2020-2022 Status Network Statewide Results

Division of Environmental Assessment and Restoration
Watershed Monitoring Section
Florida Department of Environmental Protection

Report Prepared December 2025

Goal of the Status Monitoring Network

The goal of the Status Network is to broadly characterize Florida's fresh surface water and groundwater quality with a known statistical confidence. Since it is unfeasible to sample every waterbody in the state on an annual basis, the Network employs a statewide random-site monitoring design. The purpose of the design is to provide unbiased, spatially balanced estimates of statewide and regionwide ambient freshwater quality condition with known statistical confidence. The water samples are analyzed in the DEP laboratory and inferential statistics are used to estimate the water quality conditions of the state as a whole. Based on this design, the Status Network provides a cost-effective way to produce statistically valid estimates of statewide water quality condition. The Network addresses statewide and regional (within Florida) water quality questions; it is not designed to evaluate specific waterbodies or wells. This report summarizes the 2020-2022 Status Monitoring Network design and results.

Monitoring Design

Annually, the Watershed Monitoring Section (WMS) assesses seven fresh water resource types in Florida's Status Monitoring Network; these are located within six geographical zones (Figure 1). Five resources are surface water: rivers, streams, canals, large lakes, and small lakes. The other two resources are groundwater: unconfined and confined aquifers. Based on projected annual sample sizes (90 samples each from rivers, streams, large lakes and small lakes statewide, 60 samples from canals within Zone 3 through 6, and 120 samples from each groundwater resource statewide), the design allows for reporting with a 95% confidence interval of approximately ± 12% for surface water resources and ± 9% for groundwater resources. This means there is 95% confidence that actual statewide surface water conditions are within 12% of the reported values, and similarly, actual statewide groundwater conditions are within 9% of the reported values.

Sampling locations are randomly selected from Geographical Information System (GIS) coverages of the water resources. Each year, WMS updates the resource coverages to incorporate documented changes, and deletions or additions of potential sampling locations. Randomly selected stations that can be sampled are termed accessible. Stations that cannot be sampled are categorized as either dry, inaccessible, or the wrong resource. Thus, the actual number of samples collected and used for analysis may be less than projected.

Reduced rainfall or periods of drought occur on a cyclical basis in Florida. This can cause water bodies to become dry or inaccessible. Prolonged or intense periods of drought can adversely affect water chemistry. Conversely, periods of extended rainfall can dilute concentrations of certain water quality parameters; therefore, knowledge of the yearly rainfall can assist in better understanding the overall water quality of Florida. Rainfall amounts must be taken into account when interpreting the data analysis results. According to data published by the Southeast Regional Climate Center (Southeast Regional Climate Center, 2024), Florida's average annual precipitation for the 2020-2022 period was 56.04 inches, an amount that is above the 30-year annual average of 54.13 inches.

Please see the *Design Document* (Florida Department of Environmental Protection 2022) for more information on the Status Network design.

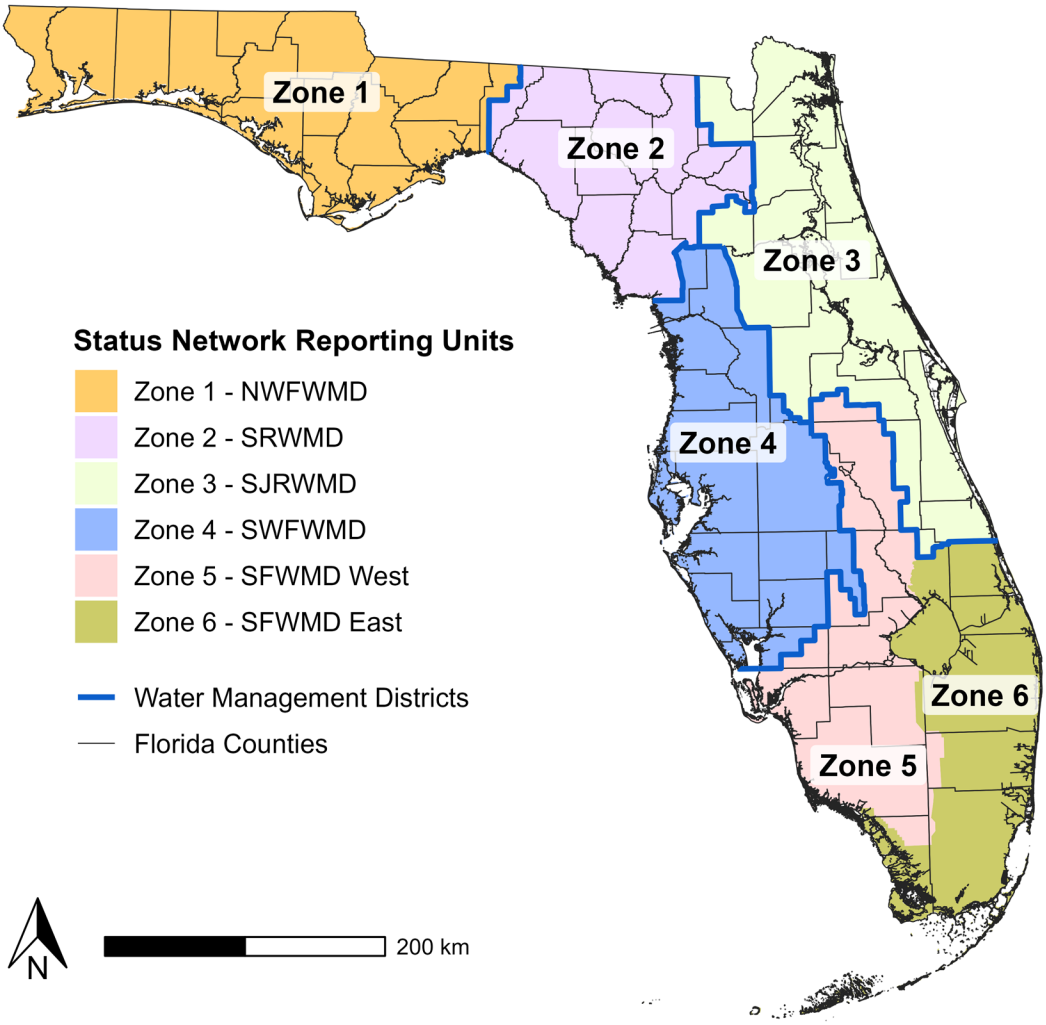


Figure 1. Status Network reporting units

Resource Description and Detail

Rivers, Streams and Canals

Rivers and Streams include linear waterbodies with perennial flow that are waters of the state (Chapters 373 and 403, Florida Statutes). WMS obtains these features from the 1:24000 (1:24K) National Hydrography Dataset (NHD) flowline feature class. The GIS coverage is developed by matching the 1:24K features to the 1:100000 (1:100K) NHD flowline feature class as an enhancement to include permanent, non-ephemeral, and non-intermittent segments within the coverage.

There have been issues using traditional classification, such as Strahler order, on the flowing surface waters of the state. In order to better categorize those waters, WMS contacted several interested parties (e.g., Water Management Districts, other sections of DEP) to submit suggestions for the river resource classification. Based on these recommendations, the state has 2629 linear miles of rivers. The remaining streams and tributaries in the coverage are designated as the stream resource, totaling about 15066 additional linear miles. River and stream sites are randomly selected by resource type and reconnoitered in the order of selection. The first 15 river and stream sites in each zone that pass sampling criteria are sampled. The two resources can have different habitats and uses.

Canals are man-made linear waterbodies that are waters of the state. Specifically, a canal is a trench, the bottom of which is normally covered by water, with the upper edges of its two sides normally above water (Section 312.020, Florida Administrative Code, or F.A.C.). WMS contacted the Water Management Districts and other sections in DEP for recommendations on a canal coverage. Based on these recommendations, irrigation and drainage ditches were excluded, and a GIS coverage of primary canals was developed. Using this definition, the state has 2370 linear miles of canals. The first 15 canal sites in Zones 3 through 6 that pass sampling criteria are sampled.

Lakes

Lakes are defined as natural or established reservoirs that are at least 1 meter deep and contain at least 1/4 acre of open water (free of emergent vegetation and trees). These features are based on the 1:24K NHD waterbody feature class. To reduce the dataset to lake features that are most likely permanent or not wetlands, the lakes coverage does not include lakes that are less than 4 hectares in area.

The WMS divides lakes into two categories by size: small lakes of 4 to < 10 hectares (25 acres) and large lakes of 10 hectares and greater. This division allows a better characterization of the state's lake resources, as the two resources can have different habitats and uses. Based on this definition and the specific GIS coverage for this program, the state of Florida has approximately 1684 large and 1574 small lakes. Lake sites are selected randomly in each of the lake resource types, and they are reconnoitered for ability to be sampled in the order of selection. The first 15 lake sites in each zone that pass sampling criteria are sampled for each lake resource.

Aquifers

Aquifers are permeable layers of sand, gravel, or other rock capable of producing water as from a well. Unconfined aquifers are near the land surface and are easily affected by human activities.

