Item 13

Russian River Pathogen TMDL Development

an update to the
North Coast Regional
Water Quality Control Board

August 23, 2012

Water Boards

Topics

1. TMDL Basics
2. Russian River Pathogen TMDL
3. Monitoring Efforts
4. Preliminary Results
5. Additional Investigations
6. Early Implementation
7. TMDL Schedule

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What is a TMDL?

TMDL stands for Total Maximum Daily Load

- ✓ It is a calculation of the maximum amount of a particular pollutant that a water body - river, stream, lake or estuary, can receive and still be safe and healthy; and
- ✓ the maximum amount of a pollutant that a water body can accept and still meet water quality standards
  - ✓ Wasteload Allocations (WLA)
  - ✓ Load Allocations (LA)
  - ✓ Margin of Safety (MOS)

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What is a TMDL?

Pollutant Sources

Point Sources

Nonpoint Sources

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Regulatory Requirements

US EPA requires states to:

- Identify waters not meeting standards and list them on the federal Clean Water Act 303(d) list
- Set priorities for TMDL development for waters listed on the 303(d) list
- Develop a TMDL or implement another program for standards attainment for each pollutant for each listed water body
- Submit TMDLs to US EPA for approval

Components of a TMDL

- **Water Body Assessment**
  Compile existing data and confirm listing
- **Data Collection/Analysis**
  Identify potential sources, identify critical conditions
- **Technical Analysis**
  Understand stress/response, loading capacity, allocate loading allowances
- **Implementation and Monitoring**
  Identify responsible parties, implementation actions, ensure compliance through regulatory controls and progress toward attainment
- **Basin Plan Amendment**
  Public process, approval by Regional Board, State Board, USEPA

Russian River Impairments

- Un-named Tributary at Fitch Mountain
- Russian River at Healdsburg Memorial Beach
- Russian River from Guerneville to Monte Rio
- Green Valley Creek
- Laguna de Santa Rosa
- Santa Rosa Creek

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Analyses Conducted

- *E. coli* Bacteria
  - Department of Health regulatory criteria
- *Enterococcus* Bacteria
  - Department of Health regulatory criteria
- *Bacteroides* Bacteria
  - specific to the host animal (human vs. bovine)
- Stable Isotope Analysis
  - Identifies the source of the surface water
- Phylochip®
  - Quantifies over 50,000 different bacteria
    including human pathogens

TMDL Monitoring Program

- Management Questions
  1. Are Basin Plan water quality objectives being met?
  2. What is the variability of fecal indicator bacteria?
     a. Sampling variability
     b. Laboratory variability
     c. Spatial variability
     d. Temporal variability
  3. What are the most significant sources?
  4. What are natural background levels of indicator bacteria?
  5. Do high-use beach areas pose a higher risk?

