

TAHOE:  
STATE  
OF THE  
LAKE  
REPORT  
2008

**PHYSICAL  
PROPERTIES**

## PHYSICAL PROPERTIES

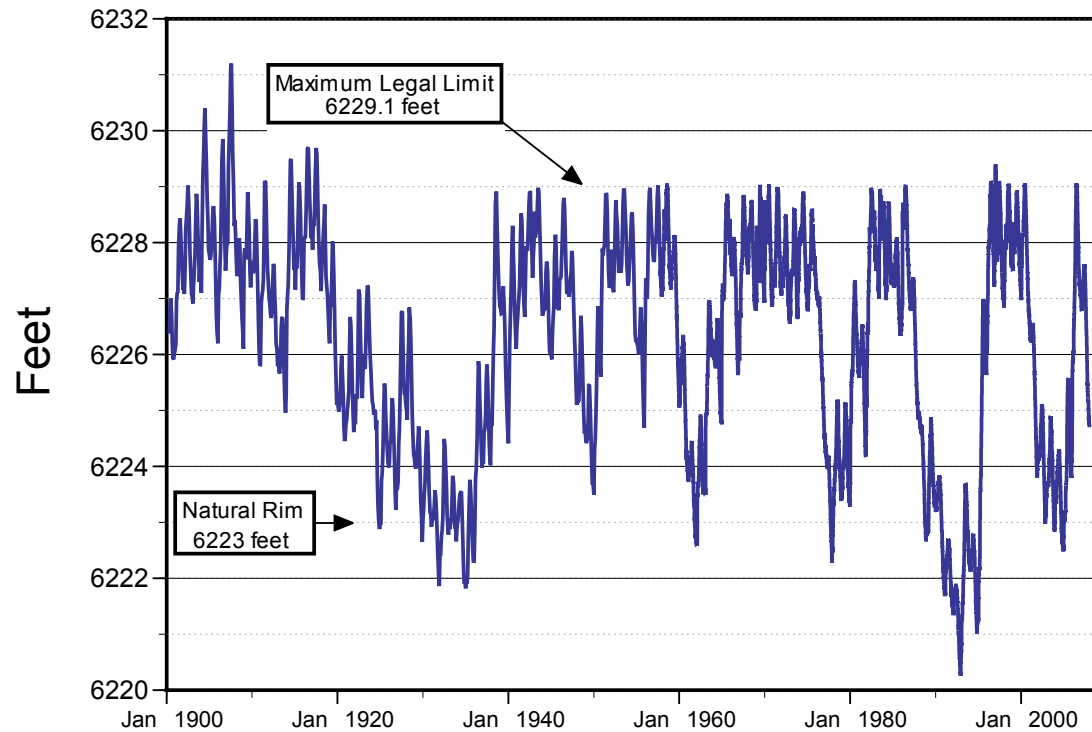
### Lake surface level

Daily since 1900

The lowest lake level on record was 6,220.26 feet on Nov. 30, 1992. Since 1900, lake level has varied by more than 10 feet. Lake level typically alternates between several years with values

close to the maximum, then several years close to the natural rim. This pattern reflects climate wet and dry cycles in the western US. (Lake surface levels are recorded by the U.S. Geological Sur-

vey as height above mean sea level. By law, Lake Tahoe cannot exceed 6,229.1 feet and nor can water be released to the Truckee River when it falls below the natural rim of 6,223 feet.)



