

Dixon/Solano RCD Water Quality Coalition



Irrigated Lands Program

ALL MEMBER ANNUAL MEETING

DIXON/SOLANO RCD WATER QUALITY COALITION

HYBRID MEETING – NOVEMBER 2, 2023

6 PM – 7:15 PM

PLEASE NOTE: THIS MEETING IS BEING RECORDED TO POST ON OUR WEBSITE FOR FUTURE VIEWING.

GROUND RULES FOR ZOOM PARTICIPANTS

- All Zoom participants will be muted for the presentation, you can unmute for the Question and Answer (Q & A) portion at the end of the event.
- Use the **Chat Room** for the following:
 - To receive the 0.5-hour INMP CEU for the meeting, you must type and send your full name and email address and keep your camera on.
 - For Q & A at the end of the presentation as an alternative to unmuting, you can type in your question.

AGENDA

- PROGRAM & COALITION UPDATE – Martha McKeen, Dixon RCD
- NITROGEN CREDITS: SOIL, WATER & ORGANIC AMENDMENTS – Annie Burkholder, Dellavalle Lab
- ORGANIC SOIL AMENDMENTS: BIOSOLIDS – Amy King, Solano RCD
- Q & A – Question and Answers

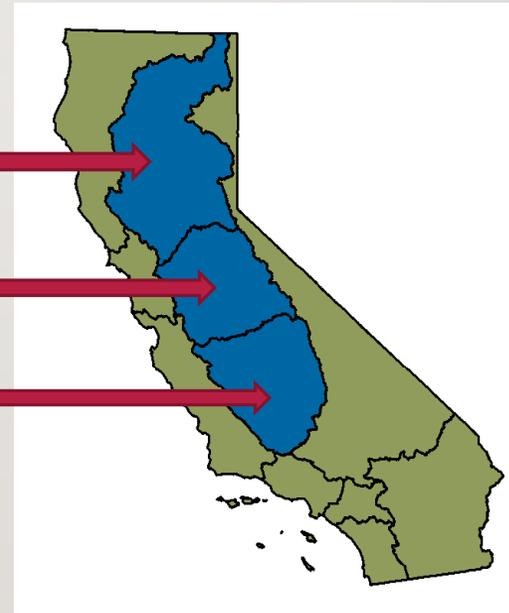


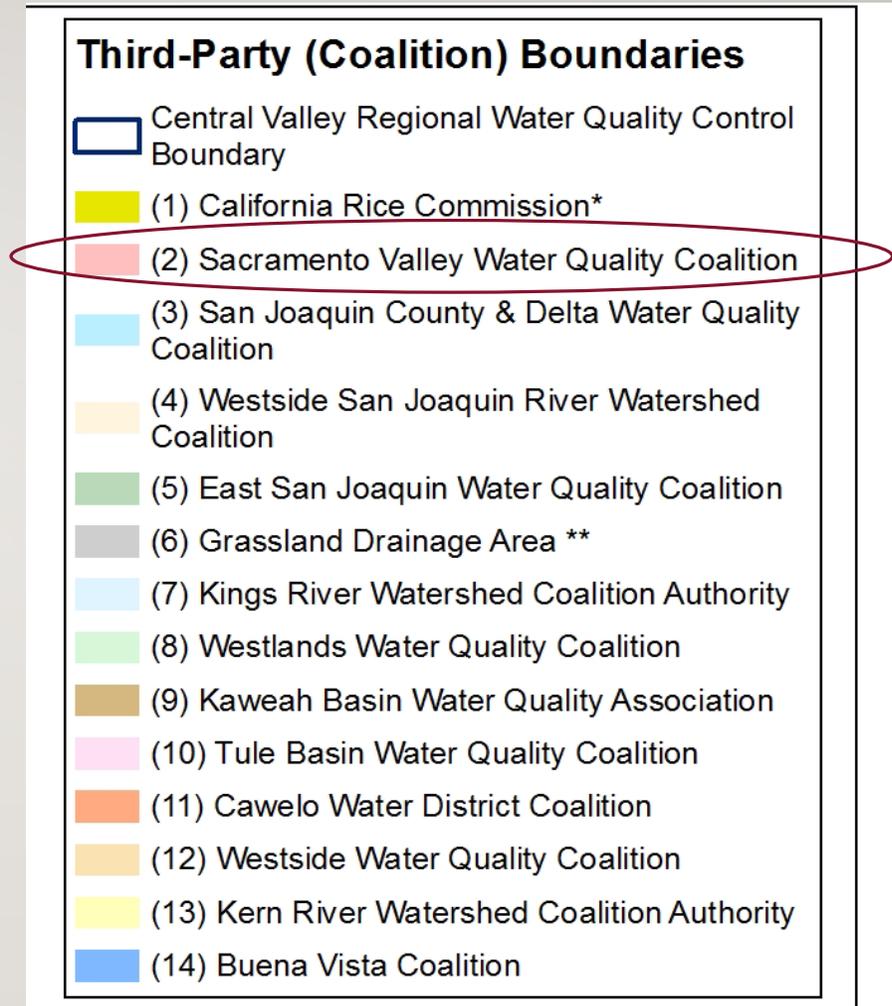
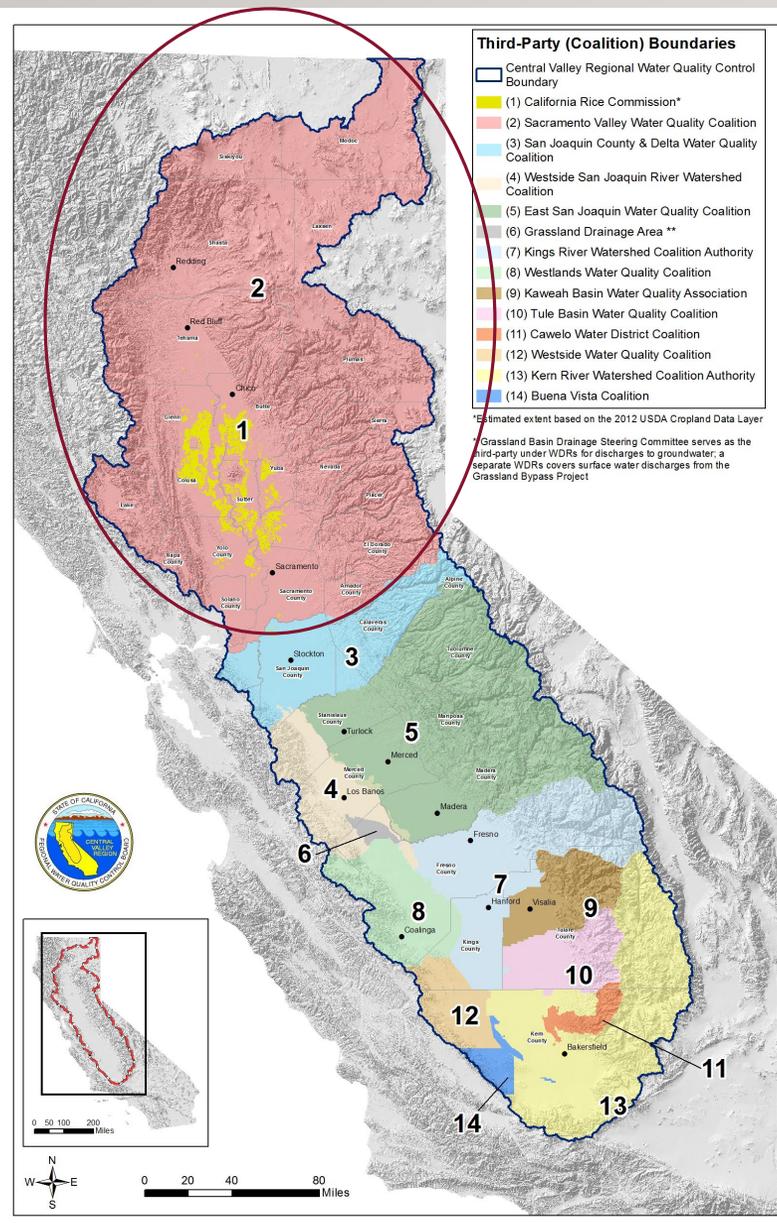
COALITION UPDATE

Martha McKeen, Program Coordinator – Dixon RCD

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD – REGION 5

- “Regional Board”
- Divided into three major watersheds:
 - Sacramento River Basin
 - San Joaquin River Basin
 - Tulare Lake River Basin





Sacramento River Basin is the largest watershed in CA with approx. 27,000 sq. miles and 30% of the state's total surface water!

