



# IRRIGATED LANDS PROGRAM DASHBOARD FOR GROWER REPORTING AND WATER QUALITY

## USER GUIDE

Last Updated: 1/8/2024



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## Introduction

Irrigated Lands Program (ILP) staff developed the first pages of the Dashboard for Grower Reporting and Water Quality in June 2023. The purpose of the dashboard is to make grower reports and water quality data public, interactive, and easily accessible. The dashboard is intended to be used by the Agricultural Order regulated community, including growers, consultants and the approved third-party program Preservation, Inc., as well as other interested parties such as researchers, environmental groups and individuals residing in heavily farmed areas.

### About this Guide

This user guide is a supplemental resource to help users better understand and navigate the dashboard. The guide provides further information about each page and visualization, definitions of key terms, and calculations for key statistics. All questions about the guide or dashboard should be directed to [AgNOI@waterboards.ca.gov](mailto:AgNOI@waterboards.ca.gov).

Each section of the guide contains screenshots of dashboard pages with boxes surrounding key visualizations accompanied by a number box. Each visualization is described below the screenshot with its corresponding number.

### Location

The [Dashboard for Grower Reporting and Water Quality](#) is located on the Irrigated Lands Program [website](#).

### Current Sections

- Irrigated Lands Program Map
- Compliance Statistics
- Why Join the Third-Party Program?
- ILP Enrollment Summary Statistics
- Total Nitrogen Applied (TNA) Summary Statistics
- Irrigation and Nutrient Management (INMP) Summary Report
- Annual Compliance Form (ACF) Summary Statistics
- Groundwater Quality – On-Farm Domestic Well Sampling
- Surface Receiving Water Quality

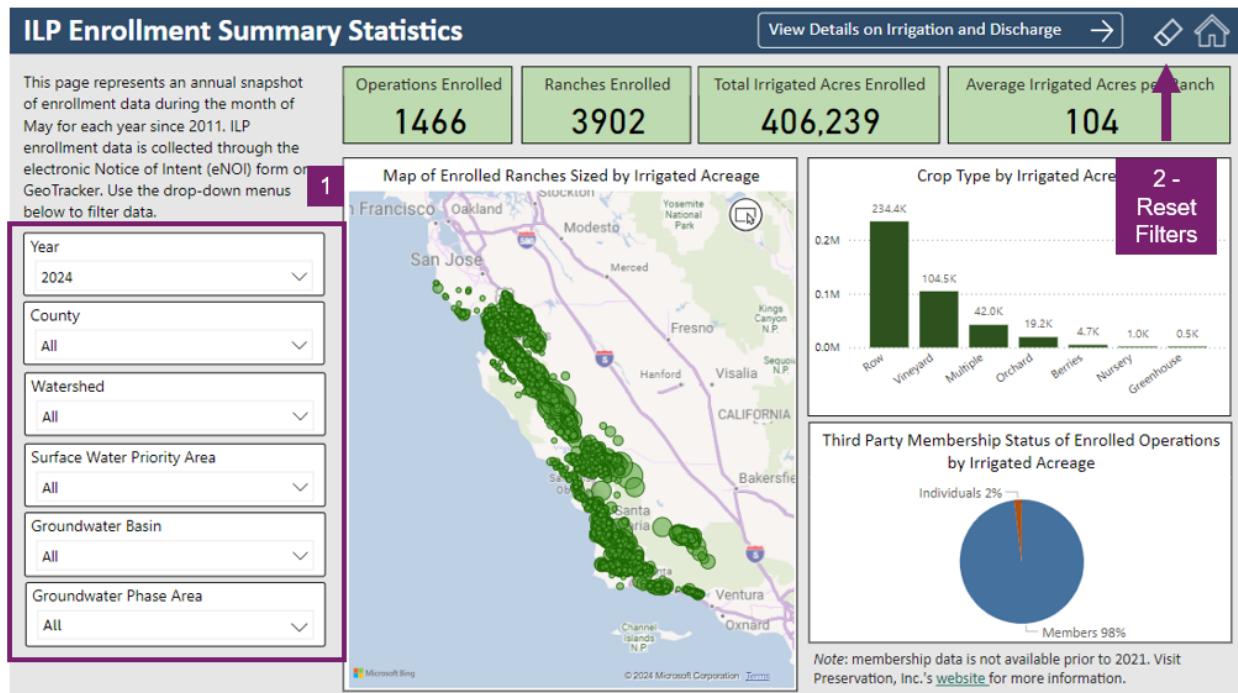
## Data Availability

Data presented on the dashboard comes from a range of sources: grower reports, surface water monitoring data, and groundwater monitoring data. All source data for the dashboard is publicly available. To request data or more information, contact [AgNOI@waterboards.ca.gov](mailto:AgNOI@waterboards.ca.gov).

- Grower reported enrollment (eNOI) data, TNA data, INMP data, and ACF data can be made available through a [Public Records Act Request \(PRAR\)](#).
- On-farm domestic well sampling data is available on the GAMA database: [GAMA - GIS | California State Water Resources Control Board](#).
- Surface water quality data is available on the CEDEN database: [CEDEN Query Tool \(ca.gov\)](#).

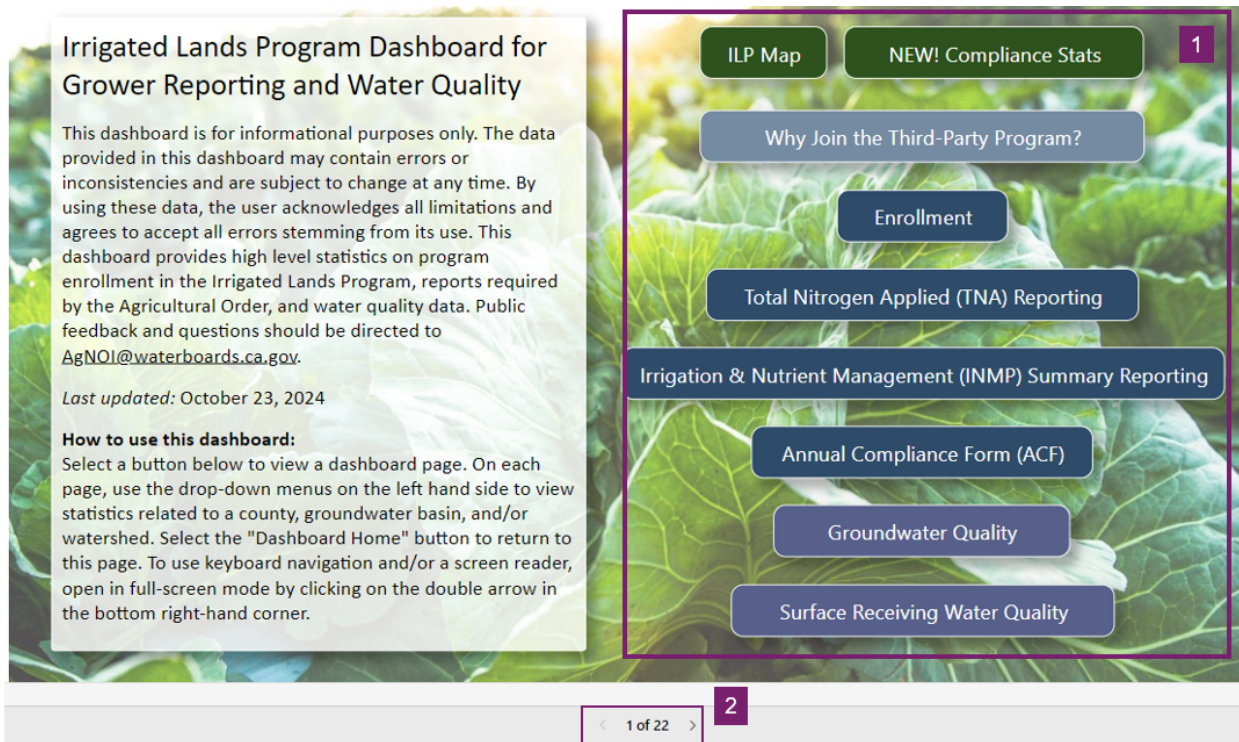
## Filters

Most of the dashboard pages have filters available to allow users to change what data is displayed. Filters are temporal, geographical or categorical. Specific filters available are listed and defined for each dashboard section.



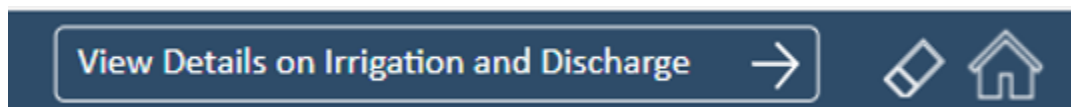
1. Use any combination of filters to alter the data visualizations on each page.
2. Use the eraser button on the top right corner to reset all filters to the default selection.

## Dashboard Navigation



There are several ways to navigate the dashboard:

1. *Use navigation buttons.* The homepage includes buttons that navigate to the main page of each dashboard section. Each page has a home button in the top right corner that will return to the homepage.
2. *Use the navigation panel.* Click on the arrows located at the bottom center of the page to navigate back and forth between pages. Or click on the numbers to pull up a navigation menu and select a specific page to view.
3. Several pages feature buttons with arrows that will navigate to additional pages in that section with more information. Once on the additional page, use the “back” arrow to return to the section main page.



# Dashboard Sections

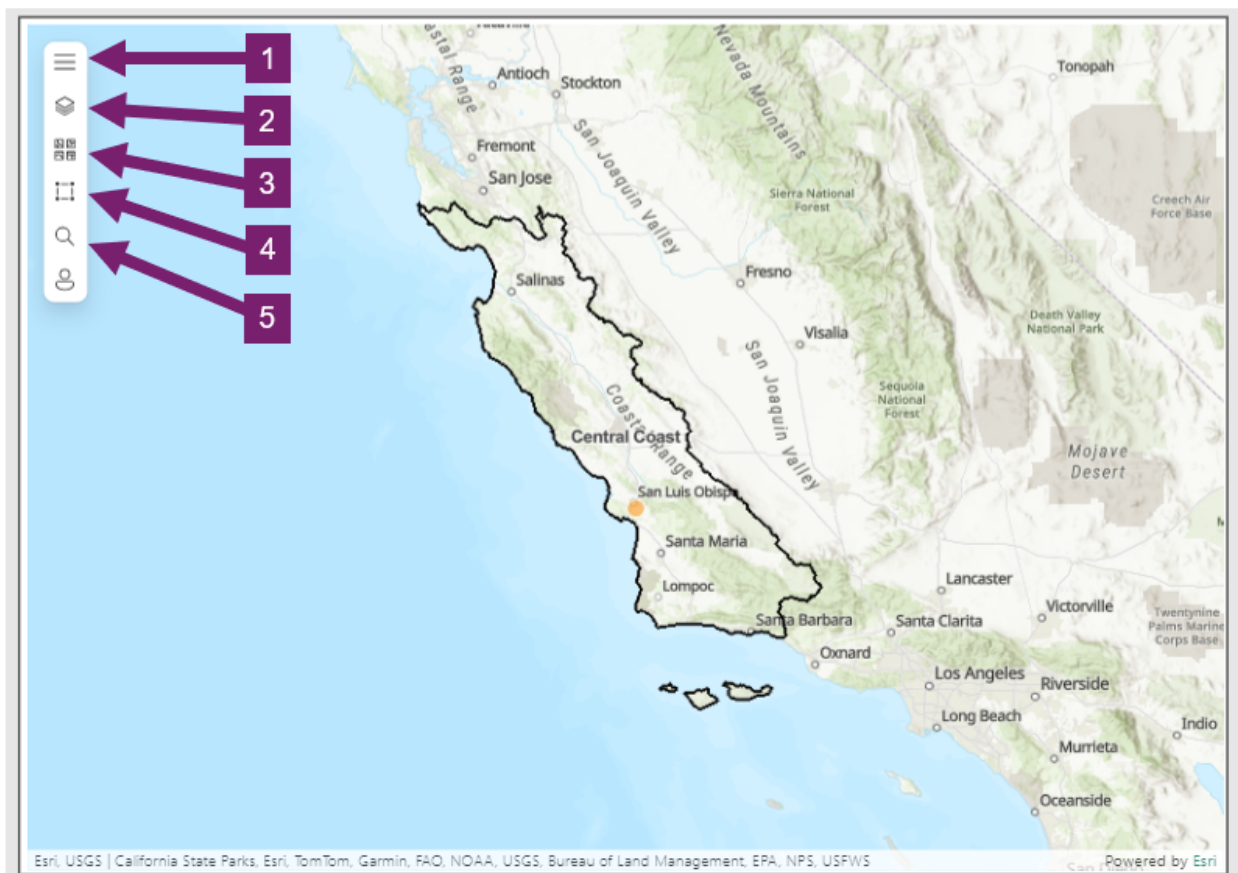
## ILP Map

### Overview

The ILP map allows users to visualize the geographic boundaries of various layers mentioned throughout the dashboard and layers relevant to the Irrigated Lands Program. The map's default layer is the Region 3 boundary; the orange circle is the Region 3 office. Map layers are listed on the dashboard page with linked sources.

