

Tahoe

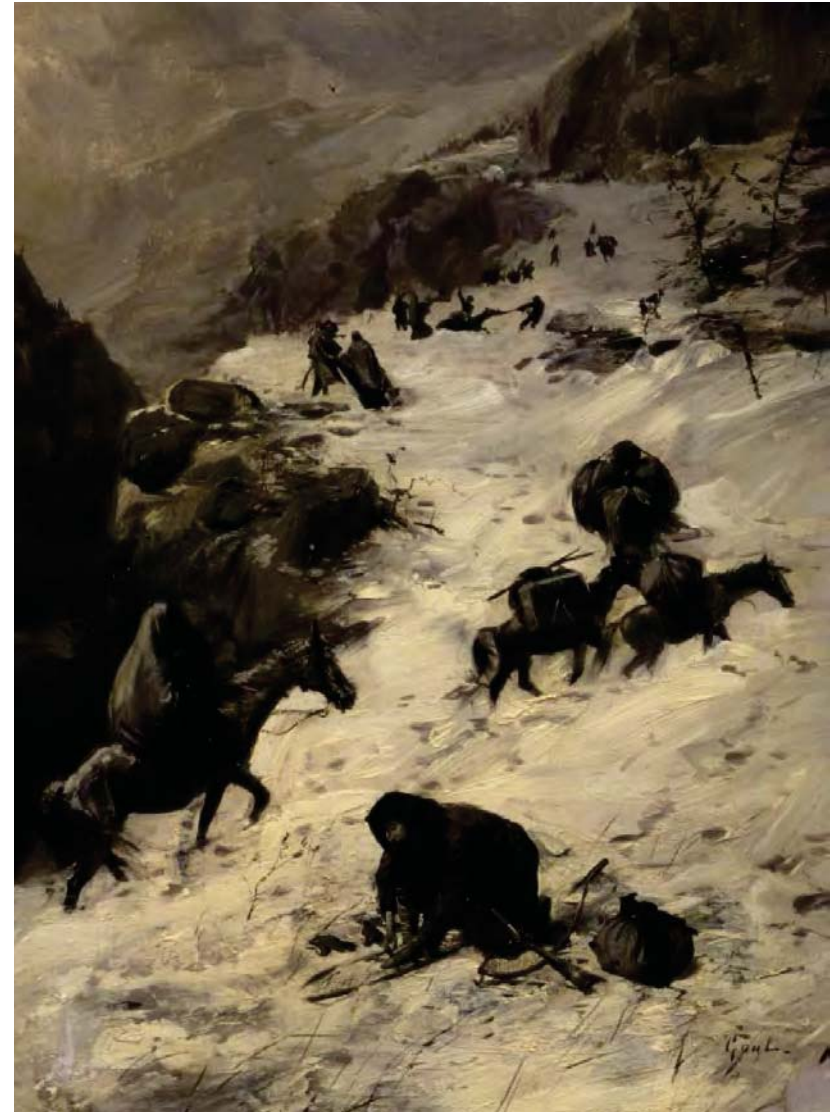
Heather Segale,  
UC Davis TERC



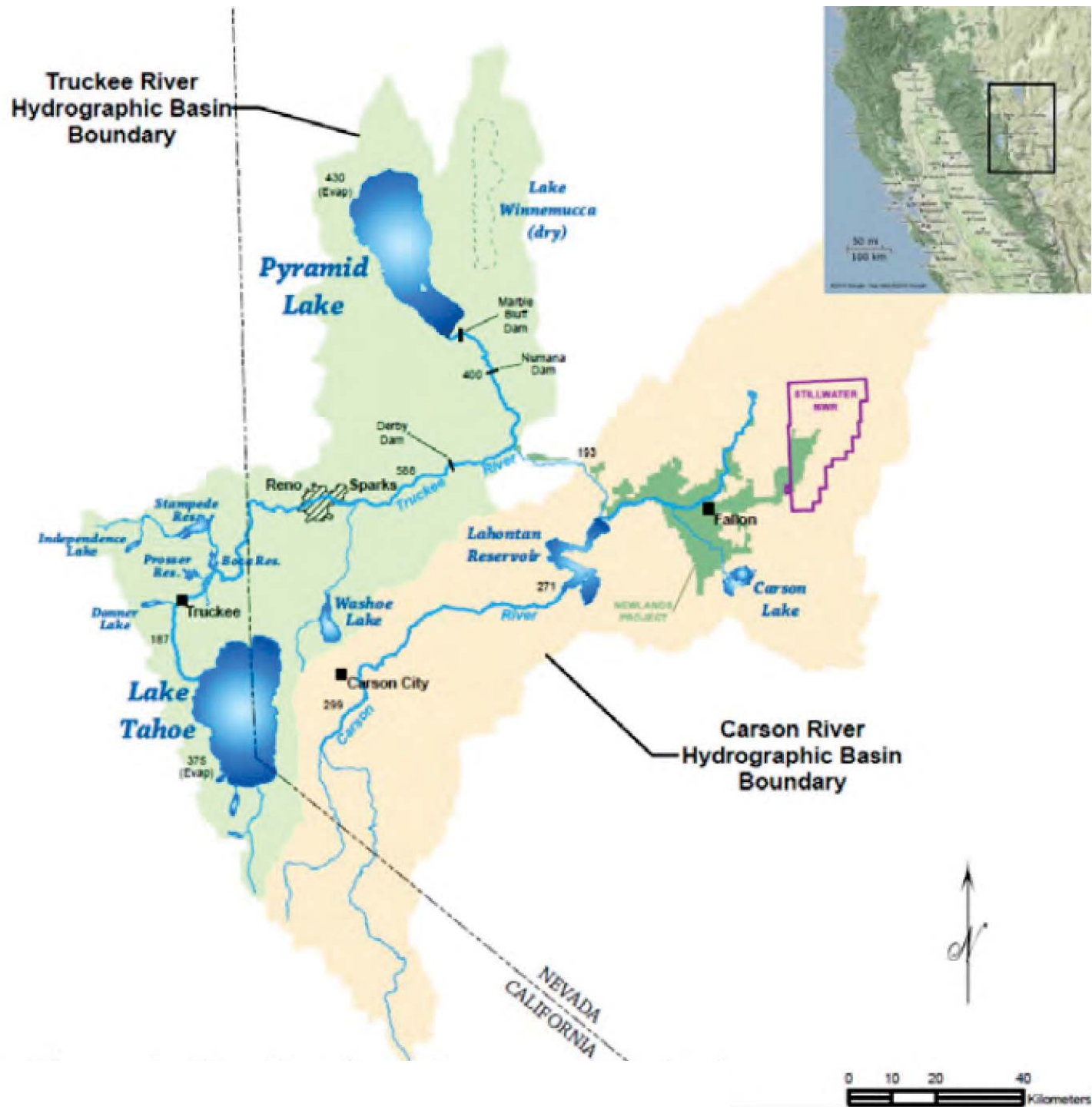
John Frémont



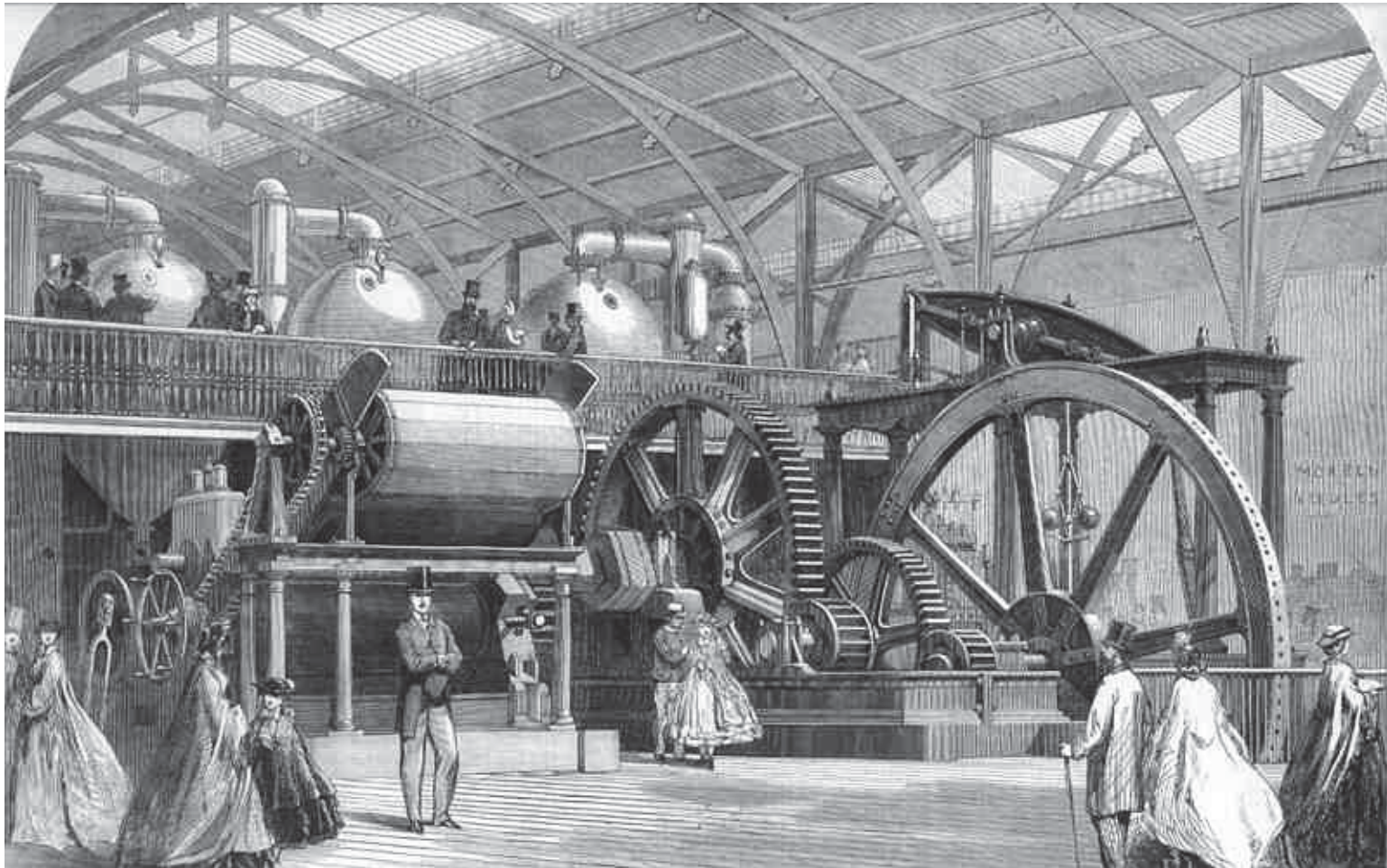
Kit Carson



An ancient, modern lake – 2 million years old, but first viewed by “Europeans” in 1844 (two years before the Donner Party)