SACRAMENTO VALLEY WATER QUALITY COALITION (SVWQC)

- SVWQC was formed by the Northern CA Water Association (NCWA)
- SVWQC holds the group permit with the Regional Board
 - Bruce Houdesheldt, Water Quality Director
 - Chelsie Bryden, Program Coordinator
- Dixon/Solano RCD Water Quality Coalition (DSRCDWQC) is one of 11 subwatersheds

Sacramento River Watershed



11 ~~13~~ Subwatersheds

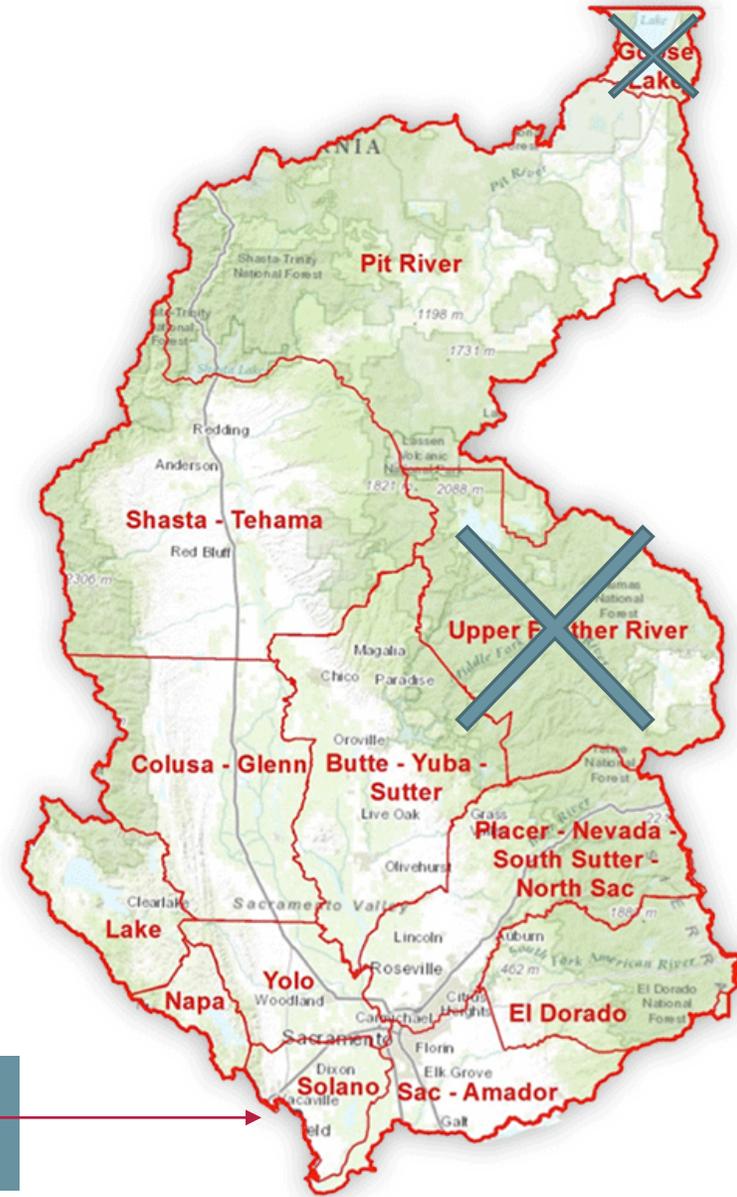
Upper Subwatersheds - 6

- ~~Goose Lake~~
- Pit River
- Shasta-Tehama
- ~~Upper Feather River~~
- PNSSNS
- El Dorado
- Lake
- Napa

Valley Floor Subwatersheds - 5

- Colusa-Glenn
- Butte-Yuba-Sutter
- Yolo
- Solano
- Sac-Amador

Dixon/Solano RCD
Water Quality Coalition



WHAT DOES THE SAC-VALLEY WATER QUALITY COALITION DO FOR US?

- Ensure the Regional Board stays current on outreach and compliance efforts for unenrolled, non-reporters, and non-responsive landowners.
- Continued efforts to exempt irrigated pastures and those landowners that do not apply nitrogen
 - Goose Lake was made exempt in 2021
 - Upper Feather River was made exempt in 2022
 - Efforts are being made to make Pit River subwatershed exempt and other Upper subwatersheds
- How about Dixon/Solano Pasture - No nitrogen applied exemption?
 - The Valley floor subwatersheds have a different landscape than the Upper subwatersheds therefore will have some risk to groundwater so an exemption is probably not going to happen here.
 - Two positive reduced reporting for Pasture – No N:
 - Do not have to complete the INMP SR
 - Do not have to do the GW MPIR (this year)

WHAT DOES THE SAC-VALLEY WATER QUALITY COALITION DO FOR US?

- Subwatershed tours with Regional Board staff where we show highlights of diversity in farming practices and the dedication of Sac-Valley farmers and ranchers in protecting water quality.
- 2023 Tours:
 - Colusa-Glenn and Butte-Yuba-Sutter in August
 - Pitt River in October
- Attend Regional Board meetings on our behalf, keep up on requirements, and reporting dates, coordinate meetings, trainings, and water monitoring, and synchronize all of this with the correct consultant and/or third party responsible for completing the tasks for us per the WDR-Waste Discharge Requirements or the “Order”.

MEMBERSHIP & PROGRAM UPDATE



MEMBERSHIP TOTALS

- 634 - Members enrolled
- 1,457 - Parcels enrolled
- 122,227 - Acres enrolled

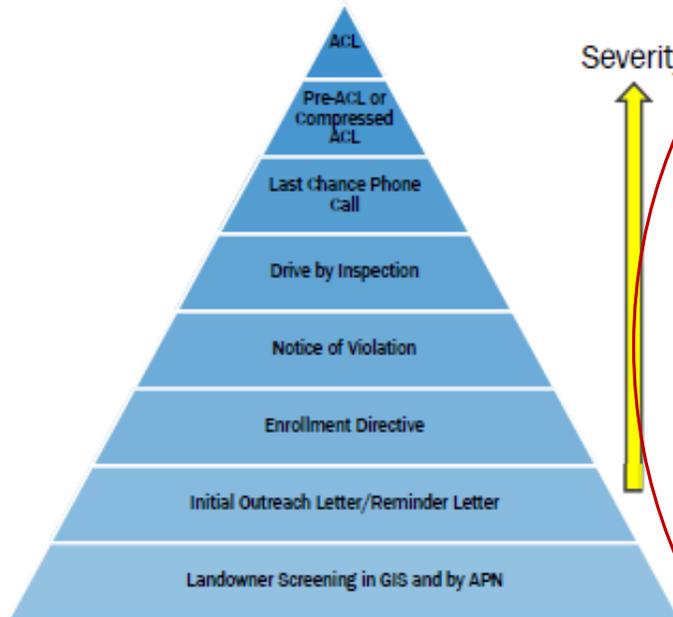


FARM REPORTING CROP YEAR 2022

- Final results: 99% of growers completed their Farm Reporting
- That means one member did not complete the farm reporting.
- The Regional Board has sent this member a certified letter - Notice of Violation for failure to comply with program requirements.

Regional Board Enforcement Efforts

Progressive Enforcement for Non-Enrolled APNs

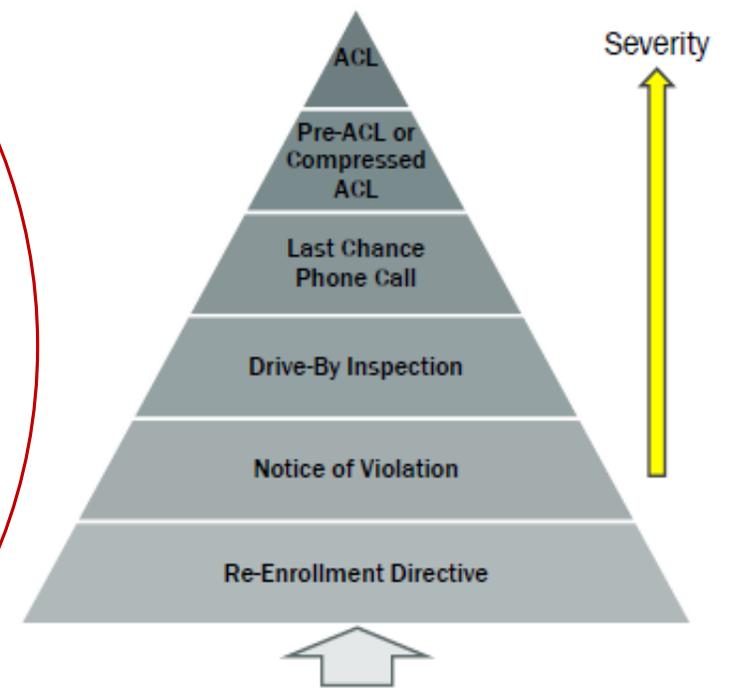


Late Reporters



Outreach/Reminders from the Coalition

Dropped Members

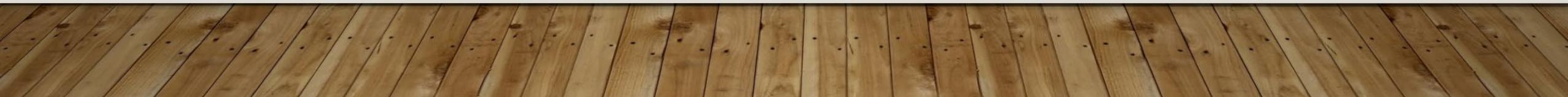


Dropped for Non-Payment and Non-Responsiveness

FARM REPORTING CROP YEAR 2023

- A detailed farm reporting letter will be emailed on or around December 1st

Farm reporting is due: February 15, 2024

- Late fees apply after 02/15/2024 - Late Reporting Fees are 20% of membership fees or \$100 whichever is more.
 - If farm reporting is not received or is incomplete by July 1st, the member is placed on an enforcement list that the Coalition is required to give to the Regional Board.
- 

FARM REPORTING CHECKLIST CROP YEAR 2023

ALL MEMBERS ARE REQUIRED TO REPORT THE FOLLOWING IN THE DMT:

- Verify My **INFO** (contact information)
- Verify **ACCOUNT**, Reporter name, account completion & account balance
- Verify **ACCOUNT CONTACT**, billing contact
- Verify **PARCELS**
- Verify **CROPPING**, irrigated acres, GW% used & crop year for permanent crops
- Complete **INMP SR**, management units, reporting & certification
- Complete **OUTREACH/TRAINING** – enter the education event “attended”
- Complete the **MPIR** – irrigation wells, irrigation uniformity, and crop fertility plan
- Verify **SECP Plan** – acknowledge understanding of requirements
- Complete **INMP WORKSHEET** – Download a copy for crop year 2024 and keep onsite on-farm



FARM REPORTING CHECKLIST CROP YEAR 2023

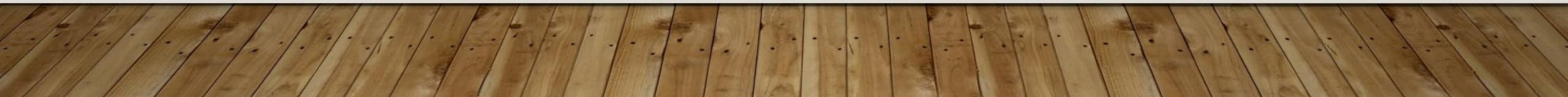
ALL MEMBERS ARE REQUIRED TO REPORT THE FOLLOWING IN THE DMT:

- Verify **CROPPING**, irrigated (farmed) acres & crop year for permanent crops

All crops must have acreage including:

Winter wheat, triticale, and other hays and grasses that may or may not be irrigated or are passively irrigated.

