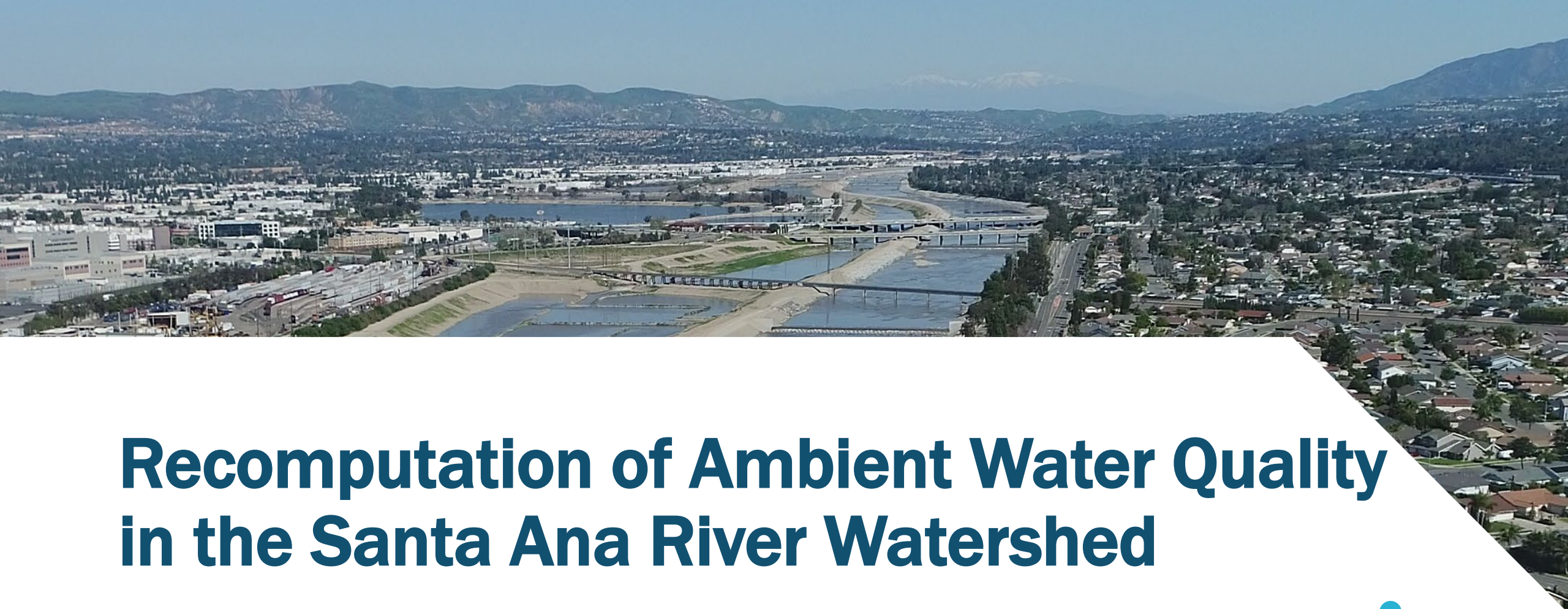




Recomputation of Ambient Water Quality in the Santa Ana River Watershed

BMPTF: September 18, 2019

Ambient Water Quality Phases

1: Data Gathering

- ✓ Data Compilation
- ✓ QA/QC, Process, and Upload recent data

2: Point Statistics

- ✓ Calculate Water Quality Point Statistics
- ✓ Shapiro-Wilk Test for Normality

3: Computations

- ✓ Groundwater Elevation Contours
- ✓ Nitrate, TDS Concentrations
- ✓ Compute ambient water quality for GMZ's