Confined aquifers lie below a layer of material, such as fine-grained clay, that limits or prevents the downward flow of water. Water in confined aquifers is older and less affected by human activities. Groundwater is monitored through wells in unconfined and confined aquifers.

The WMS annually solicits candidate wells from federal, state and local agencies, and private individuals. Currently there are 22581 unconfined and 15424 confined wells available for sampling evaluation. Wells are randomly selected from each aquifer type and reconnoitered in the order of selection. The first 20 wells of each aquifer type in each zone that pass sampling criteria are sampled.

Combining Yearly Data for Analysis

Increased sample size is desirable because it generally has a positive effect on the confidence levels for the reported data, thereby increasing the confidence for statewide reporting. One way to increase the sample size is to combine data collected in different years. For this report, three years of annually collected status monitoring network data have been combined. This increases the sample size in each Zone sufficiently to allow reporting by Zone with 95% confidence levels at $\pm < 20\%$ for regional assessments. Additionally, the increase in sample size allows statewide reporting with 95% confidence levels at $\pm < 10\%$

Sampling and Analysis

For the three-year period, 268 large lake, 182 small lake, 263 river, 203 stream and 180 canal samples were collected for surface water analysis. For sediment analysis, 266 large lake and 176 small lake samples were collected. For groundwater analysis, 349 confined and 343 unconfined aquifer samples were collected. In addition to an overall statewide assessment, WMS evaluated water conditions for each zone.

Summary of Resources Assessed

Table 1 summarizes the statewide extent and the number of samples collected for each water resource used to infer statewide water quality results.

Table 1. Summary of Water Resources Assessed by the Status Monitoring Network

This is a three-column table. Columns 1 and 2 list the resource type and resource size. Column 3 lists the number of samples analyzed in 2020-2022.

Water Resource	Resource Size	Number of Samples
Rivers	2629 miles / 4231 kilometers	263
Streams	15066 miles / 24246 kilometers	203
Canals	2370 miles / 3814 kilometers	180
Large Lakes	1684 lakes (1460 square miles / 378020 hectares)	268
Small Lakes	1574 lakes (39 square miles / 10035 hectares)	182
Confined Aquifers	15424 wells	349
Unconfined Aquifers	22581 wells	343

Results

Figure 2, Figure 4, and Figure 7 show the sample locations for each resource, and Figure 3, Figure 5, Figure 6, and Figure 8 show the percentages of waterbodies meeting water quality thresholds. Appendix A lists the definitions and numeric thresholds for water quality indicators. Appendix B provides the results in table format. All data reported are the results of inferential statistics used to estimate statewide or zone-wide water quality conditions based on the data collected at sampled locations.

For example, the data collected from 268 large lake sampling locations throughout the state indicate that 66.1% of the state's large lake area has total phosphorous levels that meet the thresholds described in Appendix A. For a given resource type and indicator, at least 23 samples are needed to report results. If the sample size was less than 23, then insufficient data (ISD) was reported for that resource type and indicator.

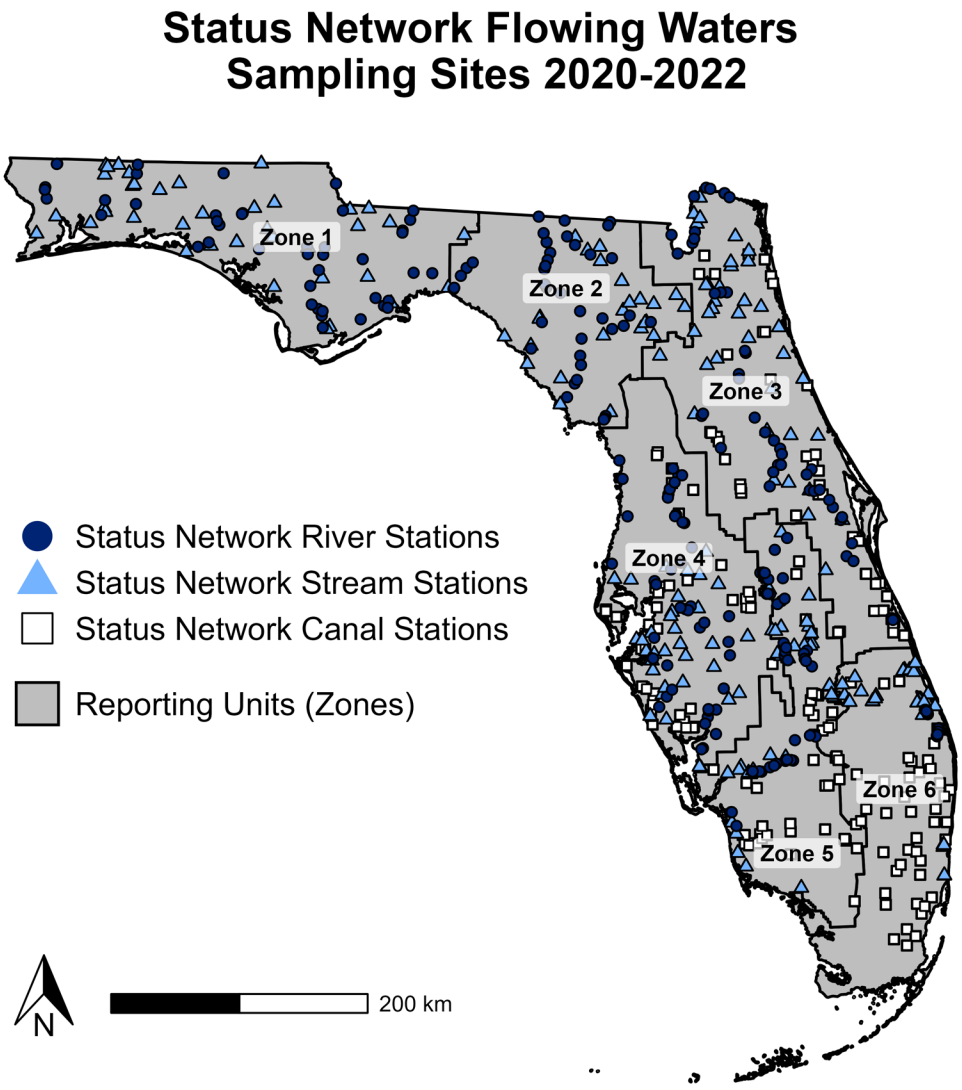
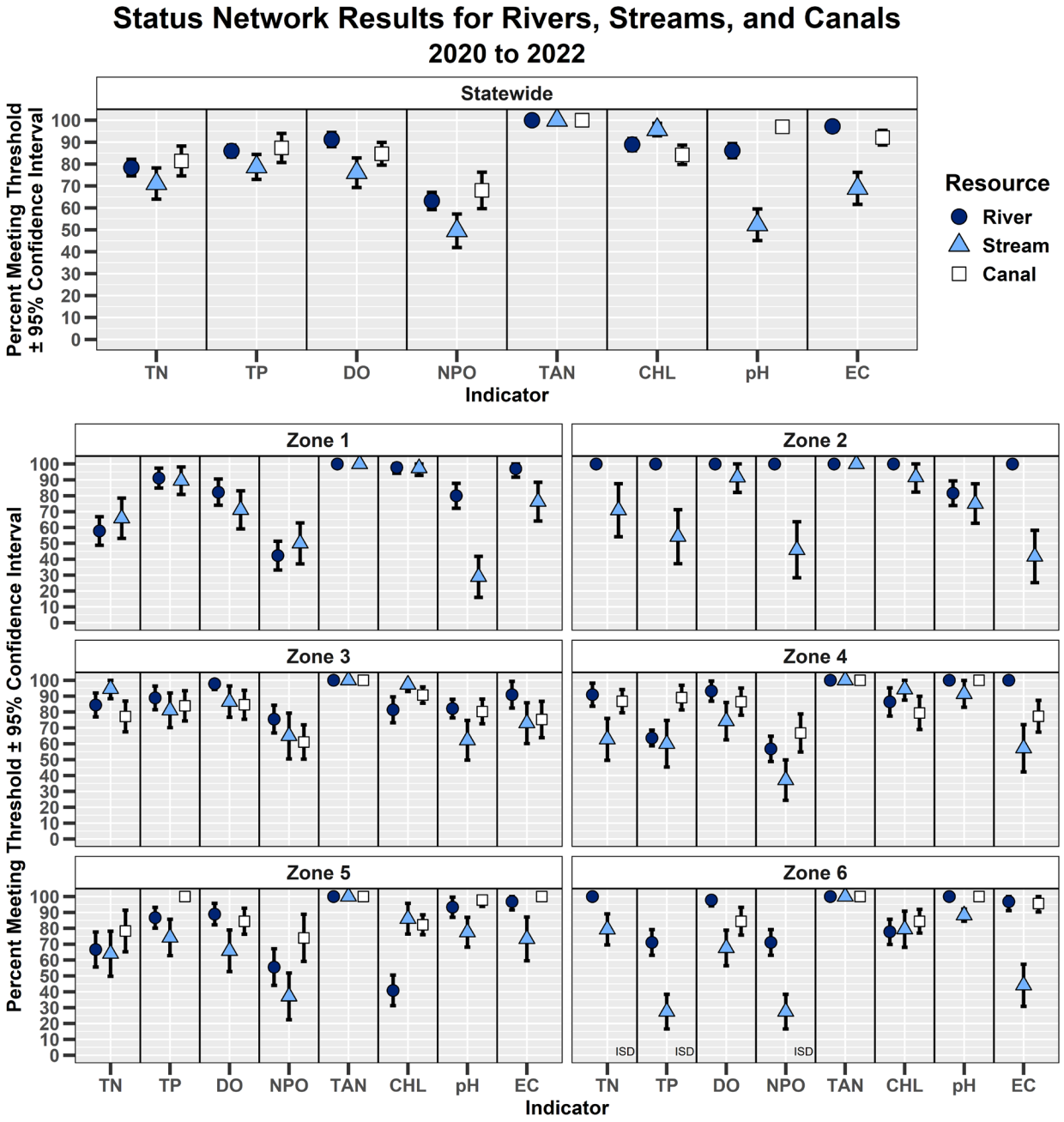


Figure 2. Sampling location map for rivers, streams, and canals.



