

Nitrogen Management Plan Approach

Nitrogen Tracking & Reporting System Task Force

August 26, 2013

**East San Joaquin
Water Quality Coalition**

Parry Klassen
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*

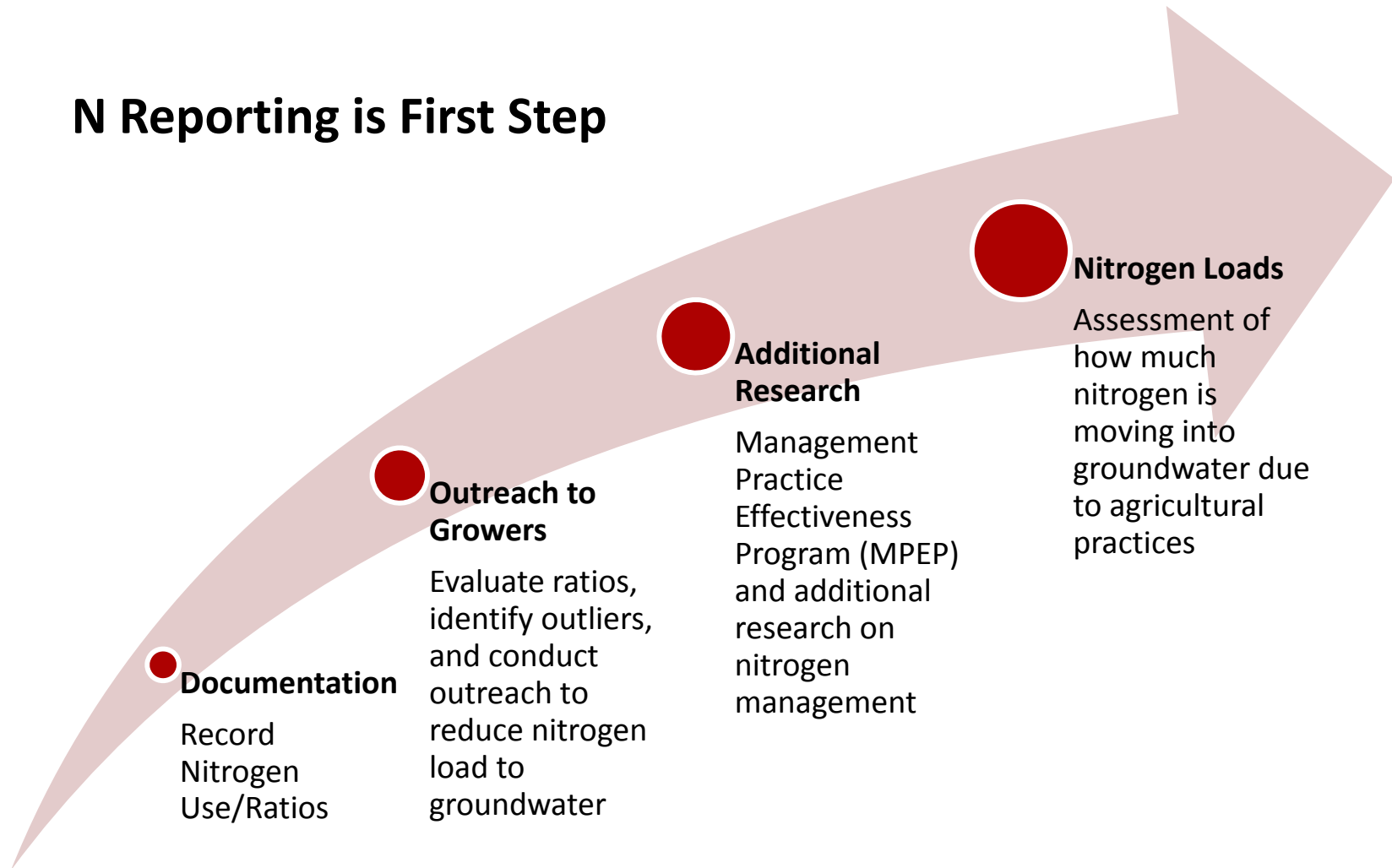


Take Home Message

- 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”