TMDL Monitoring Plan

- Monitoring Tasks

Task 1: Sampling Variability

- laboratory, site, sampling

Task 2: Spatial and Temporal Variability

- multiple sites, wet/dry period monitoring

Task 3: Land Use Assessment

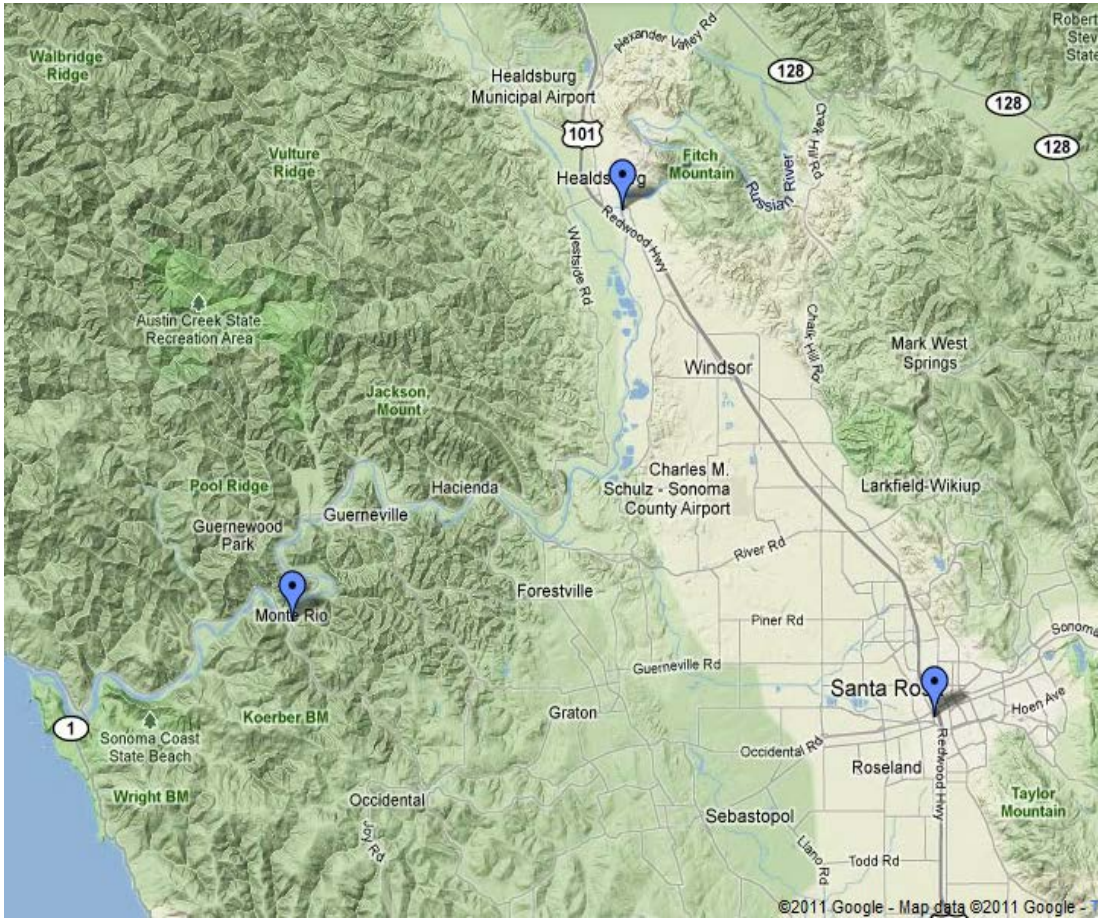
- wet and dry period monitoring of runoff
- Land use categories

