21.5 m)and back again. Such short-term variability is common in lakes. In this case the sudden decrease is likely due to a wind-driven downwelling that concentrates the less clear surface water in the vicinity of our measurement location.



CLARITY

Light transmission

In 2014

A light transmissometer 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 2014. The "steps" in transmission at 200 feet and 300 feet in the first two panels indicate the depth of active lake mixing on January 17 and March 20 respectively. Here the less clear water (lower percent transmission) is toward the surface, whereas the deeper water is much clearer (higher percent transmission). The panel for June 19 shows the typical summer pattern, with the lowest light transmission in the thermocline, where fine particles become trapped. 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.