4: Interpretive Tools

- ✓ Innovative Interpretive Tool

1: Data Gathering

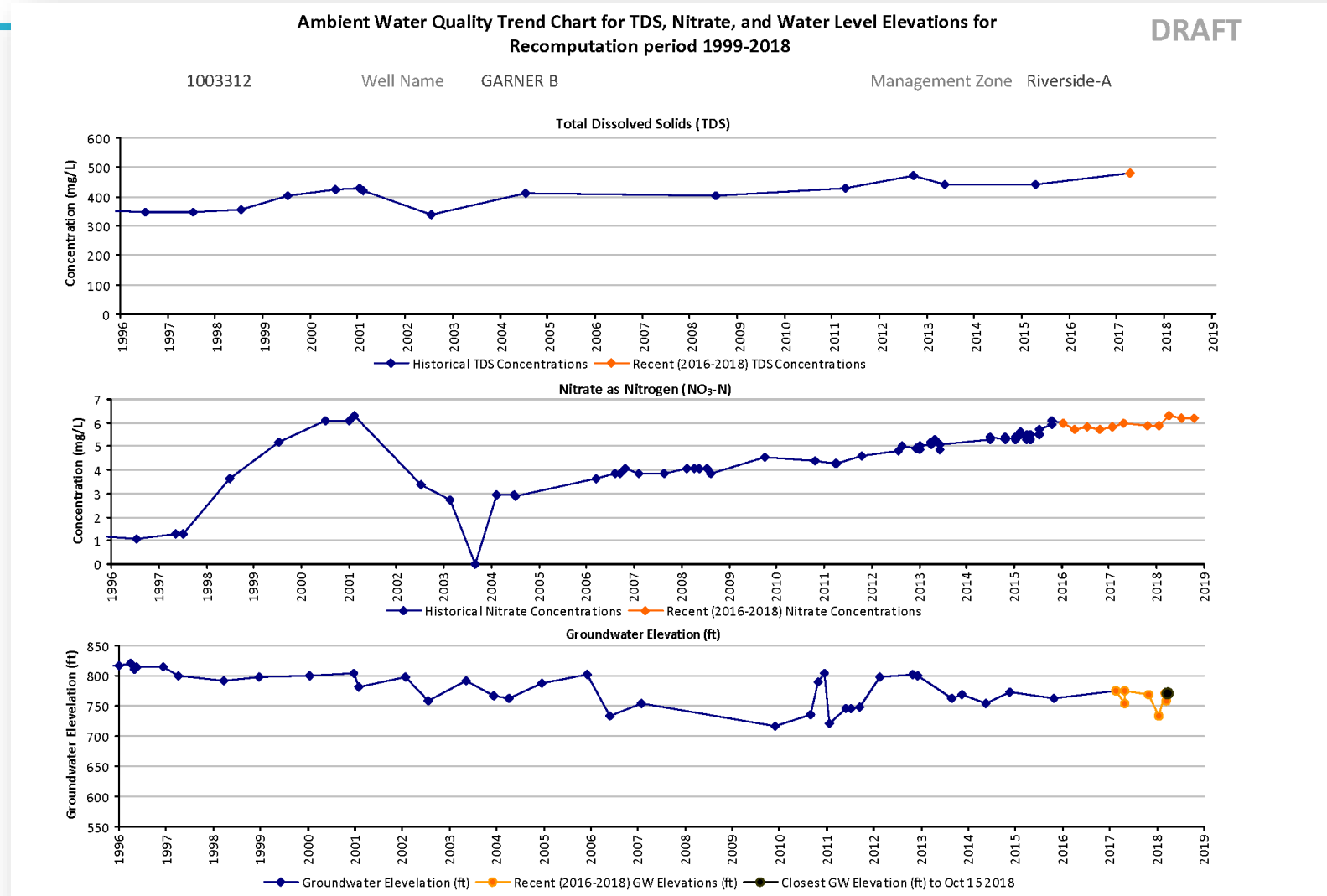
Data Compilation

1	Banning, City of	20	Riverside County Landfills
2	Beaumont, City of	21	Riverside, City of (Public Utilities)
3	Beaumont Cherry Valley Water District	22	Riverside-Highland Water Company
4	Chino Basin Watermaster	23	Rubidoux Community Services District
5	Colton, City of	24	San Bernardino County Landfills
6	Colton/San Bernardino Regional Tertiary Treatment and Water Reclamation Authority	25	San Bernardino Municipal Water Department
7	Corona, City of	26	San Bernardino Valley Municipal Water District
8	East Valley Water District		
9	Eastern Municipal Water District	27	San Geronio Pass Water Agency
10	Elsinore Valley Municipal Water District	28	South Mesa Water Company
11	Home Gardens County Water District	29	Temescal Valley Water District
12	Inland Empire Utilities Agency	30	West Valley Water District
13	Irvine Ranch Water District	31	Western Heights Water Company
14	Jurupa Community Services District	32	Western Municipal Water District
15	Loma Linda, City of	33	Western Riverside County Regional Wastewater Authority
16	Muscoy Mutual Water Company		
17	Orange County Water District	34	Yucaipa Valley Water District
18	Redlands, City of		
19	Rialto, City of		