TN = Total Nitrogen; TP = Total Phosphorus; DO = Dissolved Oxygen; NPO = combined metric (meeting thresholds for three indicators: TN, TP, DO); TAN = Total Ammonia Nitrogen; CHL = Chlorophyll a; pH = potential of hydrogen; EC = *Escherichia coli*; ISD = insufficient data
Canals not sampled in Zones 1 and 2.

Figure 3. Percent of rivers, streams and canals meeting water quality indicator thresholds.

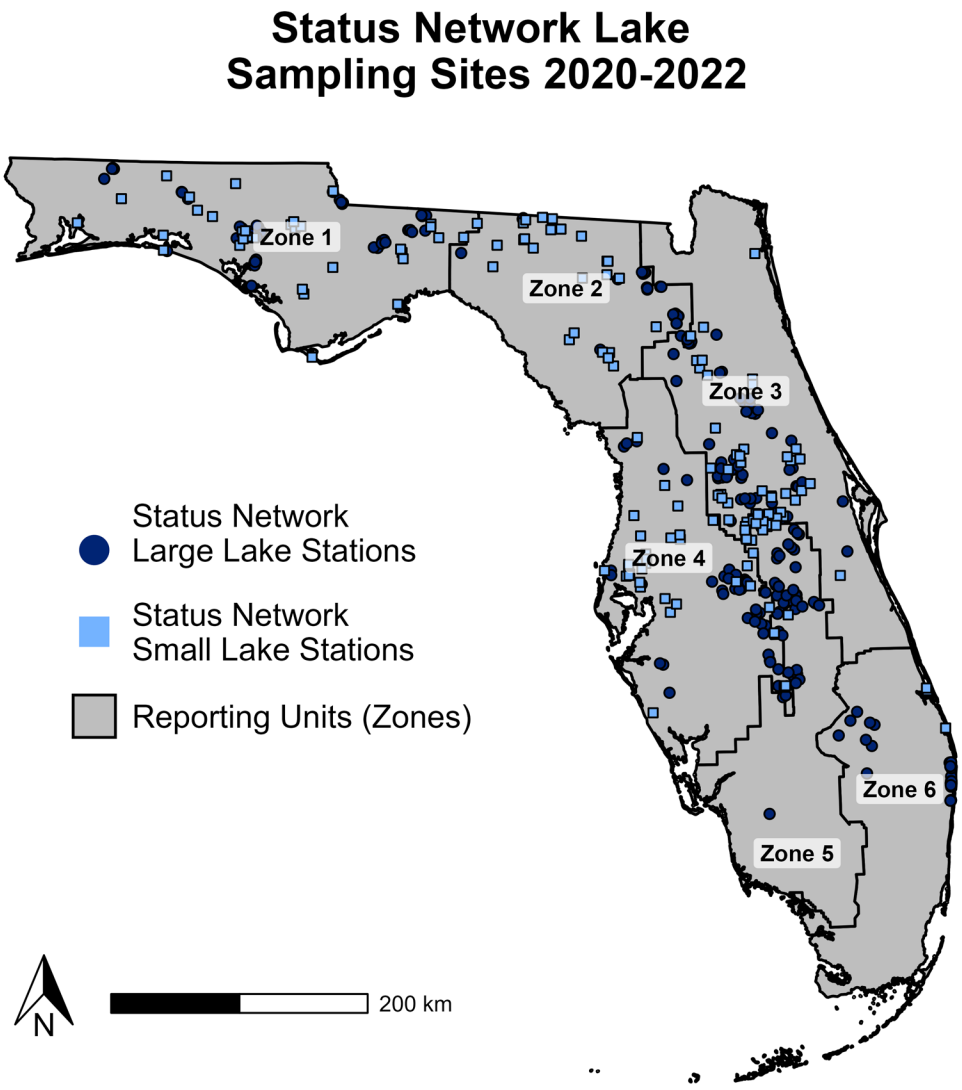


Figure 4. Sampling location map for large and small lakes.

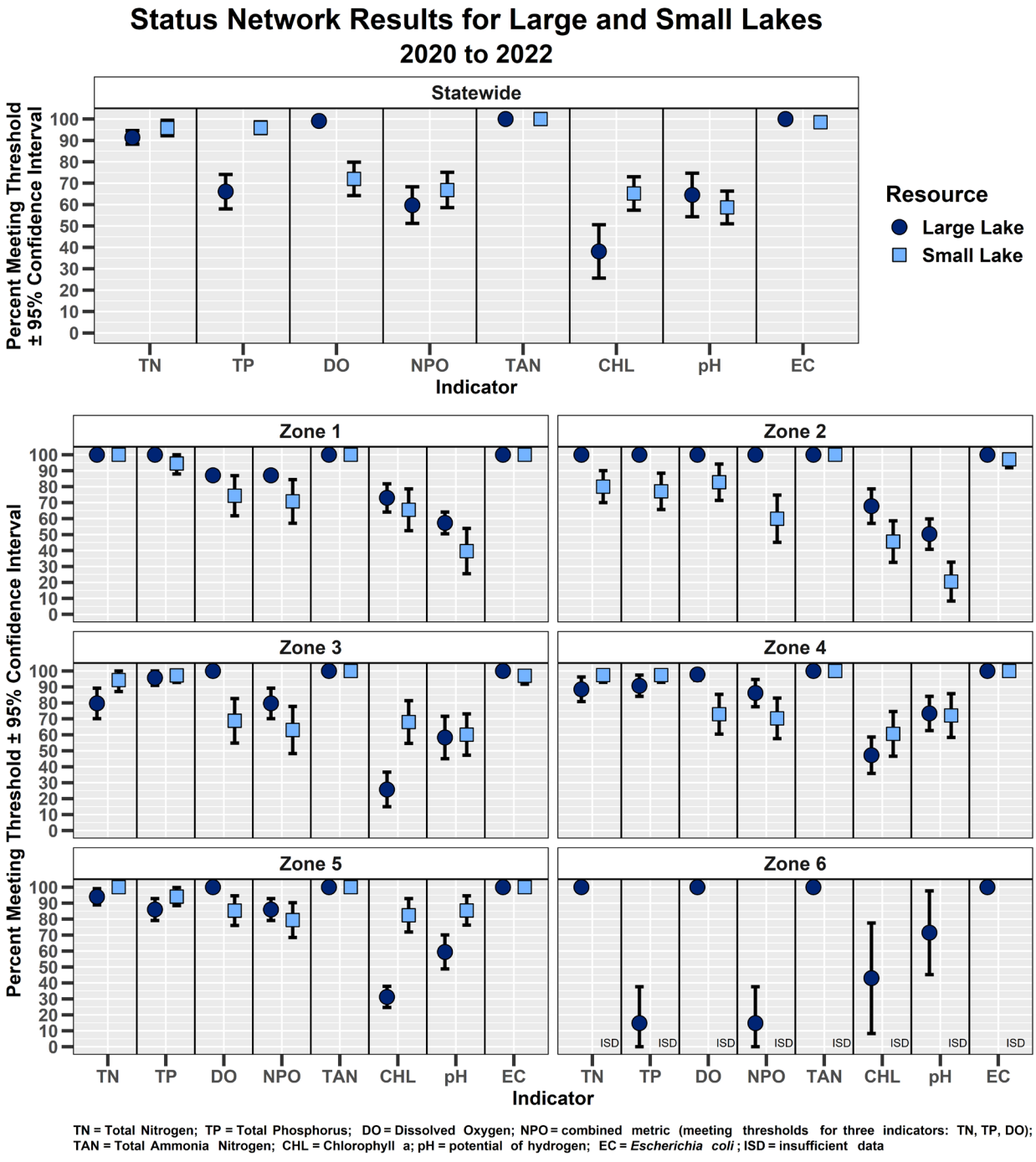
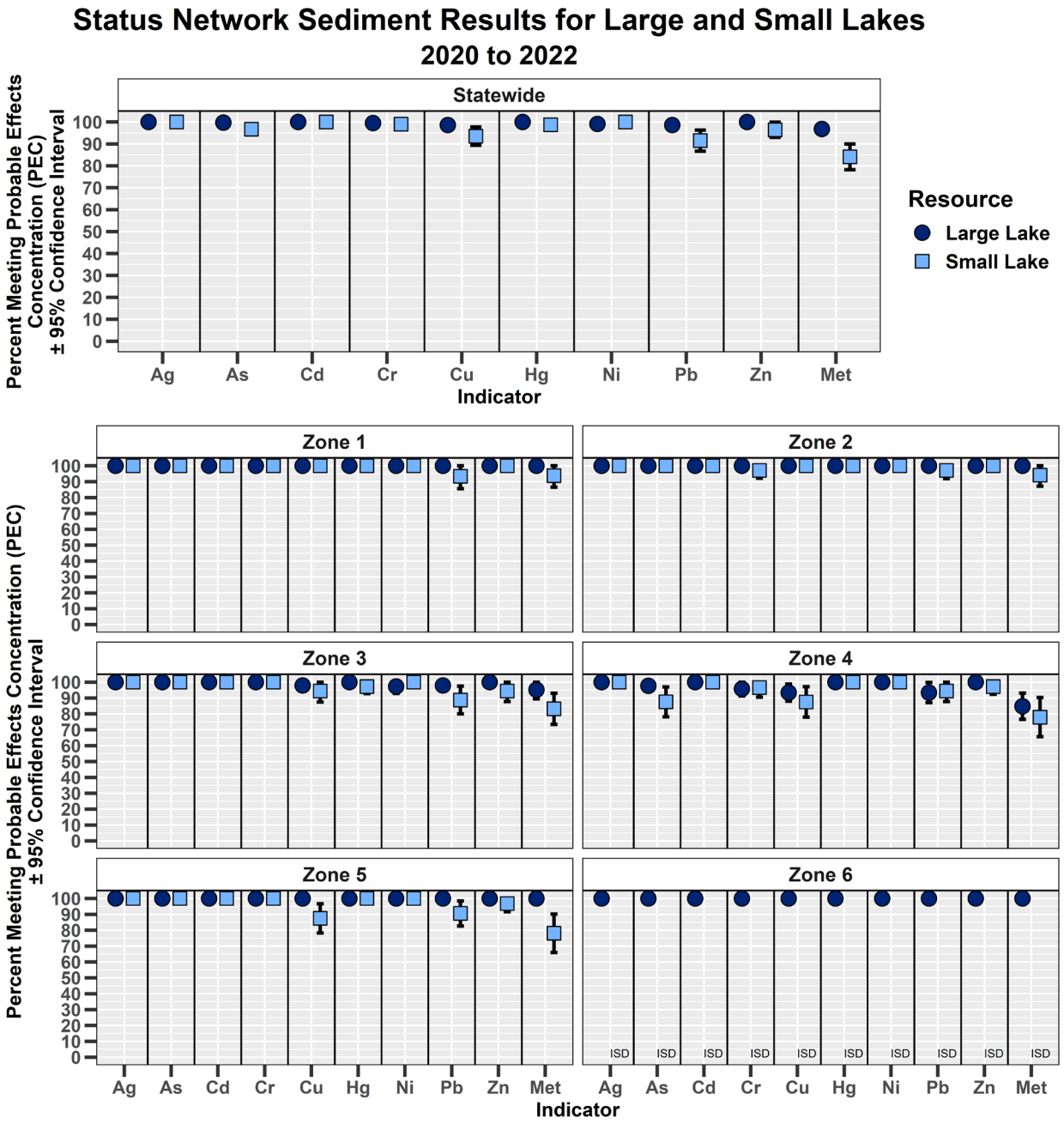