Task 4: Beach Use Assessment

- Intensive monitoring at high-use freshwater beaches

Sampling and Site Variability Monitoring

Healdsburg Memorial Beach
Monte Rio Beach
Santa Rosa Creek



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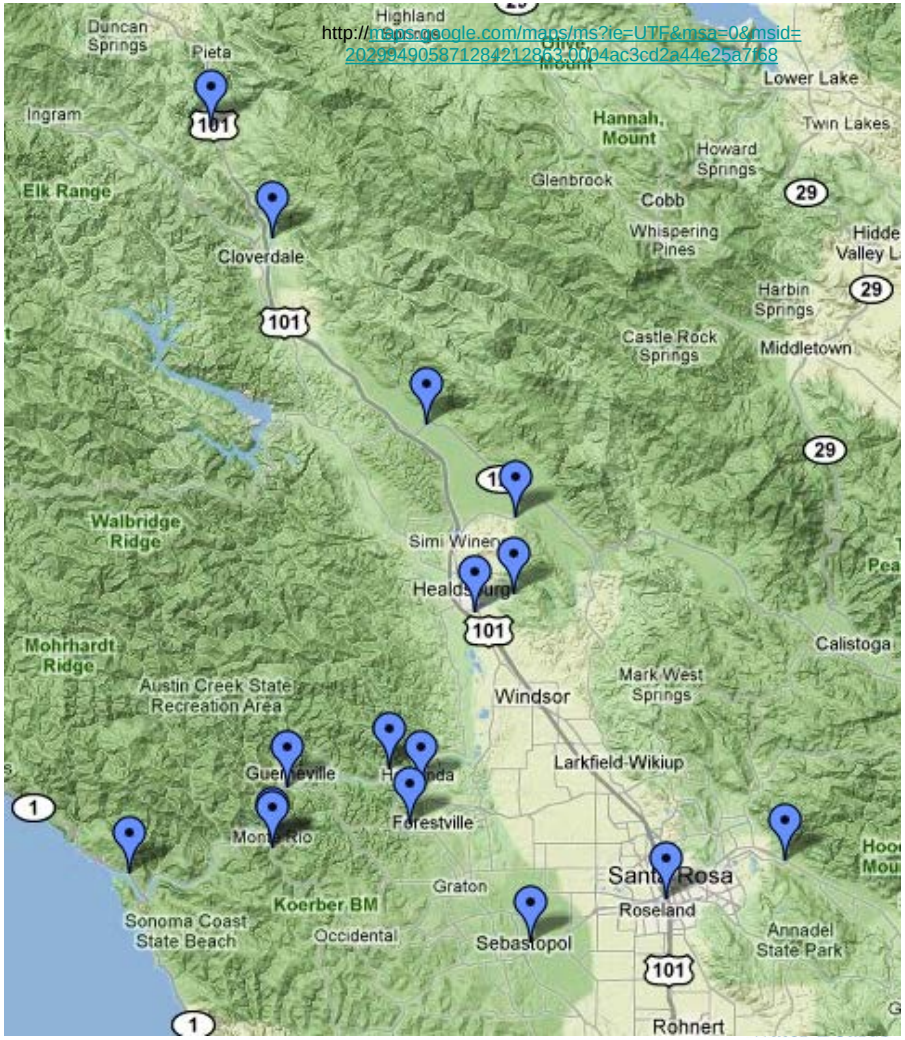
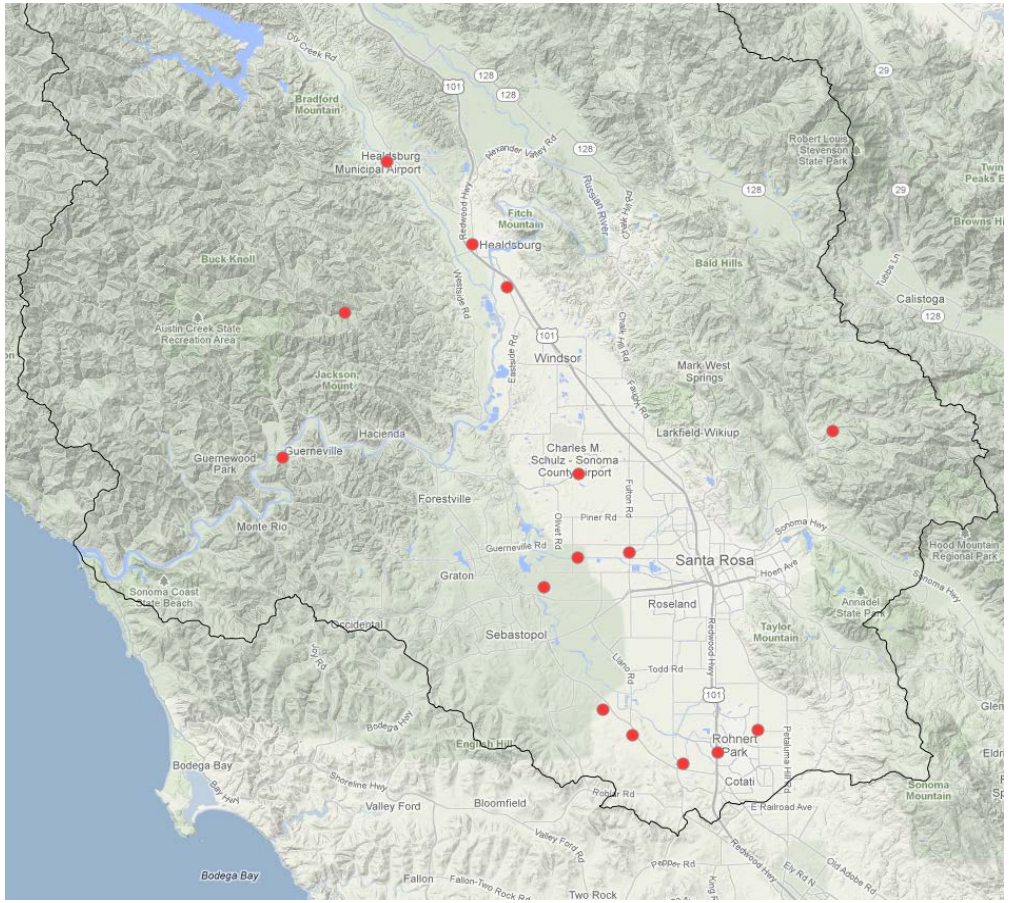
Russian River & Tributary Monitoring

