East San Joaquin Water Quality Coalition

PRESENTATION TO

STATE WATER QUALITY RESOURCES CONTROL BOARD

IN THE MATTER OF REVIEW OF EAST SAN JOAQUIN GENERAL ORDER

Presentation by Real Party in Interest, East San Joaquin Water Quality Coalition

May 4, 2016

Panel Members

- Parry Klassen, Executive Director, ESJWQC
- Tess Dunham, Legal Counsel to ESJWQC
- Michael L. Johnson, PhD., Consultant to ESJWQC
- Patrick Brown, PhD., UC Davis Department of Plant Sciences

East San Joaquin Water Quality Coalition

Overview of Panel Presentation

1. Overview of the ESJWQC area & member demographics
2. ESJWQC implementation of the Irrigated Lands Program
   a. Surface water successes
   b. Farm Evaluation & Nitrogen Reporting
   c. Education & Outreach Activities
3. Cost implications of the draft order
4. Policy implications of the draft order

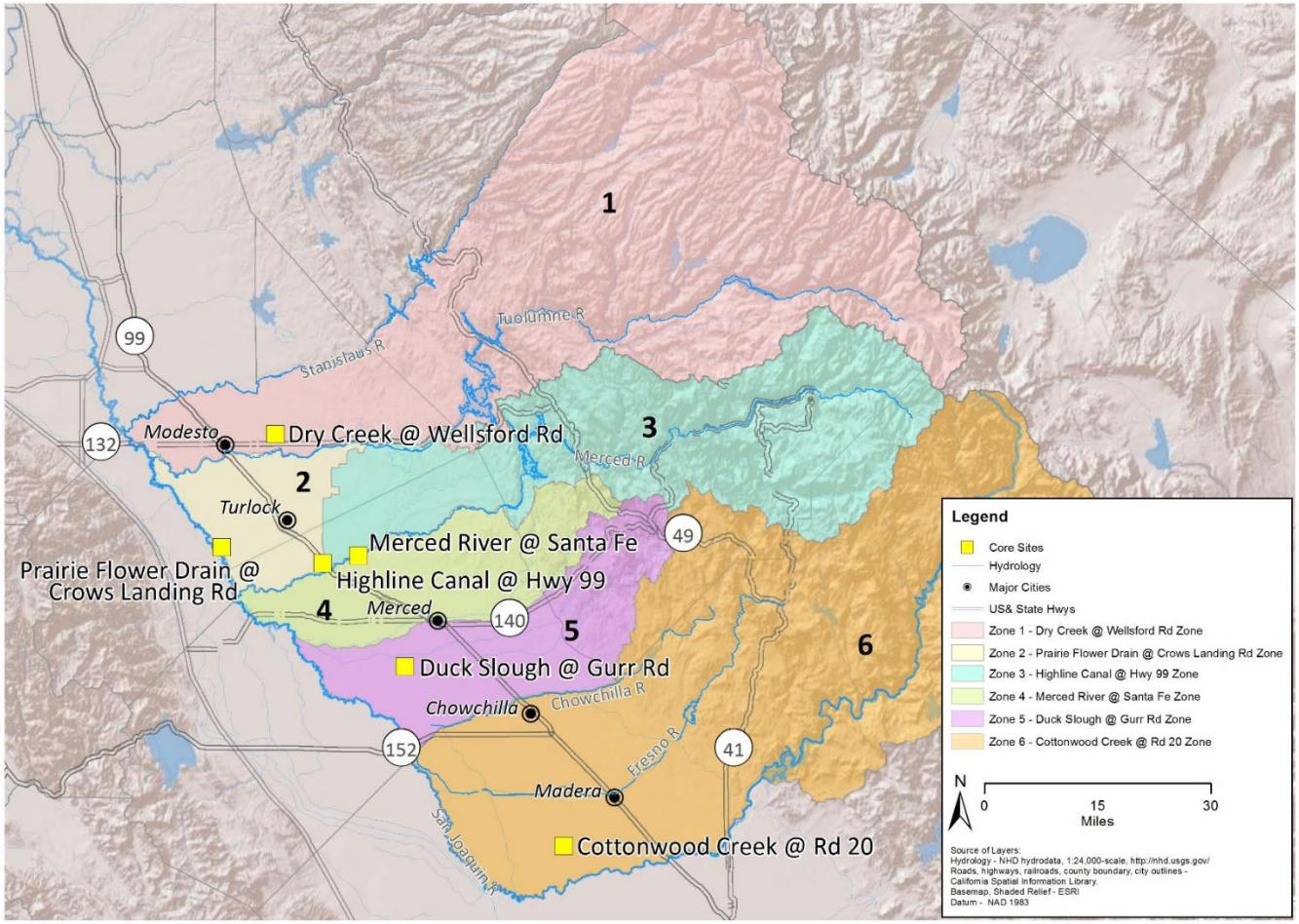
East San Joaquin Water Quality Coalition

Coalition Overview

- In operation since 2003
- 3,563 Landowner / operators
- 698,354 irrigated acres
  - Madera, Merced, Stanislaus, Tuolumne, Mariposa counties
- Average size of member operation
  - 198.53 acres
- Electronic reporting
  - 17% [607 members]
- Paper reporting
  - 83% [2,956 members]

East San Joaquin Water Quality Coalition

East San Joaquin Coalition Region



Date Prepared: 8/31/2015
ESJWQC

ESJWQC Zone Boundaries

ESJWQC_2015_rpt

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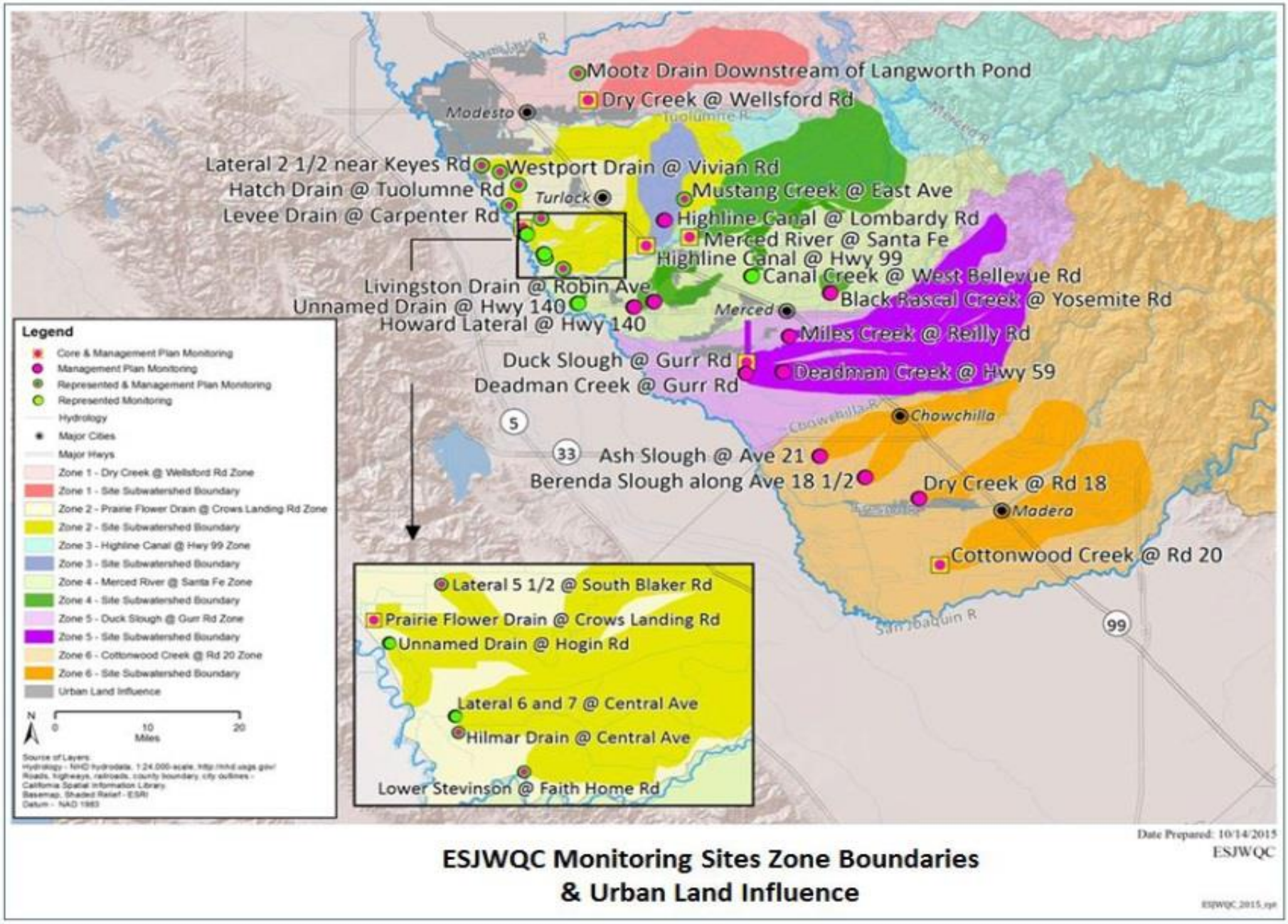
SURFACE WATER SUCCESSES


