Maps of Nutrient Conditions in Wyoming
Includes Data From 2016

The attached document contains maps showing relative concentrations (low, moderate, high) of total nitrogen, total phosphorus, and chlorophyll a for streams and rivers and total nitrogen, total phosphorus, chlorophyll a, and cyanobacteria density for lakes and reservoirs in Wyoming. The data were collected by the Wyoming Department of Environmental Quality, the United States Geological Survey, and the United States Environmental Protection Agency between approximately 2000 and 2016.

Why were the maps developed?
The maps were developed at the request of the Wyoming Nutrient Work Group to illustrate the extent and magnitude of nutrient conditions in perennial Wyoming waters based on existing data and scientific literature.

What do nutrients, chlorophyll-a and cyanobacteria tell us about nutrient conditions?
Nutrients (total phosphorus and total nitrogen) are essential elements for plant growth. Elevated nutrients (total phosphorus and total nitrogen), however, can lead to algal blooms and excess aquatic plant growth that may result in adverse impacts to uses of waters for drinking, recreation, fisheries, and other aquatic life.

Chlorophyll-a is a direct measure of photosynthetic pigment in algae; elevated chlorophyll a values indicate excessive plant growth likely caused by elevated nutrients.

Cyanobacteria (blue-green algae) are photosynthetic bacteria that naturally occur at low densities in lakes and reservoirs. Elevated total phosphorus and/or total nitrogen concentrations can lead to elevated cyanobacteria densities, which can form harmful algal blooms (HABS) that can cause adverse impacts to uses of the water for drinking, recreation, and fisheries.

What do the relative concentrations on the maps represent?
Categories of low, moderate, and high represent general guidelines on potential risks for adverse impacts to aquatic life or recreation.

- Streams

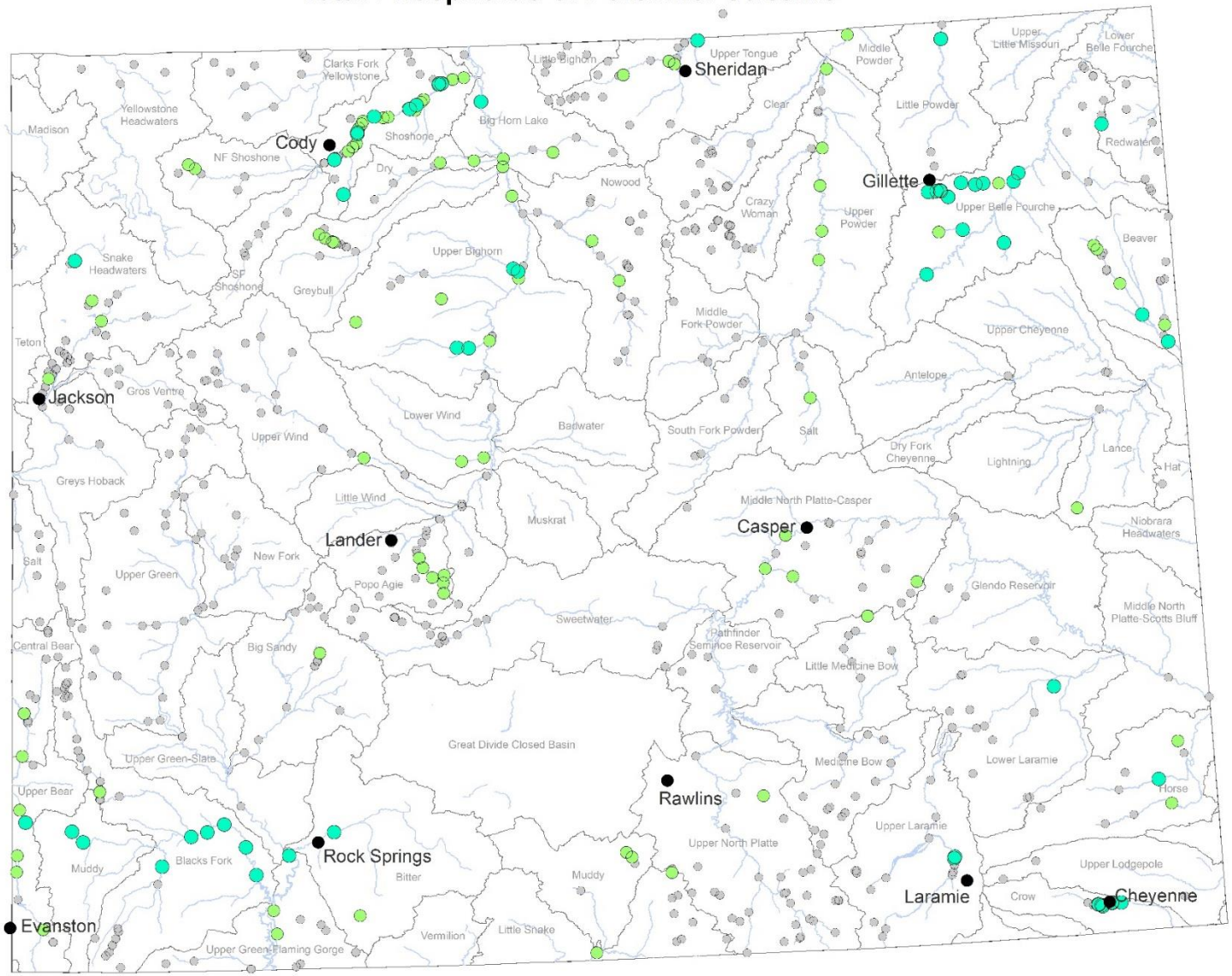
Category	Total Phosphorus (ug/L)	Total Nitrogen (ug/L)	Chlorophyll-a (mg/m^2)
LOW	<100	<1000	<150
MODERATE	100 – 300	1000 – 3000	150 – 300
HIGH	>300	>3000	>300

