Update on Smith River Plain Monitoring Studies and Consideration of Next Steps

North Coast Regional Water Quality Control Board

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Item 7

April 19, 2018

Weed, CA

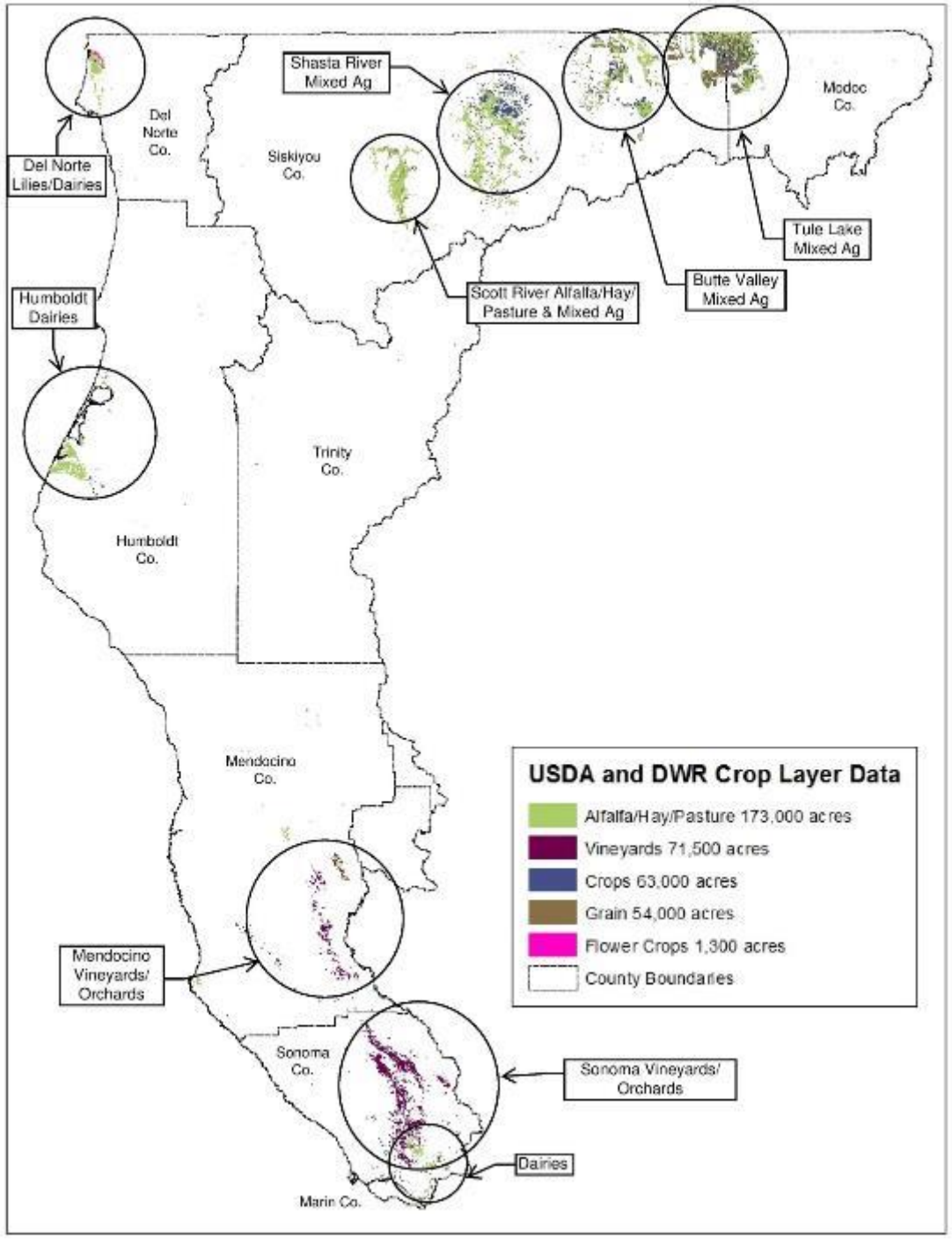
Water Boards

Presentation Outline

- Update on Agricultural Lands Discharge Program
- Review Regional Water Board studies in the Smith River Plain
- Historical and current groundwater quality
- Regional Water Board's 2013-2017 surface water monitoring
  - ✓ Purpose
  - ✓ Study results
- NOAA Fisheries/CDFW monitoring study
- Tolowa Dee-ni' Nation monitoring study
- Next steps for Regional Water Board in the Smith River Plain

