

2016

International Users Conference
United We Map



Session

Exploring Fisheries and Fish Habitat

***Water Quality and Steelhead
Trout in the Lower Santa
Ynez River Watershed***

Timothy H. Robinson
**Cachuma Operation and Maintenance
Board**

Southern Steelhead *Oncorhynchus mykiss*



NO FISHING
PROHIBIDO PESCAR



Steelhead Trout
Oncorhynchus mykiss

California Coastal Streams are inhabited by Steelhead Trout which are protected by Federal and State Laws.

Violators will be prosecuted!

Las corrientes y peces costeras son protegidas por la ley Federal y del Estado.

If you see a violation call:
Si encuentra infracciones, llamo:



16 USC 1538
30 CFR 224.161

NOAA Hotline
1-800-853-1964 or
CAL TIP Hotline
1-888-334-2258

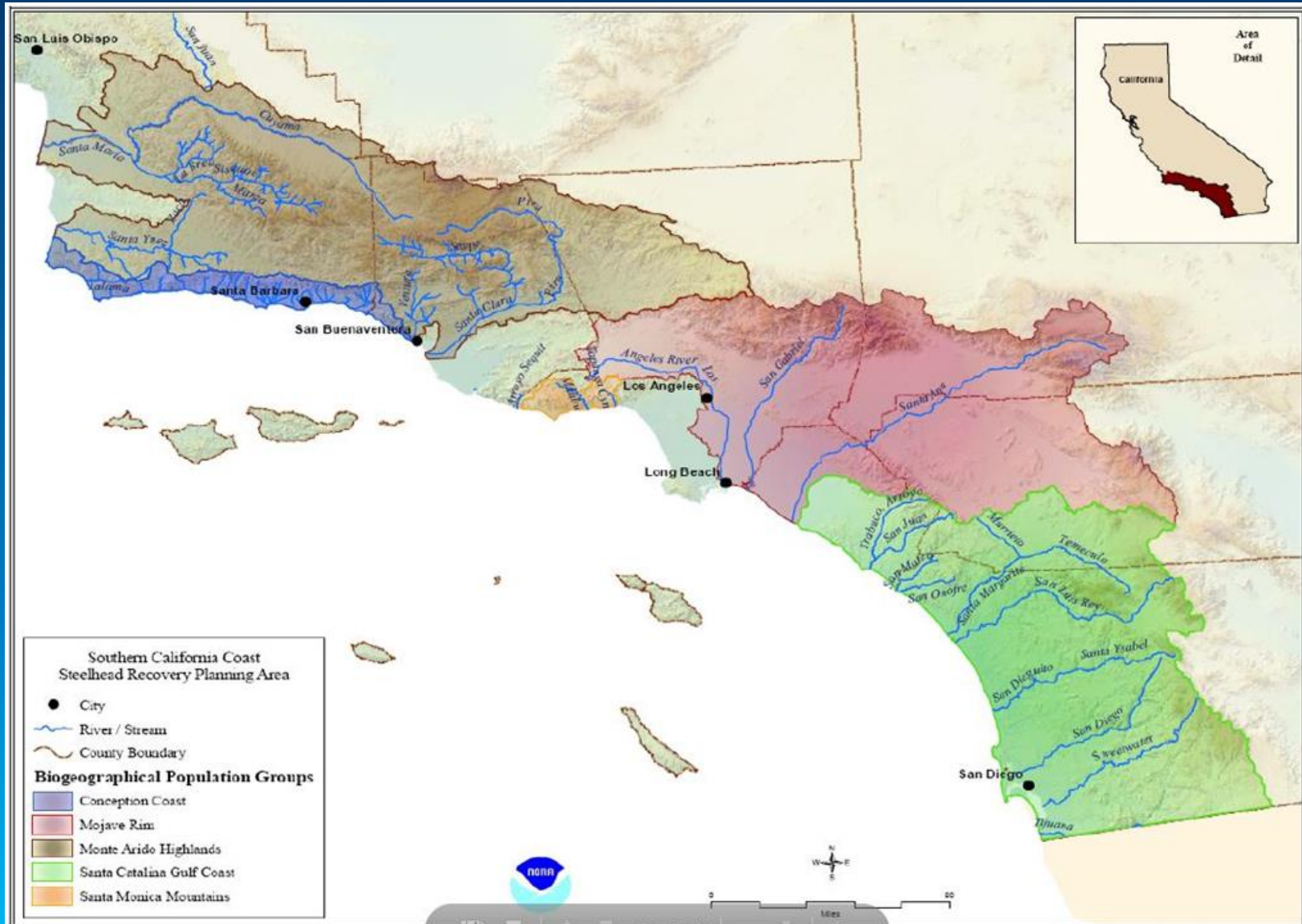


CDFG Code
Sec. 7060103



National Marine Fisheries Service
Southwest Regional Office
Long Beach, CA

Southern California Steelhead Recovery Plan, January 2012



The Cachuma Project

Cachuma Operation and Maintenance Board (Joint Powers Agency)



Objectives:

- Water delivery (reservoirs, tunnels, conduit, etc.)
- Resource management (water and biological species/habitat)



Southern Steelhead – Endangered Species List (1997)

Cachuma Project Biological Opinion (NMFS, 2000)

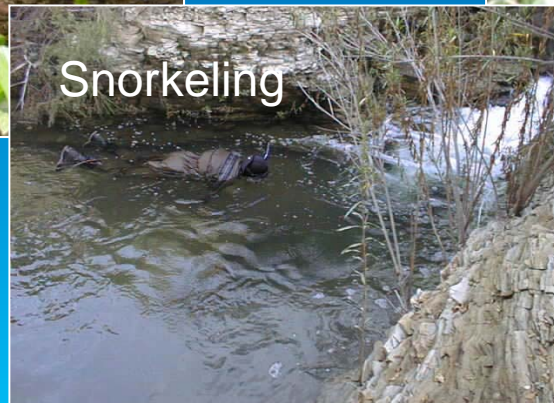
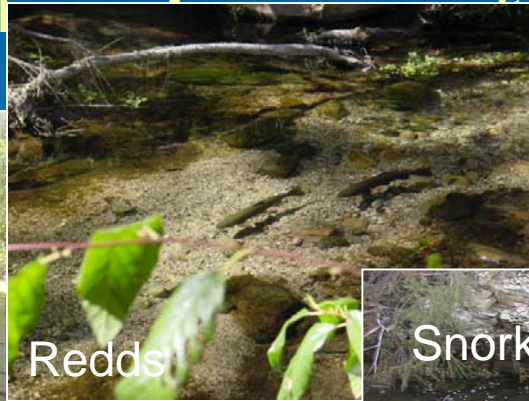
15 Reasonable and Prudent Measures (RPMs):

