



Central Coast Groundwater Coalition 2018 Program Update

CENTRAL COAST REGIONAL WATER QUALITY CONTROL BOARD

SAN LUIS OBISPO, MAY 10-11, 2018

CCGC Organization

Membership Status

- 372 members
- 216,856 acres

Organization Goals

- Cost effective approach to complying with Irrigated Lands Regulatory Program
- Provide Cooperative Groundwater Monitoring Option
- Assist in development of next Order (4.0)



CCGC Accomplishments to Date

1,531 total member wells sampled between 2013-17

- 826 domestic
- 705 irrigation

-- Completed 2.0 North and South Workplans on schedule

-- Created nitrate contour maps of major groundwater basins

-- Assisting members in completing Total Nitrogen Applied reports

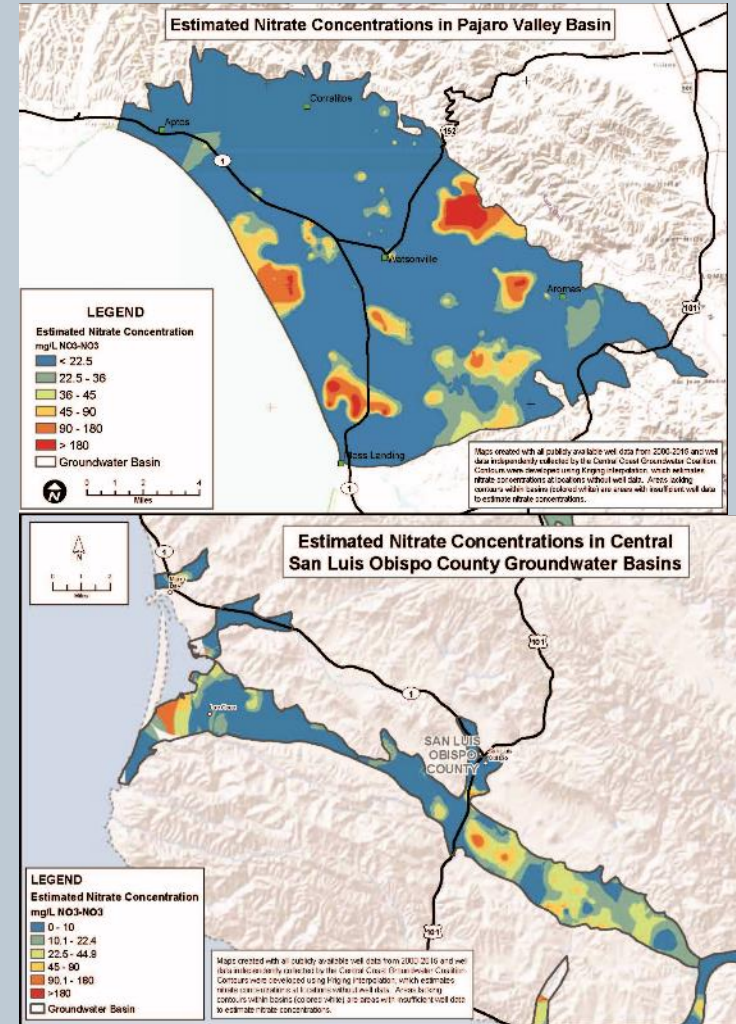
-- Proved that coalition approach can work on Central Coast



