

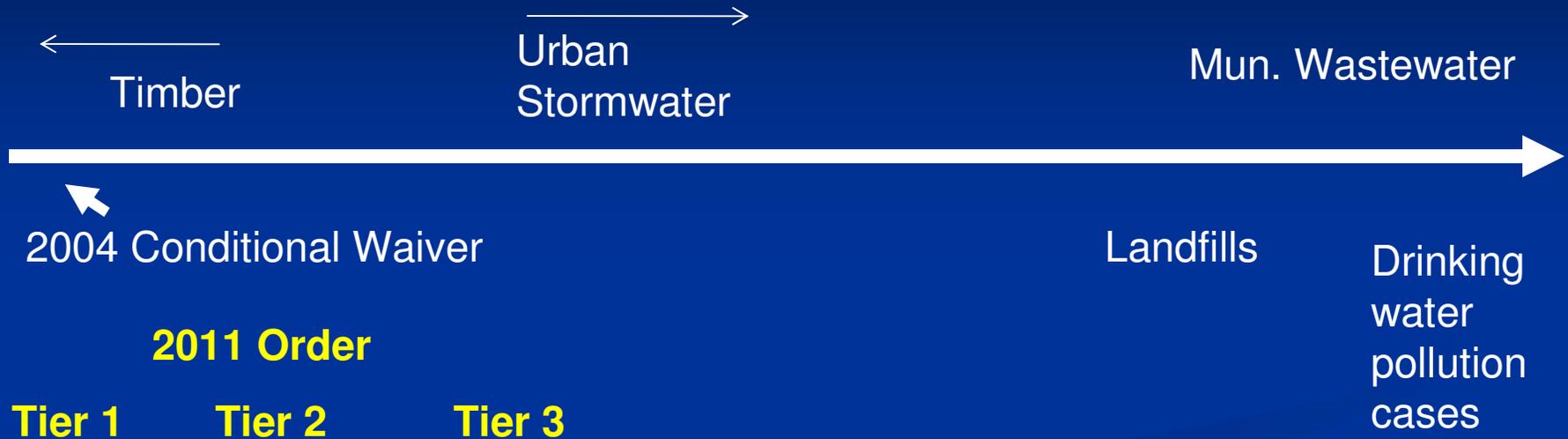
“Fairness means recognizing that everyone, and every situation, is unique.”



“Fairness means treating everybody the same.”



Relative Degree of Regulation



Relative Degree of Water Quality Impacts



We have some of the most severe pollution in the United States.

And it's not new...

Nitrates in Groundwater, Salinas, California, June 1988

Prepared by: Monterey County Flood Control & Water Conservation District
Salinas Valley Water Advisory Commission and Monterey County Board of Supervisors

“Nitrate contamination poses a substantial threat to this industry.”

“Drinking water is considered the highest beneficial use of water.”

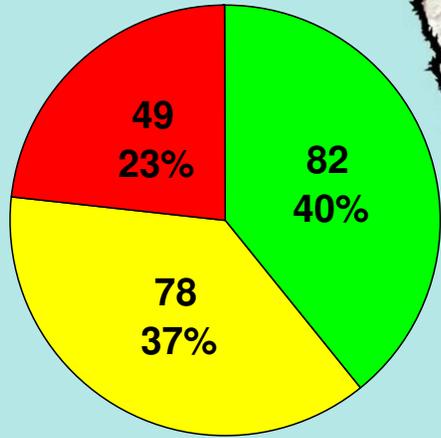
“Nitrate removal from drinking water supplies is costly.”

“The State maintains a non-degradation policy... if additional wells go out of production... **the nitrate situation will become critical**, and it is anticipated that additional regulations would be imposed.”

“...specific actions are needed to mitigate existing problems, and to reduce the potential for future problems.”

“The situation will merit a dedicated effort and special attention by the leadership in the County and around the state. **If it is ignored it will not go away.**”

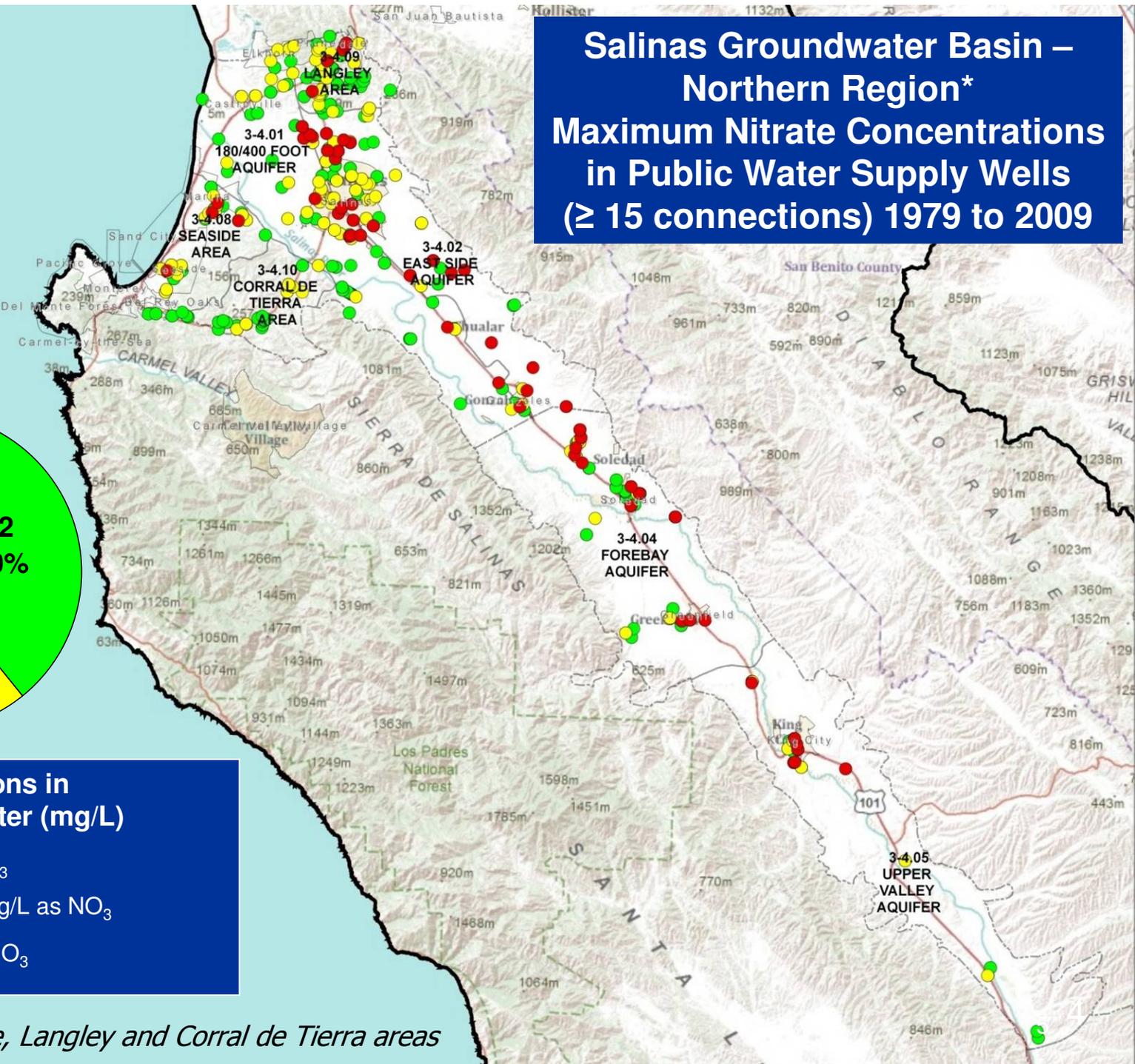
Salinas Groundwater Basin – Northern Region*
Maximum Nitrate Concentrations
in Public Water Supply Wells
(≥ 15 connections) 1979 to 2009



NO₃ Concentrations in milligrams per Liter (mg/L)

- <14 mg/L as NO₃
- 14 mg/L to 44 mg/L as NO₃
- ≥ 45 mg/L as NO₃

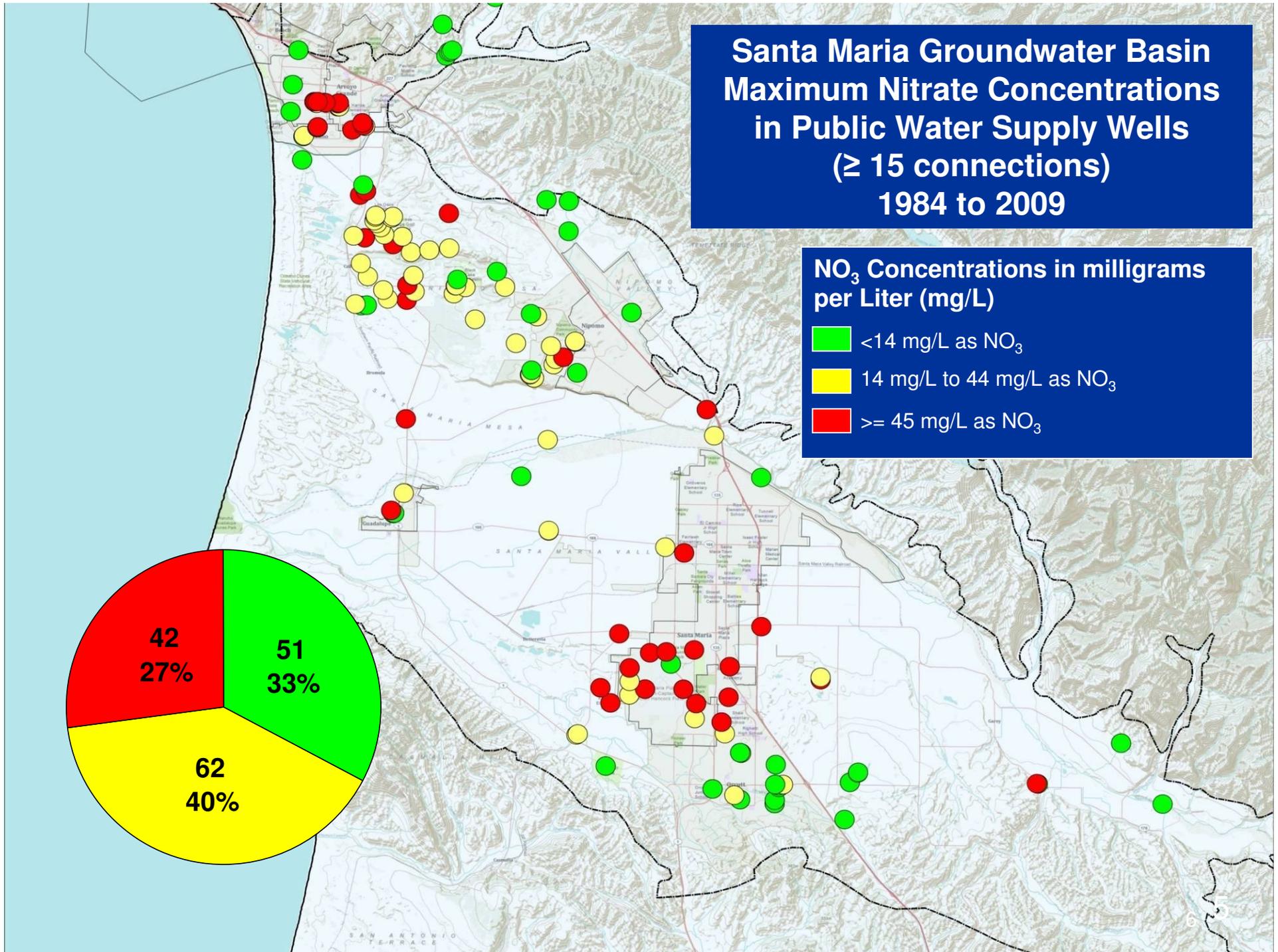
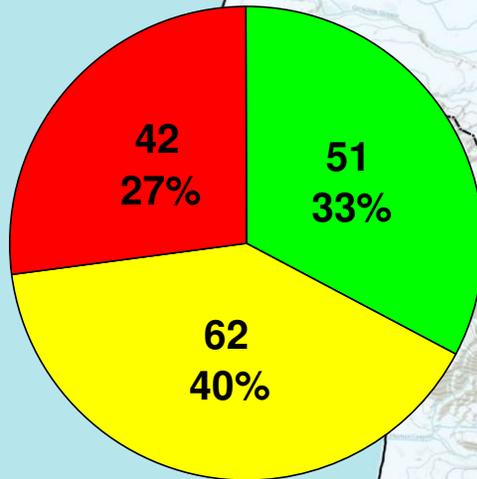
**Excluding Seaside, Langley and Corral de Tierra areas*



Santa Maria Groundwater Basin Maximum Nitrate Concentrations in Public Water Supply Wells (≥ 15 connections) 1984 to 2009

NO₃ Concentrations in milligrams
per Liter (mg/L)

- <14 mg/L as NO₃
- 14 mg/L to 44 mg/L as NO₃
- ≥ 45 mg/L as NO₃



Domestic Drinking Water Wells

How many
people are
drinking
polluted water

?