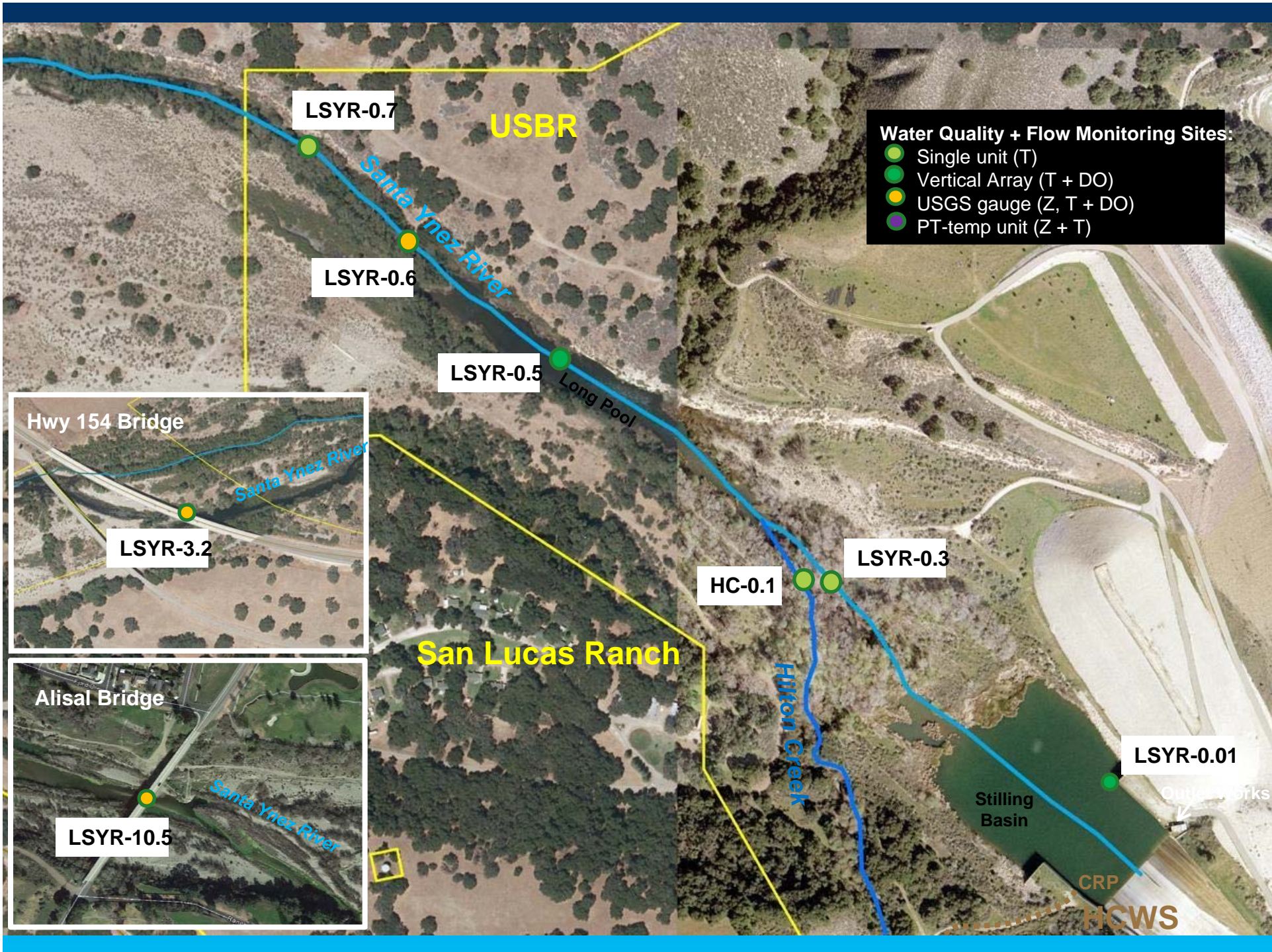
- Monitoring (migrant trapping, snorkel and redd surveys, diel and spot water quality and flow monitoring, habitat classification, etc)
- River target flows
- Passage supplementation
- Habitat quality improvement
- Migration barrier fixes (11)
- Reporting
- Outreach
- Adaptive management



Monitoring

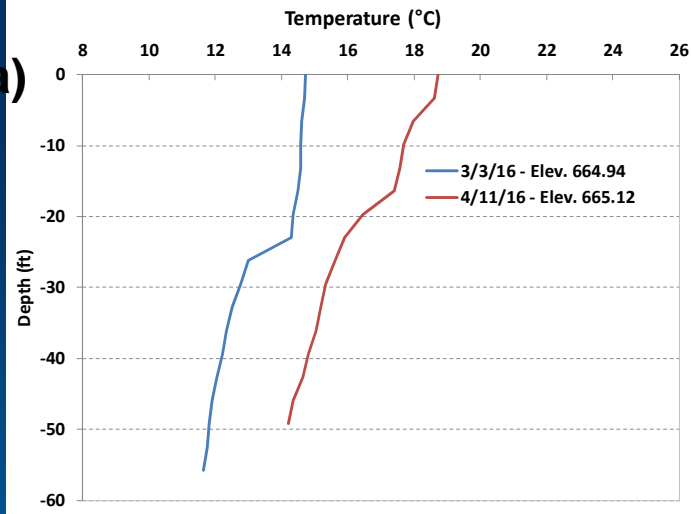
- **Trapping** (January – May): Salsipuedes and Hilton Creeks and mainstem near Solvang
- **Redd Surveys** (February – May): tributaries and mainstem
- **Snorkel Surveys** (Spring, Summer and Fall): tributaries and mainstem
- **Stream/River Discharge** (year round): USGS and spot flow measurements
- **Water Quality** (dry season, May – November): temperature, dissolved oxygen concentration, turbidity, specific conductance, lake profiles, stratified pools, and ambient air temperature (diel and spot measurements)
- **Habitat Quality** (as needed or yearly): habitat mapping and photo points
- **Restoration Projects** (as needed or annually): pre-, during, and post-construction as well as monitoring over time



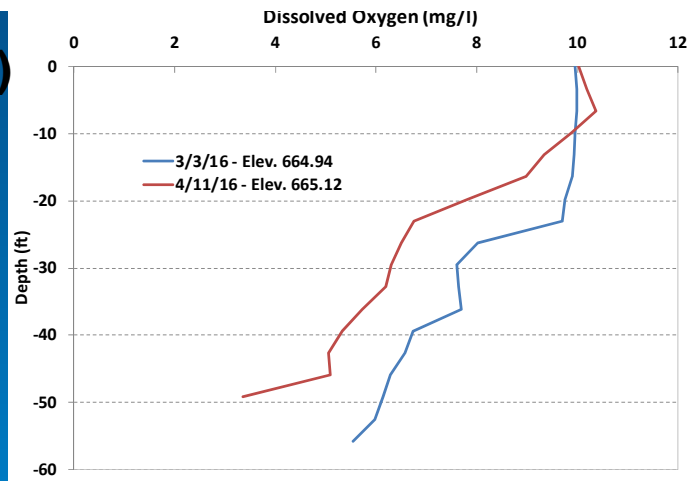


Lake Cachuma

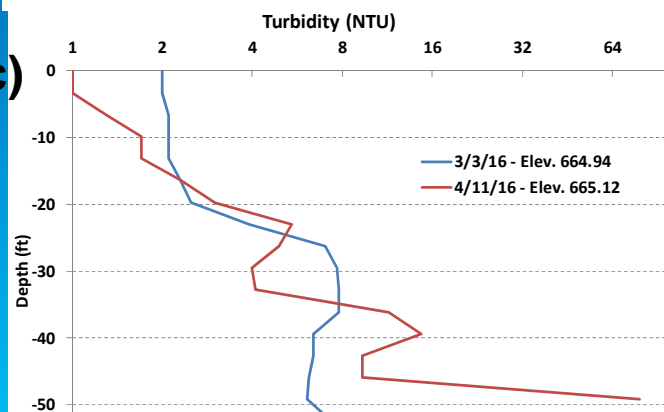
(a)