Water Boards

Agriculture Lands Program Sectors / Regions



- Vineyards & Orchards
- Dairies
- Tule Lake / Butte Valley
- Scott River
- Shasta River
- Easter Lily Bulbs
- Cannabis Regulatory Program

Water Boards

Agricultural Lands Discharge Program

- Presentation to Board in March 2017 to get input on priorities
- Board supported staff recommendation to prioritize vineyard and orchard permit development
- Other permits to be phased in pending monitoring results and staff resources
  - ✓ Lily bulb cultivation
  - ✓ Tule Lake Basin agriculture
- Continued monitoring in Smith River Plain to inform future permit development

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Timeline of Regional Water Board Studies in the Smith River Plain

1982-1985 – Groundwater assessment and modeling

1986-1989 – Report on groundwater pollution by pesticides

2001-2012 – SWAMP Status and Trends Monitoring Program

- ✓ Monitor and assess ambient surface water quality in the Smith River

2008-2013 – SWAMP Stream Pollution Trends Monitoring Program

- ✓ Stream sediment sampling in Smith River

2015 – Smith River Plain Groundwater Monitoring

- ✓ Evaluated groundwater quality of wells previously impacted

2013-2017 – Smith River Plain Surface Water and Sediment Monitoring

- ✓ Survey of water quality and screening for pesticides

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History of Groundwater Quality in Smith River Plain

1982-1985

- ✓ Regional Water Board documented levels of 1,2-Dicholorpropane (1,2-D) and Aldicarb above State Action Levels

1983

- ✓ Use of 1,2-D and Aldicarb in Smith River Plain suspended

1986-1989

- ✓ Aldicarb concentrations fall below State Action Levels
- ✓ 1,2-D still present above State Action Levels

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History of Groundwater Quality in Smith River Plain

2001-2002

- ✓ 1,2-D above Maximum Contaminant Levels (MCL) in 8 of 19 wells

2015

- ✓ 320 pesticides and pesticide residues
- ✓ 1,2-D falls below MCL, but is still above Office of Environmental Health Hazard Assessment health goal (2 of 7 wells)
- ✓ 1,2-D no longer in use (1983) and continues to attenuate
- ✓ No other pesticides detected in groundwater samples

Purpose of 2013-2017 Smith River Plain Surface Water Monitoring

- Screen for agricultural chemicals and other parameters
- Establish baseline for future monitoring
- Inform coordination with other agencies
- Compare detected chemicals to drinking water and aquatic life thresholds and criteria
- Evaluate influence of lily bulb cultivation on water quality
- Inform potential content of permit to address discharges associated with lily bulb cultivation

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SMITH RIVER PLAIN Surface Water and Sediment Monitoring Report

Errata Sheet

Page 2, First paragraph, Second line: Changed the words "*USEPA aquatic health criteria*" to "*CTR Freshwater Aquatic Life Criteria*".

Page 16, Second paragraph: Deleted paragraph and reinserted on page 15 as paragraph four.

Page 23, First paragraph, Third line: Changed the words "*Figure 7*" to "*Figure 8*".

Page 24, Table 16: Changed the words "*Station Codes*" to "*Station Names*".

Page 24, Table 16: Changed the Station Codes to Station Names for consistency throughout the report.

Page 24, Second paragraph, Second line: Changed the words "*Figure 8*" to "*Figure 9*".

Page 24, Third paragraph, Third line: Changed the words "*Figure 8*" to "*Figure 9*".

Page 24, Fourth paragraph: Changed the words from:

> "*Low conductivity and low hardness water can negatively affect the reproduction rates of C. dubia in the testing environment, especially since the test species are reared at moderate levels of conductivity and hardness, and controls are conducted at the same levels in which they were reared. To further examine the potential issue of false positive toxicity results (reduced reproductivity rates observed as a result of the low conductivity alone), an additional set of controls in which C. dubia were reared in lower conductivity water was included in the 2015 toxicity tests.*"

To:

> "*Low conductivity and low hardness water such as that in the tributaries of the Smith River Plain can negatively affect the reproduction rates of C. dubia in the testing environment. When the test species are reared in water with conductivity and hardness levels that are greater than the sample water their reproductive rates can be adversely affected. After observing chronic toxicity results in the absence of any documented toxicants and to examine the potential issue of false positive toxicity results (reduced reproductivity rates observed as a result of the low conductivity alone), an additional set of controls in which C. dubia were reared in lower conductivity water was included in the 2015 toxicity tests*."