Figure 5. Percent of large and small lakes meeting water quality indicator thresholds.



Ag = Silver; As = Arsenic; Cd = Cadmium; Cr = Chromium; Cu = Copper; Hg = Mercury; Ni = Nickel; Pb = Lead; Zn = Zinc;
Met = combined metric (not exceeding PEC thresholds for any of the following nine indicators: Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Zn);
ISD = insufficient data

Figure 6. Percent of large and small lakes meeting sediment indicator thresholds.

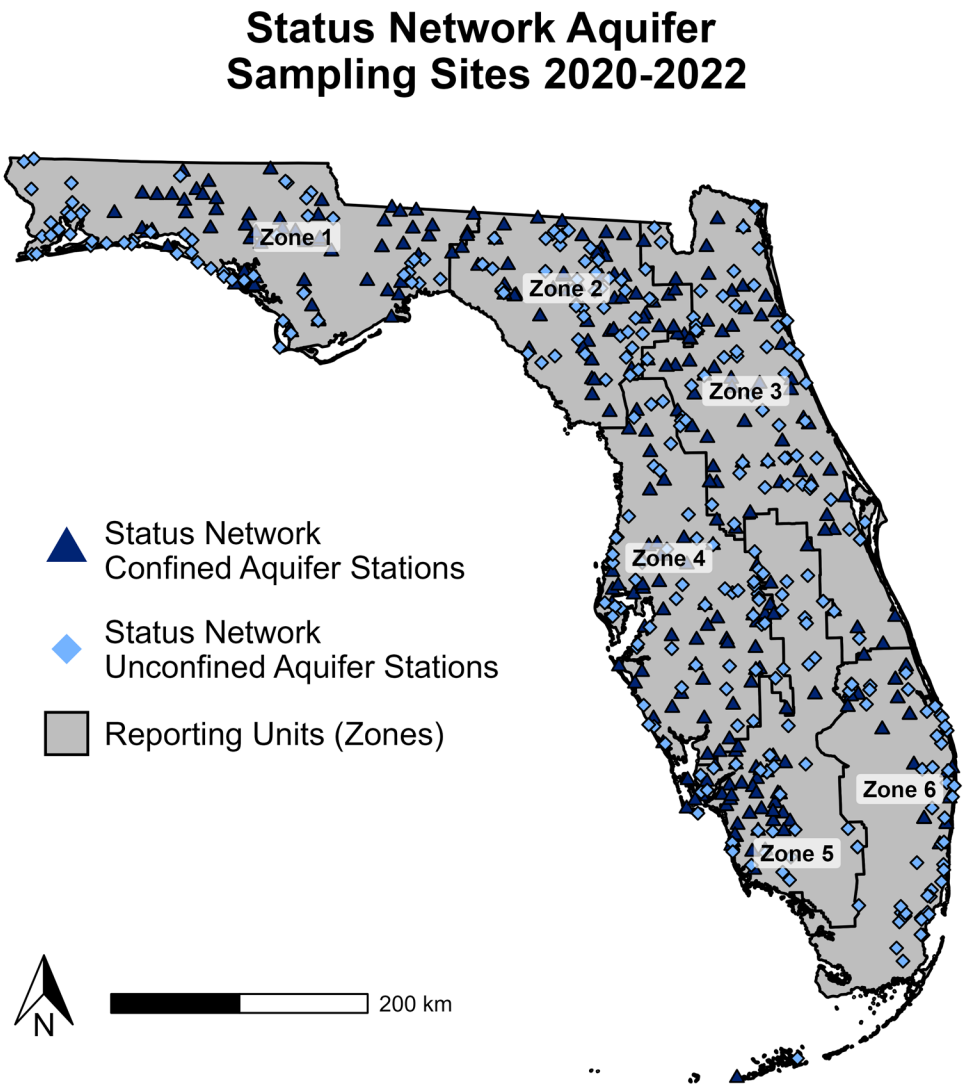


Figure 7. Sampling location map for confined and unconfined aquifers.