### How to use the map

Users can use a mouse to scroll in and out and drag the map.



1. Click on the three lines to open and close the navigation menu.
2. Click on the “layers” icon to open the layers menu. Next to each menu, click on the eye icon to view or hide a layer.
3. Click on the “basemap” icon to change the map basemap/background.
4. Click on the selection tool to select certain areas of the map.
5. Click on the search tool to search for a location by address.

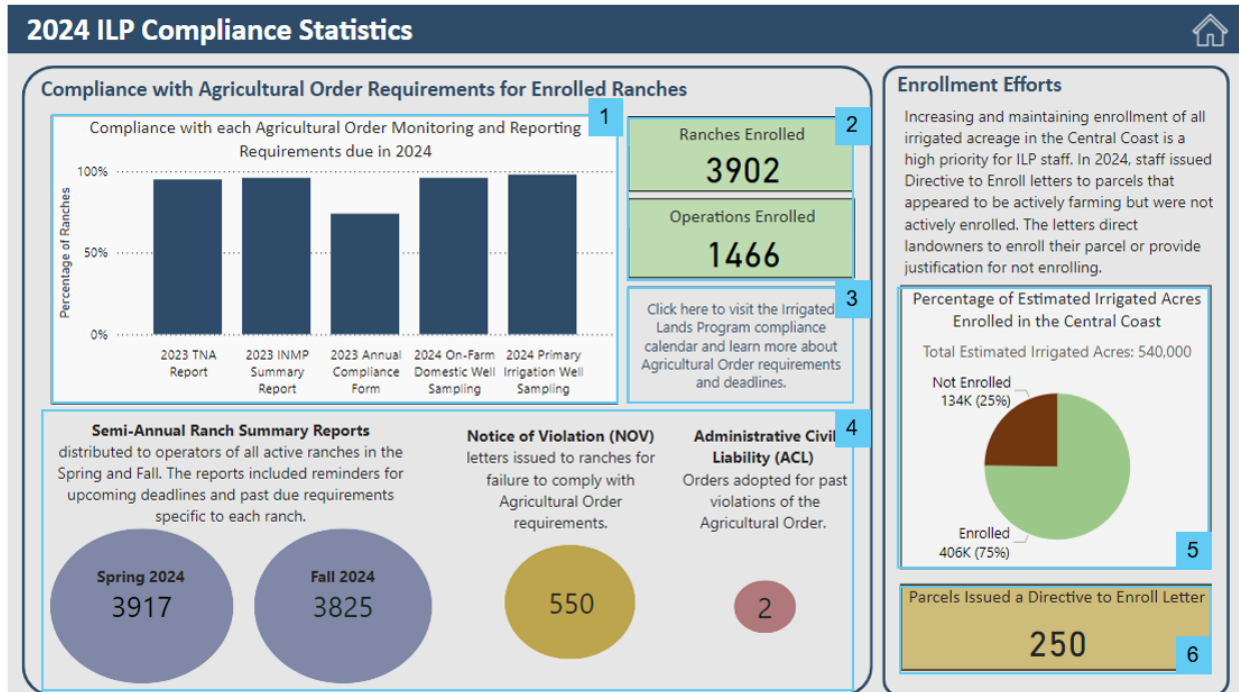


## ILP Compliance Statistics

### Overview

The purpose of this page is to inform users of general statistics regarding Agricultural Order enrollment, compliance with monitoring and reporting requirements, and programmatic efforts to improve enrollment and compliance. This page will be updated at the end of each year with the current year's statistics.

### Data Visualizations



1. Percentage of active ranches that are in compliance with each monitoring and reporting requirement. Hover over each bar to see the total number of ranches required and in compliance.
2. General enrollment numbers for ranches and operations.
3. Link to the [compliance calendar](#) with information on Agricultural Order requirements and deadlines.
4. General statistics on outreach and enforcement efforts undertaken by ILP staff to improve compliance. [Click here](#) for more information on enforcement.
5. Pie chart depicting the percentage of acres enrolled in the Agricultural Order out of the total estimated irrigated acreage for the region ([Agricultural Order Part 1, Section A, Paragraph 1](#)).
6. The number of parcels that were issued a “Directive to Enroll” letter from the Central Coast Water Board. Landowners are directed to enroll in the ILP or provide justification for not enrolling (i.e., if the landowner is a hobby farm or growers feed for livestock).

## Why Join the Third-Party Program?

### Overview

The purpose of this page is to inform users of the benefits of joining the third-party program, Central Coast Water Quality Preservation, Inc. (Preservation, Inc.). Those benefits fall into two main categories: assistance with Ag Order requirements and reduced annual fees.

### How to use the page

**Why Join the Third-Party Program?**  
Central Coast Water Quality Preservation Inc.  
(Preservation, Inc.)

**Contact Info:**  
(831)761-8644  
office@ccwqp.org  
www.ccwqp.org

**Assistance with Requirements**

Preservation, Inc. assists growers with many areas of Agricultural Order implementation, leading to improved compliance amongst members. In 2024, 98% of irrigated acres enrolled the ILP were operated by members of Preservation, Inc.

The table below summarizes how Preservation, Inc. provides assistance to their members compared with growers complying with the Agricultural Order as individuals:

Requirement	Members	Individuals
<a href="#">Domestic Well Sampling</a>	✓	✓
<a href="#">TNA/INMP Reporting</a>	✓	
<a href="#">Farm Plan</a>	✓	
<a href="#">Groundwater Quality Trends Work Plan</a>	✓	
<a href="#">Surface Water Quality Trends Work Plan</a>	✓	
<a href="#">Follow-up Surface Receiving Water - Implementation Work Plan</a>	✓	

Click on each requirement above to learn more!

**Reduced Annual Fees - see how your fees compare for 2024**

Enter the total number of irrigated acres for all ranches within your operation to nearest whole number, then press "enter":

Members	Individuals	Annual Member Savings
Reduced-rate annual permit fees \$15	Increased-rate annual permit fees \$673	Annual Member Savings for 10 acres
Preservation, Inc. program fees \$172	Estimated monitoring and reporting fees \$26,656	2 - Type in the number of irrigated acres & press "enter" in additional fees
<b>Total</b> \$186	<b>Estimated total</b> \$27,329	<b>Estimated total savings</b> \$27,143

**Disclaimer:** Dollar amounts provided above are approximate and do not include costs associated with domestic well sampling or ACF, TNA and INMP monitoring and reporting for either third-party members or individuals.

Click here to see a breakdown of fees

1. Learn about how members receive assistance from Preservation, Inc. staff with completing requirements compared to growers complying with the Agricultural Order as individuals. Each requirement is hyperlinked to an ILP webpage with further information.
2. Use the "Reduced Annual Fees" calculator to see how costs compare between member and individual operations depending on their enrolled acreage. Type in the number of irrigated acres and press "enter". The green box will provide the estimated annual savings for an operation of that size. Note: fee breakdowns for 2024 are for the fiscal year 2023-2024.
3. Select "Click here to see a breakdown of fees" for more information on how each box in the calculator is calculated.



### Overview

The enrollment dashboard pages provide a snapshot of enrollment statistics from 2010 to present. This section displays data from the grower reported electronic notice of intent (eNOI) form in GeoTracker, a form that provides general information on the ranch. The responsible party (RP) is required to maintain an updated and accurate eNOI. These pages allow users to identify the extent and types of irrigated agriculture being practiced in certain areas, and potentially parcels not enrolled in the Agricultural Order.

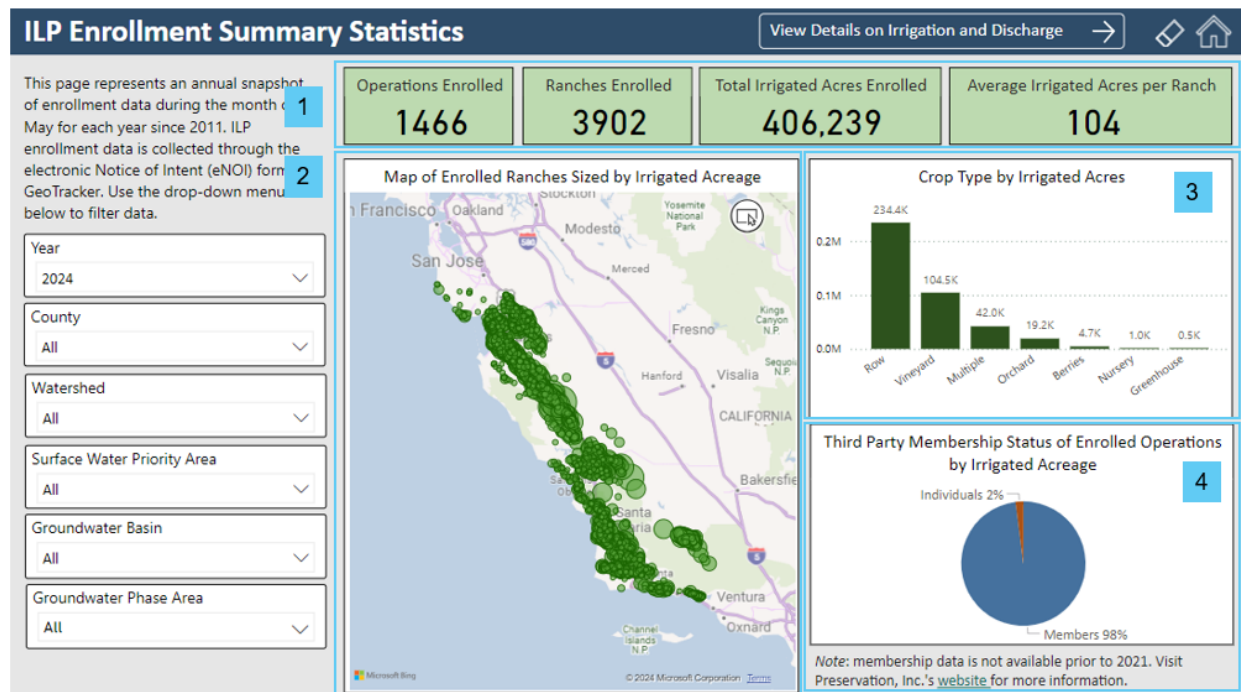
### Filters

1. **Year** – the year that data was collected.
2. **County** – counties are automatically assigned in GeoTracker based on the ranch latitude and longitude.
3. **Watershed** – HUC8 watershed names assigned in GeoTracker based on the ranch latitude and longitude.
4. **Surface Water Priority Area** – ranches are assigned the Surface Water Priority area of the HUC-8 watershed where the ranch is located based on the relative level of water quality, beneficial use impairment and risk to water quality. All ranches are assigned a Surface Water Priority of 1, 2, 3, or 4. Surface Water Priority Area 1 represents greater water quality impairment and higher risk to water quality relative to Surface Water Priority Areas 2, 3, and 4 (Agricultural Order Part 2, Section C.3. Paragraph 1).
5. **Groundwater Basin** – groundwater basin and sub-basin names are automatically assigned in GeoTracker based on the ranch latitude and longitude.
6. **Groundwater Phase Area** – ranches are assigned the Groundwater Phase Area of the groundwater basin where the ranch is located based on the relative level of water quality and beneficial use impairment and risk to water quality. All ranches are assigned a Groundwater Phase Area of 1, 2, or 3. Groundwater Phase 1 areas represent greater water quality impairment and higher risk to water quality relative to Groundwater Phase 2 and 3 areas (Agricultural Order Part 2, Section C.1. Paragraph 2).

### Data Stipulations and Filters

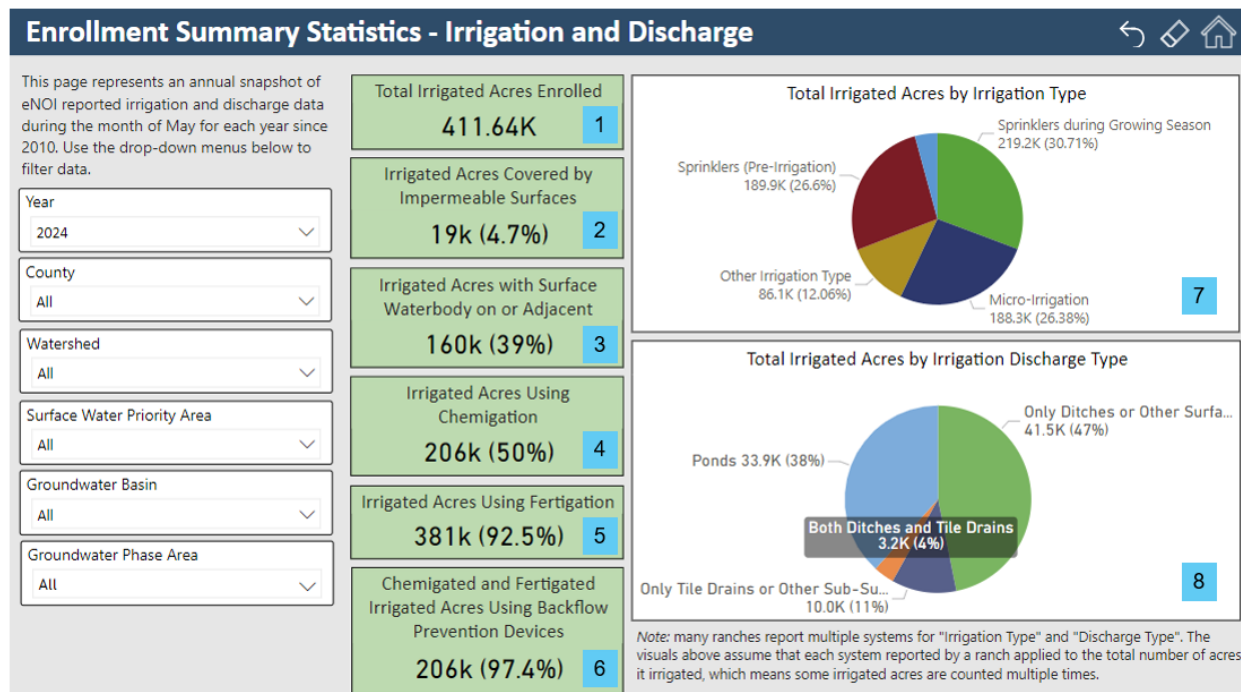
The enrollment section is filtered for actively enrolled ranches at the time that annual enrollment data was collected for the dashboard. Additionally, any ranches that are located outside of Region 3 and mistakenly enrolled are removed from the dashboard.

