



Laguna de Santa Rosa TMDL

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**North Coast Regional Water
Quality Control Board**

October 14, 2009



Overview of Presentation

- **Review TMDL Overview**
- **Review 2008 Data Collection Effort**
- **Review 2009 Data Collection Effort**



Pollutants/Stressors to be addressed by Laguna TMDL

- Sedimentation
- High Temperature
- Low Dissolved Oxygen
- Organic Matter
- Nitrogen
- Phosphorus



What is a TMDL?

- **Total Maximum Daily Load**
- **Federal Clean Water Act §303(d)**
- **Amount of a pollutant that a waterbody can receive and still meet water quality objectives**
- **Water Quality Objectives have been established to protect beneficial uses**



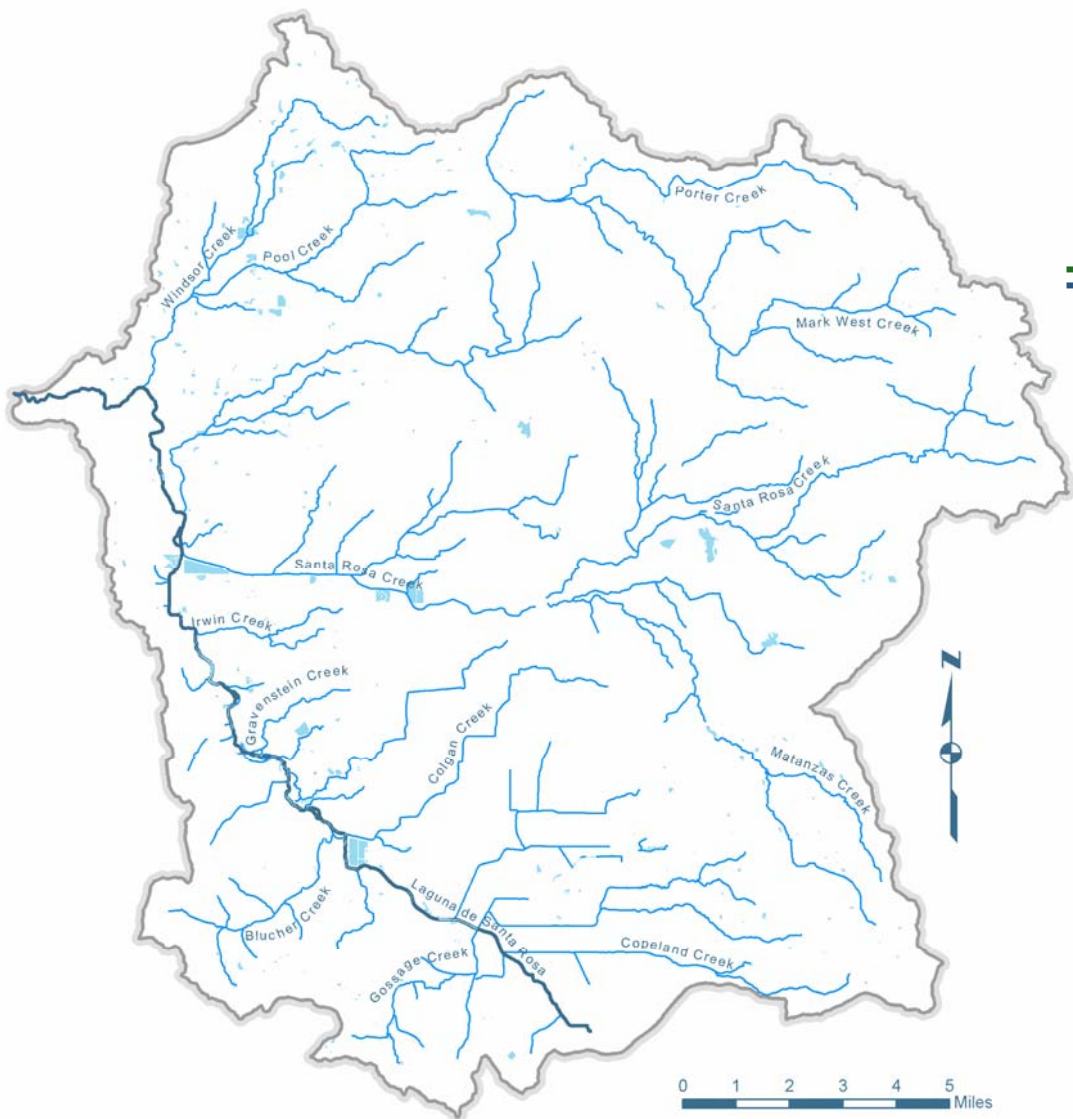
TMDL Elements

California TMDL Guidance (2005)