- Lakes/Reservoirs

Category	Total Phosphorus (ug/L)	Total Nitrogen (ug/L)	Chlorophyll-a (mg/m^2)	Cyanobacteria (cells/mL)
LOW	<50	<1000	<10	<20,000
MODERATE	50 – 100	1000 – 3000	10 – 50	20,000 - 100,000
HIGH	>100	>3000	>50	>100,000

Disclaimers: *Nutrient categories and associated concentration ranges DO NOT represent water quality criteria; maps are only for information/education and CANNOT be used for regulatory purposes; maps CANNOT be used to determine whether a water is impaired for nutrients; for sites with multiple data points, the highest value is depicted.*

Total Phosphorus of Perennial Streams



2,161 samples collected during 2000-2016
Data sources: WDEQ & USGS

● Municipality

Total Phosphorus (ug/L)

LOW | MODERATE | HIGH

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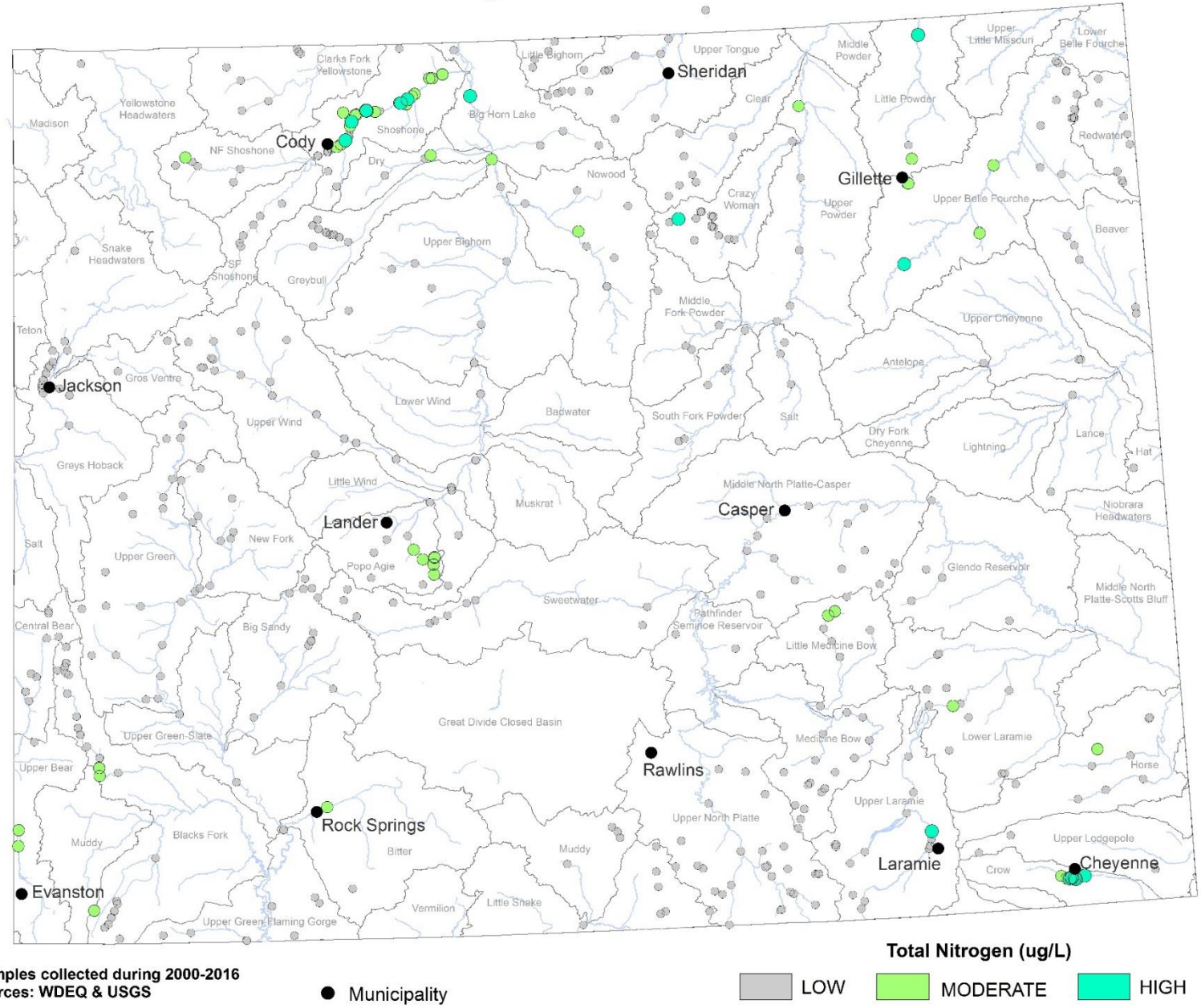
Total Nitrogen for Perennial Streams