## Data Visualizations – Main Page



- General Statistics** – call out cards with the number of total active operations, ranches and irrigated acres, and the average amount of irrigated acres per ranch.
- Map of Enrolled Ranches Sized by Irrigated Acreage** – interactive map visualization. Each dot represents an enrolled ranch, and the size of the dot is based on the reported irrigated acreage. Ranches are mapped based on their latitude and longitude. Users can zoom in on the map and select one or multiple ranches to view correlated data for the selection (acres and general crop type).
- Crop Type by Irrigated Acres** – bar graph that represents how crop types are distributed across reported irrigated acres. This information is reported on the eNOI as a multiple-choice question, therefore, acres that selected multiple crop types are included under the category labeled “Multiple”. Clicking on a column will filter the page for ranches that selected that crop type.
- Third-Party Membership Status of Enrolled Operations by Irrigated Acreage** – pie chart of the percentage of irrigated acres that are reported operations that are members of Preservation, Inc. Membership data has been provided to the Central Coast Water Board quarterly by Preservation, Inc. since 2021. Hover over the pie chart to view a tooltip with the exact number of reported irrigated acres, ranches and operations.

## Data Visualizations – Irrigation and Discharge Page



1. **Total Irrigated Acres Enrolled** – reported irrigated acres.
2. **Irrigated Acres Covered by Impermeable Surfaces** – the number of irrigated acres that are covered by impermeable surfaces. This is reported as a percentage of irrigated acres on the ranch eNOI.
3. **Irrigated Acres with Surface Waterbody on or Adjacent** - the number of irrigated acres reported by ranches that selected “YES” for “Are there any surface waterbodies on or adjacent to the ranch?” on the ranch eNOI.
4. **Irrigated Acres Using Chemigation** – the number of irrigated acres reported by ranches that selected “YES” for “Are pesticides, fumigants and/or other chemicals applied through the irrigation system on this ranch (e.g.)?” on the ranch eNOI.
5. **Irrigated Acres Using Fertigation** – the number of irrigated acres reported by ranches that selected “YES” for “Are fertilizers applied through the irrigation system on this ranch (e.g. fertigation)?” on the ranch eNOI.
6. **Chemigated and Fertigated Irrigated Acres Using Backflow Prevention Devices** – the number of irrigated acres reported by ranches that selected “YES” for “If YES to either of the above questions (fertigation or chemigation), are backflow prevention device(s) installed and maintained to prevent pollution of groundwater and surface water?” on the ranch eNOI.
7. **Total Irrigated Acres by Irrigation Type** – pie chart that breaks down the percentage of irrigated acres using irrigation systems.
8. **Total Irrigated Acres by Irrigation Discharge Type** - pie chart that breaks down the percentage of irrigated acres using irrigation discharge systems.

## Total Nitrogen Applied (TNA) Reporting

### Overview

This section displays data from the grower reported Total Nitrogen Applied (TNA) form in GeoTracker. TNA reports have been collected for select ranches since the year 2017. These pages quantify how much fertilizer nitrogen is being applied throughout the Central Coast Region. The intended use is for growers to compare their fertilizer applications to similar crop types and adjust their applications accordingly. Additionally, users can filter the data to identify high nitrogen use crop types and geographic areas (e.g., counties and groundwater basins), as well as identify areas that are highly impacted or at high risk for water quality impairments from irrigated agriculture.

### Data Stipulations and Filters

TNA reported values are determined by crop acre (the acreage reported for each *crop rotation*). This is different from some values determined for INMP reports which are by ranch acre (the total acreage farmed on the ranch during the reporting period). For example, if 5 ranch acres have two rotations of broccoli during the reporting period, that equals 10 crop acres of broccoli.

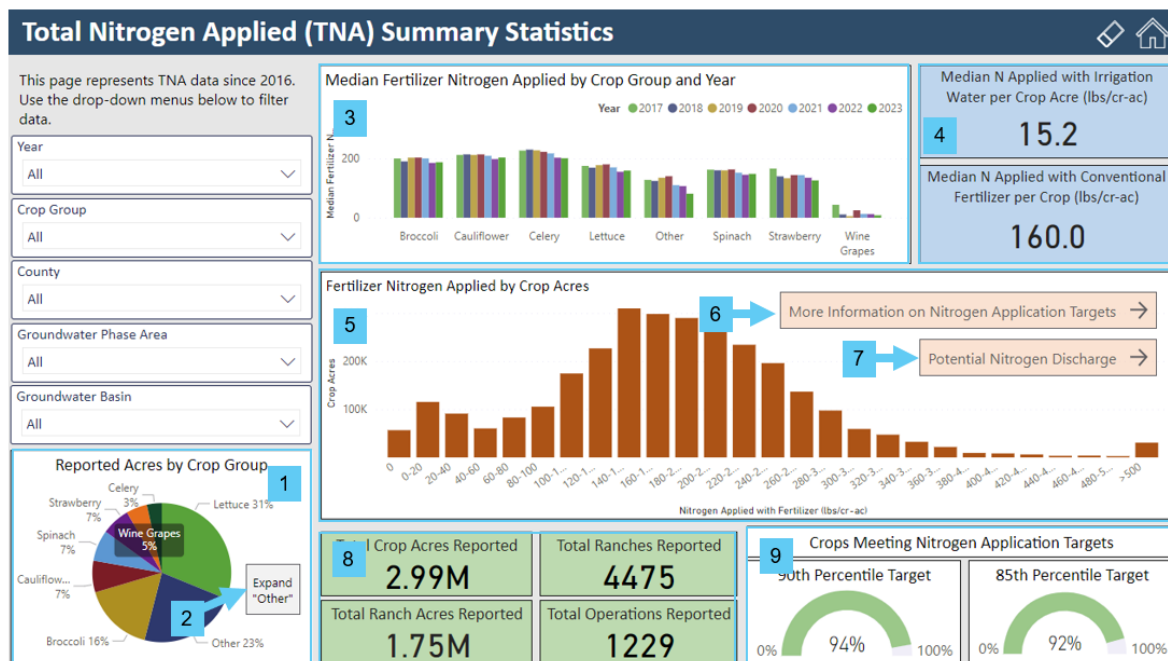
The TNA pages are filtered to display data for only valid TNA reports. Reports are excluded if they were submitted with zero crop acres or ranch acres, or more fallowed acres than reported acres.

### Available filters

Filters default to displaying data for the entire region and for all reporting years.

1. **Year** – the reporting year (January 1 – December 31) for TNA reports beginning in 2017.
2. **Crop Group** – each crop is grouped into a category to simplify data visualizations. The crop groups include the six primary nitrogen polluting crops – broccoli, cauliflower, celery, lettuce, spinach, and strawberry, and wine grapes, which is listed as its own group due to having significantly different management practices. Crops that do not fit into a listed group are categorized as “other”.
3. **County** – assigned based on ranch location.
4. **Surface Water Priority Area** – assigned based on ranch location.
5. **Groundwater Phase Area** – assigned based on ranch location.

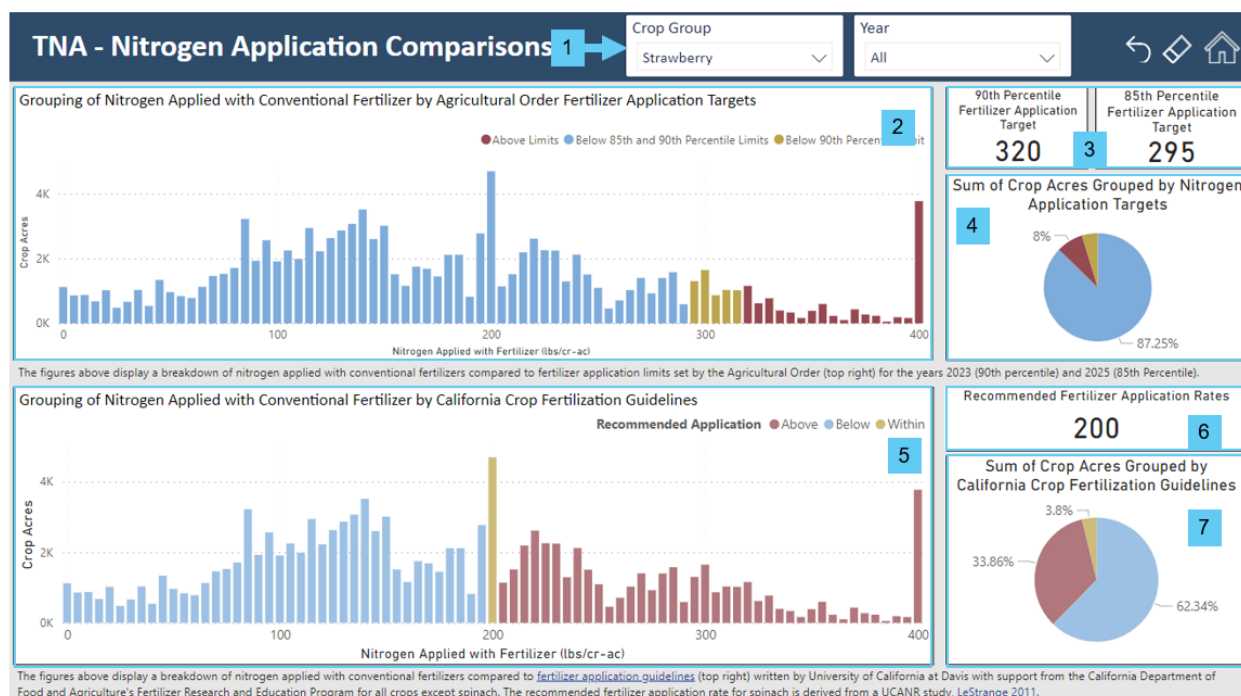
## Data Visualizations – Main Page



- Reported Acres by Crop Group** – pie chart that breaks down reported crop acreage by crop group. Hover over each slice to view a tooltip that displays the number of ranches reporting that crop and the total sum of crop acres.
- Select “Expand ‘Other’” to view a bar graph that breaks down every reported crop by crop acreage.
- Median Fertilizer Nitrogen Applied by Crop Group and Year** – a bar chart that displays the median amount of fertilizer nitrogen applied per crop group per year. Hover over each bar to view a tooltip that displays more information.
- Median values for the amount of nitrogen applied with irrigation water per crop acre and nitrogen applied with conventional fertilizer per crop acre.
- Fertilizer Nitrogen Applied by Crop Acres** – a histogram that breaks down how many crop acres are applying defined ranges of fertilizer nitrogen.
- Click on the “More Information on Nitrogen Application Targets” navigation button to view how reported nitrogen application compares with targets.
- Click on the “Potential Nitrogen Discharge” navigation button to view a page that displays potential nitrogen discharge calculated with literature harvest values.
- General reporting statistics on the total amount of crop and ranch acres reported, and the total number of ranches and operations that have submitted reports.
- Crops Meeting Nitrogen Application Targets** – the percentage of crops that are meeting the 90<sup>th</sup> and 85<sup>th</sup> Percentile nitrogen application targets (Agricultural Order Table C.1-2). The compliance date for the 90<sup>th</sup> percentile target is 12/31/2023 and for the 85<sup>th</sup> percentile target is 12/31/2025. The amount of nitrogen applied with conventional fertilizer is compared to the target for that crop group and assigned a value based on if the reported value meets the target or not.

## Data Visualizations – TNA Nitrogen Application Comparisons

This page compares reported conventional fertilizer applications with Agricultural Order nitrogen application targets (Agricultural Order Table C.1-2) and California fertilizer application guidelines.