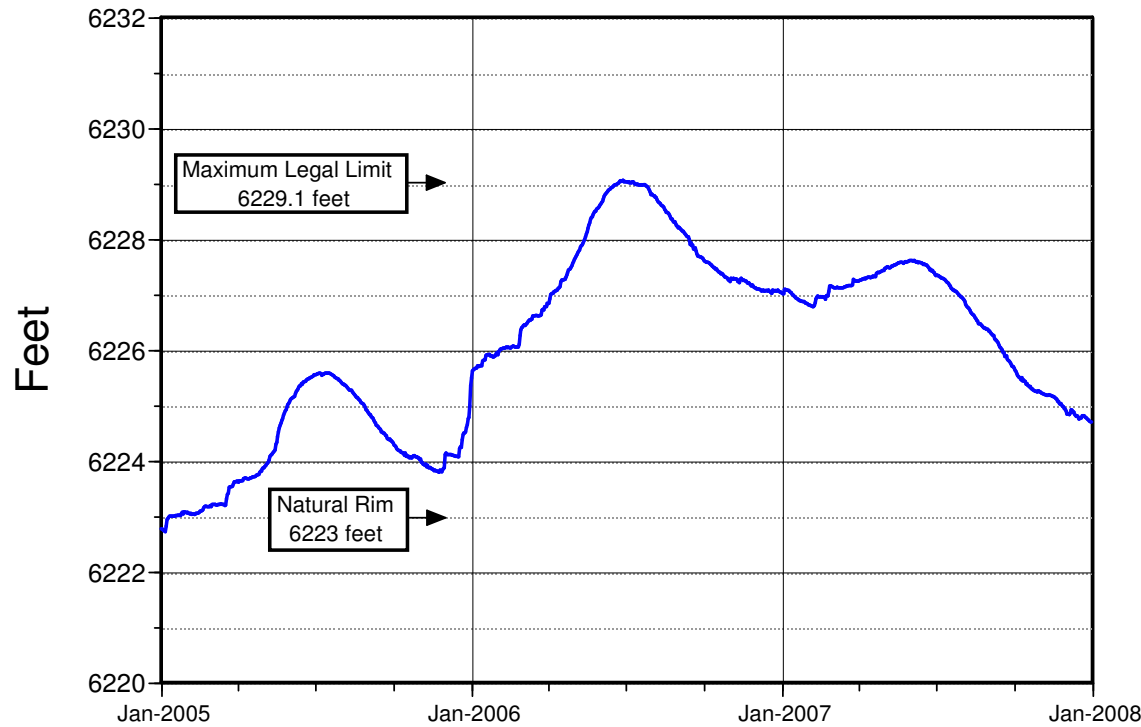
**PHYSICAL PROPERTIES**

**Lake surface level**

Daily since 2005

Lake surface level varies throughout the year. It rises due to high stream inflow and precipitation directly onto the lake. It falls due to evaporation and flow out of the Truckee River. In 2007, dry conditions caused lake level to rise

by less than one foot during snowmelt, compared with over four feet the previous year. The highest lake level was 6227.6 feet on June 3, and the lowest was 6224.7 feet on December 31.