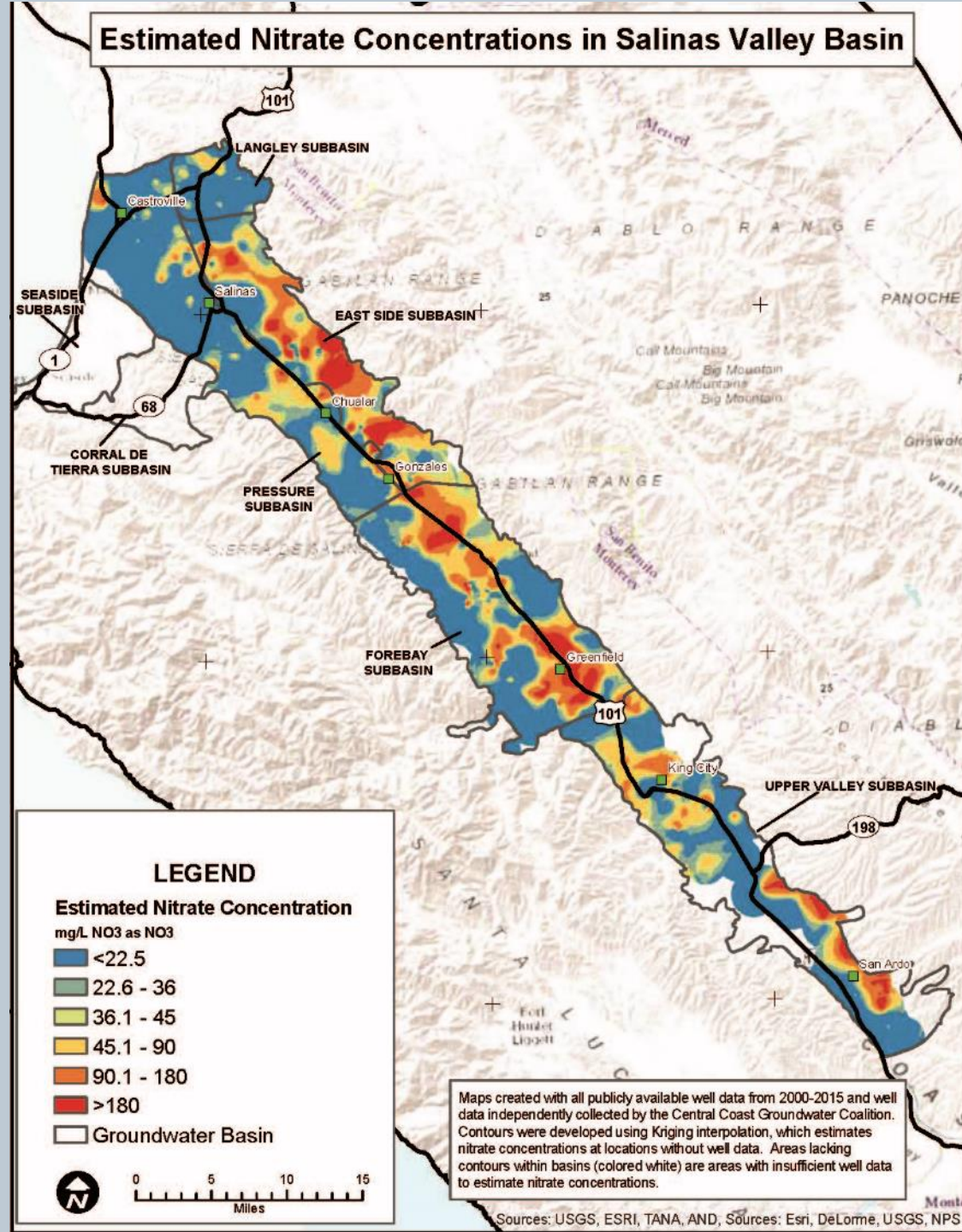
Nitrate Contour Maps

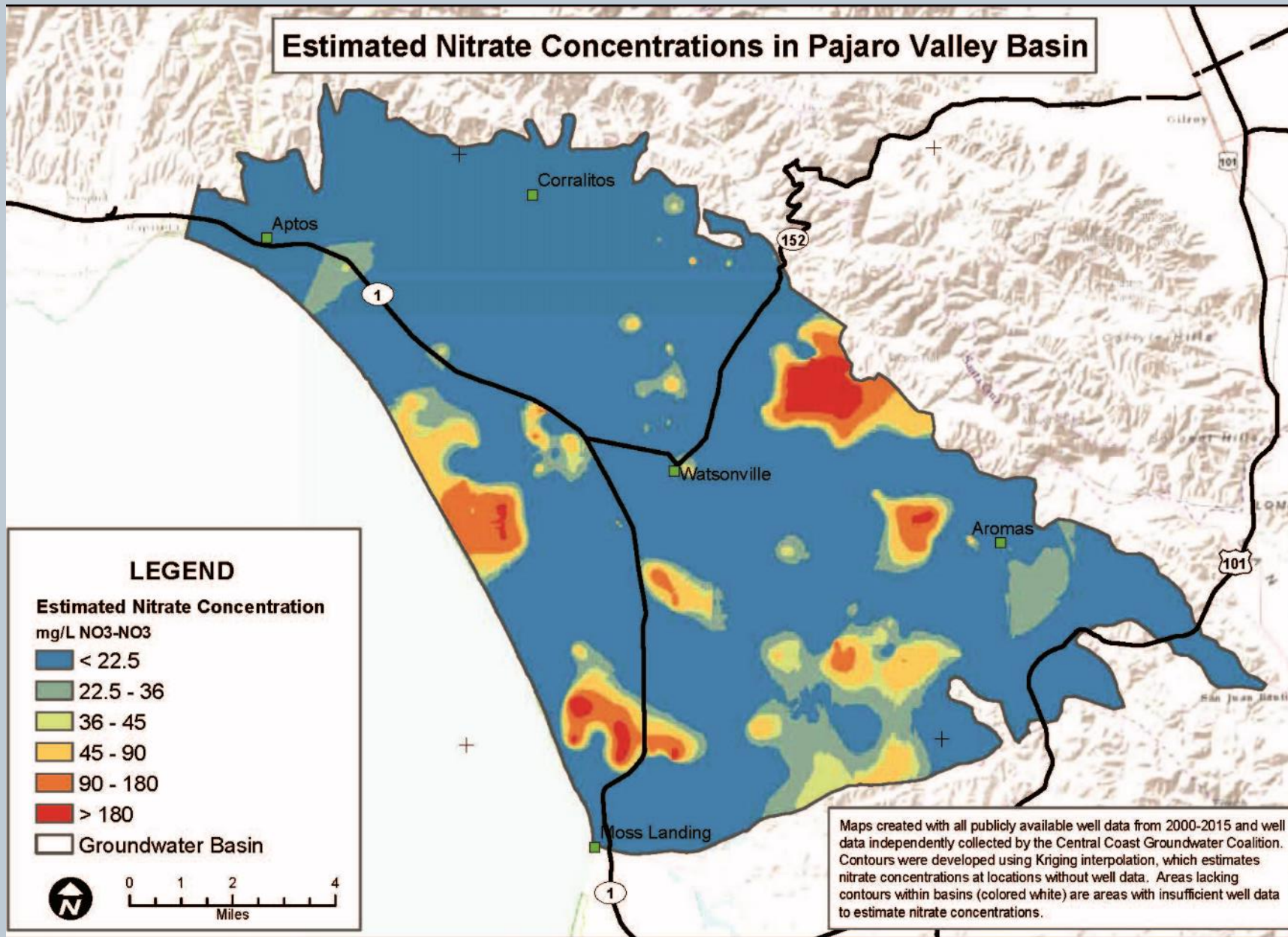
Used multiple groundwater data sources

- Data ranged from 2000 - 2014
- Geotracker GAMA data set
- USGS National Water Information System
- Lawrence Livermore National Laboratory
- CCGC member wells (2013-2014)
- ILRP individual program wells (2013-2014)