Mootz Drain Downstream of Langworth Pond
Dry Creek @ Wellsford Rd
Modesto
Tuolumne R.
Lateral 2 1/2 near Keyes Rd
Westport Drain @ Vivian Rd
Hatch Drain @ Tuolumne Rd
Turlock
Mustang Creek @ East Ave
Levee Drain @ Carpenter Rd
Highline Canal @ Lombardy Rd
Merced River @ Santa Fe
Highline Canal @ Hwy 99
Canal Creek @ West Bellevue Rd
Livingston Drain @ Robin Ave
Black Rascal Creek @ Yosemite Rd
Unnamed Drain @ Hwy 140
Howard Lateral @ Hwy 140
Merced
Miles Creek @ Reilly Rd
Duck Slough @ Gurr Rd
Deadman Creek @ Hwy 59
Deadman Creek @ Gurr Rd
Chowchilla R.
Chowchilla
5
33
Ash Slough @ Ave 21
Berenda Slough along Ave 18 1/2
Dry Creek @ Rd 18
Madera
Cottonwood Creek @ Rd 20
San Joaquin R.
99
Lateral 5 1/2 @ South Blaker Rd
Prairie Flower Drain @ Crows Landing Rd
Unnamed Drain @ Hogin Rd
Lateral 6 and 7 @ Central Ave
Hilmar Drain @ Central Ave
Lower Stevinson @ Faith Home Rd
Legend
Core & Management Plan Monitoring
Management Plan Monitoring
Represented & Management Plan Monitoring
Represented Monitoring
Hydrology
Major Cities
Major Hwys
Zone 1 - Dry Creek @ Wellsford Rd Zone
Zone 1 - Site Subwatershed Boundary
Zone 2 - Prairie Flower Drain @ Crows Landing Rd Zone
Zone 2 - Site Subwatershed Boundary
Zone 3 - Highline Canal @ Hwy 99 Zone
Zone 3 - Site Subwatershed Boundary
Zone 4 - Merced River @ Santa Fe Zone
Zone 4 - Site Subwatershed Boundary
Zone 5 - Duck Slough @ Gurr Rd Zone
Zone 5 - Site Subwatershed Boundary
Zone 6 - Cottonwood Creek @ Rd 20 Zone
Zone 6 - Site Subwatershed Boundary
Urban Land Influence
N
0
10
20
Miles
Source of Layers:
Hydrology - NHD hydrodata, 1:24,000-scale, http://nhd.usgs.gov/
Roads, highways, railroads, county boundary, city outlines - California Spatial Information Library
Basemap, Shaded Relief - ESRI
Datum - NAD 1983
Date Prepared: 10/14/2015
ESJWQC
ESJWQC Monitoring Sites Zone Boundaries
& Urban Land Influence
ESJWQC_2015.ppt

Exceedances of Water Quality Limits

Constituent Group	2008	2014
Field Parameter	198	184
Bacteria	86	12
Nutrients	48	8
Metals	19	14
Pesticides	56	6
Water Column Toxicity	66	21
Sediment Toxicity	11	3
Total	484	248

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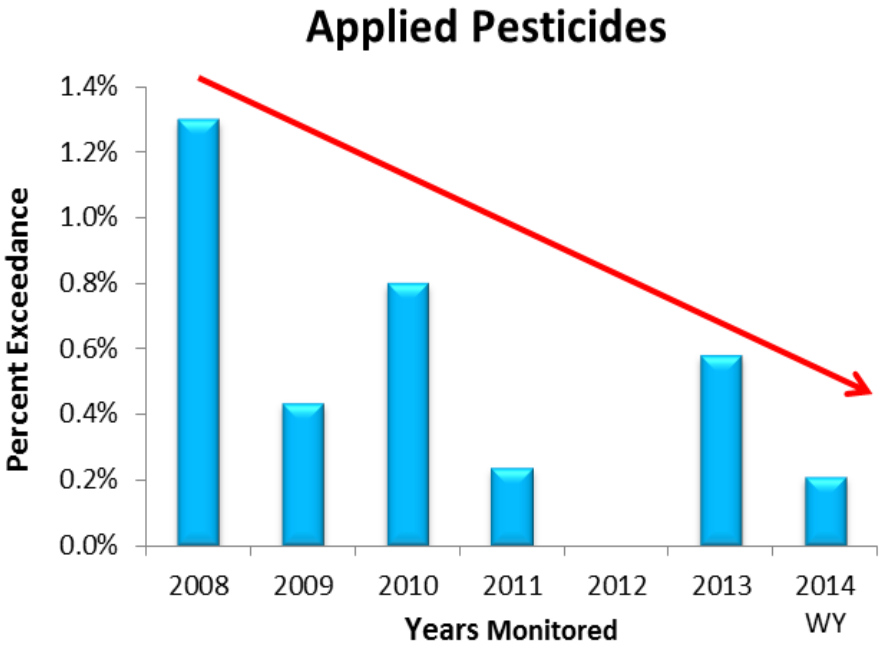
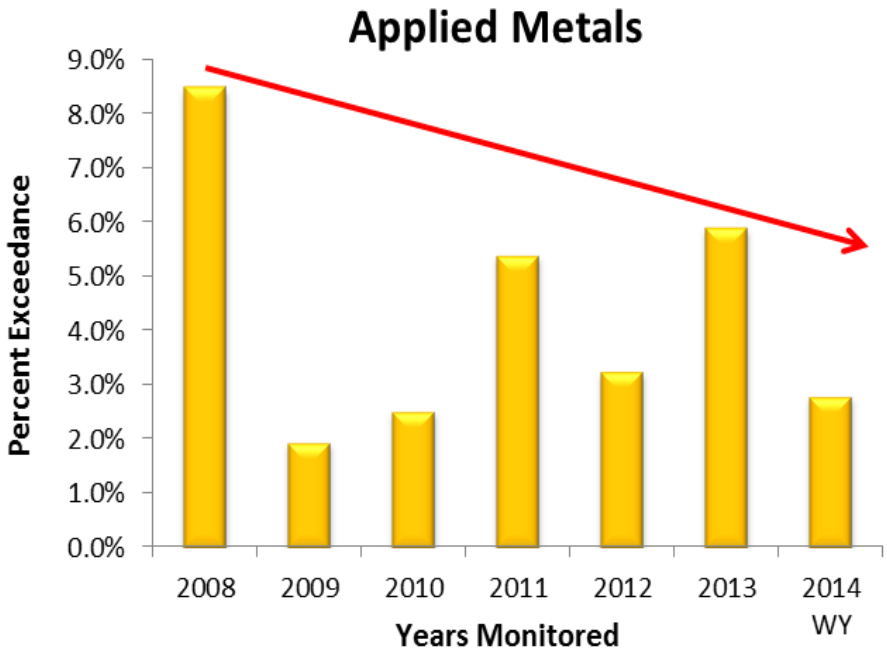
Exceedances as a Percentage of All Water Samples

- Since 2004, ESJWQC has collected **80,880** samples

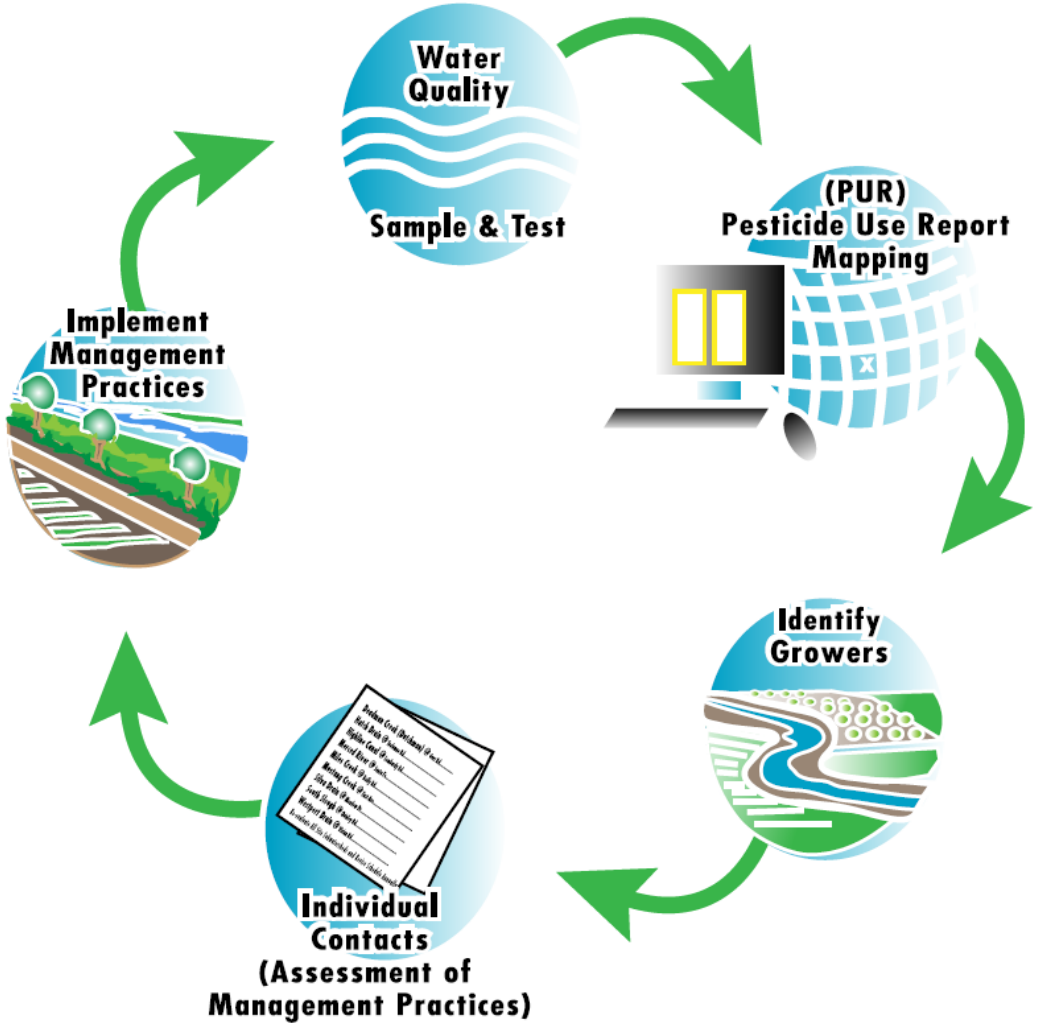
- **2008**: 3460 total samples
- **2014**: 1893 total samples