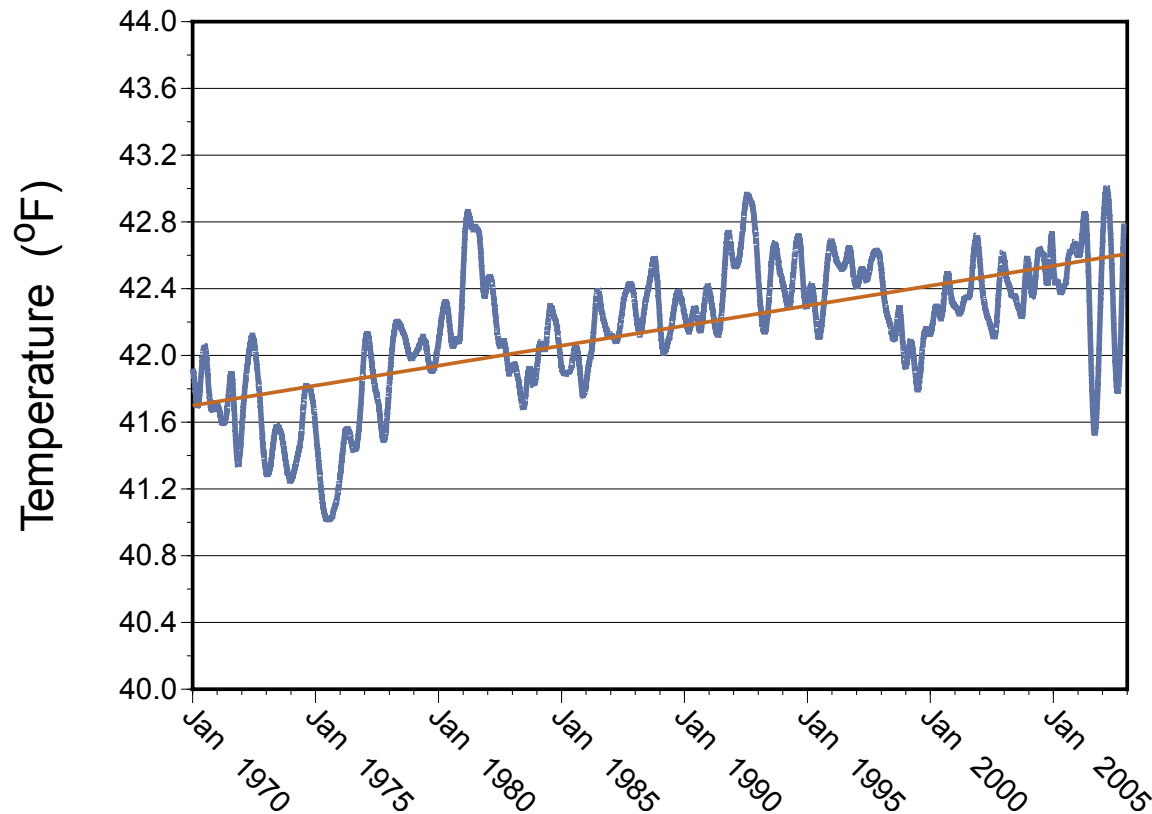


## PHYSICAL PROPERTIES

### Average water temperature

Since 1970

The volume-averaged temperature of Lake Tahoe has increased nearly a full degree since 1970, from 41.7 degrees F to 42.6 degrees F. (The monthly temperature profile data from the lake has been smoothed and deseasonalized to best show the long-term trend.)