Color	Indicator
	Data complied

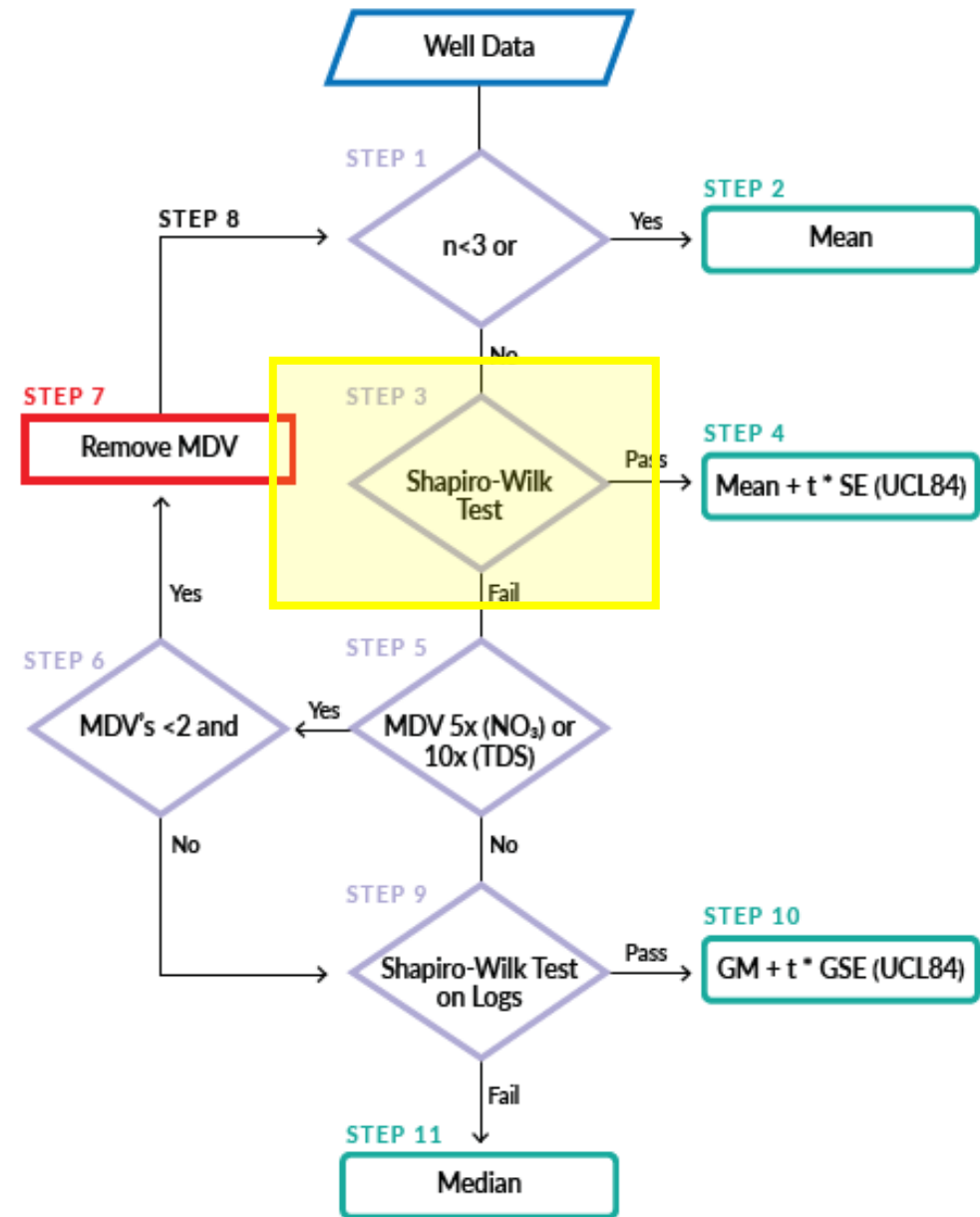
1: Data Gathering

QA/QC, Process, and Upload Recent Data



2: Point Statistics

- Annualized Averages
- At least 3 years of water quality (TDS or NO₃-N) in 20 year period
- Shapiro Wilk test for normality
- Point Statistics – mean plus $t \times \text{standard error of the mean}$