- **2008**: 459 total samples
- **2014**: 155 total samples





Iterative Process for Addressing Surface Water Problems



Results of ESJ Efforts
Completion of Management Plans

- From 2012-2016, 78 management plans completed
  1. 3 years of no exceedances
  2. Demonstrate implementation of effective practices
  3. Petition Regional Board for plan completion
  4. EO approves completion in writing
- Continue surface water sampling

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Completed Management Plans
40
35
30
25
20
15
10
5
0
2012
2013
2014
2016
Year
Toxicity
Pesticides
Metals
Nutrients
Bacteria
Field Parameters

East San Joaquin Water Quality Coalition

FARM EVALUATION & NITROGEN REPORTING

ESJ Farm Evaluation Surveys

- Requirement for all members (schedule and frequency dependent on specified factors)
- Responses collected at the *field* level
  - Approximately 923,700 records (2015)
- All responses submitted to Regional Board on the *township* level
- Responses are used for:
  - BMP implementation tracking
  - Trigger for Sediment and Erosion Control Plans
  - Member outreach (e.g., annual member report, annual meetings)

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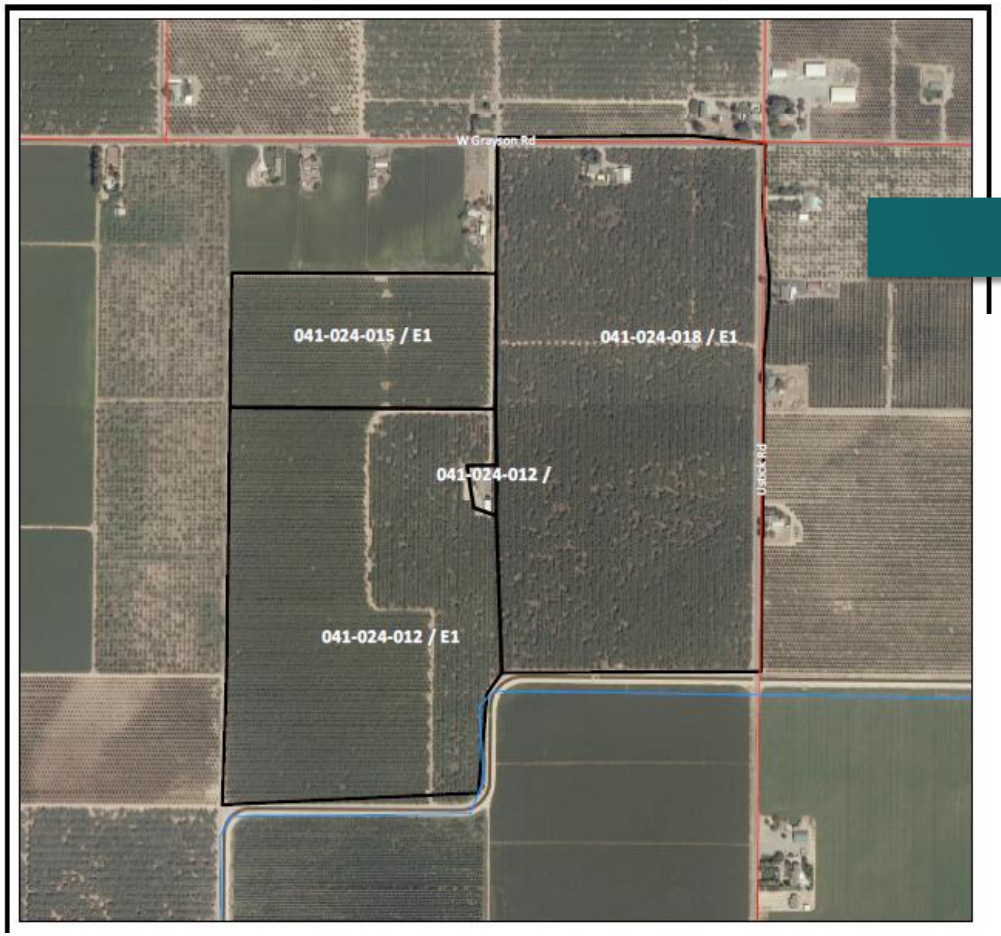
Image of grower fields → translated to survey responses

Part E - Farm Map

(Keep Onsite - For Inspection Purposes Only)

Update map with well locations and surface water discharge points

Legend
X - In Use Well Locations
A - Known Abandoned Well Locations
DP - Off Farm Surface Water Discharge Points



Part B – Specific Field Evaluation

Member Name: [redacted] Coalition Member ID#: [redacted]

1. Identify the Parcels and Fields that this survey applies to by checking the box in the first column below. *Fill out a separate survey for parcels/fields with different practices.*

SW High Vulnerability is when a parcel is within an area covered by a Surface Water Management Plan.
GW High Vulnerability is areas having potential for groundwater contamination.

High Vulnerability SW	High Vulnerability GW	Parcel (APN)	Field ID	Acres	Crop
☑	☑		B2	59	Almonds
☑	☑		B2	58.46	Almonds
☑	☐		A1	29.35	Almonds
☐	☐		F1	38.89	Almonds
☐	☑		E1		Almonds
☑	☑		E1		Almonds
☑	☑		E1	77.39	Almonds
☐	☑		D4		Grapes
☑	☑		D2		Grapes
☑	☑		D1		Almonds
☑	☑		C1	163.65	Grapes
☐	☑		C3		Almonds
☑	☑		C3	29.	Almonds

2. Irrigation Practices *(A secondary system could be used for crop germination, frost protection, crop cooling, etc.)*

Primary (check one)	Secondary (if applicable, check one)
☐ Drip	☐ Drip
☐ Micro Sprinkler	☐ Micro Sprinkler
☐ Furrow	☐ Furrow
☐ Sprinkler	☐ Sprinkler
☐ Border Strip	☐ Border Strip

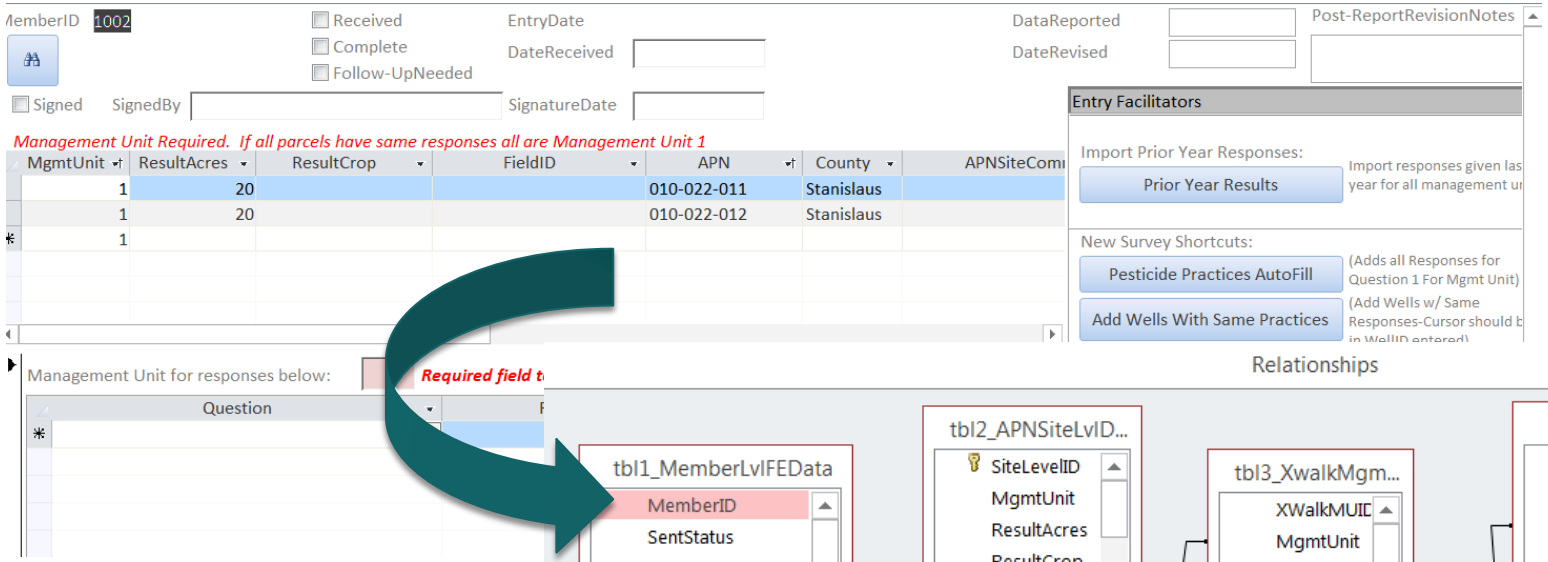
2. Irrigation Practices for Managing Sediment and Erosion