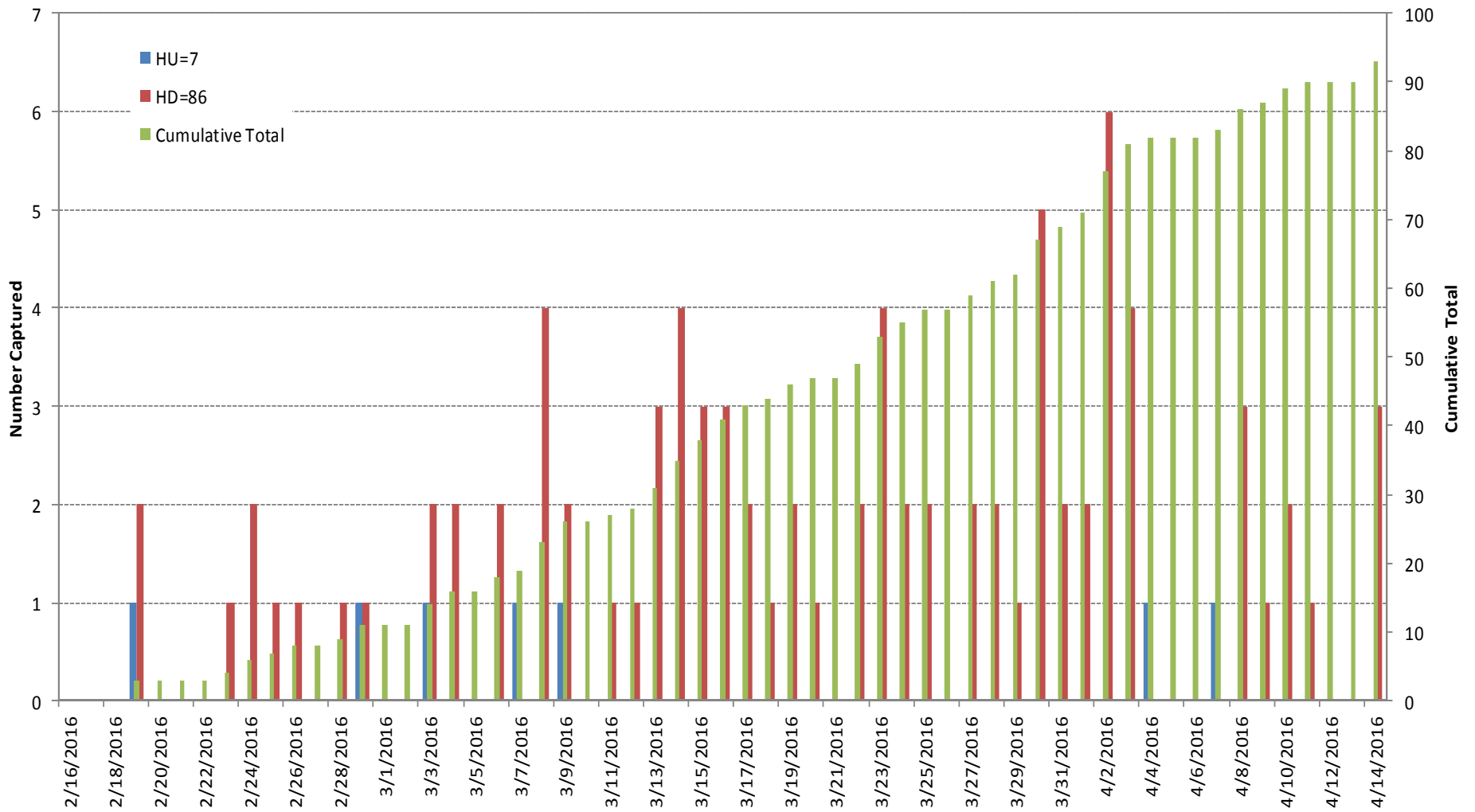
(b)



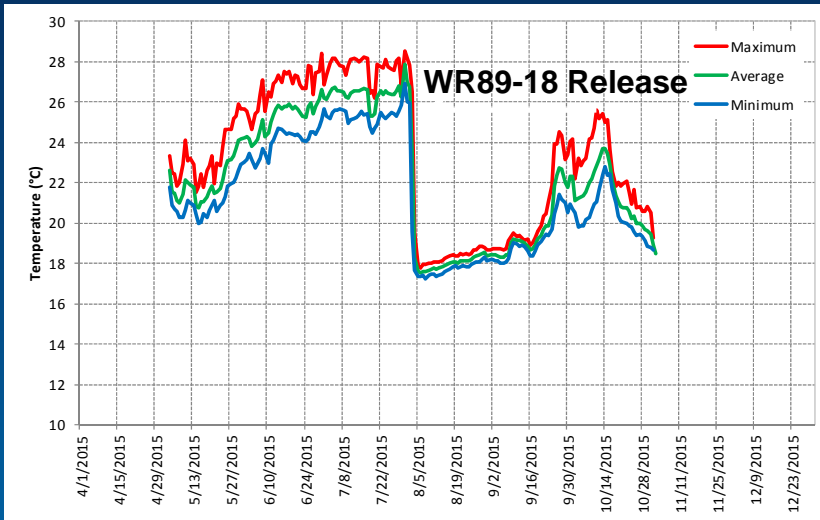
(c)



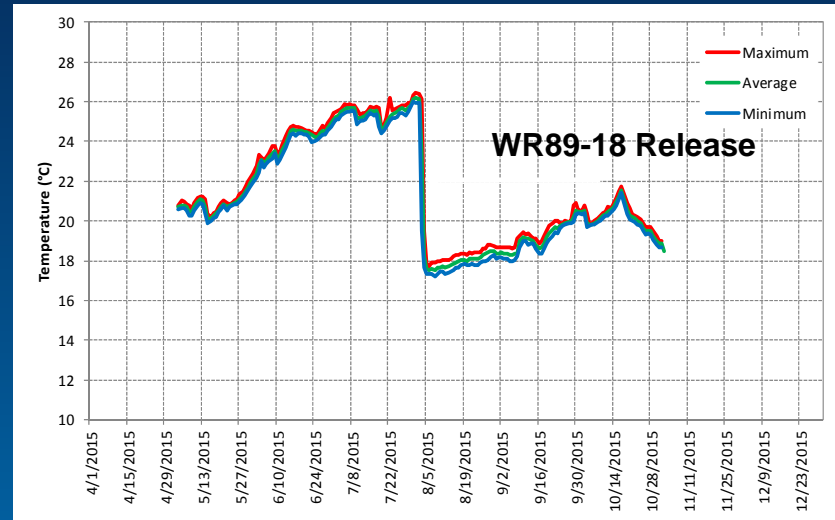
Trapping data



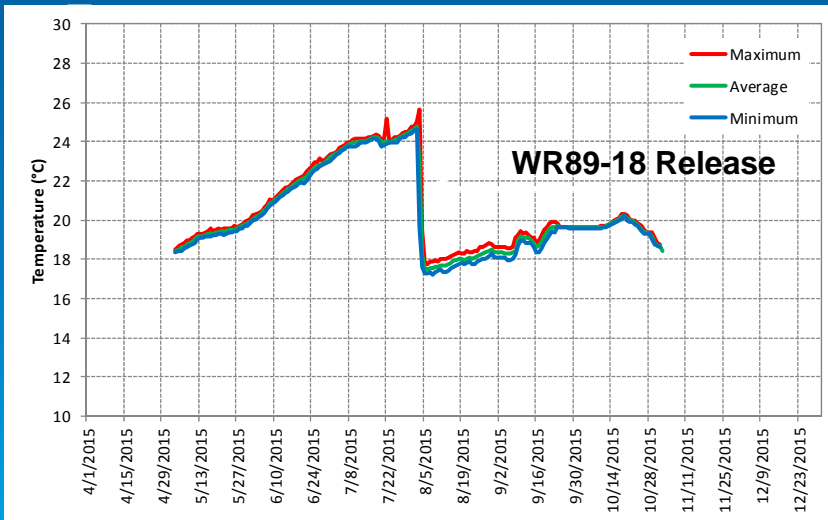
Water Quality – Thermographs – Stilling Basin



