

NUTRIENT TMDLS
LOWER SANTA MARIA RIVER WATERSHED
& TRIBUTARIES TO OSO FLACO LAKE
SANTA BARBARA AND SAN LUIS OBISPO COUNTIES

State Water Board Meeting
February 4, 2014
Agenda Item 6

Larry Harlan
Central Coast Water Board

TMDL Highlights...

- ***TMDL approved by CCWB on May 30, 2013***
- ***Uses existing regulatory measures to implement TMDL goals***
- ***TMDL consistent with CCWB's highest priorities***
- ***Approaches same as Salinas Nutrient TMDL***
(CCWB-approved March 14, 2013)
- ***USEPA reports: TMDL meets federal requirements under CWA***

Beneficial Uses...

Protects beneficial uses of 11 water bodies:

- **Municipal and domestic supply (MUN)**
- **Aquatic life (*COLD, WARM, WILD, MIGR, SPWN, RARE*)**
- **Agricultural supply(*AGR*)**
- **Ground water recharge (*GWR*)**

Numeric Targets...

- **WQO's for nitrate and unionized ammonia**
- **Wet and dry season nitrate and orthophosphate targets
(biostimulation)**
- **Targets for nutrient response indicators**
 - **Dissolved oxygen (concentration, % saturation)**
 - **Chlorophyll a, microcystins, DO supersaturation**

Public Comments/Wrap-Up...

- **Received 2 comment letters from**
 - **Richard Sweet, City of Santa Maria**
 - **Kay Mercer**
- **Recommend adoption of this Basin Plan Amendment**
“TMDLs and Implementation Plan for Nitrogen Compounds
& Orthophosphate for Lower Santa Maria River Watershed
and Tributaries to Oso Flaco Lake”
- **Questions**

Longer Version Below:

The background of the slide is a photograph of a river or lake. In the foreground, there are tall, thin reeds or grasses. The water is calm and reflects the sky. In the background, there are trees and a clear blue sky. A large green semi-transparent box is overlaid on the top half of the image, containing the main title text.

NUTRIENT TMDLS
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SANTA BARBARA AND SAN LUIS OBISPO COUNTIES

Agenda Item XX
February 4, 2014

Larry Harlan
Central Coast Water Board

Oso Flaco Lake
(March 2007)

Recommendation...

Adopt Resolution XXXXXX

TMDLs and Implementation Plan for Nitrogen Compounds & Orthophosphate for Lower Santa Maria River Watershed and Tributaries to Oso Flaco Lake

Nutrient Pollution...

Excessive Nutrients may cause...

- **Toxic Effects (*degradation of drinking water sources*)**
- **Degradation of Aquatic Habitat (*biostimulation*)**
- **Degradation of irrigation supply (*for sensitive crops*)**
- **Public health risks and nuisance (*algal toxins*)**

Greene Valley Creek @ Simas Rd
May 2007

Impairments...



