TAHOE: STATE OF THE LAKE REPORT 2012

CLARITY

UCDAVIS
TAHOE ENVIRONMENTAL
RESEARCH CENTER

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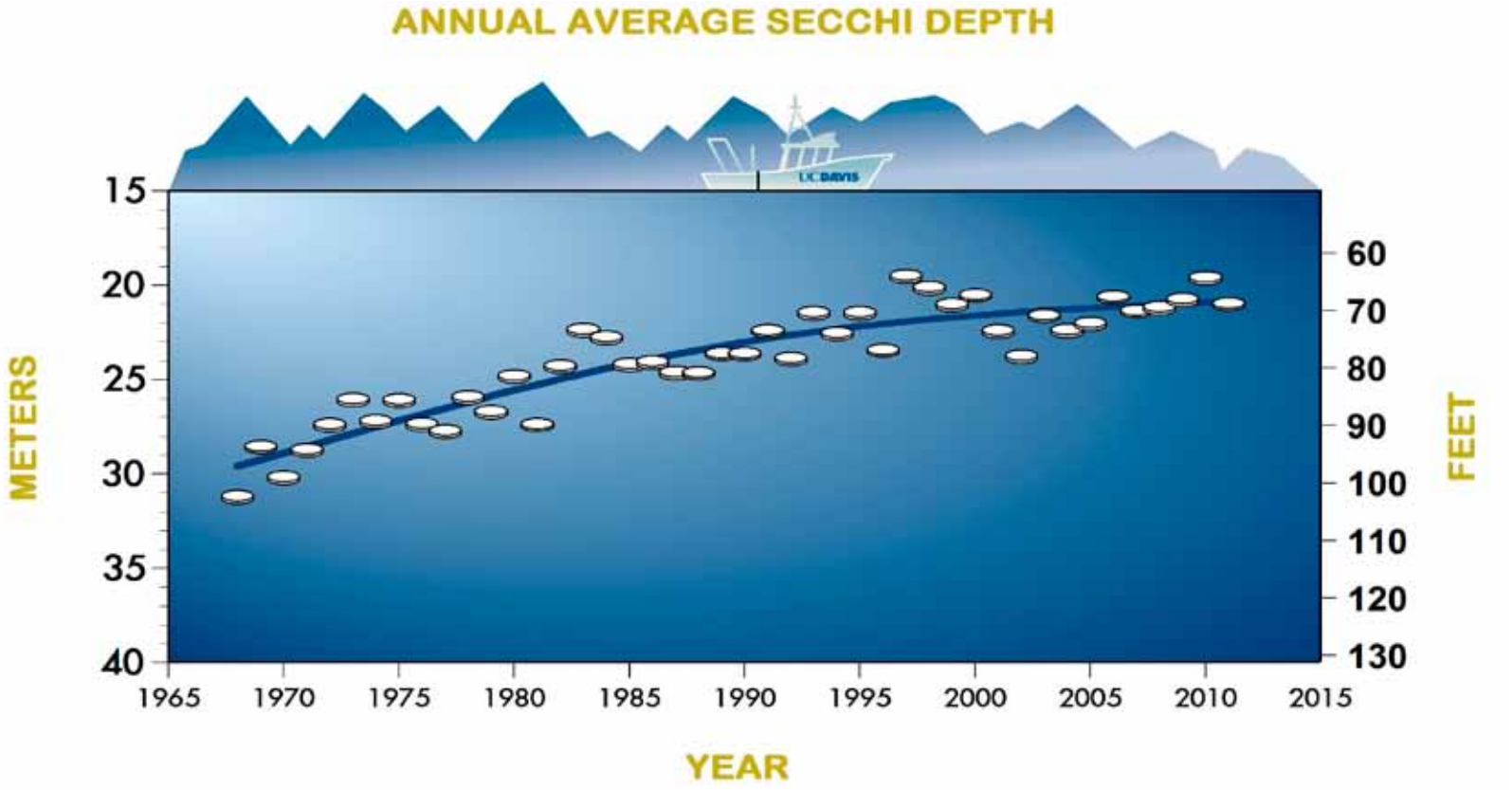
Annual average Secchi depth

Yearly since 1968

In 2011 the annual average Secchi depth was 68.9 feet, an improvement of 4.5 feet over the previous year. This improvement came despite an extremely wet year. The annual average clarity in the past decade has been better than in recent decades. In 1997-1998, annual clarity reached an all-time average low of 65.1 feet. From 2001-2011 the average clarity was 70.6 feet. It is important to understand the possible causes and to see what they tell us about past actions and future investments. Some of the critical knowledge gaps are in the monitoring of urban stormwater flows, where an independent and comprehensive monitoring program needs to be established to evaluate the status and trends of this important source of fine sediment and nutrients.