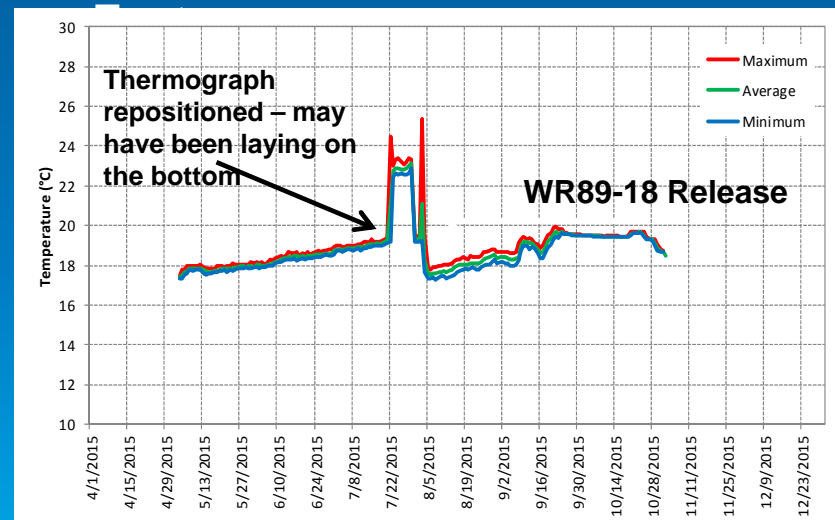
Stilling Basin Wall – Surface 1-



Stilling Basin Wall – Surface 8-



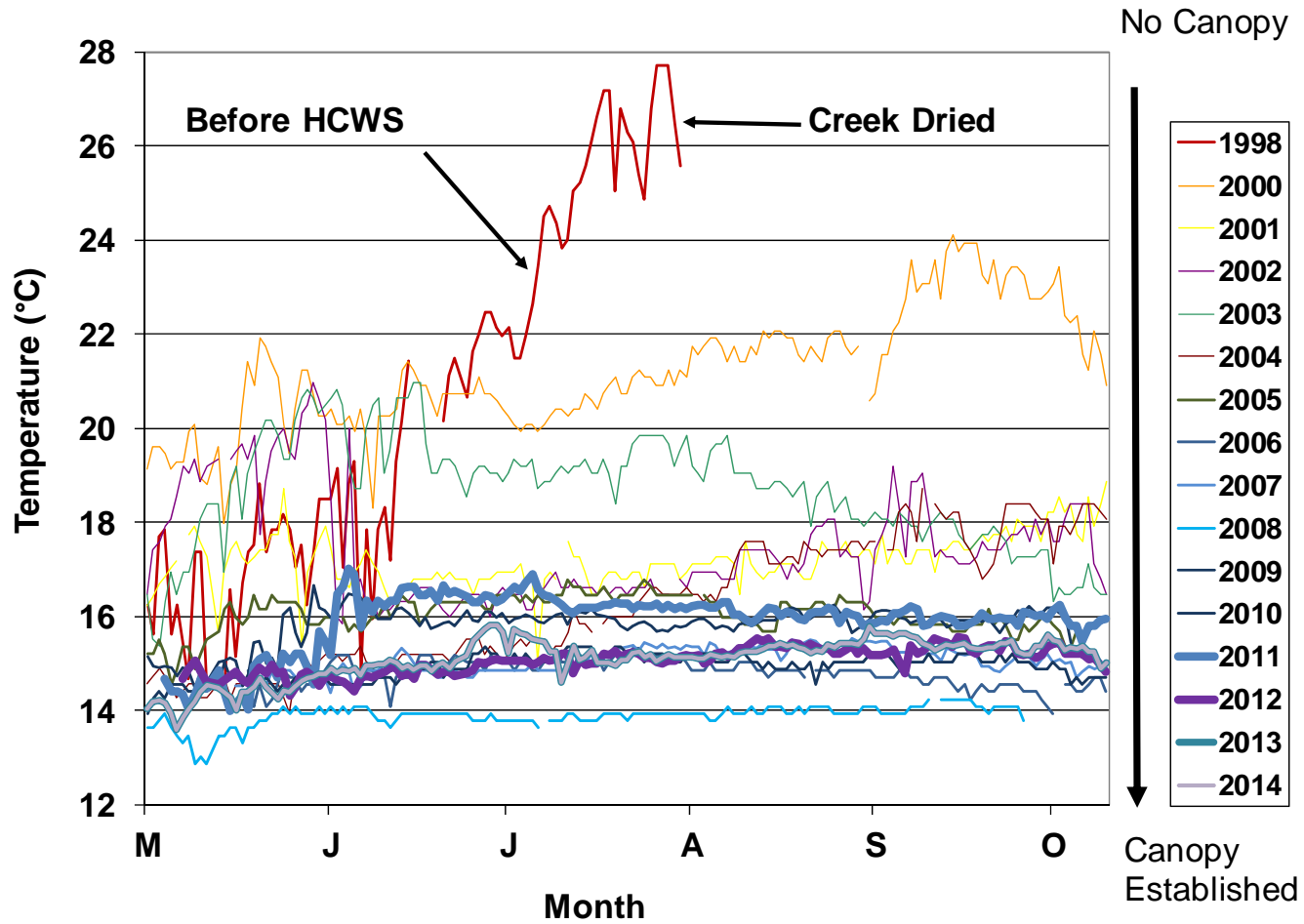
Stilling Basin Wall – Surface 16-Foot



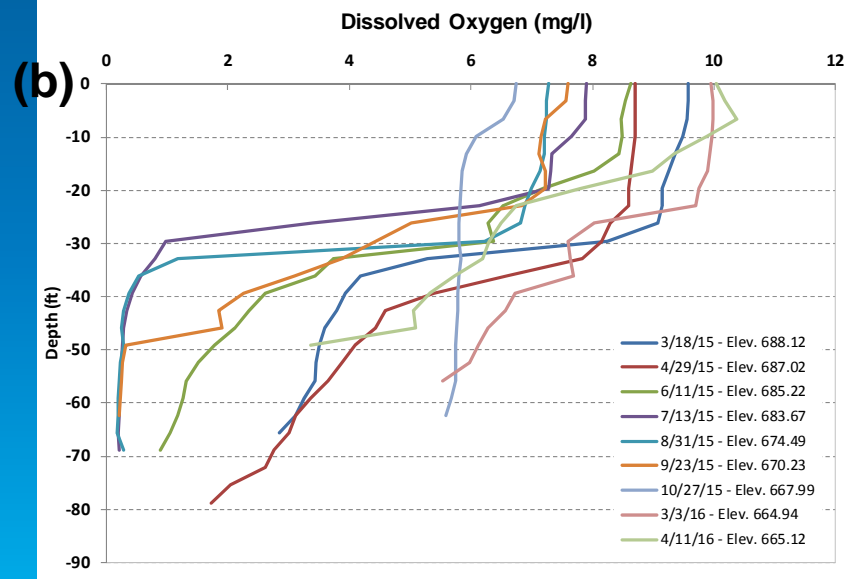
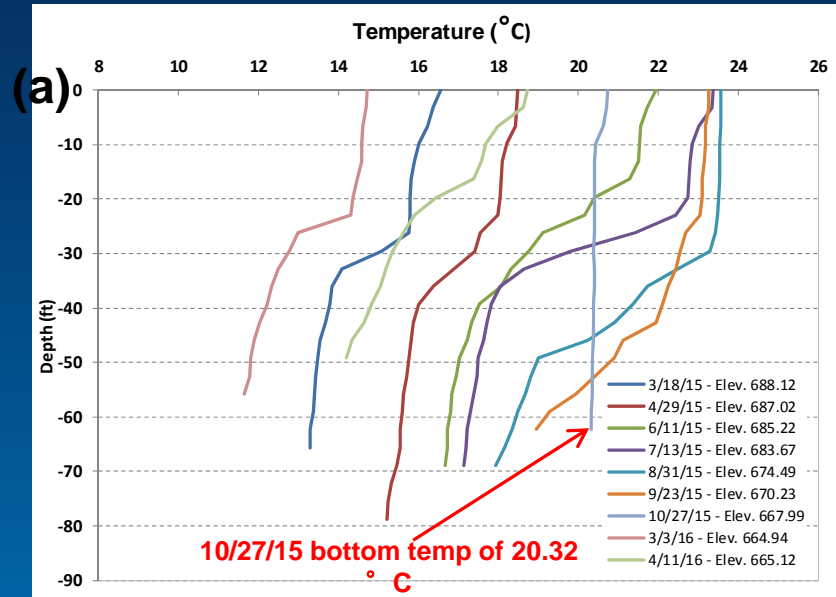
Stilling Basin Wall – Surface 24-Foot