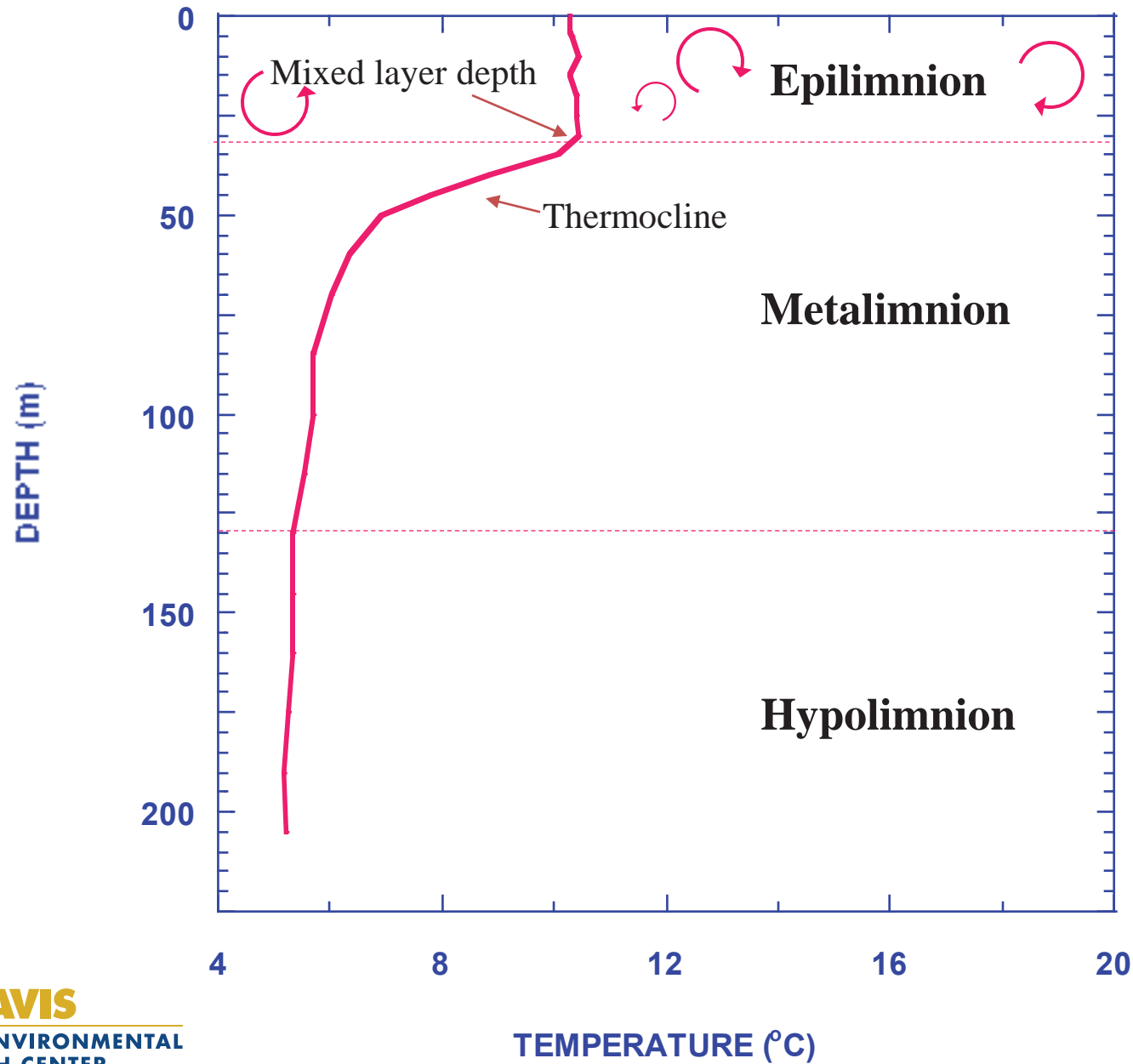


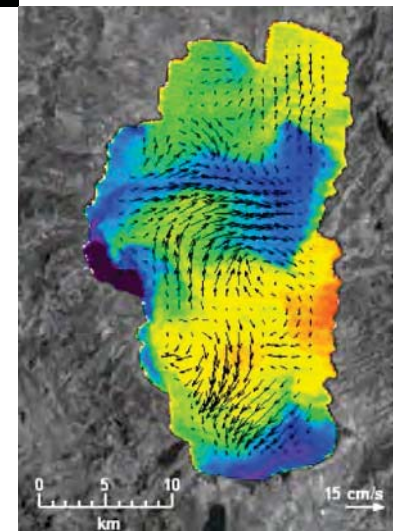
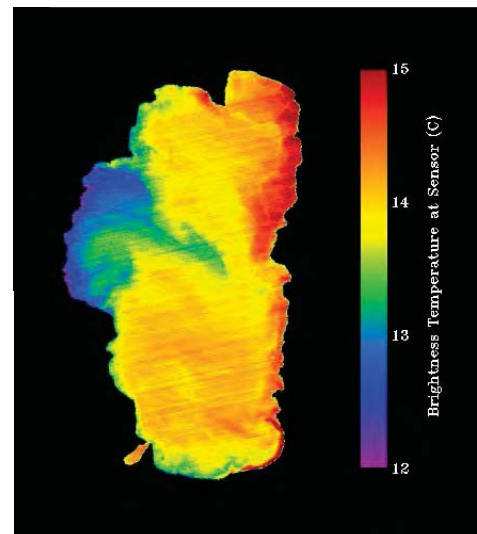
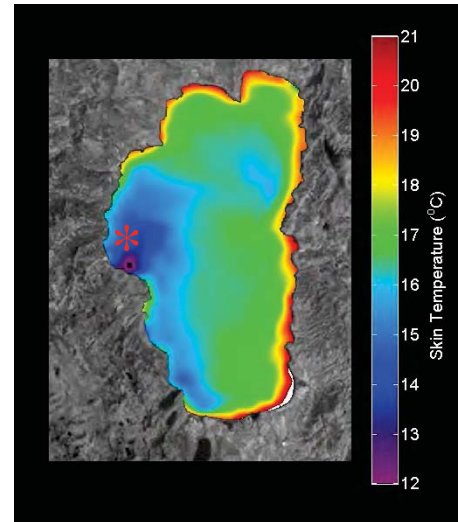
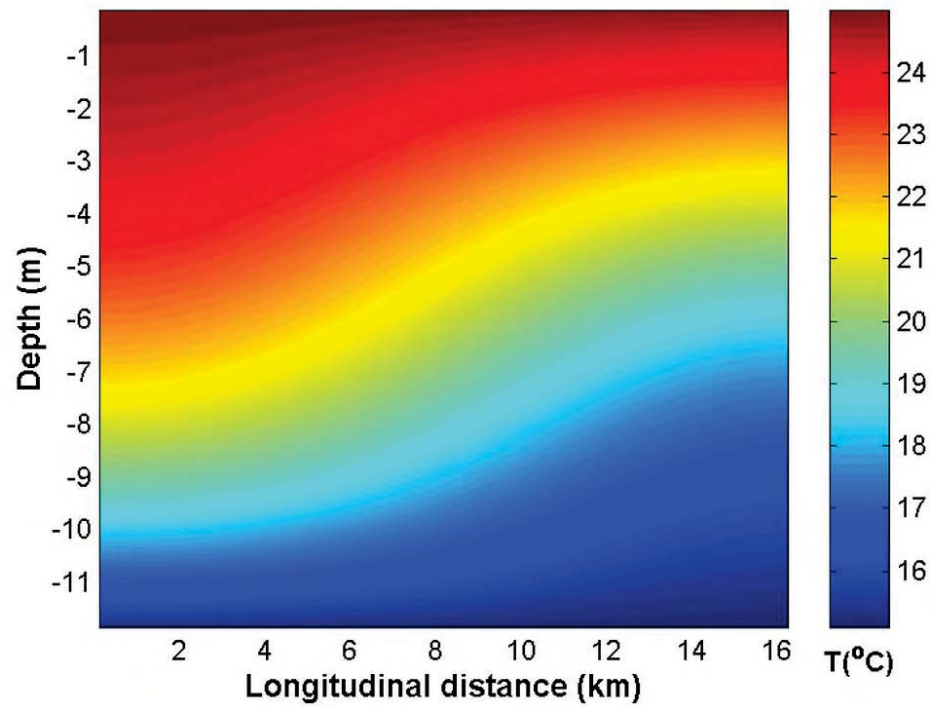
# How do lakes work??

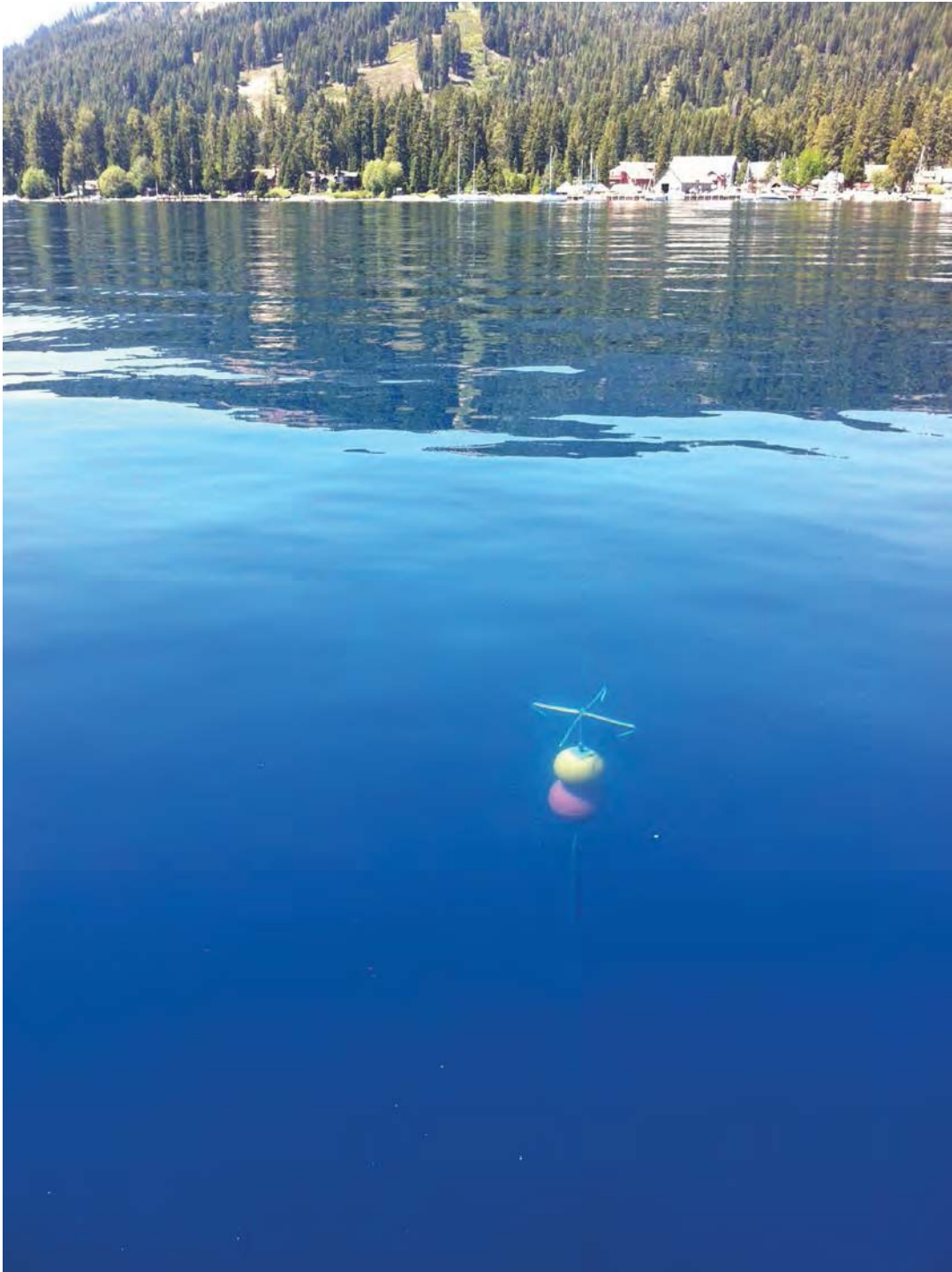
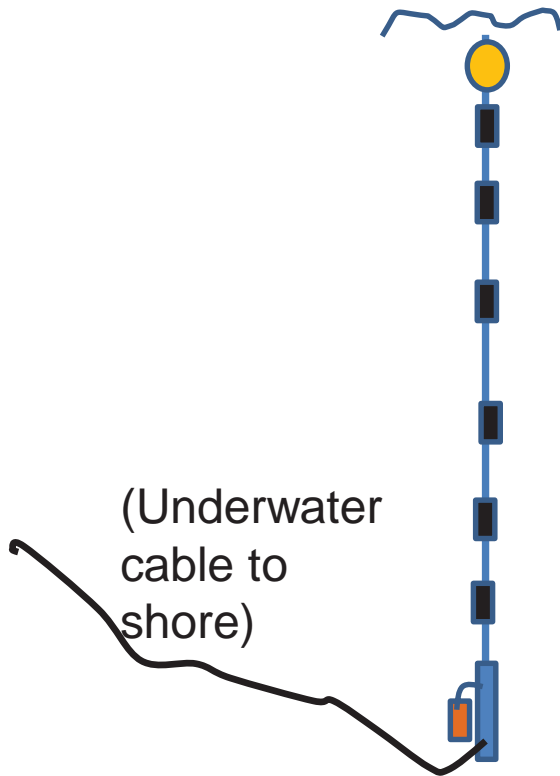


