

TAHOE:  
STATE  
OF THE  
LAKE  
REPORT  
2009

**CLARITY**

**CLARITY**

**Annual average Secchi depth**

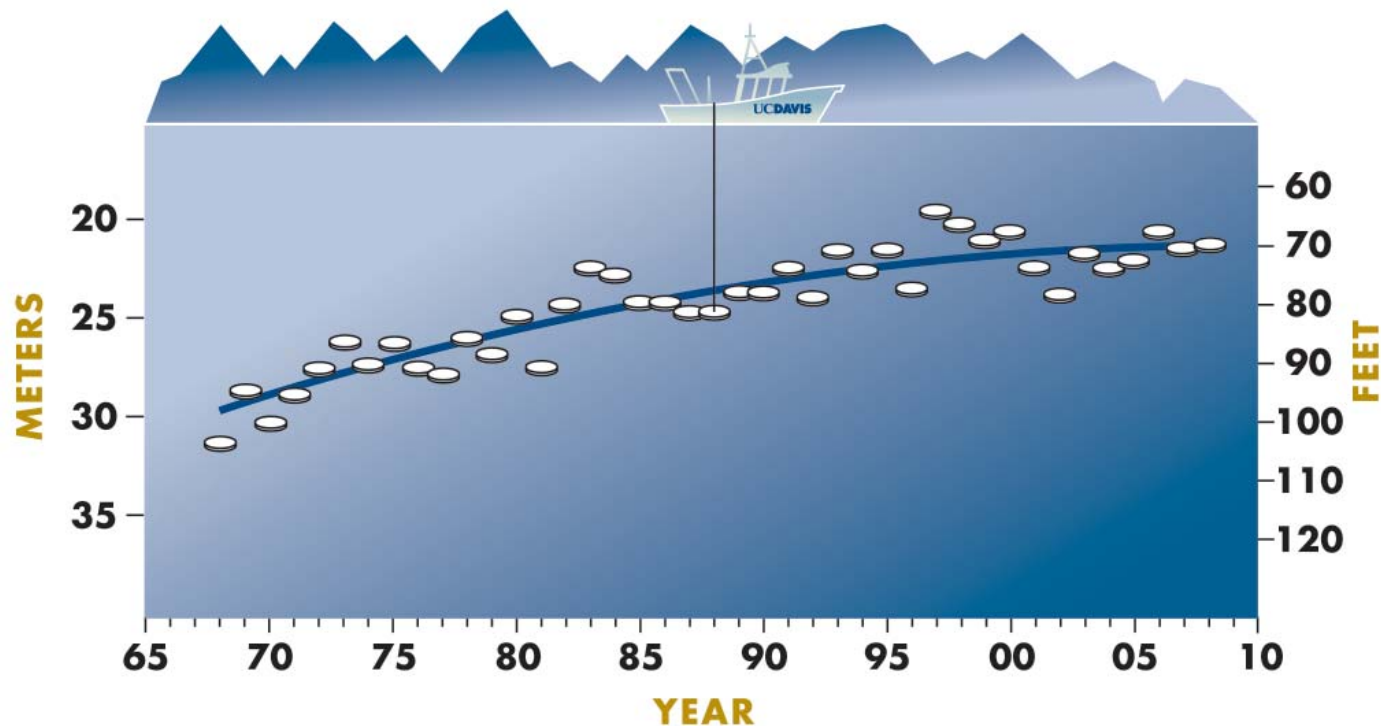
Yearly since 1968

Secchi depth (the point below the lake surface at which a 10-inch white disk disappears from view) is the longest continuous measurement of Lake Tahoe clarity. The annual Secchi depth is the average of 20 to 25 readings made throughout the year. While lake clarity has improved for brief periods since

1968, the overall long-term trend has shown a significant decline. In the last eight years, Secchi depth measurements have been better than predicted by the long-term linear trend. Statistical analysis suggests that the decline in Lake Tahoe's clarity has slowed, and is now better represented by the curve

below than a straight line. In 2008, the Secchi depth was 69.6 feet and virtually the same as 2007. With the exception of 2005 and 2006, precipitation has been low during the past 8 years. The response of the Secchi depth to a series of normal and above normal years will be very instructive.