Hilton Creek Canopy Cover Growth – water quality

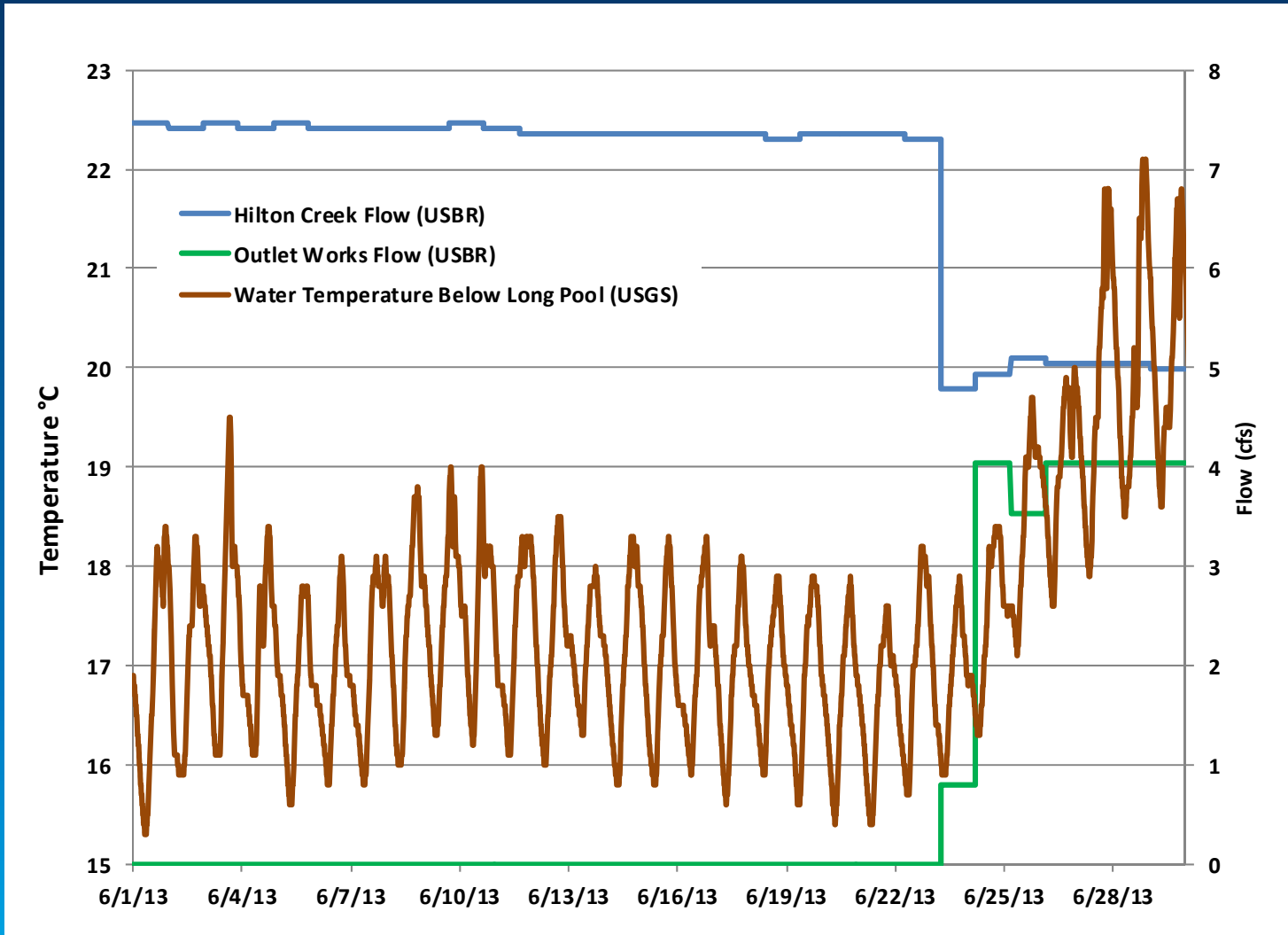
Lower Hilton Creek Maximum Temperatures 1998-2014