- 1. Project Definition**
- 2. Watershed Description**
- 3. Data Analysis**
- 4. Source Analysis**
- 5. Critical Condition and Seasonal Variation**
- 6. Numeric Target**
- 7. Linkage Analysis**
- 8. TMDL Calculations and Allocations**
- 9. Public Participation**
- 10. Implementation Plan**
- 11. Monitoring Plan**



Geographic Scope



- Includes Windsor Creek
- Extends to confluence with Russian River



Monitoring 2008

■ **Monitoring Objectives:**

- **Assess Loading from Major Laguna Watershed Tributaries**
- **Collect Dissolved Oxygen and Chlorophyll Data for Water Quality Model Calibration**
- **Collect Continuous Temperature Data for Temperature Model Calibration**



Monitoring 2008

■ **Monitoring Locations:**

➤ **Mainstem Laguna Locations**

Benson Road, Stony Point Road, Todd Road, Joe Rodata Trail,
Sebastopol Community Center, Occidental Road, River Road,
Trenton-Healdsburg Road

➤ **3 Santa Rosa Creek Locations**

Willowside Road, Fulton Road, Yulupa Ave



Monitoring 2008

■ Monitoring Locations:

➤ Tributary Locations (near mouth)

Abramson Creek, Blucher Creek, Brush Creek
Calder Creek, Colgan Creek, Cotati Creek,
Gossage Creek, Hinebaugh Creek, Matanzas Creek,
Mark West Creek, Peterson Creek, Piner Creek,
Turner Creek, Vine Hill Creek, Washoe Creek,
Wilfred Creek (Bellevue Flood Control Channel),
Windsor Creek



Monitoring 2008

■ Grab Samples

➤ Constituents:

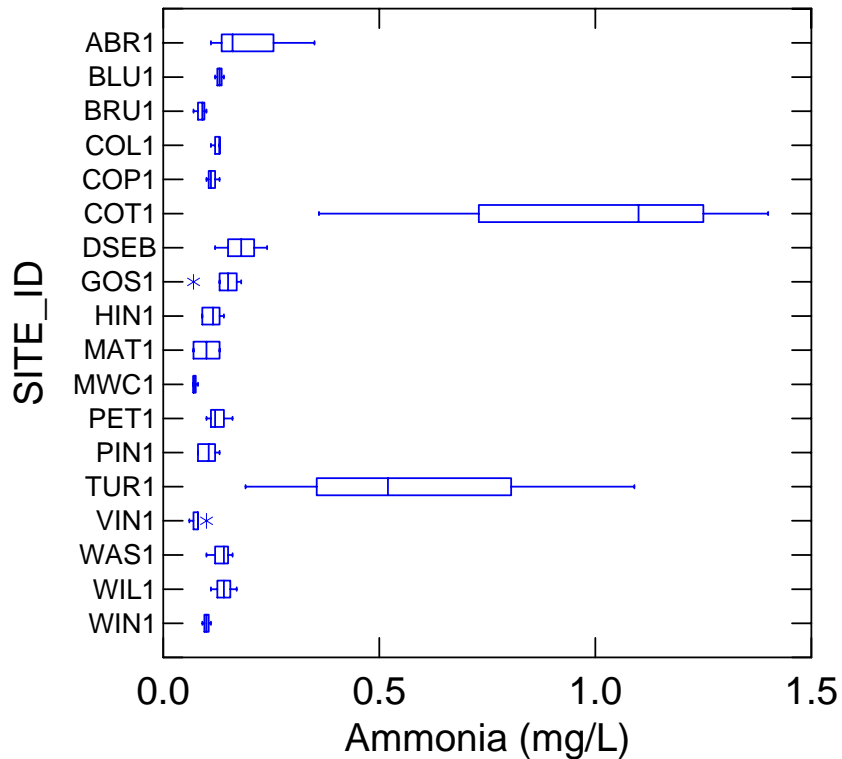
➤ TSS, BOD₅, NH₃, NO₂+NO₃, Total Kjeldahl N, Ortho-P, Total-P, Total Mercury and Methyl-Mercury

