

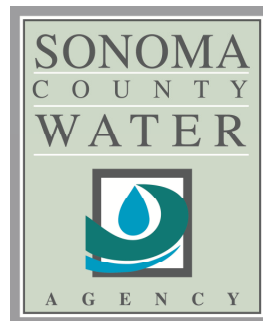


Item 2

Russian River

Biological Opinion, Fish Habitat Flow & Water Rights Projects, and Pathogen TMDL

A Workshop of the
North Coast Regional Water Quality Control Board
August 22, 2013





Workshop Outline

- I. Introduction – Matt St. John
- II. Russian River Biological Opinion –
Dr. William Hearn, NMFS
- III. Fish Habitat Flow Project and SCWA Water Quality
Monitoring Data – Pam Jeane and Jeff Church, SCWA
- IV. Pathogen TMDL Status and Monitoring –
Rebecca Fitzgerald
- V. Public Comment and Board Discussion



Purpose of Workshop

To present information & promote discussion on:

- Water management in Russian River balancing competing needs for water supply, recreation, and fisheries
- Implementation of the Russian River Biological Opinion
- TMDLs to address water quality impairments in Russian River

Nexus between Clean Water Act & Endangered Species Act

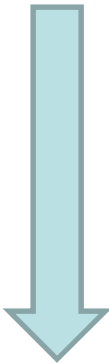


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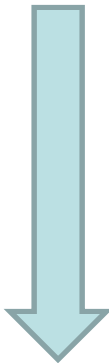


Russian River

Water Quality Impairments	Threatened or Endangered Fish
• Sediment	• steelhead
• Temperature	• coho salmon
• Pathogens	• Chinook salmon



Total Maximum Daily Load



Biological Opinion



Russian River TMDLs

- Sediment and Temperature – not scheduled
 - Sediment TMDL Implementation Policy - 2004
 - Policy and Action Plan to Implement the Water Quality Objective for Temperature – in development
- Pathogens – in development

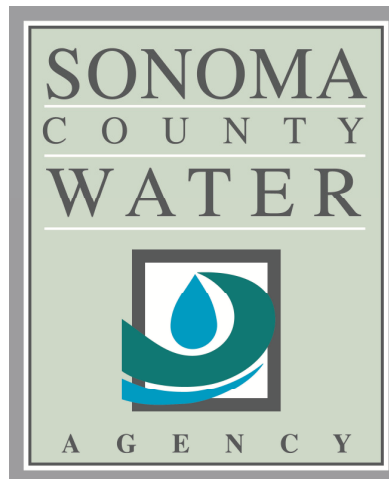


Agency Jurisdictions and Responsibilities

Water Quality Impairments	Threatened or Endangered Fish
<ul style="list-style-type: none"> • Sediment 	<ul style="list-style-type: none"> • steelhead
<ul style="list-style-type: none"> • Temperature 	<ul style="list-style-type: none"> • coho salmon
<ul style="list-style-type: none"> • Pathogens 	<ul style="list-style-type: none"> • Chinook salmon

Total Maximum Daily Load

Biological Opinion





Changing River Flows
to benefit steelhead and salmon
in the Russian River

National Marine Fisheries Service
August 22, 2013

U.S. Department of Commerce
National Oceanic Atmospheric Administration
National Marine Fisheries Service

- Administration of Federal Endangered Species Act for Marine and Anadromous Species
- Administration of Marine Mammal Protection Act
- Administration of Magnuson-Stevens Act

Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps, Sonoma County Water Agency, Mendocino County Russian River Flood Control and Water Management District in the Russian River watershed

Purpose: take authorization Public Policy Facil. Committee

- Flow ramp down rates at Coyote Valley Dam
- Channel maintenance in Russian River and greater Santa Rosa tributaries
- Impacts of flow management in 14 mi of Dry Creek
- Impacts of water releases on mainstem Russian
- Impacts of flood maintenance on estuary
- Mgmt of Warm Springs Dam Fish Hatchery

Flow related findings:

- D1610 normal yr flows: too high in upper Russian River,
- In Dry Creek, summer flows too high, prolonged winter flood releases can impact salmon and steelhead,
- D1610 normal yr flows impact natural lagoon forming process and salmonid rearing habitat.

Why lower summer flows between CVD and Cloverdale?

- Flow-habitat relations evaluated at 13 sites between Ukiah and Cloverdale (2001)

Table 1. Number of study sites at which flow releases from CVD is rated as having the largest amount of suitable steelhead rearing habitat (n=13).