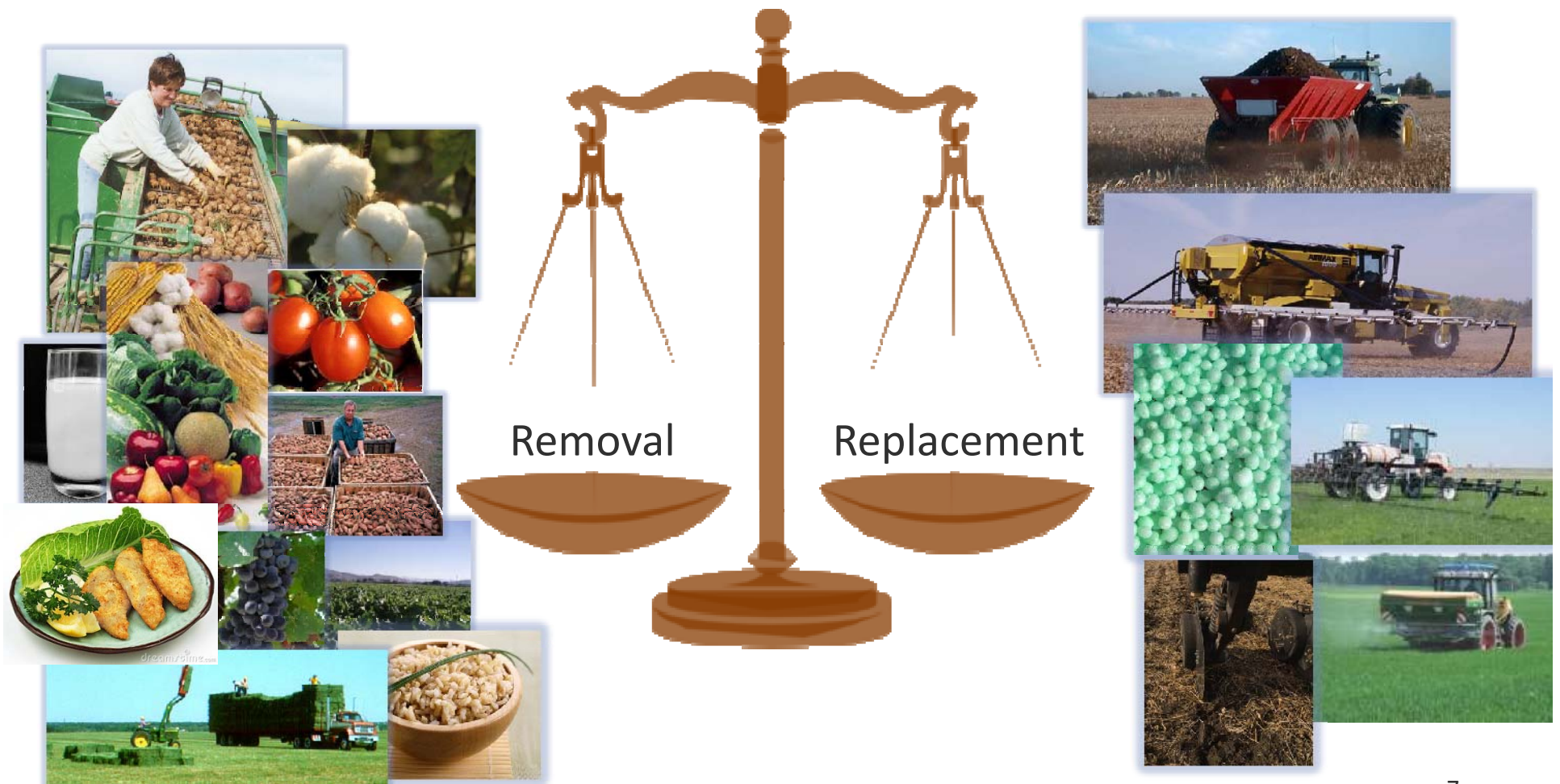
Outcome

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