Oso Flaco Lake

Oso Flaco Lake Subwatershed

Nisomo

Santa Maria River

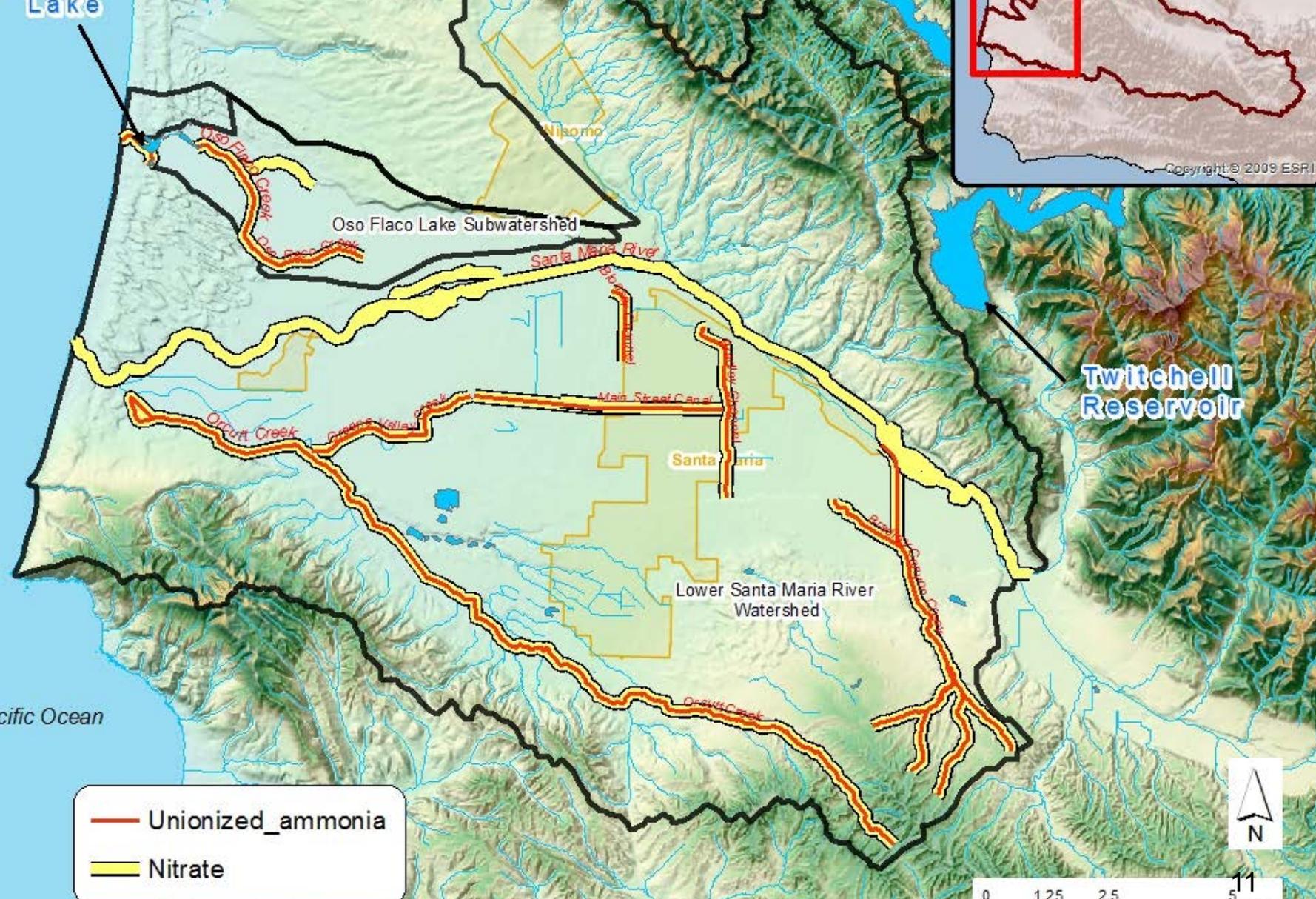
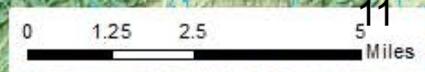
Twitchell Reservoir

Santa Maria

Lower Santa Maria River Watershed

Pacific Ocean

— Unionized ammonia
— Nitrate



Impairments...



Oso Flaco Lake

Oso Flaco Lake Subwatershed

Nisomo

Santa Maria River

Blosser Channel

Gradley Channel

Main Street Canal

Santa Maria

Lower Santa Maria River Watershed

Truman Valley Creek

Beach

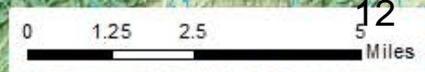
Oravitt Creek

Twitchell Reservoir

Pacific Ocean

Legend:

- DO (red line)
- Biostimulation (yellow line)



Nutrient TMDLs...

Pollutant	Source	Stream Numeric Targets (mg/L)
Nitrate-N	<i>Regulatory Standard-Basin Plan</i>	10
Unionized ammonia	<i>Regulatory Standard-Basin Plan</i>	0.025
Nitrate-N	Derived from USEPA & SWRCB-recognized methods	4.3 – 8.0
Orthophosphate	Derived from USEPA & SWRCB-recognized methods	0.08 – 0.3

Nutrient –Response Indicator Targets *(desired conditions)*

Pollutant	Source	Stream Numeric Targets
Dissolved Oxygen	<i>Regulatory Standard-Basin Plan</i>	<i>Not to be depressed below</i> 5 mg/L (WARM) 7 mg/L (COLD)
Oxygen saturation	<i>Regulatory Standard-Basin Plan</i>	<i>Not to be depressed below</i> 85% median
Oxygen Supersaturation	Sci. Literature Threshold	<i>Not to exceed</i> 13 mg/L
Chlorophyll <i>a</i>	Sci. Literature Threshold	≤ 15 μg/L
Microcystins	Calif. OEHHA health guideline	≤ 0.8 μg/L

Proposed TMDL Non-regulatory Milestones...

12 year Interim Goal
Attain nitrate drinking water standard & toxicity objective in surface waters

TMDL Re-consideration:
Propose Water Board re-visits, re-considers, revises TMDL in 10 years, as appropriate based on new research and data

20 year Interim Goal
Attain wet-season biostimulatory targets in surface waters

30 year Final Goal
Attain more-stringent dry season biostimulatory targets in surface waters

Nutrient Sources...

- **Irrigated agriculture (including ground water)**
- **Urban lands**
- **Grazing lands**
- **Atmospheric sources**
- **Natural sources**

Proposed TMDL Implementation Plan...

- **Irrigated agriculture**
 - **Comply with Agricultural Order**
- **Urban lands**
 - **NPDES MS4 permit**
- **Grazing lands**
 - **Compliance with existing Domestic Animal Waste Discharge Prohibition**

Evaluating Progress

Flexibility and “Tool Box” of Metrics Proposed....