Page 24, Fourth paragraph: Deleted paragraph and reinserted on page 22 as paragraph one.

Page 25, Paragraph 1, Fourth line: Changed the words "*copper criterion*" to "*copper CTR Freshwater Aquatic Life Criteria*".

Field and Lab Testing of 2013-2017 Samples

Standard Water Quality

- Dissolved oxygen
- pH
- Temperature
- Electrical Conductivity
- Hardness

Other Parameters

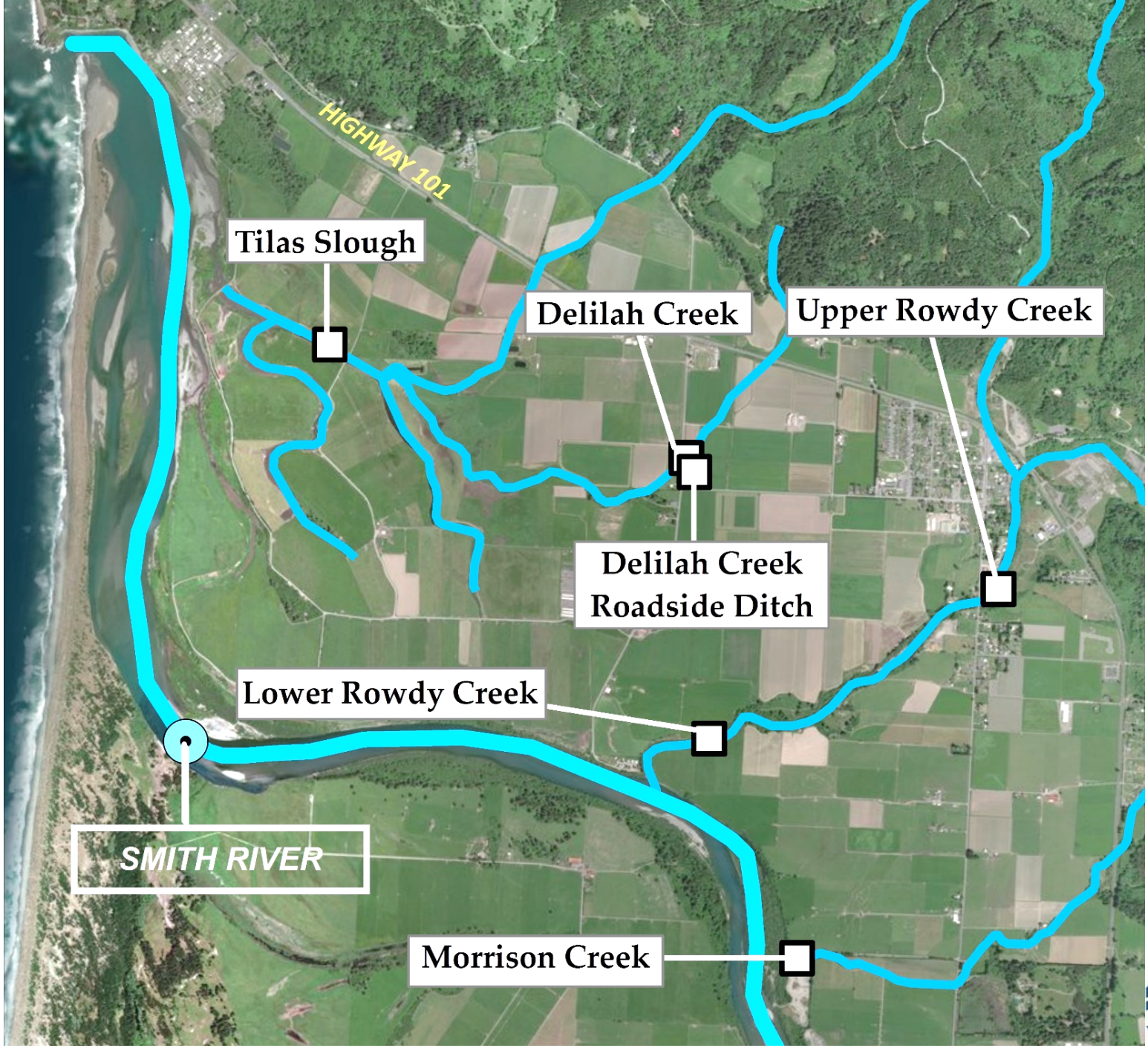
- Metals
- Nutrients
- PCBs
- PAHs

Pesticides Classes

- Organophosphates
- Organochlorines
- Carbamates
- Neonicotinoids
- Triazines
- Pyrethroids/Pyrethrins