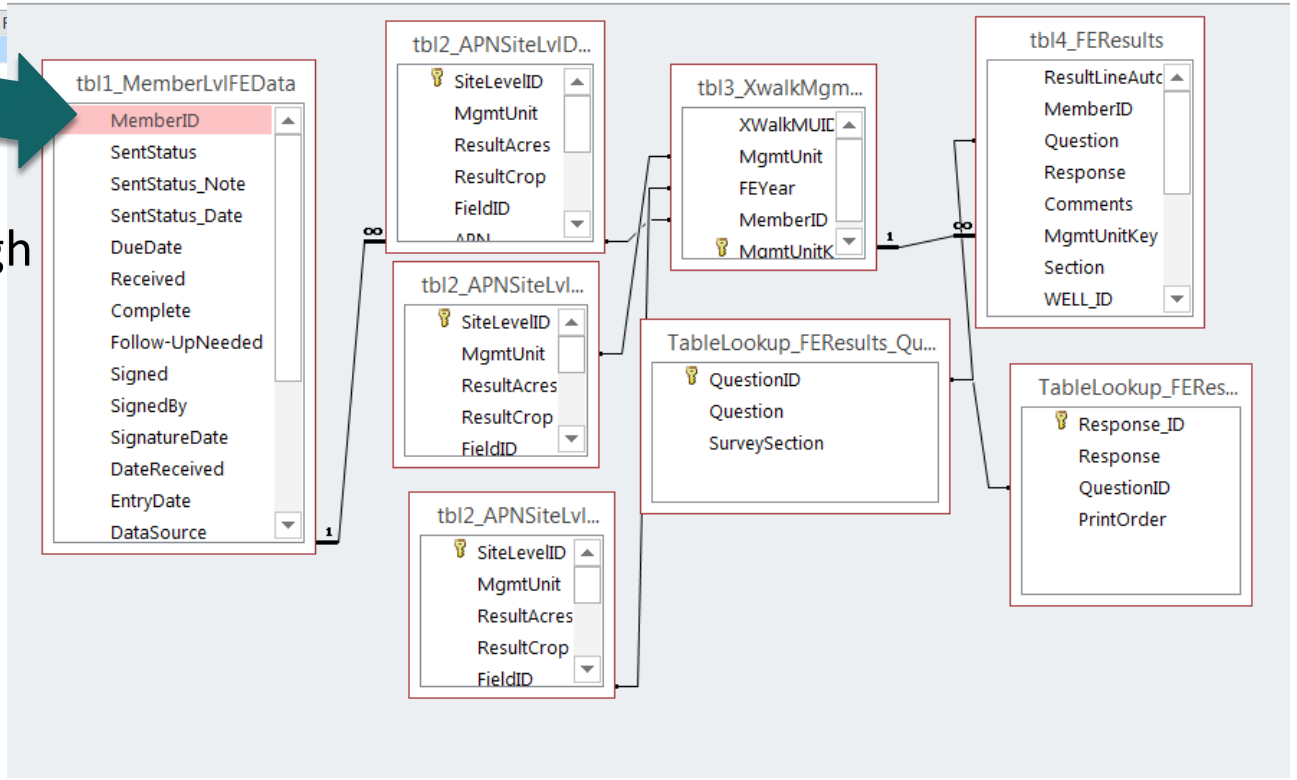
- ☑ In-furrow dams are used to increase infiltration and settling out of sediment prior to entering the tail ditch.
- ☑ The time between pesticide applications and the next irrigation is lengthened as much as possible to mitigate runoff of pesticide residue.
- ☑ Shorter irrigation runs are used with checks to manage and capture flows.
- ☐ PAM (polyacrylamide) used in furrow and flood irrigated fields to help bind sediment and increase infiltration.
- ☐ Use drip or micro-irrigation to eliminate irrigation drainage.
- ☐ Use of flow dissipaters to minimize erosion at discharge point.
- ☑ Tailwater Return System.
- ☐ Catchment Basin.
- ☐ No irrigation drainage due to field or soil conditions.

3. Cultural Practices to Manage Sediment and Erosion

- ☑ Storm water is captured using field borders.
- ☐ Vegetated ditches are used to remove sediment as well as water soluble pesticides, phosphate fertilizers and some forms of nitrogen.
- ☐ Vegetative filter strips and buffers are used to capture flows.
- ☑ Sediment basins / holding ponds are used to settle out sediment and hydrophobic pesticides such as pyrethroids from irrigation and storm runoff.
- ☑ Cover crops or native vegetation are used to reduce erosion.
- ☐ Hedgerows or trees are used to help stabilize soils and trap sediment movement.
- ☑ Soil water penetration has been increased through the use of amendments, deep ripping and/or aeration.
- ☑ Crop rows are graded, directed and at a length that will optimize the use of rain and irrigation water.
- ☐ Creek banks and stream banks have been stabilized.
- ☑ Subsurface pipelines are used to channel runoff water.
- ☑ Berms are constructed at low ends of fields to capture runoff and trap sediment.
- ☐ Minimum tillage incorporated to minimize erosion.
- ☐ Field is lower than surrounding terrain.
- ☐ No storm drainage due to field or soil conditions.

Survey Responses Stored In a Relational Database





- Data is entered through a data entry form to associate survey responses to enrolled parcel information
- Data stored in a relational database

	A	F	G	H	I	J	K	L	M	N
1	FEYear	ResultAcres	ResultCrop	APN	FieldID	County	gmtUn	Section	Question	Response
2	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide Application Practices	Attend Trainings
3	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide Application Practices	Avoid Surface Water When Spraying
4	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide	
5	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide	
6	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide	
7	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide	
8	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide	
9	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide	
10	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide	
11	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Pesticide	
12	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Who do y	
13	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Who do y	
14	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Who do y	
15	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Who do y	
16	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	A	Does you	
17	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	B	Irrigation	
18	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	B	Irrigation	
19	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	B	Irrigation	
20	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	B	Irrigation	
21	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	B	Irrigation Efficiency Practices	Water application scheduled to need
22	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	B	Nitrogen Management Methods to Min	Irrigation Water N Testing
23	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	B	Nitrogen Management Methods to Min	Soil Testing
24	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	B	Nitrogen Management Methods to Min	Split Fertilizer Applications
25	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	B	Nitrogen Management Methods to Min	Tissue/Petiole Testing
26	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	C	Do you have any irrigation wells on par	Yes
27	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	C	Are you aware of any known abandone	No
28	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	C	Wellhead Protection Practices	Air Gap (for non-pressuriz
29	2013	41.00	Almonds	041-045-0	C3	Stanislaus	1	C	Wellhead Protection Practices	Air Gap (for non-pressuriz

Individual records are summarized in Annual Reports

This grower had:

- 2 Management Units (13 parcels)
- Two crops – almonds and grapes
- 848 acres
- 336 individual records in the database per year

Results are summarized as tables and graphs

Figure 30. Acreage reported for cultural practices to manage sediment and erosion.