- **Russian River**
  - Commisky Station
  - Cloverdale Park
  - Geyserville Bridge
  - Alexander Valley Campground
  - Camp Rose
  - Healdsburg Memorial Beach
  - Steelhead Beach
  - Forestville Access Beach
  - Johnson's Beach
  - Monte Rio Beach
  - Jenner Boat Ramp
- **Santa Rosa Creek**
  - Los Alamos Road
  - Prince Memorial Greenway
- **Laguna at Sebastopol Community Center**
- **Green Valley Creek at Martinelli Road**



Land Use Monitoring

Forest Land	Mays Creek Palmer Creek Van Buren Creek
Shrub Land	Blucher Creek Gossage Creek Crane Creek
Agriculture	Abramson Creek Woolsey Creek Lambert Creek
Developed Septic Areas	Irwin Creek Limerick Creek Turner Creek
Developed Sewer Areas	Copeland Creek Foss Creek Piner Creek



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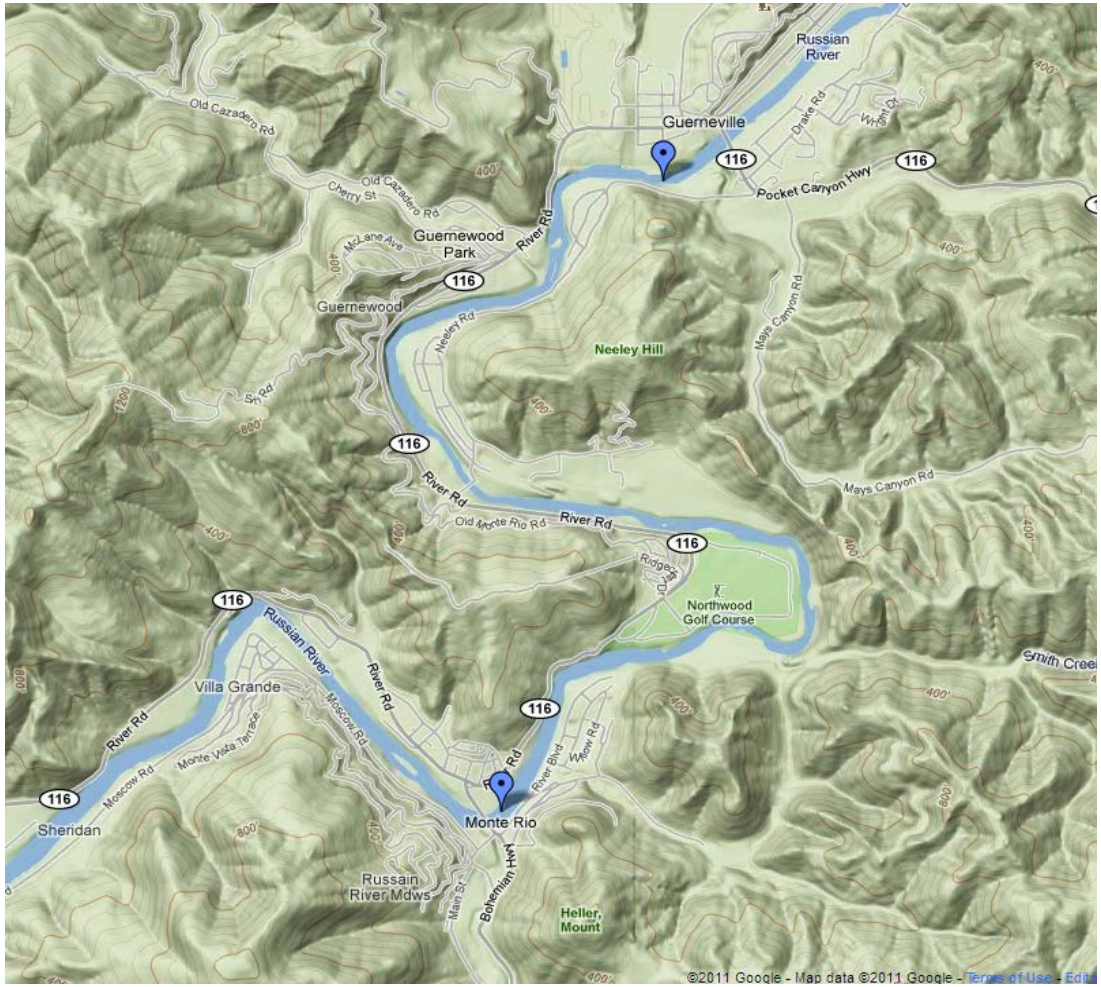
Beach Use Impacts Monitoring