1. Use the Crop Group filter to select a crop group of interest. The default crop selection is “strawberry”.
2. **Grouping of Nitrogen Applied with Conventional Fertilizer by Agricultural Order Fertilizer Application Targets** – histogram that breaks down how many crop acres are applying certain ranges of fertilizer nitrogen and compares it to Ag Order fertilizer nitrogen application targets. If the fertilizer nitrogen value is above the 90<sup>th</sup> and 85<sup>th</sup> percentile targets for that crop group, the bar is colored red. If it is between the 90<sup>th</sup> and 85<sup>th</sup> percentile targets, it is colored yellow. If it is below both the 90<sup>th</sup> and 85<sup>th</sup> percentile targets, it is colored blue.
3. Agricultural Order 90<sup>th</sup> and 85<sup>th</sup> percentile nitrogen application target values for the selected crop group.
4. **Sum of Crop Acres Grouped by Nitrogen Application Targets** -pie chart that breaks down how many crop acres are meeting the nitrogen application targets. If the fertilizer nitrogen applied for that crop acre is above the 90<sup>th</sup> and 85<sup>th</sup> percentile targets for that crop group, the bar is colored red. If it is between the 90<sup>th</sup> and 85<sup>th</sup> percentile targets, it is colored yellow. If it is below both the 90<sup>th</sup> and 85<sup>th</sup> percentile targets, it is colored blue.
5. **Grouping of Nitrogen Applied with Conventional Fertilizer by California Crop Fertilization Guidelines**– histogram that breaks down how many crop acres are applying certain ranges of fertilizer nitrogen and compares it to recommended application rates by California Department of Food and



Agriculture's Fertilizer Research and Education Program [California Crop Fertilization Guidelines](#) and a University of California Agriculture and Natural Resources study<sup>1</sup>. If the fertilizer nitrogen value is above the recommended application rate for that crop group, the bar is colored light red. If it is between the recommended application rate, it is colored light yellow. If it is below recommended application rate, it is colored light blue.

6. **Recommended Fertilizer Application Rates** listed for the selected crop group.
7. **Sum of Crop Acres Grouped by California Crop Fertilization Guidelines** – pie chart that breaks down how many crop acres are meeting the recommended fertilizer application rates. If the fertilizer nitrogen value for a crop acre is above the recommended application rate for that crop group, the bar is colored light red. If it is between the recommended application rate, it is colored light yellow. If it is below recommended application rate, it is colored light blue.

### ***Data Visualizations – TNA Nitrogen Application Comparisons***

The purpose of this page is to display the potential nitrogen discharge values calculated for ranches that have submitted TNA reports. Literature harvest values are used to calculate the amount of nitrogen removed from the ranch. For this dashboard page, potential nitrogen discharge is calculated with the following equation:

$$\text{Potential Nitrogen Discharge} = A_{\text{FER}} + A_{\text{COMP}} + A_{\text{ORG}} + A_{\text{IRR}} - R_{\text{HARV(Potential)}}$$

- a)  $A_{\text{FER}}$  is the amount of fertilizer nitrogen applied in pounds per acre.
- b)  $A_{\text{COMP}}$  is the total amount of compost nitrogen applied in pounds per acre.
- c)  $A_{\text{ORG}}$  is the total amount of organic fertilizer or amendment nitrogen applied in pounds per acre.
- d)  $A_{\text{IRR}}$  is the amount of nitrogen in pounds per acre applied in the irrigation water estimated from the volume of water applied.
- e)  $R_{\text{HARV(Potential)}}$  is the amount of nitrogen potentially removed from the field through harvest or other removal of crop material, calculated based on literature values.

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<sup>1</sup> LeStrange, M., S. Kolke, J. Valencia, and W. Chaney. (2011). Spinach Production in California. University of California Cooperative Extension Farm Advisors, Tulare/Kings, Monterey, Stanislaus, and Monterey/Santa Cruz Counties, respectively. Vegetable Research and Information Center. Vegetable Production Series. University of California. Division of Agriculture and Natural Resources. Publication 7212. <https://escholarship.org/content/qt67w2p91c/qt67w2p91c.pdf>.

## Total Nitrogen Applied (TNA) - Potential Nitrogen Discharge

This page represents TNA data since 2016. Harvest values are based on most recent literature or a default value of 93.3 lbs. for regular crops and 50.65 lbs. for baby crops (crops harvested earlier in their growing cycle). All values are in pounds per reported ranch acre (lbs/ra-ac). This is different than nitrogen applied at the crop level, which is reported in pounds per crop acre (lbs/cr-ac). [Click here to view A-R based on reported values](#)

Year  
All

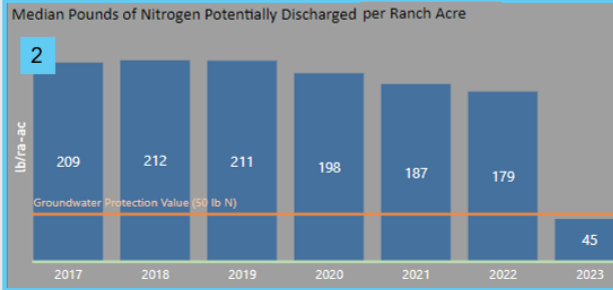
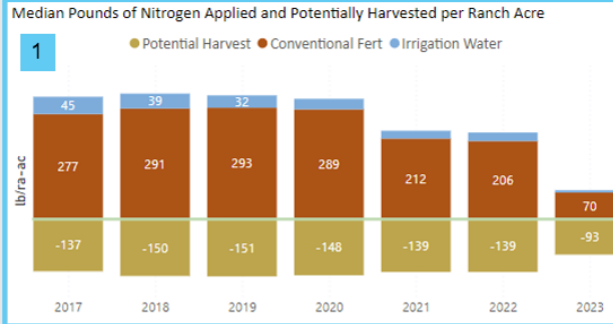
Crop Group  
All

County  
All

Groundwater Phase Area  
All

Groundwater Basin  
All

[Click here to view a list of literature based harvest values](#)



Median Nitrogen Removed (lbs/ra-ac)	129.7
Potential Nitrogen Harvested	129.7
Median Nitrogen Applied (lbs/ra-ac)	228.1
Conventional Fertilizer	228.1
Organic Fertilizer	0.0
Compost	0.0
Irrigation Water	21.4
Median Potential Nitrogen Discharged (Applied - Removed)	172.2
Median Potential Nitrogen Ratio (Applied/Removed)	2.3

- 1. Median Pounds of Nitrogen Applied and Potentially Harvested per Ranch Acre** – bar graph depicting the median amount of nitrogen applied with conventional fertilizer (red bars) and irrigation water (blue bars), and potentially harvested, or removed from the ranch (yellow bars) for each reporting year.
- 2. Median Pounds of Nitrogen Potentially Discharged per Ranch Acre** – bar graph depicting the median amount of nitrogen that is potentially discharged per ranch acre for each reporting year. The orange line represents the groundwater protection value, or the final nitrogen discharge target (50 pounds N / ranch acre).
- 3. Median values for each component of the nitrogen discharge equation (see above).** Also includes the median potential nitrogen ratio, which is calculated by dividing the amount of nitrogen applied by the amount of nitrogen potentially removed.

## Total Nitrogen Applied (TNA) - Potential Nitrogen Discharge

This page represents TNA data since 2016. Harvest values are based on most recent literature or a default value of 93.3 lbs. for regular crops and 50.65 lbs. for baby crops (crops harvested earlier in their growing cycle). All values are in pounds per reported ranch acre (lbs/ra-ac). This is different than nitrogen applied at the crop level, which is reported in pounds per crop acre (lbs/cr-ac). [Click here to view A-R based on reported values](#)


Year  
All

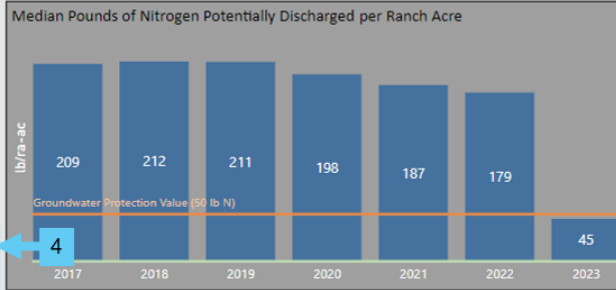
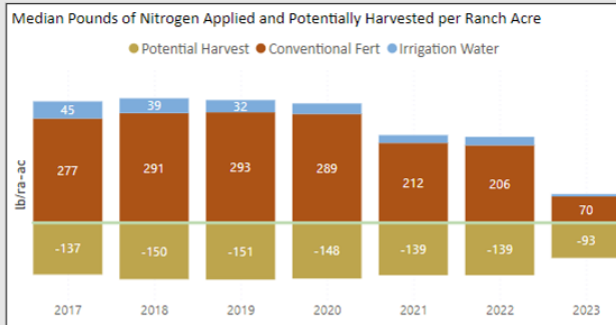
Crop Group  
All

County  
All

Groundwater Phase Area  
All

Groundwater Basin  
All

 [Click here to view a list of literature based harvest values](#)



Crop Type	Harvest Value (lbs./crop-ac)
Alfalfa	150
Baby Lettuce	45
Baby Spinach	5
Bell Pepper	110.0
Brassicas	99.0
Broccoli	99.0
Brussel Sprouts	154.0
Cabbage	180.0
Cauliflower	70.0
Celery	160.0
Cilantro	57.3
Cover Crop	0.0
Kale	58.3
Lettuce	80.0
Mixed/Leafy Greens	58.3
Other Baby Crop	50.7
Other Regular Crop	93.3
Spinach	84.5
Strawberry	100.0
Tomato	70.0

4. Select "Click here to view a list of literature-based harvest values" to view the value for specific crop types.
5. Select the "x" button to close the list.

## Irrigation and Nutrient Management (INMP) Summary Report

This section displays data from the grower reported Irrigation and Nutrient Management Plan (INMP) Summary Report form in GeoTracker. INMP reports have been collected for select ranches since 2024. These pages provide a snapshot of total nitrogen applied, removed and discharged statistics, as well as irrigation budget data. The intended use is for growers to compare their fertilizer applied and removed data to similar crop types and adjust their applications accordingly. Users can filter the data to identify high nitrogen use crop types and geographic areas (e.g., counties and groundwater basins), as well as identify areas that are highly impacted or at high risk for water quality impairments from irrigated agriculture. Nitrogen discharge is calculated with the following equation:

$$\text{Nitrogen Discharge} = A_{\text{FER}} + A_{\text{COMP}} + A_{\text{ORG}} + A_{\text{IRR}} - R_{\text{HARV}} - R_{\text{SEQ}}$$

- a)  $A_{\text{FER}}$  is the amount of fertilizer nitrogen applied in pounds per acre.
- b)  $A_{\text{COMP}}$  is the total amount of compost nitrogen applied in pounds per acre.
- c)  $A_{\text{ORG}}$  is the total amount of organic fertilizer or amendment nitrogen applied in pounds per acre.
- d)  $A_{\text{IRR}}$  is the amount of nitrogen in pounds per acre applied in the irrigation water estimated from the volume of water applied.
- e)  $R_{\text{HARV}}$  is the amount of nitrogen potentially removed from the field through harvest or other removal of crop material, calculated based on literature values.
- f)  $R_{\text{SEQ}}$  is the amount of nitrogen removed from the field through sequestration in woody materials of permanent or semi-permanent crops.

### Data Stipulations and Filters

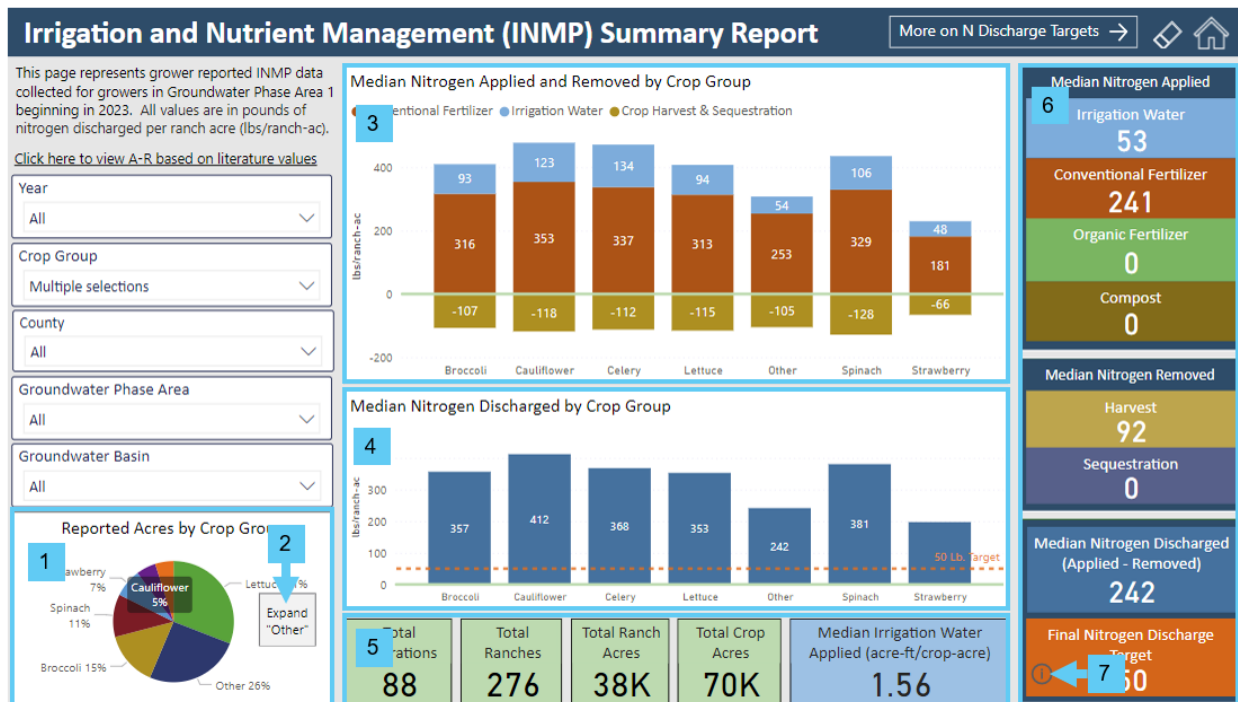
The INMP pages are filtered to display data for valid INMP reports only. Reports with zero crop acres or ranch acres are excluded. Reports are also excluded from the irrigation water budget dashboard if the ranch did not submit crop evapotranspiration data or submitted data that resulted in a negative groundwater recharge value.