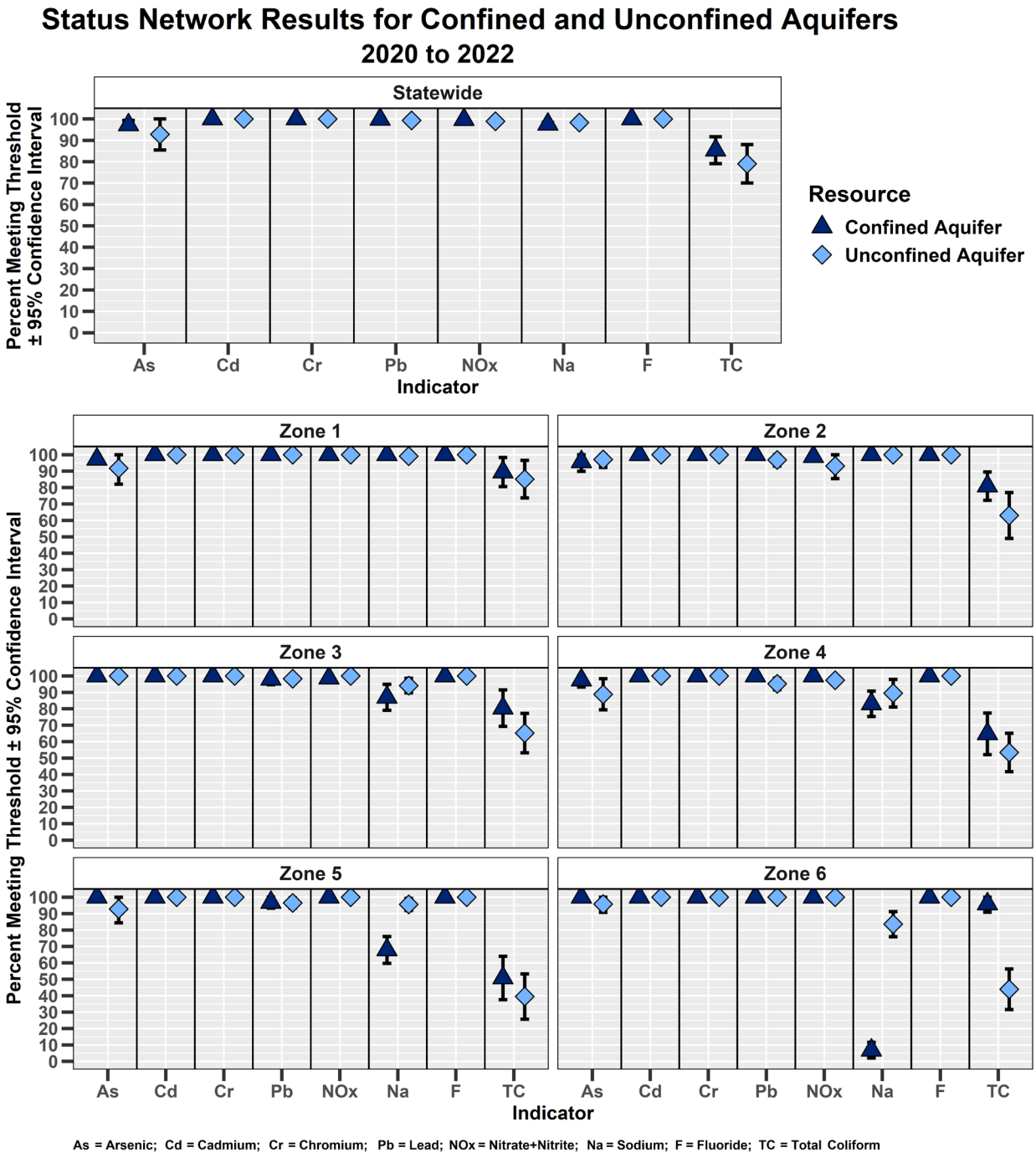


Figure 8. Percent of confined and unconfined aquifers meeting water quality indicator thresholds.

References

Florida Department of Environmental Protection. 2019. Total Ammonia Nitrogen Calculator Tallahassee, FL: Division of Environmental Assessment and Restoration, Water Quality Standards Program.

Florida Department of Environmental Protection. 2022. Florida Watershed Monitoring Status and Trend Program design document. Tallahassee, FL: Division of Environmental Assessment and Restoration, Watershed Monitoring Program.

MacDonald Environmental Sciences Ltd. and U.S. Geological Survey. 2003. Development and evaluation of numerical sediment quality assessment guidelines for Florida inland waters. Prepared for the Florida Department of Environmental Protection, Tallahassee, FL.

For more information, contact:

Florida Department of Environmental Protection
Watershed Monitoring Section, MS 3560
2600 Blair Stone Road
Tallahassee, FL 32399
850-245–8080
https://floridadep.gov/dear/watershed-monitoring-section

Appendix A. Water Quality Indicators and Associated Thresholds

Surface Water

Table A1. Nutrient Indicators Used to Assess River, Stream and Canal Resources.

This is a four-column table. Column 1 lists the Nutrient Region, Column 2 lists the total phosphorus threshold, Column 3 lists the total nitrogen threshold, and Column 4 lists the designated use of the water.

mg/L = milligrams per liter; TP = total phosphorus; TN = total nitrogen
[1] The nutrient thresholds for rivers, streams, and canals depend on the nutrient region (Figure A1).
[2] Not applied as criteria, but rather as a threshold used to estimate the impairment of state waters. These thresholds are used in the analysis of Status Monitoring Network data, based on single samples. The analysis and representation of these data are not intended to infer verified impairment, as defined in Chapter 62-303, F.A.C.
[3] Not applicable; no numeric threshold. The narrative criterion in Paragraph 62-302.530(48)(b), F.A.C., applies.

Nutrient Region[1]	TP Threshold[2] (mg/L)	TN Threshold[2] (mg/L)	Designated Use
Panhandle West	≤ 0.06	≤ 0.67	Aquatic Life
Panhandle East	≤ 0.18	≤ 1.03	Aquatic Life
North Central	≤ 0.30	≤ 1.87	Aquatic Life
Peninsula	≤ 0.12	≤ 1.54	Aquatic Life
West Central	≤ 0.49	≤ 1.65	Aquatic Life
South Florida	N/A[3]	N/A[3]	Aquatic Life

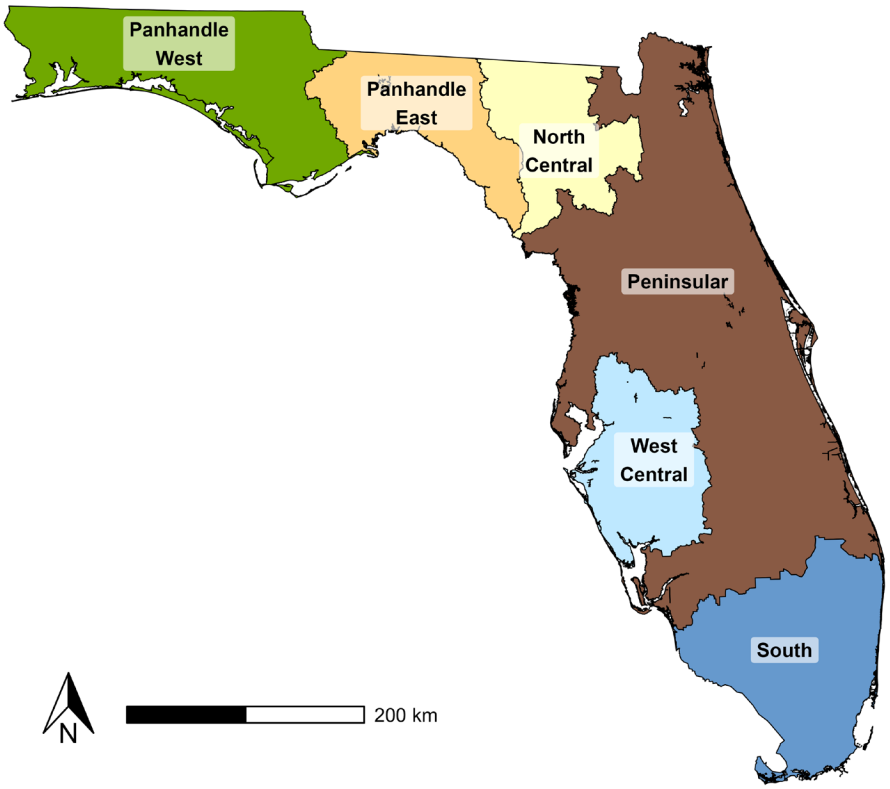


Figure A1. Nutrient Regions for River, Stream and Canal Resources.

Table A2. Nutrient Indicators Used to Assess Lake Resources.

This is a five-column table. Column 1 lists the lake color and alkalinity, Column 2 lists the chlorophyll a threshold, Column 3 lists the total phosphorus threshold, Column 4 lists the total nitrogen threshold, and Column 5 lists the designated use of the water.

PCU = Platinum cobalt units; $CaCO_3$ = Calcium carbonate; µg/L = micrograms per liter; mg/L = milligrams per liter; TP = total phosphorus; TN = total nitrogen

[1] Not applied as criteria, but rather as a threshold used to estimate the impairment of state waters. These thresholds are used in the analysis of Status Monitoring Network data, based on single samples. The analysis and representation of these data are not intended to infer verified impairment, as defined in Rule 62-303, F.A.C.

[2] For lakes with color > 40 PCU in the West Central Nutrient Region (Figure A1), the TP threshold is ≤ 0.49 mg/L.

Lake Color and Alkalinity	Chlorophyll *a* Threshold[1] (µg/L)	TP Threshold[1] (mg/L)	TN Threshold[1] (mg/L)	Designated Use
Color > 40 PCU	≤ 20	≤ 0.16[2]	≤ 2.23	Aquatic Life
Color ≤ 40 PCU and Alkalinity > 20 mg/L $CaCO_3$	≤ 20	≤ 0.09	≤ 1.91	Aquatic Life
Color ≤ 40 PCU and Alkalinity ≤ 20 mg/L $CaCO_3$	≤ 6	≤ 0.03	≤ 0.93	Aquatic Life

Table A3. Dissolved Oxygen (DO) Thresholds Used to Assess Surface Water Resources.

This is a three-column table. Column 1 lists the Bioregion, Column 2 lists the dissolved oxygen threshold, and Column 3 lists the designated use of the water.

DO = Dissolved oxygen

[1] The DO threshold for lakes, rivers, streams, and canals depends on the bioregion (Figure A2).

[2] Not applied as criteria, but rather as a threshold used to estimate the impairment of state waters. These thresholds are used in the analysis of Status Monitoring Network data, based on single samples. The analysis and representation of these data are not intended to infer verified impairment, as defined in Chapter 62-303, F.A.C.