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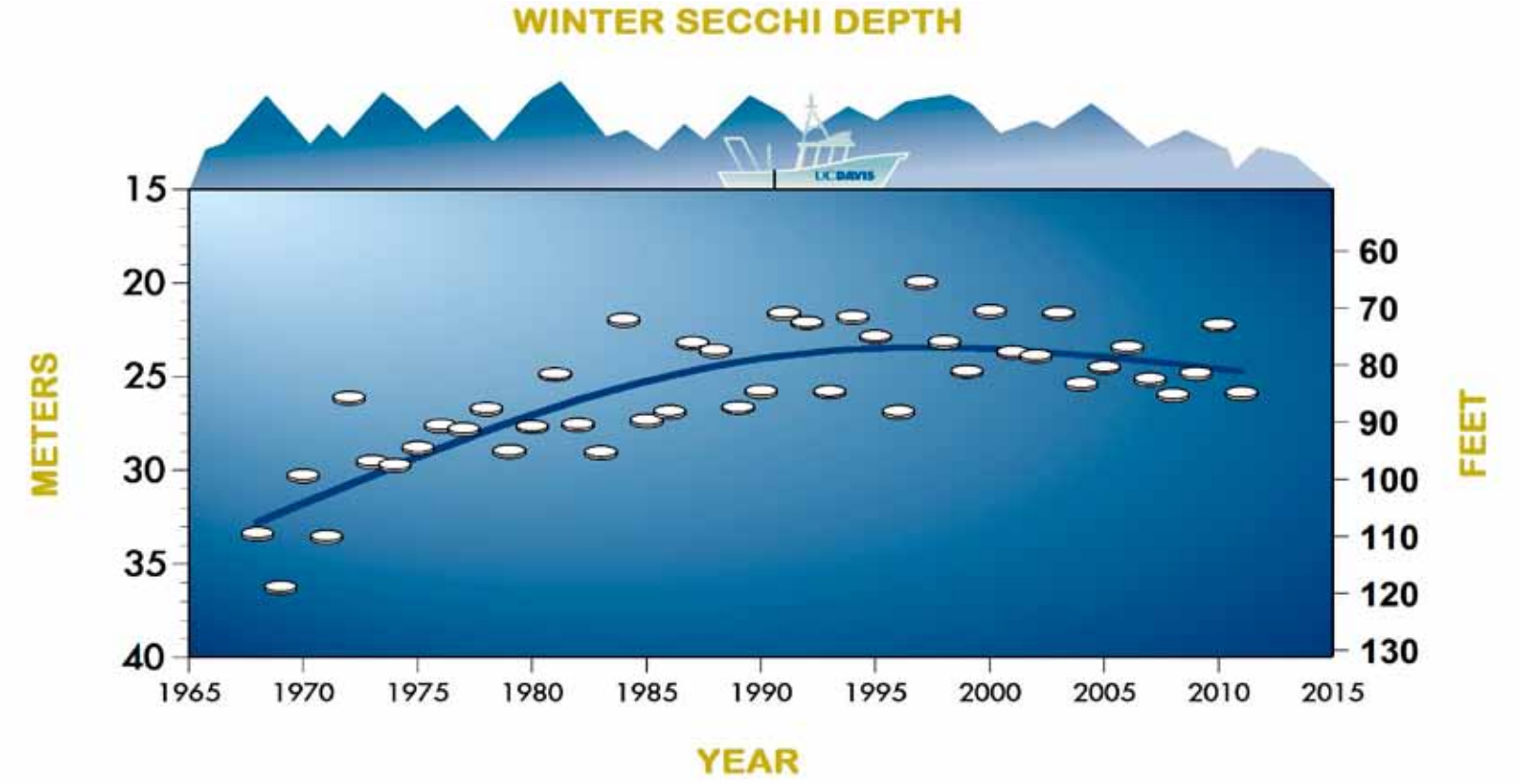
Winter Secchi depth

Yearly since 1968

Annual winter (December-March) Secchi depth measurements from 1968 to the present indicate that the long-term decline in winter clarity at Lake Tahoe is showing definite improvement. In 2011, the winter clarity increased to 84.9 feet, an improvement of 12.0 feet over the previous year. The reasons behind the continued improvement in winter clarity are not fully understood. One hypothesis is that there has been a reduction in the load of fine particles from urban stormwater. Urban stormwater is the largest source of fine particles to Lake Tahoe, and generally enters the lake in winter. A comprehensive, regional urban stormwater monitoring plan is needed to determine if recent capital investments in stormwater projects have indeed reduced these loads.