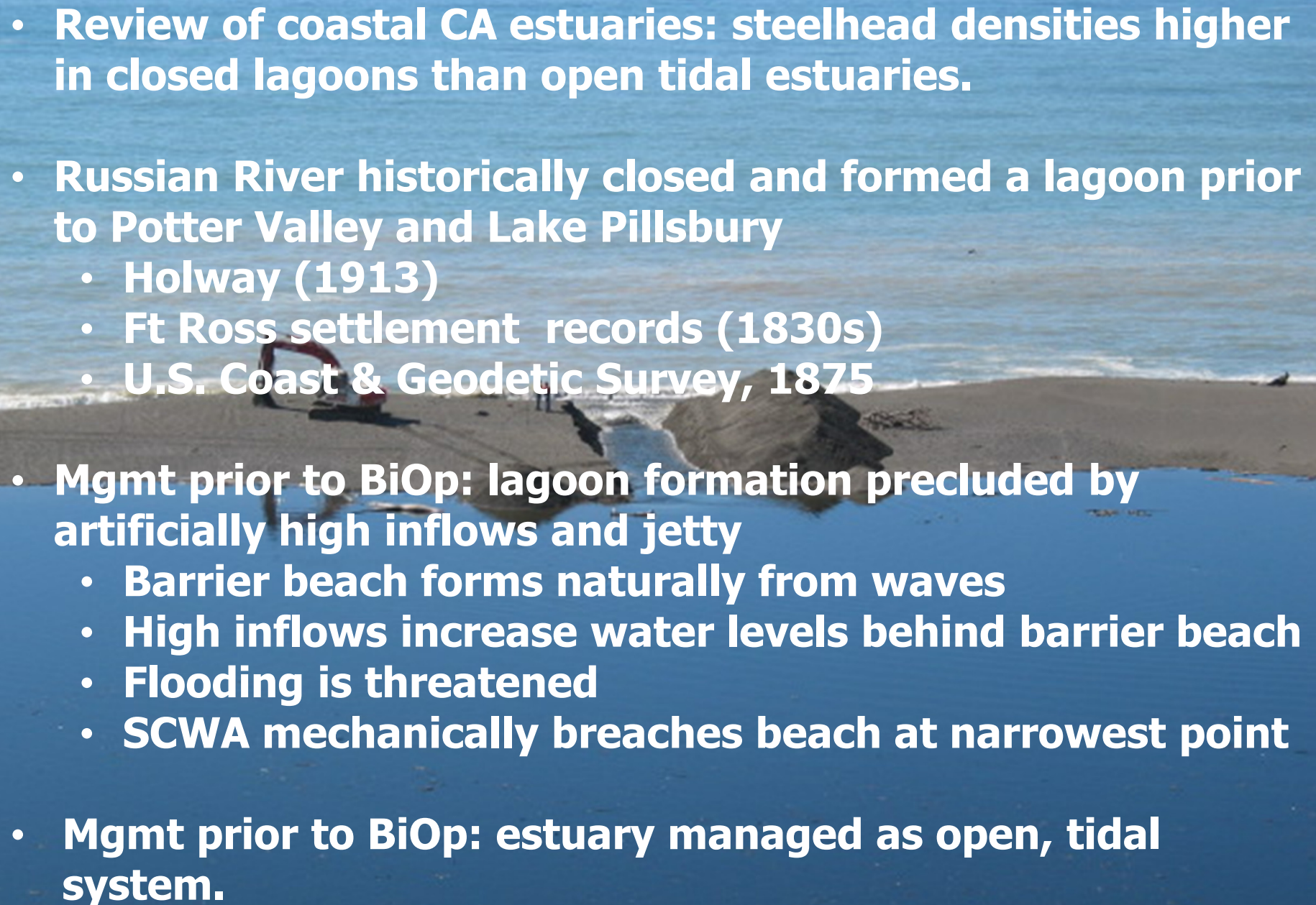
	Flow (cfs)		
<u>Life stage</u>	<u>125</u>	<u>190</u>	<u>275</u>
Steelhead fry	11	1	1
Steelhead juv.*	7	1	2

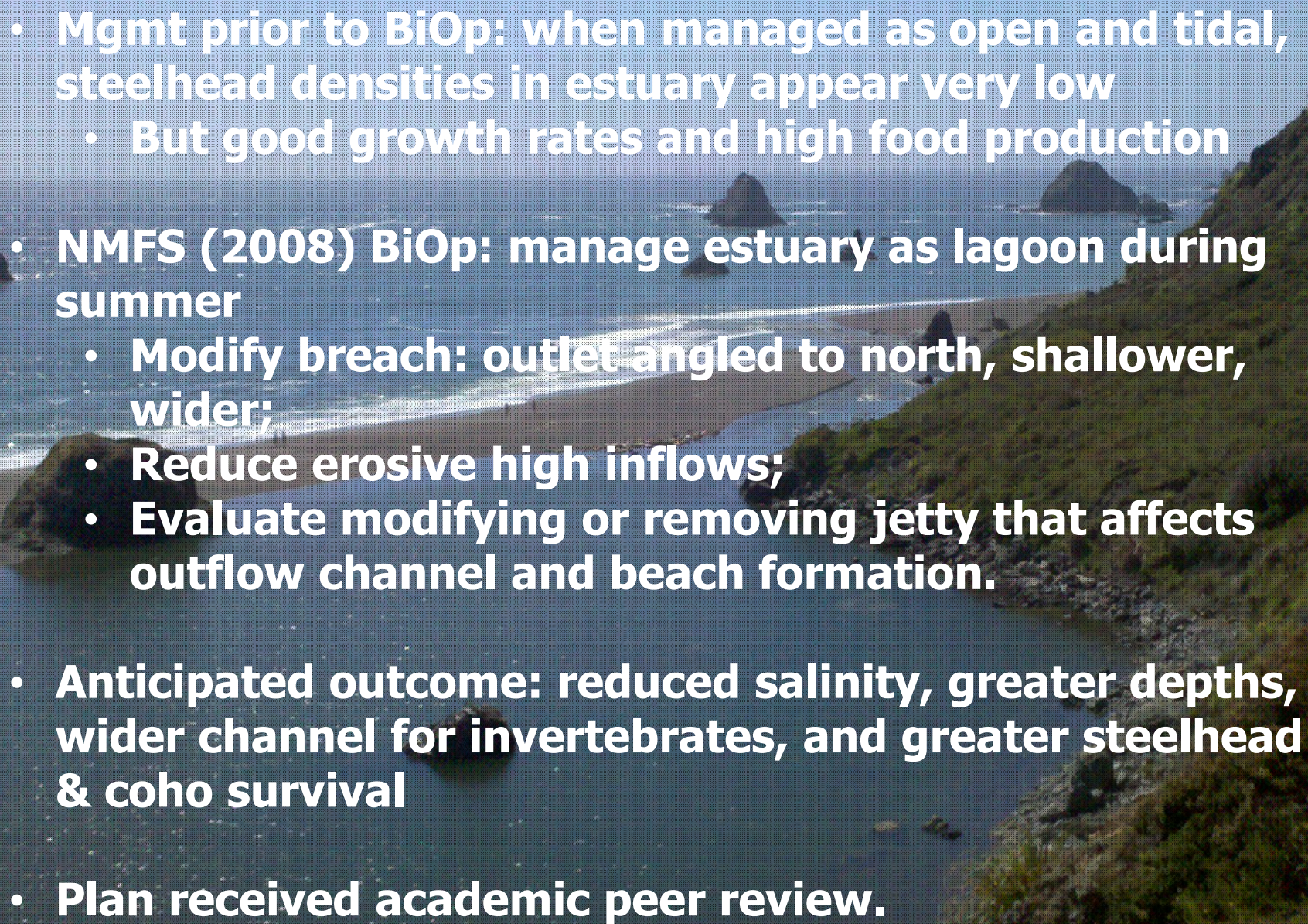
*3 Study sites had similar quantities of habitat at all flows, thus not included here.