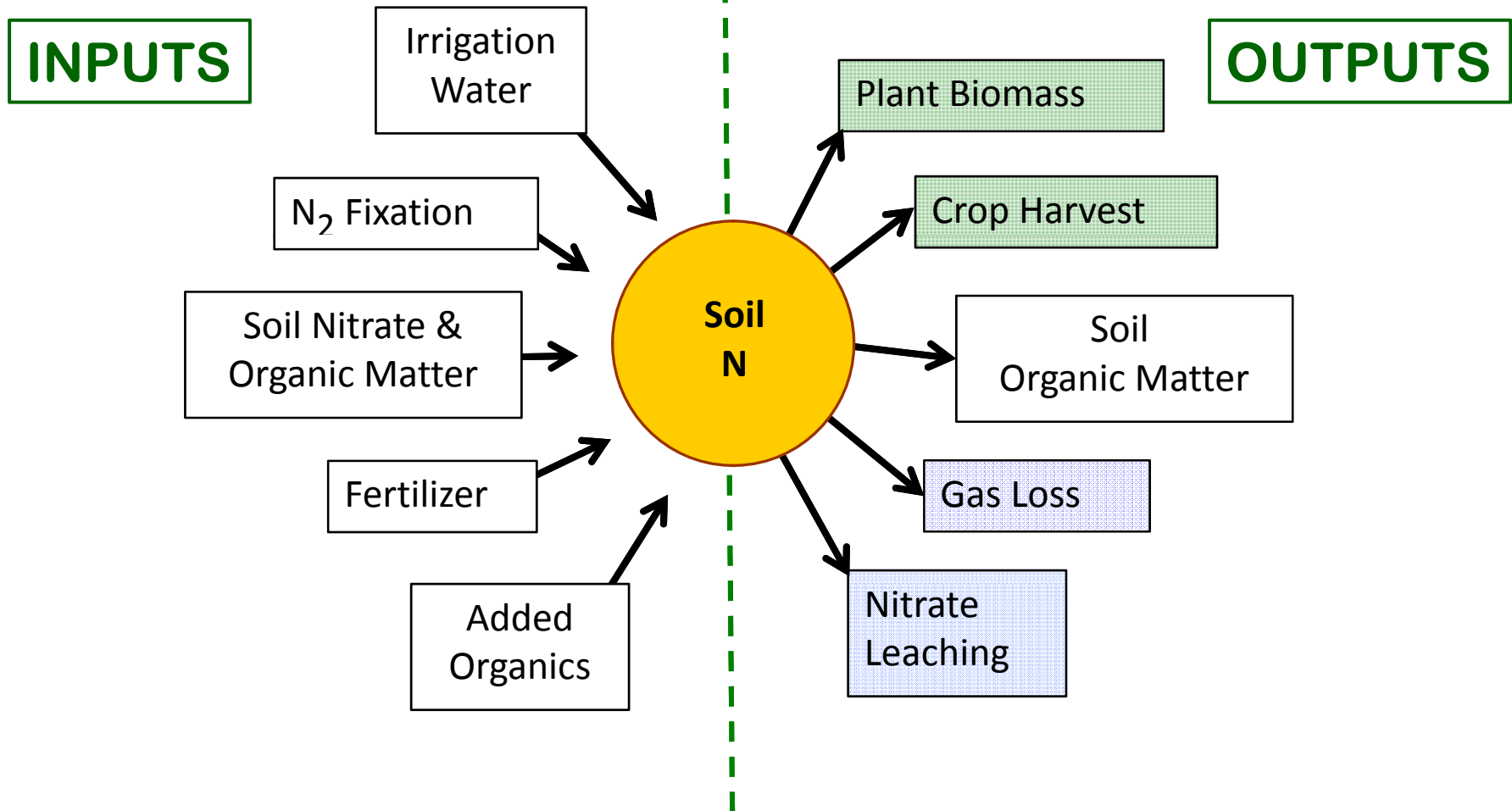
Reporting Process

- 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?