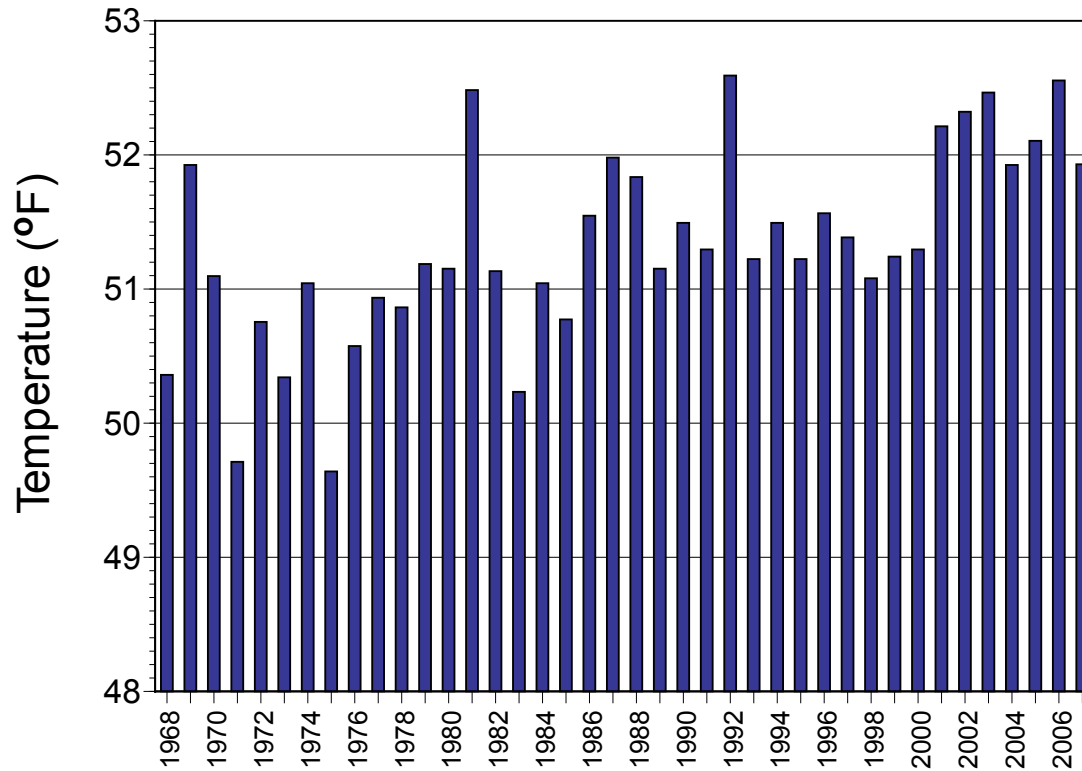
**PHYSICAL PROPERTIES**

**Surface water temperature**

Yearly since 1968

Surface water temperatures have been recorded at the mid-lake station since 1968. Despite year-to-year variability, water temperatures show an increasing trend. The average temperature in

1968 was 50.3 degrees F. For 2007, the average surface water temperature was 51.9 degrees F.