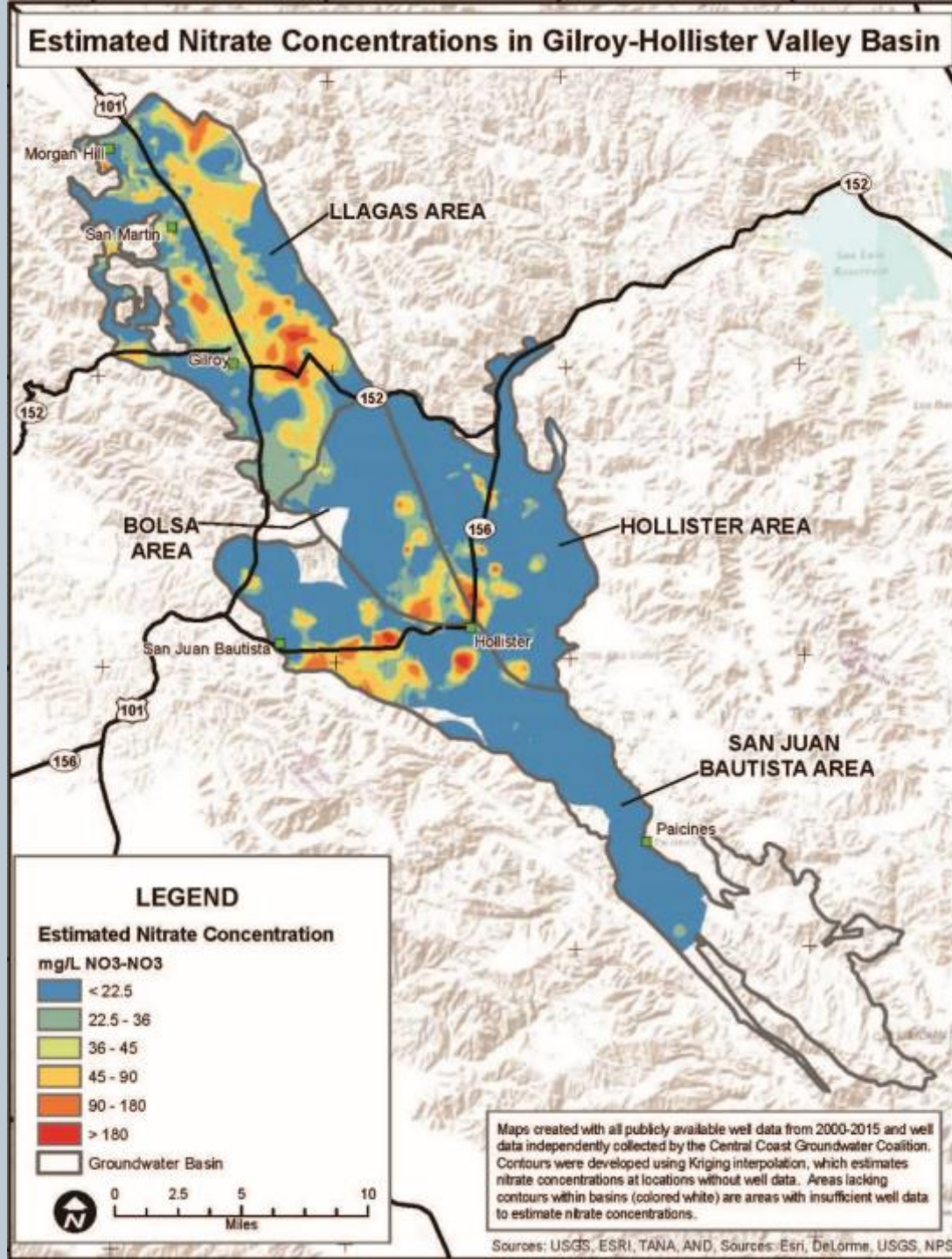
Salinas Valley

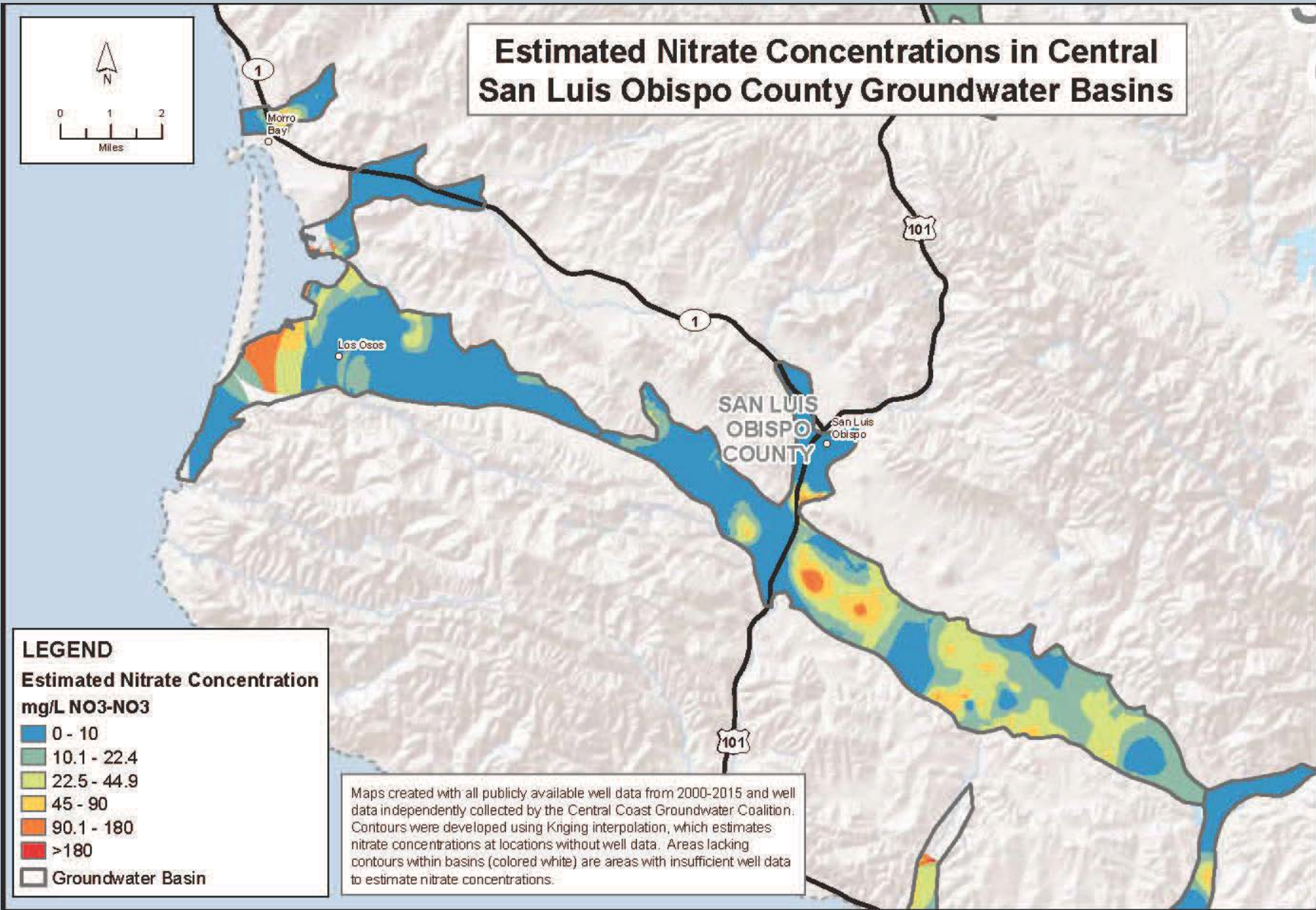




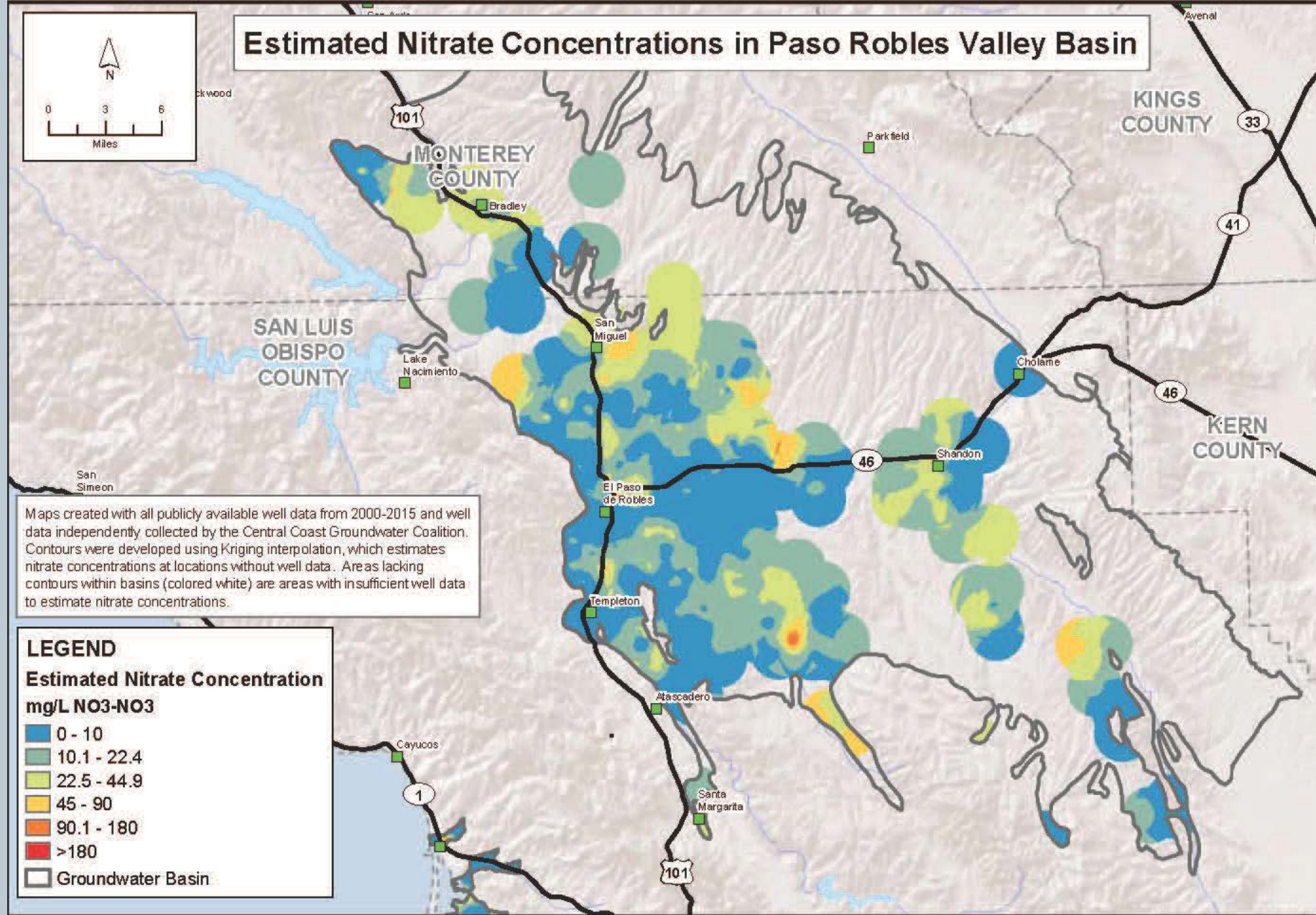
Pajaro Valley

Gilroy – Hollister Valley

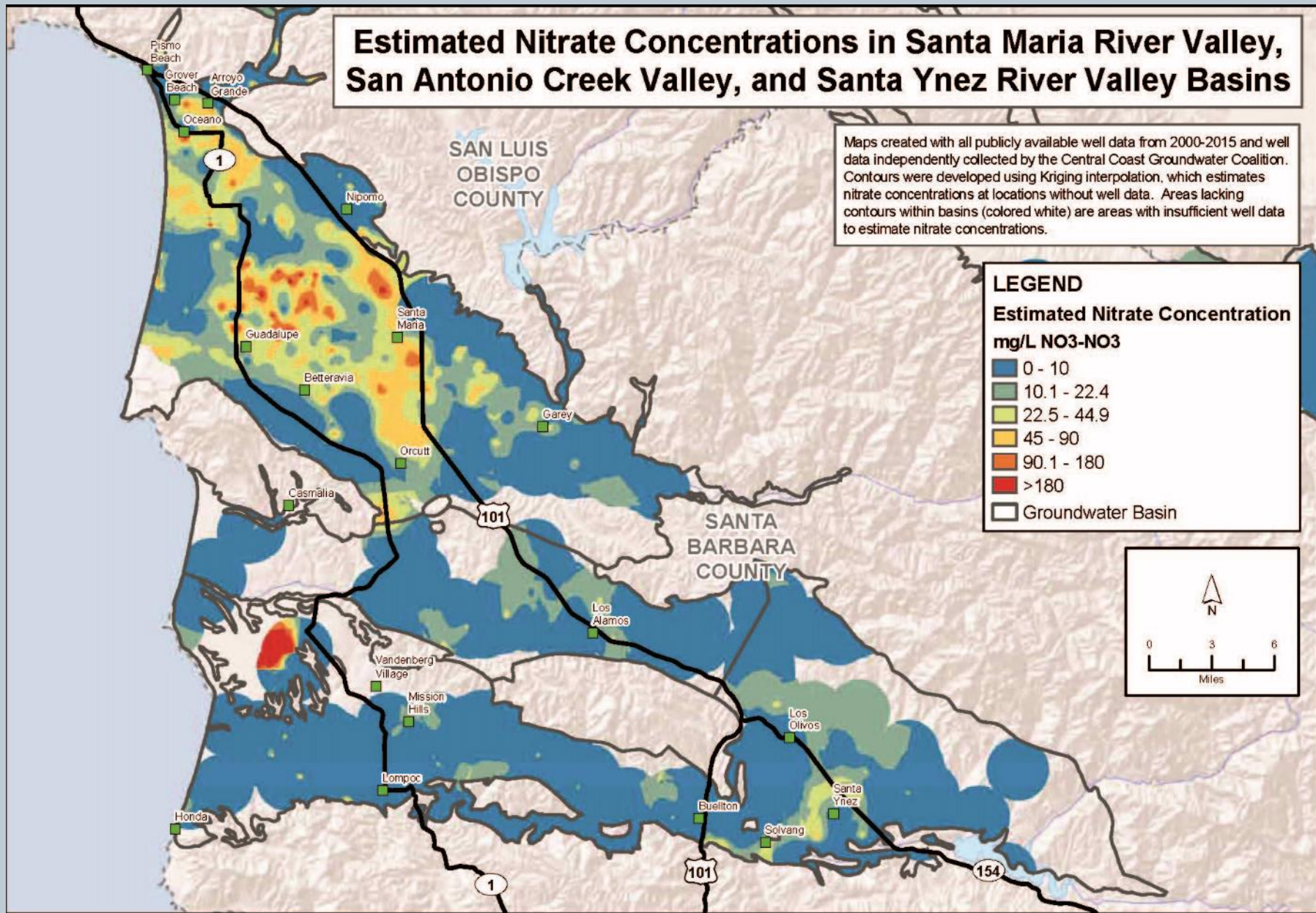




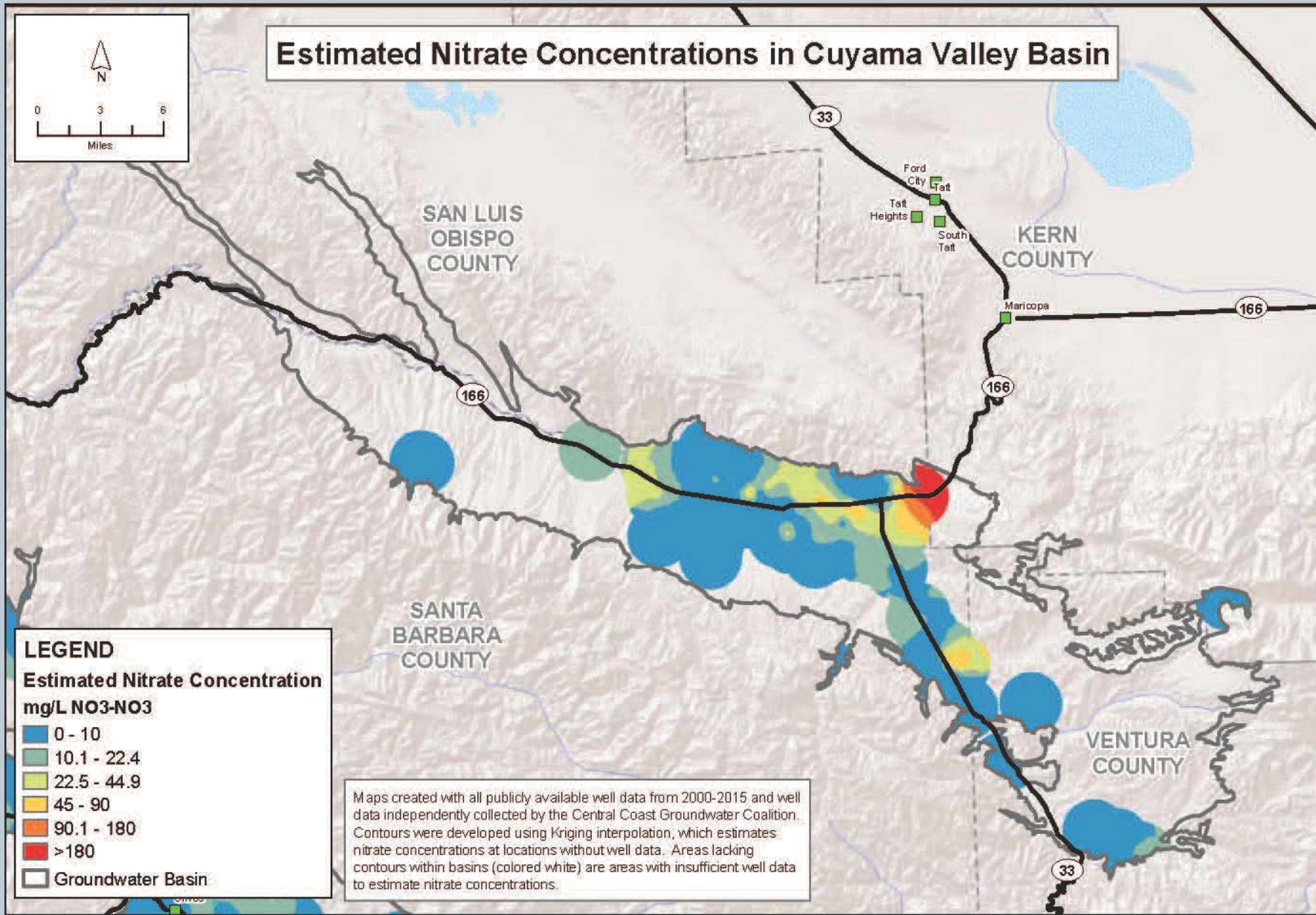
San Luis Obispo



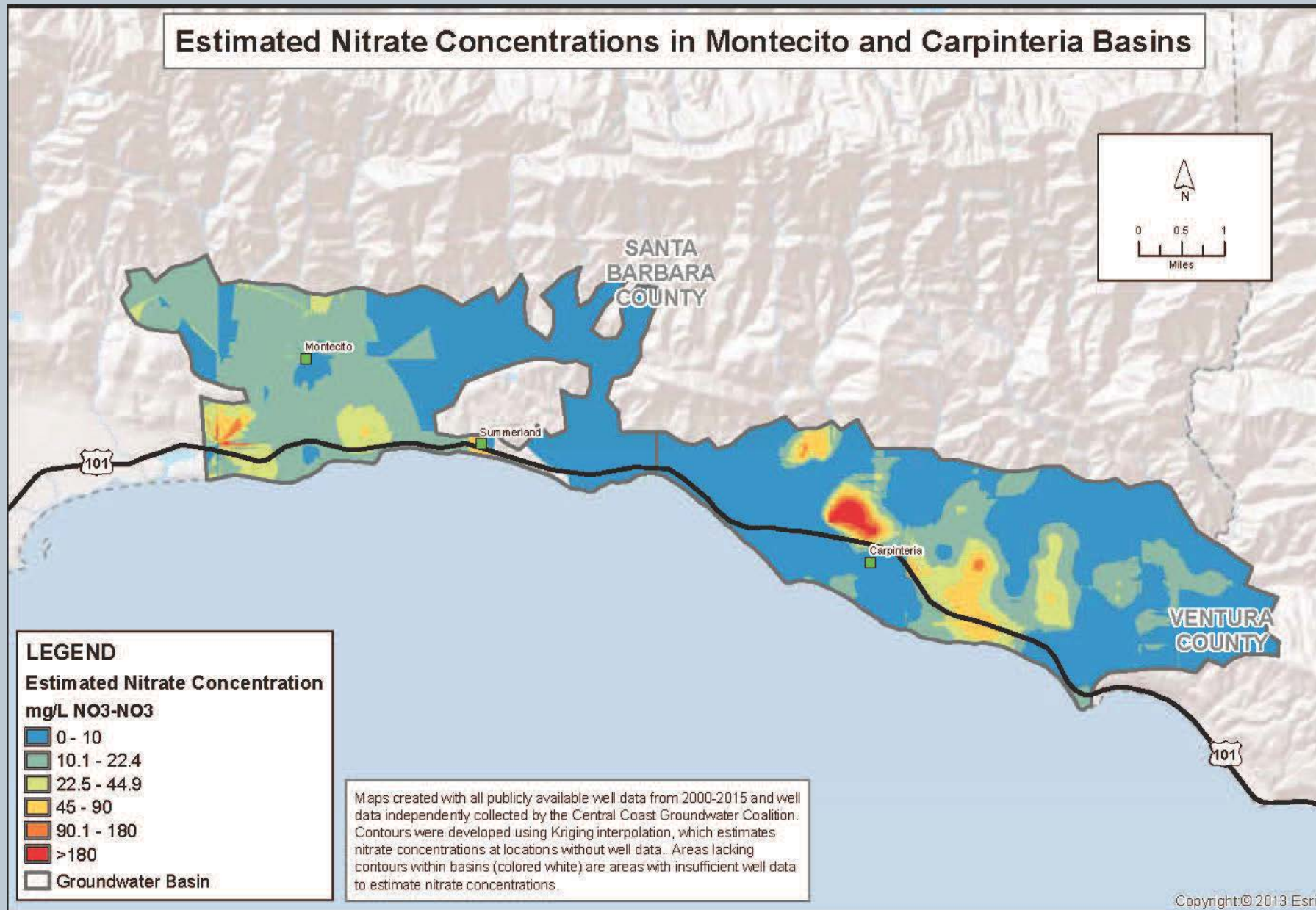
Paso Robles Valley



Santa Maria Area



Cuyama Valley



Montecito & Carpinteria

CCGC 3.0 Groundwater Plan

- Alternative schedule for sampling irrigation and domestic wells
- TNA Reporting Assistance to CCGC members
 - **Goals for TNA assistance** (*workshops and phone support*)
 - **Compliance** with TNA reporting requirement
 - **Accuracy** of submitted information
 - Developed Excel spreadsheet combining RWB worksheet elements
 - Intended for guidance on record keeping for future reporting (for those not already using N tracking technology)



Domestic Well Sampling and Reporting

- Collect domestic well monitoring results from laboratory/consultant contracted by members in a specified format (compatible with GeoTracker)
 - All well testing performed by independent labs (CCGC does not offer sampling service)
 - CCGC notifies members of an exceedance within 48 hours of verifying results
 - CCGC is responsible for member notification process
- If domestic well previously had exceedance notification process completed then...
 - Member acknowledges receipt of new exceedance notification and provides new user notification
 - Confirms that current residence was notified/aware of existing water quality



Comparison of Member Well Nitrate Concentrations

Nitrate data is from wells with two or more samples collected

- Date Range: 2013 – 2017
 - First sample – earliest sample date (2013-2016)
 - Second sample – more recent sample date (2014-2017)

Domestic Wells: 506

Irrigation Wells: 575

Well data is from CCGC database

Nitrate includes both “Nitrate a NO₃-N” and “Nitrate + Nitrite as N”



Statistic Analysis Approaches

WILCOXON SIGNED-RANK FOR PAIRED SAMPLES

Null Hypothesis: There are no differences between the paired samples.