- Receiving water nutrient concentrations
- Nutrient mass load (*i.e., pounds / tons*) reductions
- Implementation of management practices
- Improvements in biological indicators (DO and chlorophyll)
- Encourage holistic approach (*riparian improvements, water management, nutrient management, etc.*)

Proactive Efforts

1. Grant acquisition

2. Irrigation nutrient management practices

3. Treatment

1. Bioreactors

2. Vegetative treatment systems

4. Open dialogue

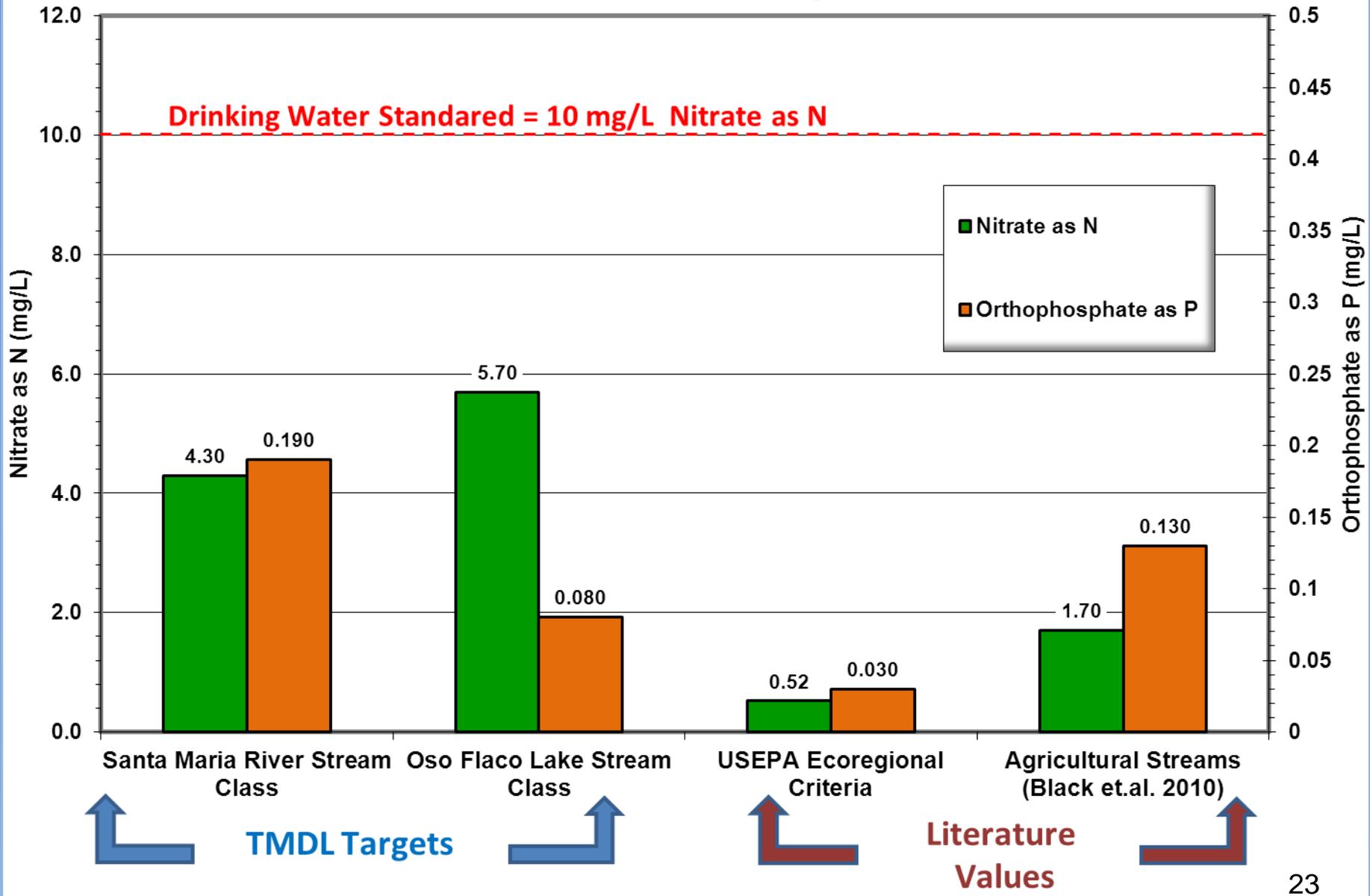
TMDL Development...

- **1st Public Stakeholder Meeting (August 2006)**
- **CEQA Scoping Meetings (Dec 2006, Feb 2007, Oct 2008)**
- **Project postponed (Feb 2009) to let Ag Order evolve**
- **Public Stakeholder Meetings:
(Feb 2010, Jan 2011, June 2012, Nov 2012)**
- **60- d Public Comment Period (Dec 2012 – Feb 2013)**
- **CCWB-approved on May 30, 2013**

Questions?...

Supplemental Slides...