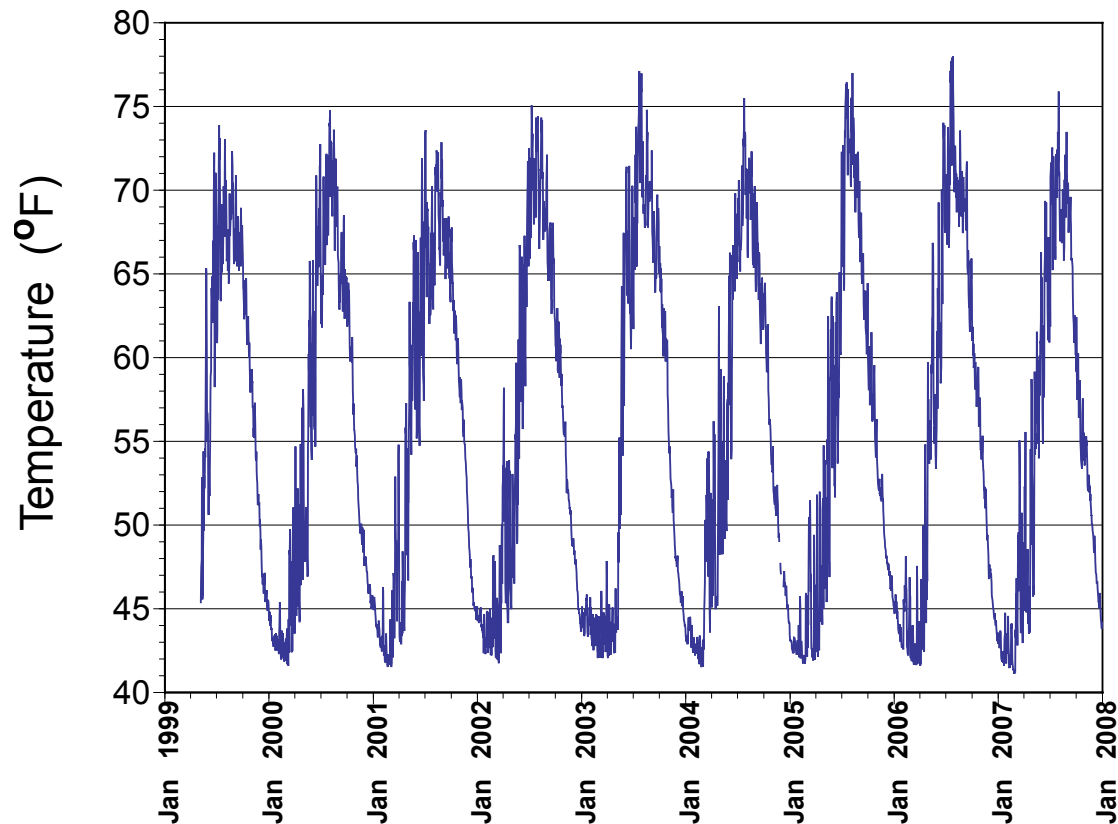
## PHYSICAL PROPERTIES

### Maximum daily surface water temperature

Every 15 minutes since 1999

Maximum daily surface water temperatures were significantly cooler in 2007, although summer surface water temperatures continue to show a long-term increase. Since May 1999, the highest maximum daily surface temperature was 77.99 degrees F on

July 26, 2006. The lowest maximum surface water temperature was 41.11 degrees F on Feb. 26, 2007. In the last decade, the 12 lowest maximum daily surface water temperatures occurred between Feb. 8, 2007 and March 1, 2007.



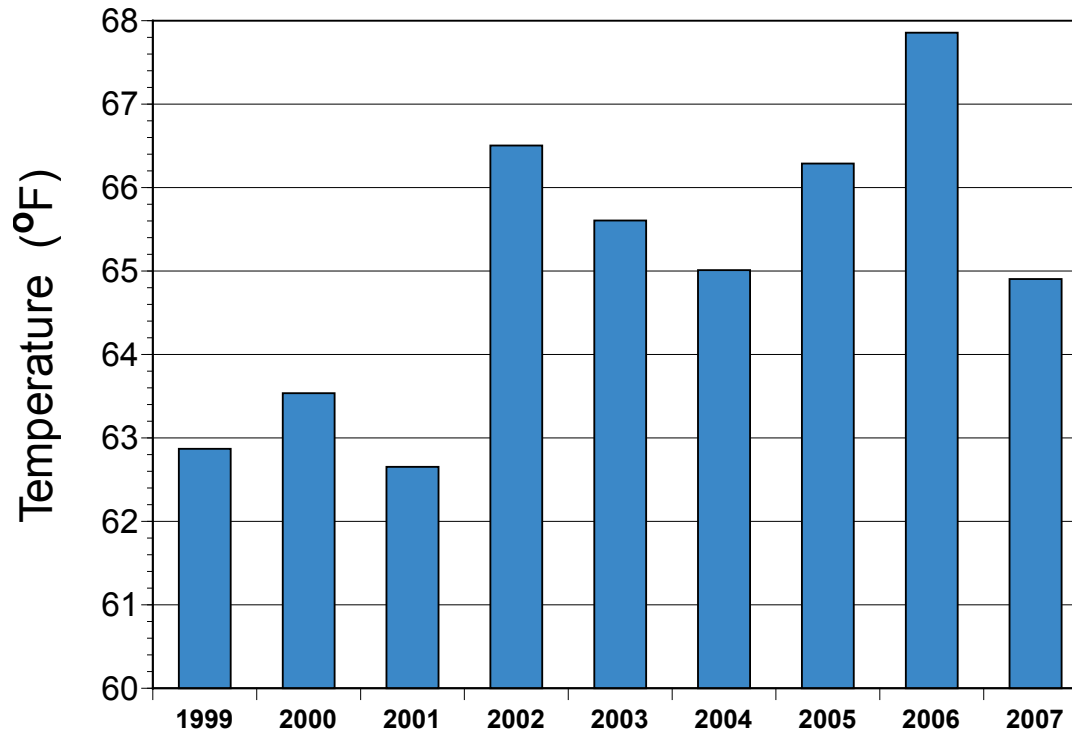
## PHYSICAL PROPERTIES

### July average surface water temperature

Since 1999

Since 1999, surface water temperature has been recorded every two minutes from four NASA/UC Davis buoys. Shown here are ten years of average surface water temperatures in the

month of July when water temperatures are warmest. In 2007, July surface water temperature averaged 64.9 degrees F., 2.9 degrees cooler than in 2006.