Alternative Hypothesis: The two samples are different.

Analysis Conclusion: **Significantly lower** median concentration in the second sample compared to the first sample ($Z=3.4802$, $p<0.05$)

CHI-SQUARED TEST

Null Hypothesis: There are no differences in the number of wells above and below the MCL in the paired samples.

Alternative Hypothesis: There are more wells above (or below) the MCL in one of the two samples (first and second).

Analysis Conclusion: There are **no differences** in the number of wells above and below the MCL between the first and second sample ($\chi^2 < 1$, $p > 0.05$)



Domestic Wells – CCGC Members

TOTAL: 506 WELLS

First Sample Concentration Range (2013-2016)

- Non Detect/0.0 – 189 mg/L

Second Sample (2014-2017)

- Non Detect/0.0 – 204 mg/L

There are significantly more non detects associated with the second sample compared to the first sample (chi-square test, domestic well chi-square = 6.36, $p < 0.05$)



Irrigation Wells – CCGC Members

TOTAL – 575 WELLS

First Sample Concentration Range (2013-2016)

- Non Detect/ 0.0 – 124 mg/L

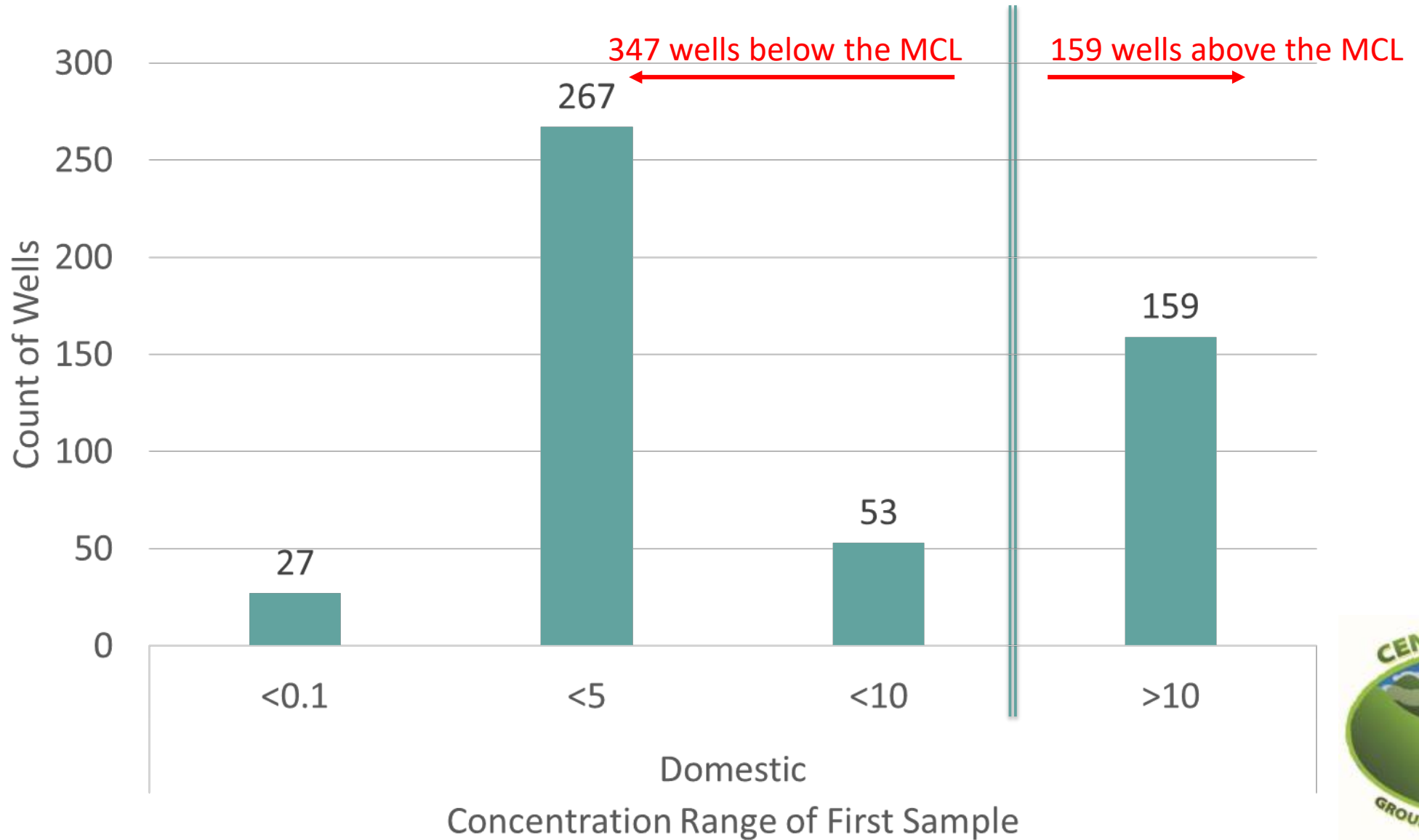
Second Sample (2014 - 2017)