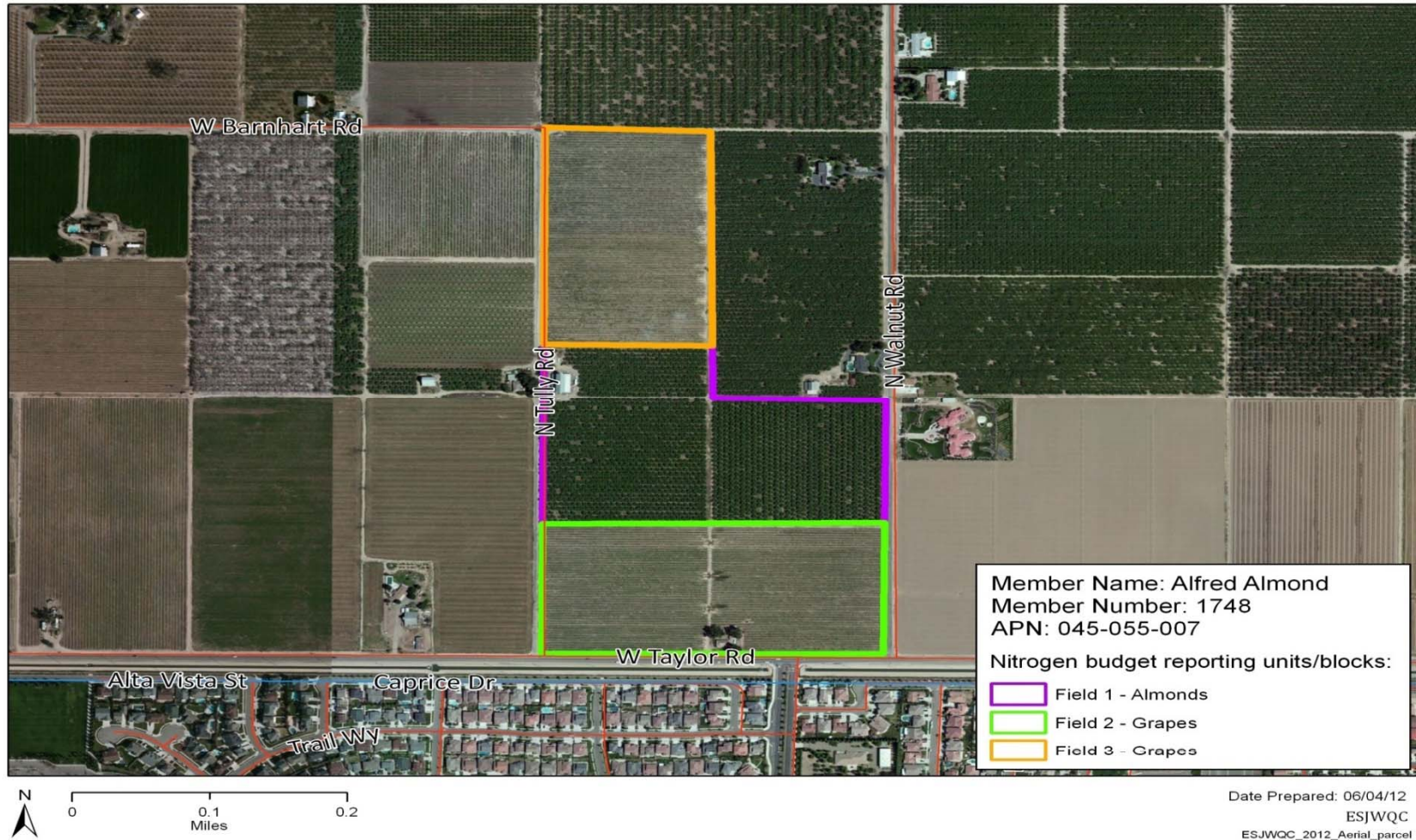


Reality: Agricultural Nitrogen Management Challenge



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>	Soil N ppm ³	Lbs N/acre
	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