Exceptions are:

- Fallow-No Water (Due to drought or allocation)
 - Fallow-No Operator (Not farming the land unable to find tenant or tenant left with short notice, etc.)
 - Fallow-In Transaction (Orchard replacement, vineyard replacement, rotation of crop)
- 

FARM REPORTING CROP YEAR 2023

- DMT – Data Management Tool

- Do you still have your login? If not, contact us ASAP.
- If you are a new member that did not report in crop year 2022, your login will be sent to you this reporting year.
- If you are an owner who has a reporter (tenant) complete your farm reporting, then they have a separate login.

VISIT: dixonrcd.org/irrigated-lands

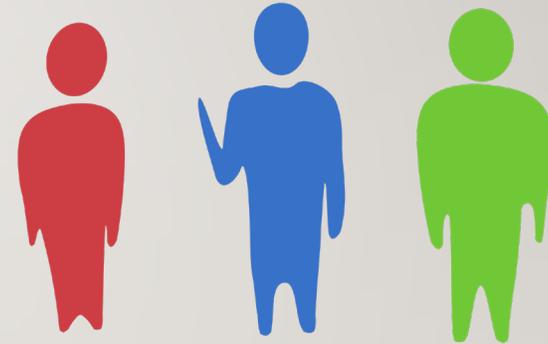
Click on the green button to take you to the login portal.



- Remember you can always make an appointment for an office visit with Martha to complete your farm reporting.

STAFF AT DIXON RCD

- Kelly Huff, District Manager
- Martha McKeen, Program Coordinator
- Joanna Yac, Office Manager



- We continue to partner with the staff of Solano RCD throughout the year and during the farm reporting season for technical assistance.

BOARD MEMBERS

DIXON RCD

- David Viguie
- Sam Beukelman
- Spencer Bei
- Eric Schene
- Daniel Jones
- Jim Campbell, Associate
- Leo Soukeris, Associate

SOLANO RCD

- Kurt Balasek
- Paul Lum
- Randi Thompson
- Kathie Stutz
- Chris Calvert
- Glenda Riddle
- Vacant

ADVISORY Ad Hoc COMMITTEE

- Kurt Balasek
- Spencer Bei
- Bruce Brazelton
- Paul Lum
- Cork Mclsaac – Rep. for Sac Valley
- David Viguie
- Vacant
- Vacant

To attend a board meeting, look for the agendas at: dixonrkd.org or solanorcd.org

FINANCES



INVOICING FISCAL YEAR 2024



- Invoices were sent on October 2nd and due on December 2nd
- Member Fees are \$3.75 per irrigated acre... NO CHANGE from last year.
- Credit for Pasture with no nitrogen applied for the previous year applied to the invoice.
- Currently, we are at 40% PAID.
- We now take online CC and debit payments!
 - There is a 2.25% service fee to the user, not the Coalition.



FISCAL YEAR 2023 BUDGET RECAP

- FY 2023 actual ending fund balance on June 30, 2023, was \$205,121
- Anticipated \$146,146
- Why such a large difference?
 - A positive net position of \$12,928
 - Used less staff time
 - Large spike in interest income
 - \$16,417 carryover from SVWQC the previous year

Dixon/Solano RCD Water Quality Coalition July 2022 - June 2023 Finances	
Total Income	\$ 456,005.65
Membership Fees (\$3.75/acre)	\$ 448,774.18
Interest	\$ 7,231.47
Total Expenses	\$ 443,077.95
State Board Fees (\$1.35 per irr/acre)	\$ 156,514.56
RCD Staff	\$ 119,609.88
RCD Direct Cost	\$ 4,681.64
Surface Water Monitoring	\$ 48,902.71
Groundwater Monitoring	\$ 61,008.55
Reporting Requirements	\$ 26,835.01
SVWQC Fees	\$ 25,525.60
Fund Balance - 06/2023 (Final)	\$ 205,121.00

FISCAL YEAR 2024 BUDGET PLANNING

Dixon/Solano RCD Water Quality Coalition July 2023 - June 2024 Finances

Budgeted Income	\$ 452,164.62
Membership Fees (\$3.75/acre)	\$ 450,664.62
Interest	\$ 1,500.00
Budgeted Expenses	\$ 507,592.49
State Board Fees (\$1.47 per irr/acre)	\$ 173,840.80
RCD Staff	\$ 137,994.00
RCD Direct Cost	\$ 15,030.00
Surface Water Monitoring	\$ 54,661.06
Groundwater Monitoring	\$ 60,685.83
Reporting Requirements	\$ 32,330.17
SVWQC Fees	\$ 33,050.63
Fund Balance - 06/2024 (Projected)	\$ 149,693.13

Note: Our budget is approved in June

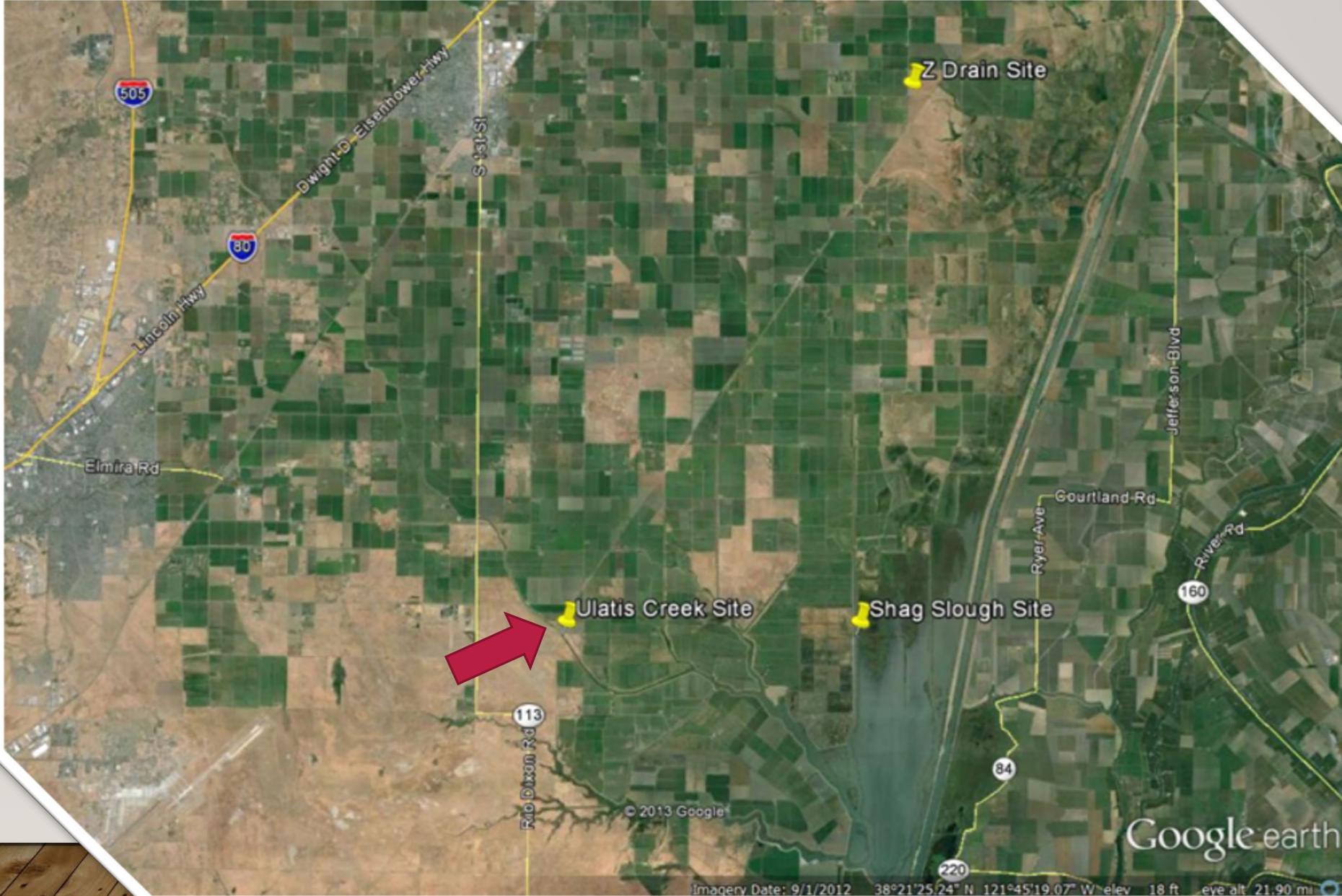
2024 is a non-assessment water quality monitoring year

- Budgeted income \$452,165
- Budgeted expenses \$507,592
- Net position of -\$55,428
- Projected ending balance for June 30, 2024, is \$149,693
 - No change - \$3.75 irrigated/acre fee this year
- Update - SVWQC budget in November - State fees are \$1.42

For details about the water quality budget contact Martha at 707-678-1655 x103

SURFACE WATER





ZDDIX
Special Project
Monitoring Site
Not in use a this time

SSLIB
Integrative
Monitoring Site

UCBRD
Representative
Monitoring Site
(Management
Plan for sediment
toxicity)

SEDIMENT TOXICITY MANAGEMENT PLAN

Ulatis Creek at Brown Road Monitoring Site

Date of last exceedance: April 21, 2022

- Extends Sediment Toxicity Management Plan for 3 years, until 2025.
- No exceedance in 2023 

Keep up the good work and follow BMP-best management practices while using pyrethroids or any pesticide.