# LIMNOLOGY 101

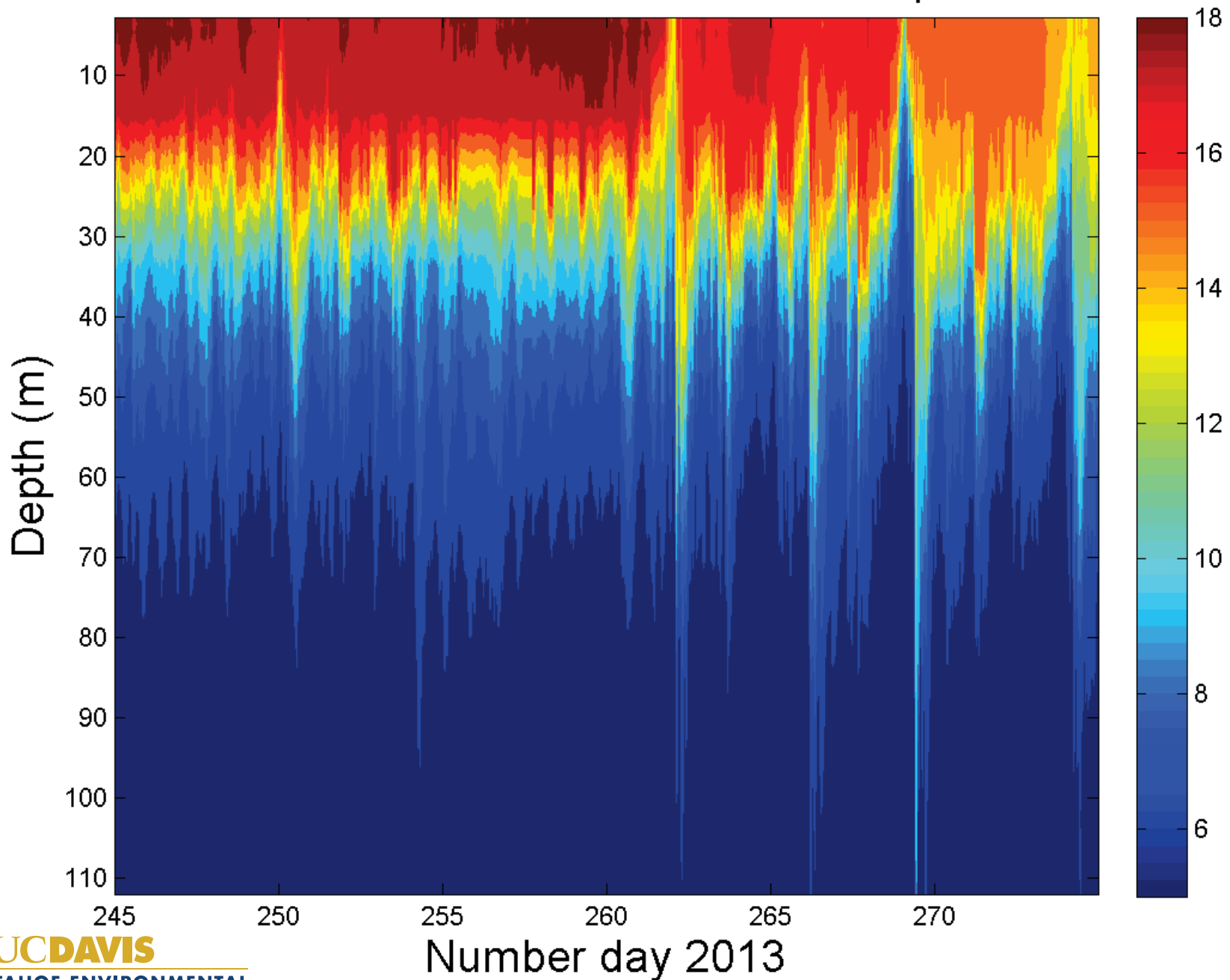
LAKE IS "PARTITIONED" BASED ON THERMAL (aka DENSITY) STRATIFICATION





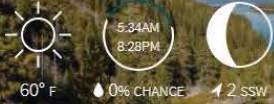


# Homewood Thermistor Chain Data: September





# LAKE TAHOE IN DEPTH



## WEATHER

Tahoe enjoys sunshine about 300 days of the year, but rain, hail, or even snow can happen in any season. Check the forecast and be prepared!

- IMAGES
- ACTIVITIES
- WEATHER**
- CITIZEN SCIENCE
- RIVER CONDITIONS
- LAKE CONDITIONS

AIR TEMPERATURE

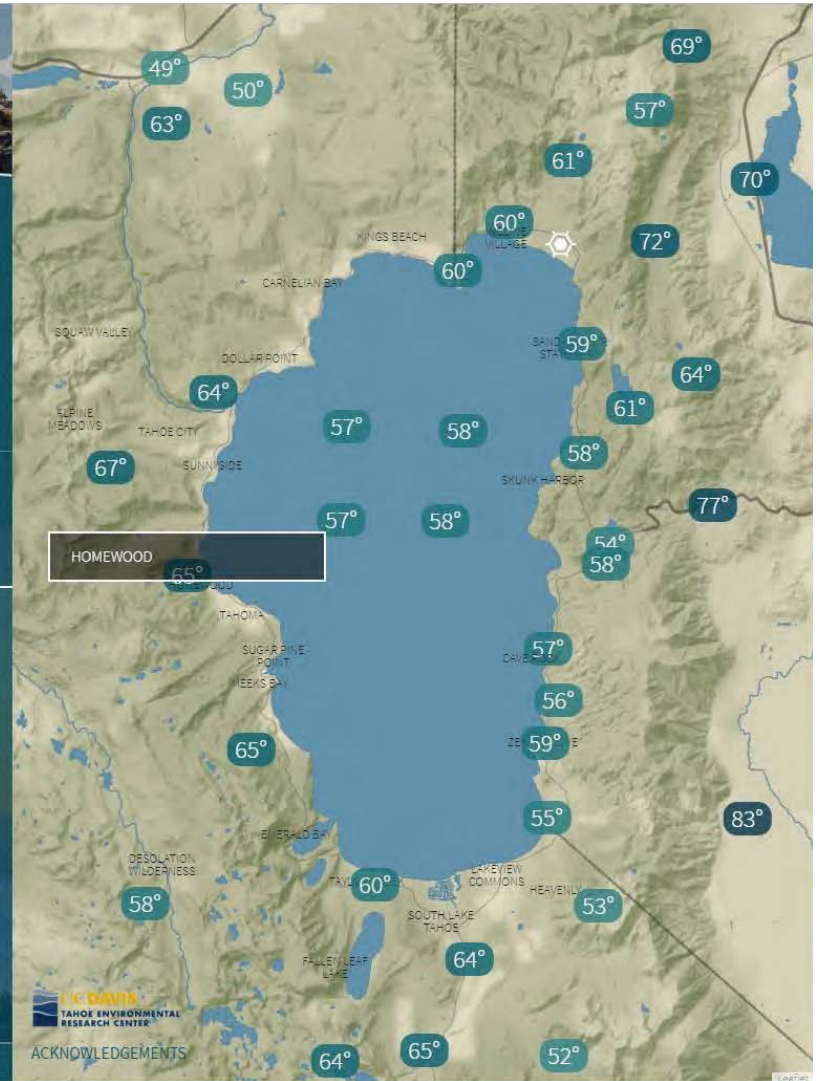
WIND SPEED

### HOMECOOD





### Wind Speed

Wind speed is recorded at weather stations around Lake Tahoe. Daily fluctuations depend on time of day and seasonal weather fronts.



# LAKE TAHOE IN DEPTH

 60° F  
 5:34AM  
 8:28PM  
 0% CHANCE  
 12 SSW

## LAKE CONDITIONS

Varying wave height, water temperature, algae concentrations, clarity, and lake levels all combine to create a complex and ever-changing freshwater environment.