Bioregion[1]	DO Threshold[2] (% saturation)	Designated Use
Panhandle	≥ 67	Aquatic Life
Big Bend	≥ 34	Aquatic Life
Northeast	≥ 34	Aquatic Life
Peninsula	≥ 38	Aquatic Life
Everglades	≥ 38	Aquatic Life

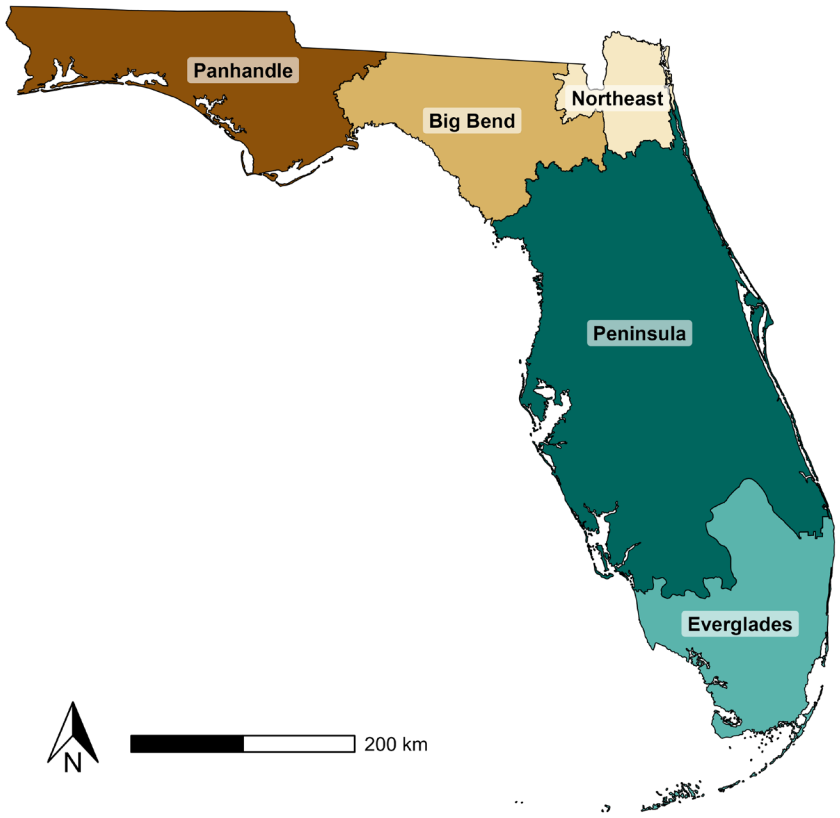


Figure A2. Bioregions for Surface Water Resources.

Table A4. Additional indicators for aquatic life and recreation use with water quality thresholds

This is a three-column table. Column 1 lists the indicator, Column 2 lists the threshold, and Column 3 lists the designated use of the water.

µg/L = micrograms per liter; mL = milliliters, su = standard units; E. coli = *Escherichia coli*; pH = potential of hydrogen; TAN = total ammonia nitrogen

[1] Not criteria, but rather a threshold used to estimate the impairment of state waters.

[2] Counts may be expressed as colony-forming units (CFU) or most probable number (MPN), depending on the analytical method used.

These thresholds are used in the analysis of Status Monitoring Network data, based on single samples. The analysis and representation of these data are not intended to infer verified impairment, as defined in Chapter 62-303, F.A.C.

The chlorophyll threshold applies to rivers, streams, and canals only. Table A2 lists chlorophyll thresholds for lakes.

Surface Water Indicator	Threshold[1]	Designated Use
Chlorophyll *a*	≤ 20 µg/L	Aquatic Life
E. coli	≤ 410 counts[2]/100 mL	Aquatic Life
pH	≥ 6, ≤ 8.5 su	Aquatic Life
TAN	See DEP's Ammonia Criteria (DEP 2019)	Aquatic Life

***Escherichia coli* (E. coli):** The single-sample threshold for E. coli is less than 410 counts per 100 milliliters of water. These bacteria can enter water through the discharge of waste from mammals and birds, agricultural and storm water runoff, and untreated human sewage. The presence of E. coli bacteria may indicate that the water is contaminated by disease-causing organisms.

The **potential of hydrogen (pH)** is measured in standard units (SU) and ranges between zero (very acidic) to 14 (very basic). For example, the pH of lemon juice is approximately two SU. Water with a pH of seven SU is considered neutral. The surface water threshold for pH is between 6 and 8.5 SU. The pH measurement is influenced by the geology present in the area of the surface water, the chemistry of the atmosphere, rainfall, and the biological inputs to the surface water. Concentrations of pH are also influenced by sources of water pollution such as runoff and wastewater discharge.

Dissolved oxygen (DO): See Table A3 for the DO thresholds. Algae and plants produce oxygen through photosynthesis. Oxygen also is dissolved in water by wind and wave action. Discharges of wastewater, storm water runoff from urban streets or farmland, and failing septic tanks consume oxygen. Natural conditions—such as respiration by aquatic animals, groundwater from springs, water from swamps/wetlands, higher water temperatures, and calm and cloudy weather—can lead to reduced DO levels in waterbodies.

Total ammonia nitrogen (TAN): The single-sample threshold for TAN is adjusted for temperature and pH. Aquatic systems can contain ammonia in different forms depending on these conditions and it can be toxic to fish and invertebrates.

Chlorophyll *a*: The threshold for chlorophyll *a* in rivers, streams, and canals is a maximum of 20 micrograms per liter (µg/L). See Table A2 for the chlorophyll *a* thresholds in lakes. Chlorophyll is the pigment that allows algae and plants to convert sunlight into energy during photosynthesis. High concentrations of chlorophyll may indicate an overabundance of algae, which can reduce water clarity and limit the light available to shallow-water ecosystems.

Total nitrogen (TN) and total phosphorus (TP): See Table A1 and Table A2 for the TN and TP thresholds. These elements are essential nutrients for living organisms. They occur naturally and also can be found in fertilizers. An overabundance of nutrients in water can cause adverse health and ecological effects, including excessive plant and algae growth. These organisms use up oxygen as they decompose and can block light to deeper waters, leading to reductions in animal and plant diversity.

Sediments

DEP selected large and small lakes for sediment contaminant evaluation, since lakes integrate runoff within watersheds. Sediment contaminants such as metals, pesticides, and excess nutrients come from upland runoff and discharges, organic decomposition, and atmospheric deposition. DEP does not have the statutory authority to establish sediment criteria or standards, but DEP does use scientifically defensible thresholds (guidelines) to evaluate Florida sediments. DEP freshwater sediment guidelines are based on a weight-of-evidence approach based on studies containing paired sediment chemistry and biological responses from benthic organisms (MacDonald Environmental Sciences and USGS 2003). The weight-of-evidence approach created two guidelines for each contaminant: a lower guideline, the threshold effects concentration (TEC), and a higher guideline, the probable effects concentration (PEC). A value

below the TEC indicates a low probability of harm to sediment-dwelling organisms. Conversely, sediment values above the PEC have a high probability of biological harm. Table A5 lists the PEC for each metal analyzed.

Table A5. DEP freshwater sediment PEC threshold for metals

This is a two-column table. Column 1 lists the indicator, Column 2 lists the probable effects concentration (PEC) threshold.
mg/kg = milligrams per kilogram

Metal	PEC (mg/kg)
Arsenic	33.0
Cadmium	5.0
Chromium	110
Copper	150
Silver	2.2
Nickel	49
Lead	130
Mercury	1.1
Zinc	460

Groundwater

Table A6. Status Network physical/other indicators for potable water supply for groundwater with water quality thresholds

This is a three-column table. Column 1 lists the indicator, Column 2 lists the threshold, and Column 3 lists the designated use of the water
mg/L = milligrams per liter; µg/L = micrograms per liter; mL = milliliter
[1] Thresholds are Maximum Contamination Levels of Primary Drinking Water Standards as defined in 62-550, F.A.C.
[2] Counts may be expressed as colony-forming units (CFU) or most probable number (MPN), depending on the analytical method used.

Indicator	Threshold for Potable Water Supply (Groundwater)[1]	Designated Use
Fluoride	≤ 4 mg/L	Potable Water
Arsenic	≤ 10 µg/L	Potable Water
Cadmium	≤ 5 µg/L	Potable Water
Chromium	≤ 100 µg/L	Potable Water
Lead	≤ 15 µg/L	Potable Water
Nitrate+Nitrite	≤ 10 mg/L (as nitrogen)	Potable Water
Sodium	≤ 160 mg/L	Potable Water
Total Coliform Bacteria	≤ 4 counts[2]/100 mL	Potable Water

Arsenic, cadmium, chromium, and lead are naturally occurring metals in the earth's crust. These and other metals are used in manufacturing and can be found in pesticides, preservatives, and industrial operations. They may enter water as a pollutant. Florida has primary standards

(thresholds) for these metals to protect human health. Excess levels in drinking water can cause adverse health effects.