### Available filters

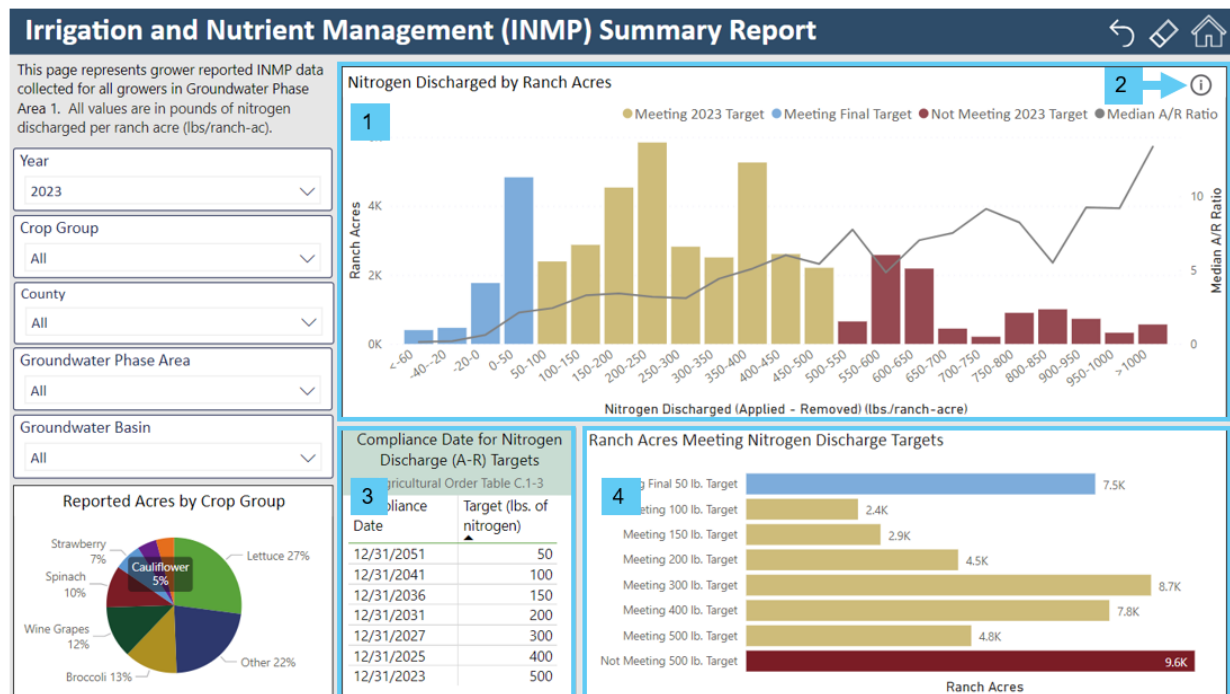
Filters default to displaying data for the entire region and for all reporting years.

1. **Year** – the reporting year (January 1 – December 31) for INMP reports beginning in 2023.
2. **Crop Group** – each crop is grouped into a category to simplify data visualizations. The crop groups include the six main polluting crops – broccoli, cauliflower, celery, lettuce, spinach, and strawberry, and wine grapes, which is listed as its own group due to having significantly different management practices. And crops that do not fit into one of those groups is listed as “other”.
3. **County** – assigned based on ranch location.
4. **Surface Water Priority Area** – assigned based on ranch location.
5. **Groundwater Phase Area** – assigned based on ranch location.

## Data Visualizations – Main Page



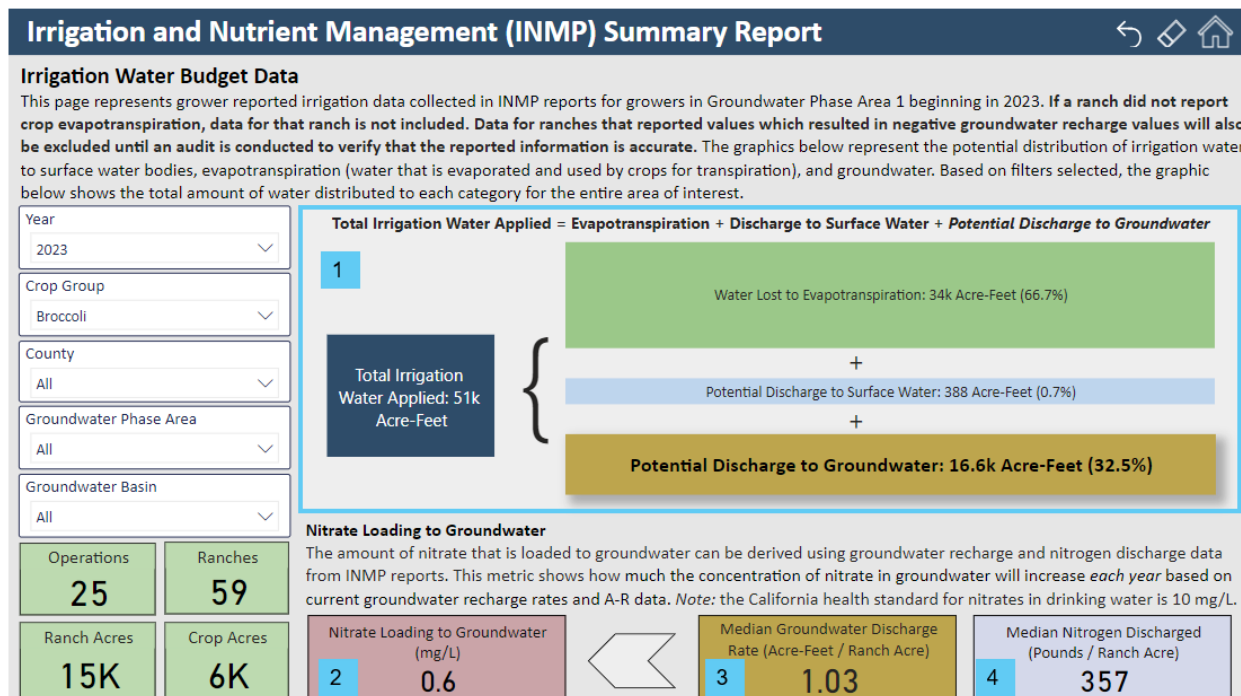
- Reported Acres by Crop Group** – pie chart that breaks down reported crop acreage by crop group. Hover over each slice to view a tooltip that displays the number of ranches reporting that crop and the total sum of crop acres.
- Select “Expand ‘Other’” to view a bar graph that breaks down very reported crop by crop acreage
- Median Nitrogen Applied and Removed by Crop Group** – bar graph depicting the median amount of nitrogen applied with conventional fertilizer (red bars) and irrigation water (blue bars), and harvested, or removed from the ranch (yellow bars) for each main crop group.
- Median Nitrogen Discharged by Crop Group** – bar graph depicting the median amount of nitrogen that is discharged per ranch acre for each main crop group. The orange line represents the groundwater protection value, or the final nitrogen discharge target (50 pounds N / ranch acre).
- General reporting statistics on the total number of ranches and operations that have submitted reports, the total amount of crop acres reported, and the total amount of ranch acres reported. Also included is the median volume of irrigation water applied to the ranch in acre-feet per crop acre. This value is required to be measured for INMP Summary reporting.
- Median values for each component of the nitrogen discharge equation (see above).
- Click on the information icon to learn more about the final nitrogen discharge target.



- Nitrogen Discharged by Ranch Acres** – a histogram that breaks down how many ranch acres are discharging certain ranges of nitrogen and compares it to Ag Order fertilizer nitrogen discharge targets. If the nitrogen discharge value is above the 2023 target, the bar is colored red. If the discharge value meets the 2023 target, it is colored yellow. If the discharge value meets the final target, it is colored blue. The grey line depicts the median A/R ratio for each bar. Where the grey line intercepts the right y-axis is the median A/R ratio for all of the ranches that reported nitrogen discharge within a certain range, depicted on the x-axis. Hover over the graph to view tooltips with more information.
- Click on the information icon to learn more about this histogram and the A/R ratio.
- Compliance Date for Nitrogen Discharge (A-R) Targets** – copy of Agricultural Order Table C.1-3.
- Ranch Acres Meeting Nitrogen Discharge Targets** – bar chart displaying the distribution of ranch acres meeting each nitrogen discharge target. If the nitrogen discharge value for a ranch is above 500lbs (the 2023 target), those ranch acres are displayed in the bar labeled “Not Meeting 500 lb. Target”. If the discharge value for a ranch is between 400-500, those ranch acres are displayed in the bar labeled “Meeting 500 lb. Target”, etc.



## Data Visualizations – Irrigation Water Budget Data



1. Breakdown of how irrigation water is distributed according to INMP Summary Report data
  - a. **Total Irrigation Water Applied** (thousands of acre feet) – the sum of the reported volume of irrigation water applied for all included ranches
  - b. **Water Lost to Evapotranspiration** – the sum of the volume of water lost to evapotranspiration. Calculated from reported Crop Evapotranspiration values.
  - c. **Potential Discharge to Surface Water** – the sum of the estimated volume of irrigation water discharged to surface water through surface outflows, including tile drains, reported as a percentage of water applied.
  - d. **Potential Discharge to Groundwater** – the total volume of water potentially discharged to groundwater. Calculated for each ranch with the formula: total irrigation water applied – water lost to evapotranspiration – potential discharge to surface water.
2. **Nitrate Loading to Groundwater** (mg/L) – the amount of nitrate that is loaded to groundwater based on median groundwater discharge rates and median nitrogen discharge rates. See Appendix B for the full formula.
3. **Median Groundwater Discharge Rate** – the median value of groundwater discharged in acre-feet per ranch acre.
4. **Median Nitrogen Discharged** – the median value of nitrogen discharge for included ranches.

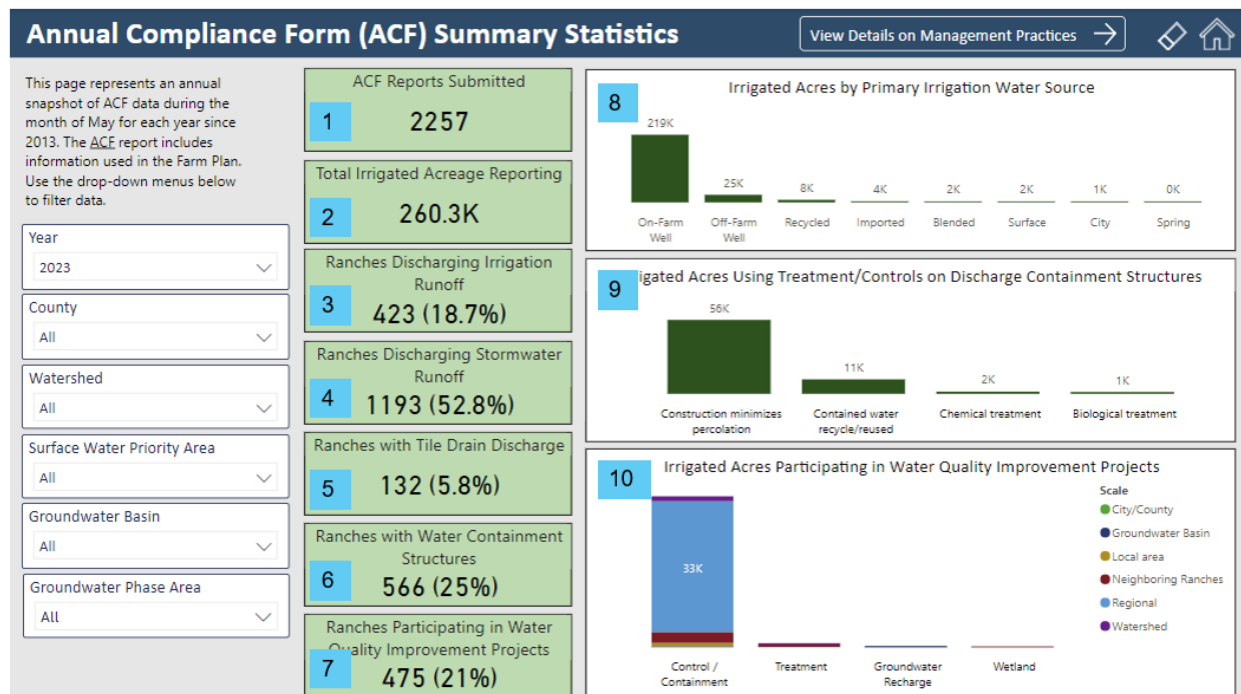
## Annual Compliance Form (ACF) Summary Statistics

This section provides a snapshot of management practice statistics reported on the Annual Compliance Form since 2013. The ACF includes information used in the Farm Plan.