Visit our website at: dixonrcd.org/bmps-for-pesticides



SURFACE WATER MPIR*

*Management Plan Implementation Report - It is not the MPIR in the DMT - data management tool-online reporting

- It is required and triggered by our management plan for sediment toxicity
- The SW MPIR is specific to only tomato, alfalfa, barley and pear growers that use lambda-cyhalothrin and bifenthrin
- It is a 13-question survey about irrigation and sediment run-off practices
- Required for specific growers for fall of 2023 and 2024 and ends when the management plan is complete.

WATER QUALITY MONITORING-WATER COLUMN

- On June 23, 2021, there was a water column toxicity exceedance at the Ulatis Creek monitoring site, where we have an active management plan for sediment toxicity.

Update since then...

As of October 2023, we have not had another water column exceedance at the site.

- This could not have happened without the ongoing efforts of our growers/applicators to use BMP of pyrethroid pesticides.

GROUNDWATER

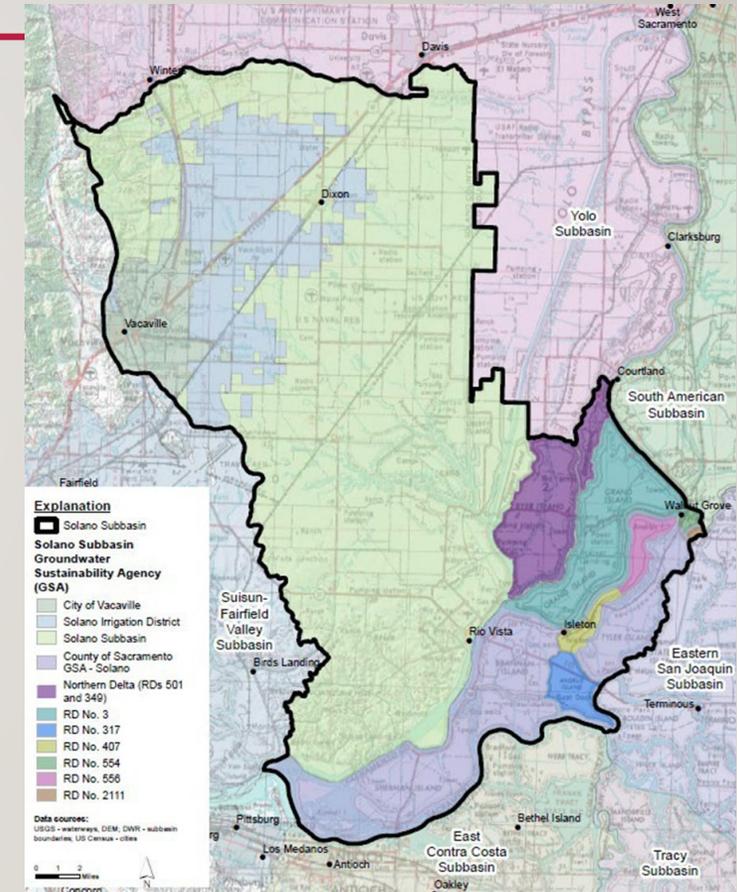


GSP-GROUNDWATER SUSTAINABILITY PLAN

- The plan was submitted to the State in January 2022.
- Waiting to hear the evaluation determination:
 - Approved-DWR recommends some changes
 - Incomplete-DWR requires corrective actions-GSA has 180 days to complete to address deficiencies
 - Inadequate-More than 180 days to fix, the State will step in to manage the basin.
- The State has two years to complete the evaluation.

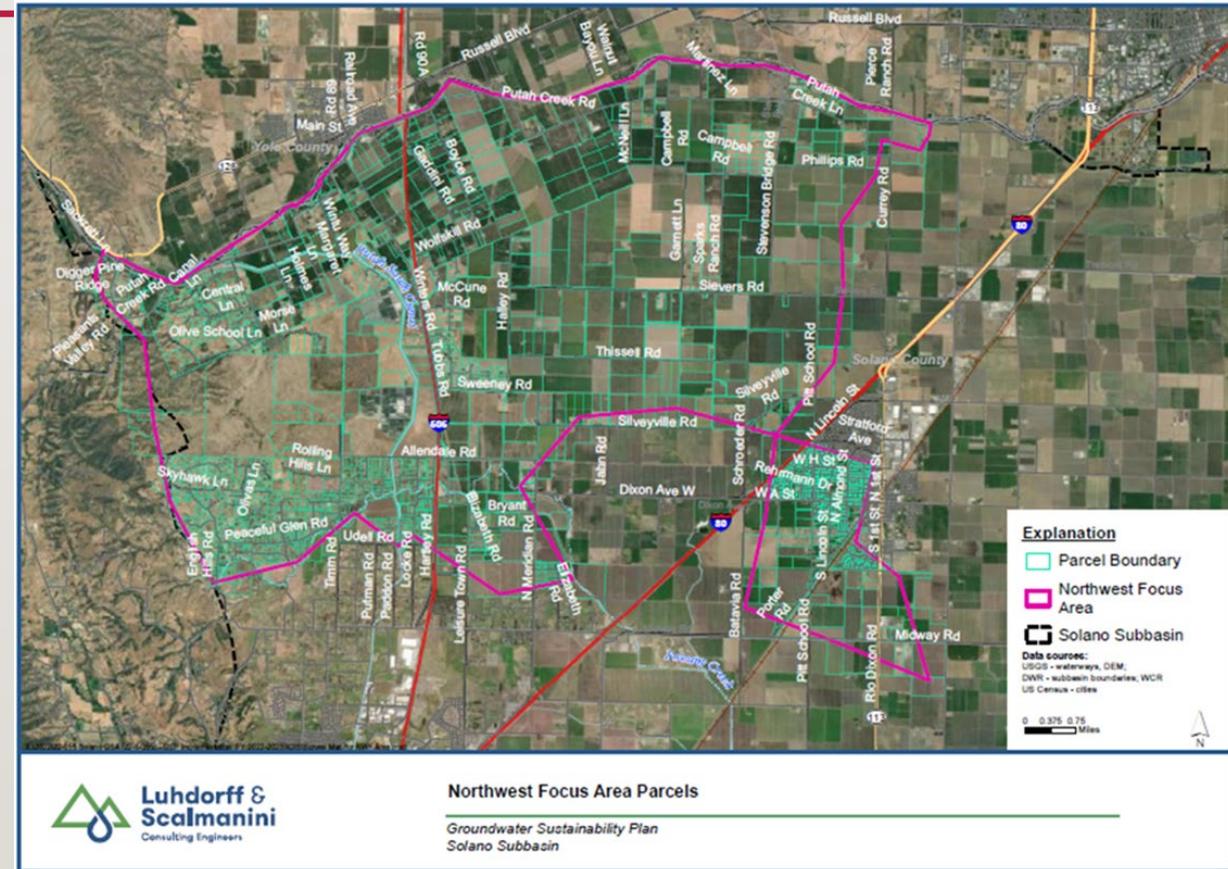
More about this process can be found on the SGMA website

<https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Groundwater-Sustainability-Plans>



GSP-GROUNDWATER SUSTAINABILITY PLAN

- Overall, the subbasin is considered balanced and is sustainable for the next 50 years with the exception of the Northwest Focus Area
- \$4.4 million grant awarded to the GSA for groundwater protection projects and ongoing costs
- If you have a parcel in this area and are interested in participating in groundwater projects, call Martha with your contact information, project idea, and date available to start a project.



GSP AND THE DIXON/SOLANO RCD WATER QUALITY COALITION

- Keep coalition members informed with the latest info
- Try to avoid duplicate efforts with data sharing to reduce costs to landowners/operators
- DMT-data management tool data collection to ground truth and improve GSP data on water use

GSP – STAKEHOLDER ENGAGEMENT

- GSA Board Meetings

www.solanogsp.com

www.groundwaterguide.com



DRINKING WATER WELLS MONITORING

- Parcels enrolled in the Coalition with active drinking water wells must have the water tested for nitrates by December 31, 2023
- For more information, visit:

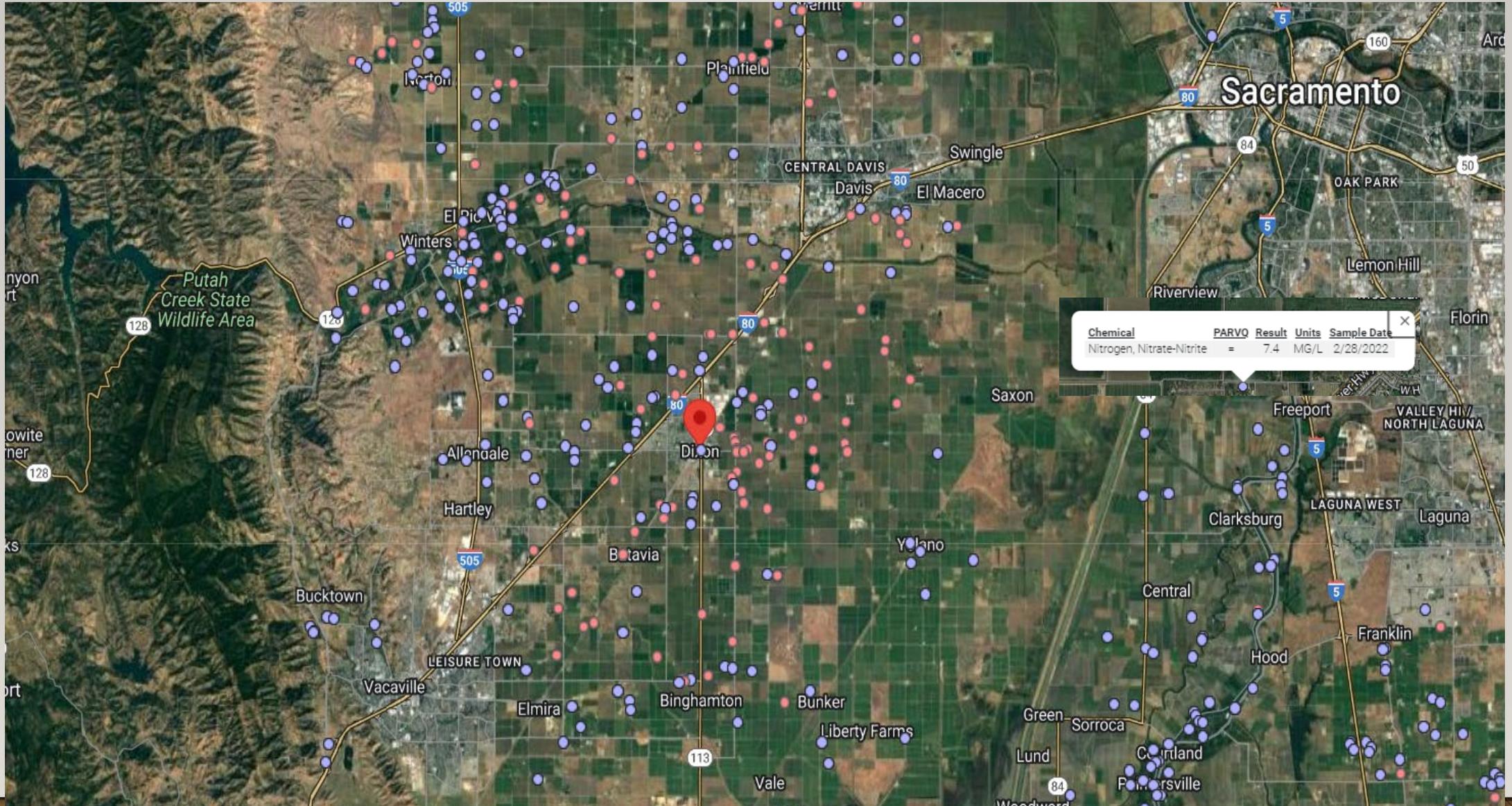
https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/drinking_water/

Or

<https://www.dixonrcd.org/drinking-water-well-monitoring>



STATE GEOTRACKER WEBSITE



- Nitrate + Nitrite as N above 10 mg/L
- Nitrate + Nitrite as N below 10 mg/L

<https://geotracker.waterboards.ca.gov/>

TO REPORT A DRY WELL

<https://mydrywell.water.ca.gov/report/>

Your own private wells!

Dry Well Reporting System

Contact Us Feedback Help Sign In

Has your well gone dry?

Report it here to inform state and local agencies on drought impacts

Report your Dry Well and Find Resources Here

This site is for Californians experiencing problems with their private (self-managed) wells (not for residents served by a public water system already regulated by the State). Report your dry well in a few steps and find available resources.

[Submit Report](#) [Enviar Reporte](#) [Resources](#)

GROUNDWATER WORKSHOP*

WHEN: Tuesday, January 23, 2024

TIME: 9:00 AM – 12:00 Noon

WHERE: Legion Hall Dixon, CA



**SAVE
THE
DATE**

The second annual groundwater meeting with local groundwater experts to present interesting information on the topic. Log it in your calendar!

*We will apply for CDFA INMP CEUs

INMP SR – IRRIGATION AND NITROGEN MANAGEMENT PLAN SUMMARY REPORT

- Fill out pre-harvest by March 1st - what is expected for the season
- Complete after harvest - actual totals
- Stays on-farm, data used to complete the INMP SR
- Certify the worksheet if the parcel is in an HVA - high vulnerability area for nitrogen
- Be accurate in your reporting. Why?
 - Pasture-No N applied exempt

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

Member ID: _____ INMP Field or MU: _____ Crop: _____ Total Acres: _____

IRRIGATION MANAGEMENT		Pre-Season Planning		
1. Irrigation Method* (check one for Primary; if applicable, check one for Secondary) Primary Secondary <input type="checkbox"/> <input type="checkbox"/> Drip <input type="checkbox"/> <input type="checkbox"/> Micro Sprinkler <input type="checkbox"/> <input type="checkbox"/> Furrow <input type="checkbox"/> <input type="checkbox"/> Sprinkler <input type="checkbox"/> <input type="checkbox"/> Border Strip <input type="checkbox"/> <input type="checkbox"/> Flood		2. Crop Evapotranspiration (ET, inches)		
		3. Anticipated Crop Irrigation (inches)		
		4. Irrigation Water N Concentration (ppm or mg/L, as NO ₃ -N)		
5. Irrigation Efficiency Practices* (Check all that apply)				
<input type="checkbox"/> Laser Leveling <input type="checkbox"/> Use of ET in scheduling irrigations <input type="checkbox"/> Water application schedule to need <input type="checkbox"/> Use of moisture probe (e.g. tensiometer)		<input type="checkbox"/> Soil Moisture Neutron Probe <input type="checkbox"/> Pressure Bomb <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____		
HARVEST / YIELD INFORMATION				
Harvest / Yield Information		Expected (A)	Actual (B)	
6. Production Unit (lbs, tons, etc.)		7. Harvested Yield*		
NITROGEN MANAGEMENT				
8. Nitrogen Efficiency Practices* (Check all that apply)		Nitrogen Sources	Recommended/ Planned N (A)	Actual N (B)
<input type="checkbox"/> Split Fertilizer Applications <input type="checkbox"/> Irrigation Water N Testing <input type="checkbox"/> Soil Testing <input type="checkbox"/> Tissue/Petiole Testing <input type="checkbox"/> Fertigation <input type="checkbox"/> Foliar N Application <input type="checkbox"/> Cover Crops <input type="checkbox"/> Variable Rate Applications using GPS <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____		9. Soil – Available N in Root Zone (Annualized, lb/acre)		
		10. N in Irrigation Water* (Annualized, lb/acre)		
		11. Organic Amendments* (Manure/Compost/Other, lb/acre estimate)		
		12. Dry/Liquid Fertilizer N* (lb/acre)		
		13. Foliar Fertilizer N* (lb/acre)		
		14. TOTAL NITROGEN (lb/acre)		

* A secondary irrigation system could be used for crop germination, frost protection, crop cooling, etc.
 * (Bold Text) Data to be reported to the Coalition on the INMP Summary Report, based on Actual Yield and Actual N.

Plan Certifier Initials

GROUNDWATER PROTECTION TARGETS (GWPT)

- The GWPTs draft was approved by RB in June 2023 with some revisions to be made.
- The main purpose of the GWPTs is to incorporate them into Groundwater Quality Management Plans (GQMPs), which the Coalition must update and include the revised GWPT by June 2024
- GWPTs are non-regulatory in nature but intended to ensure the protection of groundwater/drinking water.
- Proposed GWPTs build upon previous efforts from the Coalitions to quantify current township-scale nitrogen loading at the root zone based on grower-reported Irrigation and Nitrogen Management Plan Summary Report data.

INMP SR – IRRIGATION AND NITROGEN MANAGEMENT PLAN SUMMARY REPORT

- Your data is part of the overall A-R for nitrogen applied minus nitrogen removed for townships and is how we ultimately get to the Groundwater Protection Targets-GWPTs (INMP SR data from 2017-2020 were used)

So...

- Be accurate in your reporting.
 - Update due again in June 2028

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET			
IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET			
Member ID: _____ INMP Field or MU: _____		Crop: _____ Total Acres: _____	
IRRIGATION MANAGEMENT			
1. Irrigation Method* (check one for Primary; if applicable, check one for Secondary)		Pre-Season Planning	
Primary	Secondary	2. Crop Evapotranspiration (ET, inches)	
<input type="checkbox"/>	<input type="checkbox"/> Drip	3. Anticipated Crop Irrigation (inches)	
<input type="checkbox"/>	<input type="checkbox"/> Micro Sprinkler	4. Irrigation Water N Concentration (ppm or mg/L, as NO ₃ -N)	
<input type="checkbox"/>	<input type="checkbox"/> Furrow		
<input type="checkbox"/>	<input type="checkbox"/> Sprinkler		
<input type="checkbox"/>	<input type="checkbox"/> Border Strip		
<input type="checkbox"/>	<input type="checkbox"/> Flood		
5. Irrigation Efficiency Practices* (Check all that apply)			
<input type="checkbox"/> Laser Leveling		<input type="checkbox"/> Soil Moisture Neutron Probe	
<input type="checkbox"/> Use of ET in scheduling irrigations		<input type="checkbox"/> Pressure Bomb	
<input type="checkbox"/> Water application schedule to need		<input type="checkbox"/> Other: _____	
<input type="checkbox"/> Use of moisture probe (e.g. tensiometer)		<input type="checkbox"/> Other: _____	
HARVEST / YIELD INFORMATION			
Harvest / Yield Information		Expected (A)	Actual (B)
6. Production Unit (lbs, tons, etc.)	7. Harvested Yield*		
NITROGEN MANAGEMENT			
8. Nitrogen Efficiency Practices* (Check all that apply)		Nitrogen Sources	Recommended/Planned N (A)
<input type="checkbox"/> Split Fertilizer Applications		9. Soil – Available N in Root Zone (Annualized, lbs/ac)	
<input type="checkbox"/> Irrigation Water N Testing		10. N in Irrigation Water* (Annualized, lbs/ac)	
<input type="checkbox"/> Soil Testing		11. Organic Amendments* (Manure/Compost/Other, lbs/ac estimate)	
<input type="checkbox"/> Tissue/Petiole Testing		12. Dry/Liquid Fertilizer N* (lbs/ac)	
<input type="checkbox"/> Fertigation		13. Foliar Fertilizer N* (lbs/ac)	
<input type="checkbox"/> Foliar N Application		14. TOTAL NITROGEN (lbs/ac)	
<input type="checkbox"/> Cover Crops			
<input type="checkbox"/> Variable Rate Applications using GPS			
<input type="checkbox"/> Other: _____			
<input type="checkbox"/> Other: _____			

* A secondary irrigation system could be used for crop germination, frost protection, crop cooling, etc.
* (Bold Text) Data to be reported to the Coalition on the INMP Summary Report, based on Actual Yield and Actual N.