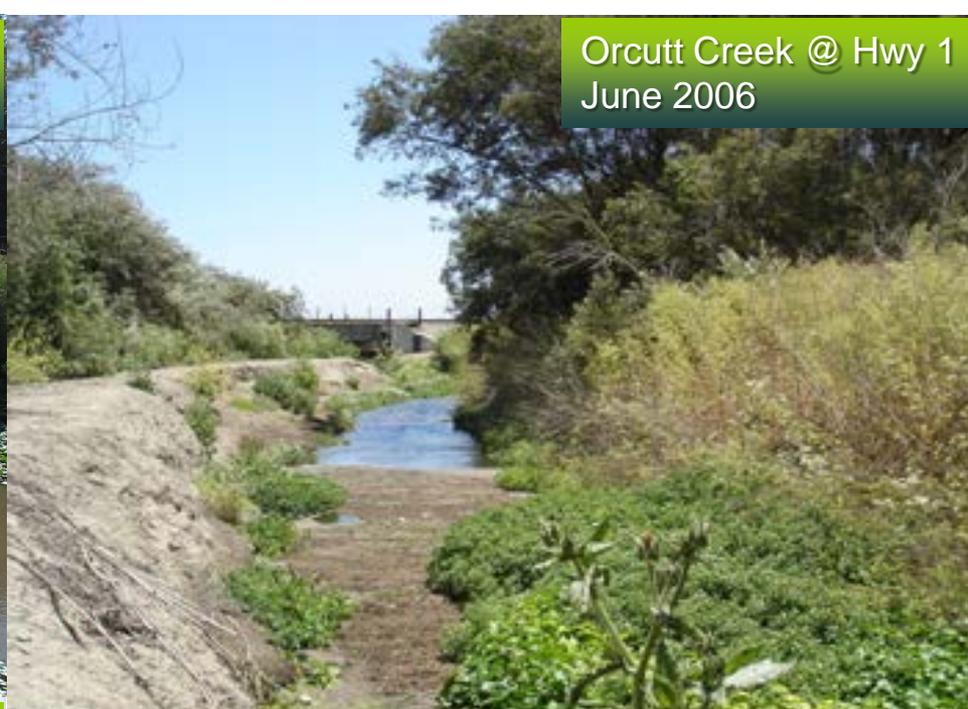
Comparison of Proposed TMDL numeric targets with literature values



Orcutt Creek @ Sand Plant
June 2006



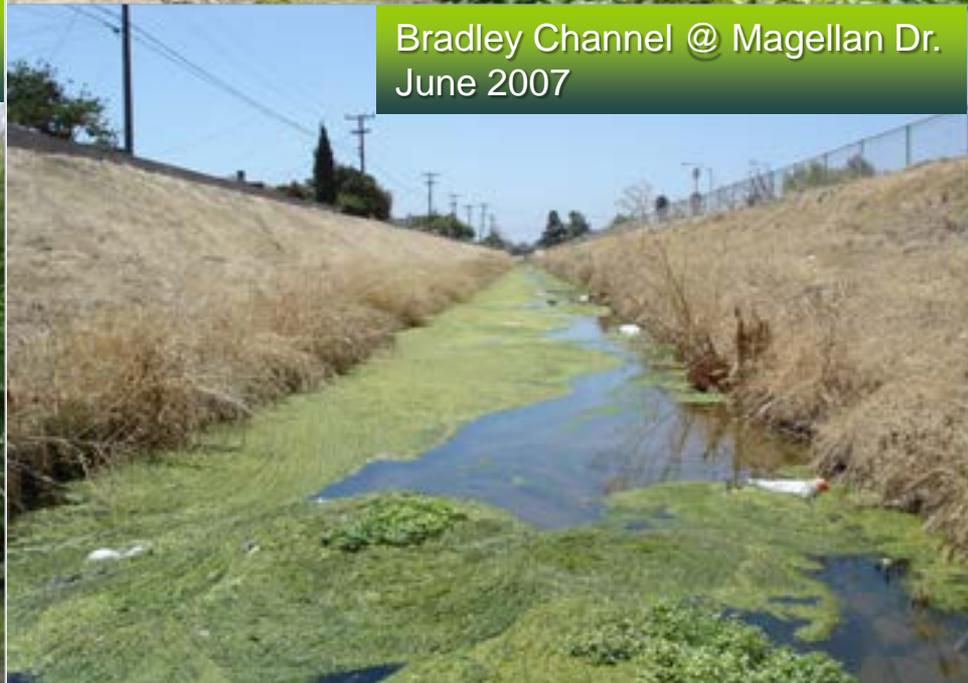
Orcutt Creek @ Hwy 1
June 2006



Greene Valley Creek @ Simas Rd
May 2007



Bradley Channel @ Magellan Dr.
June 2007



Physical factors:
*substrate, temperature,
hydraulics*

Nutrients

Sunlight availability
(canopy, turbidity)