44,000+ domestic
wells - Central Coast
Region

Water Board actions:

- identifying high risk areas
- identifying home owners
- drafting notice to homeowners
- well testing program
- alternative water cases

Human Health Impacts and Costs Due to Nitrate

Health impacts

- Blue Baby Syndrome

Growing evidence of risks

- Cancer
- Thyroid inhibition
- Parkinson's
- Diabetes
- Endocrine system disruption

Costs

- Water purveyors and municipalities spending millions

Switch to surface water

Regional Context: Monterey Bay



Image from Bryan Largay
Elkhorn Slough National Estuarine Research Reserve

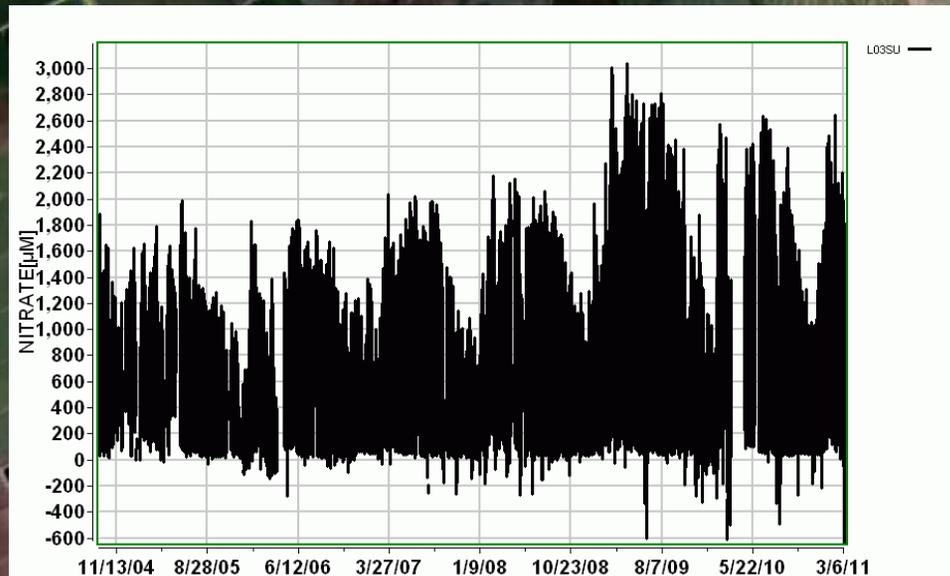
Water Quality Monitoring in Elkhorn Slough: A Summary of Results 1988-1996

“A significant increase in nitrate concentrations since the 1970s”

“Extraordinarily high nitrate concentrations in the lower Salinas River which may be the highest recorded in scientific literature for a river or estuary”

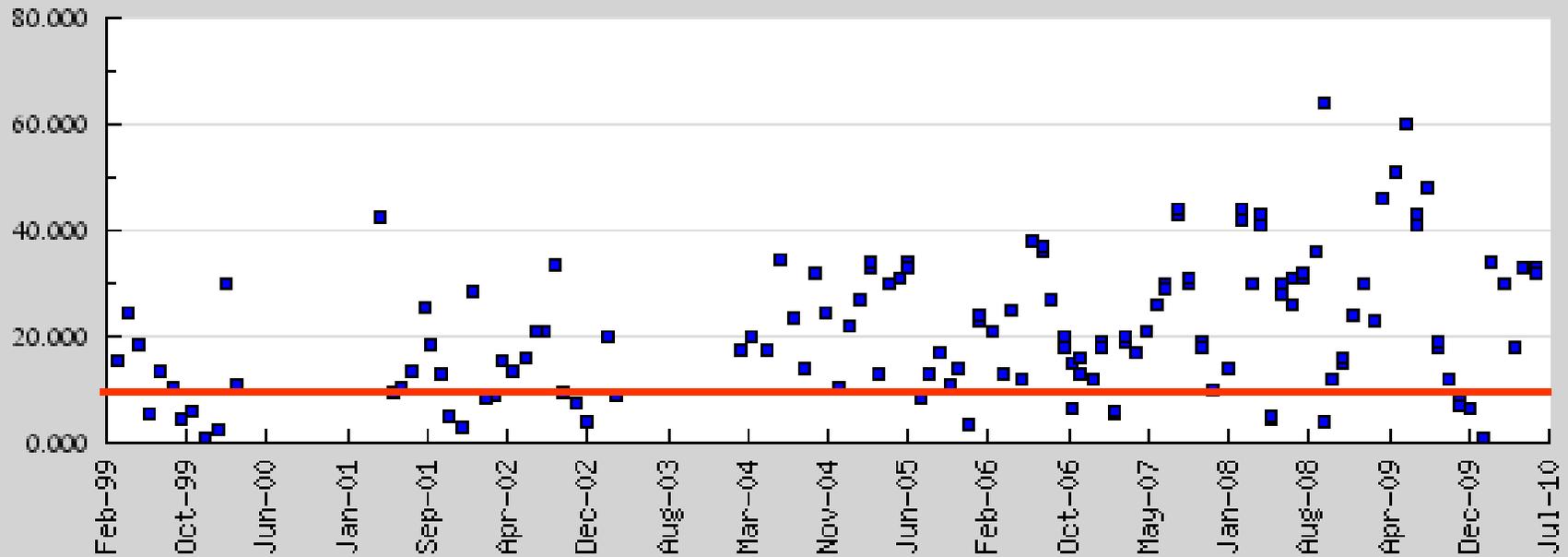
And still increasing...

MBARI



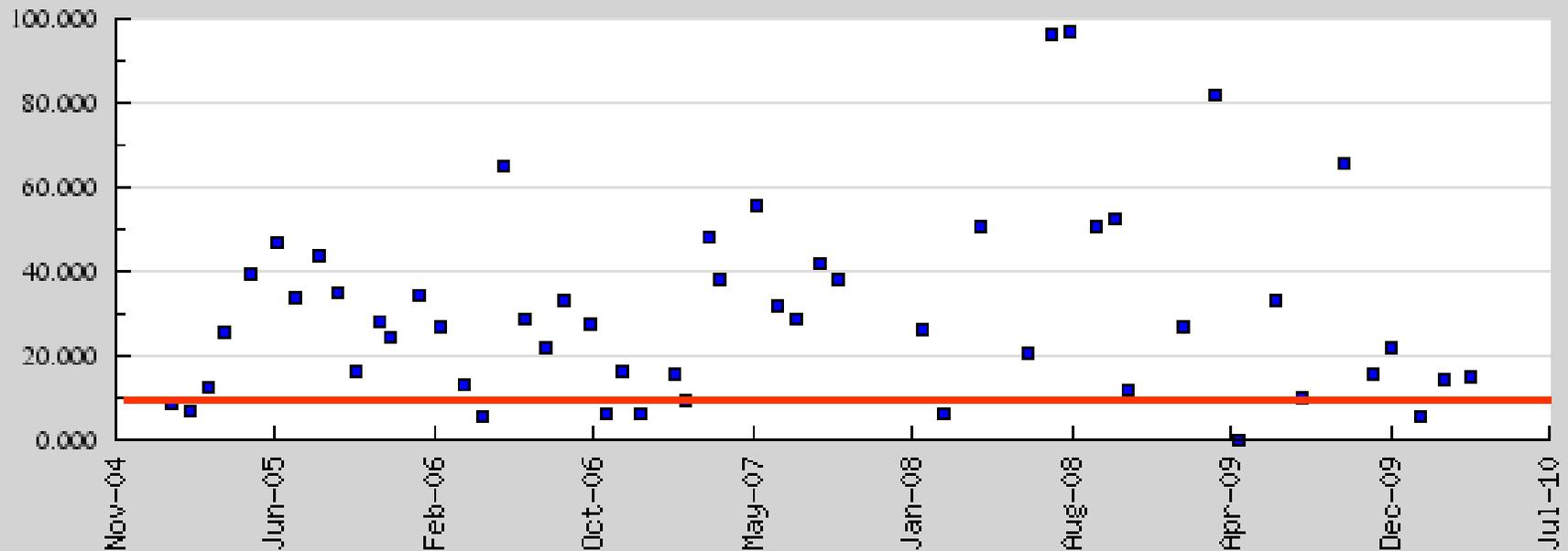
Old Salinas River at Monterey Dunes Way

Nitrate as N at 309OLD (mg/l)



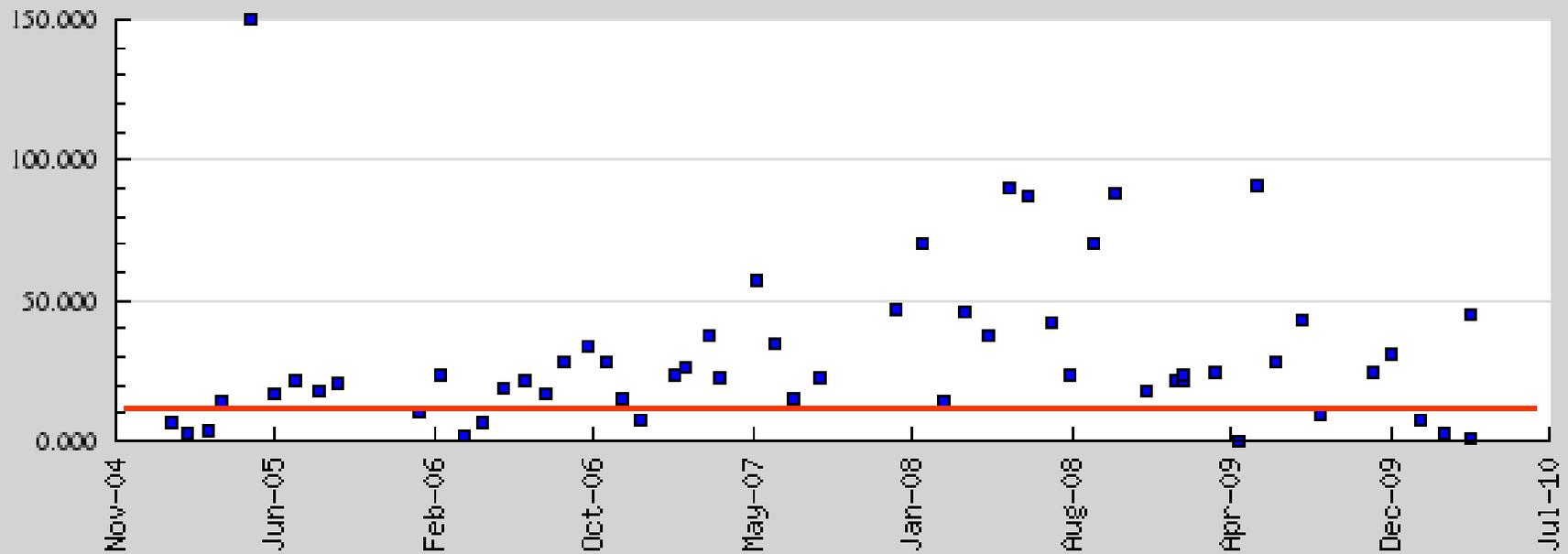
Quail Creek at Highway 101

Nitrate as N at 309QUI (mg/l)