Plan Certifier Initials

GROUNDWATER – HVA HIGH VULNERABILITY AREAS 2023

GAR-Groundwater Assessment Report 2022 (September 2022)-The GAR looks at HSA (Hydrologically Sensitive Areas) parcels that overlie with HVA parcels

- The coalition is required to periodically update HVA
- 2023-Newly enrolled parcels with overlying HVA
- 2023-Parcels near DW wells with nitrate exceedances influenced by irrigated ag

UPDATES IN DMT...

- The number of parcels that changed is 537 out of 1457 enrolled in the coalition.
- High to low = 345 or 24%
- Low to high = 192 or 13%  May need to certify your INMP Worksheet now!
 - Get INMP self-certified or hire a CCA

- <https://www.cdfa.ca.gov/is/ffldrs/frep/training.html#grower>

DMT – DATA MANAGEMENT TOOL HVA UPDATE 2023

PARCELS PAGE

DS|DMT

MEMBER DATA

- Account
- Account Contacts
- Parcels**
- Cropping

INMP SUMMARY REPORT

- INMP Management Units
- INMP Reporting
- INMP Certification
- Outreach and Training

MPIR

- Irrigation Wells
- Irrigation Uniformity
- Crop Fertility Plan

SECP PLAN

- SECP Plan

MAPS AND REPORTS



Notice! High Nitrogen Vulnerability Changes

- High N vulnerability change from *Low* to *High* for parcel *000-000-0000*

OK

Nitrogen Credits: Soil, water & organic amendments

Annie Burkholder, CCA
Dellavalle Laboratory
anne@dellavallelab.com
530-400-1346

Credits = Supply nitrogen to crop

NITROGEN MANAGEMENT

Nitrogen Sources

9. Soil – Available N in Root Zone
(Annualized, lbs/ac)

10. N in Irrigation Water*
(Annualized, lbs/ac)

11. Organic Amendments*
(Manure/Compost/Other, lbs/ac estimate)



Available N
in soil



Irrigation
water



Organic
Amendments

+



Fertilizer

Credits+ Fertilizer = Total N applied

Credit 1: Soil - Available N in Root Zone

- Testing is recommended in row crops but not in permanent crops
 - (for annual systems enter 0 or N/A)
- Includes N mineralized:
 - from recent fertilizer or irrigations
 - mineralized from crop residues and soil organic matter
- Sample must be collected after the rainy season and just before or after planting
- To calculate the amount of nitrogen in the soil multiply the ppm (mg/kg) by 3-4 depending on the soil texture.
- Many factors effect the amount of nitrogen in the soil that will be available to the crop. Less than 100% of this nitrogen present in the soil at testing will be available.

Example: Calculating Soil N in Root Zone

20 mg/kg in 0-12” and 15 mg/kg in 12-24”

Remember: mg/kg =ppm

$20 \text{ mg/kg} * 3.6 = 72 \text{ lbs/acre} * 50\% \text{ available} = 36 \text{ lbs/acre}$

$15 \text{ mg/kg} * 3.6 = 54 \text{ lbs/acre} * 25\% \text{ available} = 13.5 \text{ lbs/acre}$

Sum = 36 + 13.5 = 50 lbs/acre

Determining N availability in soil can be tricky. Best practice is to run periodic in-season tissue analyses to insure adequate nutrition.

Credit 2: N in Irrigation Water

Nitrate in your water is the same as fertilizer N

Converting N in irrigation water to fertilizer N:

Nitrate-N (in ppm or mg/L) x (feet H₂O transpired) x (2.7) = **pounds N taken up by crop**

Example:

Lab reports 10 mg/L Nitrate-N and the crop's ET is 3 feet

10 mg/L x 3 acre feet x 2.7 = **81 pounds of nitrogen**

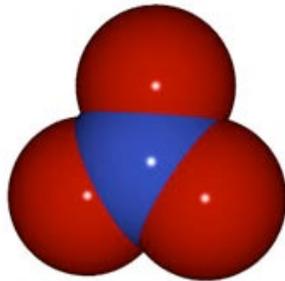
(Some of this nitrogen may be “applied” when it can not be effectively utilized by the crop, thus an efficiency factor of 0.7-0.9 may be used)

Remember: mg/L=ppm

Converting between nitrate and nitrate-N

Measuring Nitrate:

45 ppm NO_3 (measure 1 N + 3 O)



=

Measuring Nitrate-N:

10 ppm $\text{NO}_3\text{-N}$ (measure 1 N only)



Preferred Measurement

To convert nitrate to nitrate-nitrogen:
Nitrate Nitrogen = Nitrate x 0.226

Potential savings when accounting for N in irrigation water

NO ₃ -N ppm or mg/L	Pounds nitrogen acre-feet	Tomato ET is approximately 2 feet			Walnut ET is approximately 3 feet			Almond ET is approximately 3.5 feet		
		(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
10	27	54	40.5	\$ 27	81	60.75	\$ 41	94.5	70.875	\$ 48
15	40.5	81	60.75	\$ 41	121.5	91.125	\$ 61	141.75	106.313	\$ 71
20	54	108	81	\$ 54	162	121.5	\$ 82	189	141.75	\$ 95

(a) Pounds of nitrogen taken up by the crop.

(b) Due to nitrogen uptake timing, not all nitrogen in the water will be "useful" to the crop.

This example assumes that 75% of the applied N in irrigation water is effective.

(c) Potential saving per acre.

Credit 3: N Organic Amendments

Organic matter applied to the soil in-season, such as manure, compost, or cover crop residue will release N over time (mineralization)

- N released is dependent on soil temperature, moisture, C:N ratio of the amendment (lower C:N ratio will release more quickly), incorporation
- Calculations depend on whether is a one-time application or an annual application

Organic Nitrogen Mineralized in the Soil

Single application of organic matter

- N credits = dry lbs. OM x % N x % decomposition 1st year
- Laboratory analysis is needed to determine %N in the material

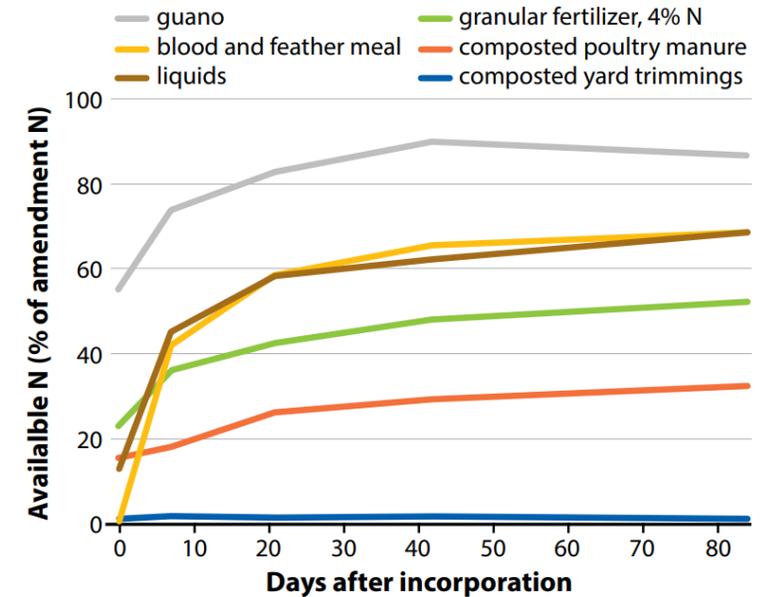


Figure 8. Predicted nitrogen release curves from different amendment types under warm, moist conditions (Lazicki et al. 2020).

First Year Decomposition Rates

Cured Compost	5-10%
Dried Manure	20-30%
Cover Crop	10-35%
Lagoon Water	40-50%

Organic Nitrogen Mineralized in the Soil

- Consistent application OM or a growing of cover crop yearly
 - N Contribution = Dry lbs. OM x % N x 70%

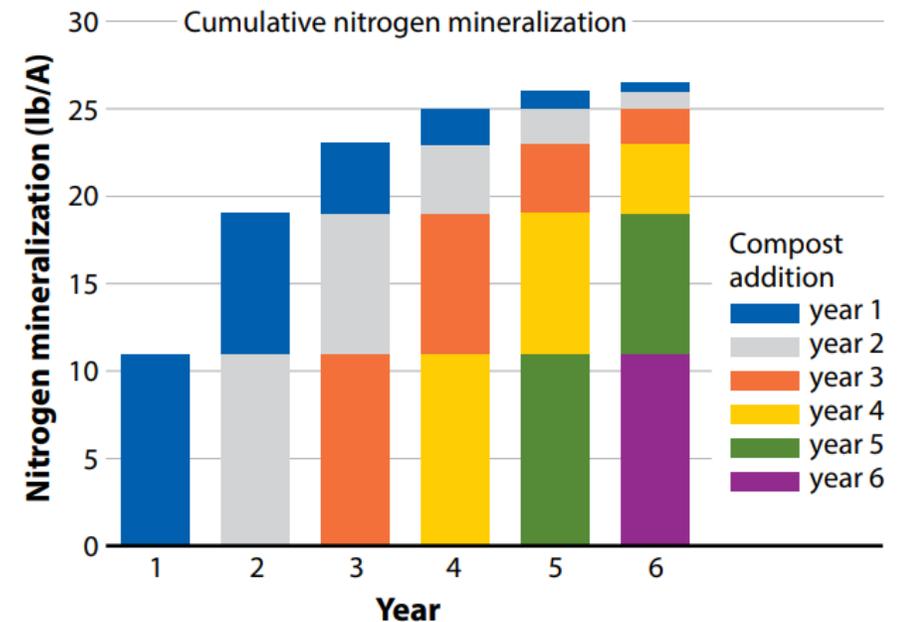


Figure 2. A model of available mineral nitrogen increasing and approaching a steady state after about 4 years, when receiving continual application of the same amount of organic nitrogen (43 lb N/acre) from a cover crop (Crohn 2004).