- Non Detect/0.0 – 132 mg/L

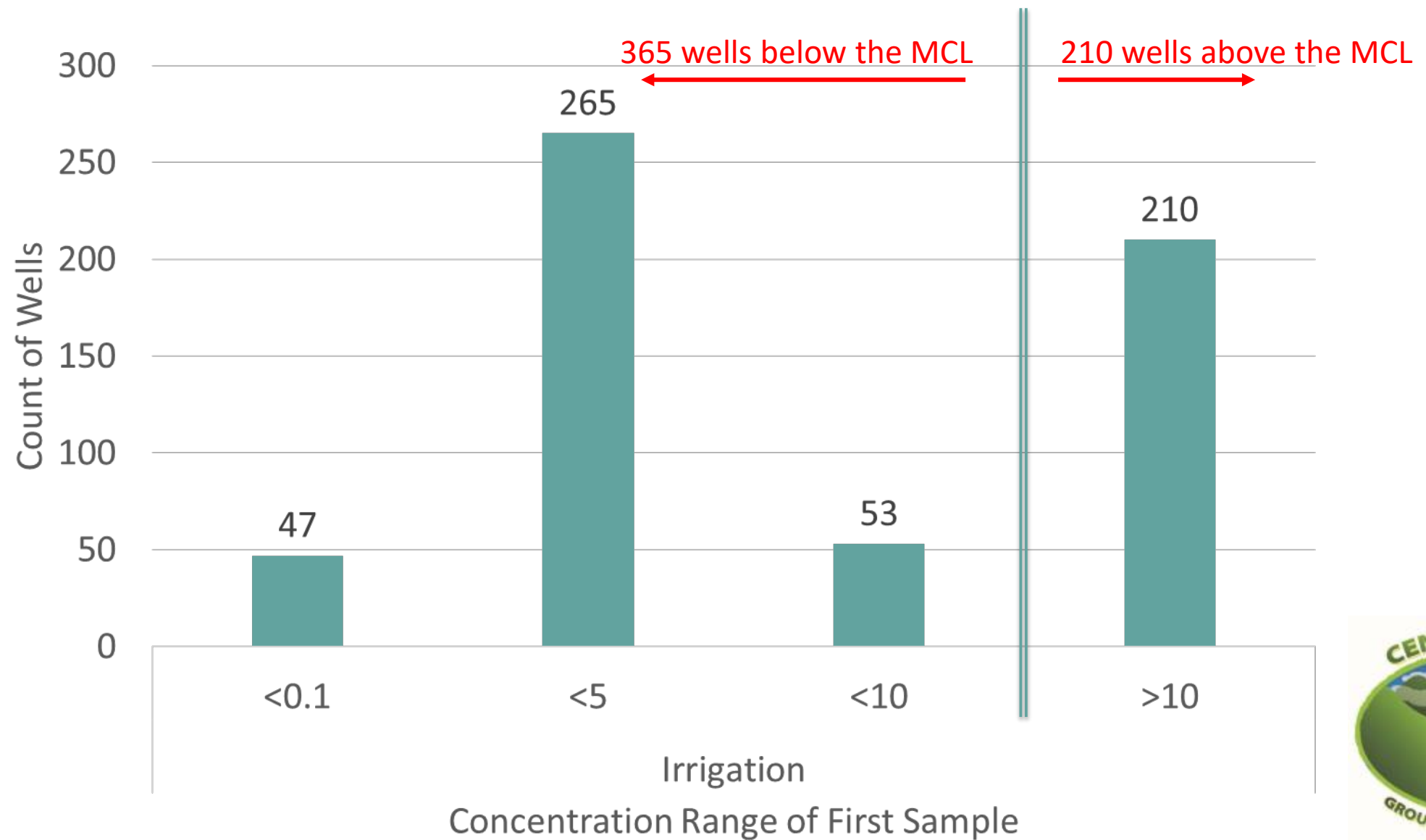
There are significantly more non detects associated with the second sample compared to the first sample (chi-square test, irrigation well chi-square = 6.66, $p < 0.05$)



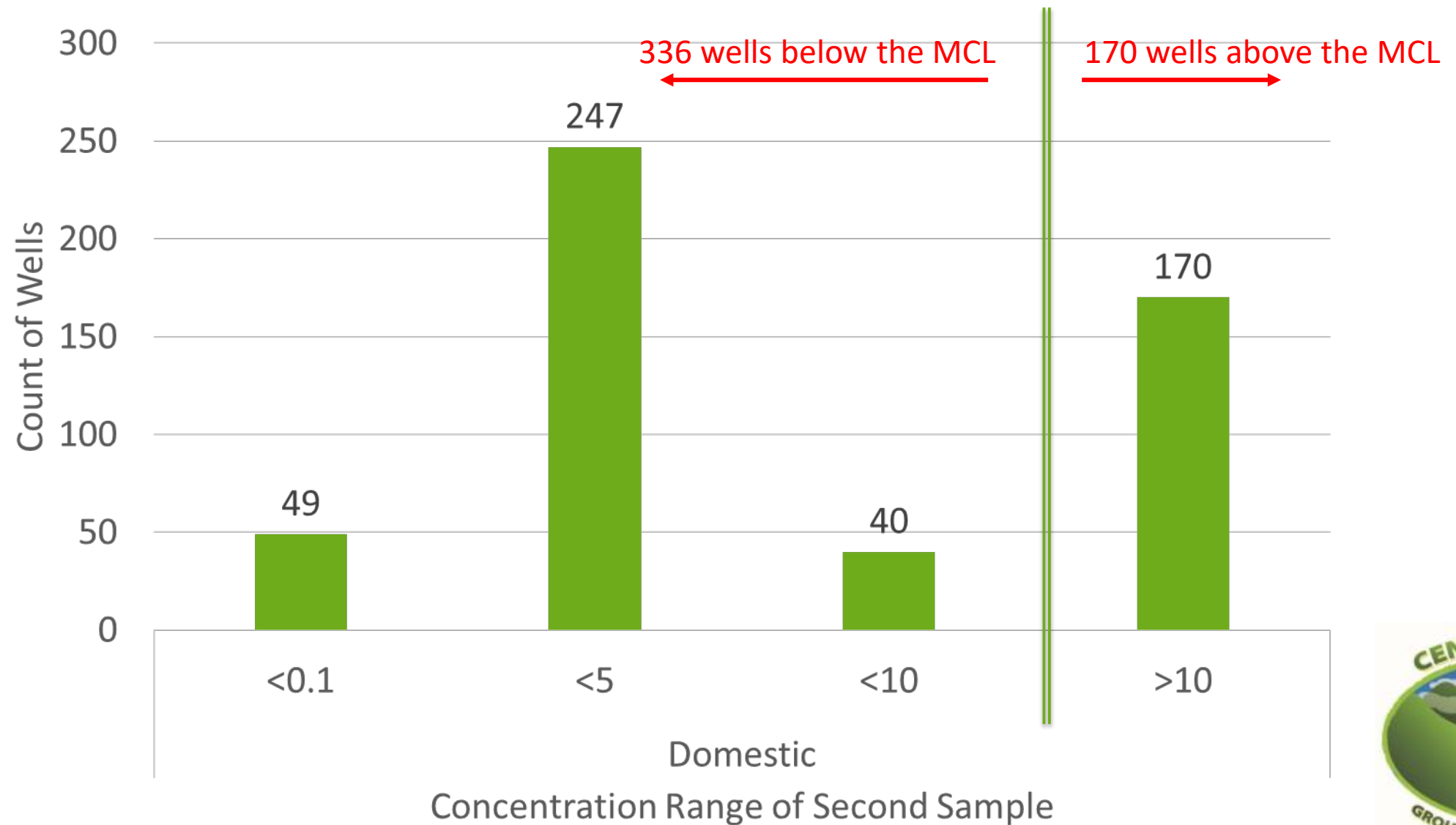
First Sample Concentration Ranges - Domestic