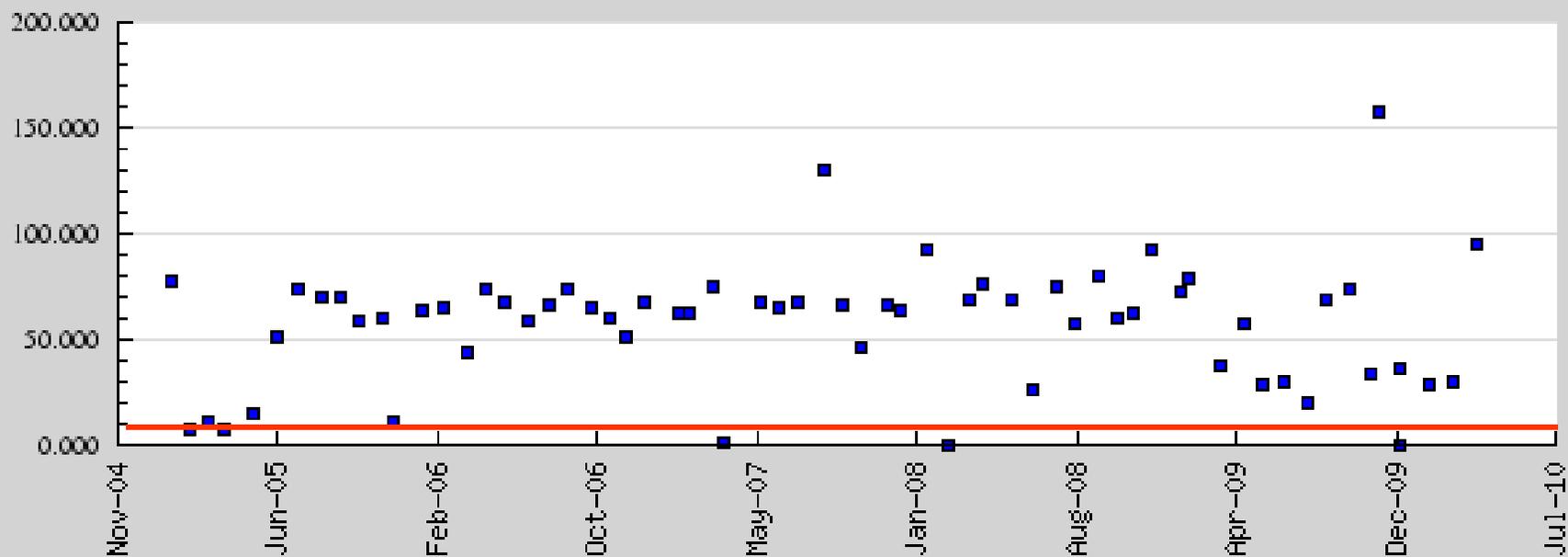
Natividad Creek upstream Salinas Rec Canal

Nitrate as N at 309NAD (mg/l)



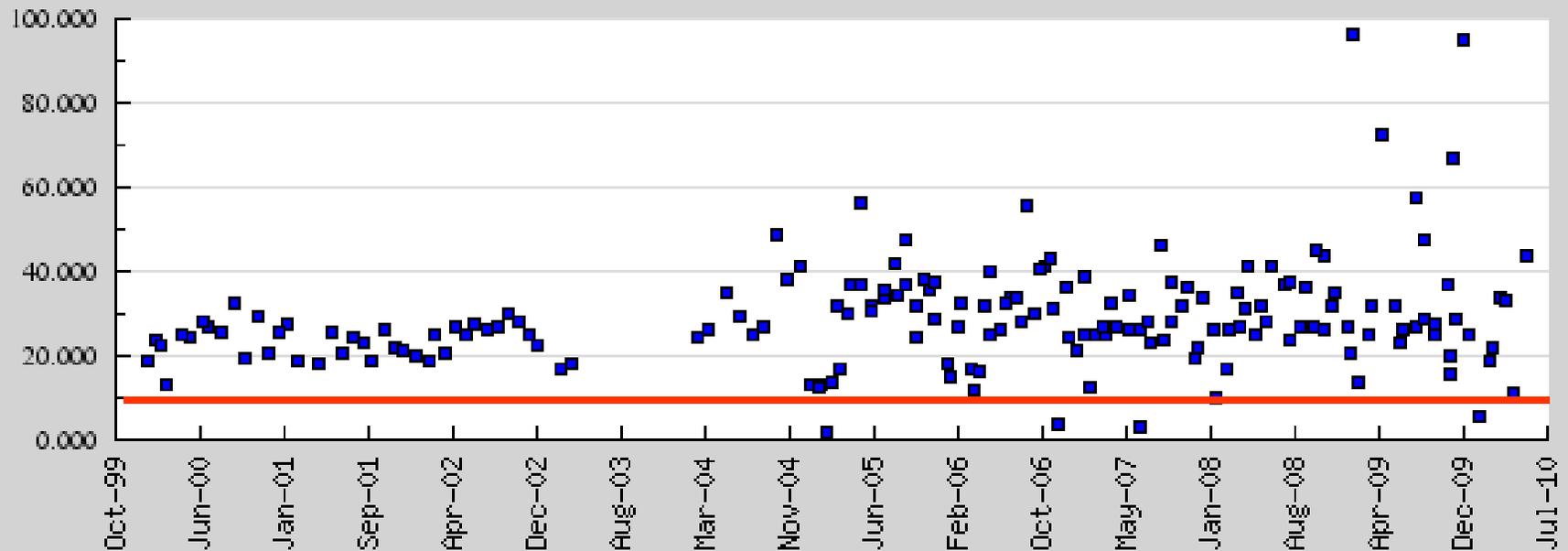
Blanco Drain

Nitrate as N at 309BLA (mg/l)



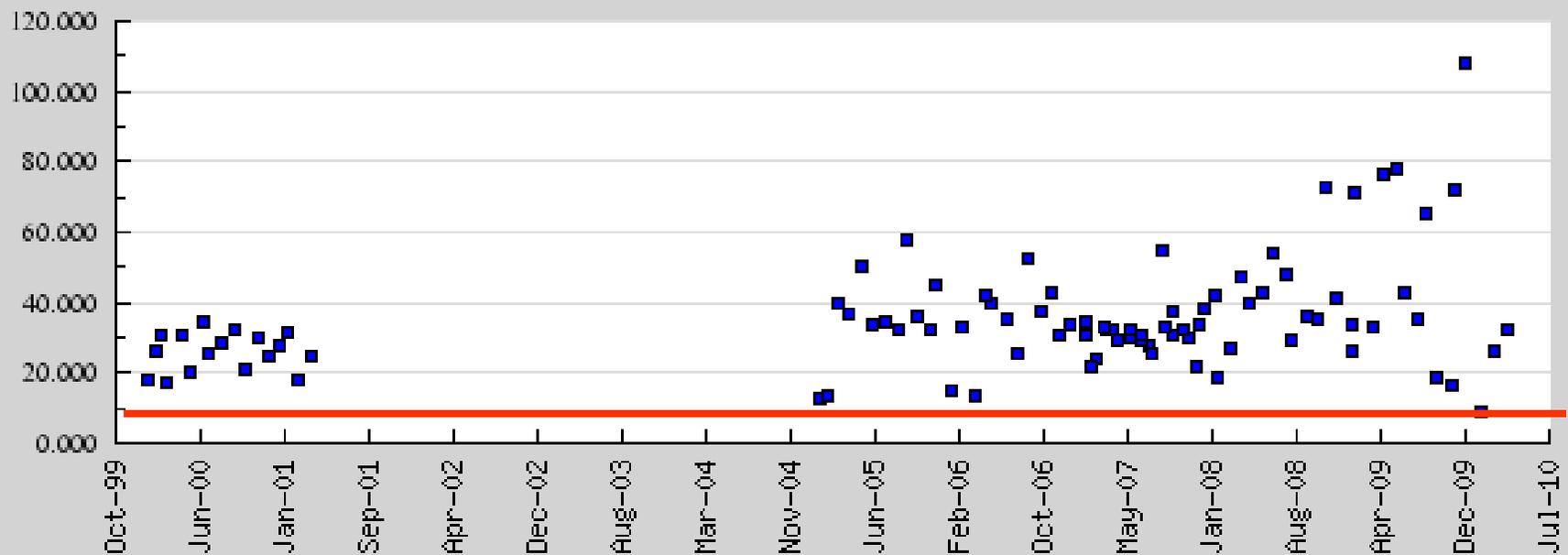
Santa Maria River Estuary

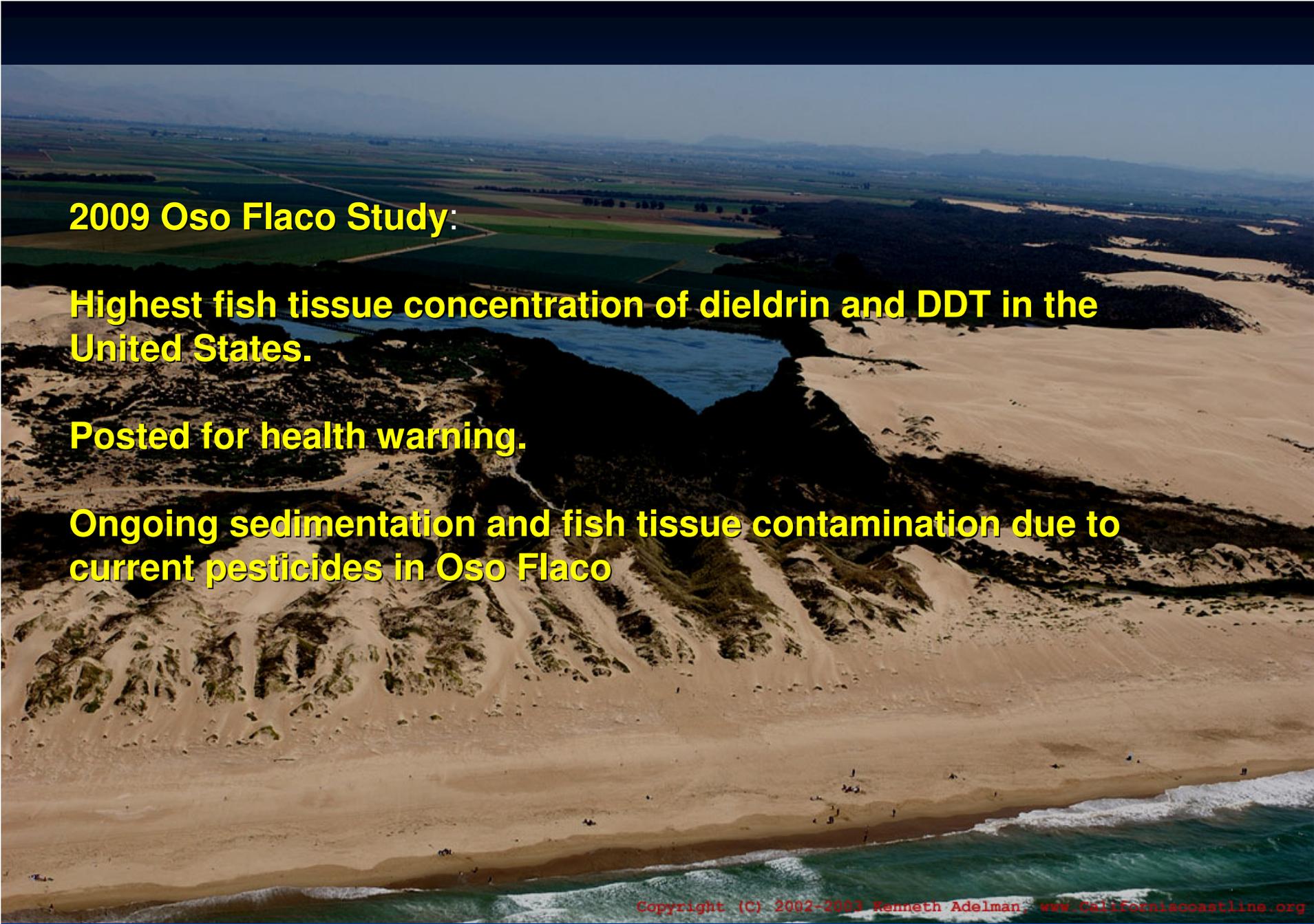
Nitrate as N at 312SMA (mg/l)



Orcutt Creek upstream SM River

Nitrate as N at 312ORC (mg/l)



An aerial photograph showing a coastal landscape. In the foreground, there is a wide, sandy beach with some people walking. The ocean waves are breaking onto the shore. Behind the beach, there are large, flat, sandy areas that appear to be wetlands or a former beach. In the middle ground, there is a large, irregularly shaped body of water, possibly a lagoon or a reservoir. The background shows a vast, flat agricultural area with various shades of green and brown, indicating different crops or fields. The sky is clear and blue.