✓ Collected in June and September

✓ Triplicates of each constituent to assess sampling variability

Monitoring 2008

■ Constituent Grab Samples





Monitoring 2008

■ Instantaneous Dissolved Oxygen

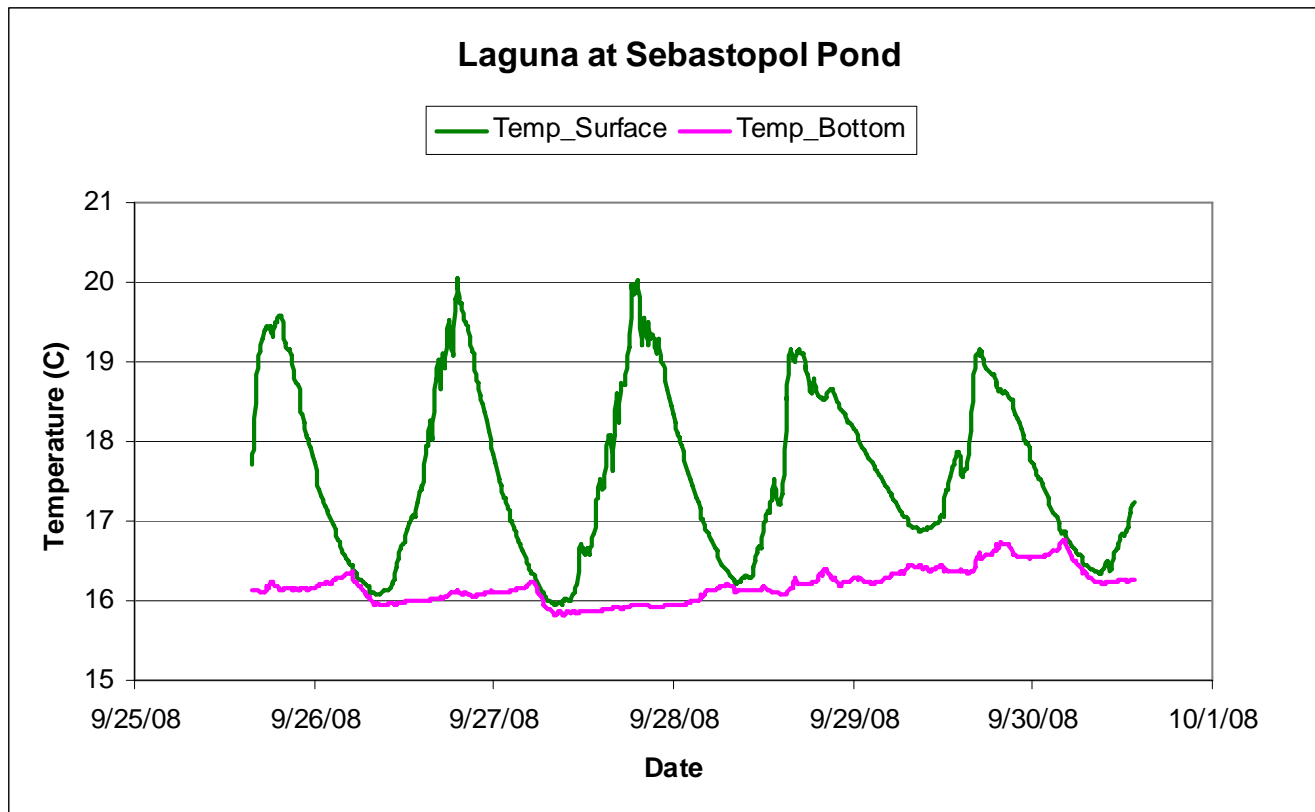
- Compare early morning vs. late afternoon
- Calibration issues culled morning data set
- Summer DO - 61% exceed WQO
- Fall DO – 48% exceed WQO