**NITROGEN MANAGEMENT PLAN
SUMMARY REPORT**

Date March 15 2015

Name Joe Member

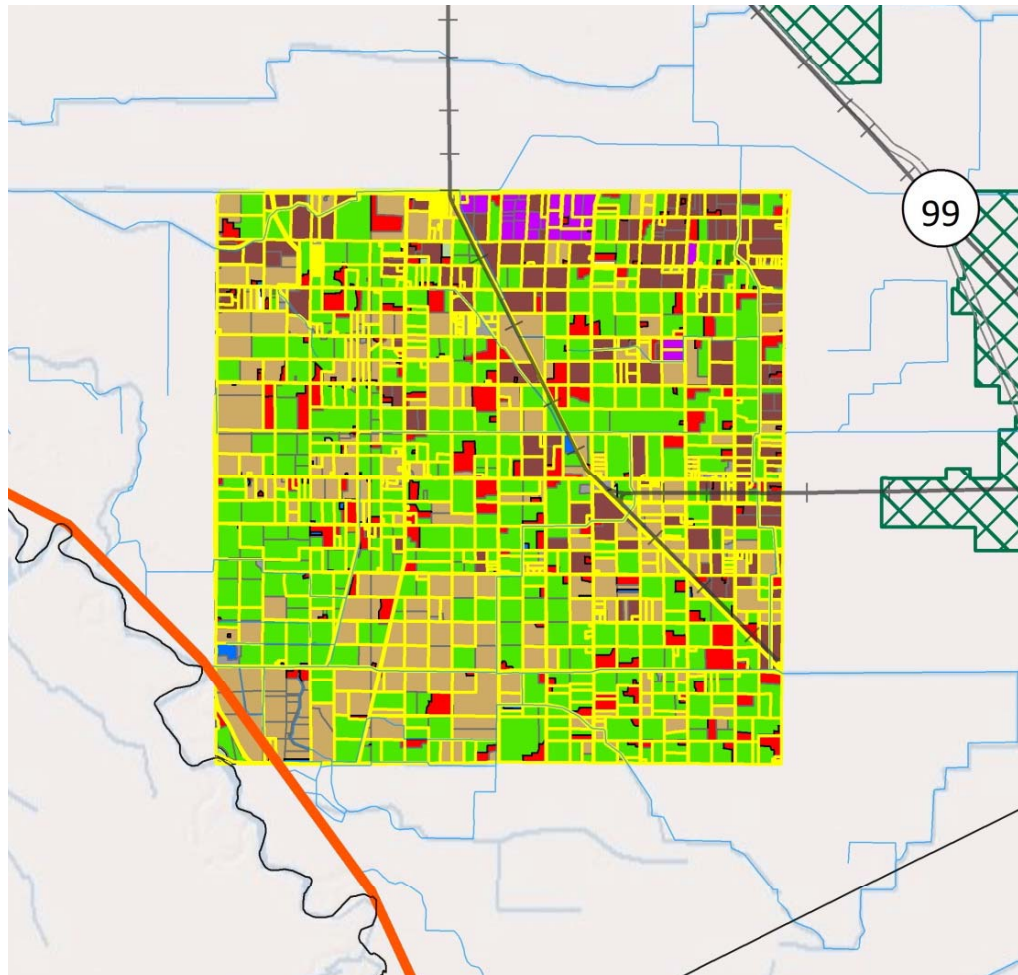