[IMAGES](#) | [ACTIVITIES](#) | [WEATHER](#) | [CITIZEN SCIENCE](#) | [RIVER CONDITIONS](#) | [LAKE CONDITIONS](#)

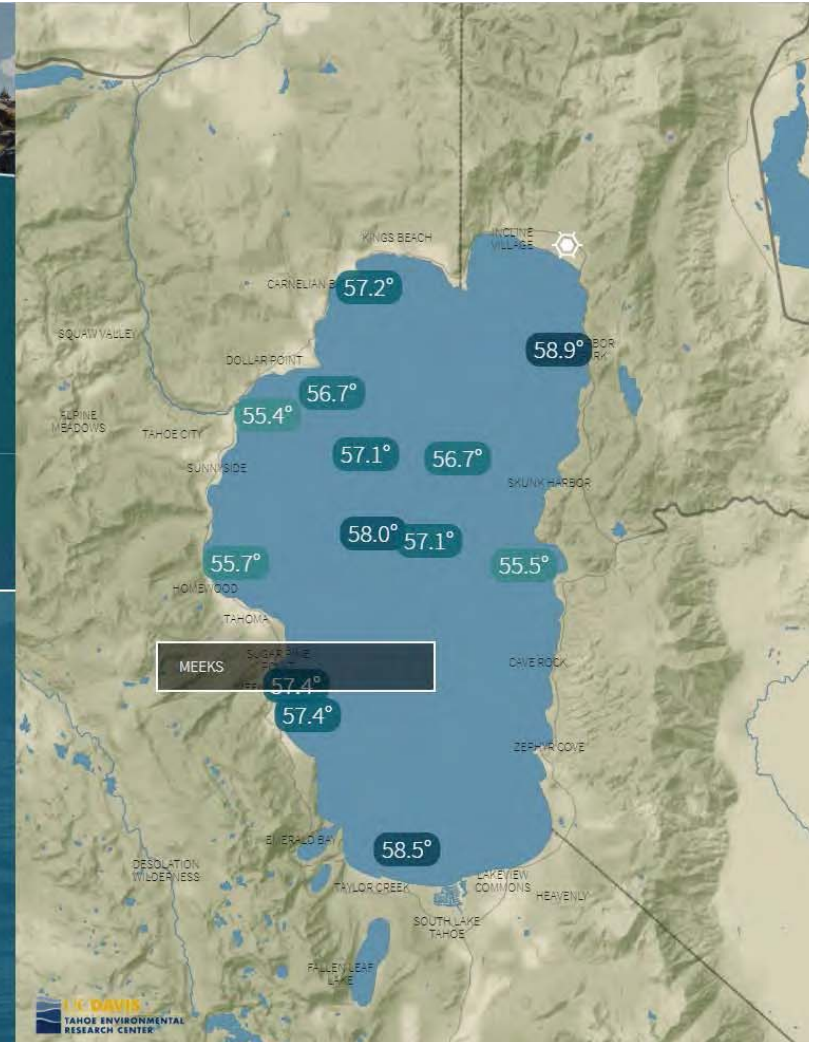
[WAVE HEIGHT](#) | [WATER TEMPERATURE](#) | [ALGAE](#) | [CLARITY](#) | [LAKE LEVEL](#)



### Water Temperature

Lake Tahoe water is cold for most swimmers, with surface temperatures ranging from 42 degrees in the winter to over 70 degrees in July and August. Though refreshing on a hot day, a plunge into Lake Tahoe can literally take your breath away. Swimmers should be prepared for dangerously cold conditions.

Photo Credit: Emily Crook

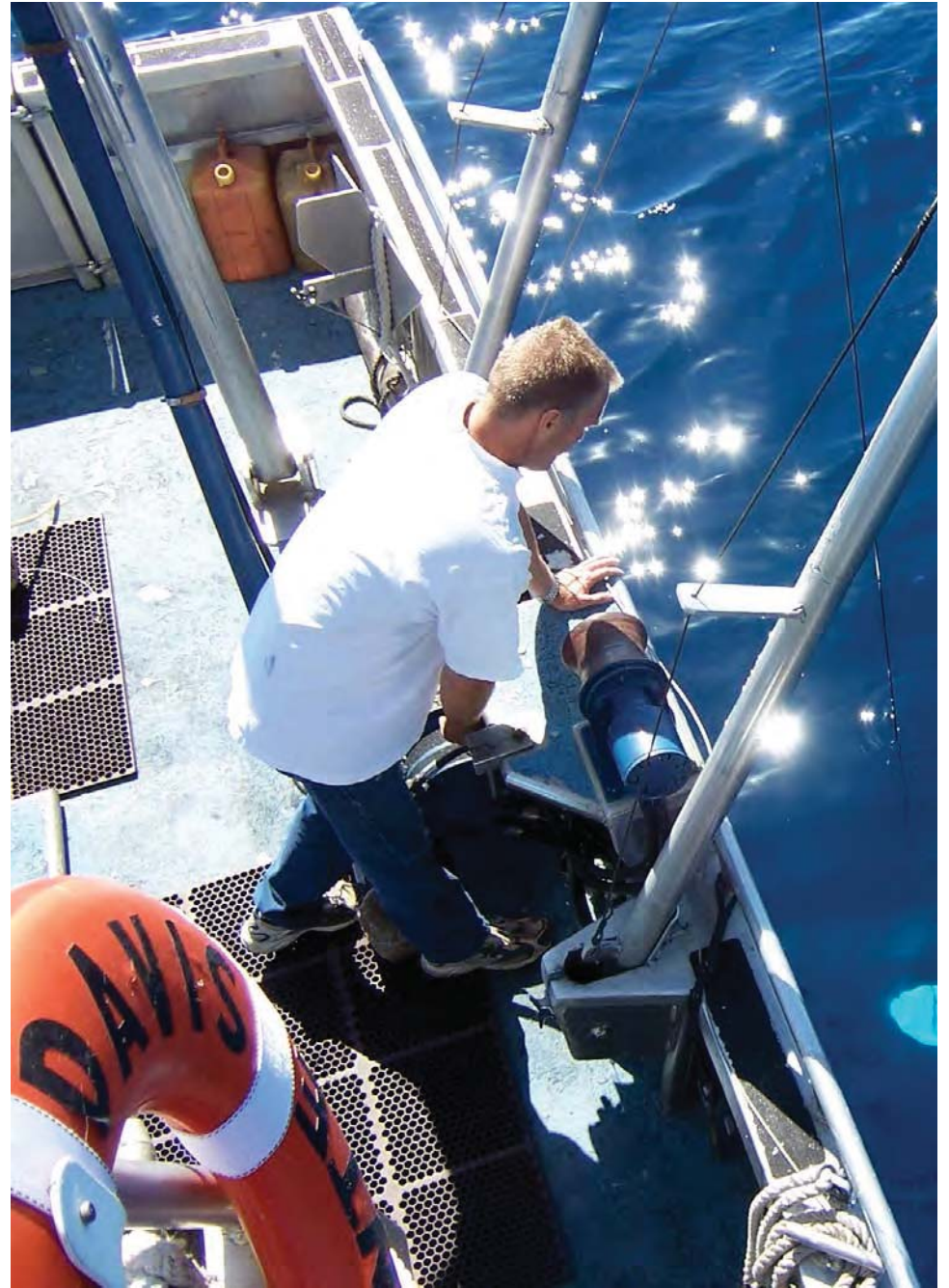
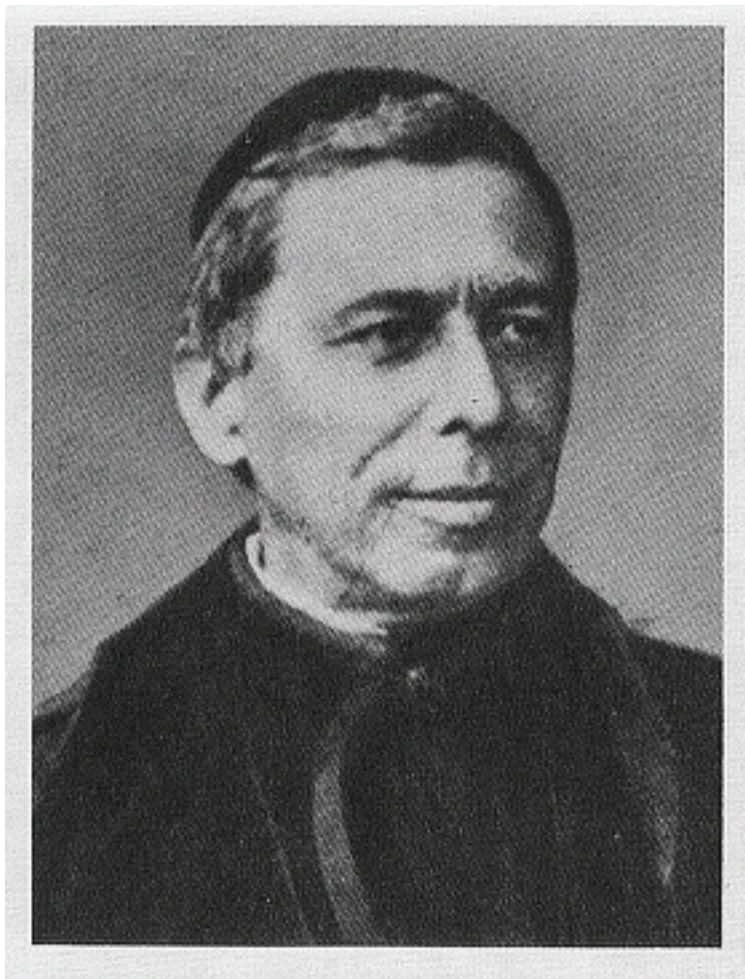




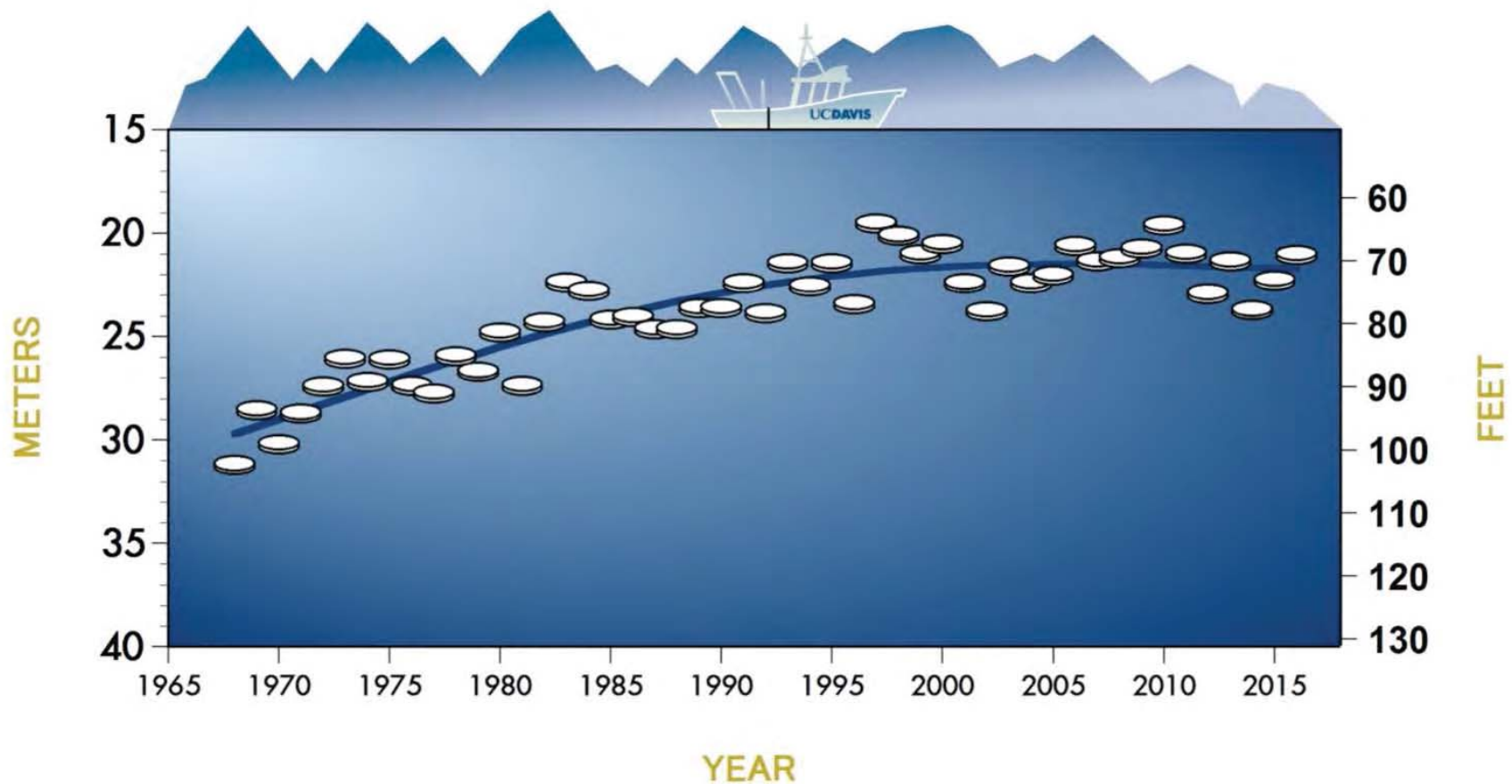
# Clarity



Father Angelo Secchi (1818-1878) was the “Father of Astrophysics”, renowned meteorologist, founder of the Vatican observatory. And credited by others for inventing the Secchi disk.