### *Filters*

1. **Year** – the year that data was collected. The annual compliance form is required to be submitted annually. However, prior to 2024, RPs did not have the option to select the reporting year. Therefore, if the RP submitted the ACF in October, November or December, the reporting year is the same as the year submitted. Otherwise, the CCWB assumes that the RP is submitting the ACF for the year prior. Only one reporting year can be selected at a time; the default year is 2023.
2. **County**
3. **Watershed**
4. **Surface Water Priority Area**
5. **Groundwater Basin**
6. **Groundwater Phase Area**

## Data Visualizations – Main Page



1. **ACF Reports Submitted** - total number of ACF reports submitted for the selected year.
2. **Total Irrigated Acreage Reporting** - sum of irrigated acres reported by ranches that submitted ACF reports.
3. **Ranches Discharging Irrigation Runoff** - number and percentage of ranches that answered “YES” to “Does irrigation runoff leave this ranch / farm?”
4. **Ranches Discharging Stormwater Runoff** - number and percentage of ranches that answered “YES” to “Does stormwater leave this ranch / farm?”
5. **Ranches with Tile Drain Discharge** – number and percentage of ranches that answered “YES” to “Does tile drain water leave this ranch / farm?”
6. **Ranches with Water Containment Structures** - number and percentage of ranches that answered “YES” to “Are there water containment structure(s) (i.e., ponds, reservoirs) on this ranch/farm?”
7. **Ranches Participating in Water Quality Improvement Projects** - Number and percentage of ranches that answered “YES” to “Is this ranch/farm participating in a specific water quality improvement project with other growers?”
8. **Irrigated Acres by Primary Irrigation Water Source** – bar graph displaying the total amount of irrigated acres reported by ranches that selected a certain irrigation water source as the primary source of irrigation water.
9. **Irrigated Acres Using Treatment/Controls on Discharge Containment Structures** – bar graph displaying the total amount of irrigated acres reported by ranches that selected a certain type of treatment or control that is used to minimize and/or prevent the percolation of waste to groundwater.

10. **Irrigated Acres Participating in Water Quality Improvement Projects** – bar graph displaying the total amount of irrigated acres reported by ranches that selected a certain type of project. The projects are colored based on the geographical scale selected.

### Data Visualizations – Management Practices

#### Annual Compliance Form (ACF) Management Practices

This page represents an annual snapshot of management practices reported on the ACF since 2013. Use the drop-down menus below to filter data. The table depicts how many ranches and irrigated acres reported each management practice, assessment method, and outcome.

**1 Select a Management Practice Section**

Irrigation

Nutrient

Pesticide

Sediment

**2 Select a Management Practice Type**

Assessment

Implementation

Outcome

Section	Type	Practice/Method/Outcome	Number of Ranches	Irrigated Acres
3	Assessment	Compared amount of irrigation water applied to crop water uptake	488	67,757.5
Irrigation	Assessment	Conducted field quick tests or used handheld meters to determine waste concentrations in irrigation runoff or tile drain water.	22	2,359.2
Irrigation	Assessment	Conducted laboratory analysis to determine waste concentrations in irrigation runoff.	12	1,861.4
Irrigation	Assessment	Conducted photo monitoring before and after practice implementation.	98	18,939.6
Irrigation	Assessment	Consulted with a qualified professional to assess practice implementation (e.g. CCA, PCA, UCCE Specialist, NRCS, RCD, agronomist or other).	1481	164,500.7
Irrigation	Implementation	Contained and/or treated irrigation water runoff prior to discharge off the farm/ranch.	146	31,267.7
Irrigation	Implementation	Determined amount of crop water uptake and applied irrigation water accordingly.	1692	203,250.4
Irrigation	Assessment	Estimated/measured volume of irrigation runoff.	140	19,834.3
Irrigation	Implementation	Improved irrigation distribution uniformity (DU) based on results of mobile lab or similar assessment.	481	77,765.9
Irrigation	Implementation	Installed a variable speed pump and/or control system to improve irrigation distribution uniformity (DU).	466	82,787.9
Irrigation	Implementation	Installed more efficient irrigation system (e.g. microirrigation).	1118	137,841.7
Irrigation	Implementation	Maintained irrigation system to maximize efficiency and minimize losses (e.g. system components are replaced and/or flushed/cleaned).	1942	233,070.7

1. Select one or more management practice sections to filter the table. Hold the “ctrl” key to select multiple.
2. Select one or more management practice types to filter the table
  - a. **Assessment** = methods used to assess the effectiveness of the implemented management measure(s) / practice(s), to reduce or eliminate the discharge of waste
  - b. **Implementation** = management measure(s)/practice(s) implemented on this ranch / farm to protect water quality
  - c. **Outcome** = outcomes that demonstrate progress towards reducing or eliminating the discharge of waste
3. Table depicting the number of ranches and corresponding irrigated acres that selected a certain management practice/method/outcome for the selected year.

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## Groundwater Quality – On-Farm Domestic Well Sampling

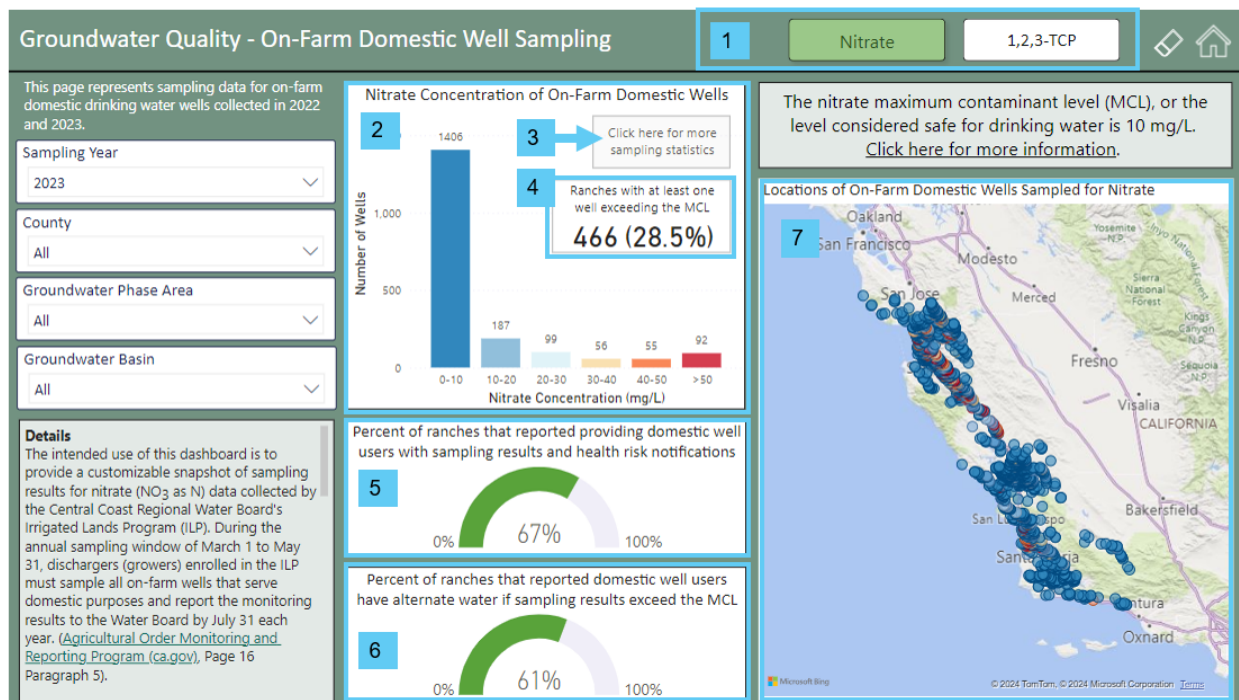
### Overview

This section displays data from the annual well sampling of on-farm wells used for domestic purposes. All active ranches are required to report all active domestic and dual-purpose wells on their eNOI and sample them annually for nitrate, 1,2,3-TCP, and field sampling parameters. RPs must also provide sampling results to all domestic and dual-purpose well users and confirm the notification on the ranch eNOI.

### Filters

1. **Year** – the year that the well was sampled. The annual sampling period is from March 1 to May 31.
2. **County**
3. **Groundwater Basin**
4. **Groundwater Phase Area**

### Data Visualizations



1. Select between viewing data for nitrate or 1,2,3-TCP.
2. **Nitrate (or 1,2,3-TCP) Concentration of On-Farm Domestic Wells** – histogram that breaks down how many sampled wells measured a certain concentration range for the pollutant.
3. Select “Click here for more sampling statistics” to display a table that breaks down the number of samples, number of samples that exceeds the drinking water standard, the median, mean, minimum and maximum measured concentration, standard deviation and variance by county.

4. The total number of ranches and percentage out of all ranches that sampled in the sampling year with at least one well sample with a concentration exceeding the drinking water standard.
5. Percentage of ranches that have confirmed on their ranch eNOI that “existing and any new dual purpose and/or domestic well users have been provided with a summary of the most recent sampling results and health risk information for each dual purpose and/or domestic well”
6. Percentage of ranches that have confirmed on the ranch eNOI that if sampling results indicate that the concentration is greater than the drinking water standard, all domestic well users have alternative replacement water for drinking, cooking, washing, and bathing.
7. Interactive map with locations of on-farm domestic wells sampled for the pollutant. Each dot represents one well sample. The color of each dot is based on the measured concentration (blue for a low concentration, red for a high concentration).



## Surface Receiving Water Quality

### Overview

The Surface Receiving Water Quality section displays surface receiving water data collected by Preservation, Inc.'s Cooperative Monitoring Program (CMP) since 2005. The section illustrates the extent of water quality impairment throughout the Central Coast Region and helps users identify persistent pollutants and impaired waterbodies. Interested parties and growers can use these dashboard pages to assess and prioritize follow-up efforts to address site-specific pollution.

The dashboard displays water quality scores for each CMP monitoring site and pollutant using the Magnitude and Exceedance Quotient (MEQ) methodology. The MEQ rating system was developed by the Surface Water Ambient Monitoring Program (SWAMP) and is described in their final report.<sup>2</sup> Measured pollutants are compared with water quality thresholds, i.e., surface water limits for TMDL areas and non TMDL areas. The MEQ approach considers the magnitude of each measurement relative to a parameter's applicable water quality threshold and the frequency of samples exceeding the threshold at a site. These factors are then combined into a single score between 0 (poor water quality) and 100 (excellent water quality). MEQ scores are calculated for each individual parameter at each of the 55 CMP monitoring sites during the dry season (May 1 to September 30) and wet season (October 1 through April 30).

### Filters

1. **Analyte** – pollutant or chemical constituent being identified and measured
2. **Year / Season** – year and season that sampling was conducted. California seasons are wet (October – April) and dry (May – September).
3. **Third Party Surface Water Priority Area** – Priority areas based on threat to water quality. Assigned areas are high, medium and low (Agricultural Order Table C.3-1.3P).
4. **Waterbody** - watershed and sub-watershed where sampling was conducted.
5. **County**
6. **Pesticide Class** – group of pesticide chemicals (pyrethroid, organophosphate, neonicotinoid, or herbicide).
7. **CMP Site** – Cooperative Monitoring Program site where sampling is conducted
8. **Matrix** – sediment or water
9. **Analyte Class** – group of chemical constituents
10. **Limit Designation** – TMDL or Agricultural Order non-TMDL limit

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<sup>2</sup> Worcester, K., D. Paradies, and J. Hunt. (2015). California Central Coast Healthy Watersheds Project – Part 1. California Water Quality Control Board, Surface Water Ambient Monitoring Program. [https://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/workplans/hw\\_swamp\\_methods\\_report.pdf](https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/workplans/hw_swamp_methods_report.pdf)

## Navigating this Section

Surface Receiving Water Quality

Overview
Basic Water Quality
Pesticides
Over Time
By Site
Data Table

This page displays water quality data for nutrients and turbidity. To use this page, select an analyte of interest from the drop-down menu. Further drill down using the additional filters below. Hover over the graphics to display more information.

Analyte

Nitrate

Year / Season

All

Third Party Surface Water Priority Area

All

County

All

Waterbody

All

Clear All Filters

Dashboard Home

Hover for sampling information

### Nitrate

Designated limit: 1.4 - 10 mg/L

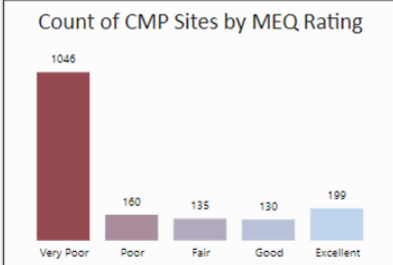
Median Concentration

14.4 mg/L

Median MEQ\*

27

Count of CMP Sites by MEQ Rating



MEQ Rating	Count
Very Poor	1046
Poor	160
Fair	135
Good	130
Excellent	199

The graphics below display the number and percentage of sites with seasonal (wet and dry) averages exceeding their designated limit.