Nitrate and nitrite are used in fertilizer and are found in human and animal waste. Florida's drinking water threshold is a maximum of 10 mg/L for nitrate and a maximum of 1 mg/L for nitrite. Toxicity of nitrate and nitrite is additive, therefore the sum of nitrate and nitrite concentrations must be less than or equal to 10 mg/L. In the long term, nitrates and nitrites have the potential to cause serious adverse effects in humans.

Sodium (salt) has a drinking water standard to protect individuals who are susceptible to sodium-sensitive hypertension or diseases that cause difficulty in regulating body fluid volume. Sodium is monitored so that individuals on sodium-restricted diets may take into account the sodium in their water. Drinking water contributes less than 10% of an individual's overall sodium intake.

Fluoride is a natural element added to some drinking water systems to reduce dental cavities. Prolonged exposure to levels above 4 mg/L may result in skeletal fluorosis, a serious bone disorder. At lower levels, children may develop dental fluorosis. In its moderate and severe forms, dental fluorosis is a brown staining and/or pitting of the permanent teeth.

Total coliform bacteria are common in the environment and generally are not harmful. The presence of these bacteria in drinking water, however, indicates that disease-causing organisms may be present. To reduce the risk of adverse health effects, the U.S. EPA and the State of Florida have set a single-sample maximum of 4 coliform counts per 100 milliliters of fluid. Drinking water that meets this standard is considered safe.

This survey does not represent a comprehensive analysis of any individual waterbody. DEP also analyzes for other indicators that do not have numeric thresholds. For a list of all analytes see the *Design Document* (DEP 2022).

Appendix B. Tables of Status Network Results from 2020-2022

Table B1. Percentage of rivers meeting threshold values for indicators calculated using probabilistic monitoring design

This is a ten-column table. Column 1 lists the Zone; Columns 2-9 list the percent ± 95% confidence interval of river kilometers that meet threshold values. Column 10 lists the number of samples analyzed (N).
TN = Total Nitrogen; TP = Total Phosphorus; DO = Dissolved Oxygen; NPO = combined metric (meeting thresholds for three indicators: TN, TP, DO); TAN = Total Ammonia Nitrogen; CHL = Chlorophyll a; pH = potential of hydrogen; EC = *Escherichia coli*.
ISD = Insufficient data, fewer than 23 samples; statewide results include data from zones categorized as ISD.

Zone	TN	TP	DO	NPO	TAN	CHL	pH	EC	N
Statewide	78.4 ± 3.8	86.0 ± 2.8	91.2 ± 3.3	63.2 ± 4.0	100	88.9 ± 2.8	86.1 ± 3.2	97.2 ± 2.4	263
Zone 1	57.8 ± 9.0	91.1 ± 6.2	82.2 ± 8.2	42.3 ± 9.1	100	97.8 ± 3.7	80.0 ± 7.9	97.0 ± 5.3	45
Zone 2	100	100	100	100	100	100	81.6 ± 7.8	100	39
Zone 3	84.4 ± 7.5	88.9 ± 7.5	97.8 ± 3.6	75.5 ± 8.7	100	81.4 ± 8.2	82.2 ± 5.9	90.9 ± 8.4	45
Zone 4	90.9 ± 7.3	63.6 ± 4.9	93.2 ± 6.4	56.8 ± 8.0	100	86.4 ± 8.9	100	100	44
Zone 5	66.6 ± 11.0	86.7 ± 6.6	88.9 ± 6.8	55.5 ± 11.5	100	40.8 ± 9.6	93.3 ± 6.4	96.8 ± 5.2	45
Zone 6	100	71.1 ± 8.1	97.8 ± 3.7	71.1 ± 8.1	100	77.8 ± 8.0	100	96.8 ± 5.7	45

Table B2. Percentage of streams meeting threshold values for indicators calculated using probabilistic monitoring design

This is a ten-column table. Column 1 lists the Zone; Columns 2-9 list the percent ± 95% confidence interval of stream kilometers that meet threshold values. Column 10 lists the number of samples analyzed (N).
TN = Total Nitrogen; TP = Total Phosphorus; DO = Dissolved Oxygen; NPO = combined metric (meeting thresholds for three indicators: TN, TP, DO); TAN = Total Ammonia Nitrogen; CHL = Chlorophyll a; pH = potential of hydrogen; EC = *Escherichia coli*.
ISD = Insufficient data, fewer than 23 samples; statewide results include data from zones categorized as ISD.

Region	TN	TP	DO	NPO	TAN	CHL	pH	EC	N
Statewide	71.1 ± 7.1	78.7 ± 5.7	76.1 ± 6.8	49.6 ± 7.7	100	95.7 ± 2.8	52.3 ± 7.2	68.9 ± 7.3	203
Zone 1	65.8 ± 12.7	89.5 ± 8.7	71.1 ± 12.0	50.0 ± 12.9	100	97.4 ± 4.6	28.9 ± 12.9	76.3 ± 12.2	38
Zone 2	70.9 ± 16.7	54.2 ± 17.0	91.6 ± 9.5	45.9 ± 17.6	100	91.7 ± 9.4	75.0 ± 12.4	41.7 ± 16.5	24
Zone 3	94.6 ± 6.2	81.1 ± 11.0	86.5 ± 9.8	64.9 ± 14.4	100	97.3 ± 4.4	62.2 ± 12.5	73.0 ± 12.9	37
Zone 4	62.8 ± 13.2	60.0 ± 14.7	74.3 ± 11.8	37.1 ± 12.7	100	94.3 ± 6.8	91.4 ± 8.4	57.2 ± 14.9	35
Zone 5	64.0 ± 14.2	74.2 ± 11.5	65.8 ± 13.1	37.1 ± 14.7	100	86.0 ± 9.6	77.5 ± 9.4	73.3 ± 13.8	35
Zone 6	79.3 ± 9.8	27.5 ± 10.9	67.6 ± 11.2	27.5 ± 10.9	100	79.4 ± 11.4	88.2 ± 3.8	44.1 ± 13.3	34

Table B3. Percentage of canals meeting threshold values for indicators calculated using probabilistic monitoring design

This is a ten-column table. Column 1 lists the Zone; Columns 2-9 list the percent ± 95% confidence interval of canal kilometers that meet threshold values. Column 10 lists the number of samples analyzed (N).
TN = Total Nitrogen; TP = Total Phosphorus; DO = Dissolved Oxygen; NPO = combined metric (meeting thresholds for three indicators: TN, TP, DO); TAN = Total Ammonia Nitrogen; CHL = Chlorophyll a; pH = potential of hydrogen; EC = *Escherichia coli*.
ISD = Insufficient data, fewer than 23 samples; statewide results include data from zones categorized as ISD.

Region	TN	TP	DO	NPO	TAN	CHL	pH	EC	N
Statewide	81.4 ± 6.8	87.4 ± 6.7	84.7 ± 5.2	68.0 ± 8.3	100	84.2 ± 4.4	97.0 ± 1.4	92.1 ± 3.4	180
Zone 3	77.2 ± 9.7	83.9 ± 9.5	84.6 ± 9.2	61.1 ± 10.8	100	90.7 ± 5.1	80.3 ± 7.7	75.3 ± 11.5	45
Zone 4	86.8 ± 7.3	89.1 ± 7.8	86.5 ± 8.5	66.8 ± 12.0	100	79.4 ± 10.4	100	77.3 ± 10.0	45
Zone 5	78.3 ± 13.1	100	84.4 ± 8.2	73.9 ± 14.8	100	82.2 ± 6.2	97.8 ± 4.0	100	45
Zone 6	ISD	ISD	84.4 ± 8.7	ISD	100	84.4 ± 7.4	100	95.6 ± 5.3	45

Table B4. Percentage of large lakes meeting threshold values for indicators calculated using probabilistic monitoring design

This is a ten-column table. Column 1 lists the Zone; Columns 2-9 list the percent ± 95% confidence interval of large lake hectares that meet threshold values. Column 10 lists the number of samples analyzed (N).
TN = Total Nitrogen; TP = Total Phosphorus; DO = Dissolved Oxygen; NPO = combined metric (meeting thresholds for three indicators: TN, TP, DO); TAN = Total Ammonia Nitrogen; CHL = Chlorophyll a; pH = potential of hydrogen; EC = *Escherichia coli*.
ISD = Insufficient data, fewer than 23 samples; statewide results include data from zones categorized as ISD.

