

# Nitrogen Management Plan Approach

Nitrogen Tracking & Reporting System Task Force

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**East San Joaquin  
Water Quality Coalition**

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Executive Director



# Coalition Overview



- In operation since 2003
- **3,950 Landowner / operators**
- **706,336 irrigated acres**
  - Madera, Merced, Stanislaus, Tuolumne, Mariposa counties
- *We manage group permit for our members*

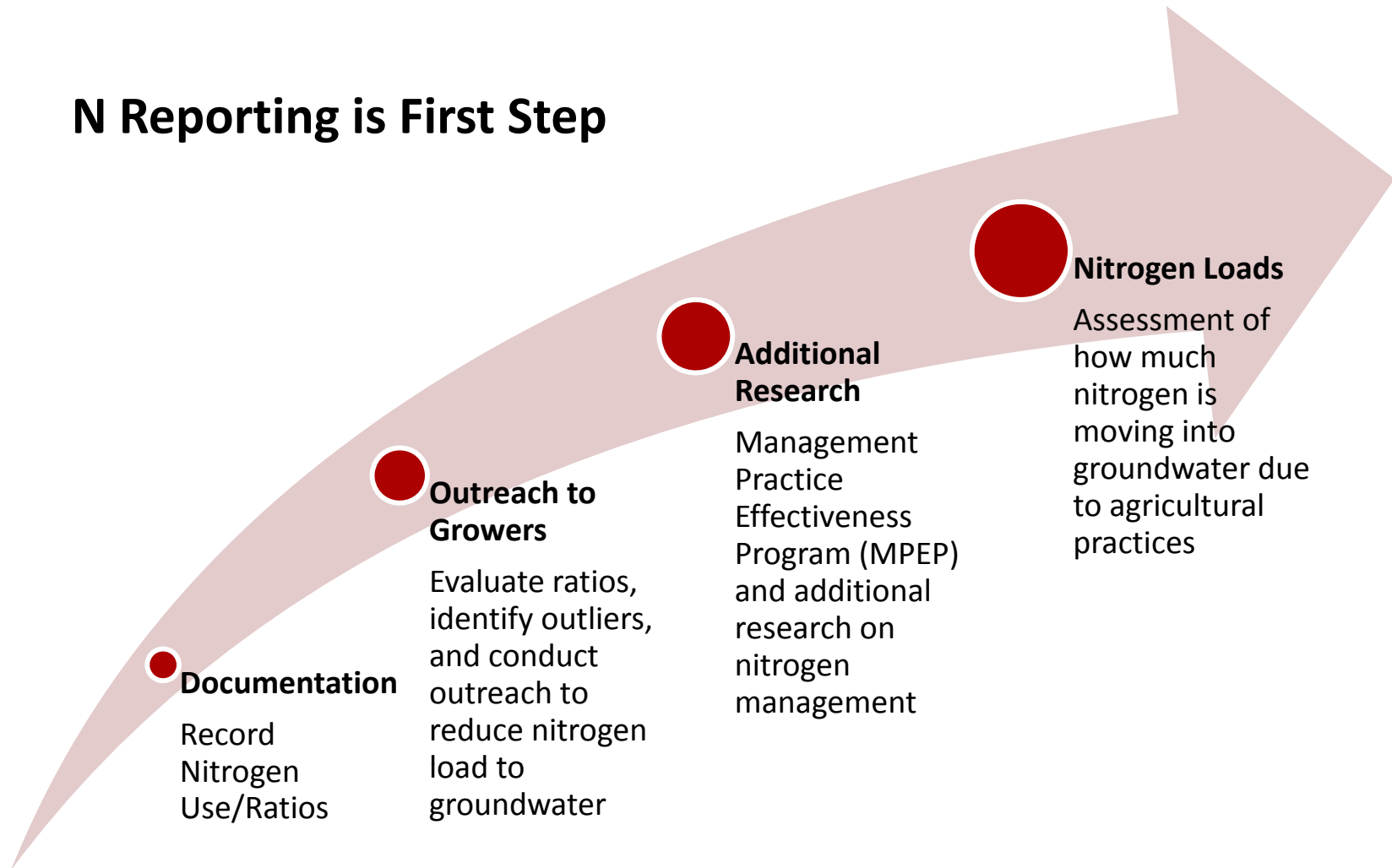


# Take Home Message

- Created a reporting approach that is *hopefully* workable
  - Spent two years developing *a proposed* nitrogen use reporting system with cooperation from growers, watershed coalitions and commodity groups
- Compliance with Irrigated Lands Regulatory Program, WDR R5-2012-0116
  - WDR General Order for the Growers Within the Eastern San Joaquin River Watershed that are Members of the Third Party
- Substantial step toward answering questions about nitrogen loading due to irrigated agriculture