Sites Exceeding Limit

50 (90%)

Sites Exceeding Limit Two-Fold or More

43 (78%)


Sites Exceeding Limit Five-Fold or More

34 (61%)

**Waterbodies with Seasonal Average Exceeding Threshold by Five-Fold or More**

- Alisal Slough
- Beach Road Ditch
- Blanco Drain
- Bradley Canyon Creek
- Bradley Channel
- Carnadero Creek
- Chorro Creek
- Chualar Creek
- Espinosa Slough

Cooperative Monitoring Program Sites



*Note on this visual:* CMP site colors are based on a gradient of the average MEQ for the selected nutrient. Red indicates a low (poor) MEQ, and blue indicates a high (good) MEQ.

1. Use the buttons at the top of each page to navigate between pages in the surface receiving water quality section
2. Select “Dashboard Home” to return to the dashboard main page
3. Select “Clear All Filters” to reset filters to default selections

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## Data Visualizations – Overview Page

The surface receiving water quality section overview page contains information about the section and an interactive map. Each dot on the map represents a CMP monitoring site, colored by the watershed where it is located. Users can hover the mouse over each dot to view more information about each site.

Surface Receiving Water Quality

Overview Basic Water Quality Pesticides Over Time By Site Data Table

The Surface Water Quality section displays data collected by Preservation, Inc.'s [Cooperative Monitoring Program](#). The program has been monitoring sites throughout the Central Coast since 2005. New surface water data is updated bi-annually in Spring and Fall, downloaded from the [CEDEN](#) database.

The pages in this section display Magnitude Exceedance Quotient (MEQ) ratings that represent water quality impairment. The MEQ rating system was developed by the Surface Water Ambient Monitoring Program (SWAMP) and is described in their [final report](#). The MEQ approach considers the magnitude of each measurement relative to a parameter's applicable water quality threshold and the frequency of samples exceeding the threshold at a site. These factors are then combined into a single score between 0 (poor water quality) and 100 (excellent water quality). MEQ scores are calculated for each individual parameter at each of the 55 CMP monitoring sites during the dry season (May 1 to September 30) and wet season (October 1 through April 30).

Click [here](#) to view Water Quality Report Cards for each TMDL Project.

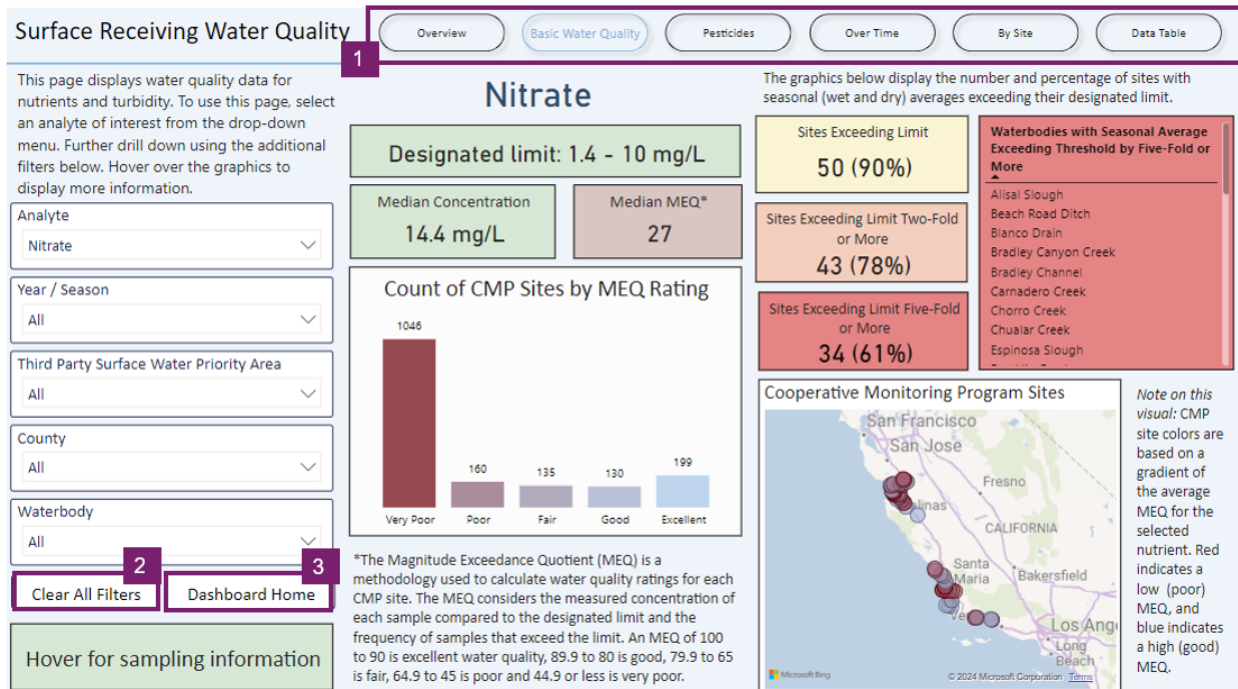
Dashboard Home

### Cooperative Monitoring Program (CMP) Site Map

The map displays monitoring sites across California, with a legend for watersheds: Estero Bay (green), Lower Salinas (dark blue), Pajaro (yellow), San Antonio (red), Santa Maria (light blue), Santa Ynez (purple), and South Coast (orange). Sites are clustered in the Central Coast region, with a concentration in the San Francisco Bay Area and another cluster along the Central Coast from San Luis Obispo to Santa Barbara. A 'Microsoft Bing' logo and copyright information are visible at the bottom of the map.

## Data Visualizations – Basic Water Quality

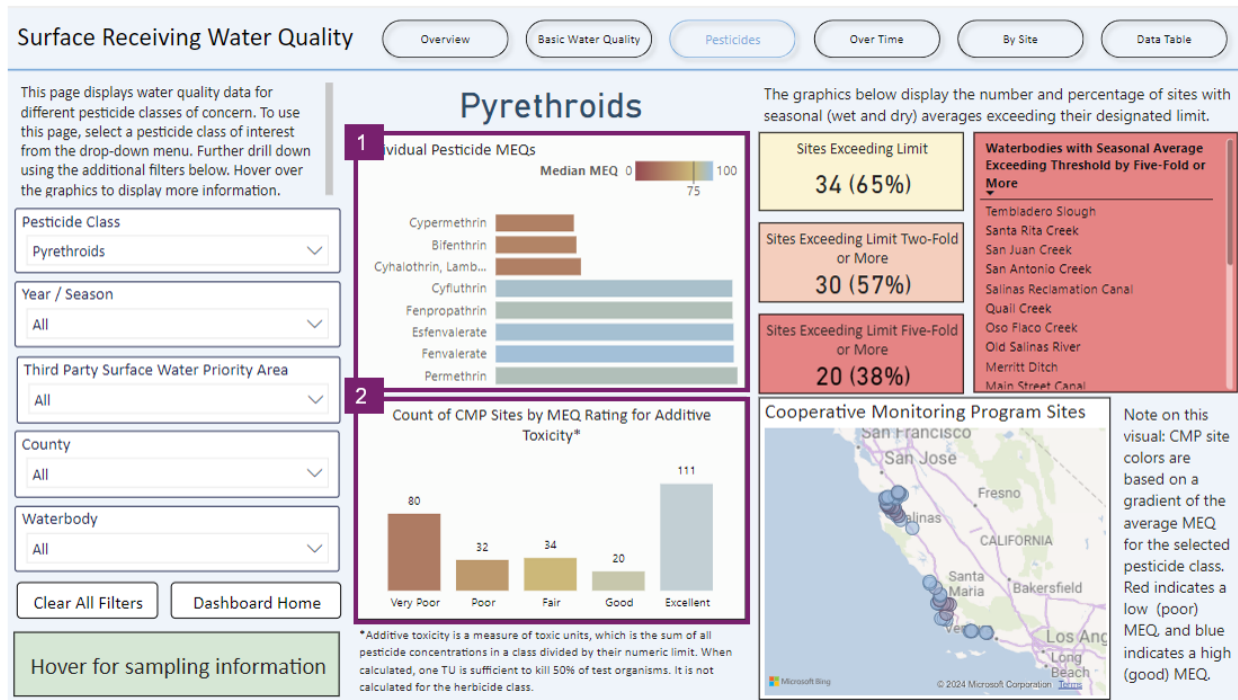
This page displays sampling data and statistics for nutrients and turbidity.



1. Users can hover the mouse over “Hover for sampling information” to learn more about the sampling frequency for the selected parameters.
2. Water quality limit or range of limits designated by a TMDL or Agricultural Order non-TMDL limit for the waterbody in which the CMP site is located.
3. Median measured concentration for the selected analyte.
4. Median MEQ for the selected parameter.
5. **Count of CMP Sites by MEQ Rating** - histogram that displays the distribution of CMP sites by their seasonal MEQ rating.
6. This section displays the number and percentage of CMP sites with a seasonal average concentration exceeding the designated limit for the selected analyte by one-fold, two-fold and five-fold. For example, if the average concentration for nitrate at a CMP site in a waterbody with a 10 mg/L limit is over 50 mg/L, then that site will be counted towards “Sites Exceeding Limit Five-Fold or More”. Any waterbody included in this category will also be listed under the table titled “Waterbodies with Seasonal Average Exceeding Threshold by Five-Fold or More”.
7. Map of CMP site locations. Each dot represents a CMP site and is colored based on the average MEQ rating at the site for the selected analyte. Red indicates a low rating, and blue indicates a high rating.

## Data Visualizations – Pesticides

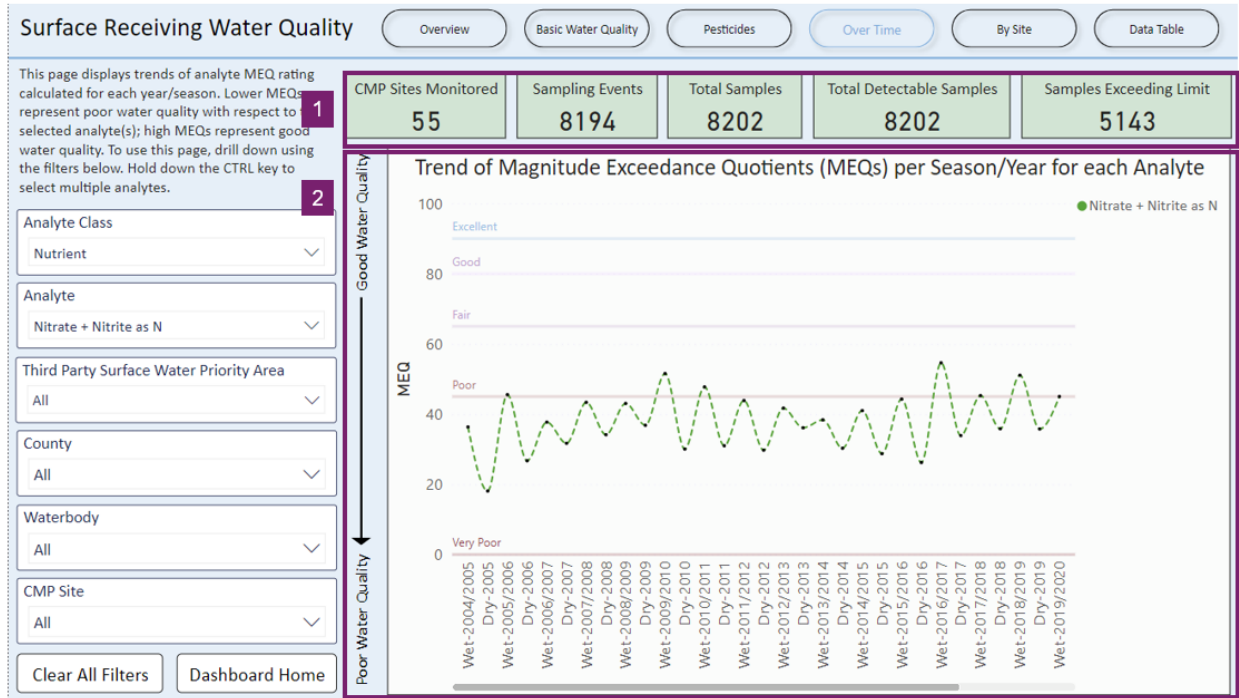
This page displays sampling data and statistics for pesticide classes. Visualizations for this page are similar to Basic Water Quality. There are two different visualizations:



- 1. Individual Pesticide MEQs** - because this page breaks down water quality for pesticide classes that include many individual pesticides, MEQ information is displayed as a bar chart. Each pesticide included in the class is listed on the y-axis; the x-axis and color legend are the MEQ rating for that individual pesticide. Users can hover over each bar to view the limit range, median concentration and MEQ rating value.
- 2. Count of CMP Sites by MEQ Rating for Additive Toxicity\*** - histogram for pesticides is based on additive toxicity at each site. Additive toxicity is a measure of how pesticides in a class combine to increase the toxicity of one another. The visual breaks down the distribution of seasonal MEQ rating for additive toxicity at each site.