2009 Oso Flaco Study:

Highest fish tissue concentration of dieldrin and DDT in the United States.

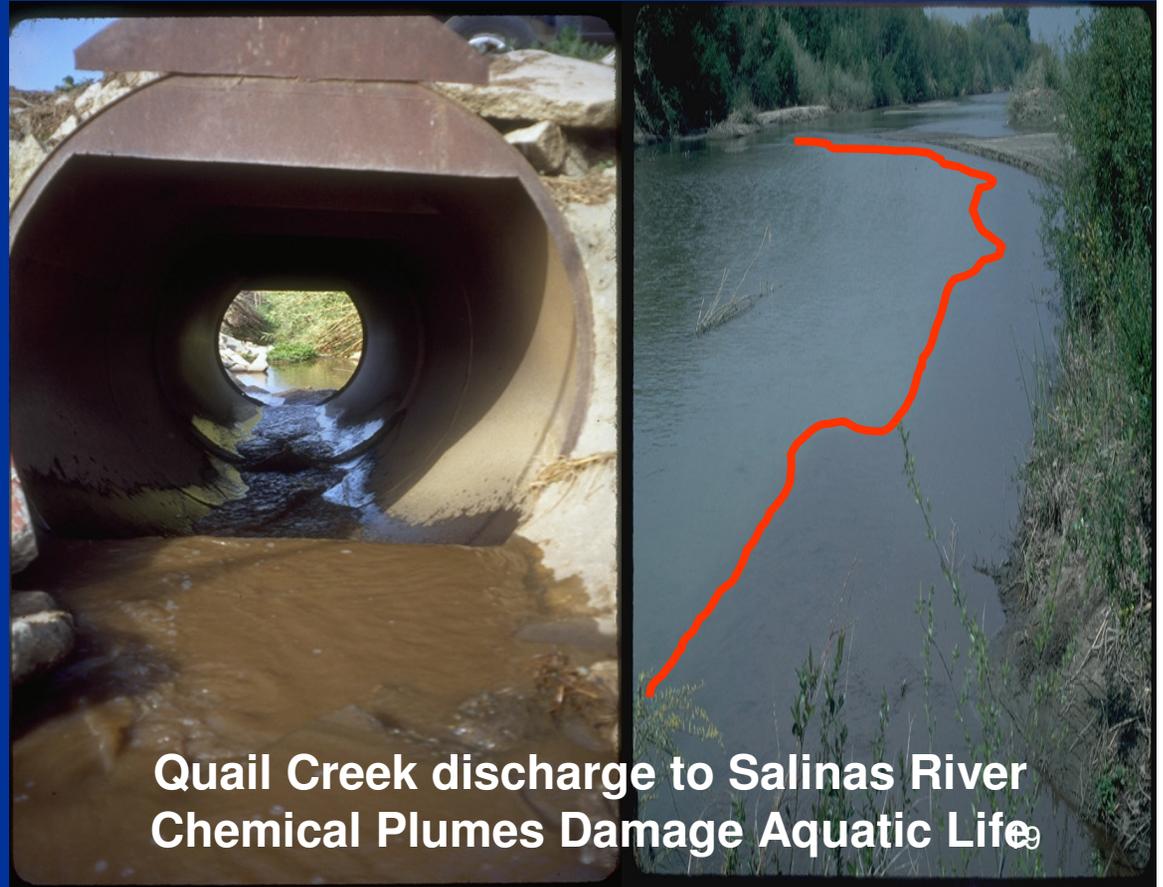
Posted for health warning.

Ongoing sedimentation and fish tissue contamination due to current pesticides in Oso Flaco

Copyright (C) 2002-2003 Kenneth Adelman, www.CaliforniaCoastline.org

2010 State Report Toxicity in California Waters

- Central Coast streams have highest percentage of toxic sites state-wide.
- 56% of sites Toxic
- 22% of sites *Highly Toxic*



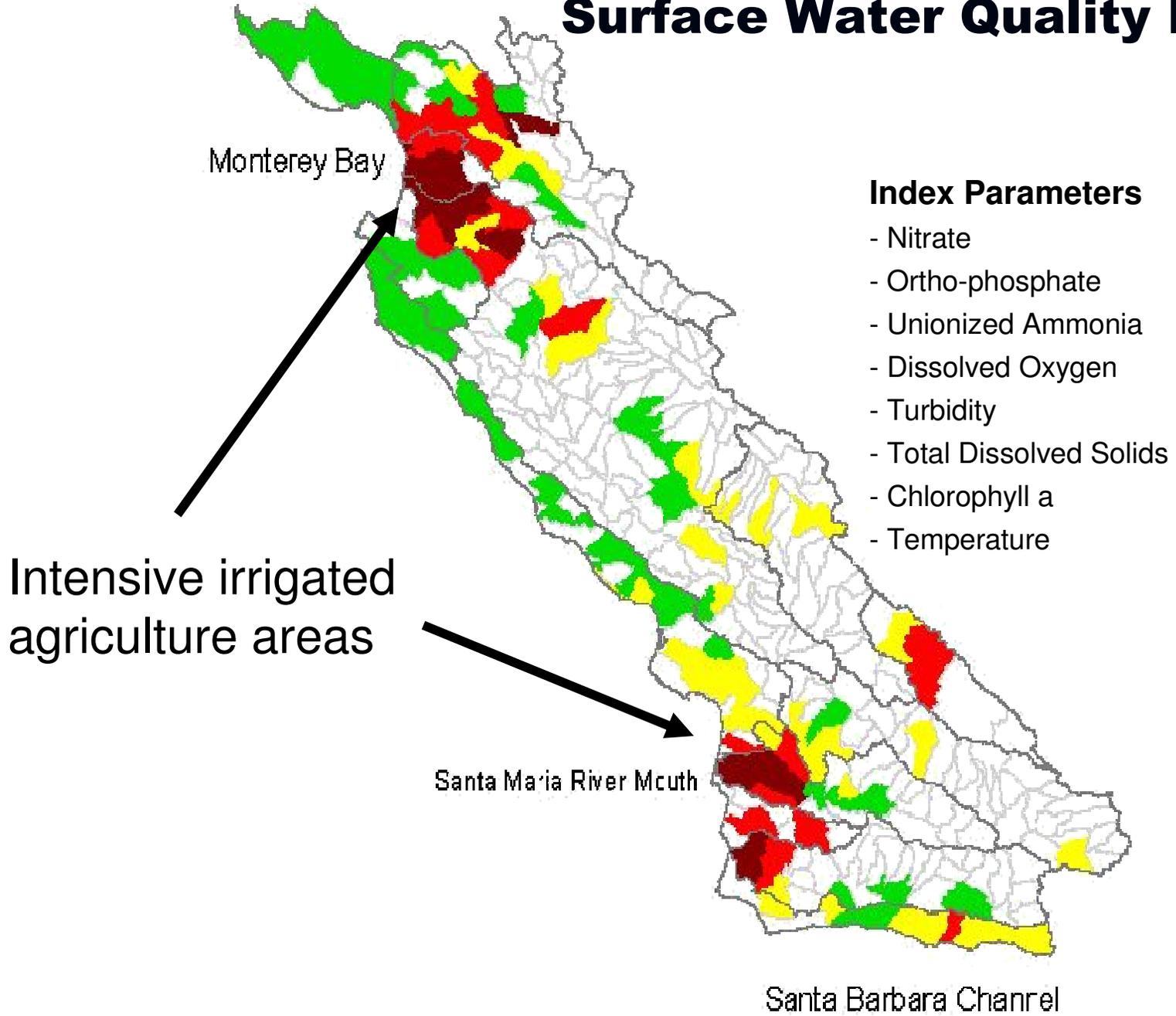
Quail Creek discharge to Salinas River
Chemical Plumes Damage Aquatic Life

Agricultural Pesticide Use

- Agricultural pesticide use in the Central Coast Region and associated toxicity are among highest in State.
- DPR Study*:
 - Salinas River area had highest % of study sites with pyrethroid detections (85%),
 - Highest % of sites exceeding toxic levels (42%), and
 - Highest rate of active ingredients applied (113 lbs/acre, three-fold compared to other locations)

* Statewide study included Salinas River, Sacramento Valley/Feather River, Northern San Joaquin Valley (NSJV), and Imperial Valley

Surface Water Quality Index



This is why we must renew the 2004 Conditional Waiver

Intent of the 2004 Conditional Waiver

1. The intent of this Conditional Waiver is to regulate discharges from irrigated lands to ensure that such discharges are not causing or contributing to exceedances of any Regional, State, or Federal numeric or narrative water quality standard.

16. Although time will be allowed, increased reporting and monitoring may be required in order to ensure that water quality is improving.

Building on the 2004 Conditional Waiver

2004 Conditional Waiver

Meet Water Quality Standards

File Notice of Intent

Farm Plan

-- irrigation management

-- pesticide management

-- nutrient management

-- erosion management

-- schedules to implement

Management Practice Checklist

Surface Water Monitoring

Education

Groundwater requirements

Backflow prevention

Annual compliance info - Online
entry form

2011 Order Tier 1

Tier 2 Minus:

Annual compliance info
- Online entry form

2011 Order Tier 2

Meet Water Quality Standards

File Notice of Intent

Farm Plan

-- irrigation management

-- pesticide management

-- nutrient management

-- erosion management

-- schedules to implement

~~Management Practice Checklist~~

Surface Water Monitoring

Education

Groundwater requirements

Backflow prevention

Annual compliance info - Online
entry form

2011 Order Tier 3

Tier 2 Plus:

Water Quality Buffer Plan

Individual Monitoring

Irrigation and Nutrient
Mgmt Plan

Time Schedules

Tier 1	Tier 2	Tier 3
500	1200	100
~ 21% Acreage, ~92,000 Acres	~25% Acreage, ~110,000 Acres	~54% Acreage, ~233,000 Acres

Annual Compliance Form

Section XI: Ranch Acreage Information

Total Irrigated Acres: Total Tailwater Acres Equals A + B:

Irrigation Discharge Type: (fill in all that apply)

A). Acres Discharging to Ditches or Any Other Type of Surface Discharge:

B). Acres Discharging to Tile Drains or Any Other Type of Sub-Surface Drainage System:

C). Acres Discharging to Pond(s):

Irrigation System Type(s): (check all that apply)

Micro-irrigation year round (drip and micro-sprinklers) and no pre-irrigation

Sprinklers used for pre-irrigation only and then micro-irrigation

Sprinklers used for germination or in the growing season

Surface irrigation systems (furrow and/or flood) throughout the growing season, at any point in time, and/or in combination with any other irrigation system type

Other:

Crop Type(s): (check and/or state for all that apply)

Row / Field (select specific crop(s) from drop down lists):

Vineyard Nursery Orchard Greenhouse

Specific Chemical Use: (check all that apply)

Diazinon Chlorpyrifos

Section XII: Waterbody Information

Is this ranch/farm adjacent to a waterbody: YES NO If YES, provide name of waterbody:

Additional waterbody name: Additional waterbody name:

Does a waterbody pass through or exist on this ranch/farm?: YES NO If YES, provide name of waterbody:

Additional waterbody name: Additional waterbody name:

Section XIII: Pesticide Permit Information [ADD ADDITIONAL OIN / SITE ID / PERMIT HOLDER](#)

Are pesticides applied on this ranch / farm? YES NO

If YES, are they applied under a Department of Pesticide Regulation Permit? YES NO

Operator Identification Number: - - Site ID:

(for Pesticide Applications on Ranch/Farm)

Name of Permit Holder: Site ID:

All Tier 2 and Tier 3:

- Date of completed Farm Plan
- Type and characteristics of discharge
- Identify direct agricultural discharges to a waterbody
- Specific practices completed, in progress, and planned (dates)
- Nitrate concentration of irrigation water
- Backflow prevention
- Description of method and location of pesticide use relative to surface water
- Nitrate Loading Risk factors and level
- Practice outcomes and effectiveness

Subset of Tier 2 and Tier 3:

- Photo monitoring
- Total nitrogen applied

Subset of Tier 3:

- Proof of Certified INMP and elements
- Water Quality Buffer Plan

Tiering Criteria

Misunderstandings

Growers must drill monitoring wells.