# Long Term Goal

## N Reporting is First Step



# Purpose / Expected Outcome

- Purpose is working toward improvements in nitrogen management (when/if needed)
  - Focuses on crop uptake – not total applied
  - Helps growers understand their use in context with like crops
  - Helps to identifies “outliers”

## **Outcome**

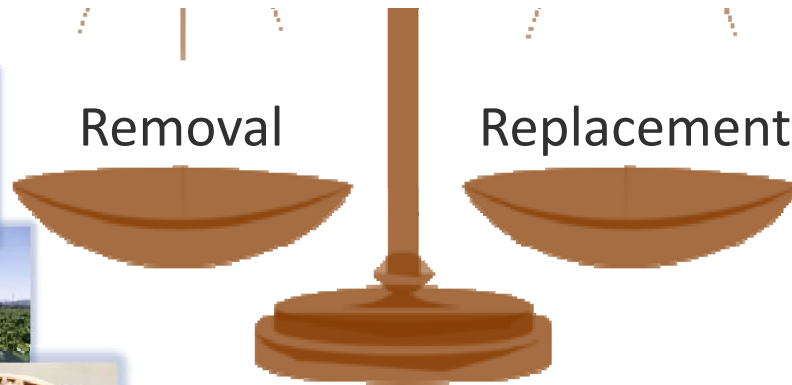
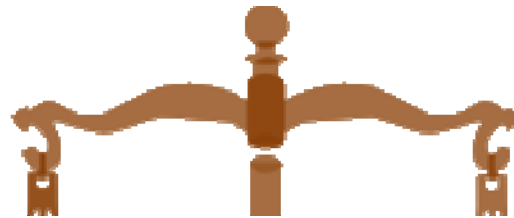
- Better management of nitrogen as information is developed leading to improved groundwater quality