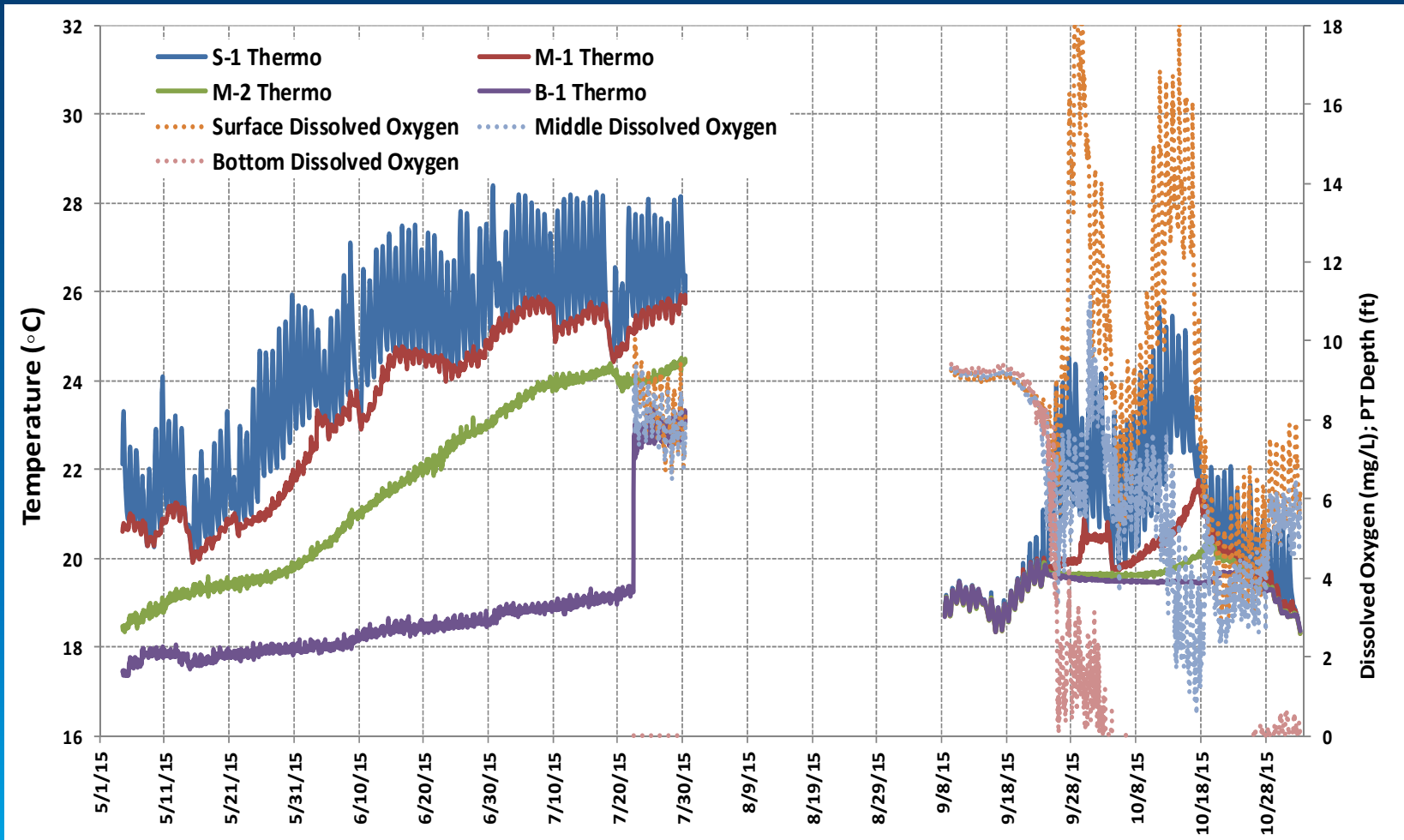
Lake Profiles at Lake Cachuma



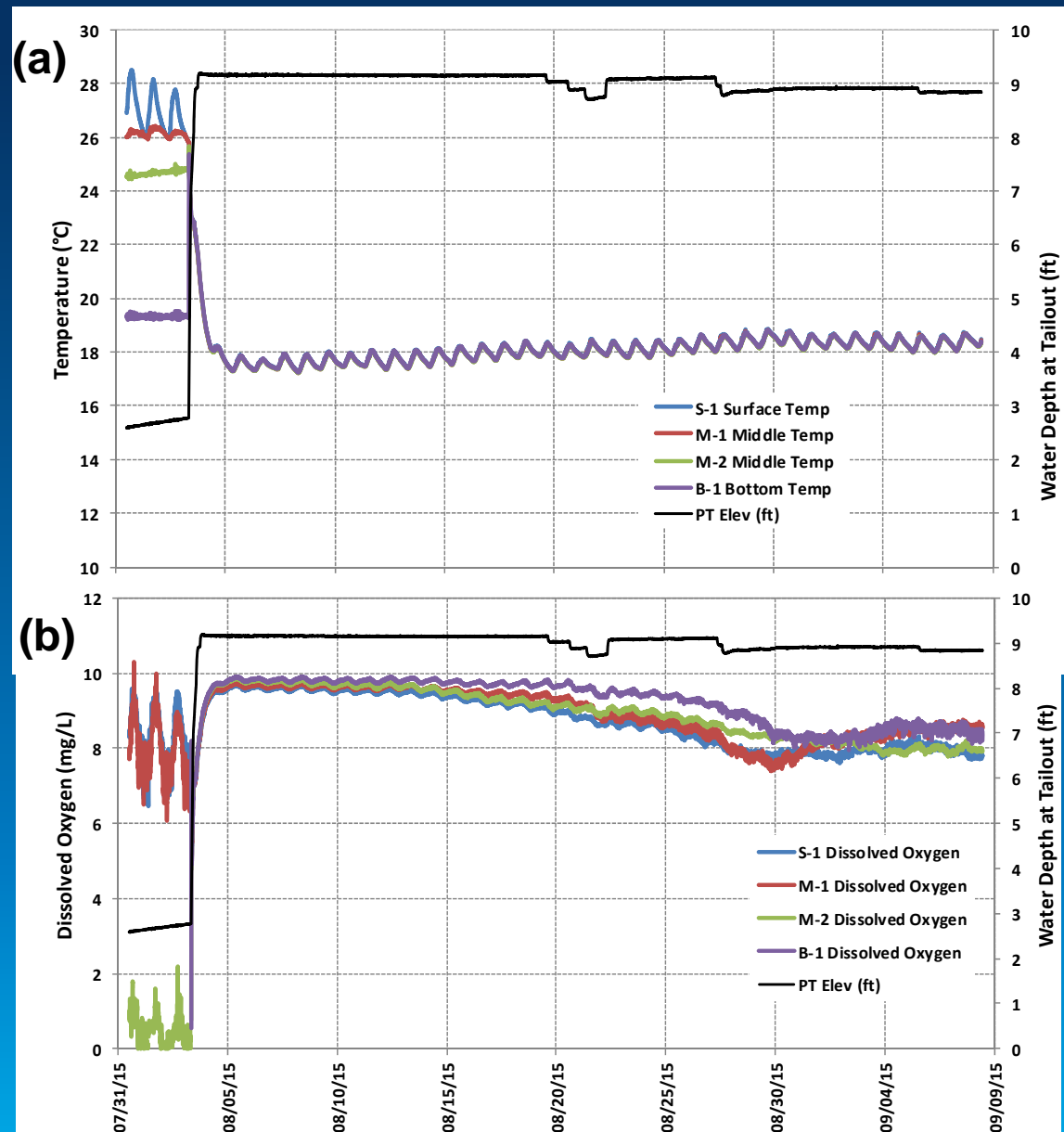
Stilling Basin – Thermal burping

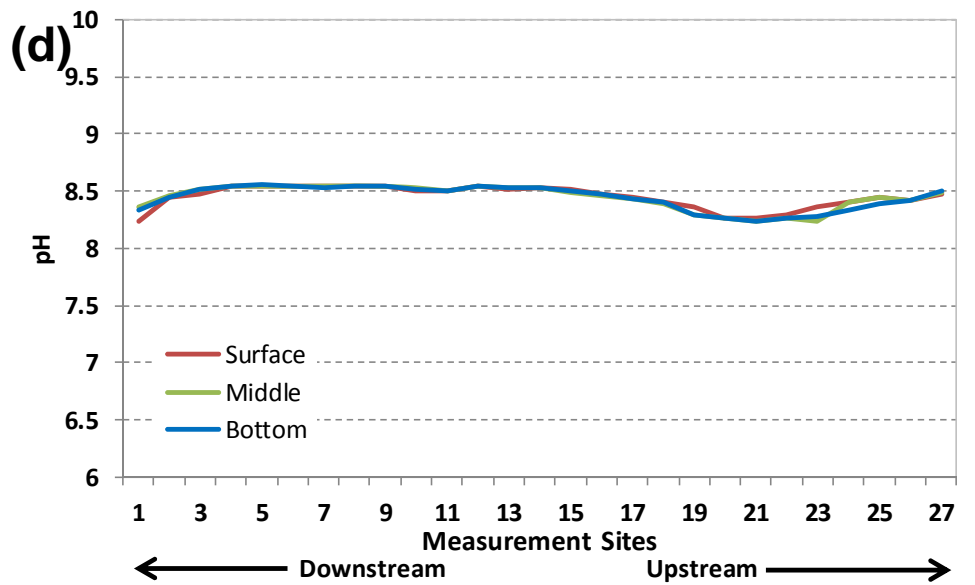
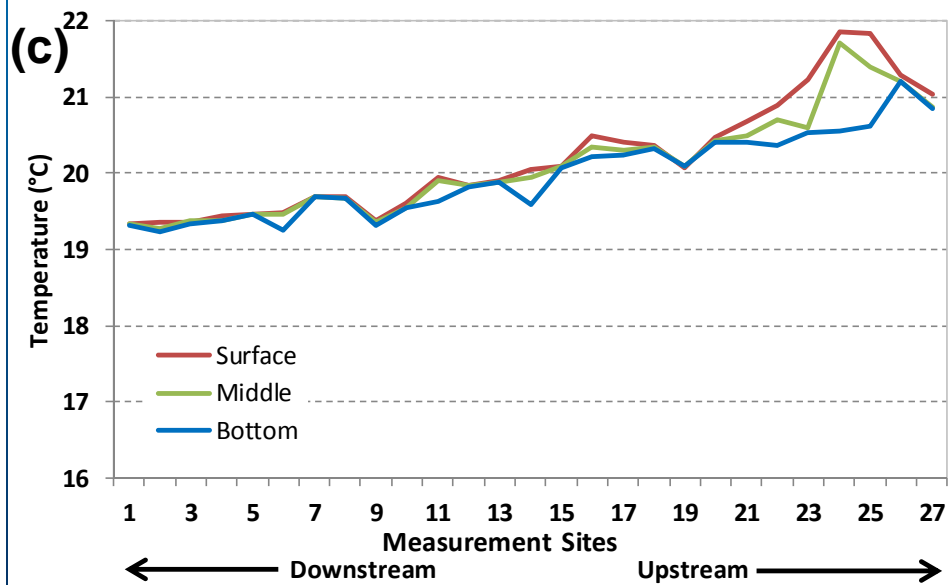
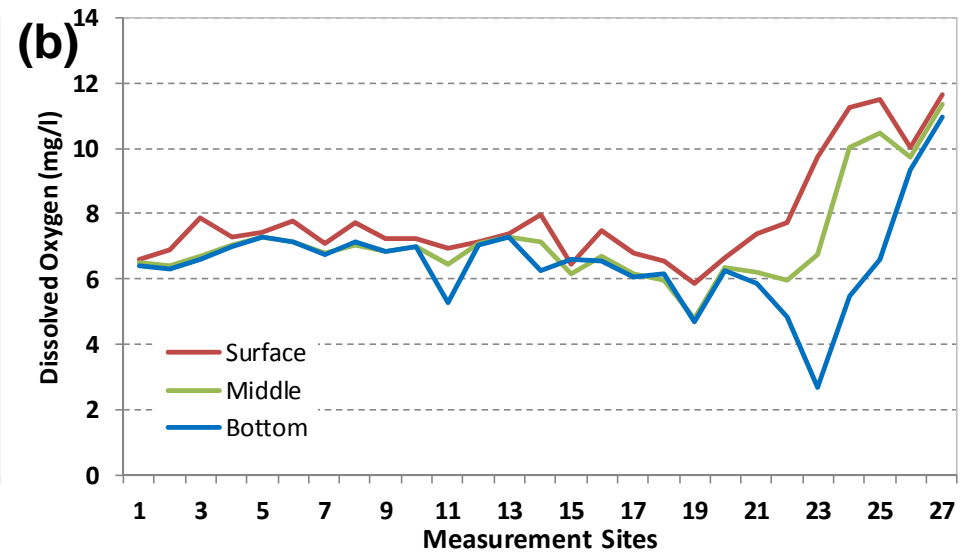
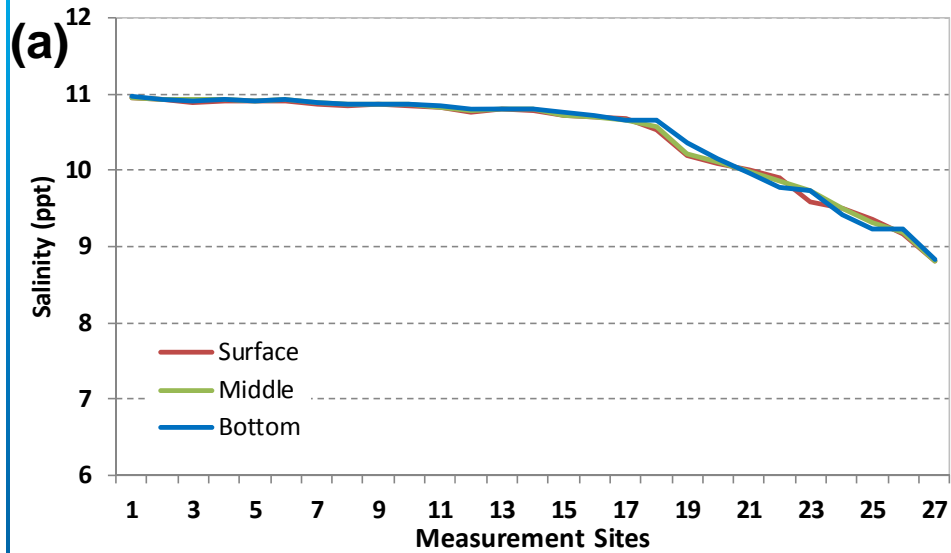