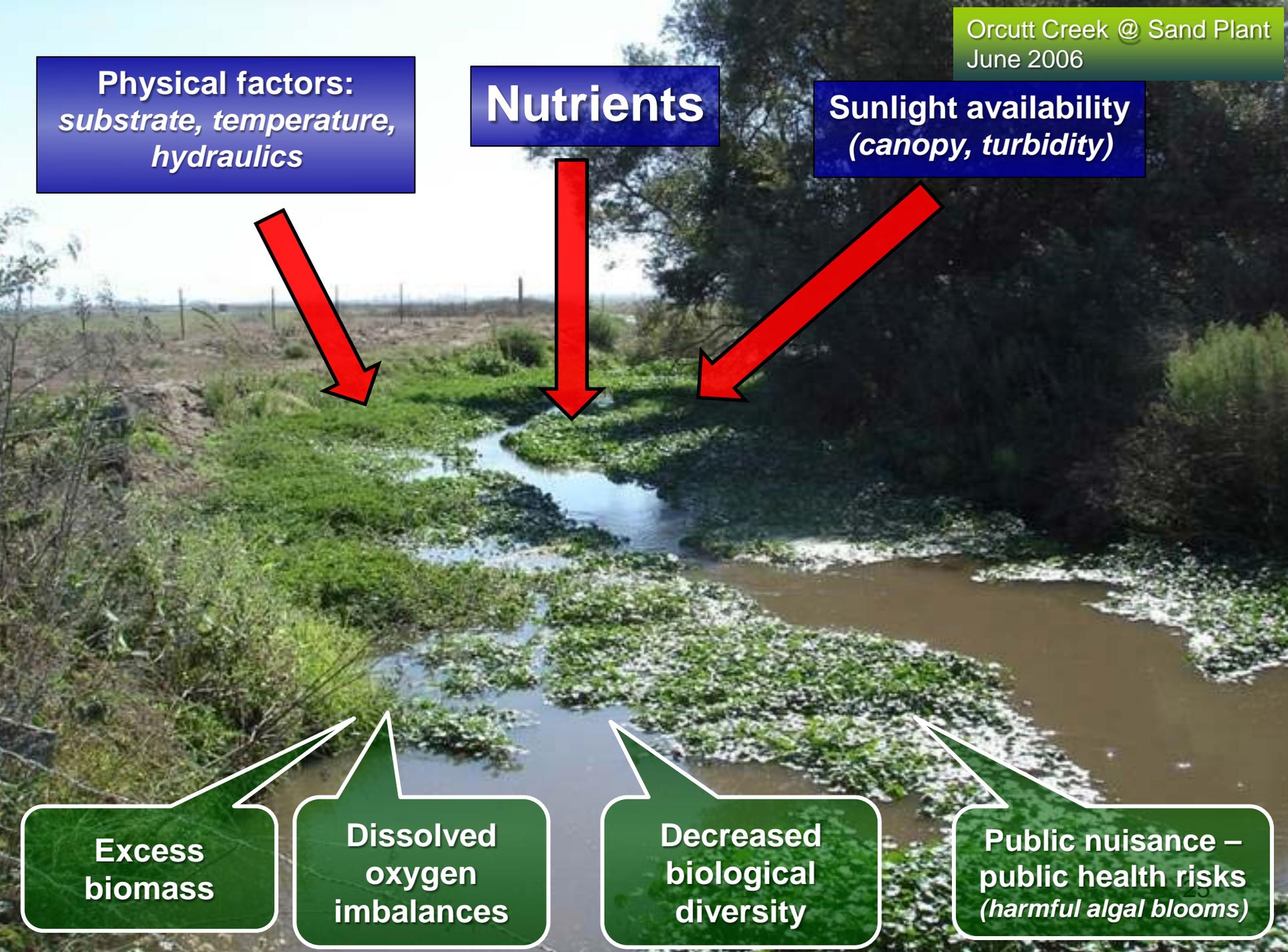


Excess biomass

Dissolved oxygen imbalances

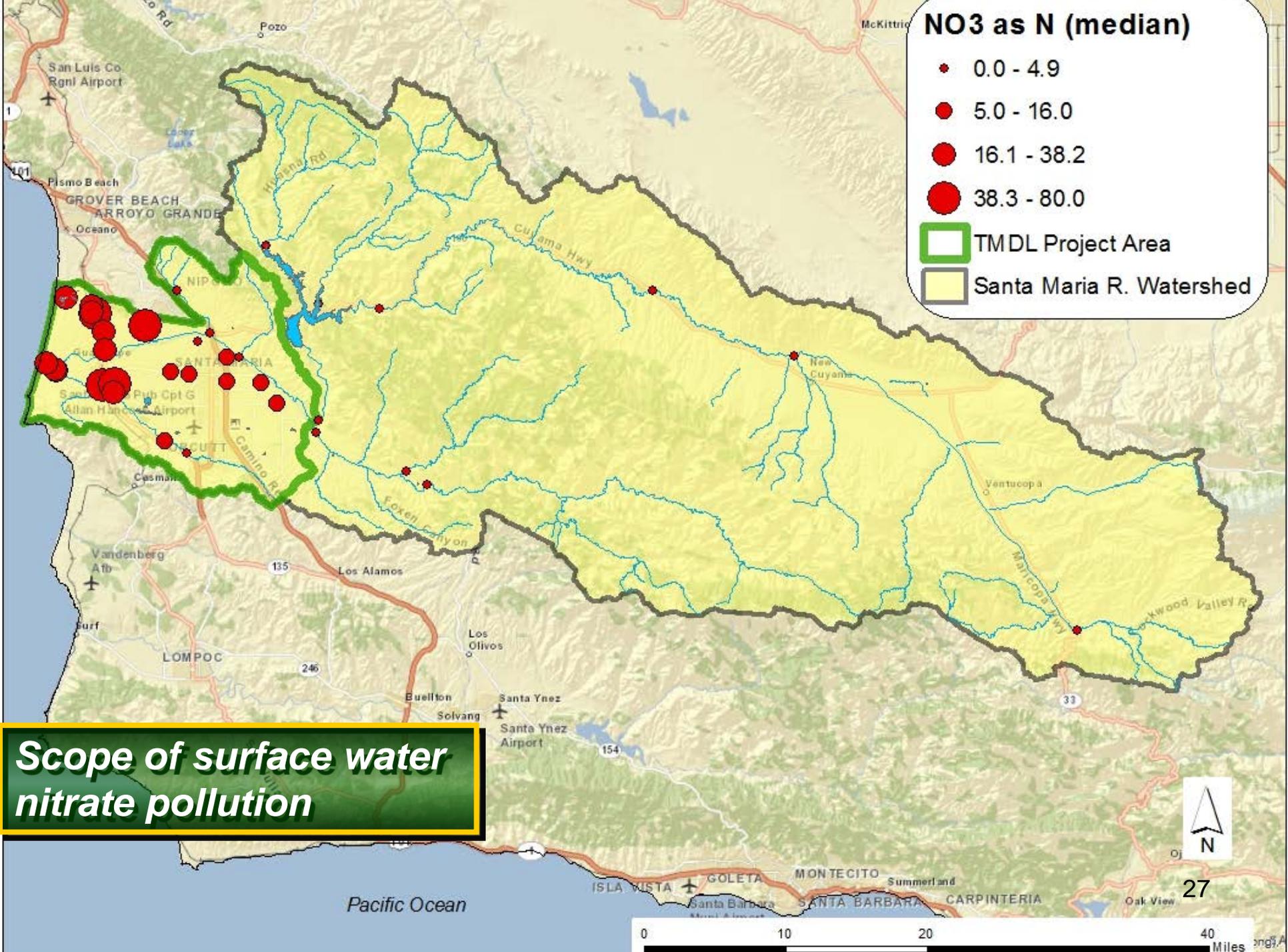
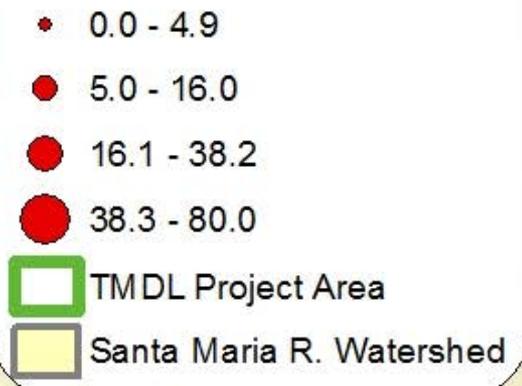
Decreased biological diversity

Public nuisance – public health risks
(harmful algal blooms)



Supplemental Slides...

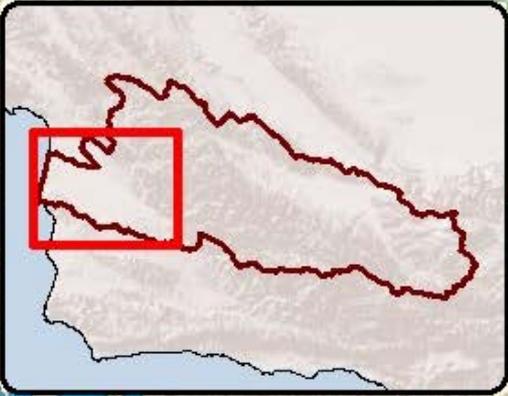
NO3 as N (median)



Scope of surface water nitrate pollution



Oso Flaco Lake



Twitchell Reservoir

Pacific Ocean

 TMDL Project Area
 Impaired Waters

TMDL project area



 0 1.25 2.5 5 Miles

Pacific Ocean

NO3 as N (median)

- 0.0 - 4.9
- 5.0 - 10.0
- 10.1 - 38.2
- 38.3 - 80.0

TMDL Project Area

Land Use

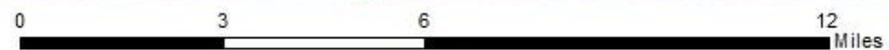
- Urban
- Agriculture
- Grazing
- Undeveloped/Forest