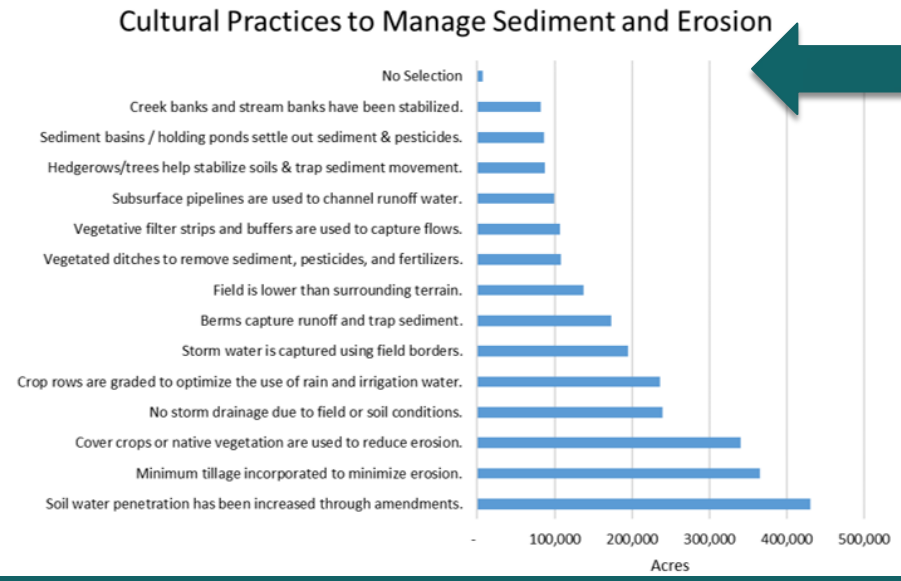
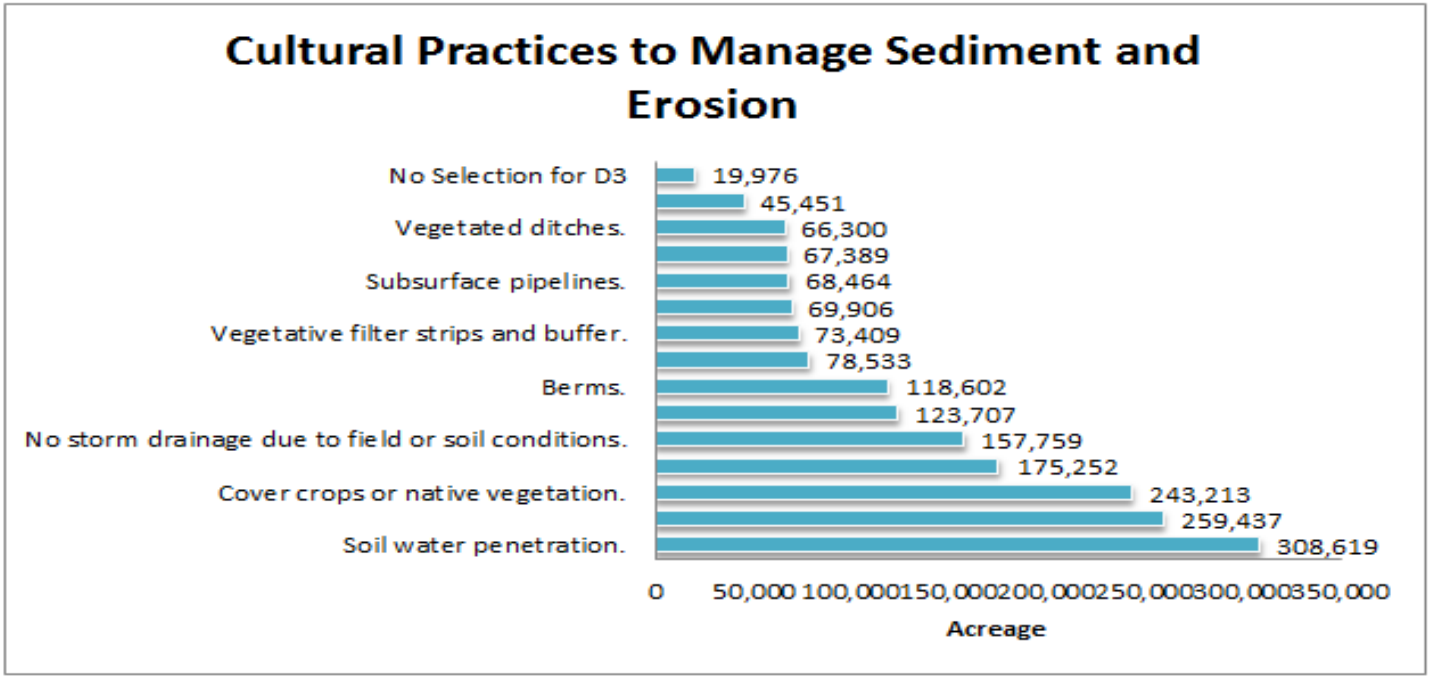
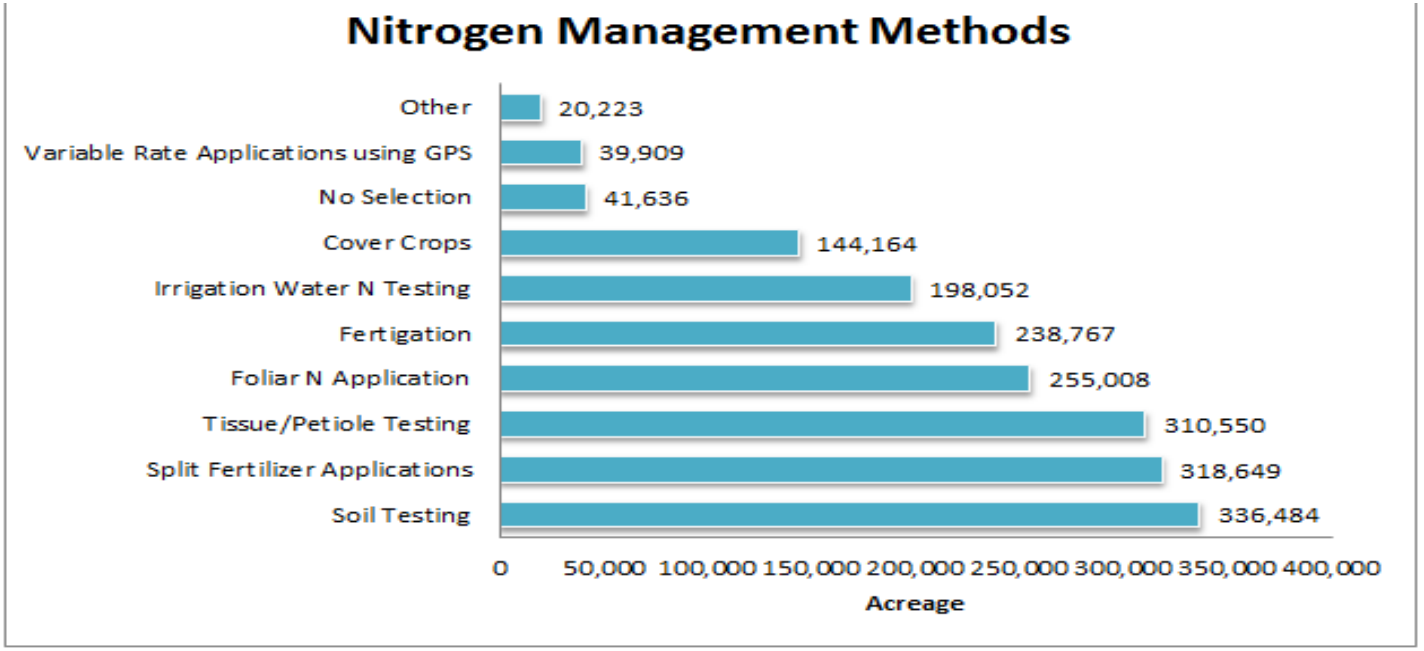