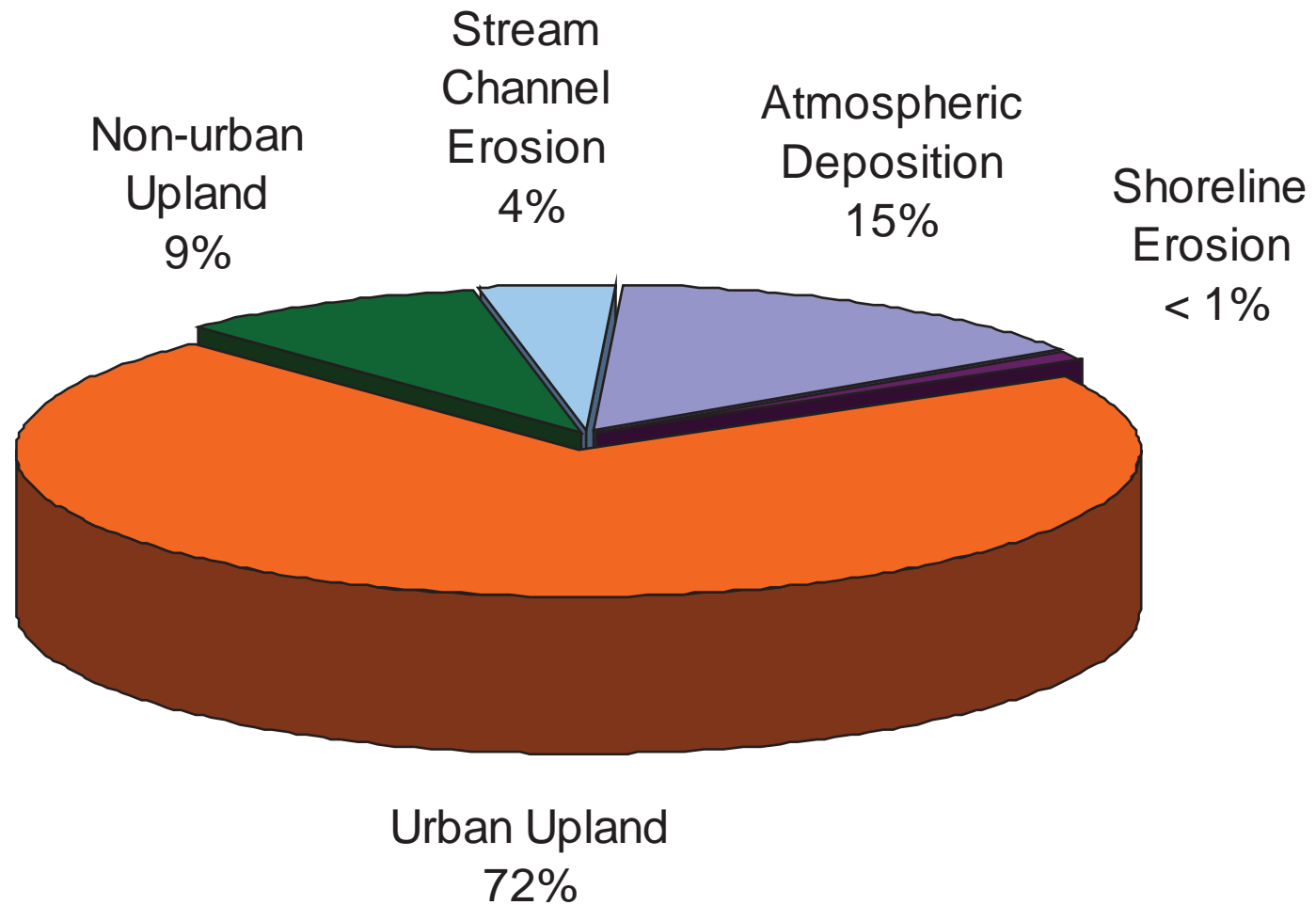


# ANNUAL AVERAGE SECCHI DEPTH



# Fine Particles < 20 microns (really < 8)

$5 \times 10^{20}$ /year





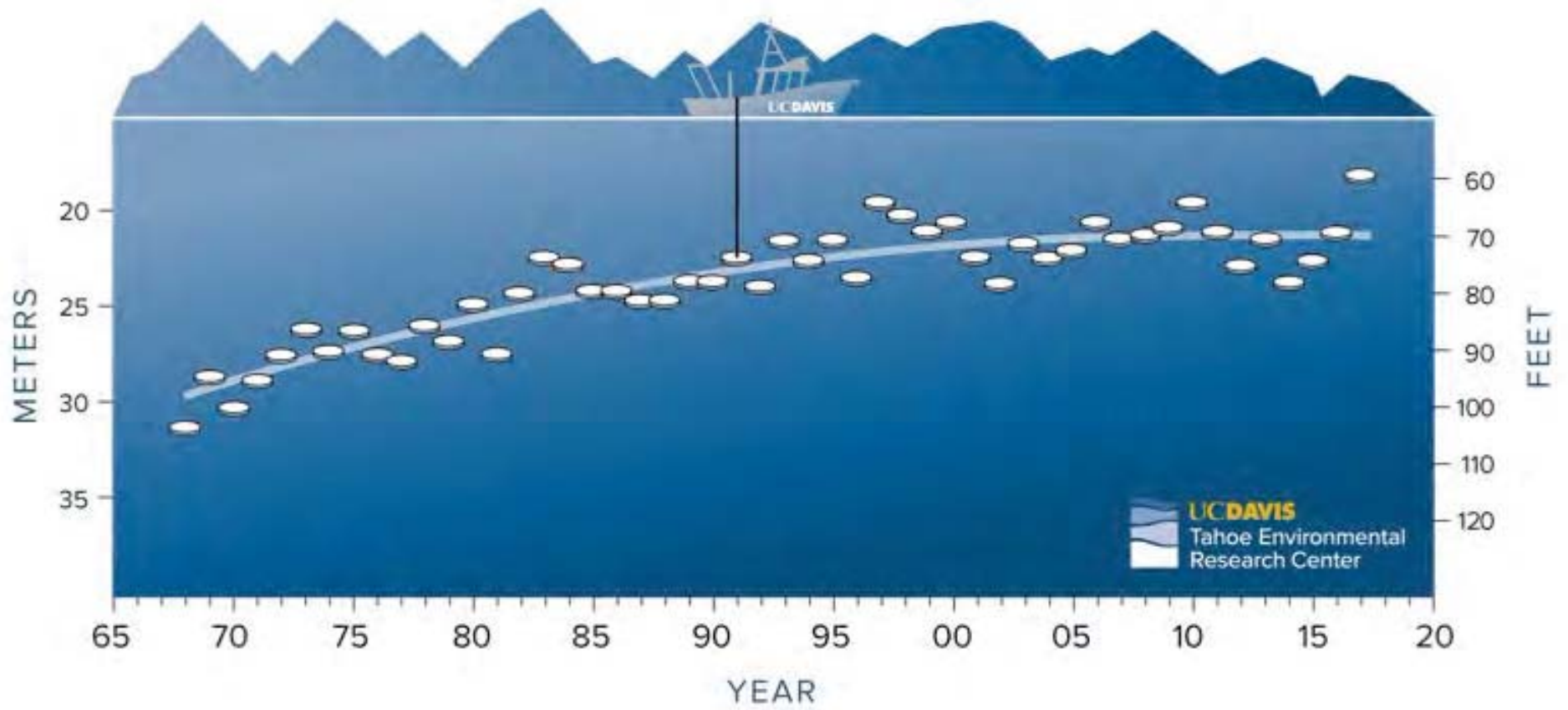
## **PARTICLE INPUT TO THE LAKE FROM URBAN AREAS – THE LEADING LOCAL CAUSE OF CLARITY LOSS**



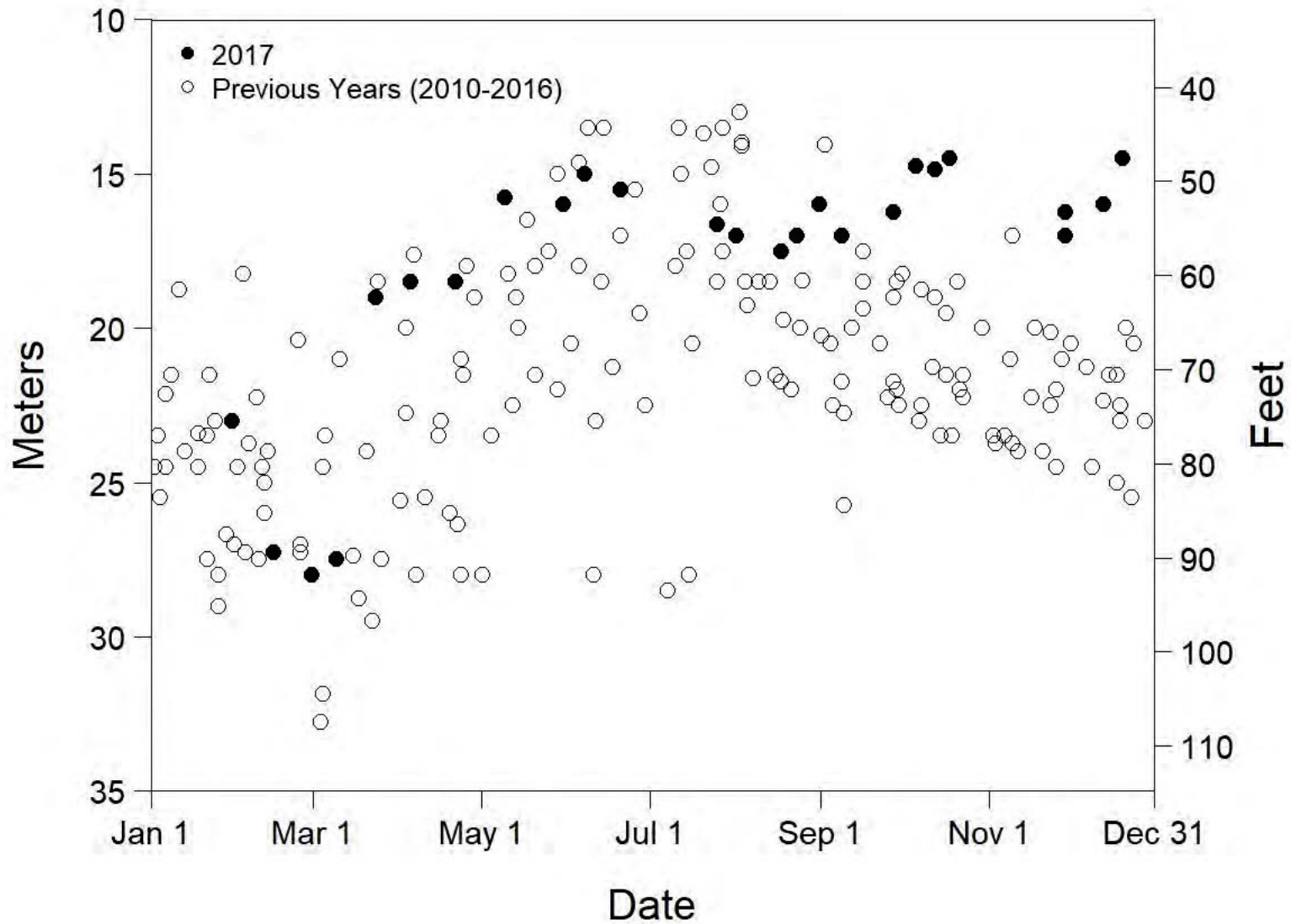
# Lake Tahoe Clarity in 2017 – Harbinger of the Future or Confluence of Extreme Events?