- High releases can deplete Lake Mendocino coldwater pool

WHY REDUCE FLOWS FOR THE ESTUARY?

- Central CA coast: estuaries commonly form lagoons-
Mattole, Navarro, Gualala, Scott Creek, San Gregorio
- Lagoons formed by barrier beach and low summer flows.
- Lagoons highly productive, important summer rearing habitat for steelhead.
- Lagoons: deeper, less saline, increased streambed area.
- A disproportionately large number of adult steelhead returning from the ocean are reared in freshwater lagoons, *e.g.*, Scott Creek 85% of adults returning were lagoon reared (Bond et al. 2008).

- 
- **Review of coastal CA estuaries: steelhead densities higher in closed lagoons than open tidal estuaries.**
 - **Russian River historically closed and formed a lagoon prior to Potter Valley and Lake Pillsbury**
 - **Holway (1913)**
 - **Ft Ross settlement records (1830s)**
 - **U.S. Coast & Geodetic Survey, 1875**
 - **Mgmt prior to BiOp: lagoon formation precluded by artificially high inflows and jetty**
 - **Barrier beach forms naturally from waves**
 - **High inflows increase water levels behind barrier beach**
 - **Flooding is threatened**
 - **SCWA mechanically breaches beach at narrowest point**
 - **Mgmt prior to BiOp: estuary managed as open, tidal system.**

- 
- **Mgmt prior to BiOp: when managed as open and tidal, steelhead densities in estuary appear very low**
 - **But good growth rates and high food production**
 - **NMFS (2008) BiOp: manage estuary as lagoon during summer**
 - **Modify breach: outlet angled to north, shallower, wider;**
 - **Reduce erosive high inflows;**
 - **Evaluate modifying or removing jetty that affects outflow channel and beach formation.**
 - **Anticipated outcome: reduced salinity, greater depths, wider channel for invertebrates, and greater steelhead & coho survival**
 - **Plan received academic peer review.**

Summer Flow Scenarios:

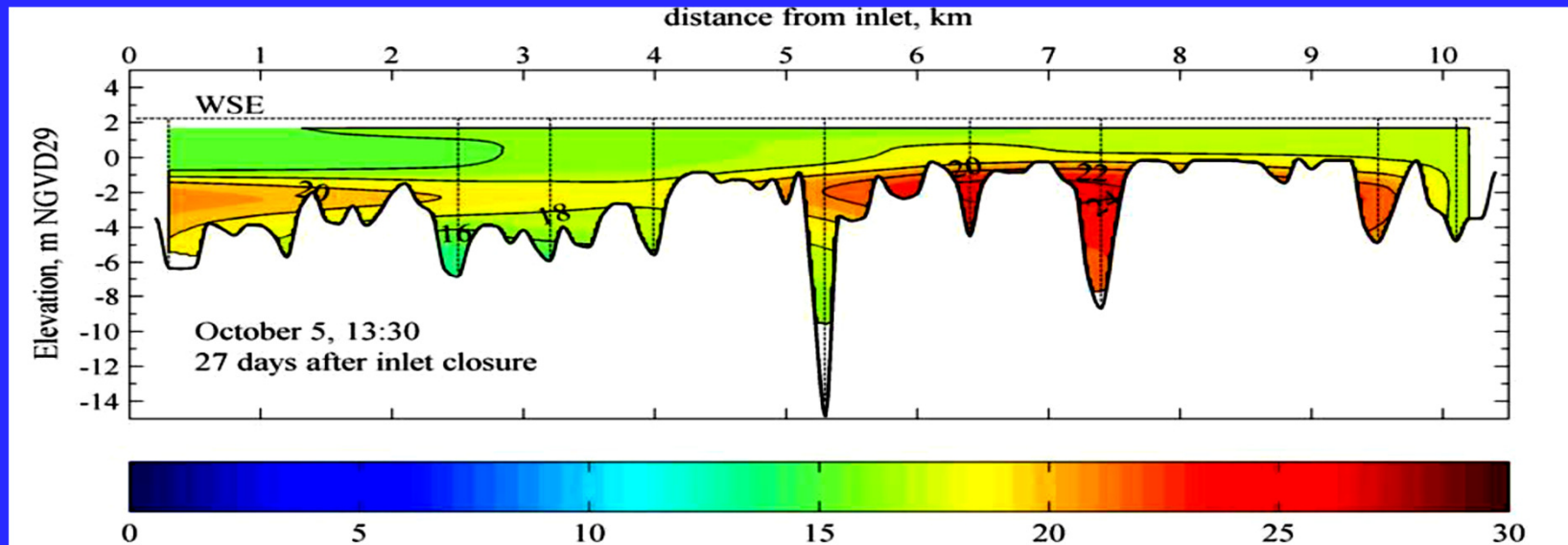
- **Pre-reservoirs:** USGS Geyserville gage 1910-1913:
(Pre-1920s) Aug-October flows generally 0-25 cfs
- **D1610 Normal:** Hacienda min Q=125 cfs,
(1986-present) managed about 200 cfs
- **D1610 Dry*:** Hacienda min Q= 85 cfs,
managed about 80-110 cfs
- **D1610 Critical:** Hacienda min Q=35 cfs,
managed about 50-75 cfs
- **NMFS BiOp*:** Hacienda min Q= 70 cfs (instantaneous),
managed about 75-105 cfs

**At Healdsburg: D1610 dry=75 cfs; NMFS recommends 100 cfs*

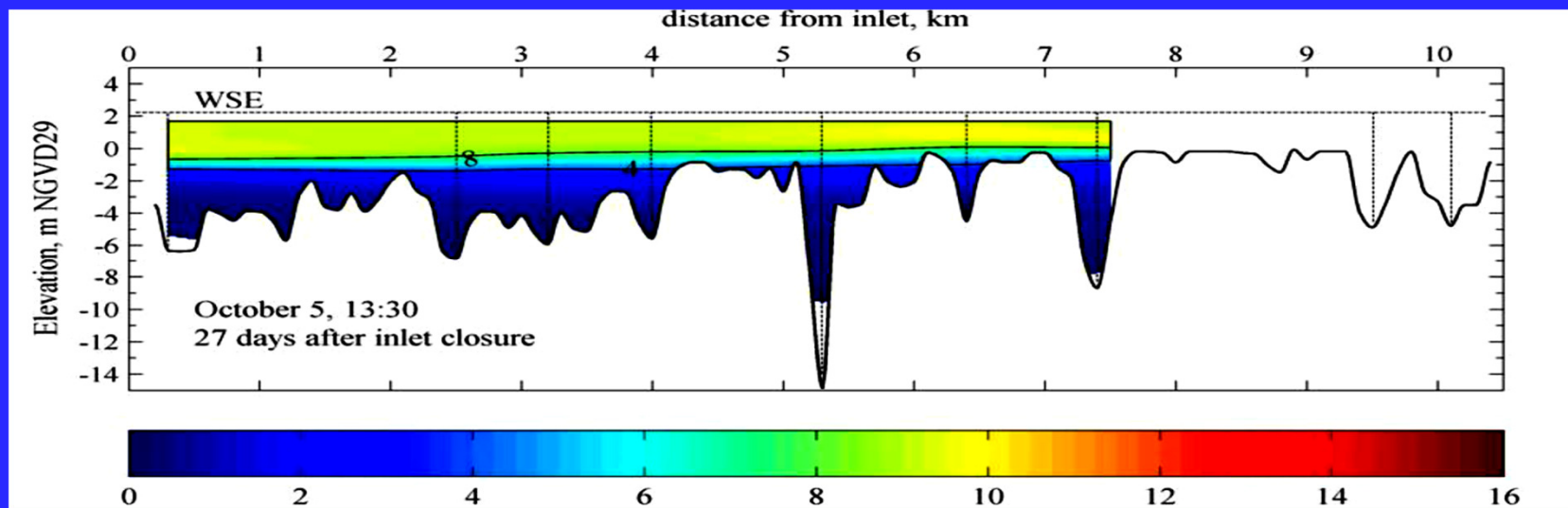
Difficulties keeping a closed estuary 2009-2013

- **Lack of permits for alternative outlet channel**
 - 2009 NEPA issue related to pinnipeds
 - Permits for additional volume for north angled outlet channel
- **High inflow to estuary**
 - Natural high trib inflow in some years -2010 & 2011
 - Healdsburg min Q too high during TUC
- **Jenner Jetty likely interferes with outlet channel and barrier beach formation**

Russian River Estuary longitudinal profile: Temperature (°C) (2009)



Dissolved Oxygen (mg/l)



Extensive Monitoring of Estuary Biota Water Quality and Physical Conditions

- SCWA implementing fisheries, water quality, macroinvertebrate, and pinniped monitoring in estuary
- SCWA monitoring juvenile downstream migration patterns.
- Monitoring enables Adaptive Management of Estuary water levels,
 - Fine tune inflows, outlet channel mgmt, and potential modification of jetty.