Toxicity Testing

- Acute (Survival)
- Chronic (Reproductive)



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Tilas Slough

Delilah Creek

Lower Rowdy Creek

Water Boards

Pesticide Results

- 200-300 Pesticides sampled in 2013-2017
- 17 pesticides detected – 5 above EPA benchmarks
  - ✓ Diuron
  - ✓ Imidacloprid
  - ✓ Mirex
  - ✓ Permethrin
  - ✓ Tebuconazole
- Delilah Creek and Tilas Slough: only sites with pesticides detections above USEPA 2017 Aquatic Life Benchmarks
- Fumigants 1,3-Dichloropropene and MITC not detected in surface waters

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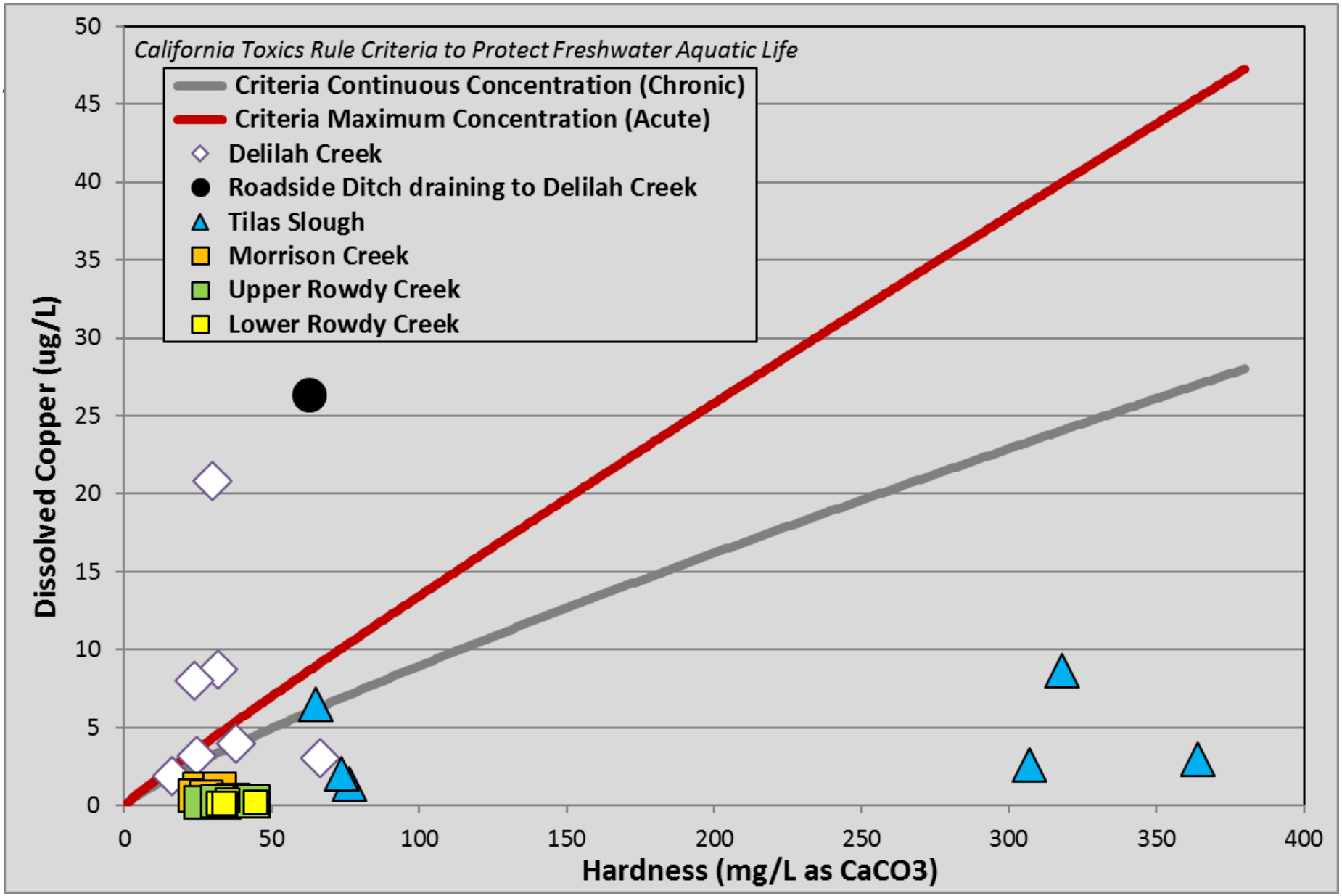
Dissolved Copper Concentrations and Hardness 2013-2017