“The average annual clarity level for 2017 was 59.7 feet. This was a 9.5-foot decrease from the previous year, surpassing the previous lowest value of 64.1 feet in 1997”

# ANNUAL AVERAGE SECCHI DEPTH



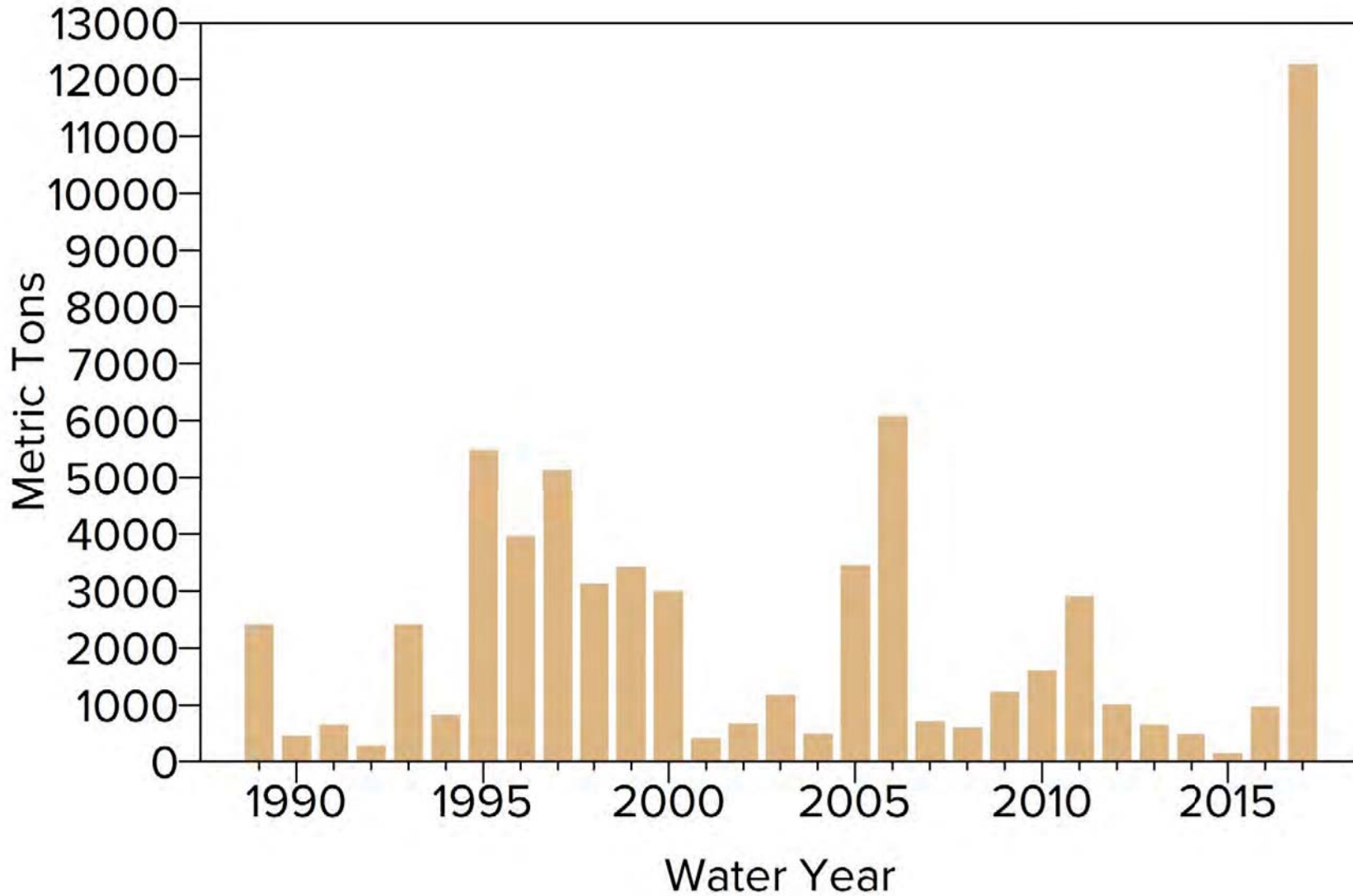
**Individual Secchi depth measurements for 2010-2016 (hollow circles)  
and 2017 (filled circled)**



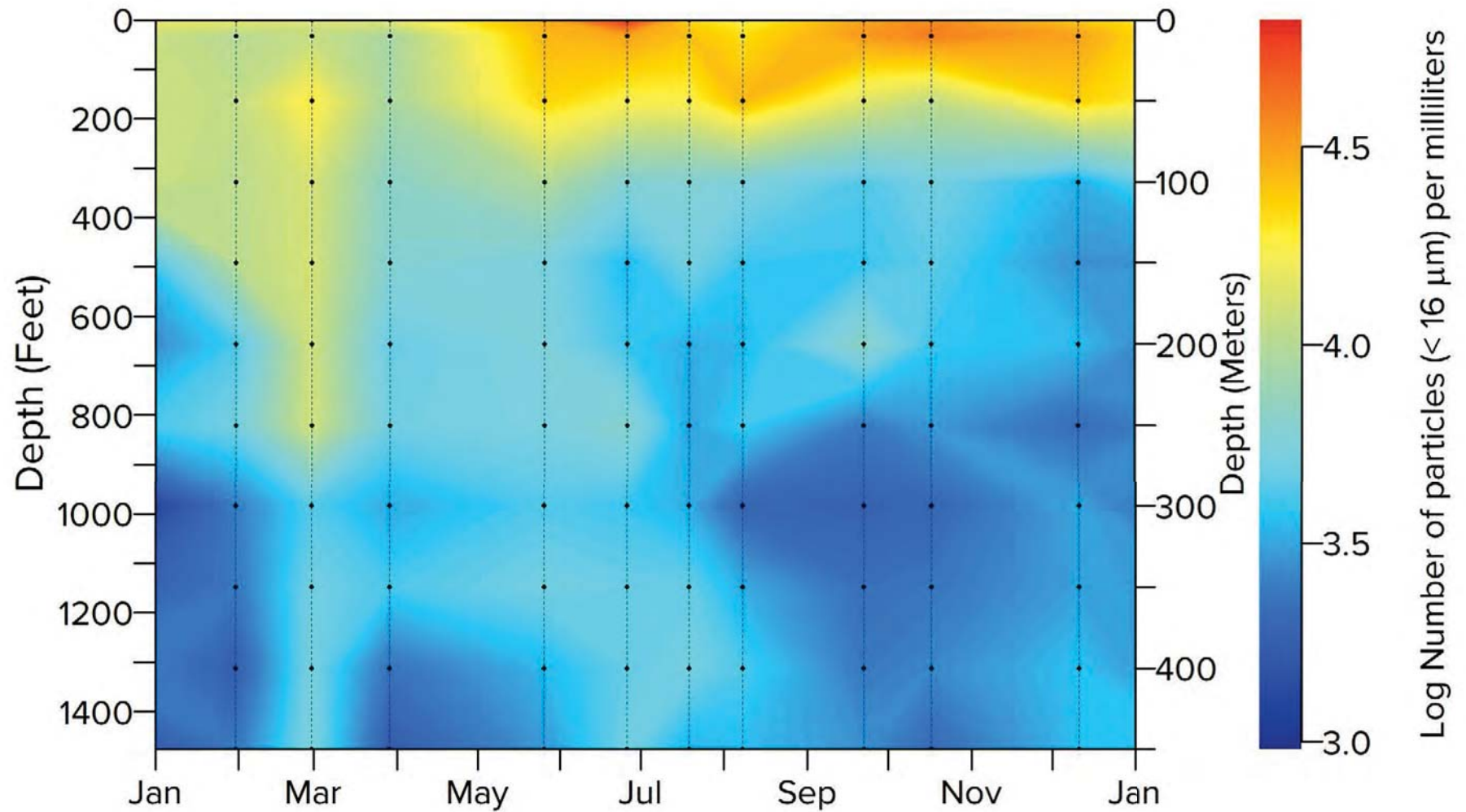
Here is what happened

- There was a 5 year drought that was the most extreme in 1600 years
- The drought was ended with the wettest winter on record (300% of annual precipitation; 58 Atmospheric Rivers...
- 5 years of material that had accumulated in the streams PLUS a lot of new material all got washed into the lake
- The runoff occurred relatively late in the year, so the impacts persisted late into the year