Johnson's Beach

Monte Rio Beach



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Preliminary Observations

- Single grab samples are representative of monitoring site.
- Indicator bacteria concentrations are higher during wet periods compared to dry periods.
- Indicator bacteria concentrations are higher in the tributaries during wet periods than in the mainstem Russian River.
- indicator bacteria concentrations are modestly higher in urban sewered areas and areas with onsite septic systems compared to less developed areas during wet periods.
- Human-host Bacteroides were detected in all sample locations and land use categories throughout the watershed.

Preliminary Observations

- Human-host Bacteroides were highest in the agricultural land use designation and modestly higher in septic system areas compared to sewered areas.
- Human-host Bacteroides were highest at Steelhead Beach and Forestville Access Beach during dry periods and at Santa Rosa Creek along the Prince Memorial Greenway during wet periods.
- Bovine-host Bacteroides were uniformly low throughout the watershed except at Steelhead Beach and Forestville Access Beach during wet periods.
- Stable Isotope Analysis results show that the dominant sources of source water for bacteria samples are manure and septic wastes.
- No apparent input from high-use recreation at Johnson's Beach and Monte Rio Beach

Additional Monitoring Questions

1. Do areas with a high density of septic systems pose a higher risk of impairment for water contact and non-water contact beneficial uses?
2. Does increased human recreational use pose a higher risk of impairment for water contact and non-water contact beneficial uses at public beach areas?

Early Implementation Efforts

- Coordination with Sonoma County:
  - Russian River Pathogen TMDL
  - Septic System Regulation
- Public Outreach:
  - Public Toilets
  - Ours to Protect Signs
  - Russian River Guide
- Ongoing Regulatory Staff Work
  - Facility Inspections
  - Municipal Storm Water Program
  - Dairy Program Implementation

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Russian River Pathogen TMDL Schedule

Activity	Timeframe
Monitoring Report Complete	Summer 2013
Technical TMDL Analysis Draft Complete	Winter 2014
CEQA Scoping Meeting	Spring 2014
Implementation Plan Draft Complete	Summer 2014
Peer Review and Basin Plan Amendment Complete	Fall 2014
Public Comment Period	Winter 2015
Regional Board Consideration/Hearing	Spring 2015
State Board Consideration/Hearing	Fall 2015
EPA Consideration	Spring 2016

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