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Summary:

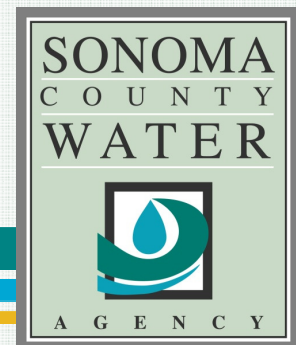
- **Russian River summer flows artificially high due to reservoirs**
- **Cloverdale to Lake Mendocino:**
 - Water temperatures suitable for steelhead
 - High current velocities limit amount of steelhead summer rearing habitat
 - High releases deplete L. Mendocino coldwater pool
- **Estuary**
 - Breaching practices and high summer inflow adversely affect lagoon formation
 - Managing estuary as lagoon would reduce salinity & increase depths and width: improve salmonid survival



Pam Jeane

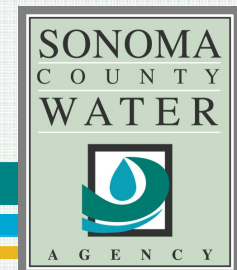
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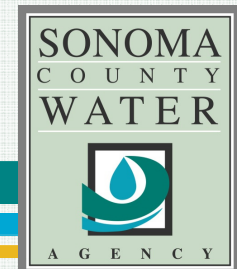
Who We Are

- Special district providing wholesale water supply, flood control, and sanitation services
- Local sponsor in operation of Russian River Project, including water supply releases from Lake Mendocino and Lake Sonoma, in cooperation with the Army Corps of Engineers
- Operations subject to compliance with federal and state laws, including Endangered Species Acts



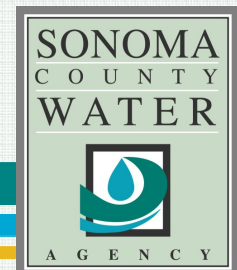
Need for Section 7 Consultation

- To provide “incidental take” coverage for the Corps and Water Agency’s current operations and maintenance activities
 - Avoiding jeopardizing listed salmon and their critical habitats
 - Providing for continued flood control and water supply services for residents of Sonoma and Marin counties



Biological Opinion Implementation

- Fish Flow EIR, Estuary Management Project, and Temporary Urgency Change (TUC) Petitions required to avoid jeopardizing listed salmon and their critical habitats
- Extensive water quality monitoring in coordination with NMFS, CDFW, NCRWQCB, Sonoma County DPH

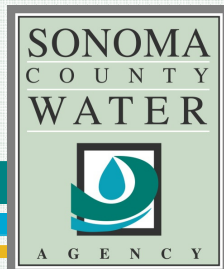




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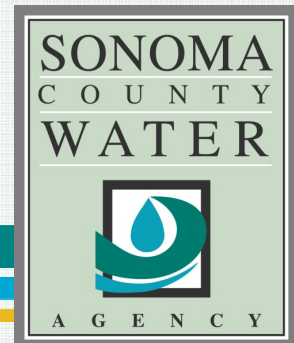
Russian River Water Quality Monitoring



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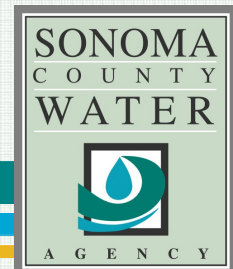


Goals and Objectives

Monitor water quality in support of Biological Opinion (BO) required changes in operations:

- Reduced summer flows and summer lagoon at Russian River estuary

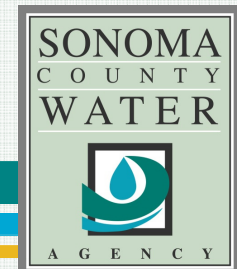
Collect baseline data and analyze changes to operations for potential effects on availability of suitable aquatic habitat for salmonids.



Need for Additional Monitoring

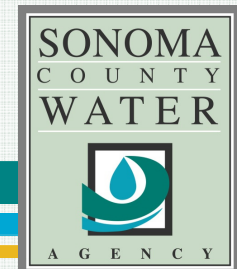
TUC requires additional monitoring:

- Water samples collected to analyze potential effects on contact recreation and public health
- Monitoring Plan developed in coordination with NMFS, SWRCB, NCRWQCB, CDFW, and Sonoma County DPH
- Locations selected to complement and support NCRWQCB Pathogen TMDL effort



Current Monitoring Effort

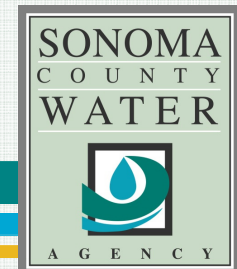
- Long-term continuous monitoring at 15 stations:
 - Temperature, dissolved oxygen, pH, specific conductance, and salinity in estuary
- Water samples collected weekly at 11 stations:
 - Nutrients, algae and bacteria