Groundwater sampling will cost tens of thousands per grower (Tiers 1-2 \$790, Tier 3 \$2,370, over life of permit).

Prohibition of tile drains; land will be fallowed.

Everyone has to have buffer strip of x feet. More land out of production.

Dischargers must meet 1 mg/l nitrate limit.

Conclusions and Recommendations

Severity

Evidence

Water Board authority, responsibility, accountability.

Solutions

Discharger accountability

The public right to clean water. No one has a right to pollute public waters.

Reasonableness

Urgency

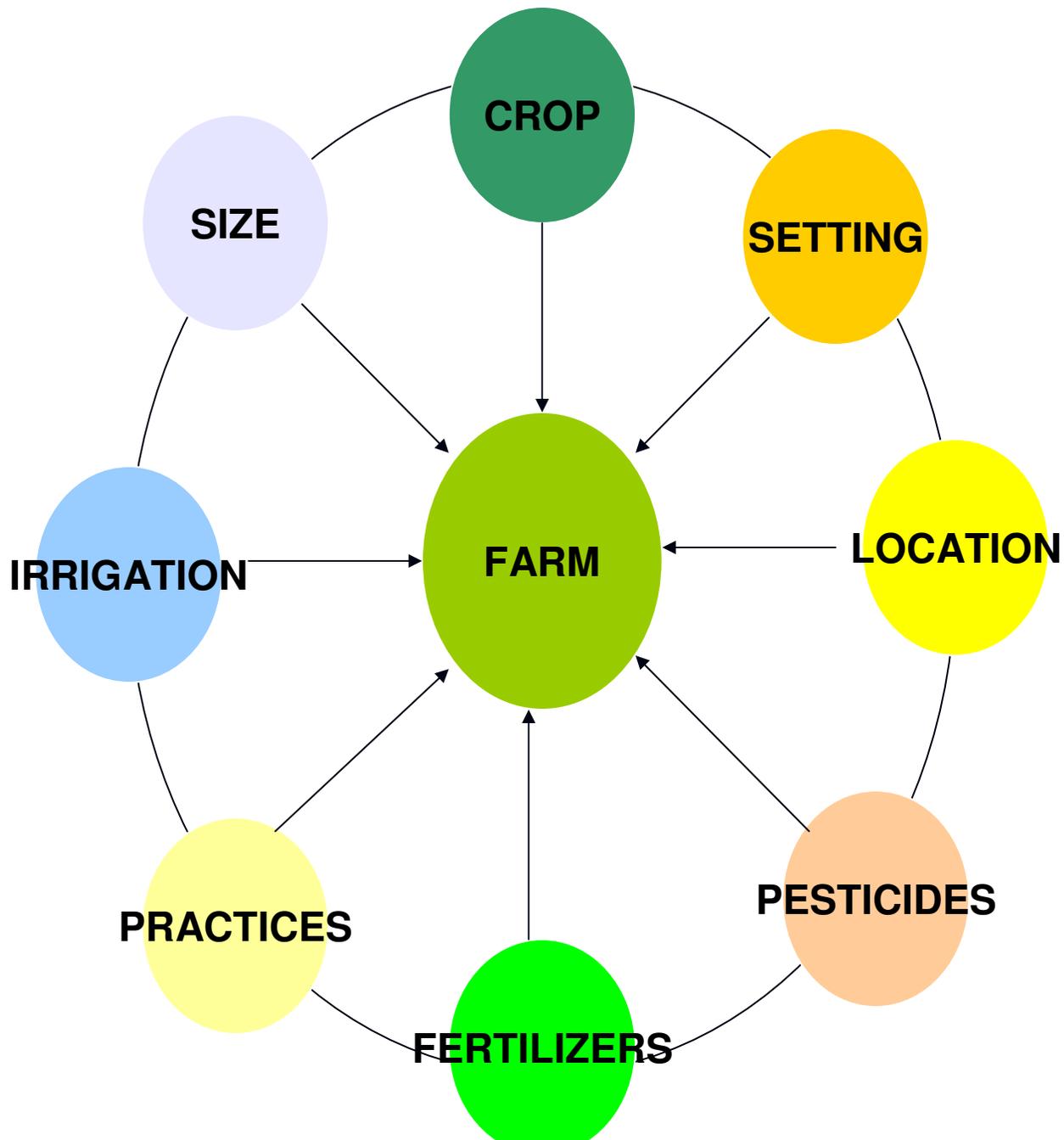
Recommendation:

Adopt the proposed Order and get on to implementation.

Draft Agricultural Order

Item 14
Central Coast Water Board Meeting
March 17, 2011

Angela Schroeter, Agricultural Regulatory Program



Central Coast Region

Surface Water
~17,000 Miles

Groundwater
~4000 Miles²

Irrigated Agriculture
~1700 Operations
~ 3000 Farms
~ 435,000 Acres

3 Tiers - Criteria

Crops known to have higher nitrate loading impacts

Chemicals known to cause pollution

Proximity to an impaired waterbody or public water system well

Discharge to toxic or pesticide impaired waterbody

Size of farm operation

Tier 1

- Does not use chlorpyrifos or diazinon, and
- Operation not located within 1000 feet of an impaired surface waterbody, and
- If growing crops with high potential to load nitrate to groundwater, then operation must be <1000 acres and not within 1000 ft of impacted public well

OR

- SIP Certified Vineyard

Tier 2

- Use chlorpyrifos or diazinon, or
- Operation located within 1000 feet of an impaired surface waterbody, or
- If growing crops with high potential to load nitrate to groundwater, then operation is <1000 acres and within 1000 ft of impacted public well

Tier 3

- Operation >1000 acres, and grows crops with high potential to load nitrate to groundwater; or
- Use chlorpyrifos or diazinon, and discharge to waterbody impaired for toxicity or pesticides;

How does the Draft Order evaluate threat to water quality and use tiers?

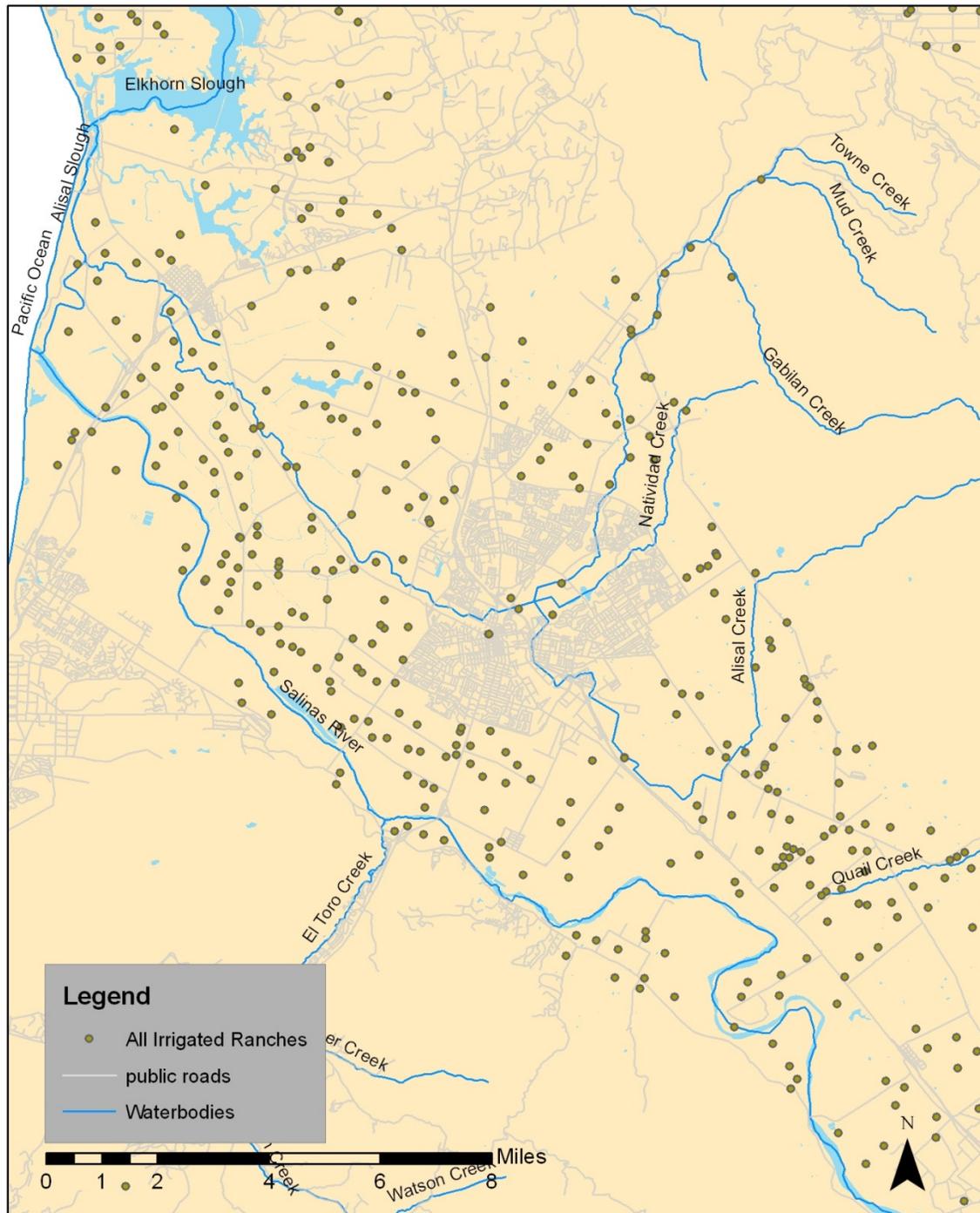
Salinas example:

- Toxicity and pesticides
- Operation and individual farm characteristics
- Water quality conditions
- Threat to water quality