## ANNUAL SEDIMENT LOAD FROM UPPER TRUCKEE RIVER



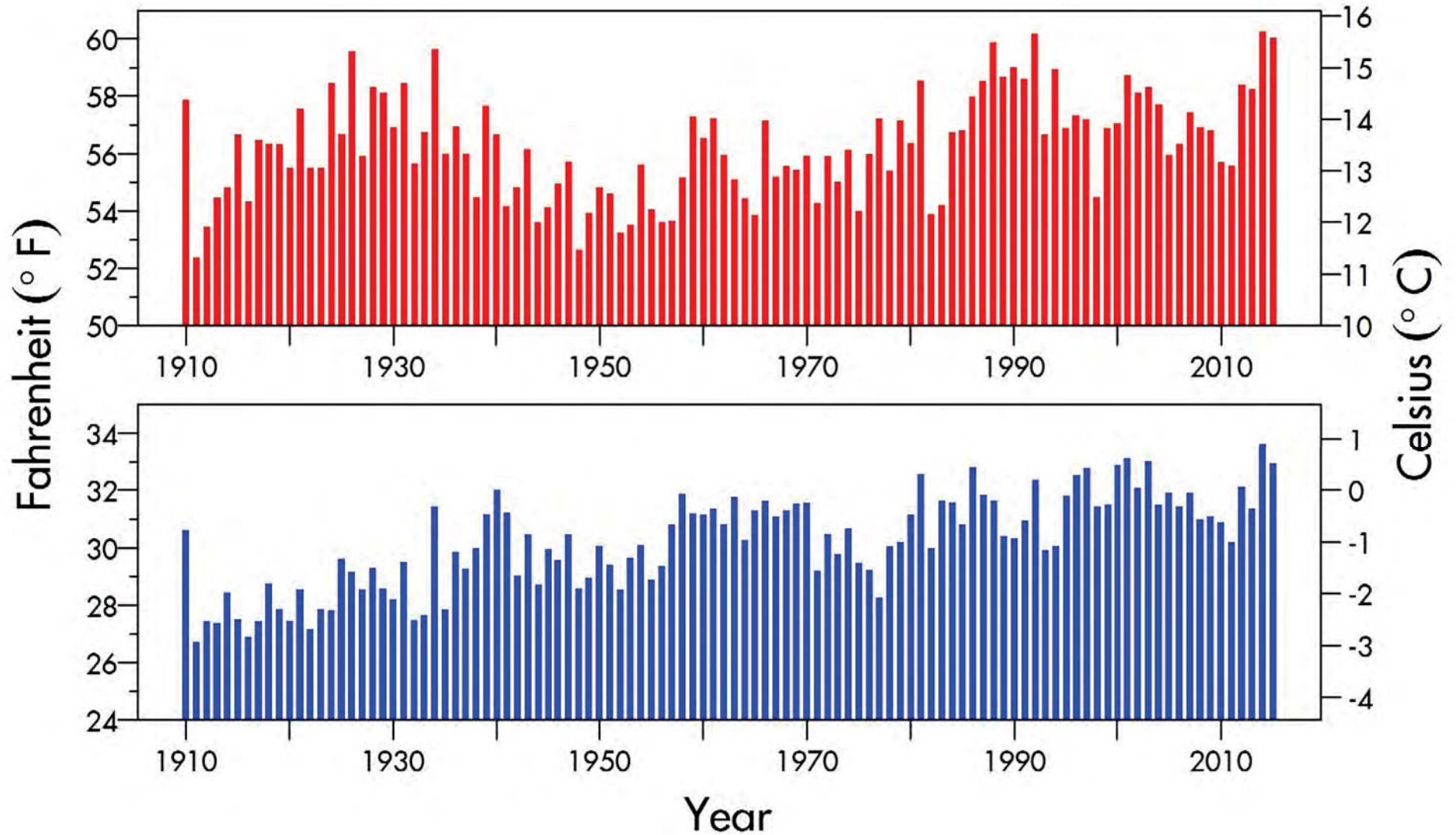
## Fine particle distribution in Lake Tahoe during 2017