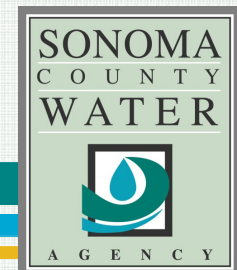
General Observations

- High temperatures ($>20^{\circ}\text{C}$) observed under range of flows (≤ 500 cfs) and river mouth conditions:
 - Including above and below D1610 minimums
 - Typically downstream of Cloverdale
- Exceedances of nutrient, algal, turbidity and bacteria criteria (EPA and CDPH):
 - Under range of flows and river mouth conditions
 - Primarily in upper river and lower river
- DO/pH generally stable and supportive of beneficial uses



Future Steps

- Continue monitoring in coordination with regulatory agencies to support BO and TUC requirements
- Share data with NCRWQCB and other agencies
- Utilize data for CEQA analysis in the Fish Flow EIR (Draft EIR - early 2014)



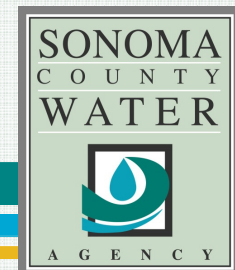
Russian River Water Quality Monitoring



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Water Board's Pathogen TMDL

Presentation Outline

1. Overview of the Russian River Pathogen TMDL

- Definitions & scope
- Schedule

2. Monitoring Efforts

- History of work to date
- Initial results



Russian River Pathogen TMDL

Total Maximum Daily Load

- Determines the maximum amount of a pollutant that a water body can receive and still be safe and healthy
- Identifies sources
- Provides a clean-up/implementation strategy

Fecal Indicator Bacteria

- *E. coli*, *Enterococcus* spp.
- Indicators of pathogens

Fecal Indicator Bacteria 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





Russian River Pathogen TMDL Schedule

Activity	Timeframe
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
U.S. EPA Consideration	Spring 2016

TMDL Monitoring Efforts

- UC Davis Pilot Study – 2007 to 2010
 - Provided monitoring design recommendations
- Pathogen TMDL Monitoring Effort – 2011 to 2013
 - Sampled to help answer the following questions:
 - Are objectives attained?
 - What is the variability of fecal indicator bacteria?
 - What are the most significant sources?
 - What are natural background levels?
 - Do high-use beach areas pose a higher risk?
- TMDL Septic Source Study – 2012 to 2013
 - Sampled to help answer:
 - Do rural watersheds with a higher density of parcels with septic systems contribute more fecal indicator bacteria than watersheds with a lower density of parcels with septic systems?