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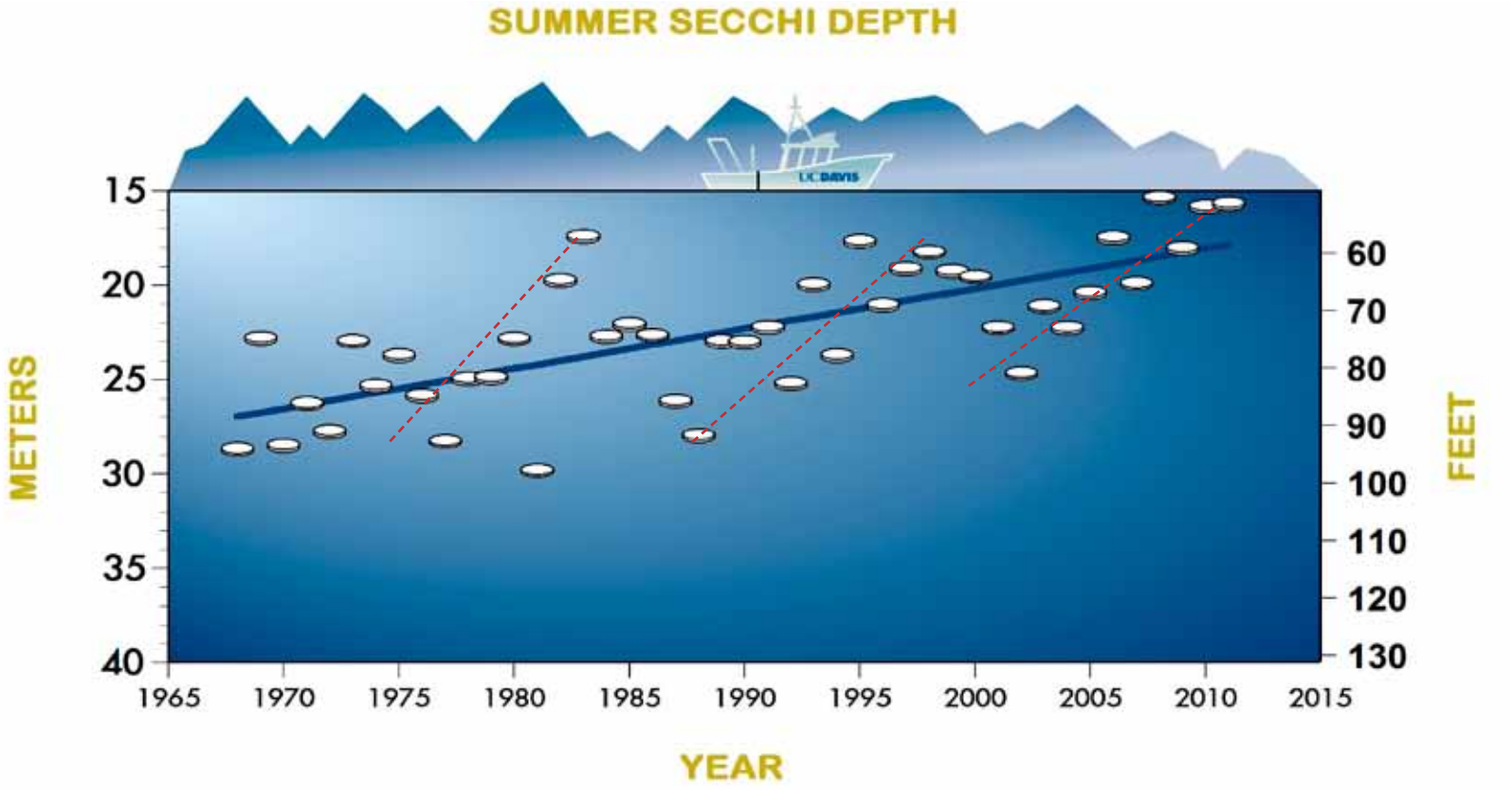
Summer Secchi depth

Yearly since 1968

Summer clarity in Lake Tahoe in 2008 and 2011 were the lowest values ever recorded (50.4 feet and 51.4 feet respectively). Unlike the winter clarity pattern, where there is a long-term trend of declining and then improving clarity, the summer trend is dominated by a consistent long-term decline but with a noticeable 10-15 year cyclic pattern.

This is clearly visible in 1968-1983, 1984-1997 and 2000-2011 (see red dashed lines on graph). For about the last decade there has been a near-continuous decline in summer clarity.

The reasons behind this periodicity are being investigated, however, there is evidence pointing towards increasing numbers of very small diatoms (2 – 4 microns diameter) scattering light in the same way that fine stormwater particles do.



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Light Transmission

In 2011

A light transmissometer measures what percentage of a given wavelength of light is received over a 10 inch pathlength. Here, the light transmission at all depths is shown for all four seasons. It is evident that the lowest light transmission is in the surface layers where 90 to 95 percent of light is transmitted. The highest light transmission is in the very deepest parts of the lake where over 95 percent of the light can be transmitted. The reason is that there are fewer fine particles in the deep lake water.