# Reporting Process

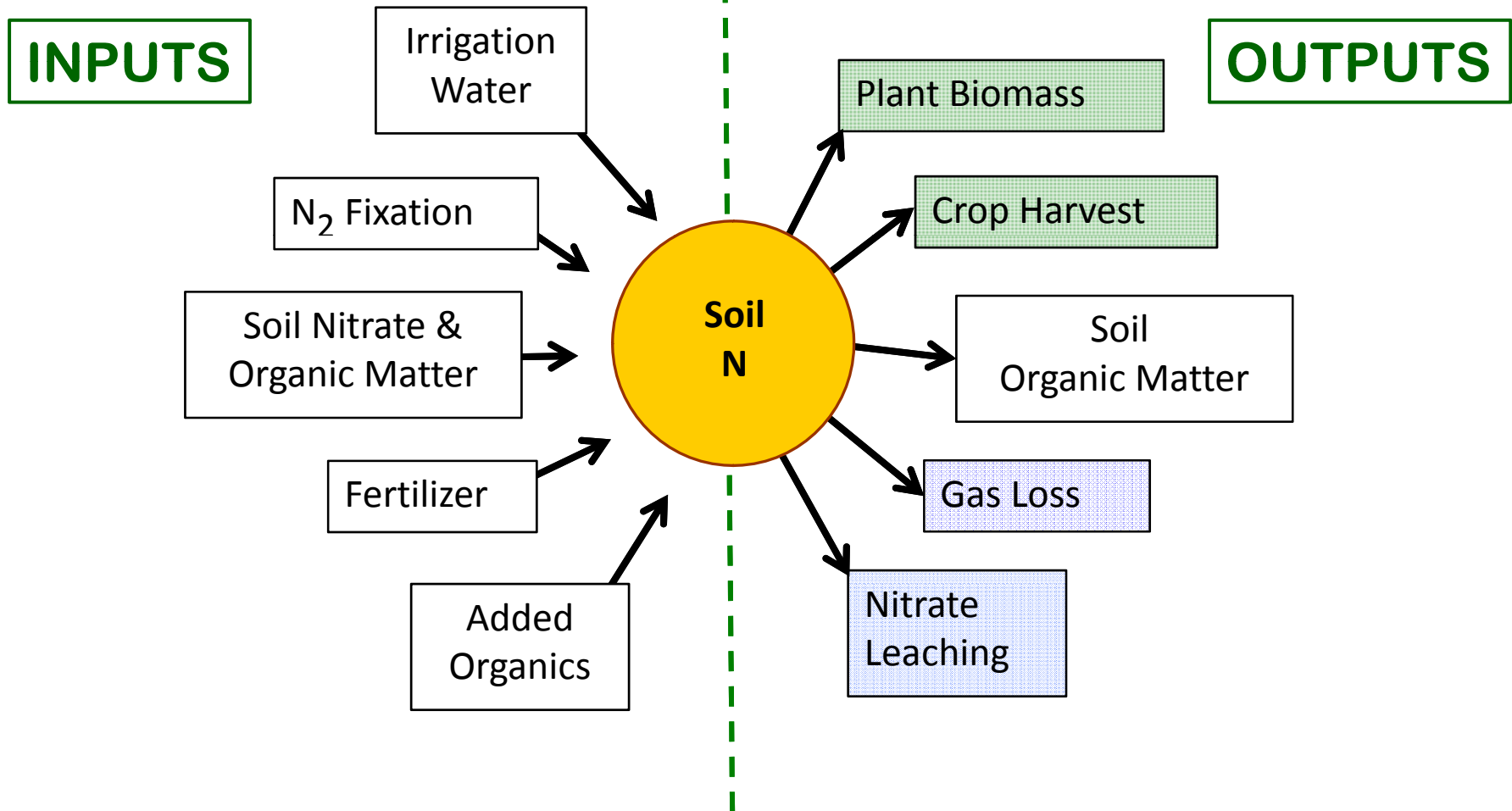
- Coalition members fill out annual Nitrogen Management Plan Worksheet on a field by field basis
  - Data gathered either electronically or paper reporting
- Coalition records ratio for each field and associates with Assessor Parcel Number (APN)
- Ratio associated with a specific field and crop
- Ratios compared using box and whisker plots on a crop by crop basis; outliers identified
- Coalition reports ratios by Township to Regional Board
  - Order specifies grouping by commodity, similar practices and similar soils
- Outreach focuses on selected members and their practices
  - Not on generating useless information (total applied per acre)