Oso Flaco Lake Watershed

Lower Santa Maria River Watershed

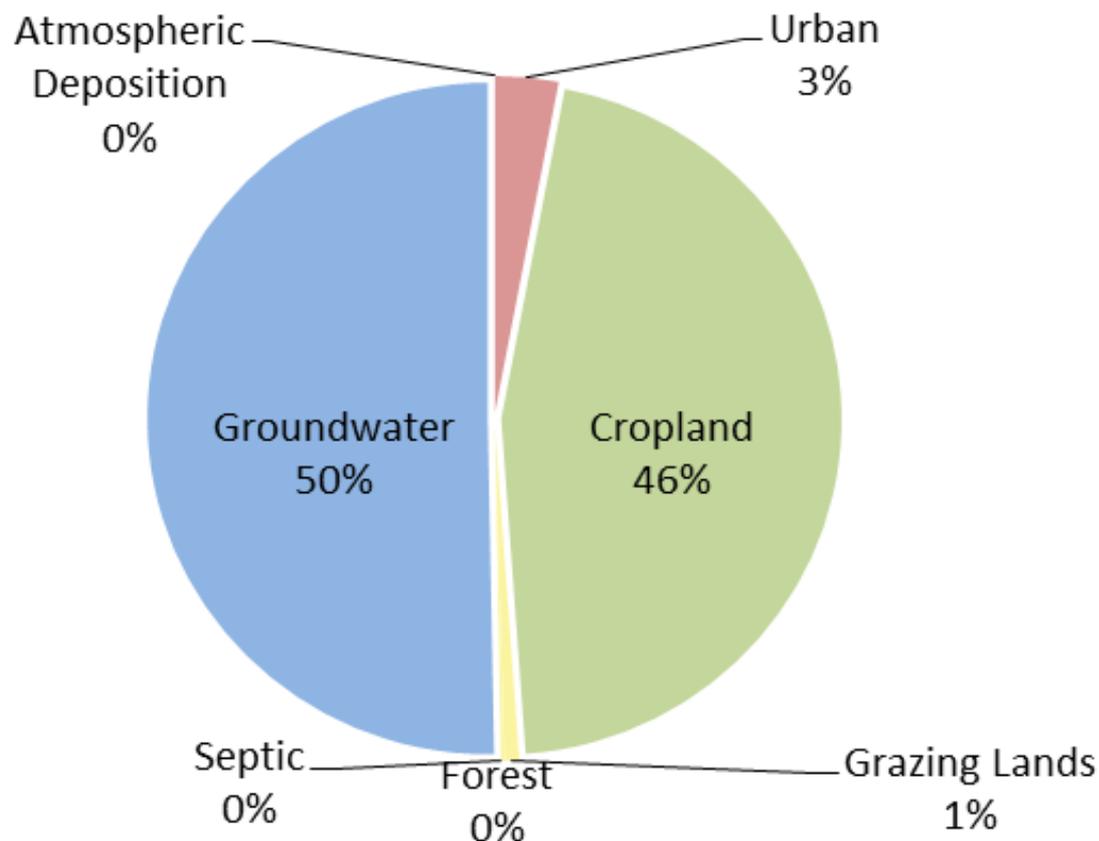
CASMALIA

Nitrate pollution TMDL project area



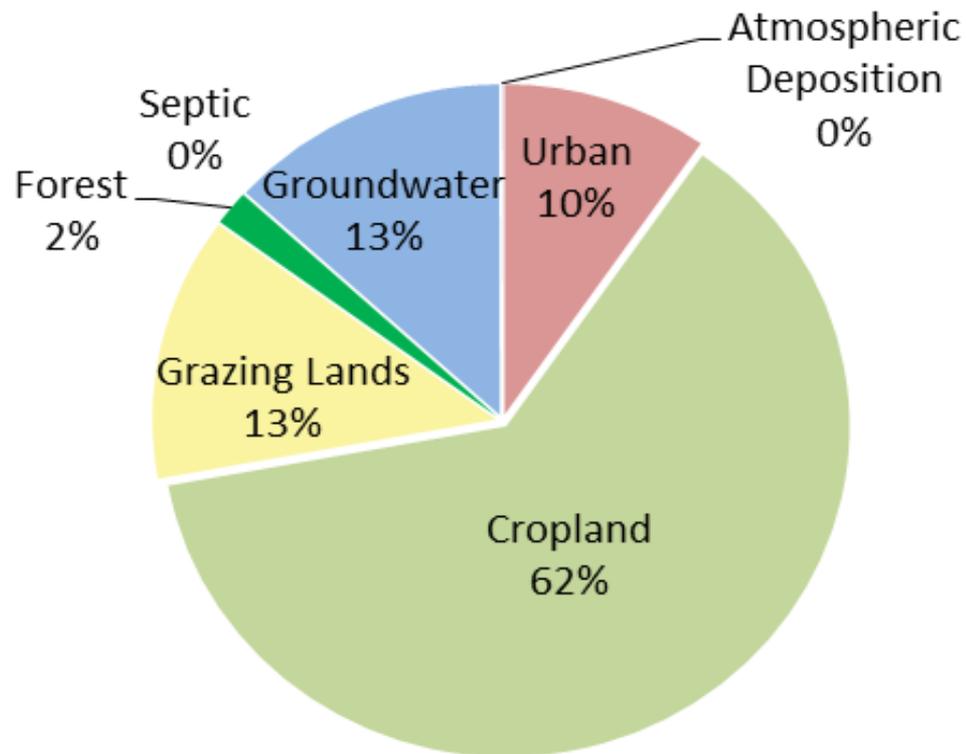
Source Analysis

TMDL Project Area Nitrogen Average Annual Load Distribution (%)