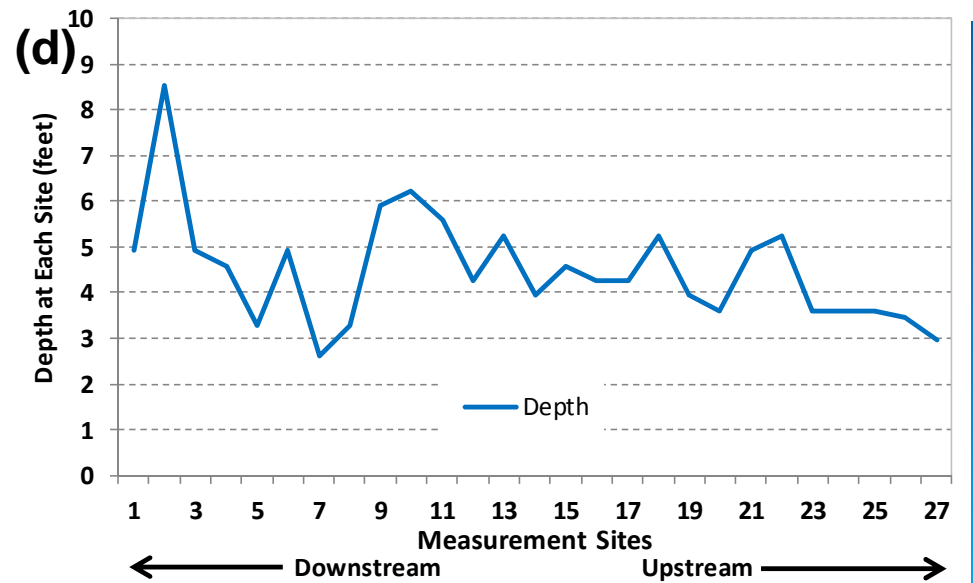
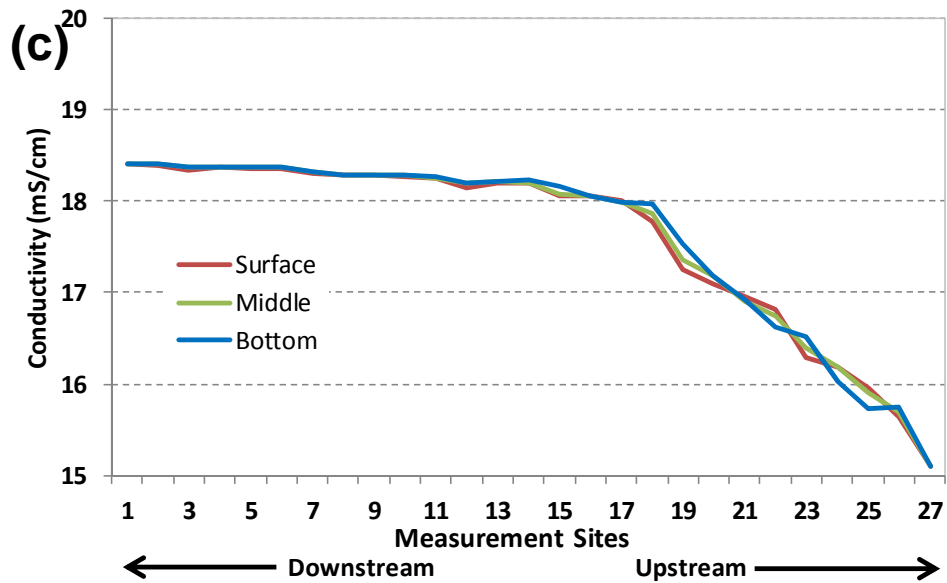
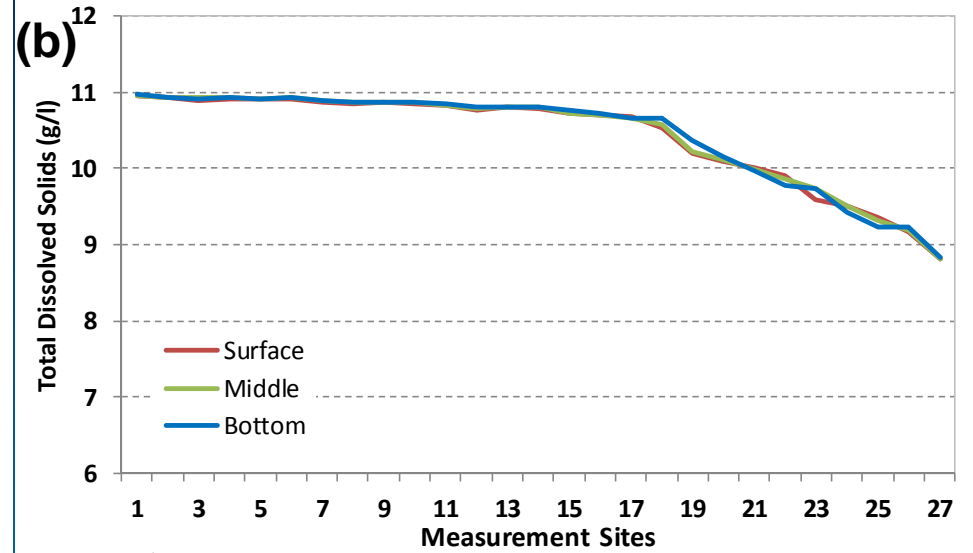
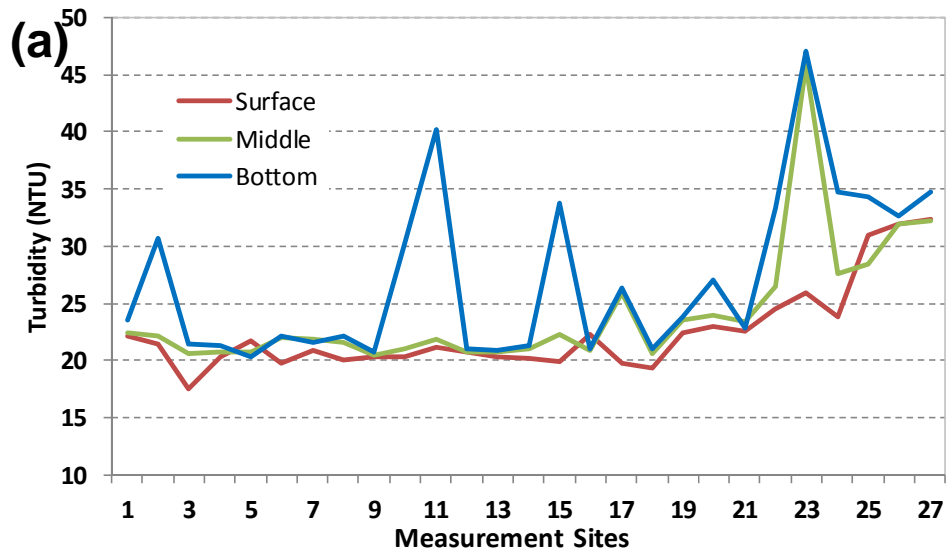
Long Pool – Water Quality Monitoring