**Numbers of farms estimated based on data from 2011 eNOI update.*

**Salinas –
360 Farms**



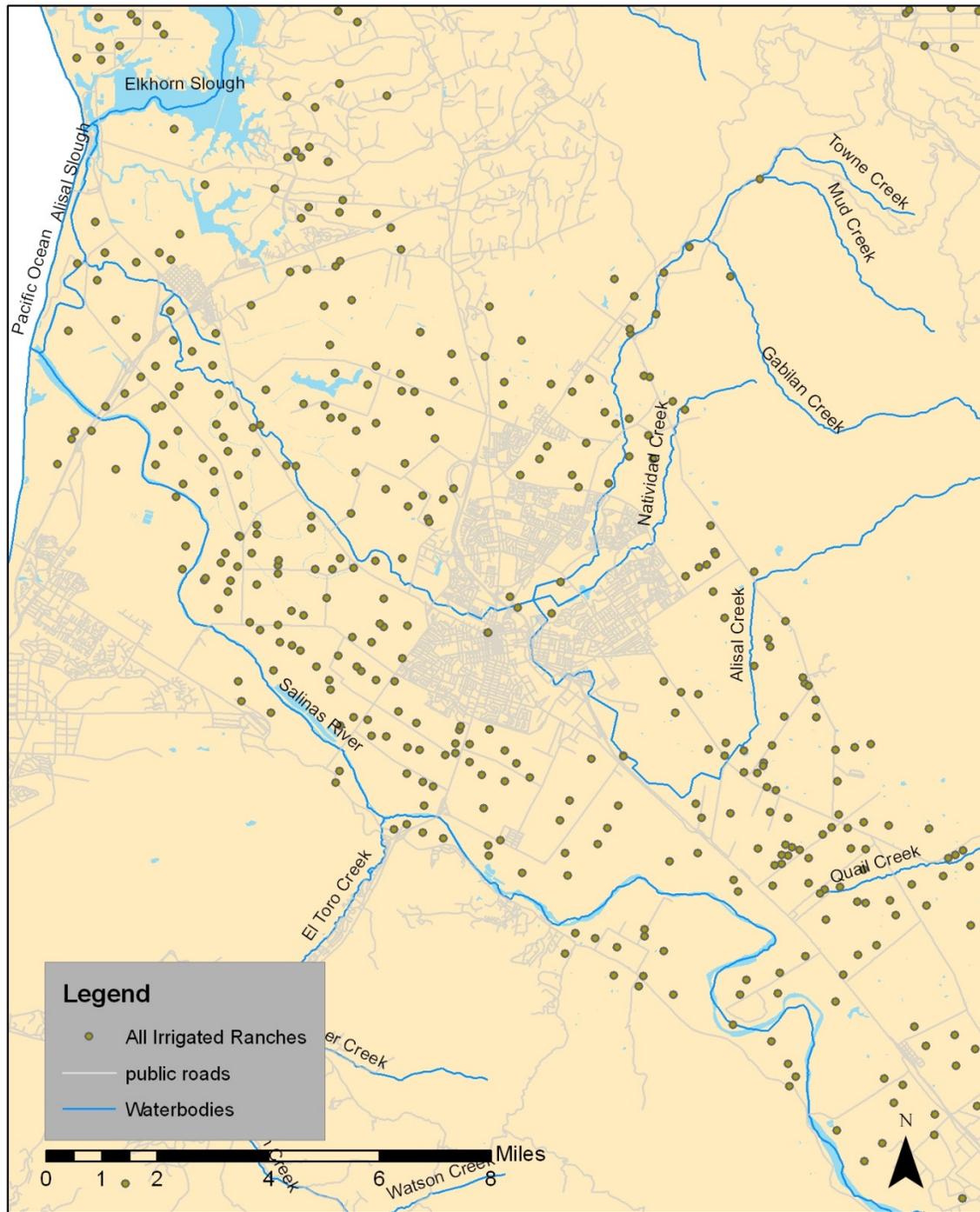


Salinas – 360 Farms

Requirement:
Minimize toxicity
and pesticide
discharges

Which farms pose
minimal threat to
water quality?

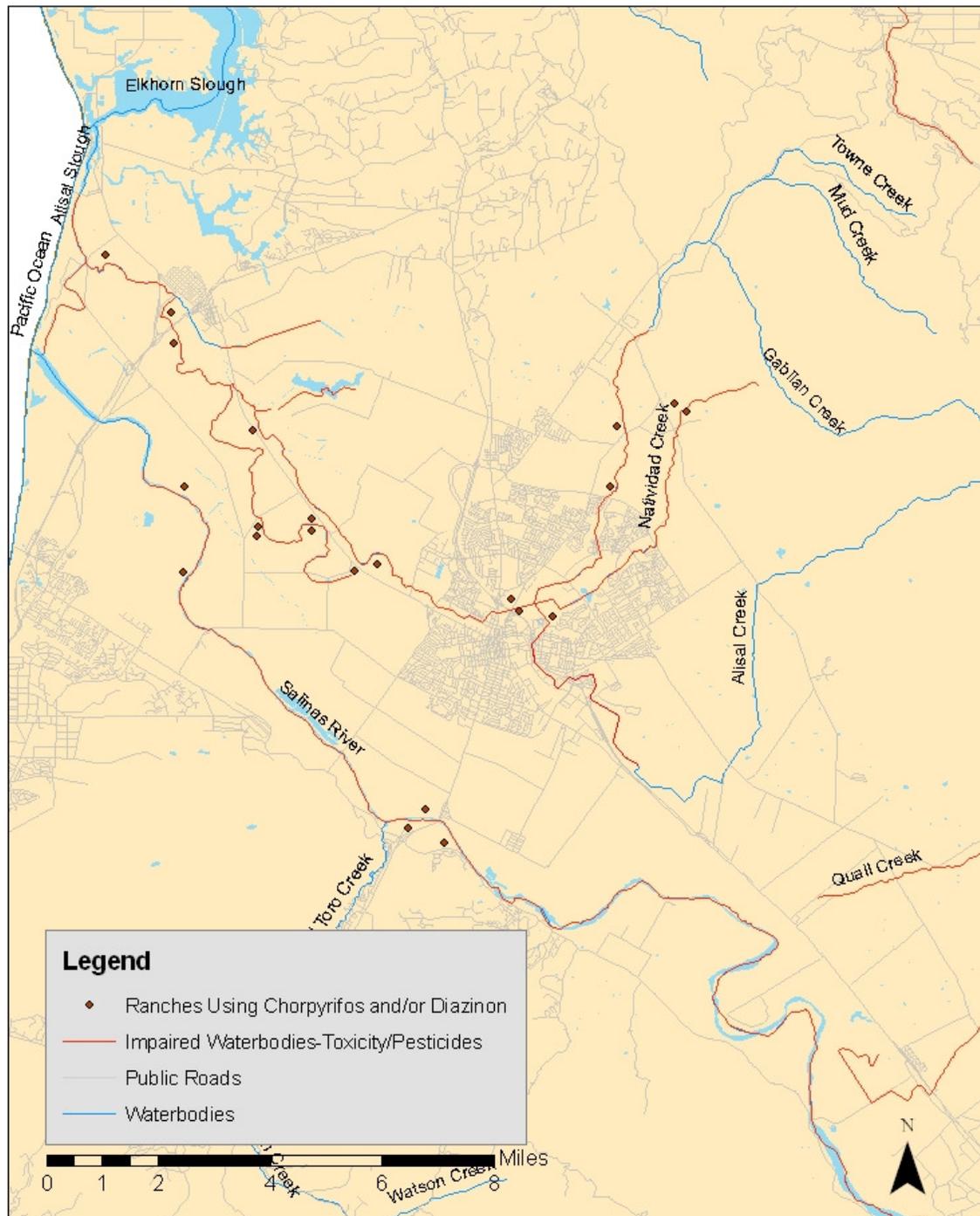
Which farms pose
increased threat to
water quality?



Salinas – 360 Farms

*Which farms are a
lower threat to
water quality?*

SIP certified?
0 Vineyards



Salinas – 360 Farms

Which farms apply pesticides?

360 Farms

Apply pesticides detected in surface water?

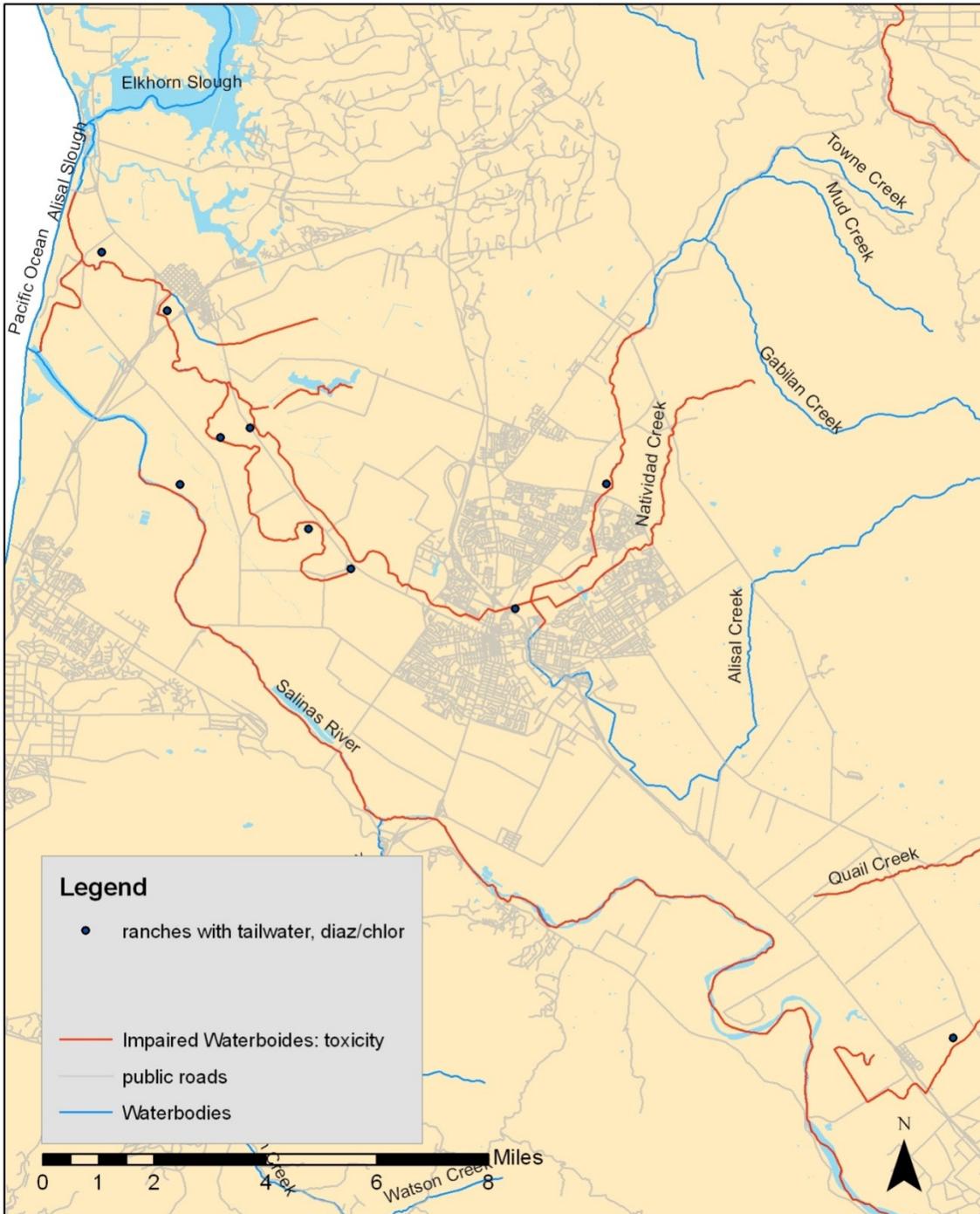
360 Farms

Apply pesticides that cause toxicity and impairment?

~170 Farms

Apply chlorpyrifos or diazinon within 1000 feet?

~22 Farms



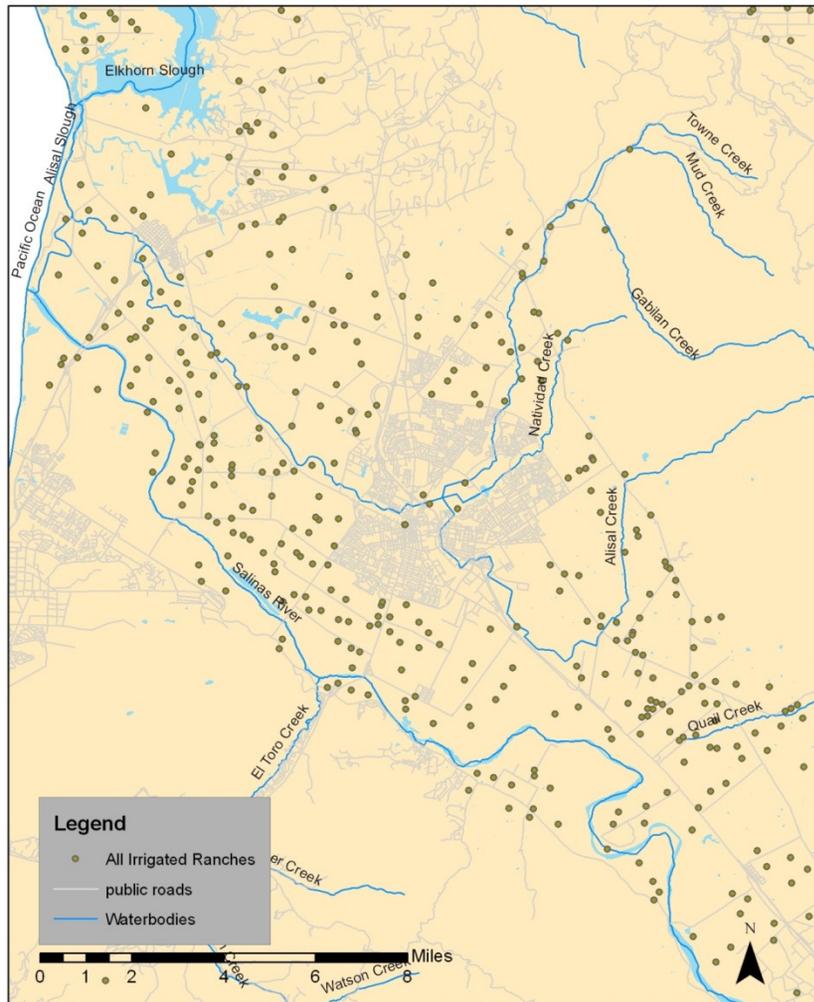
Salinas – 360 Farms

*Which farms apply
chlorpyrifos or
diazinon and drain
to a creek impaired
for toxicity or
pesticides?*