# Nitrogen ... a simple matter of balance?



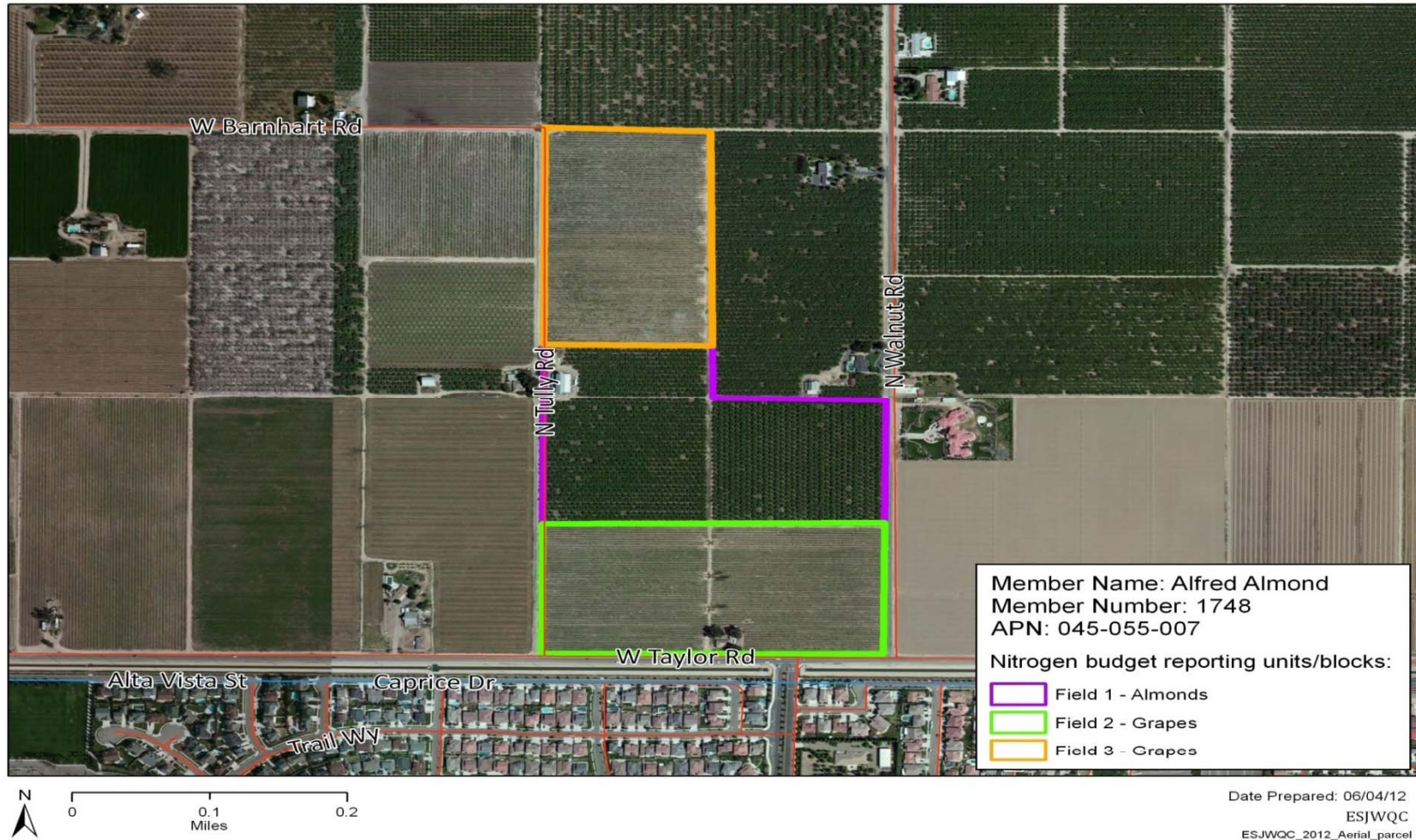
# Reality: Agricultural Nitrogen Management Challenge



Many processes are variable, uncontrollable or poorly predicted



# Scale - Individual Farm Map



## Nitrogen Management Plan Worksheet

Crop Year 2012

Member ID# 1234

APN: 111-00-222

Owner/mgr Joe Almond

Field # A, B, C

CROP NITROGEN DEMAND Crop Nitrogen Needs / Uptake	NITROGEN APPLICATIONS AND CREDITS		
		Recommended N	Actual N
Crop	Total N applied to field (lbs/ac)		
Almonds			
Expected yield (Lbs of production/ acre)	<i>Nitrogen fertilizers</i> (conventional and organic)		
3000 lbs / ac	Dry & Liquid Fertilizers	100	105
Nitrogen Crop Needs to meet expected yield (lbs of Nitrogen per acre)	Foliar N fertilizers	100	90
250	Other N fertilizers	0	0
Total Acres	Organic Material N (manure, compost, etc.)	10	0
178		5	5
	Other N containing materials		
	TOTAL N APPLIED (per acre)	215	200
	<i>Soil Nitrogen Credits</i>		
	Nitrogen from previous legume crop	0	0
	N residual from manure applications	5	5
	Soil organic matter mineralization	5	5
	Nitrates in irrigation water (annualized)	50	50
	TOTAL N CREDITS (per acre)	60	60
	Total N Credits and Applications:	275	260
	Crop N needs:	250	250
	Balance	25	10
	Ratio	1.100	1.040