■ Continuous Temperature at 18 Locations

- Exceedance of MWMT for salmonid migration
 - 100% of 4 Laguna Sites
 - 35% of 14 tributaries (near Mouth)

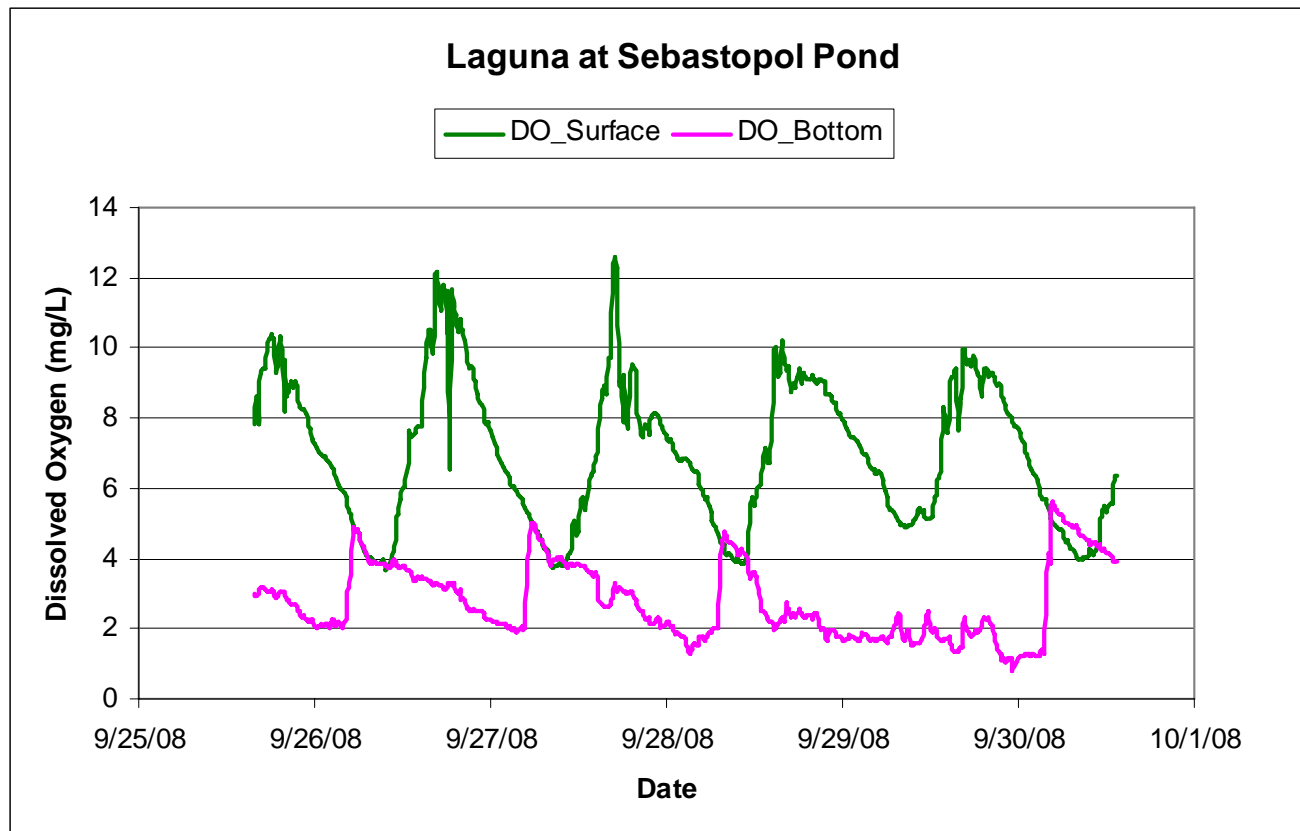
Monitoring 2008

■ Stratification Measurements



Monitoring 2008

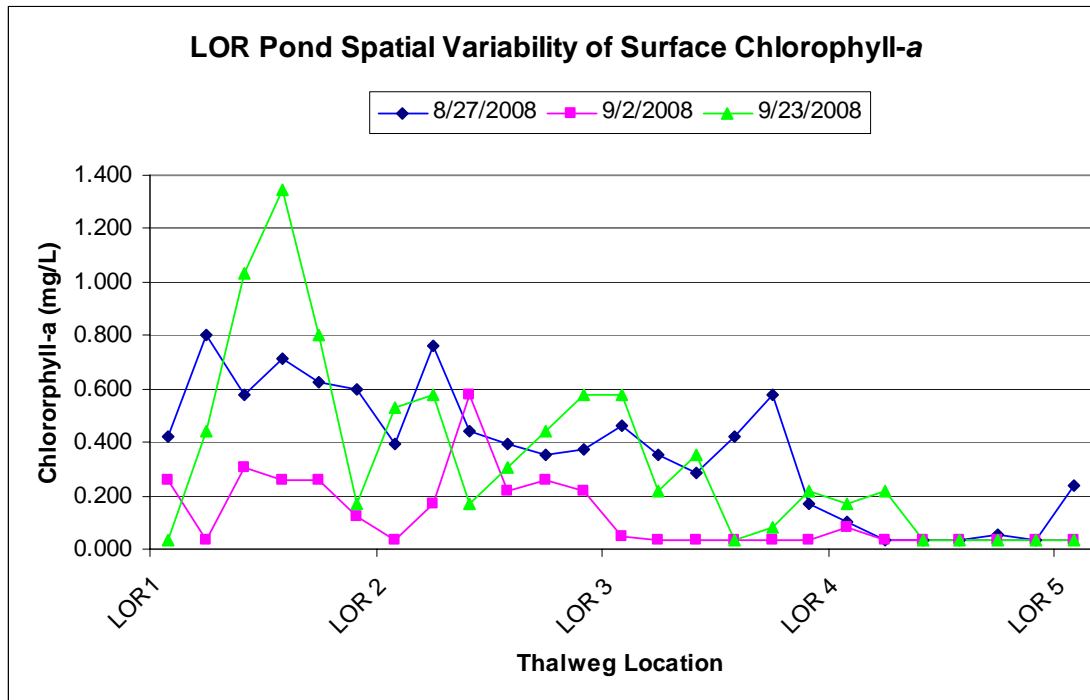
■ Stratification Measurements



Monitoring 2008

■ Chlorophyll Sampling

✓ Grab samples & *in-situ* Fluorometry





Monitoring 2009

■ **Monitoring Objectives:**

- **Assess Loading from Specific Land Uses**
- **Collect additional Dissolved Oxygen Data for Water Quality Model Calibration**
- **Collect Additional Continuous Temperature Data for Temperature Model Calibration**



Monitoring 2009

■ Land Use Loading Estimation:

- Sites Randomly Selected for Sampling
- 18 Dry & 18 Wet weather samples per land use
- 7 Land Use Categories:

Cropland and pasture

Orchards, Groves, Vineyards, Nurseries, and Ornamental Horticultural Areas

Residential – sewer

Residential – non-sewer

Commercial and Services

Rangeland

Evergreen Forest Land



Monitoring 2009

■ Continuous Temperature Measurement:

➤ Watershed Divided into Lithotopo Units

➤ Existing Data compiled from:

City of Santa Rosa, Sonoma County Water Agency,
Sotoyome Resource Conservation District, Cotati Creek Critters,
and Regional Water Board.