Whole Orchard Recycling

Proper nitrogen applications are important the first leaf after whole orchard recycling:

- 1/4 oz at planting
- 5 oz actual N per tree (45 lbs N/acre) during first leaf and apply early
- Apply N in small frequent doses, applying no more than one ounce per application or you can burn trees.
- Only a difference the first year, 2nd and 3rd leaf should receive standard nitrogen rate.

Resources on organic amendment N mineralization

Estimating Nitrogen Availability in Organic Annual Production

<https://anrcatalog.ucanr.edu/Details.aspx?itemNo=8712>

Article: <https://ucanr.edu/sites/SFA/files/322312.pdf>

Worksheet: <https://ucanr.edu/sites/SFA/files/322313.pdf>

Calculator: http://geisseler.ucdavis.edu/Amendment_Calculator.html

Nitrogen Credits: Soil, water & organic amendments

Annie Burkholder, CCA
Dellavalle Laboratory
anne@dellavallelab.com
530-400-1346

Organic soil amendments: Biosolids



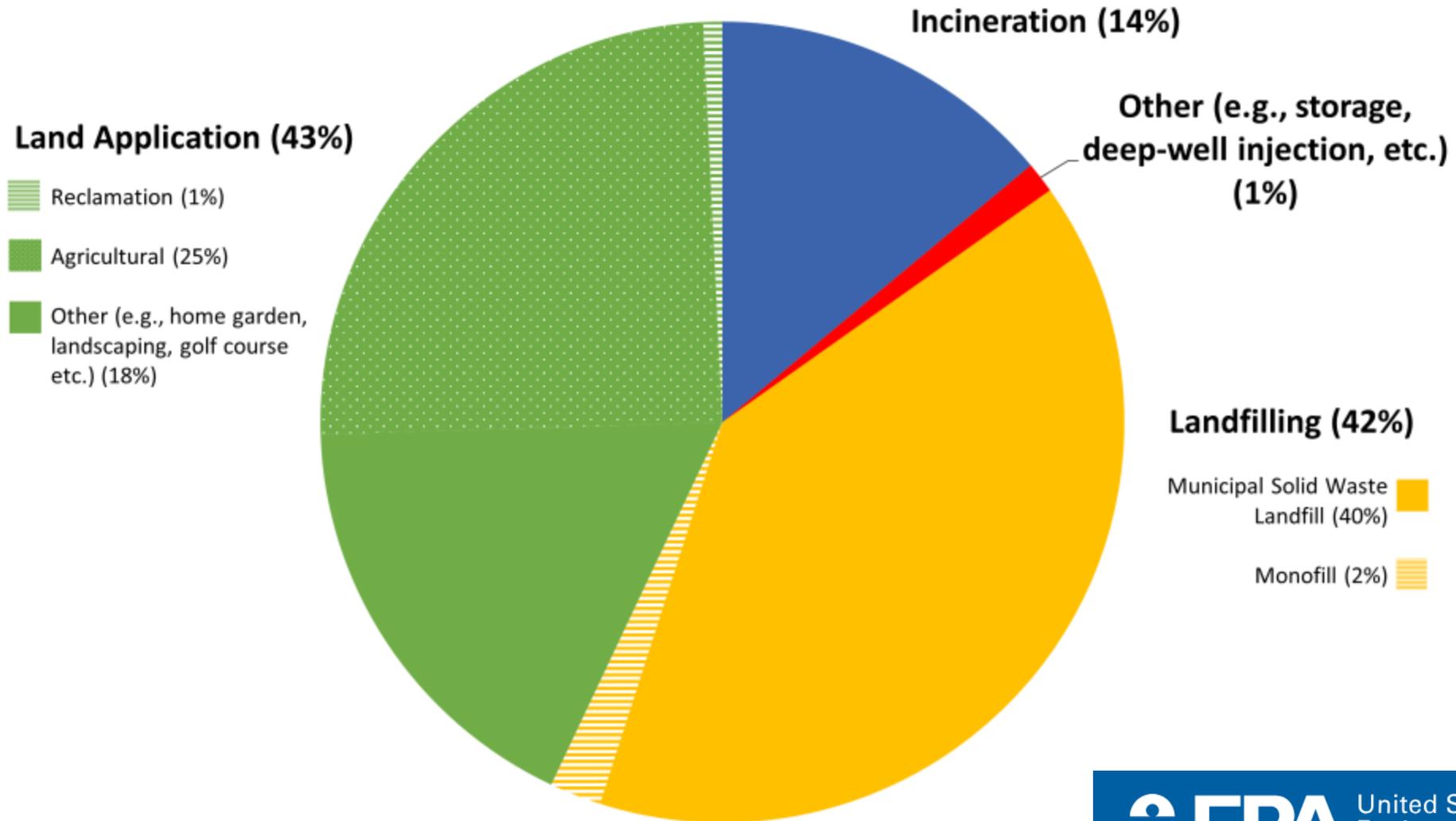
Photo: State of Michigan

Biosolids definition

Biosolids are a product of the wastewater treatment process. During wastewater treatment the liquids are separated from the solids. Those solids are then treated physically and chemically to produce a semisolid, nutrient-rich product known as biosolids. The terms 'biosolids' and 'sewage sludge' are often used interchangeably.



Biosolids Use & Disposal from 2021 Biosolids Annual Program Reports



Biosolids sources



Facility at the Fairfield-Suisun Sewer District converts 100% of the solid waste to usable product (Class A fertilizer)



Biosolids sources



Facilities in Sacramento County
– sell both pelletized and wet
product

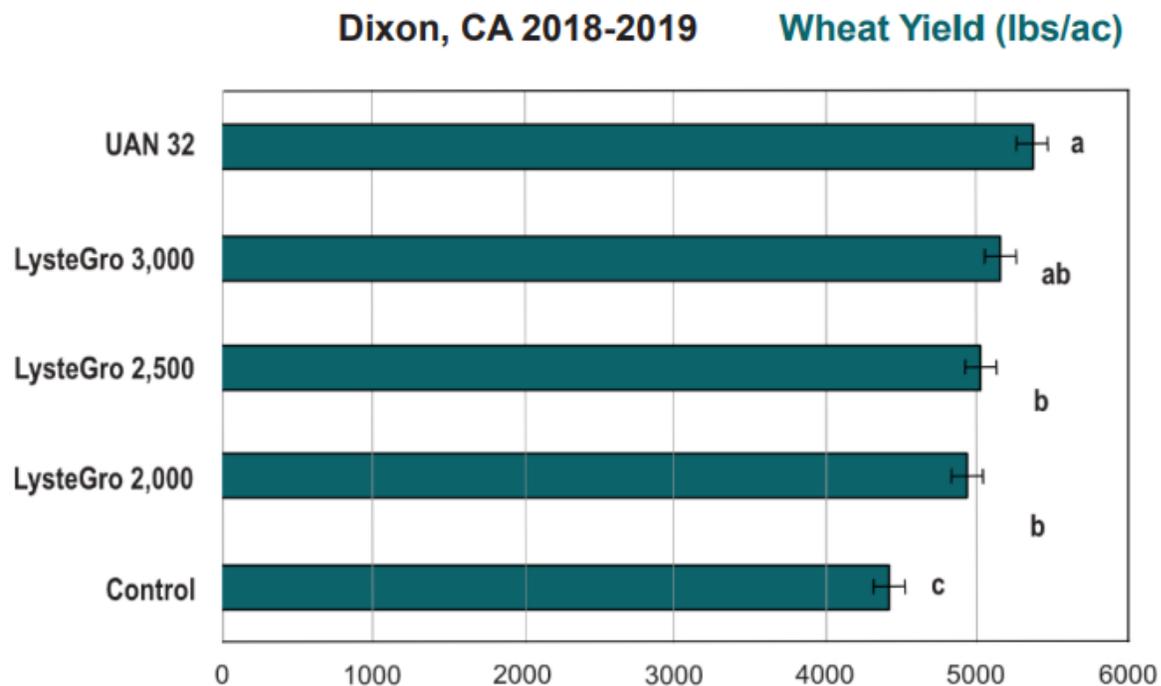
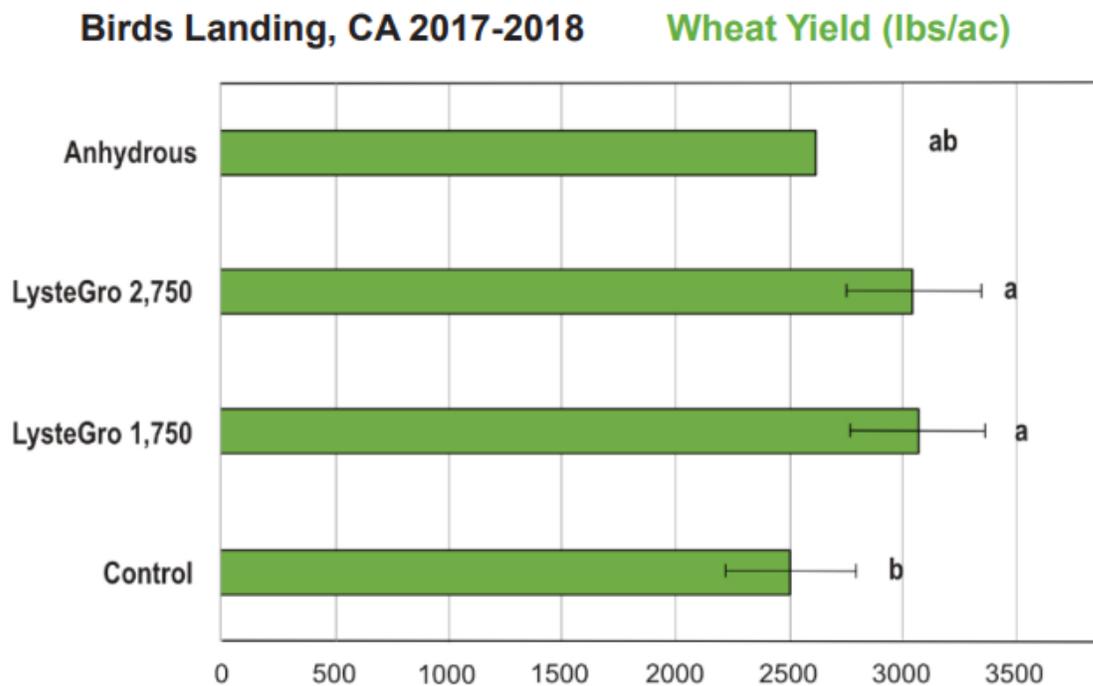
What biosolids bring to your soil system