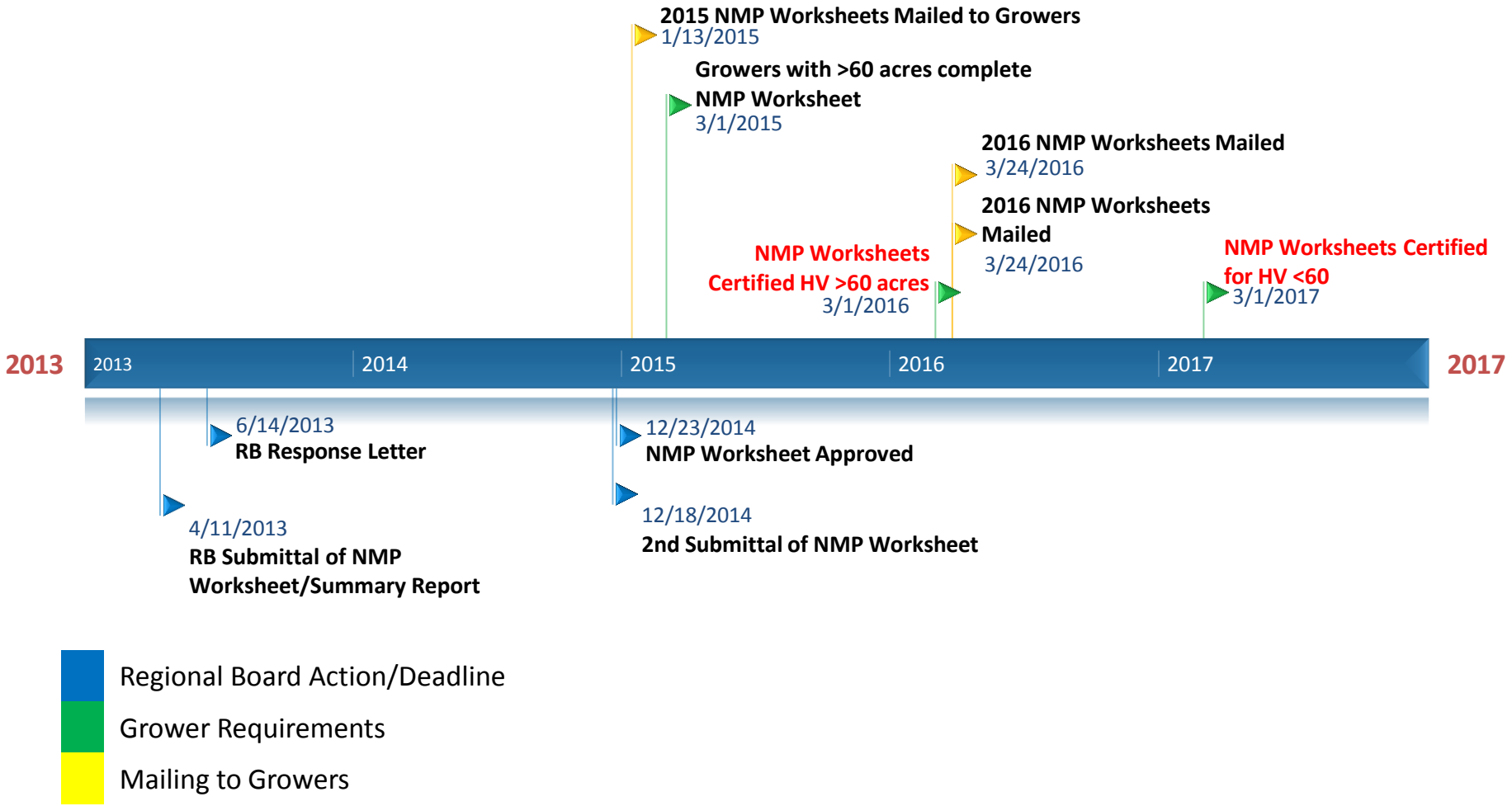
Table 71. Acreage associated with 2015 sediment management practice questions and responses.

Survey Section	Question	Response	Acreage	Response Count
A	Does your farm have the potential to discharge sediment to off-farm surface w			
		No	440,017	2,594
		Yes	122,484	251
		No Selection	14,623	65
D	Cultural Practices to Manage Sediment and Erosion			
		Soil water penetration has been increased through amendments.	430,094	1,401
		Minimum tillage incorporated to minimize erosion.	364,695	1,599
		Cover crops or native vegetation are used to reduce erosion.	339,706	1,292
		No storm drainage due to field or soil conditions.	239,492	1,773
		Crop rows are graded to optimize the use of rain and irrigation water.	236,344	874
		Storm water is captured using field borders.	194,592	912
		Berms capture runoff and trap sediment.	173,276	804
		Field is lower than surrounding terrain.	136,857	800
		Vegetated ditches to remove sediment, pesticides, and fertilizers.	108,036	245
		Vegetative filter strips and buffers are used to capture flows.	107,287	277
		Subsurface pipelines are used to channel runoff water.	99,660	201
		Hedgerows/trees help stabilize soils & trap sediment movement.	86,988	306
		Sediment basins / holding ponds settle out sediment & pesticides.	86,165	181
		Creek banks and stream banks have been stabilized.	81,814	194
		No Selection	7,542	122
	igation Practices for Managing Sediment and Erosion			
		Use drip or micro-irrigation to eliminate irrigation drainage.	419,488	1,402
		Time is increased between pesticide applications and irrigation.	369,219	1,560
		No irrigation drainage due to field or soil conditions.	272,089	1,892
		Shorter irrigation runs are used with checks to manage and capture flows.	176,786	791
		Tailwater Return System.	127,686	278
		Catchment Basin.	96,633	202
		Use of flow dissipaters to minimize erosion at discharge point.	58,025	130
		In-furrow dams used to increase infiltration and settle sediment.	55,070	194
		PAM used to bind sediment & increase infiltration.	8,554	27
		No Selection	5,476	93
		Other	238	1


Cultural Practices to Manage Sediment and Erosion
No Selection for D3
Vegetated ditches.
Subsurface pipelines.
Vegetative filter strips and buffer.
Berms.
No storm drainage due to field or soil conditions.
Cover crops or native vegetation.
Soil water penetration.
19,976
45,451
66,300
67,389
68,464
69,906
73,409
78,533
118,602
123,707
157,759
175,252
243,213
259,437
308,619
0
50,000
100,000
150,000
200,000
250,000
300,000
350,000
Acreage


Nitrogen Management Methods
Other
Variable Rate Applications using GPS
No Selection
Cover Crops
Irrigation Water N Testing
Fertigation
Foliar N Application
Tissue/Petiole Testing
Split Fertilizer Applications
Soil Testing
20,223
39,909
41,636
144,164
198,052
238,767
255,008
310,550
318,649
336,484
0
50,000
100,000
150,000
200,000
250,000
300,000
350,000
400,000
Acreage

Timeline for NMP Worksheet Development



NITROGEN MANAGEMENT PLAN WORKSHEET

1. Crop Year (Harvested): _____

2. Member ID# _____

3. Name: _____

4. APN(s):	5. Field(s) ID	

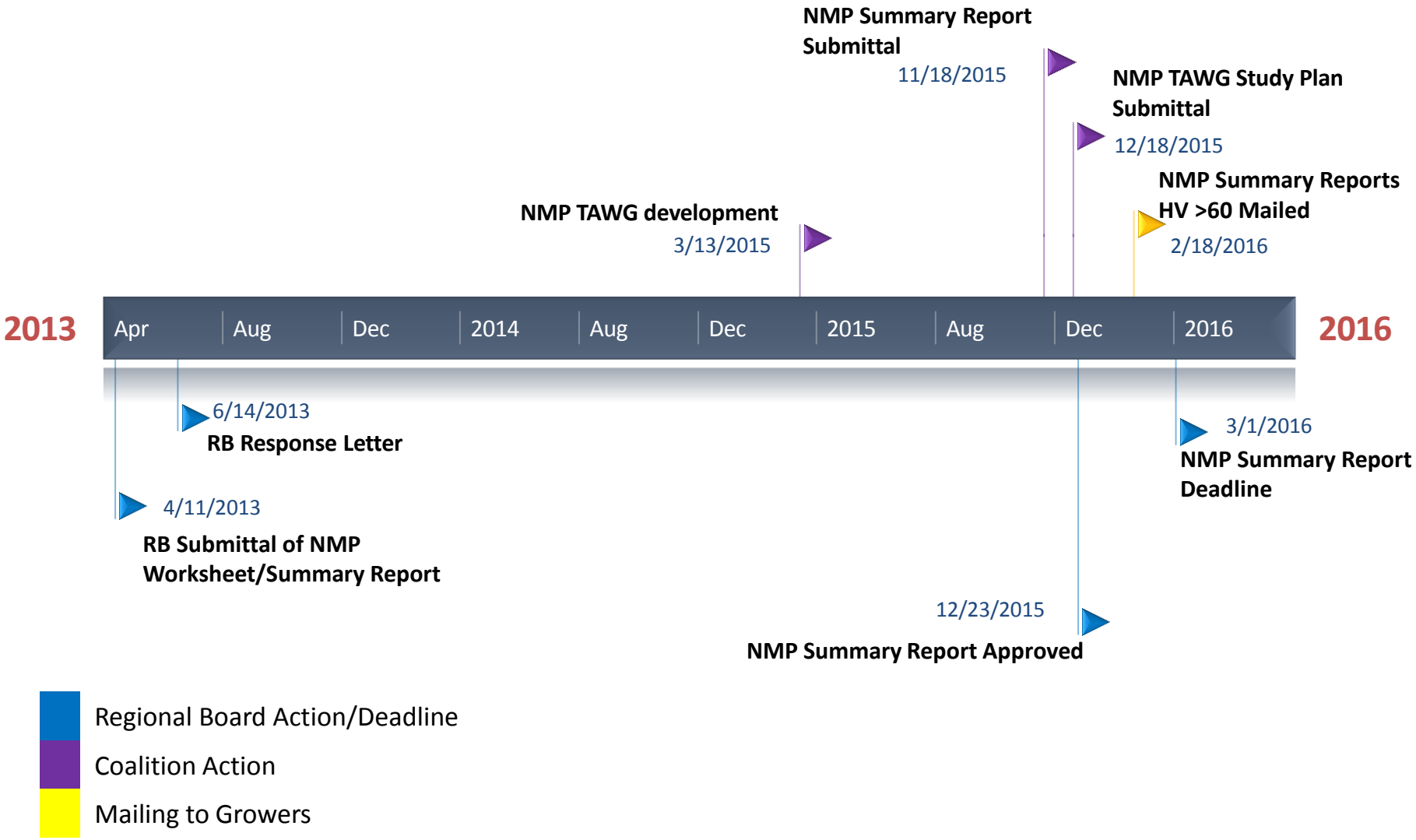
CROP NITROGEN MANAGEMENT PLANNING		N APPLICATIONS/CREDITS	26. Recommended/ Planned N	27. Actual N
6. Crop		**15. Nitrogen Fertilizers**		
7. Production Units		16. Dry/Liquid (lbs/ac)		
8. Projected Yield (Units/Acre)		17. Foliar N (lbs/ac)		
9. N Recommended (lbs/ac)		**18. Organic Material N**		
10. Acres		19. Available N in Manure/Compost (lbs/ac estimate)		
Post Production Actuals		**20. Total Available N Applied** (lbs per acre)		
11. Actual Yield (Units/Acre)		**21. Nitrogen Credits (est)**		
12. Total N Applied (lbs/ac)		22. Available N carryover in soil; (annualized lbs/acre)		
13. ** N Removed (lbs N/ac)		23. N in Irrigation water (annualized, lbs/ac)		
14. Notes:		**24. Total N Credits** (lbs per acre)		
		25. Total N Applied & Available		