# Reporting Elements

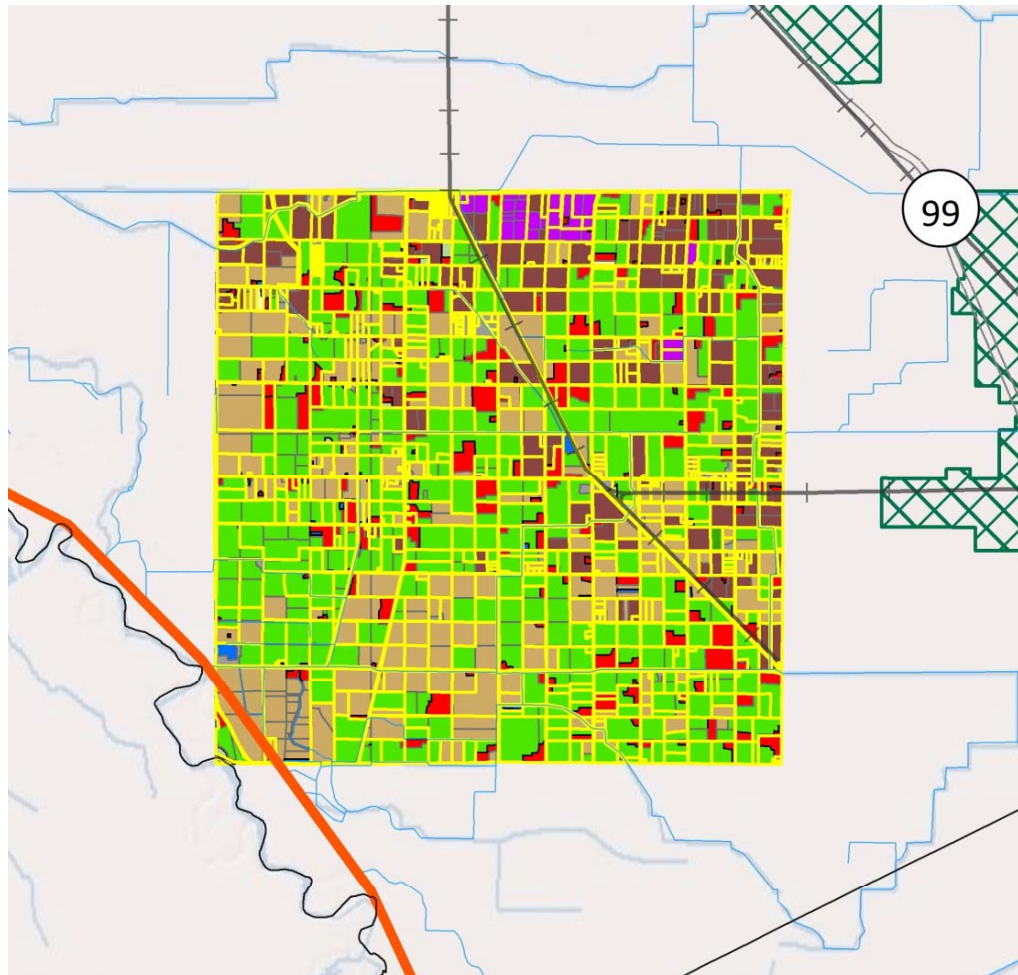
- Nitrogen Worksheet kept on farm
- Summary information submitted to coalition
  - Member ID, APN, field, crop, acres
    - Nitrogen Applied
    - Nitrogen Crop Uptake
    - Ratio:

Nitrogen Applied  
Nitrogen Uptake



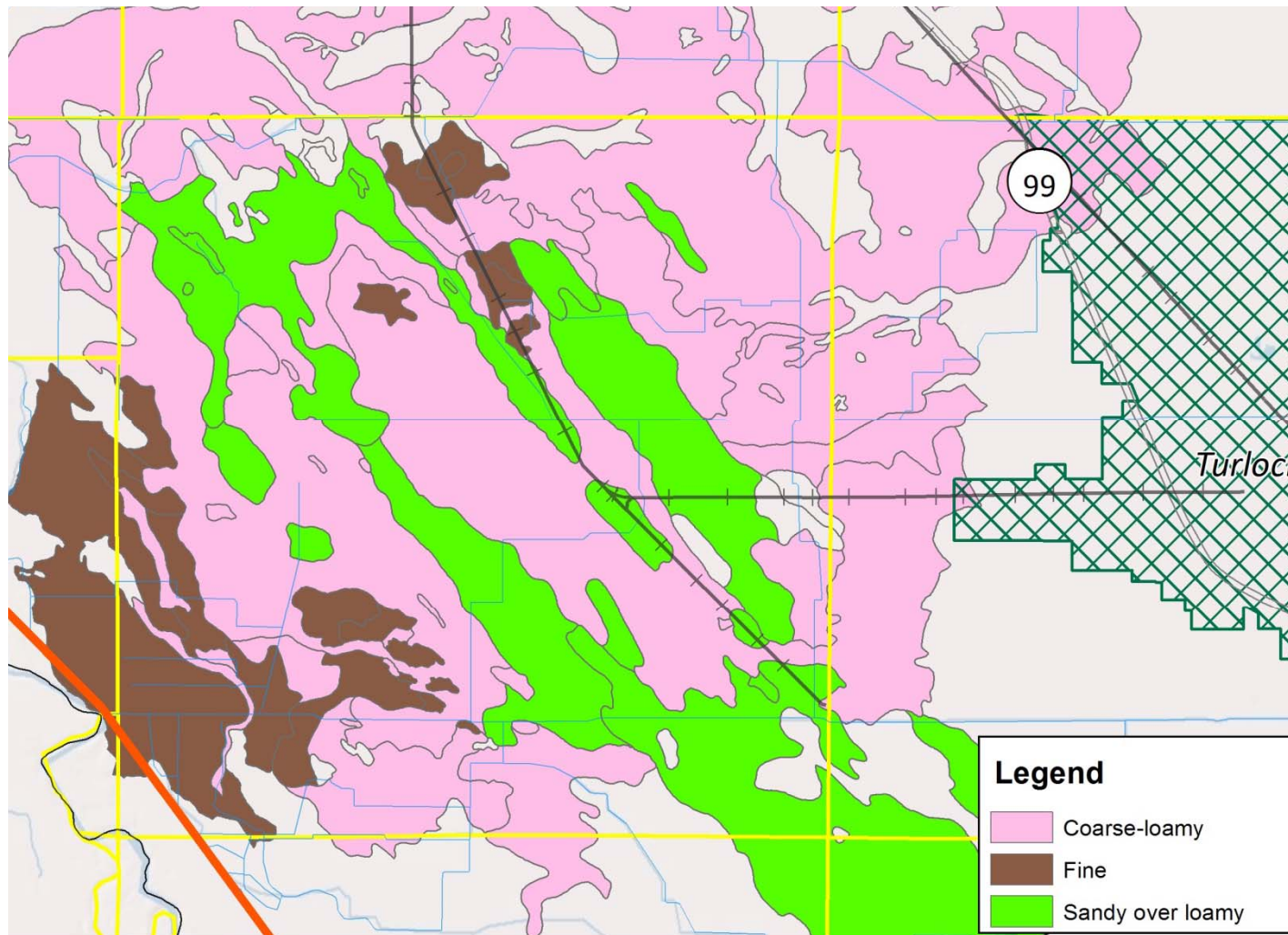
# Township Map

Stanislaus County Example: 23,040 acres





# Stanislaus County Example: Soil Profile



# Township Data Summary

## Stanislaus County example

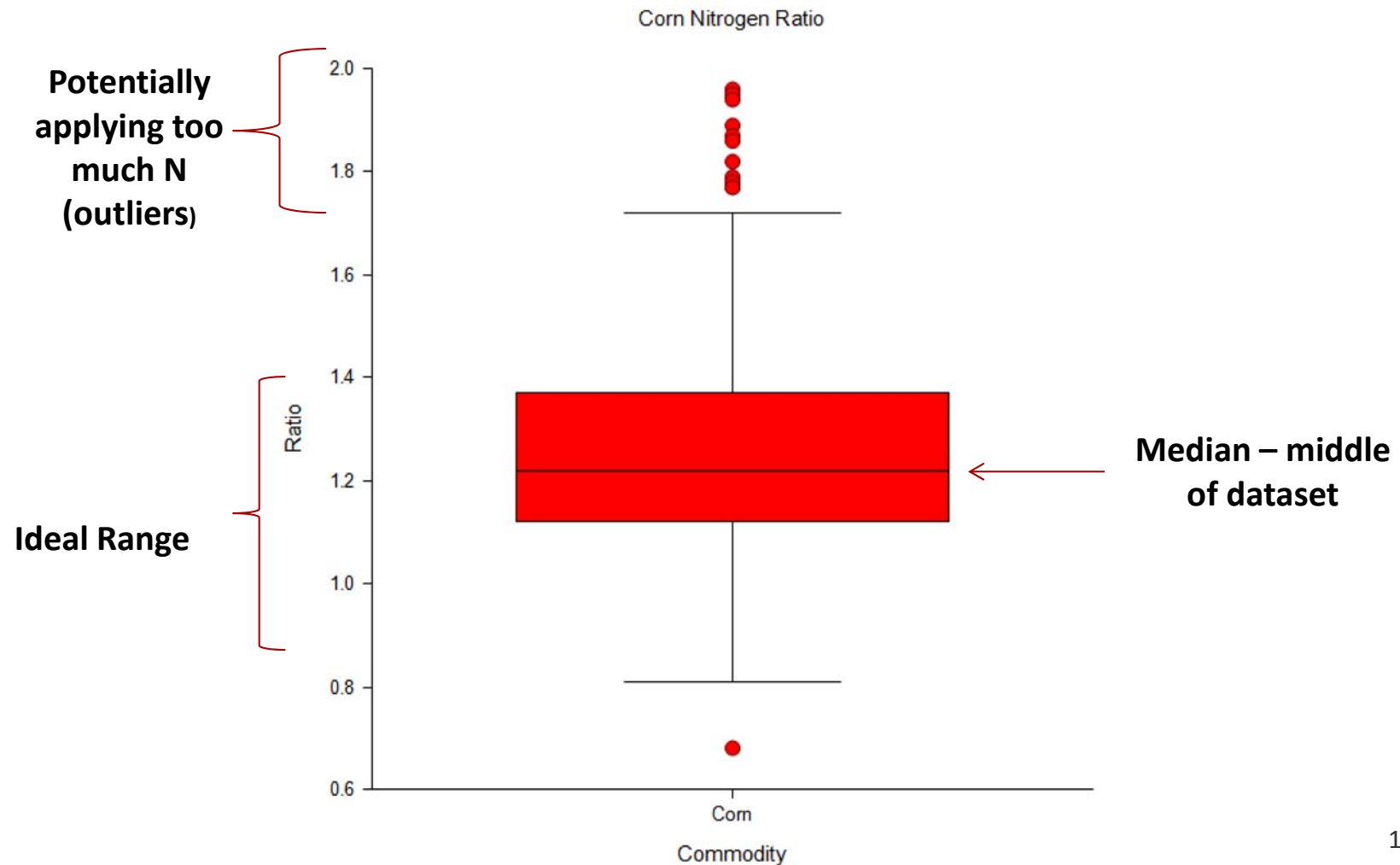
- Total acres: 23,040 acres
  - Irrigated: 20,210
  - Non Irrigated: 2,830
- Number of Members: 137
- Number of APNs: 304
- Number of Fields (Estimated): 286



# What the township report should show

- Where most growers are with nitrogen ratios
- The “Outliers”: those who apply too much
- Outliers focus of outreach with commodity specific information/references
- Ratio not meant to be a regulatory end point at this time

# Box and Whisker Plot Visual



# Benefits and Challenges

## Benefits

- Ready for implementation
- Ratio
  - Captures both replacement and removal in one number
- Vetting shows support from multiple groups
  - Fertilizer suppliers, commodity groups, coalitions
  - Believe to be reasonable approach
    - (Resigned acceptance)
  - Not developed as regulatory endpoint

## Challenges

- Refining crop consumption number
- Rates don't take into account all variables
  - For example:
    - Soil conditions
    - Weather
    - Irrigation system
    - Applied water
- Reflects mass loading but is not absolute loading

# Waste Discharge Requirements

## Irrigated Lands Regulatory Program

### Management Practice Effectiveness Studies

- **Confirm that management practices implemented to improve groundwater quality are working**
- Are agricultural management practices protective of groundwater?
- Modify practices if needed

*Proposing* coordinated effort by coalitions/commodity groups to complete

- Share expense across Central Valley
- Coalition to present Water Board with phased approach
- CURES USDA project to be starting point for approach
  - Literature search
  - Interview experts in field

# Economic Costs / Impacts

## Cost to Coalition

- Development of online tools
  - In house data entry from paper reports
  - Online data submittal software
- Reporting to Regional Board
- Outreach to growers
- Database Management

## Cost to Grower

- Increased dues
- Certification by CCAs
  - Growers time to complete certification (if pursued)
- Grower time to complete paperwork
- Possible change of management practices
- Reduction in nitrogen applications (potential)

***Reporting approach allows growers to comply with order in a cost effective manner while supplying necessary information to assist with the prioritization of outreach and effectiveness studies necessary to reduce loading of nitrogen to groundwater.***