- Biosolids are not compost! They are an organic fertilizer with a C:N ratio around 1.
- The N is tied to carbon in organic molecules upon application. Microbes break these down and release N as ammonia and nitrate.
- Biosolids contain numerous micronutrients in addition to N-P-K
- As an organic input, multi-year applications will build organic matter in the soil.
- Metered N release means less opportunity for N loss to groundwater or atmosphere.



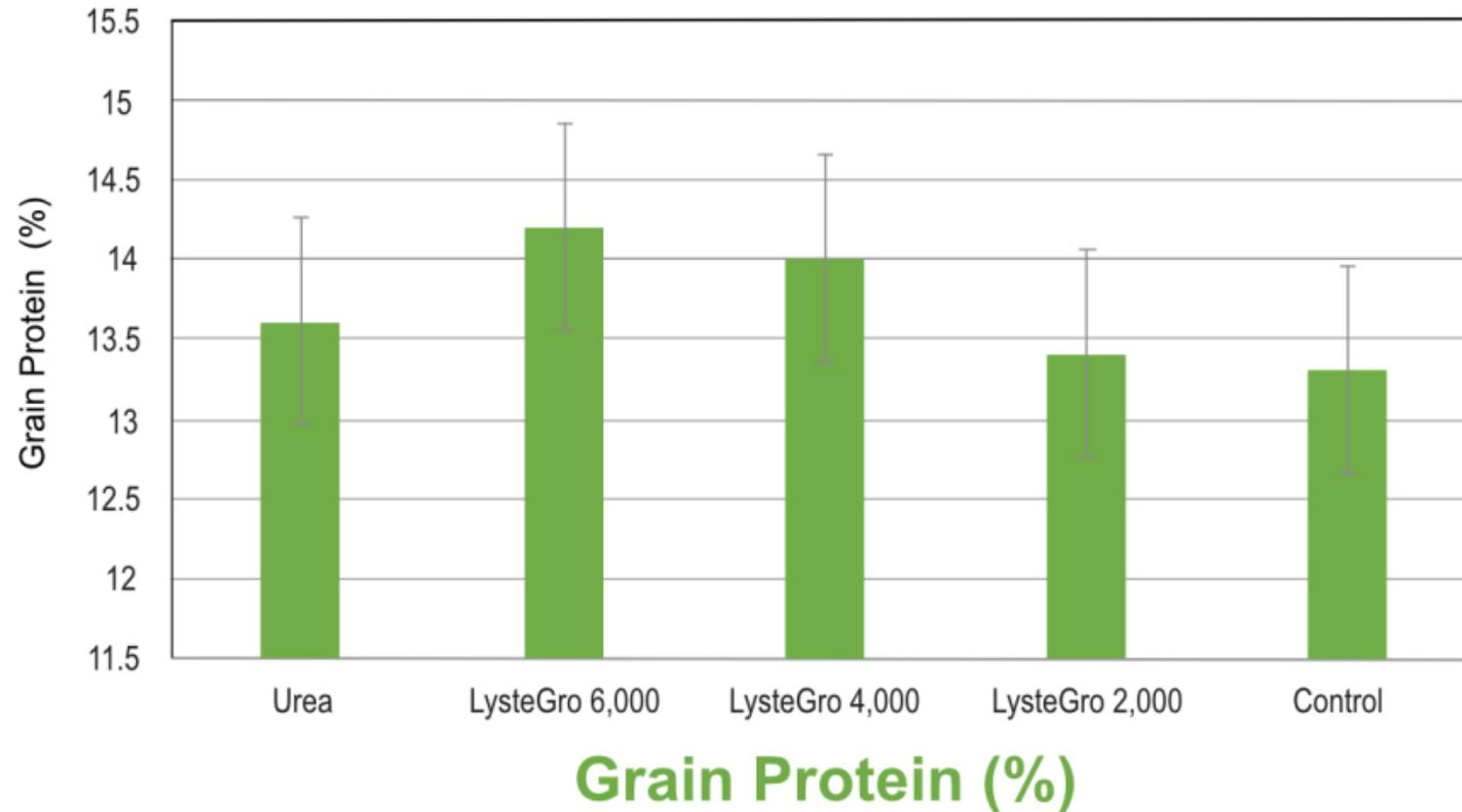
What biosolids bring to your soil system

Using Lystek's LysteGro product as an example:



LysteGro performed similarly to traditional inorganic fertilizers

What biosolids bring to your soil system



LysteGro fields had significantly higher grain N at harvest, possibly due to late season N mobilization in the biosolids

How to account for this source of N in your reporting

NITROGEN MANAGEMENT			
8. Nitrogen Efficiency Practices* (Check all that apply)	Nitrogen Sources	Recommended/ Planned N (A)	Actual N (B)
<input type="checkbox"/> Split Fertilizer Applications <input type="checkbox"/> Irrigation Water N Testing <input type="checkbox"/> Soil Testing <input type="checkbox"/> Tissue/Petiole Testing <input type="checkbox"/> Fertigation <input type="checkbox"/> Foliar N Application <input type="checkbox"/> Cover Crops <input type="checkbox"/> Variable Rate Applications using GPS <input checked="" type="checkbox"/> Other: Biosolids fertilizer <input type="checkbox"/> Other: _____	9. Soil – Available N in Root Zone (Annualized, lbs/ac)		
	10. N in Irrigation Water* (Annualized, lbs/ac)		
	11. Organic Amendments* (Manure/Compost/Other, lbs/ac estimate)		
	12. Dry/Liquid Fertilizer N* (lbs/ac)		
	13. Foliar Fertilizer N* (lbs/ac)		
	14. TOTAL NITROGEN (lbs/ac)		

How to account for this source of N in your reporting

Using Lystek's LysteGro product as an example:

N-P-K = 4.5 - 7 - 2.5

The product weighs about 8.76 lbs/gal

Applied at 3,000 lbs/ac = 1.314 dry tons/ac

At 4.5% N, this = 130 lbs N/ac



NITROGEN MANAGEMENT			
8. Nitrogen Efficiency Practices* (Check all that apply)	Nitrogen Sources	Recommended/ Planned N (A)	Actual N (B)
<input type="checkbox"/> Split Fertilizer Applications <input type="checkbox"/> Irrigation Water N Testing <input type="checkbox"/> Soil Testing <input type="checkbox"/> Tissue/Petiole Testing <input type="checkbox"/> Fertigation <input type="checkbox"/> Foliar N Application <input type="checkbox"/> Cover Crops <input type="checkbox"/> Variable Rate Applications using GPS <input checked="" type="checkbox"/> Other: Biosolids fertilizer <input type="checkbox"/> Other: _____	9. Soil – Available N in Root Zone (Annualized, lbs/ac)		
	10. N in Irrigation Water* (Annualized, lbs/ac)	10	8
	11. Organic Amendments* (Manure/Compost/Other, lbs/ac estimate)	150	130
	12. Dry/Liquid Fertilizer N* (lbs/ac)		
	13. Foliar Fertilizer N* (lbs/ac)		
	14. TOTAL NITROGEN (lbs/ac)	160	138

Questions or suggestions welcomed!

Amy King

Solano Resource Conservation District

Watershed Project Manager

530-848-3551

Amy.King@solanorcd.org

1170 N. Lincoln Street, Suite 110

Dixon, CA 95620

707-678-1655 x101



SOLANO

Resource
Conservation
District



THANK YOU FOR ATTENDING!

- **In-person attendees-** CEU certificates will be emailed or mailed to all participants who signed in.
- **Zoom attendees-** CEU certificates will be emailed to all participants who signed into the chat room and had their cameras on.
- If you do not receive the certificate by the end of next week, contact Martha at 707-678-1655 x103 or martha-mckeen@dixonrcd.org



Any questions
or comments?