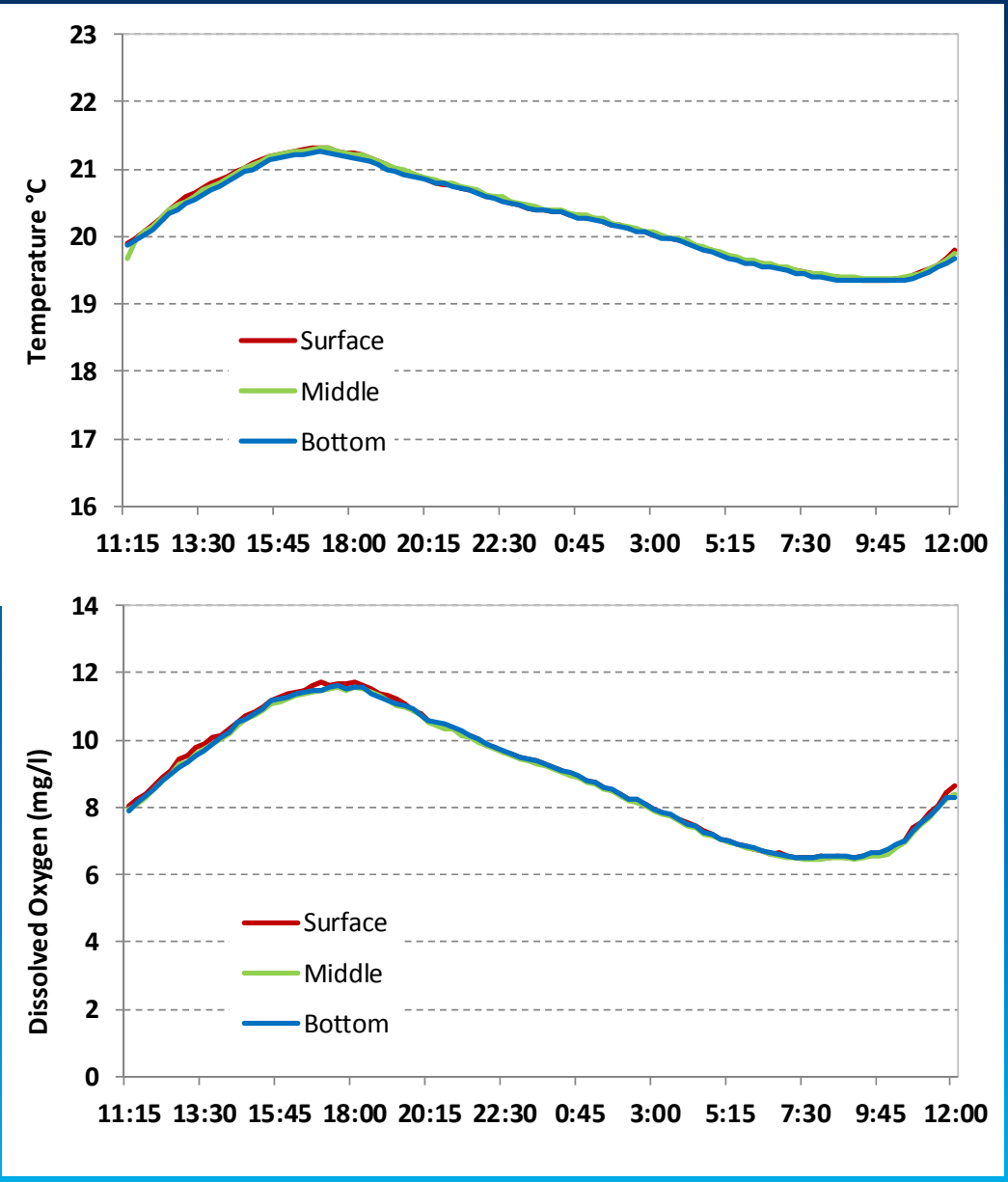
LSYR-0.1 Stilling Basin





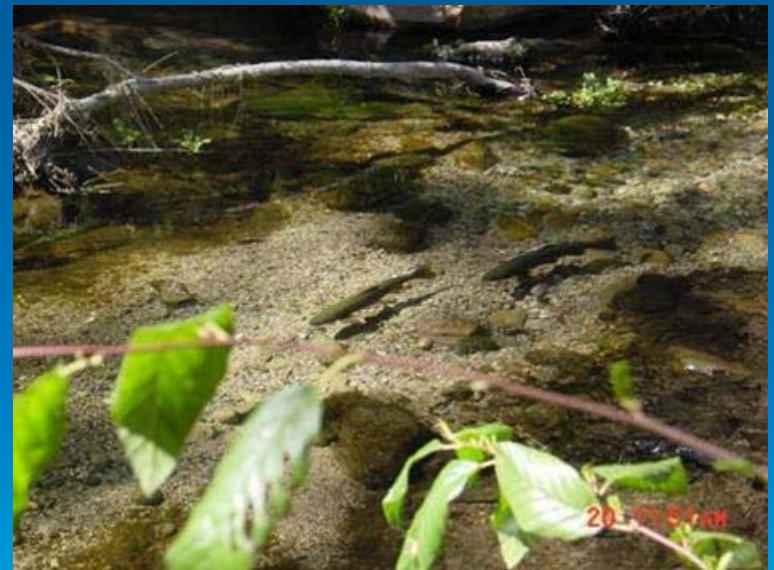


Vertical Diel Profile at Cross Section C



Conclusions

- Drought – difficult for southern steelhead
- Water quality monitoring – more important than ever (diel)
- Creative and extreme measures are needed
- Climate change: expect extremes (the new norm)
- Human consumption: reduce, update, reclaim and be creative
 - Desalinization: not sustainable
- **Future: conserve and think-act dry**



Endangered Santa Ynez River
Southern Steelhead