**DECLINE OF WATER CLARITY AT LAKE TAHOE**



**CLARITY**

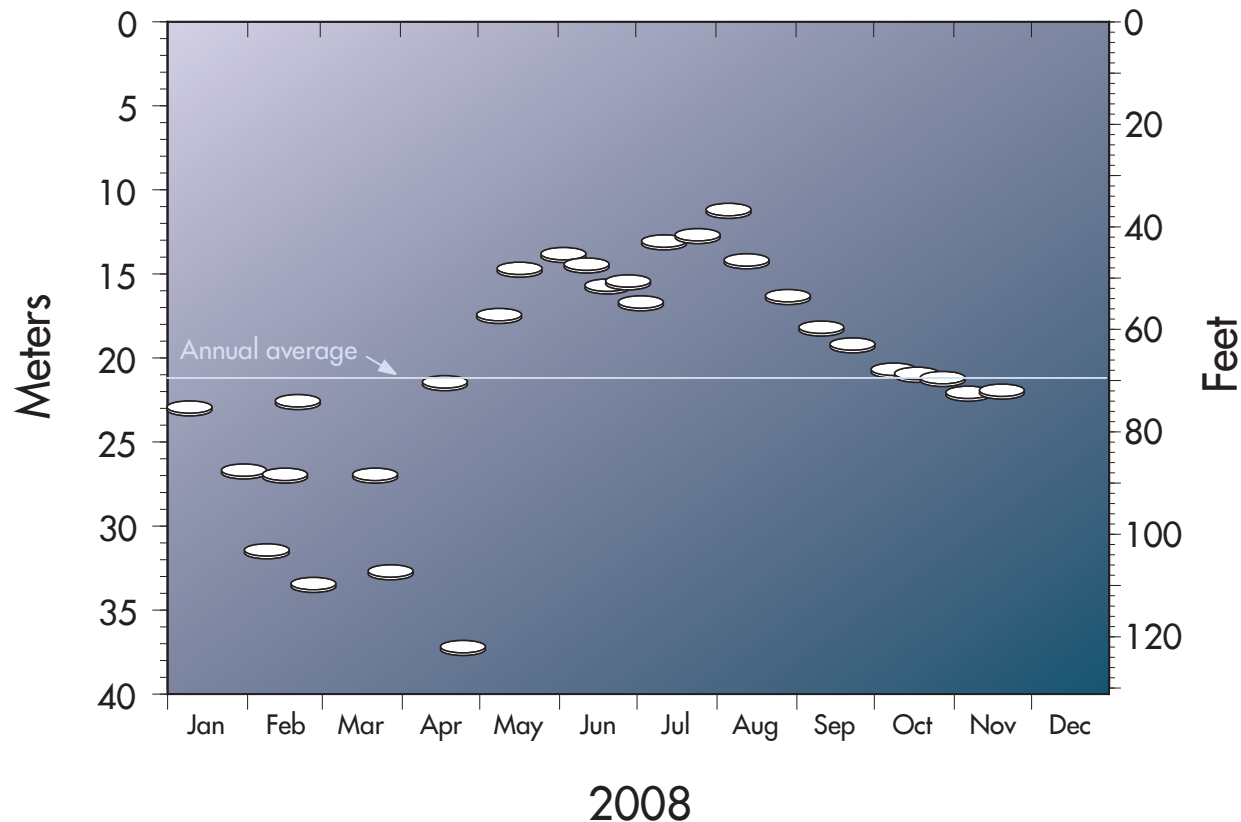
**Secchi depth measurements**

**In 2008**

Secchi depth has a strong seasonal feature which was clearly expressed in 2008. The deepest Secchi depth readings (the clearest water) typically occur in winter and 2008 was no exception. In 2008, the deepest reading was 122 feet on April

24th, while the lowest (37 feet) was measured on August 5th. This represents an 85 foot swing in clarity this year. A Secchi depth in Lake Tahoe of 37 feet is uncommonly low and the reduced readings in July and early August could have resulted

from smoke transported into the Tahoe basin from significant regional wildfires that began in late June. The annual average Secchi values (Fig. 11.1) represent the most robust indicator of the status and trend in Lake Tahoe clarity.



## CLARITY

### Penetration of photosynthetically active radiation

In 2008

Photosynthetically active radiation (PAR) is that part of solar radiation spectrum that is utilized in photosynthesis. The black line below shows the depth at which PAR is 1% of its level on the lake surface, known as the euphotic depth. PAR penetration

varies throughout the year, but is often deepest in the summer when the sun is highest in the sky. In 2008, the euphotic depth increased in February and March, corresponding to the onset of deep mixing when clear bottom water is brought to the surface (Fig.

8.9). 2008 was the second year in succession when deep mixing occurred. This year, the maximum Secchi depth reading was 122 feet on April 24th, which also corresponded to the occurrence of the maximum PAR penetration.