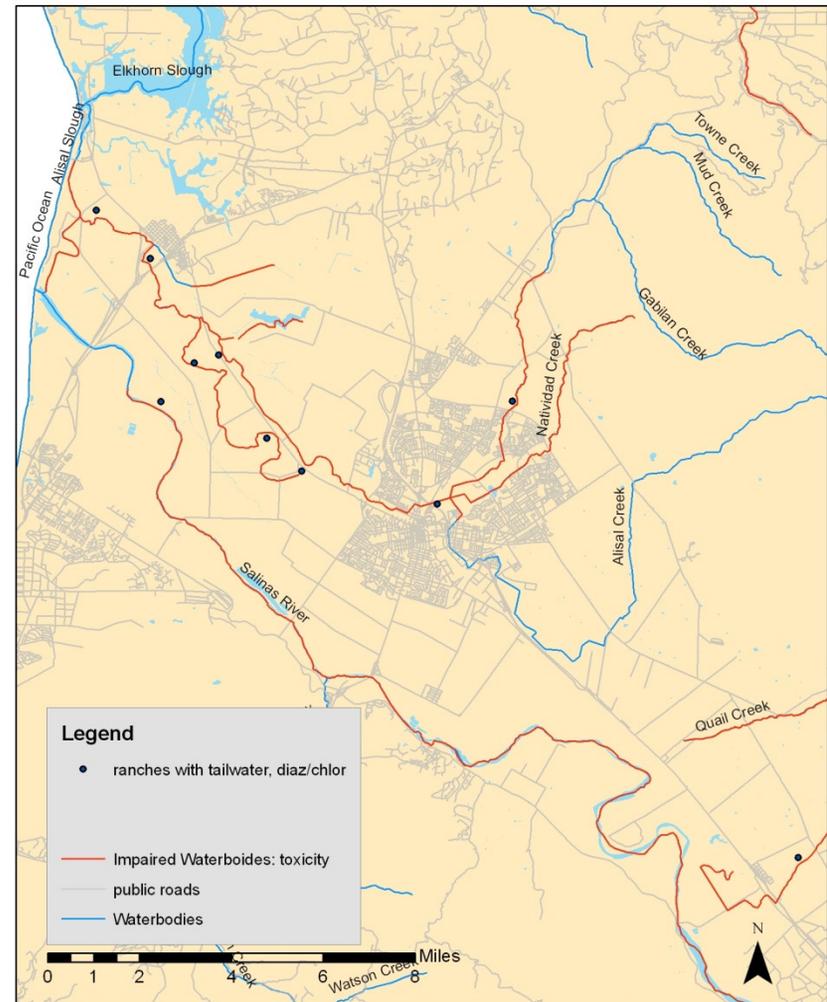
~10 Farms

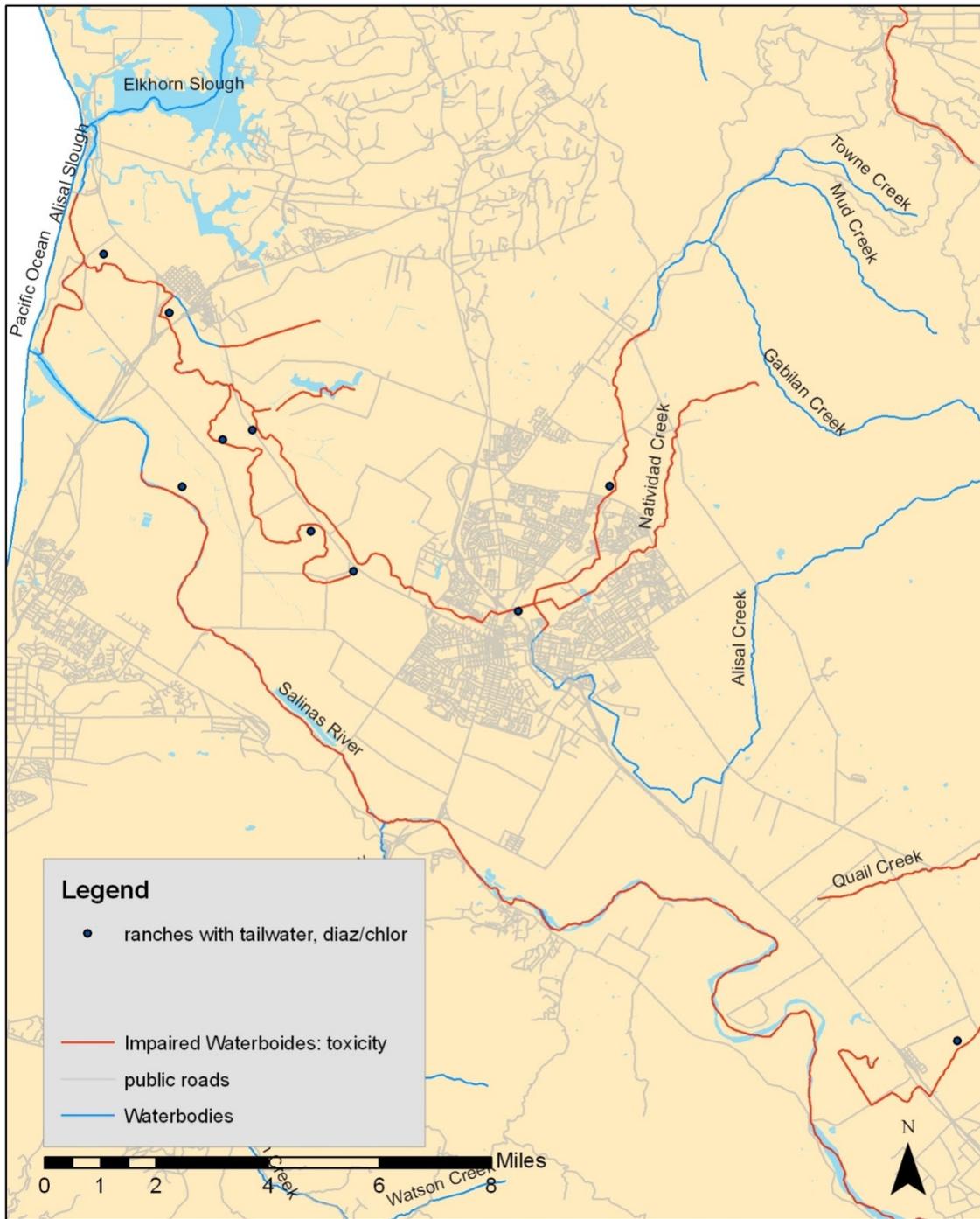
Salinas Example -

360 Farms



~ 10 Farms





Salinas – 360 Farms

(Toxicity / Pesticides)

SIP or apply lower risk pesticides
~ 151 Farms

Tier
1

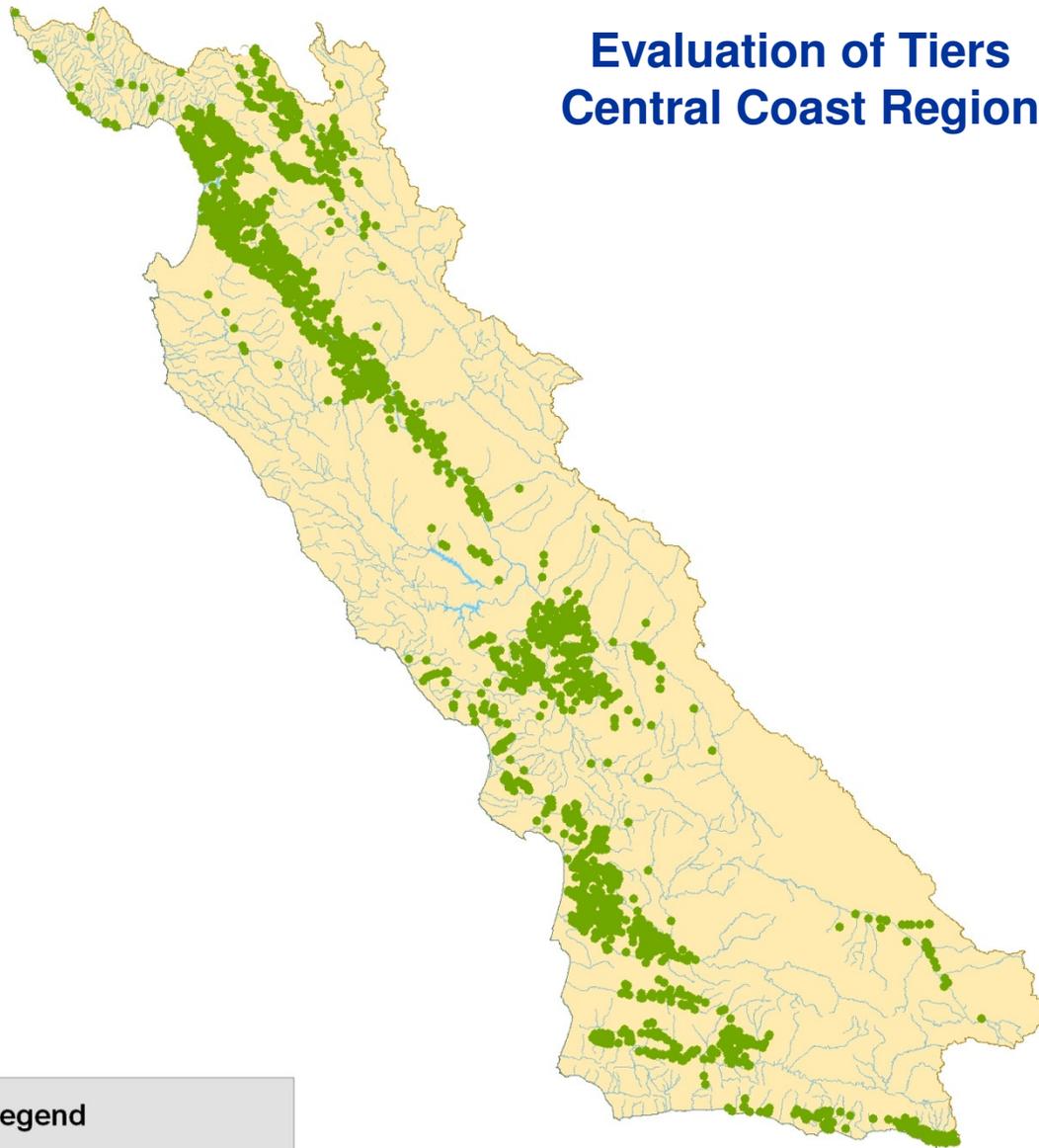
Within 1000 ft, apply pesticides that cause toxicity and impairment
~ 199 Farms

2

Apply chlorpyrifos or diazinon and drain to a creek impaired for toxicity or pesticides
~ 10 Farms

3

Evaluation of Tiers Central Coast Region



Legend

- All Irrigated Ranches
- Waterbodies

Tier 1

Minimal Threat

~ 500 Growers

~ 21% Acreage

~92,000 Acres

Tier 2

Moderate Threat

~ 1200 Growers

~25% Acreage

~110,000 Acres

Tier 3

Increased Threat

~100 Growers

~54% Acreage

~233,000 Acres

2011 Order Tier 1

Tier 2 Minus:

Annual compliance info
- Online entry form

2011 Order Tier 2

Meet Water Quality Standards

File Notice of Intent

Farm Plan

-- irrigation management

-- pesticide management

-- nutrient management

-- erosion management

-- schedules to implement

Surface Water Monitoring

Education

Groundwater sampling and reporting

Backflow prevention

Annual compliance info – Online entry form

2011 Order Tier 3

Tier 2 Plus:

Individual Monitoring

Water Quality Buffer Plan

Irrigation and Nutrient
Mgmt Plan

Time Schedules

Tier 3

Individual Surface Discharge Monitoring

- Irrigation and Stormwater Runoff
- Discharge Flow/Volume
- Temperature
- pH
- Electrical Conductivity
- Nitrate
- Chlorpyrifos / Diazinon
- Toxicity

Tier 3

Irrigation & Nutrient Management Plan

Subset of Tier 3 Operations – Farms with high nitrate loading risk

Purpose: Minimize nitrate loading to surface water and groundwater due to excess fertilizer.