Shapiro-Wilk Test for Normality

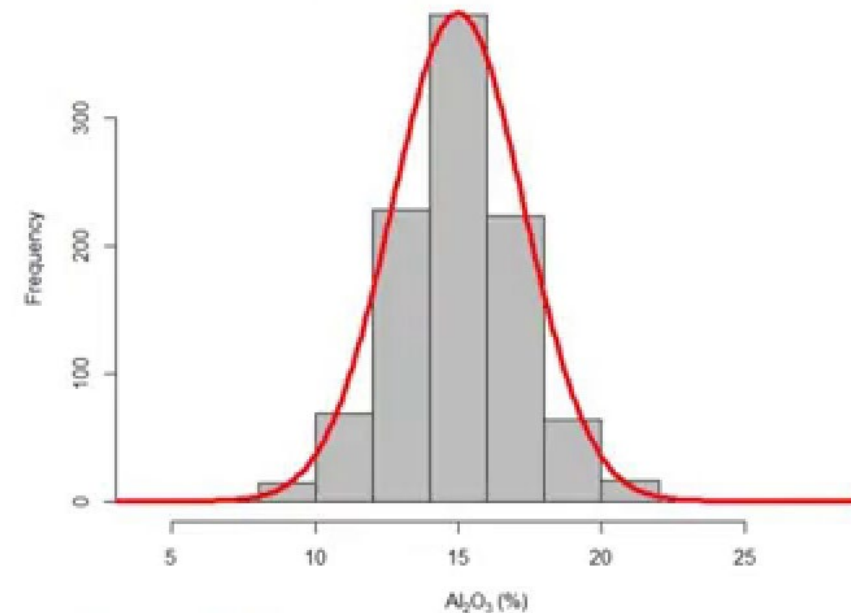
Assumes “normal” data

Bias towards low values

No apparent limit on the number of iterations

Rejects data that may correspond to event changes

Testing for Normality Shapiro-Wilk Test



EART125: Statistics and Data Analysis in the Geosciences UC Santa Cruz

Nitrate-Nitrogen (mg/L)