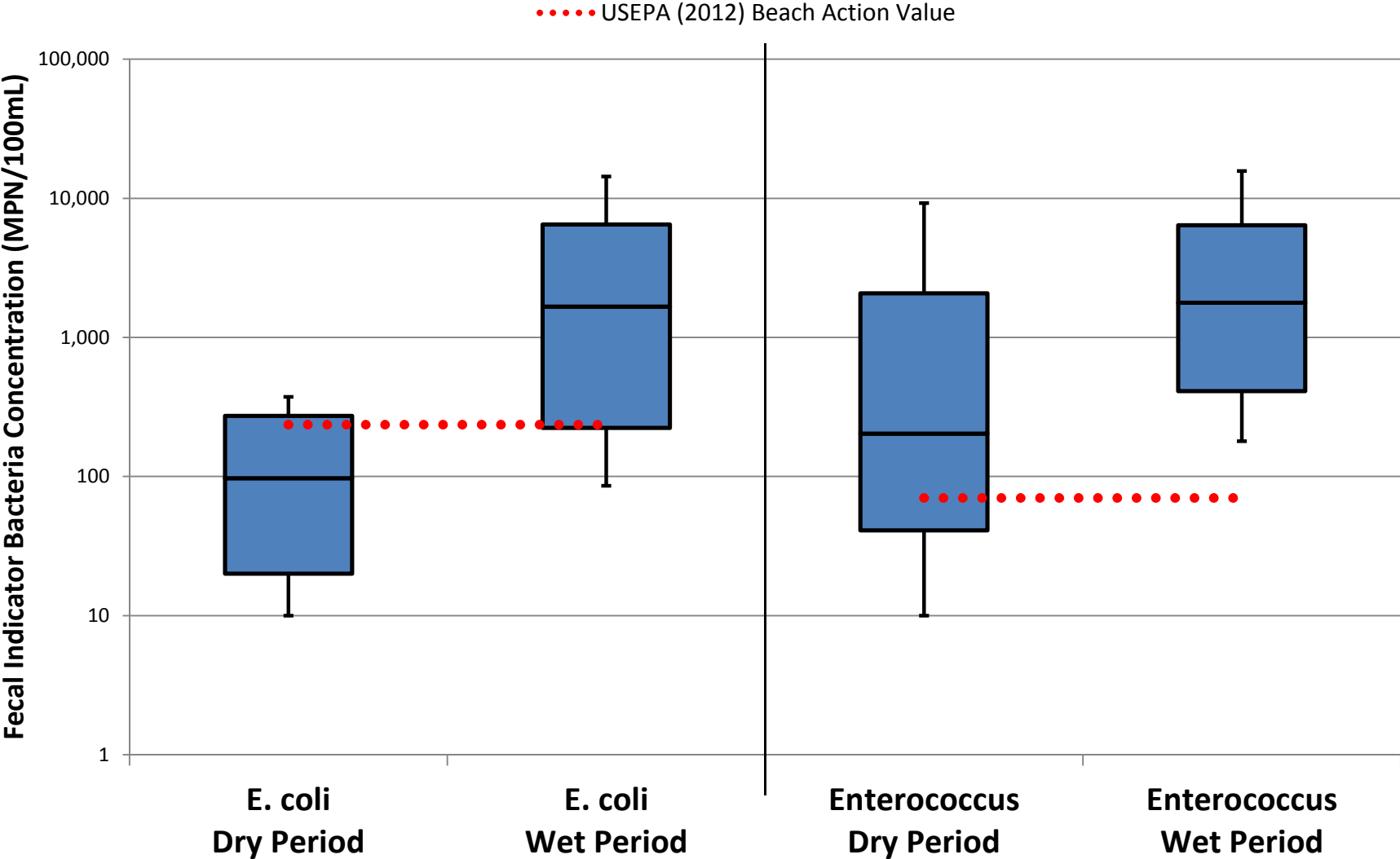


TMDL Monitoring Initial Results

- Fecal indicator bacteria (FIB) levels are higher in tributaries than in the mainstem
- FIB levels are higher during wet periods than dry periods
- During wet periods, FIB levels are higher in urban sewered areas and in areas with septic systems than in less developed areas

Russian River Fecal Indicator Bacteria

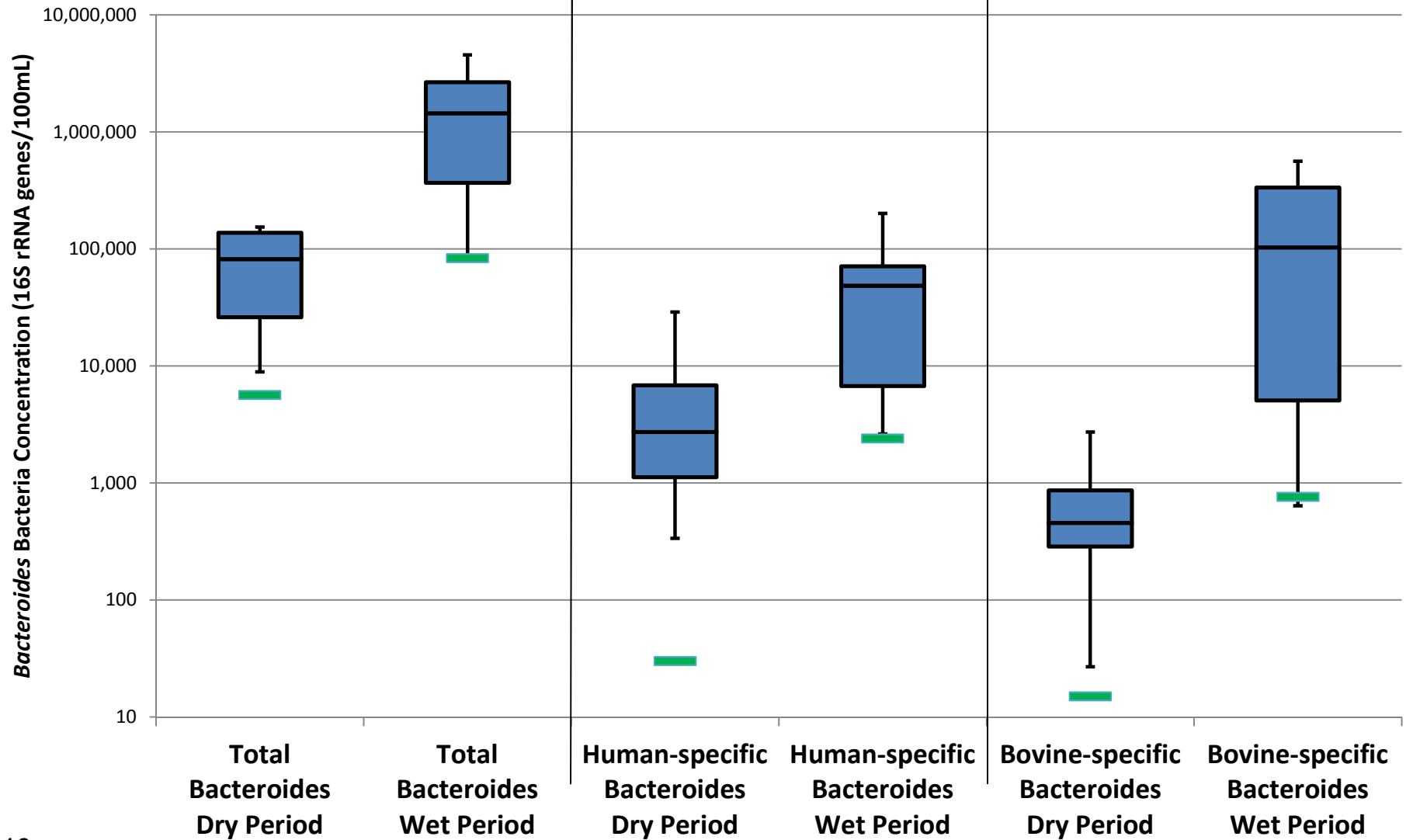
Comparison of Dry vs Wet Weather Periods