2 Member ID No. 1234

1 Crop Year 2014

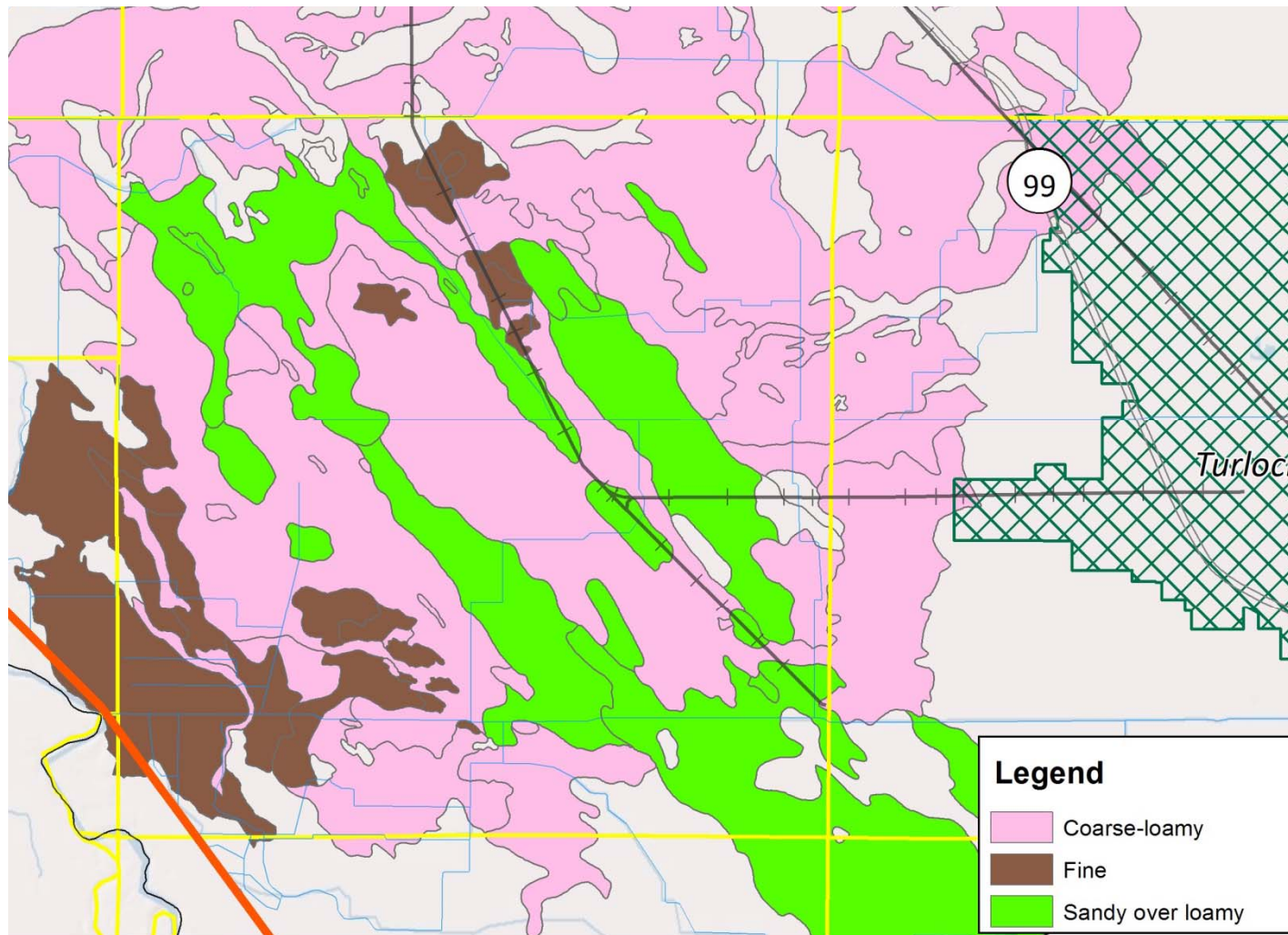
4 APN (1)	5 Field ID (1)	6 Crop (2)	11 Acres (3)	24 Ratio (4)