Region	TN	TP	DO	NPO	TAN	CHL	pH	EC	N
Statewide	91.4 ± 3.2	66.1 ± 8.1	99.1 ± 0.4	59.7 ± 8.5	100	38.1 ± 12.5	64.5 ± 10.2	100	268
Zone 1	100	100	87.1 ± 3.0	87.1 ± 3.0	100	73.0 ± 8.9	57.3 ± 6.8	100	45
Zone 2	100	100	100	100	100	67.8 ± 10.8	50.3 ± 9.6	100	44
Zone 3	79.7 ± 9.6	95.7 ± 4.7	100	79.7 ± 9.6	100	25.7 ± 10.8	58.3 ± 13.3	100	45
Zone 4	88.5 ± 7.7	90.7 ± 6.6	97.8 ± 3.7	86.2 ± 8.6	100	47.2 ± 11.4	73.4 ± 10.7	100	45
Zone 5	94.0 ± 5.1	86.0 ± 6.9	100	86.0 ± 6.9	100	31.2 ± 6.6	59.4 ± 10.6	100	44
Zone 6	100	14.8 ± 14.8	100	14.8 ± 14.8	100	43.0 ± 34.7	71.5 ± 26.3	100	45

Table B5. Percentage of small lakes meeting threshold values for indicators calculated using probabilistic monitoring design

This is a ten-column table. Column 1 lists the Zone; Columns 2-9 list the percent ± 95% confidence interval of small lake hectares that meet threshold values. Column 10 lists the number of samples analyzed (N).
TN = Total Nitrogen; TP = Total Phosphorus; DO = Dissolved Oxygen; NPO = combined metric (meeting thresholds for three indicators: TN, TP, DO); TAN = Total Ammonia Nitrogen; CHL = Chlorophyll a; pH = potential of hydrogen; EC = *Escherichia coli*.
ISD = Insufficient data, fewer than 23 samples; statewide results include data from zones categorized as ISD.

Region	TN	TP	DO	NPO	TAN	CHL	pH	EC	N
Statewide	95.8 ± 3.6	95.9 ± 2.7	72.0 ± 7.8	66.8 ± 8.2	100	65.2 ± 7.8	58.7 ± 7.7	98.5 ± 2.5	182
Zone 1	100	94.5 ± 6.6	74.3 ± 12.6	70.8 ± 13.7	100	65.5 ± 13.1	39.6 ± 14.2	100	35
Zone 2	80.0 ± 10.0	77.1 ± 11.4	82.8 ± 11.4	59.9 ± 14.8	100	45.6 ± 13.0	20.5 ± 12.2	97.1 ± 5.2	35
Zone 3	94.3 ± 7.2	97.2 ± 4.4	68.8 ± 14.0	63.0 ± 14.8	100	68.0 ± 13.4	60.1 ± 12.9	97.0 ± 5.3	35
Zone 4	97.4 ± 4.5	97.4 ± 4.5	72.9 ± 12.4	70.3 ± 12.7	100	60.6 ± 14.0	72.1 ± 13.7	100	34
Zone 5	100	94.1 ± 5.6	85.3 ± 9.3	79.4 ± 10.9	100	82.4 ± 10.5	85.4 ± 9.2	100	34
Zone 6	ISD	ISD	ISD	ISD	ISD	ISD	ISD	ISD	9

Table B6. Percentage of large lakes meeting sediment threshold values for indicators calculated using probabilistic monitoring design

This is a twelve-column table. Column 1 lists the Zone; Columns 2-11 list the percent ± 95% confidence interval of large lake hectares that meet sediment threshold values. Column 12 lists the number of samples analyzed (N).
Ag = silver; As = arsenic; Cd = cadmium; Cr = chromium; Cu = copper; Hg = mercury; Ni = nickel; Pb = lead; Zn = zinc;
Met = combined metric (not exceeding PEC thresholds for any of the following nine indicators: Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Zn).
ISD = Insufficient data, fewer than 23 samples; statewide results include data from zones categorized as ISD.

Region	Ag	As	Cd	Cr	Cu	Hg	Ni	Pb	Zn	Met	N
Statewide	100	99.7 ± 0.4	100	99.5 ± 0.5	98.6 ± 1.3	100	99.1 ± 1.3	98.6 ± 1.3	100	96.8 ± 2.1	266
Zone 1	100	100	100	100	100	100	100	100	100	100	45
Zone 2	100	100	100	100	100	100	100	100	100	100	44
Zone 3	100	100	100	100	97.9 ± 3.5	100	97.3 ± 4.4	97.9 ± 3.5	100	95.2 ± 5.7	45
Zone 4	100	97.7 ± 3.7	100	95.8 ± 4.5	93.4 ± 5.4	100	100	93.4 ± 6.3	100	84.8 ± 8.2	45
Zone 5	100	100	100	100	100	100	100	100	100	100	42
Zone 6	100	100	100	100	100	100	100	100	100	100	45

Table B7. Percentage of small lakes meeting sediment threshold values for indicators calculated using probabilistic monitoring design

This is a twelve-column table. Column 1 lists the Zone; Columns 2-11 list the percent ± 95% confidence interval of large lake hectares that meet sediment threshold values. Column 12 lists the number of samples analyzed (N).
Ag = silver; As = arsenic; Cd = cadmium; Cr = chromium; Cu = copper; Hg = mercury; Ni = nickel; Pb = lead; Zn = zinc;
Met = combined metric (not exceeding PEC thresholds for any of the following nine indicators: Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Zn).
ISD = Insufficient data, fewer than 23 samples; statewide results include data from zones categorized as ISD.

Region	Ag	As	Cd	Cr	Cu	Hg	Ni	Pb	Zn	Met	N
Statewide	100	96.7 ± 2.6	100	99.0 ± 1.6	93.5 ± 4.1	98.7 ± 2.1	100	91.5 ± 4.8	96.4 ± 3.4	84.1 ± 5.9	176
Zone 1	100	100	100	100	100	100	100	93.4 ± 7.8	100	93.8 ± 7.3	33
Zone 2	100	100	100	97.1 ± 4.9	100	100	100	97.1 ± 5.2	100	94.1 ± 6.9	35
Zone 3	100	100	100	100	94.4 ± 6.9	97.2 ± 4.4	100	88.7 ± 8.7	94.4 ± 6.6	83.2 ± 9.8	35
Zone 4	100	87.6 ± 9.4	100	96.6 ± 6.0	87.5 ± 9.5	100	100	94.4 ± 6.6	97.2 ± 4.8	77.9 ± 12.3	32
Zone 5	100	100	100	100	87.5 ± 9.2	100	100	90.6 ± 7.9	96.8 ± 5.1	78.1 ± 12.1	32
Zone 6	ISD	ISD	ISD	ISD	ISD	ISD	ISD	ISD	ISD	ISD	9

Table B8. Percentage of confined aquifers meeting threshold values for indicators calculated using probabilistic monitoring design

This is a ten-column table. Column 1 lists the Zone; Columns 2-9 list the percent ± 95% confidence interval of confined aquifers that meet threshold values. Column 10 lists the number of samples analyzed (N).
As = arsenic; Cd = cadmium; Cr = chromium; Pb = lead; NOx = nitrate+nitrite; Na = sodium; F = fluoride; TC = total coliform.
ISD = Insufficient data, fewer than 23 samples; statewide results include data from zones categorized as ISD.

Region	As	Cd	Cr	Pb	NOx	Na	F	TC	N
Statewide	97.2 ± 2.1	100	100	99.8 ± 0.2	99.7 ± 0.4	97.5 ± 0.7	100	85.4 ± 6.3	349
Zone 1	97.2 ± 2.7	100	100	100	100	100	100	89.4 ± 8.8	60
Zone 2	95.7 ± 5.8	100	100	100	98.8 ± 2.1	100	100	80.9 ± 8.7	58
Zone 3	100	100	100	98.0 ± 3.3	98.7 ± 2.0	87.0 ± 7.9	100	80.4 ± 11.1	58
Zone 4	97.5 ± 4.3	100	100	100	100	83.0 ± 7.7	100	64.8 ± 12.7	56
Zone 5	100	100	100	96.8 ± 3.5	100	67.9 ± 8.2	100	50.8 ± 13.2	58
Zone 6	100	100	100	100	100	6.8 ± 4.8	100	95.9 ± 5.0	59

Table B9. Percentage of unconfined aquifers meeting threshold values for indicators calculated using probabilistic monitoring design

This is a ten-column table. Column 1 lists the Zone; Columns 2-9 list the percent ± 95% confidence interval of unconfined aquifers that meet threshold values. Column 10 lists the number of samples analyzed (N).
As = arsenic; Cd = cadmium; Cr = chromium; Pb = lead; NOx = nitrate+nitrite; Na = sodium; F = fluoride; TC = total coliform.
ISD = Insufficient data, fewer than 23 samples; statewide results include data from zones categorized as ISD.

Region	As	Cd	Cr	Pb	NOx	Na	F	TC	N
Statewide	92.8 ± 7.3	100	100	99.3 ± 0.6	98.9 ± 1.2	98.3 ± 1.2	100	79.0 ± 9.0	343
Zone 1	91.7 ± 9.7	100	100	100	100	99.1 ± 1.5	100	85.1 ± 11.4	60
Zone 2	97.1 ± 4.8	100	100	96.8 ± 3.7	93.1 ± 7.7	100	100	63.0 ± 14.0	51
Zone 3	100	100	100	98.3 ± 2.7	100	94.1 ± 4.4	100	65.2 ± 12.0	59
Zone 4	88.8 ± 9.4	100	100	95.2 ± 3.6	97.4 ± 2.5	89.5 ± 8.4	100	53.4 ± 11.7	59
Zone 5	92.8 ± 8.4	100	100	96.5 ± 3.1	100	95.6 ± 3.7	100	39.5 ± 13.8	56
Zone 6	95.8 ± 5.0	100	100	100	100	83.6 ± 7.7	100	43.9 ± 12.3	58