2,112 samples collected during 2000-2016
Data sources: WDEQ & USGS

● Municipality

Total Nitrogen (ug/L)

LOW | MODERATE | HIGH

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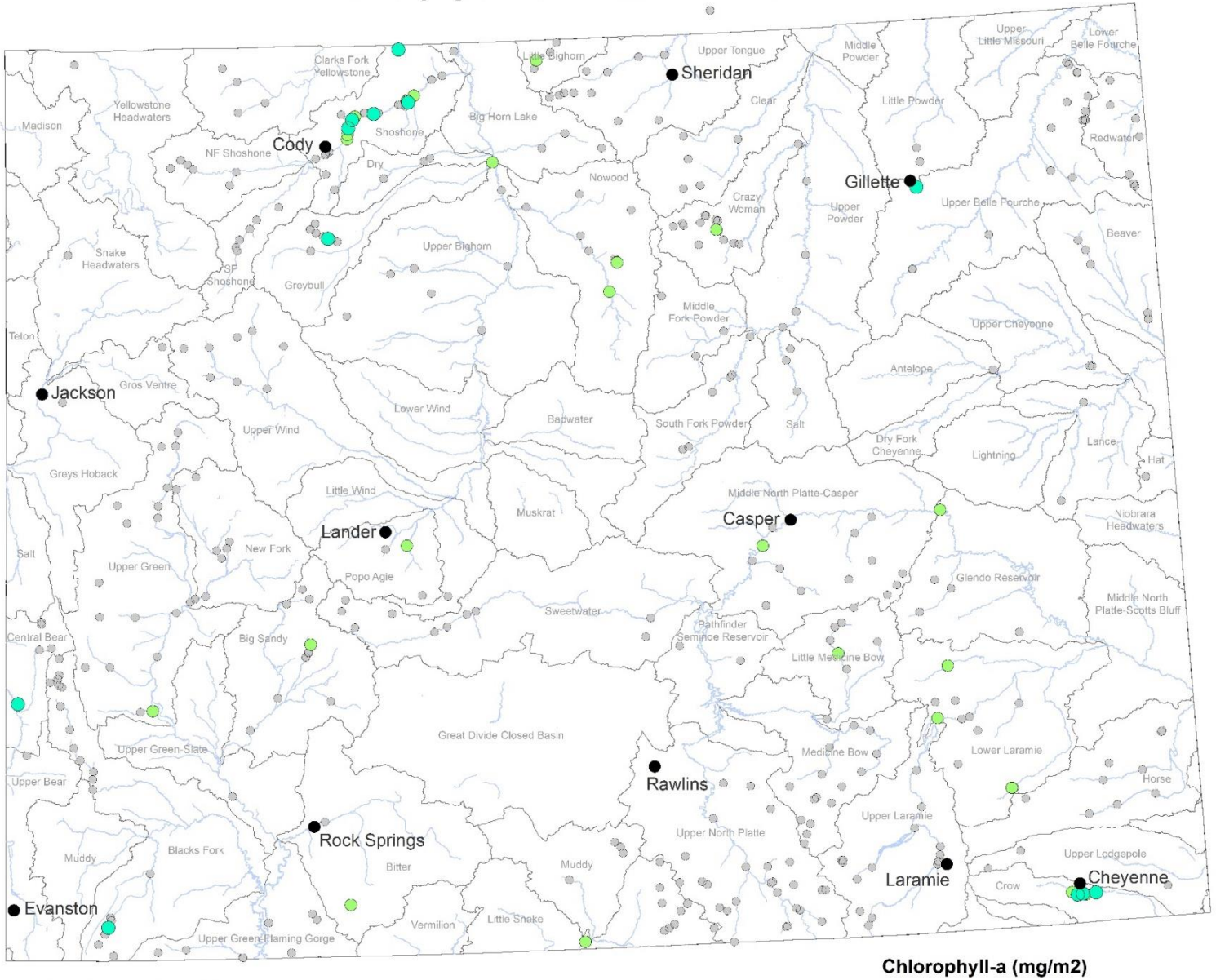
Chlorophyll-a of Perennial Streams