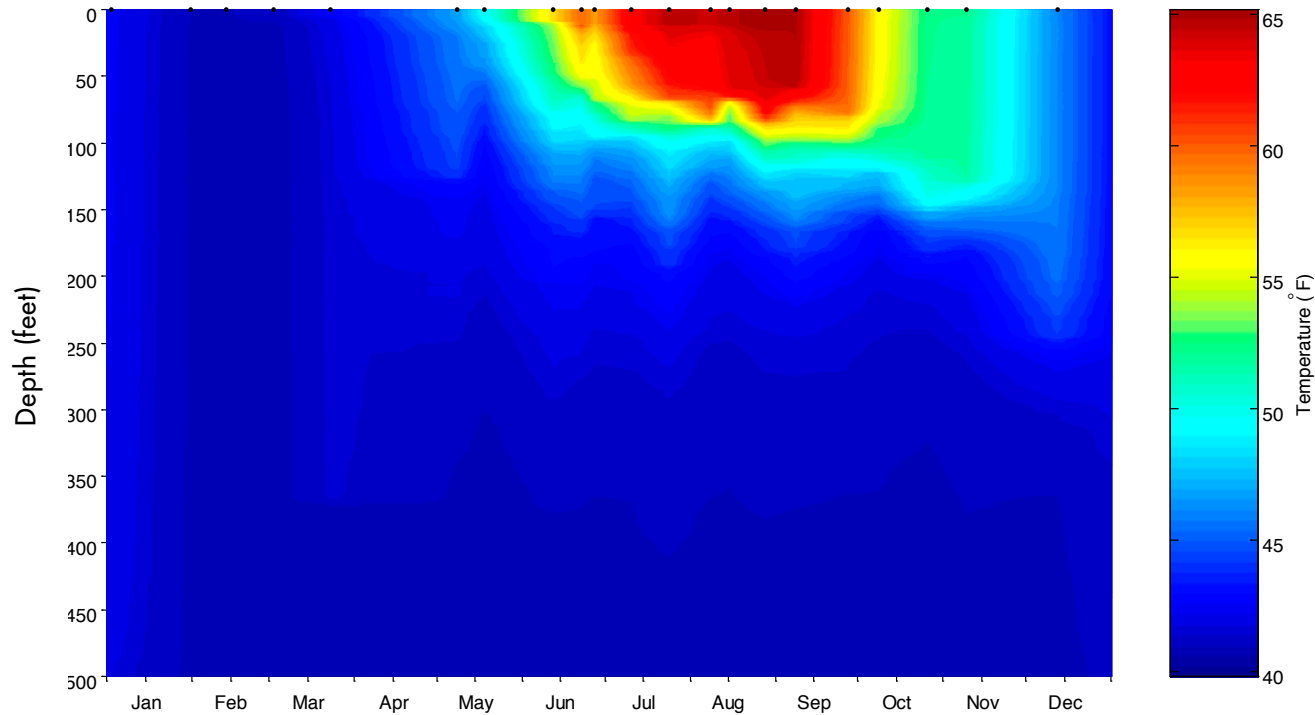
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### Water temperature profile

In 2007

Water temperatures are measured at six-inch intervals every two to four weeks to produce Lake Tahoe's thermal profile. In 2007, that profile followed a typical seasonal pattern. In early March, the lake was coldest with a uniform temperature throughout

its depth. This resulted in a complete mixing from the surface to the bottom (1,645 feet). Thermal stratification began in May and peaked in late August. From September onwards, the surface layer cooled and deepened.