Toxicity Testing

Toxicity determined by the statistical difference between survival rate (acute toxicity) or the reproduction/growth rate (chronic toxicity) in field samples vs. laboratory controls

Ceriodaphnia dubia,
a water flea

Hyalella azteca,
an amphipod crustacean

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2013-2015 Acute Toxicity Results

- 2 of 27 samples tested positive for acute toxicity
- August 2013 sample from Lower Rowdy Creek
  - ✓ Copper concentrations below CTR criteria and no pesticides detected
- March 11, 2015 Delilah Creek samples
  - ✓ Dissolved copper concentration above CTR criteria
  - ✓ Pesticide permethrin concentration above EPA benchmark
  - ✓ Lab performed a Toxicity Identification Evaluation (TIE)
  - ✓ TIE supports linkage between pesticides/metals and toxicity
- March 23, 2015 sample from Delilah Creek and roadside ditch not toxic
  - ✓ Pesticide and copper concentrations above EPA benchmarks

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Toxicity Identification Evaluation

- Toxicity Identification Evaluation (TIE)
  - ✓ Follow up lab procedure to help identify the cause of observed toxic response
  - ✓ Lab neutralizes classes of chemicals one at a time and observes the toxic response in the sample
  - ✓ When neutralizing a particular class of chemical results in less of a toxic response, that chemical is identified as a 'driver' of the toxicity

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2013 Chronic Toxicity Results

- 3 of 11 samples tested positive for chronic toxicity
- Positive chronic toxicity results in sample water without corresponding elevated levels of chemicals/metals
- Possible that test species were being affected by naturally occurring low hardness/electrical conductivity of the sample water
- Therefore, a second laboratory control with low hardness/EC was employed for 2015-2017 testing

2015 Chronic Toxicity Results

- Introduced additional low hardness/EC control
- 5 of 12 samples tested positive for chronic toxicity
- 2 of 3 samples from both Upper and Lower Rowdy Creek, upstream and downstream from fields, positive for chronic toxicity
- Delilah Creek – 1 of 2 samples positive for chronic toxicity
- TIE performed on June 2015 sample from Delilah Creek
  - ✓ Low hardness/conductivity may have been a driver
  - ✓ No chemical groups identified

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2017 Follow-Up Monitoring Results

- 2017 analysis included an additional test species that is not affected by low hardness/EC
- Samples were collected from 3 sites
- Delilah Creek sample exhibited chronic toxicity
  - ✓ Dissolved copper exceeded acute criteria
  - ✓ 2 pesticides detected: diuron and chlorpropham
  - ✓ TIE suggested metals and a pesticide were drivers
- Similar TIE results from Delilah Creek in June 2017 and March 2015
  - ✓ Metals and pesticides are likely causing the positive toxic results

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Stakeholder Outreach

- January 2018 – public release of monitoring report
- Links distributed by email
  - ✓ Smith River Advisory Group members
  - ✓ Email list subscribers
- Regional Water Board staff met with stakeholders
  - ✓ Lily bulb growers
  - ✓ Environmental Groups
  - ✓ State and Federal Agencies
  - ✓ Tolowa Dee-ni' Nation
- Regional Water Board staff interviews
  - ✓ America Magazine
  - ✓ KMUD Radio

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Regional Water Board Staff Follow Up

- Monitoring documented toxicity in some locations
- Further follow up and characterization needed
- Working with Tolowa Dee-ni' Nation and federal and state agencies to conduct some additional monitoring
- Coordination with landowners, local RCD, NRCS, and County Agricultural Commissioner

Regional Water Board Potential Next Steps

- Potential next steps could include some combination of the following:
  - ✓ Continue coordination and support of additional monitoring and assessment
  - ✓ Continue collaboration with lily bulb growers and technical assistance agencies to identify management practices to control discharges
  - ✓ Enforcement actions and/or issuing an investigative order
  - ✓ Initiate development of a regulatory permit to address discharges from lily bulb operations

QUESTIONS

Water Boards

NOAA/CDFW Study

Justin Ly

Dan Free

Water Boards

QUESTIONS

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Tolowa Dee-ni' Nation Study Plan

Megan Van Pelt

Water Boards

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