Russian River *Bacteroides* Bacteria

Comparison of Dry vs Wet Weather Periods

Median Values from Forested Land Use Category

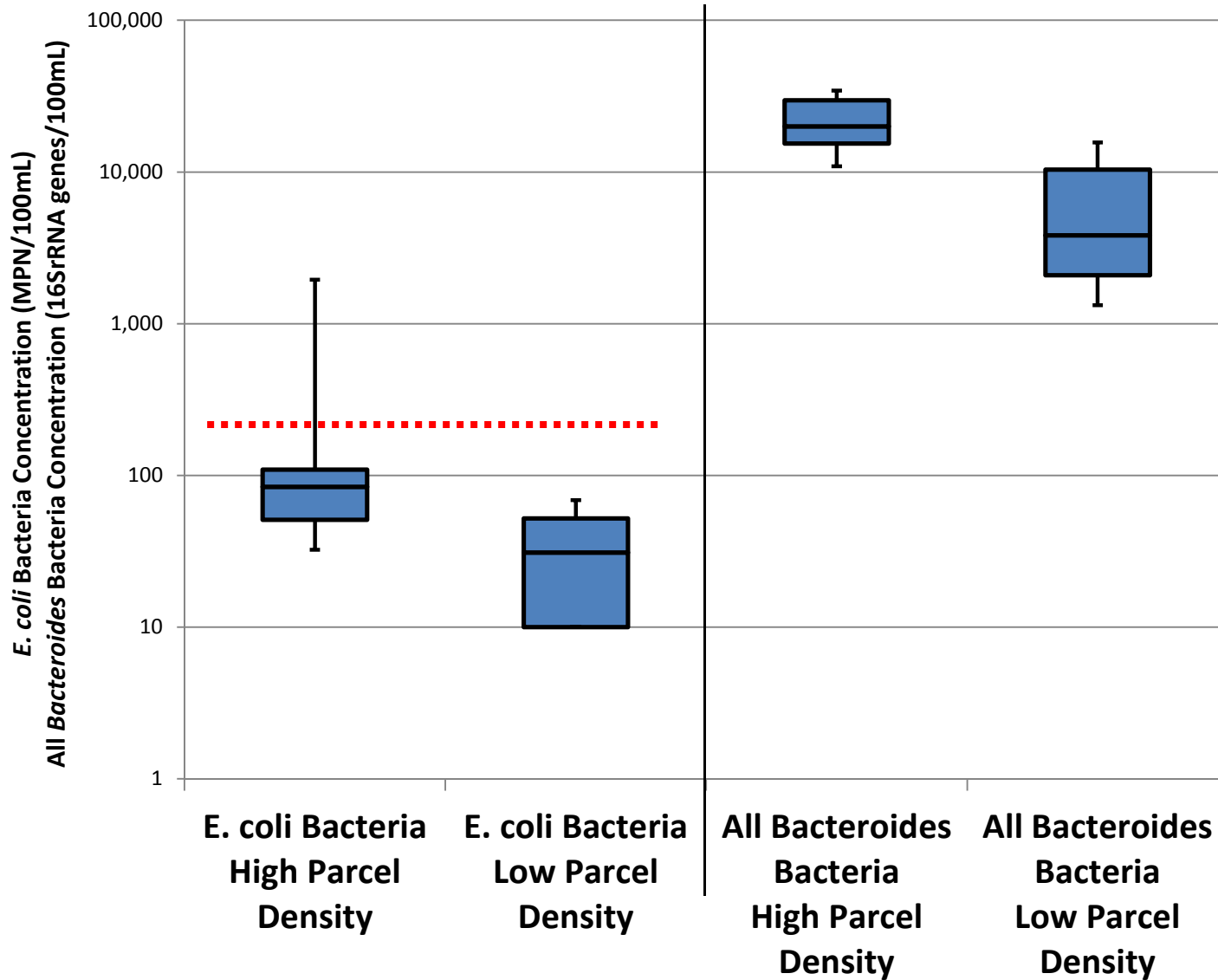




TMDL Monitoring Initial Results

- Human-source *Bacteroides* bacteria were detected in all locations and in all land use categories
- Human-source *Bacteroides* bacteria levels were higher in areas with septic systems than in urban sewered areas
- *E. coli* and *Bacteroides* bacteria levels were higher in rural watersheds with a high density of parcels with septic systems than in watersheds with a low density of parcels with septic systems

Septic Source Study Results Comparison of Parcel Densities



..... EPA (2012) Beach Action Value

High Parcel Density:
 0.76 to 3.99 parcels/acre

Low Parcel Density:
 0.01 to 0.11 parcels/acre
 or
 100 ac. to 10 ac. parcels



Russian River Nutrient Study

- Purpose: to help understand nutrient concentrations, algal growth, and algal species
- Summer 2011
- Samples were collected along the mainstem Russian River from Healdsburg Memorial Beach to Monte Rio Beach
- Results
 - Diel dissolved oxygen and pH data do not show a signal of biostimulatory response in most of the river during most of the summer
 - Algal biomass increases seen in late June
 - No microcystin toxin found

Contact Information

Webpage:

http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/russian_river

Mailing List:

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Summary and Conclusions

- Pollutant source control is key
- Source control will take time
- Other factors may affect pathogen concentrations
- We will continue to work together