● < 2.5

● 2.5 - 5

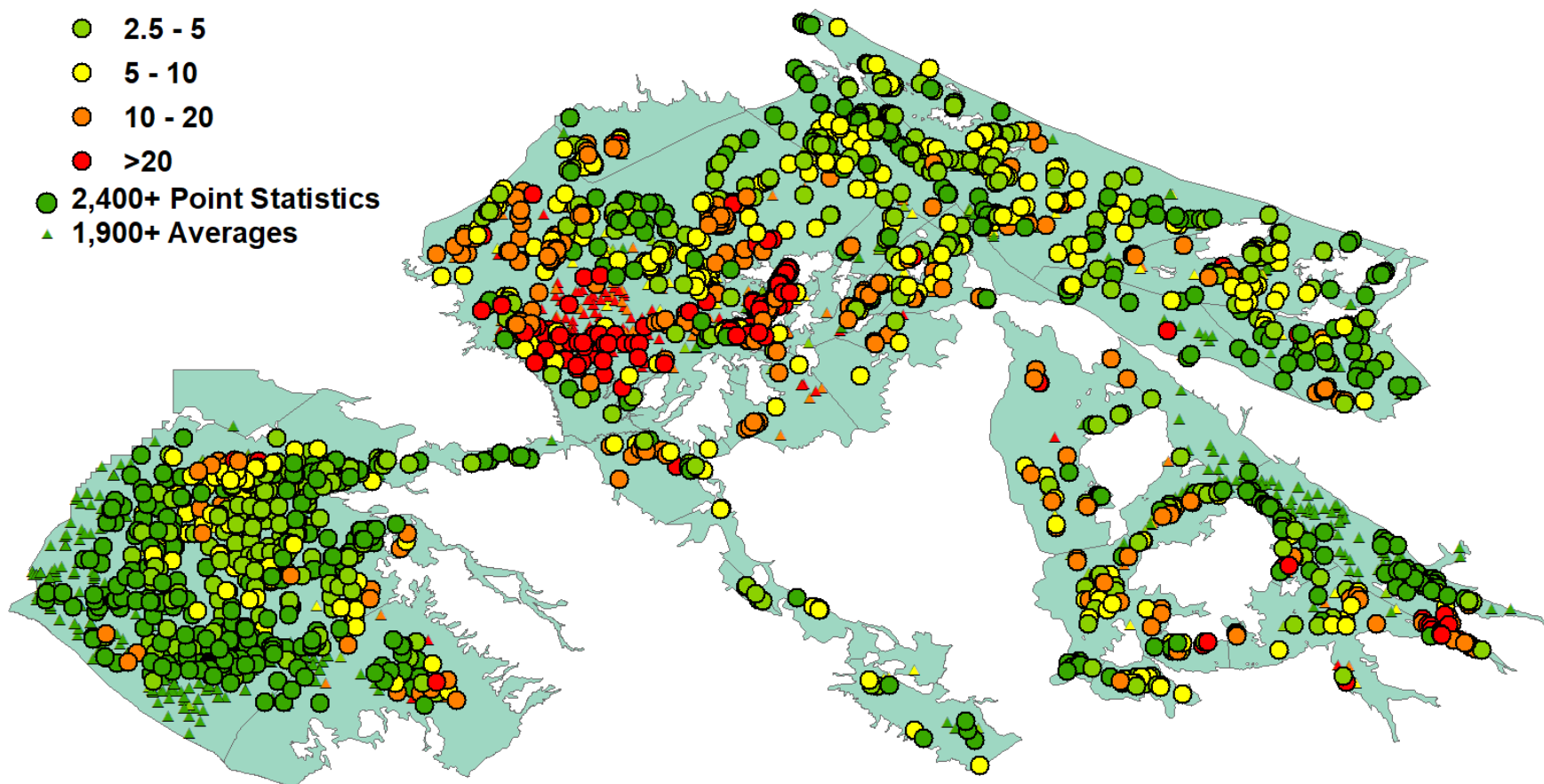
● 5 - 10

● 10 - 20

● >20

● 2,400+ Point Statistics

▲ 1,900+ Averages



TDS (mg/L)