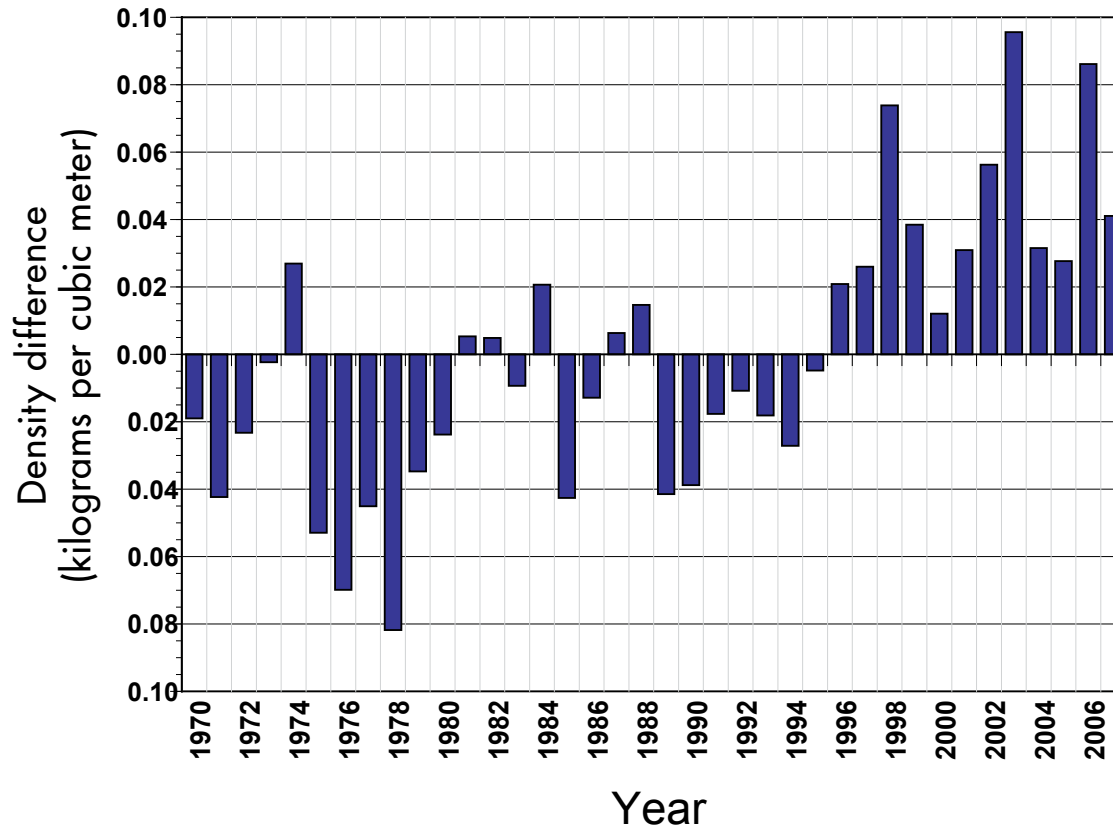
**PHYSICAL PROPERTIES**

**Density stratification**

Since 1970

Density stratification in Lake Tahoe has increased since 1970, as shown by the trend below. Each bar represents the annual average density difference between deep (100 to 165 feet) and shallow (0 to 33 feet) water, subtracted

from mean density. Density differences increase as Lake Tahoe's surface waters warm, making them less dense or lighter. Increasing density stratification makes deep mixing of the lake occur less frequently.



## PHYSICAL PROPERTIES

### Depth of mixing

Yearly since 1973

Lake Tahoe mixes each winter as surface waters cool and sink downward. In a lake as deep as Tahoe, the wind energy of winter storms helps to determine how deeply the lake mixes. Mixing depth has profound impacts on

lake ecology and water quality. Deep mixing brings nutrients to the surface, where they promote algae growth. It also moves oxygen to deep waters, promoting aquatic life throughout the water column. The deepest mix-

ing typically occurs in late February to early March. In 2007, Lake Tahoe mixed all the way to the bottom at the mid-lake station. This was the first complete mix since 2001.