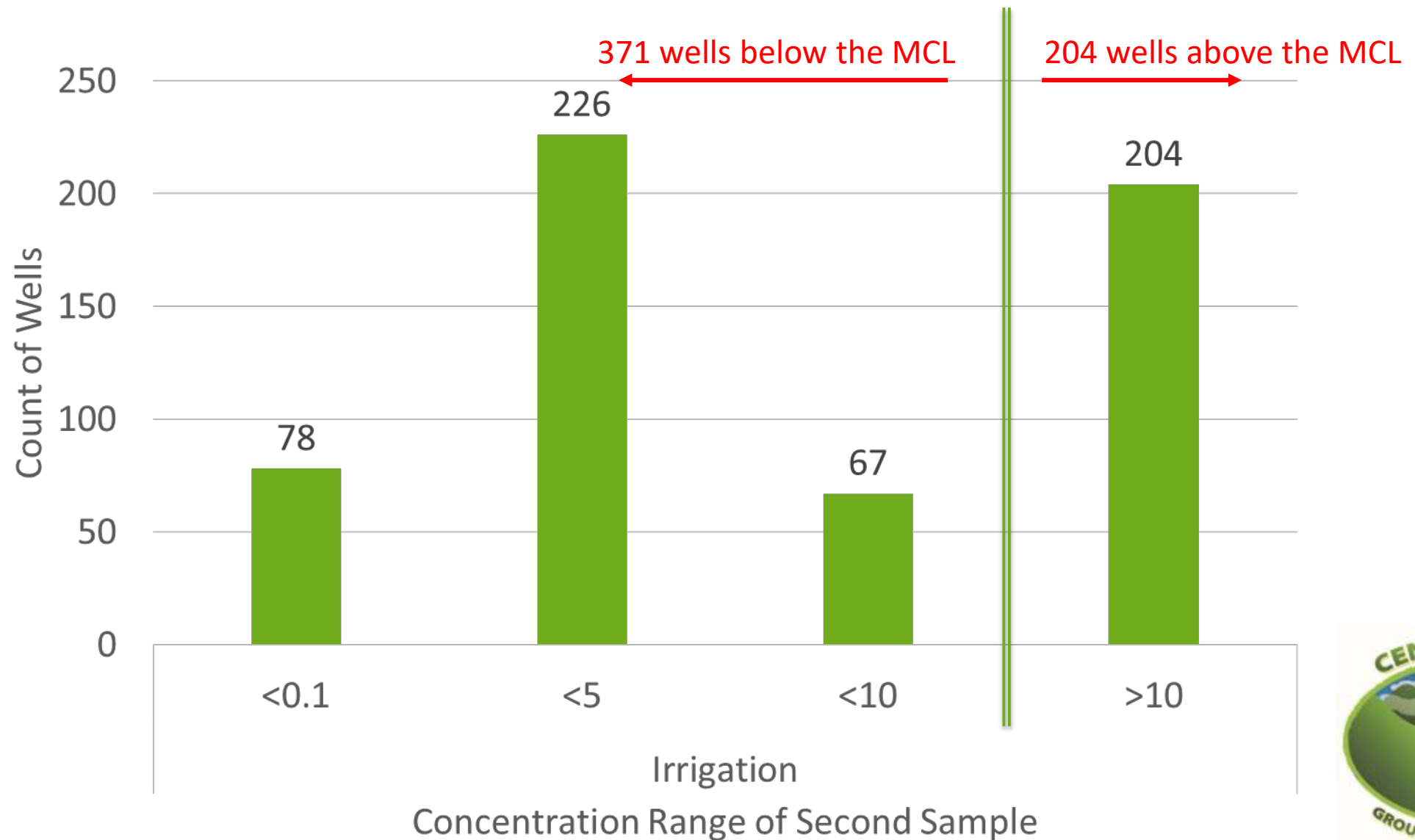
First Sample Concentration Ranges - Irrigation



Most Recent Sample Concentration Ranges - Domestic



Most Recent Sample Concentration Ranges - Irrigation

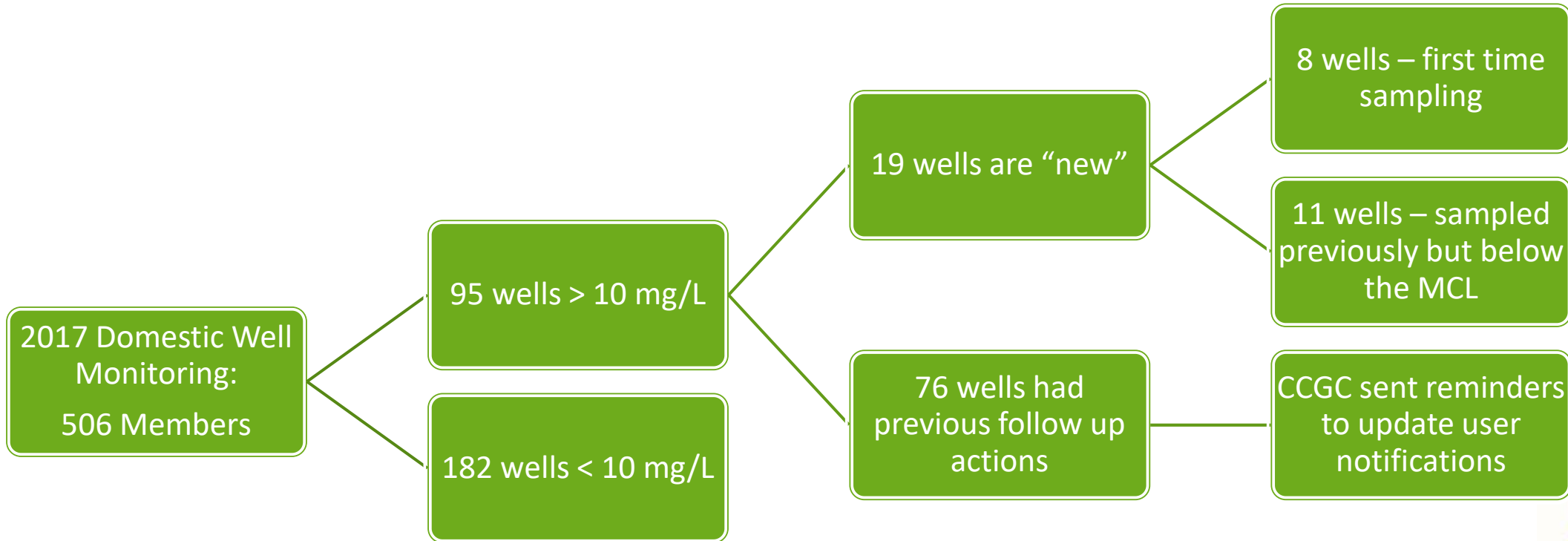


Conclusions from Analysis

- For wells with more than one sample, there is a **slight decrease in nitrate** concentration from the first sample collected and the last sample collected; however, there is not a significant difference between the number of wells above/below the MCL between the first and last sample collected.
- **CAVEATS TO REMEMBER:**
 - Two points don't make a trend!
 - Some wells have more than two samples such that the “second” sample may be the third or fourth sample.
 - Time between first and second sample varies from less than a year to more than 3 years.
 - There are many factors affecting nitrate concentrations – this is a complicated story



Domestic Well Follow Up Actions



More than 50% of members were already supplying replacement water (prior to 2013 program adoption)



Questions?

25

www.centralcoastgdc.org

For additional questions, call 831-240-9533

Email: director@centralcoastgdc.org