PLAN CERTIFICATION		
28. CERTIFIED BY:	**29. CERTIFICATION METHOD**	**X**
	30. Low Vulnerability Area, No Certification Needed	
	31. Self-Certified, approved training program attended	
DATE:	32. Self-Certified, UC or NRCS site recommendation	
	33. Nitrogen Management Plan Specialist	

** Your Coalition will provide the method to be used to estimate N Removed.

Provided by the Central Valley Water Board 23 December 2014.

NMP Summary Report Development Timeline



Nitrogen Management Plan Summary Report

Crop Harvested Year (1): _____ **Submittal Date: _____**

Member ID (2): _____ **Member Name (3): _____**

	Site Location Information[1]	Crop (6)	Total Acres (10)	Total Available N Applied (20+23) pounds per acre	A/Y Total Available N (20+23) / Actual Yield (11)[2]	Production Unit (7)
1						
2						
3						
4						
5						
6						

Calculating Applied Nitrogen/Yield (A/Y) and Conversion to Applied Nitrogen/Removed Nitrogen (A/R)

- ***Grower Supplied Information***
  - Crop
  - Acreage
  - Nitrogen (N) applied (pounds per acre)
  - A/Y Ratio (A = N applied, Y = yield)
  - Unit of yield

- ***Coalition Conversion of Grower Information***
  - Divide A/Y by N applied to get Yield
  - Convert Yield to pounds (if not already reported as pounds)
  - Multiply Yield by N removal converter (per CDFA guidance values) to obtain the pounds of N removed
  - Divide N applied per acre by N removed per acre to get A/R ratio

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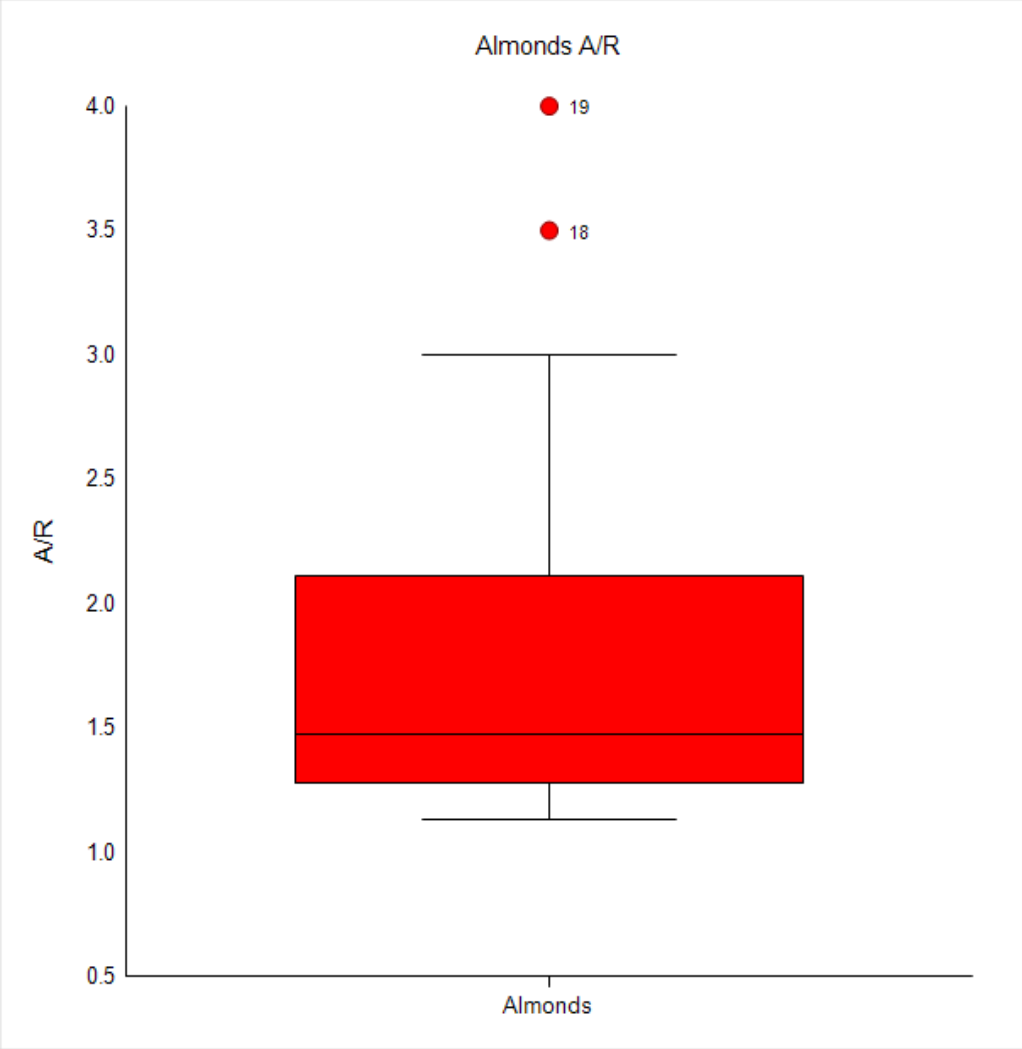
Township Aggregation of NMP Summary Reports



Outreach on NMP Results

1. Mail A/R conversion to all reporting members prior to next crop year
   a. Growers results plotted in comparison to like crops, in same geographic area
   b. Provide additional information on crop specific N management

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Outreach to "Outliers"

1. *Year 1*
   a. Compare "outliers'" A and R to members growing the same crops
   b. Provide additional information on crop specific N management
2. *Year 2*
   a. Direct outreach/individual member meeting
   b. Review Farm Evaluation responses
3. *Year 3*
   a. Potential consultation with Regional Board

East San Joaquin Water Quality Coalition

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EDUCATION & OUTREACH ACTIVITIES

Education & Outreach Activities

- Annual Member Meetings
  - WDR Updates
  - Presentation by CCAs on Nitrogen management
  - Irrigation and Fertigation Efficiency

Year	Attendees	# Meetings
2016 (to date)	1,938	6
2015	2,960	15
2014	2,831	15

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COST IMPLICATIONS

Annual Coalition Costs

- Surface water monitoring program
- Implementation of Farm Evaluation requirements
- Implementation of NMP requirements
  - Number of staff needed to work with growers
  - This is based on application of requirement to 1200 growers versus potential application to 4000
- Annual Report

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Anticipated Coalition Cost Increases *Not Including Grower Direct Costs*

- 2016 Budget: $3.1 Million
  - Per Acre Cost to Grower: $3.75
- New Order Budget: $3.7 Million
  - 19% Increase
  - Per Acre Cost to Grower: $5.00
- Does not factor in potential State Board fee increase

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POLICY IMPLICATIONS

Major Issues of Concern with Proposed Revisions

- Fails to recognize realities of farming i.e.,
  - maintains expectation that water quality objectives can be met under all circumstances
- Fails to recognize need for alternative compliance pathways
  - Fails to acknowledge extensive planning efforts underway through CVSALTS
- Eliminates Coalition flexibility by eliminating vulnerability distinctions
- Mandates public reporting of field level information
- Makes a landlord/tenant issue into an irrigated lands issue

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Impact of Eliminating Vulnerability Designation

- Imposes member requirements based on size of operation versus location
- Results in increased administrative burdens
- Eliminates ESJWQC flexibility to address highest priority areas first