# CLIMATE CHANGE

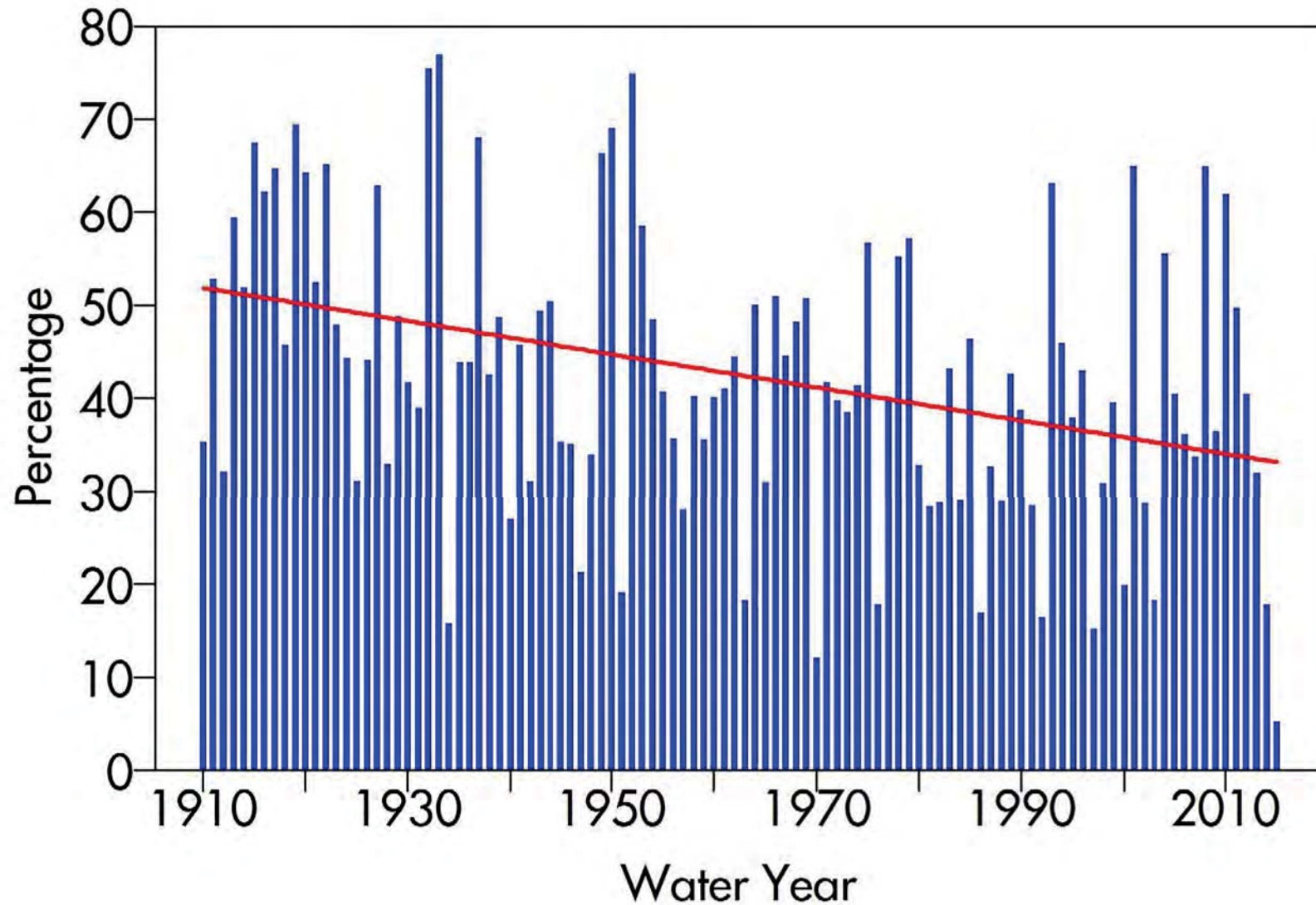


# Annual Average Air Temperature - Tahoe

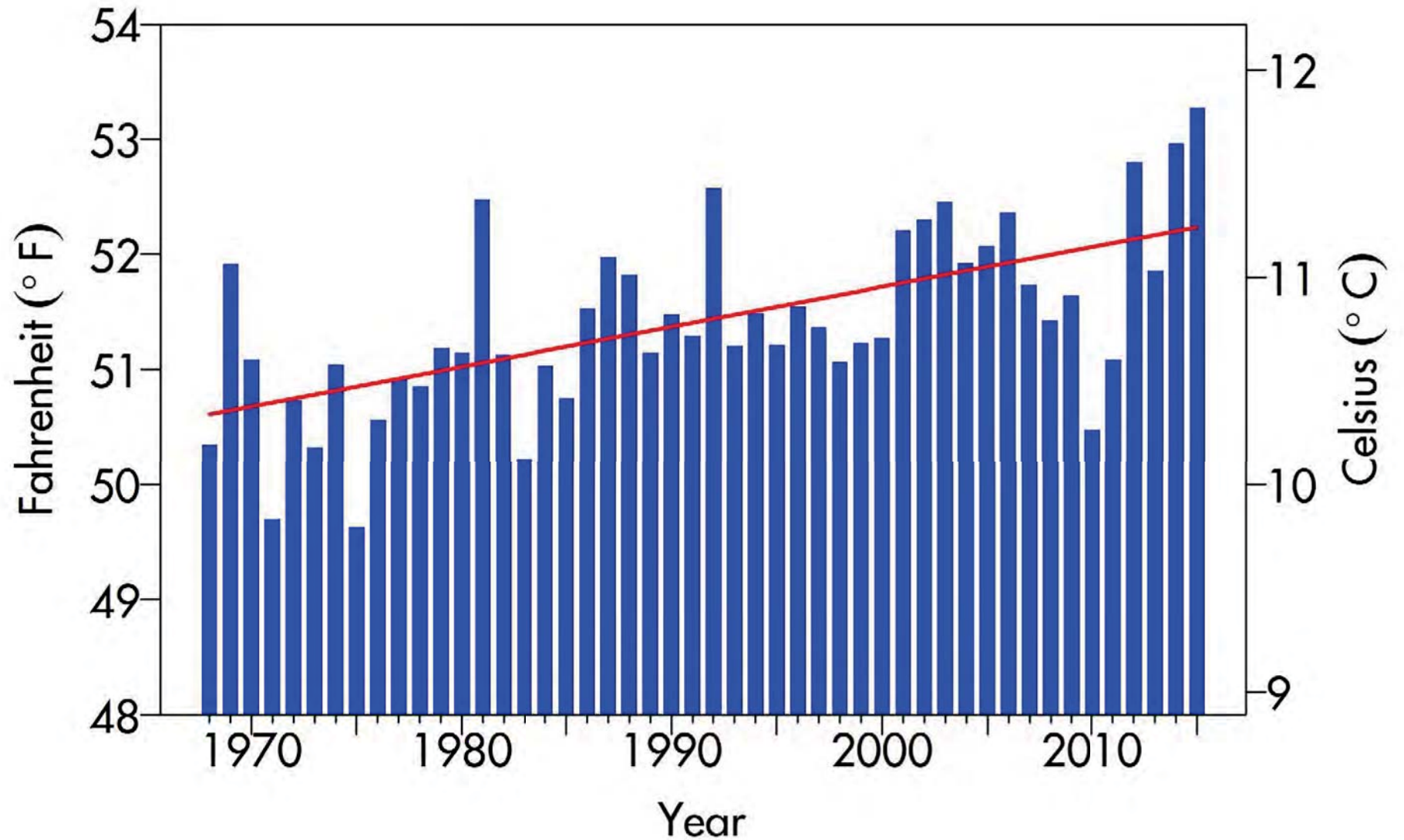




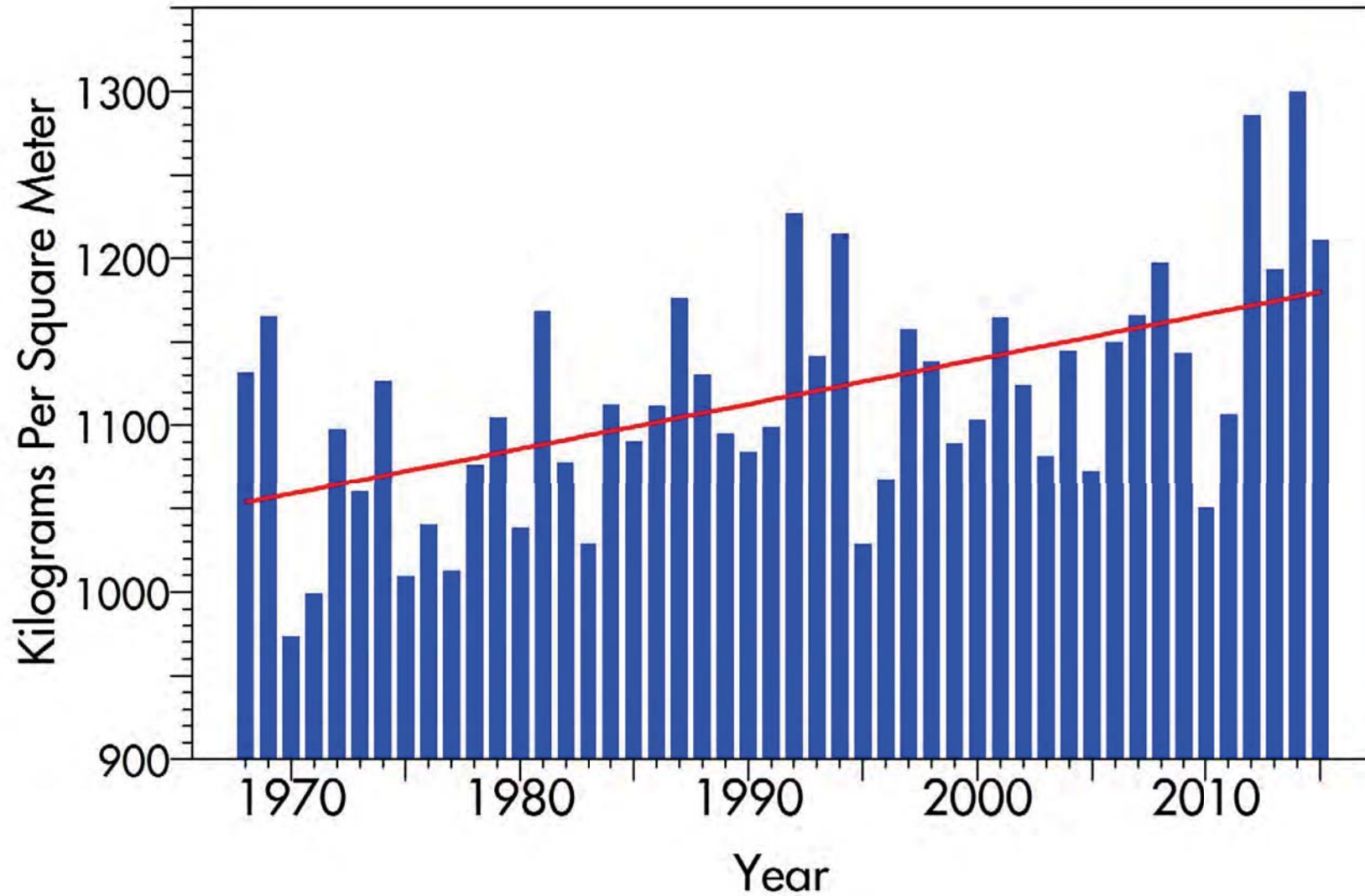
# Snow as a fraction of precipitation- Tahoe



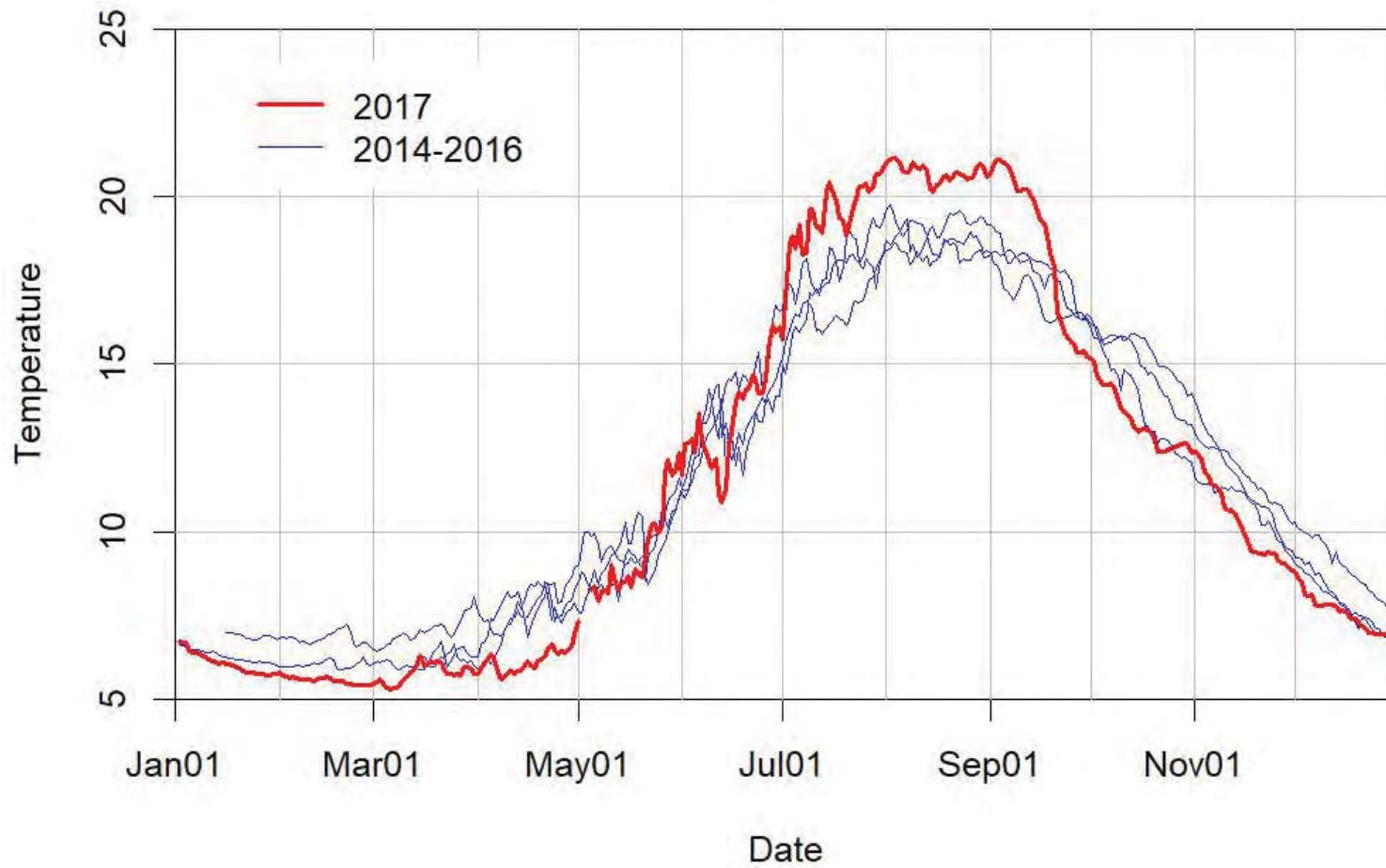
# Annual Average Lake Surface Temperature = 11.9° C

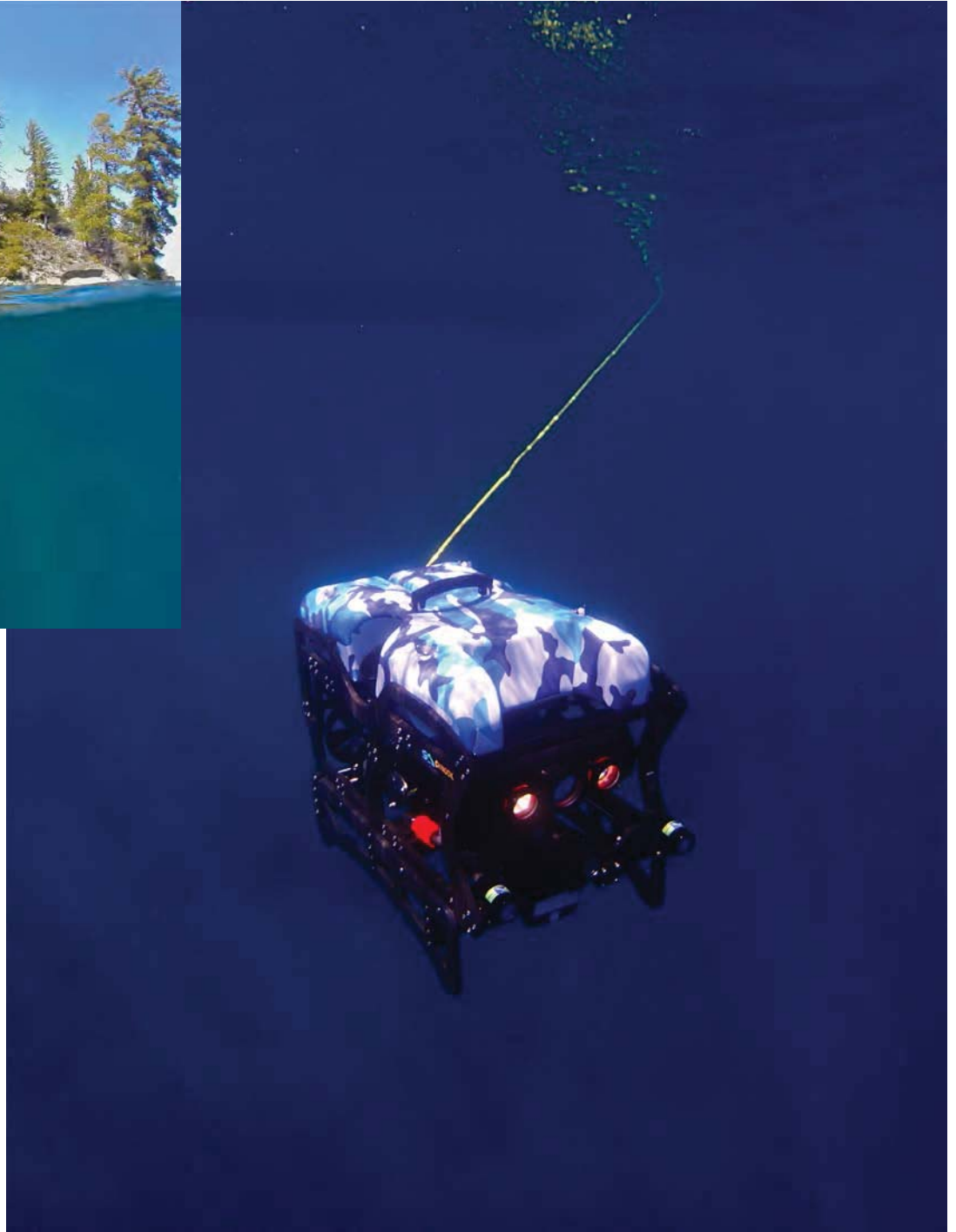


# Increasing Lake Stability - Tahoe



## Daily Mean Water Temperature at 5.5m (TB3)





# “RUBICON CLIFFS” AT THE EDGES OF LAKE TAHOE



# MYSIS SHRIMP AT THE BOTTOM OF LAKE TAHOE

