Item 13

Russian River Pathogen TMDL Development

an update to the North Coast Regional Water Quality Control Board

August 23, 2012
Topics

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

Pollutant Sources

Point Sources

Nonpoint Sources
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
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
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

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Creek Names</th>
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<tbody>
<tr>
<td>Forest Land</td>
<td>Mays Creek, Palmer Creek, Van Buren Creek</td>
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<tr>
<td>Shrub Land</td>
<td>Blucher Creek, Gossage Creek, Crane Creek</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Abramson Creek, Woolsey Creek, Lambert Creek</td>
</tr>
<tr>
<td>Developed Septic</td>
<td>Irwin Creek, Limerick Creek, Turner Creek</td>
</tr>
<tr>
<td>Developed Sewer Areas</td>
<td>Copeland Creek, Foss Creek, Piner Creek</td>
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</tbody>
</table>
Beach Use Impacts Monitoring

Johnson’s Beach
Monte Rio Beach
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
Russian River Pathogen TMDL Schedule

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