Tier 3

Irrigation & Nutrient Management Plan

Approximately 30 Operations – Farm specific

- Certified by crop advisor
- Standard nutrient budgeting tools
 - Identify crop needs (nitrogen uptake values)
 - Report total nitrogen applied
 - Calculate nitrate balance ratios
- Report management practices implemented
- Estimate nitrate loading to groundwater
- INMP effectiveness
- Alternative – monitoring to evaluate nitrate loading

Nitrogen Balance Ratio Targets

Within 3 years:

1 → Multiple (triple or double) cropping systems
(e.g. vegetables)

1.2 → Annual crop
(e.g. strawberries)

$$\text{Nitrogen Balance Ratio} = \frac{\text{Total Nitrogen Applied}}{\text{Crop Needs}}$$

Is your N application program reasonable ?

In more than 100 lettuce fields monitored over the past decade ...

$$\text{Nitrogen Balance Ratio} = \frac{\text{Total Nitrogen Applied}}{\text{Crop Needs (120 - 140)}}$$

	Seasonal N application	
	Spring planting	Summer planting
High	392	306
Low	70	27
Average	215	152
Average of lowest 50% of fields	149	106
Average of highest 50% of fields	281	198

Staff overlaid nitrogen balance ratio info on graphic presented at the 2011 Irrigation and Nutrient Management Meeting and Cover Crop and Water Quality Field Day Presentations (UCANR)

Tier 3

Water Quality Buffer Plan

Subset of Tier 3 Operations – Farms that contain or are adjacent to waterbody impaired for sediment, turbidity, or temperature.

Purpose: Prevent waste discharge, comply with water quality standards, and protect beneficial uses in compliance with Order and Basin Plan.

Tier 3

Water Quality Buffer Plan

Approximately 10 Operations – Farm Specific

- Minimum 30 foot buffer
- Any increases in buffer width to prevent discharge of waste
- Schedule for implementation
- Maintenance provisions to ensure water quality protection
- Photo monitoring
- Alternatives - functionally equivalent

2011 Order Tier 1

Tier 2 Minus:

Annual compliance info
- Online entry form

2011 Order Tier 2

Meet Water Quality Standards

File Notice of Intent

Farm Plan

-- irrigation management

-- pesticide management

-- nutrient management

-- erosion management

-- schedules to implement

Surface Water Monitoring

Education

Groundwater sampling and reporting

Backflow prevention

Annual compliance info – Online entry form

2011 Order Tier 3

Tier 2 Plus:

Individual Monitoring

Water Quality Buffer Plan

Irrigation and Nutrient
Mgmt Plan

Time Schedules



EXTRA SLIDES

TIER 3 OPERATION

1300 ACRES – 3 FARMS

FARM #1
800 Acres
Lettuce

Tailwater

INMP
Ind Monitoring
Irrigation + Stormwater

FARM #2
200 Acres
Carrots

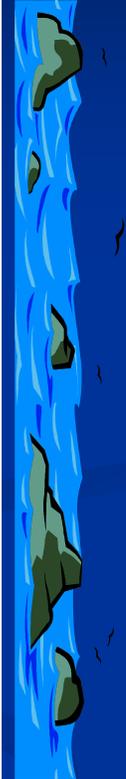
**No
Tailwater**

Ind Monitoring
Stormwater Only

FARM #3
300 Acres
Grapes

**No
Tailwater**

WQ Buffer Plan
Ind Monitoring
Stormwater Only



Public Input and Staff Responses

- **Process**
- **Input**
- **Alternatives**
- **Comments**
- **Responses**

Public Input Process

- **Fall 2008 - present**
- **2.5 years**
- **Numerous stakeholders**
- **Diverse interests**
- **Multiple events and meetings**

Table of Public Outreach Meetings

Summary of Input

- **Prioritize**
- **Human health, drinking water**
- **“One size does not fit all”**
- **Reasonableness**
- **Flexibility**

Options and Alternatives Compared

- **2004 Conditional Waiver**
- **OSR Enterprises**
- **Farm Bureau**
- **2011 Draft Order**
- **Environmental Organizations**
- **Feb 1, 2010 Preliminary Draft Order**

Farm Bureau Proposal

- **Changes to Order:**
 - **Added use of coalitions to assist individual growers comply**

- **Unworkable elements:**
 - **Monitoring and Reporting**
 - **No indicators to show control of waste discharges**
 - **No indicators to show pollution reduction at individual farm level**
 - **No reporting results of groundwater monitoring**
 - **No reporting results of *optional* individual discharge monitoring**

 - **Time Schedules**
 - **Milestones**

Draft Order Milestones

- **General Condition**
 - **Meet WQ standards**
 - **Protect beneficial uses**
 - **Prevent nuisance**
- **Specific Conditions**
 - **Control Discharges**
 - **By specific dates**
 - **Nutrients controlled by October 1, 2015**
- **Milestones**
 - **Indicators of Conditions**
 - **Indicators of water quality improvement**

Milestones Compared

Draft Order

- Receiving water
- Individual discharge-pollution reduction
- Farm nitrate loading to GW
- Greater water quality improvement
- Shorter timeframes

Farm Bureau Proposal

- Receiving Water
- NO Individual discharge
- NO GW
- Less water quality improvement
- Longer timeframes

Comparison of Milestones, Applied

10% Load Reduction = 10% Concentration Reduction,
if flow stays the same

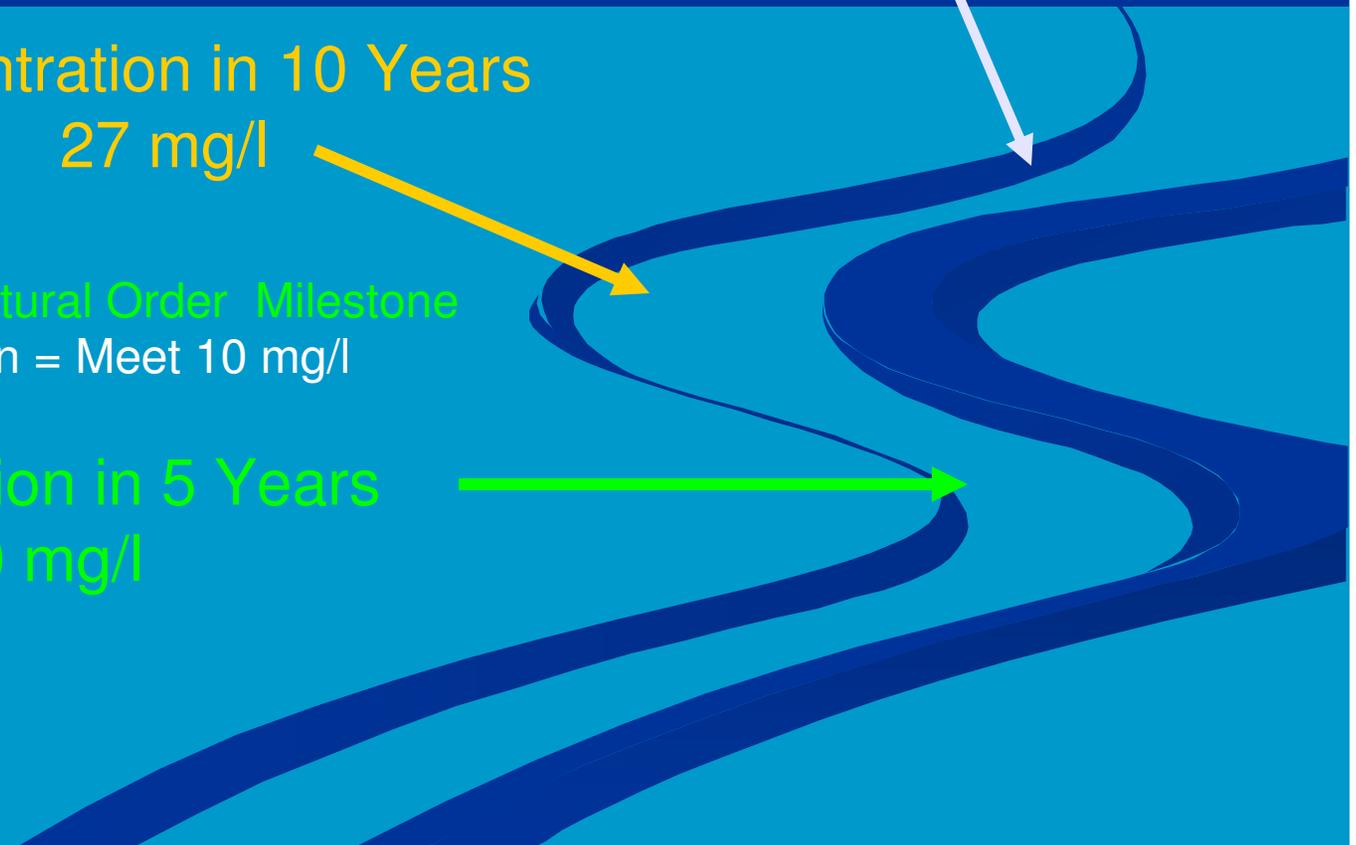
Current Nitrate Concentration
30 mg/l

Farm Bureau Milestone
10 % reduction = 3 mg/l reduction

Concentration in 10 Years
27 mg/l

2011 Draft Agricultural Order Milestone
67% reduction = Meet 10 mg/l

Concentration in 5 Years
10 mg/l



<u>2011 DRAFT AGRICULTURAL ORDER</u>	<u>FARM BUREAU PROPOSAL</u>
MILESTONE -- TIMEFRAME	MILESTONE -- TIMEFRAME
NITRATE- SURFACE WATERS	
Drinking water quality standard, 10 mg/l NO3-N -- 5 years	Decrease nitrate loads from current CMP sites by 10% -- 10 years
Load reduction in individual discharge, 50% -- 2 years	
Load reduction in individual discharge 75% -- 3 years	
NITRATE- GROUNDWATER	
Drinking water quality standard, 10 mg/l NO3-N -- 5 years	
Nitrogen loading to groundwater, annual load reduction -- 3 years	

Environmental Alternative

- **Like Feb. 1, 2010 Prelim Draft Order**
- **“More protective of water quality”**

- **Monitoring requirements**
- **Increased erosion and sediment control**
- **Riparian area protection**
- **Clarification**

Public Comments and Responses

- **116 letters**
- **All stakeholder groups**
- **Comments focused on:**
 - **Tiering criteria**
 - **Drinking water impacts**
 - **Groundwater protection**
 - **Monitoring**
 - **Legal issues**

Tiers and Tiering Criteria - Response to Comments

- **Added proximity to public water supply wells**
- **Changed re: pesticide use**
 - **Deleted size**
 - **Replaced “adjacent to” with “discharge to” to impaired water**
 - **Added EO will add pesticides based on new information**
 - **Added Sustainable In Practice Certification for Tier 1**

Drinking Water and Groundwater - Response to Comments

- **Reduced frequency of
sampling**
- **Clarified gw level
measurement**
- **Reduced time for backflow
prevention devices-
3 years to 1 year**

Monitoring- Response to Comments

- **Removed parameters
from surface water**
- **Changed toxicity test for
individual discharge**
- **Separated MRPs for each Tier**

Legal Issues- Response to Comments

- Clarified law re: confidential info
- Deleted prohibitions
 - e.g., use of excess fertilizer
- Changed prohibitions to conditions
 - e.g., cover bare soil to prevent sediment discharge
- Clarified time and requirements to meet water quality standards

In Summary

- Options
- Alternative proposals
- Hundreds of comments

- **LOTS OF CHANGES**