<u>Recommendations</u>

1) Eliminate phasing of reporting requirement by acreage size of operation

2) Allow ESJWQC flexibility to phase in reporting requirements based on priority areas

a. ***Quality of groundwater***
b. ***Location as compared to DACs & DUCs***

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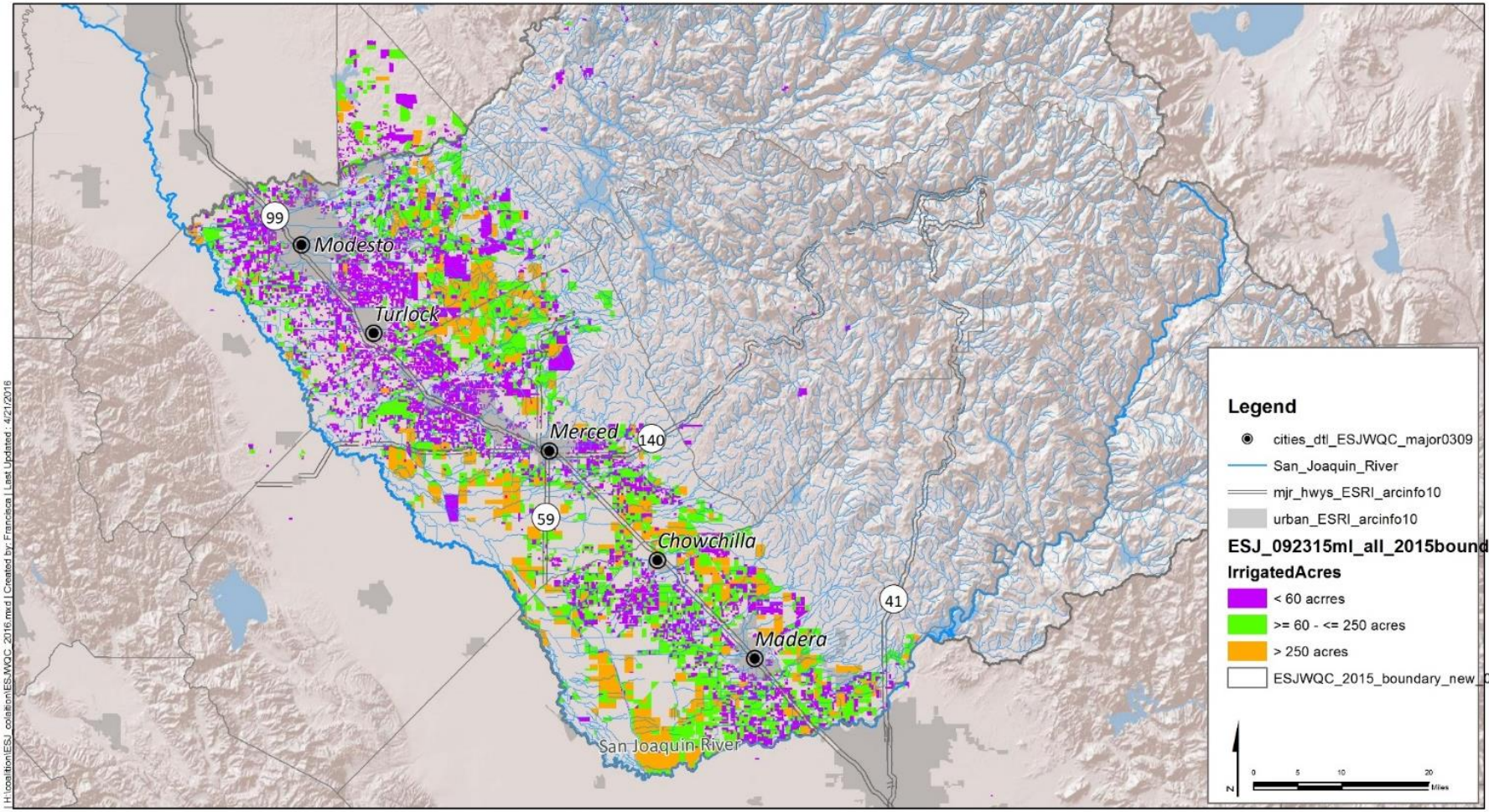

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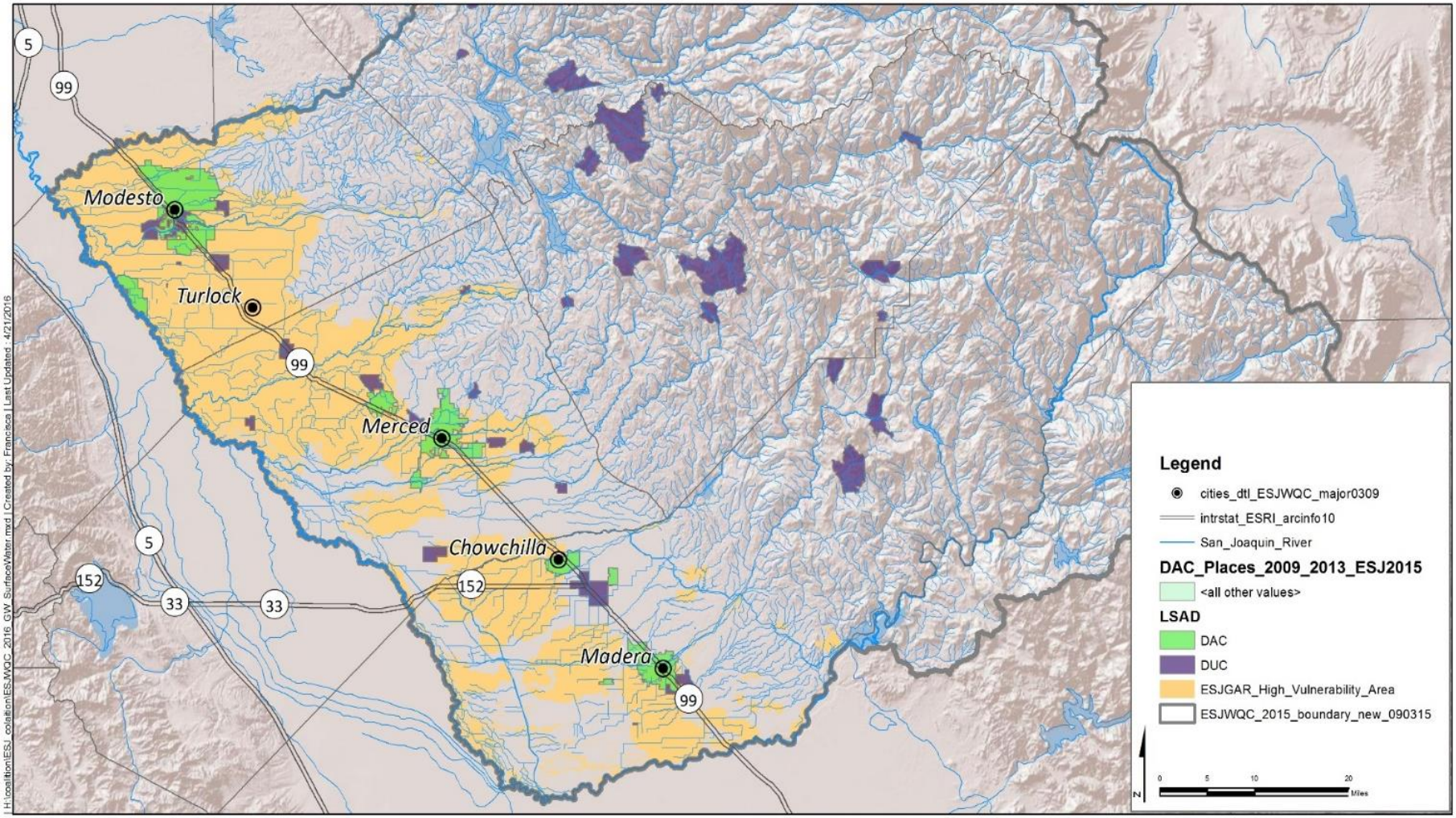
ESJWQC Map of Operation Size

ESJWQC

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: property=Lambert Conformal Conic
Units: Foot US

Service Layer Credits: Shaded Relief: Copyright © 2009 ESRI
Hydrology - NHD hydrodata, 1:24,000 scale, http://nhd.usgs.gov/
Roads, highways, Urban Areas - ESRI
TRS - Texas Public Land Survey System, Pub. date: 20090101



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ESJWQC HighVulnerability Areas with DAC & DUC Areas

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: property=Lambert Conformal Conic
Units: Foot US

Service Layer Credits: Shaded Relief: Copyright © 2009 ESRI
Hydrology - NHD hydrodata, 1:24,000 scale, http://nhd.usgs.gov/
Roads, highways, railroads - ESRI
DAC & DUC - http://www.water.ca.gov/irwmgrants/resources_dac.cfm

Public Reporting of Field Level Information Not Necessary

- Regional Board maintains all existing authority
- Regional Board may inspect grower operations at anytime
- Regional Board may inspect/audit Coalition records at anytime

<u>Recommendations</u>

1) Require Coalition records to be audited at least annually by Regional Board

2) Audit certain percentage of grower records annually

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Domestic Well Monitoring is a Landlord/Tenant Issue

- Quality of drinking water from domestic wells is a public health issue (state and/or local)
- Requirement to monitoring domestic wells through irrigated lands program only reaches a small percentage of domestic wells
- Administrative burden on ESJWQC to gather all such samples is ***HUGE***

Recommendations

1) ***Change law to mandate such sampling by all domestic well owners, or require County's to adopt ordinances***
2) ***At the very least, make requirement direct between grower and Regional Board – eliminate ESJWQC role***

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