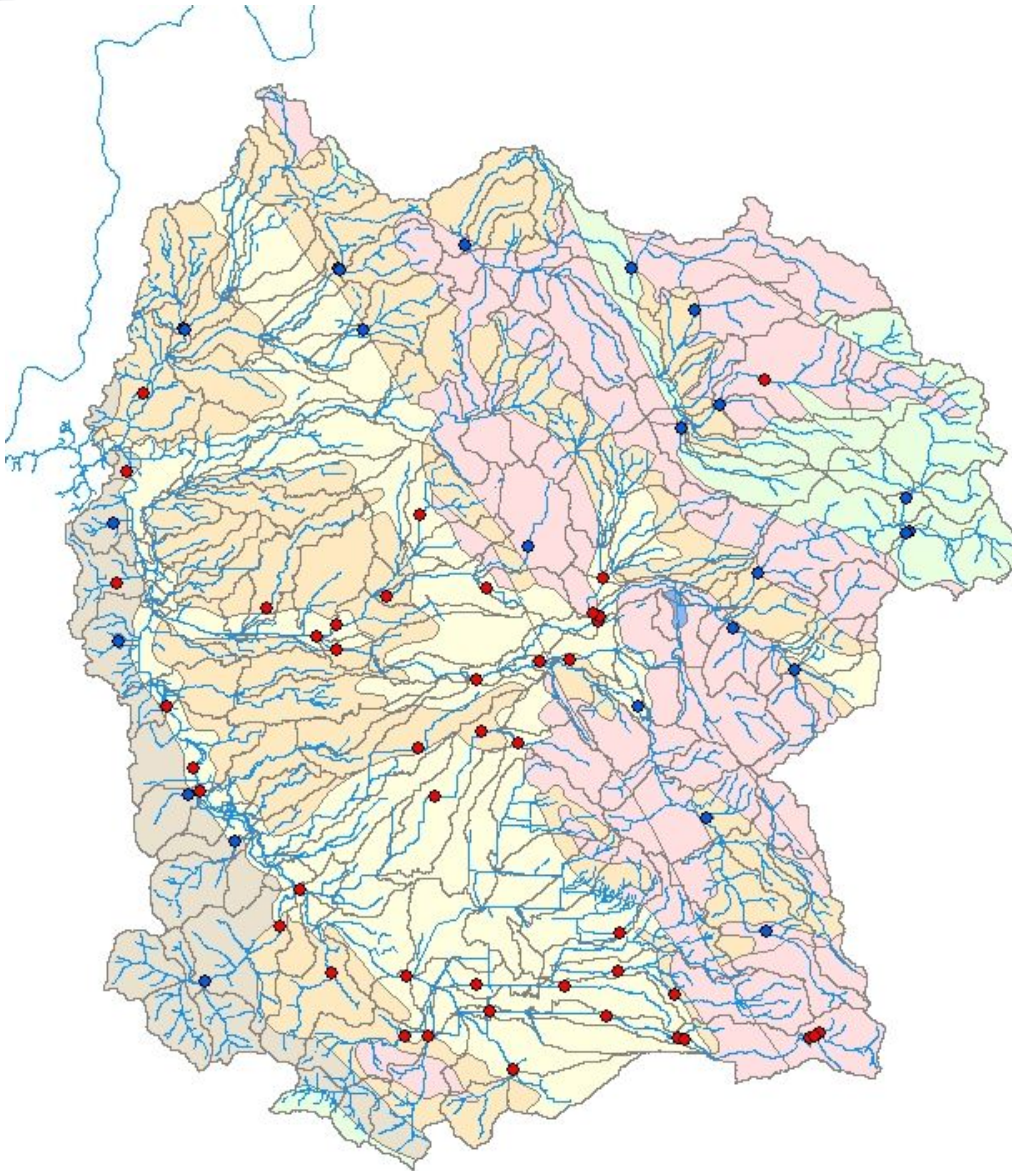
➤ 26 New Sites Selected to Fill Data Gaps



Monitoring 2009

Temperature Monitoring Locations

- Existing Data
- New Sites





Monitoring 2009

■ Continuous Data Sonde Measurement:

- Sites Selected to Fill Data Gaps
- Data collected for QUAL2Kw Model Calibration and Validation
- Locations to be Monitored:
 - Laguna near Sebastopol Community Center
 - Laguna near Occidental Road
 - Laguna near Confluence with Santa Rosa Creek
 - Santa Rosa Creek near Willowside Road
 - Santa Rosa Creek near Brookwood Ave



Next Steps

- **Develop Models for Water Quality and Temperature**
- **Assess Different Management Scenarios**
- **Allocation of Loads**
- **Implementation Planning**



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