● <250

● 250-500

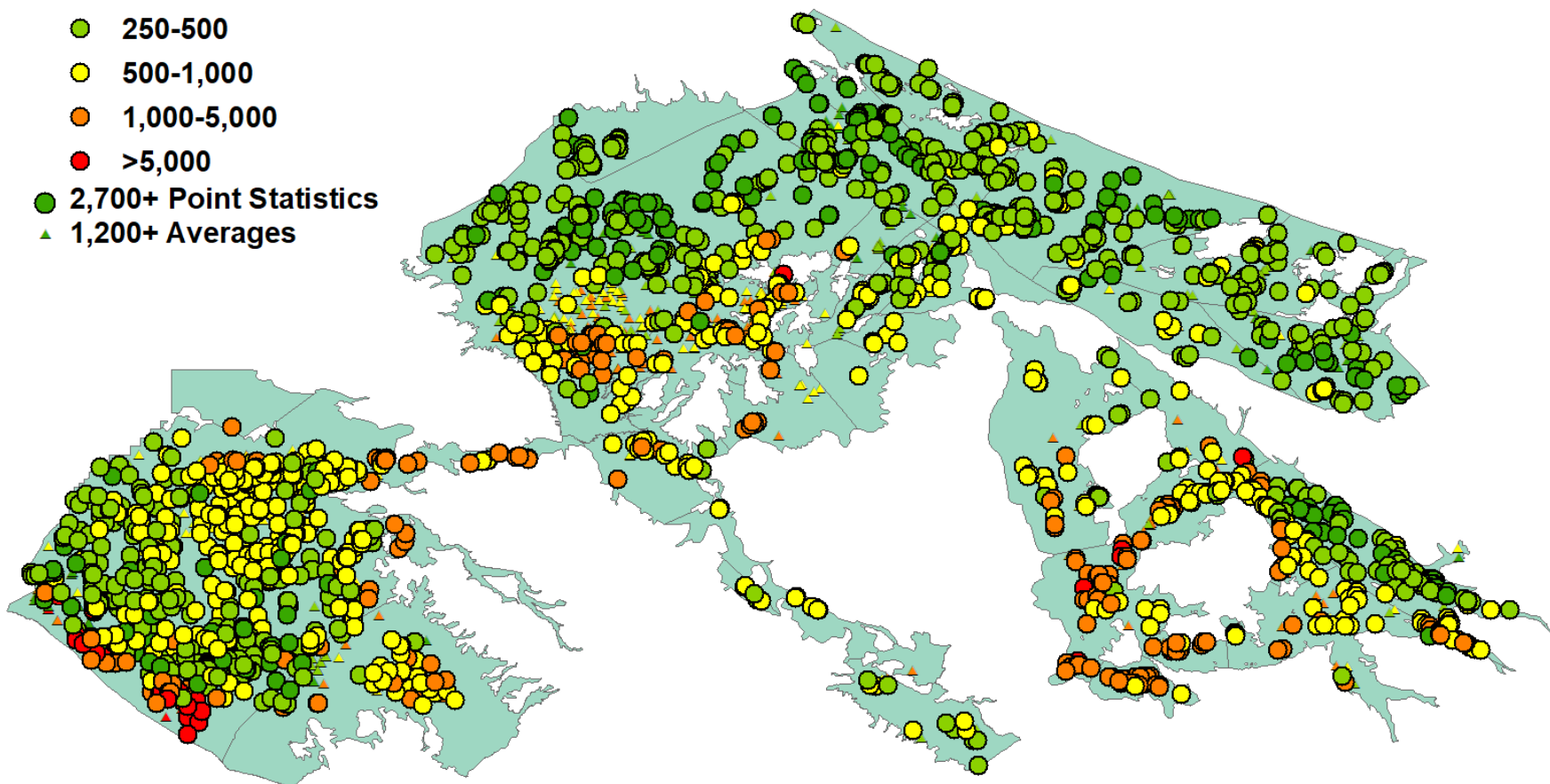
● 500-1,000

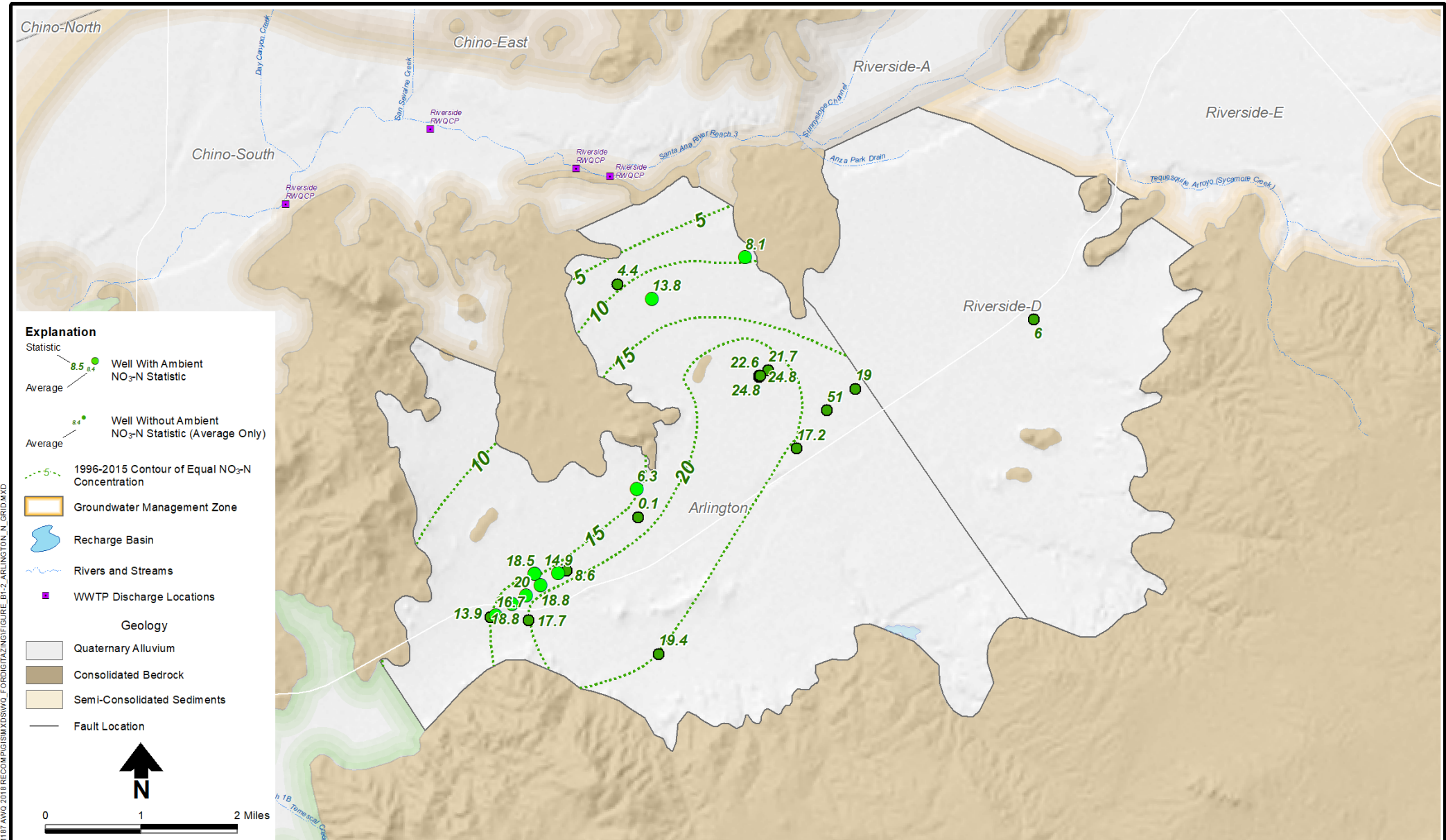
● 1,000-5,000

● >5,000

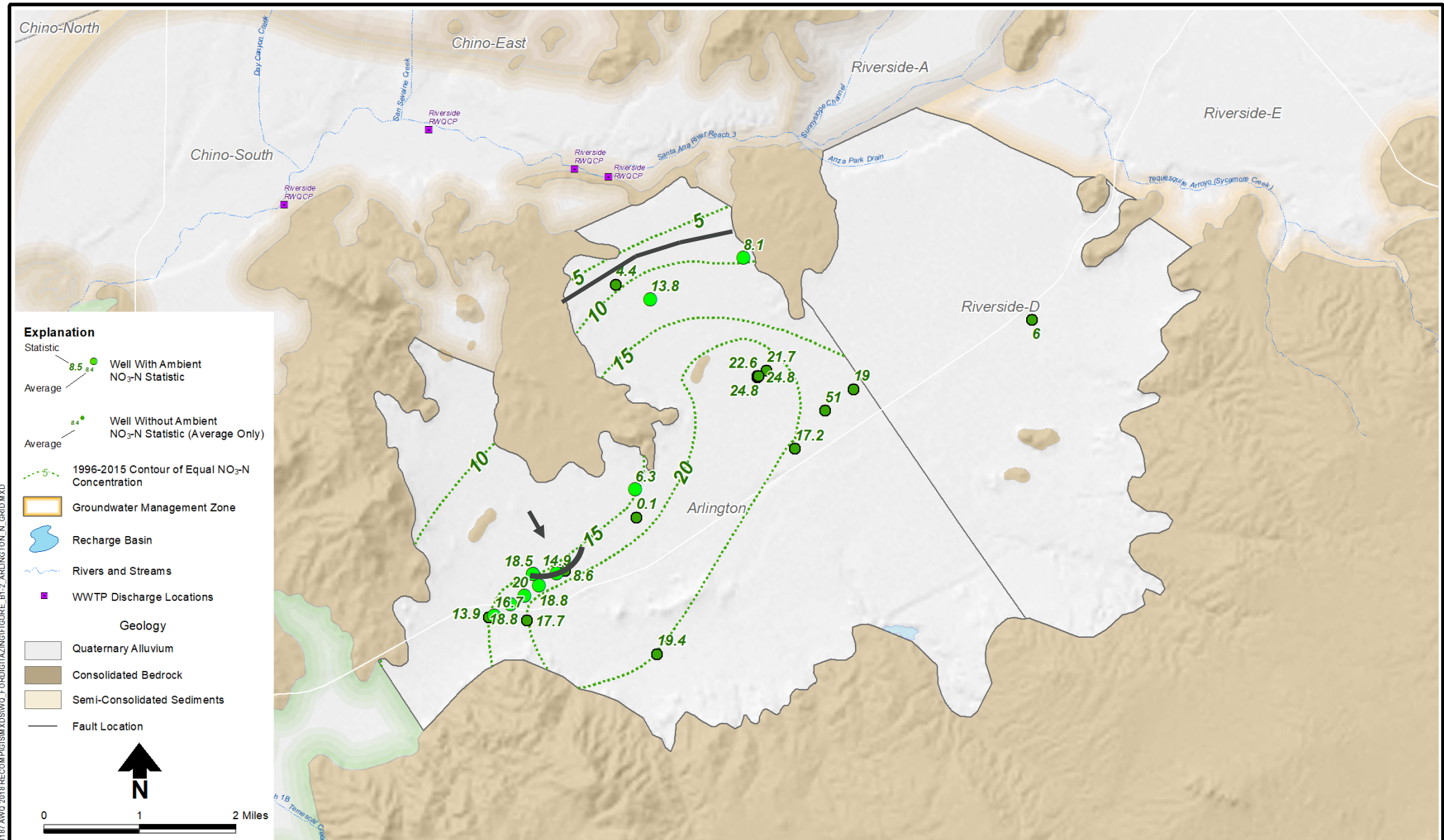
● 2,700+ Point Statistics

▲ 1,200+ Averages



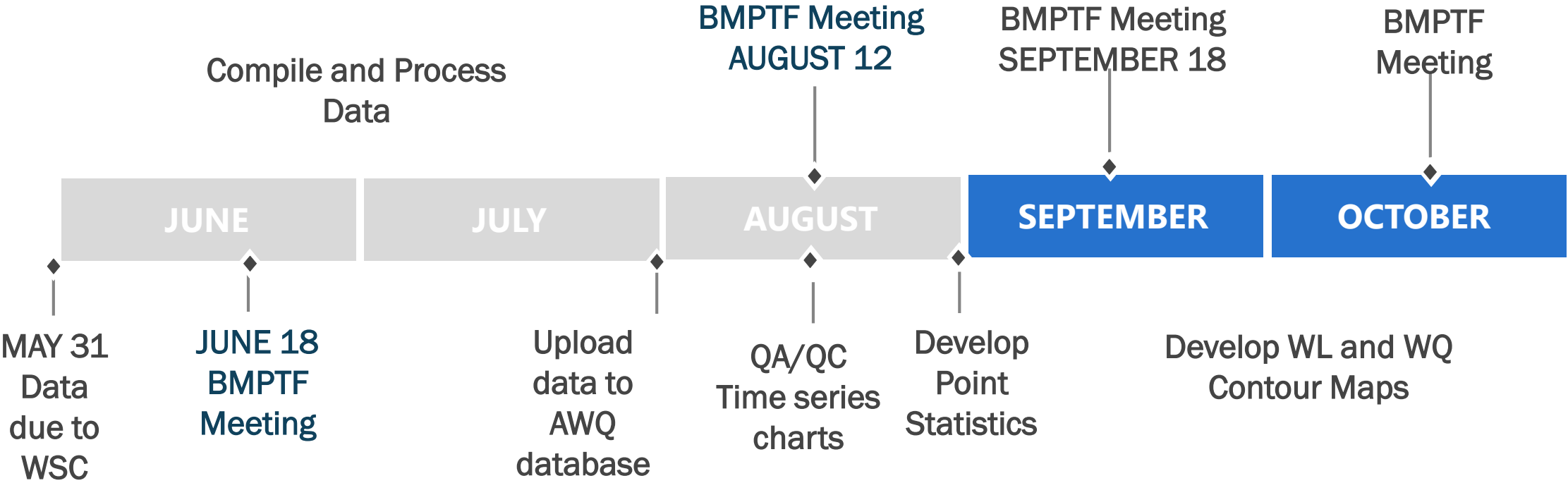


Source: SAWPA.net, January 2017



Source: SAWPA.net, January 2017

Near-term Schedule



A photograph of two people kayaking on a calm body of water. The person in the foreground is on the left, wearing a green shirt, with their arms and hands on a black paddle. The kayak is yellow. In the background, another person is kayaking away from the viewer. The water is still, reflecting the sky and the kayakers. The background shows a line of trees under a soft, hazy sky. A white horizontal line with a central dot is positioned above the text.

QUESTIONS?