Township Map

Stanislaus County Example: 23,040 acres



Stanislaus County Example: Soil Profile



Township Data Summary

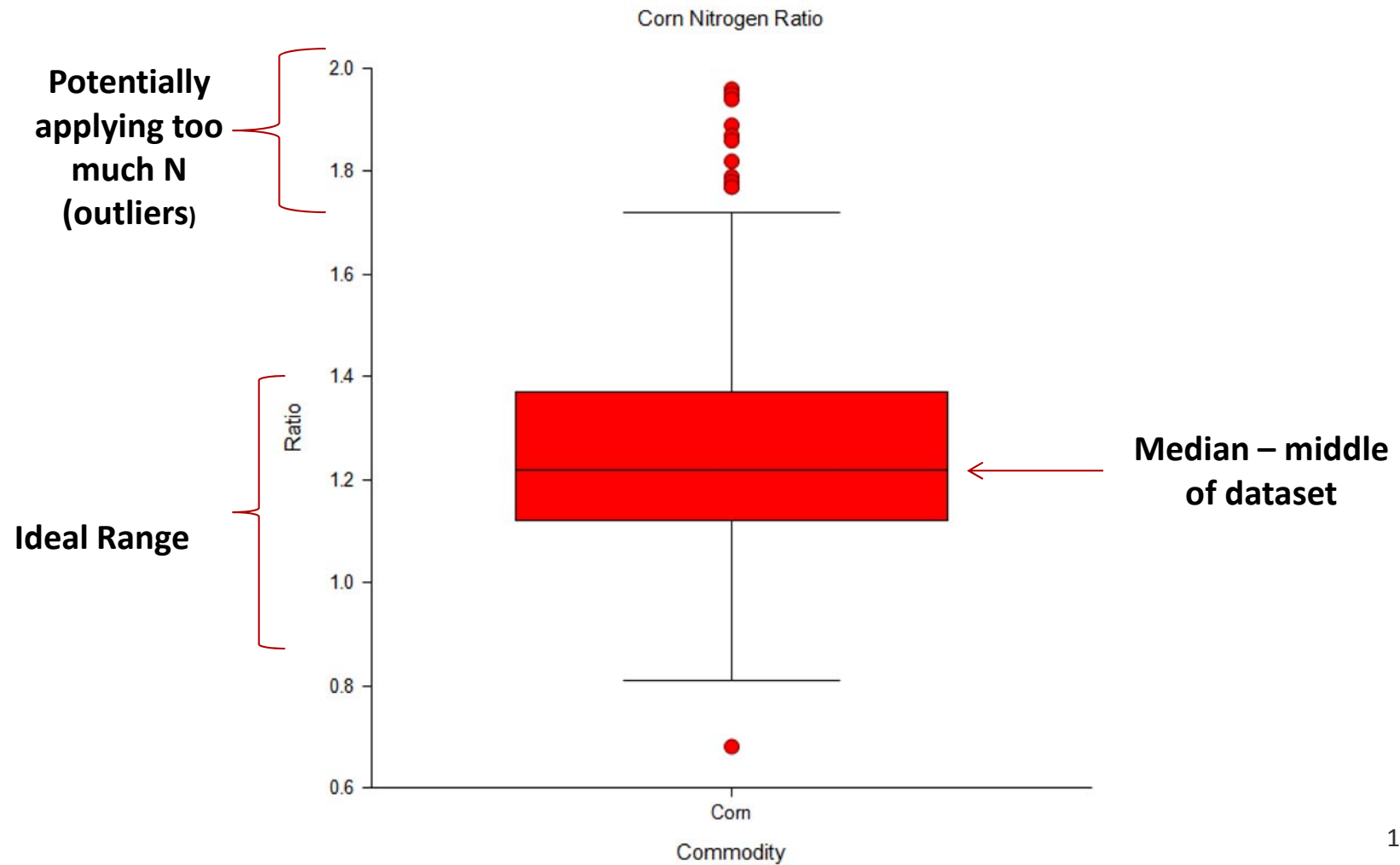
Stanislaus County example

- 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.