## Date Visualizations – Over Time

This page displays water quality measurements at multiple points in time. *Note:* this page *does not* display statistically significant trends.

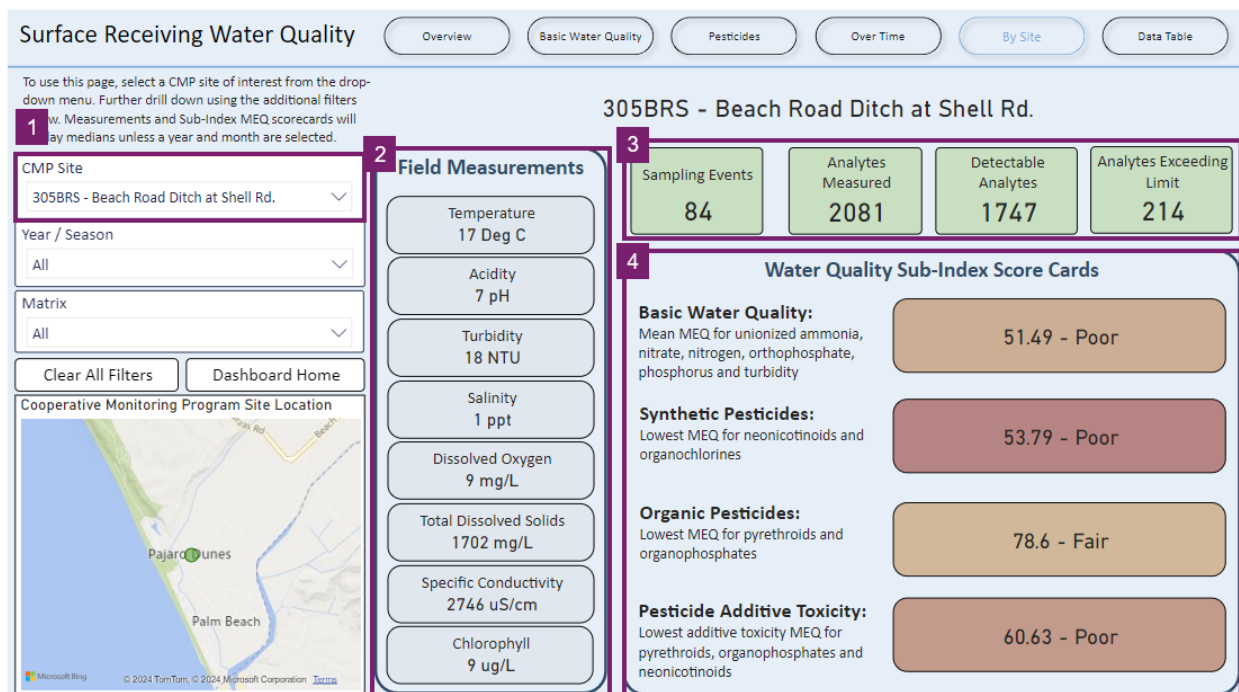


1. Sampling statistics.
2. **Trend of Magnitude Exceedance Quotients (MEQs) per Season/Year for Each Analyte** - line chart displaying MEQ measurements at distinct points in time. Each point on the chart represents an MEQ rating (y-axis) for the season listed on the x-axis, connected by a dotted line. Using the Analyte filter, users can display one or more analytes. The color of the dotted line will be different for each analyte and depicted in the legend in the top right corner.



## Date Visualizations – By Site

This page displays water quality sub-index score cards for each CMP site. Sub-index scores are calculated using methods described in the SWAMP report.<sup>3</sup>



1. Users must first select a CMP site to view data. If no site is selected, the field measurements section (2) and sampling statistics (3) will show data for all sites.
2. Field measurements include the median measured field parameters at the site for all selected seasons.
3. General sampling statistics
4. **Water Quality Sub-Index Score Cards** – this section displays sub-index score cards for basic water quality, synthetic pesticides, organic pesticides, and pesticide additive toxicity. Each category receives a numeric and category rating based on the calculated sub-index score. The color of each card is determined by this rating (red if the score is low; blue if the score is high). If a site does not have the minimum number of detectable samples needed to calculate a sub-index score, the card displays “Insufficient Detectable Samples”.

<sup>3</sup> Worcester et al., California Central Coast Healthy Watersheds Project – Part 1, Chapter 4. (2015).

### ***Date Visualizations – Data Table***

This page displays a table with summarized data for each analyte. The table contains:

- Each analyte name
- The minimum, maximum, average and median result
- The standard deviation for the result
- The unit measured
- The number or count of samples taken
- The designated limit and source
- The number of exceedances
- The average MEQ, color coded based on the MEQ value (blue for a high MEQ; red for a low MEQ).

## Appendix A – Glossary

Term	Definition
Ranch	A tract of land where commercial crops are produced or normally would have been produced. Individual ranches typically have a similar ranch manager, operator, or landowner, and are categorized by geographic location ( <a href="#">Agricultural Order Attachment C</a> ).
Operation	A distinct farming business, generally characterized by the form of business organization, such as a sole proprietorship, partnership, corporation, and/or cooperative. A farming operation may be associated with one or many individual farms/ranches (Agricultural Order Attachment C).
eNOI	The ranch electronic Notice of Intent is a form that is required for all ranches and describes the ranch’s location and characteristics.
Irrigated Acres	Total acres that are irrigated for commercial crop production, reported on the ranch eNOI.
Crop Acre (cr-ac)	The amount of acres that are reported on a TNA or INMP report as being farmed for a specific crop during the reporting period.
Ranch Acre (ra-ac)	The total amount of acres that are reported on a TNA or INMP report as being farmed during the reporting period.
90 <sup>th</sup> Percentile Target	Fertilizer nitrogen application target for all crop groups, applicable for all ranches required to submit TNA reports. The compliance date is 12/31/2023 (Agricultural Order Table C.1-2).
85 <sup>th</sup> Percentile Target	Fertilizer nitrogen application target for all crop groups, applicable for all ranches required to submit TNA reports. The compliance date is 12/31/2025 (Agricultural Order Table C.1-2).
Nitrogen Discharge Target	Target for how much nitrogen is discharged to groundwater in pounds per ranch acre, applicable for all ranches required to submit INMP reports (Agricultural Order Table C.1-3).

Term	Definition
On-Farm Domestic Well	Any groundwater well that is connected to a residence, workshop, or place of business that may be used for human consumption, cooking, or sanitary purposes that is located within the enrolled ranch Assessor Parcel Number (APN). This includes all domestic wells located within the enrolled APN, not limited to the leased property or within the ranch boundary. This definition includes “dual use” wells that are used for both irrigation and domestic purposes (Agricultural Order Attachment C).
Drinking Water Standard	For groundwater with the beneficial use of municipal or domestic water supply, the applicable drinking water standards are those established by the USEPA or California Division of Drinking Water, whichever is more stringent (Agricultural Order Attachment C). The nitrate drinking water standard is established by California DDW and is MCL 10 mg/L. The drinking water standard for 1,2,3-TCP is established by California DDW and is MCL 0.005 mg/L.
MCL	Maximum Contaminant Level (interchangeable with drinking water standard)
CMP	The Cooperative Monitoring Program is a surface water trend monitoring program that has monitored sites in the Central Coast Region since 2005.
MEQ	Magnitude Exceedance Quotient is a rating system to quantify water quality impairment.
TMDL	Total Maximum Daily Load. The calculation of the maximum amount of a particular material that a waterbody can assimilate on a regular basis and still support beneficial uses designated for that waterbody (Agricultural Order Attachment C).
Agricultural Order non-TMDL limit	The Agricultural Order establishes surface receiving water quality limits for pollutants for dischargers in areas without an established TMDL (Agricultural Order Table C.3-3, Table C.3.5, and Table C.3.7).
Sub-Index Score	MEQ scores from multiple parameters are combined into sub-indices and given a numeric value and letter grade.

## Appendix B – Formulas

### Total Nitrogen Applied (TNA) Report Section

Calculation	Formula
Ranch Acres	Report Acres – Fallow Acres
Fertilizer nitrogen applied per crop acre (lbs/cr-ac)	Nitrogen Applied in Conventional Fertilizers (Total Pounds) / Crop Acres <b>Note:</b> calculated for each reported crop
$A_{FER}$ (lbs/ra-ac)	Sum of Nitrogen Applied in Conventional Fertilizers (lbs) / Total Ranch Acres
$A_{ORG}$ (lbs/ra-ac)	Sum of Nitrogen Applied in Organic Fertilizers (lbs) / Total Ranch Acres
$A_{COMP}$ (lbs/ra-ac)	Sum of Nitrogen Applied in Compost and Other Materials (lbs) / Total Ranch Acres
$A_{IRR}$ (lbs/ra-ac)	$\frac{[N \text{ Concentration in Irrigation Water (mg/L)} * \text{Total Water Applied (gallons)} * 3.785]}{[\text{Total Ranch Acres}]}$ <b>Note:</b> this value is automatically calculated in GeoTracker reports
TNA	$A_{FER} + A_{ORG} + A_{COMP} + A_{IRR}$

Calculation	Formula
Potential Harvest Value (lbs/cr-ac)	<p>The potential harvest value is determined for each crop based on the crop name.</p> <p>If the crop is reported a “not final harvest”, “no yield”, or for “research”, the potential harvest value is zero</p> <p>If the crop is reported as “low yield” or “diseased”, the potential harvest value is multiplied by ½</p> <p>If the crop is reported as “hydroponic” or “propagation crop”, the potential harvest value is equal to the total amount of nitrogen applied as fertilizer</p>
Potential R <sub>HARV</sub>	[Sum of (Potential Harvest Value (lbs/cr-ac) * Crop Acres)] / Ranch Acres
Potential Nitrogen Discharge	TNA – Potential R <sub>HARV</sub>
Potential Nitrogen Discharge Ratio	TNA / Potential R <sub>HARV</sub>



## Irrigation and Nutrient Management (INMP) Summary Report Section

Calculation	Formula
Ranch Acres	Report Acres – Fallow Acres
$A_{FER}$ (lbs/ra-ac)	Sum of Nitrogen Applied in Conventional Fertilizers (lbs) / Total Ranch Acres
$A_{ORG}$ (lbs/ra-ac)	Sum of Nitrogen Applied in Organic Fertilizers (lbs) / Total Ranch Acres
$A_{COMP}$ (lbs/ra-ac)	Sum of Nitrogen Applied in Compost and Other Materials (lbs) / Total Ranch Acres
$A_{IRR}$ (lbs/ra-ac)	<p>N Concentration in Irrigation Water (mg / L) * Total Water Applied (gallons) * 3.785 / Total Ranch Acres</p> <p><b>Note:</b> this value is automatically calculated in GeoTracker reports. A factor of 3.785 is used to convert from gallons to liters.</p>
$R_{HARV}$ (lbs/ra-ac)	<p>Sum of <math>R_{HARV}</math> (lbs / cr-ac) * Crop Acres / Total Ranch Acres</p> <p><b>Note:</b> <math>R_{HARV}</math> (lbs/cr-ac) is automatically calculated in GeoTracker using the formula below</p> <p><math>R_{HARV}</math> (lbs / cr-ac) = Crop Nitrogen Conversion Coefficient * Crop Material Removed (lbs / cr-ac)</p>
$R_{SEQ}$	Sum of Nitrogen Sequestered (lbs / cr-ac) * Crop Acres / Total Ranch Acres

Calculation	Formula
Nitrogen Discharge (A-R)	$A_{FER} + A_{ORG} + A_{COMP} + A_{IRR} - R_{HARV} - R_{SEQ}$
Nitrogen Discharge Ratio (A/R)	$( A_{FER} + A_{ORG} + A_{COMP} + A_{IRR} ) / ( R_{HARV} + R_{SEQ} )$
Water Lost to Evapotranspiration (acre-feet)	<p>ETc (acre-in) / 12 * Crop Acres</p> <p><b>Note:</b> Crop ETc can be manually input or will be automatically calculated in GeoTracker with the formula below. Factor of 12 is used to convert from inches to feet.</p> <p>ETc (acre-in) = Reference Evapotranspiration Value (ETo) * Crop Coefficient (Kc)</p> <p><b>Note:</b> ETc is calculated for each reported crop.</p>
Irrigation Water Potentially Discharged to Surface Water	Total Volume of Irrigation Water Applied * Estimated Percentage Discharged to Surface Water / 100
Nitrate Loading to Groundwater (mg/L/ranch-acre)	<p><math>( \text{Median Nitrogen Discharge (lbs)} - 4.5 \text{ lbs} * 453592 ) /</math></p> <p><math>( \text{Median Groundwater Discharge Rate (ac-ft/ra-ac)} * 1.233 * e^6 )</math></p> <p><b>Note:</b> 4.5 lbs are subtracted to account for denitrification. The factor of 453592 is used to convert from lbs to mg and a factor of 1.233 *e^6 is used to convert from acre feet to liters.</p>