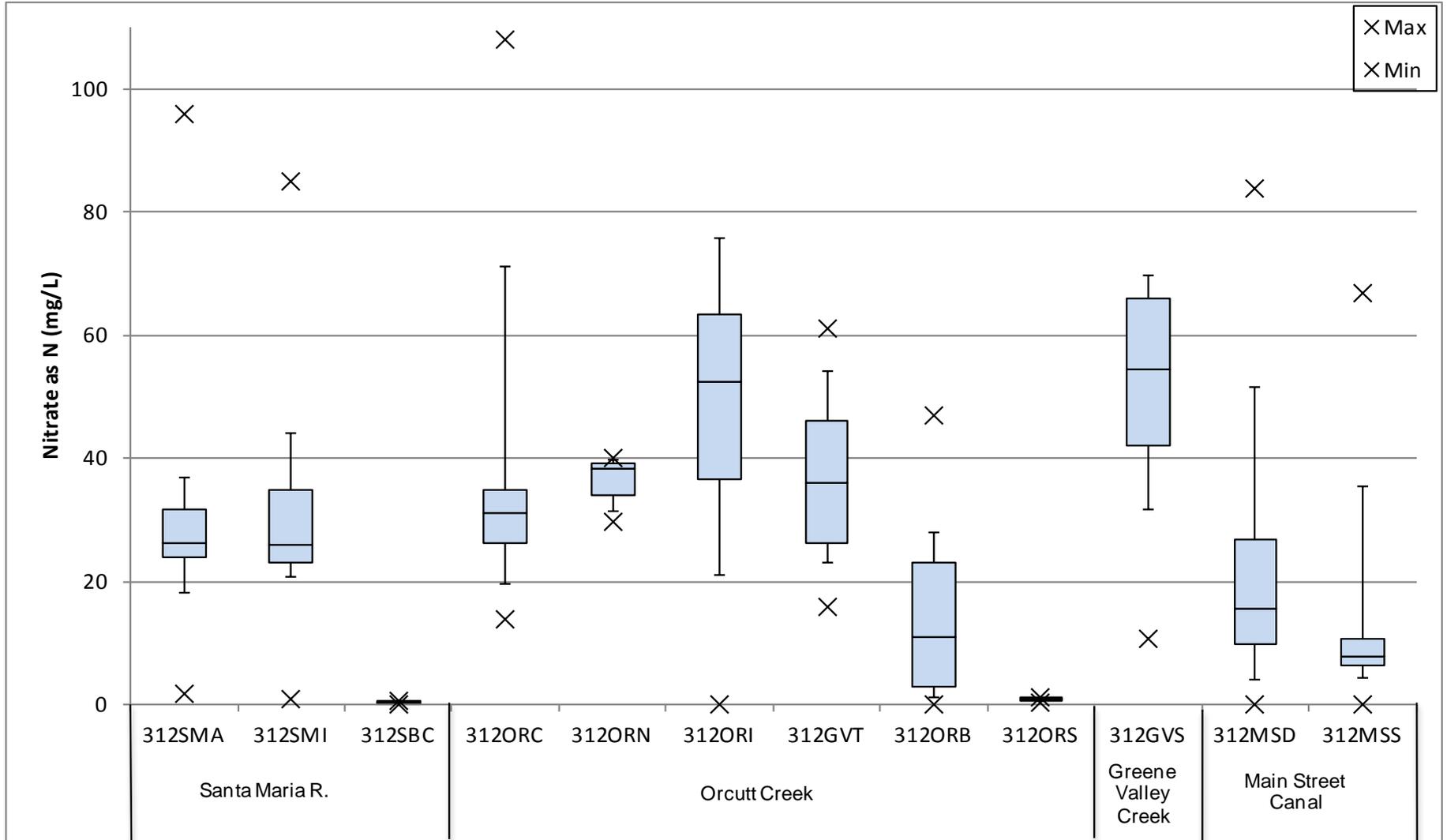
Source Analysis Con't.

TMDL Project Area Phosphorus Average Annual Load Distribution (%)



Nitrate as N for sites in Lower Santa Maria River watershed

Note: Not shown are 312ORI maximum (159 mg/L) and 312GVS maximum (150 mg/L)



Nitrate as N for sites in Oso Flaco Lake watershed

Note: Not show is 312BSR maximum (125 mg/L).