568 samples collected during 2002-2016
Data sources: WDEQ & USGS

● Municipality

Chlorophyll-a (mg/m2)

LOW MODERATE HIGH

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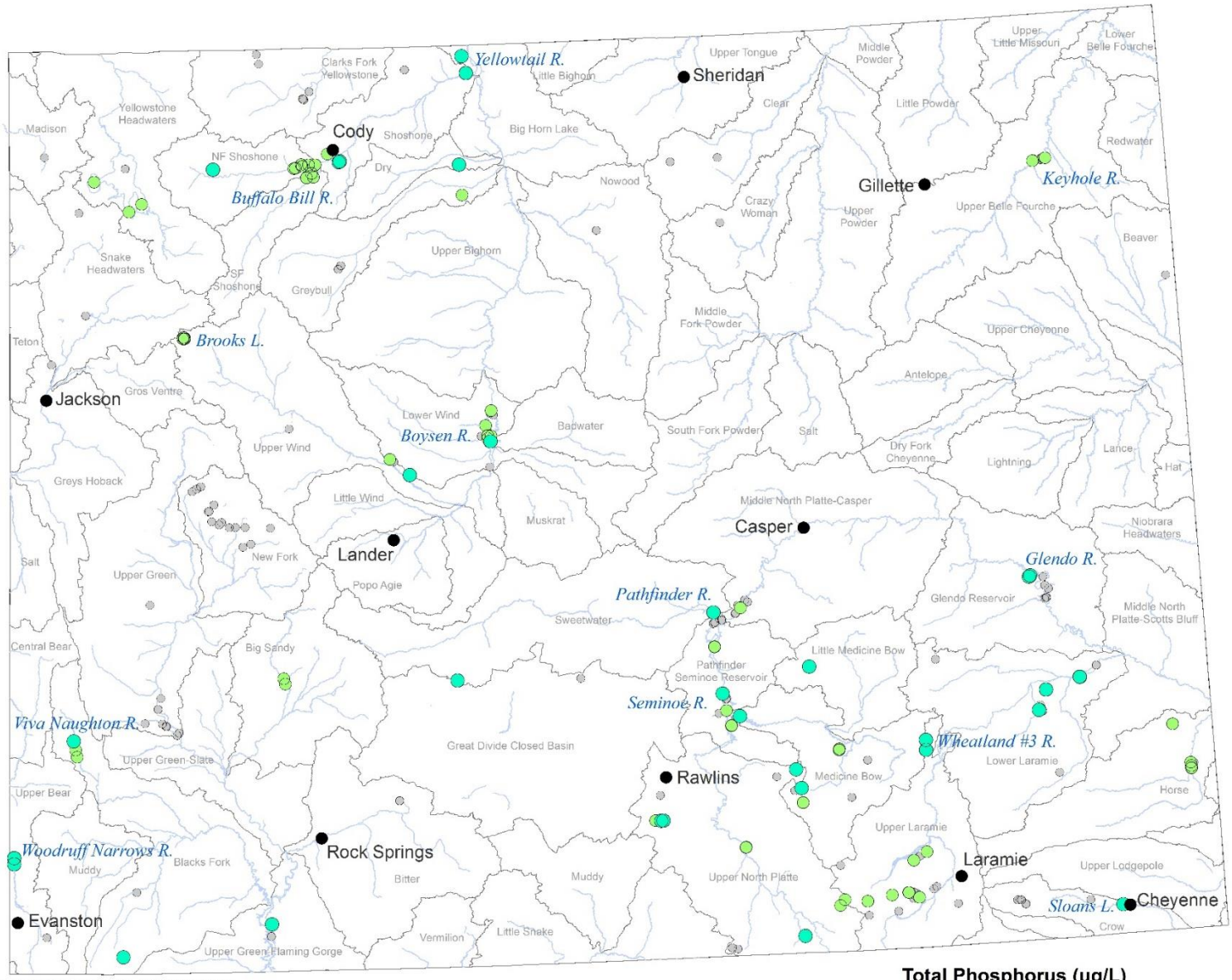
Total Phosphorus for Perennial Lakes



837 samples collected during 2000-2016
Data sources: WDEQ, USGS, NPS, EPA
Near-surface concentrations only

● Municipality

Total Phosphorus (ug/L)

LOW MODERATE HIGH

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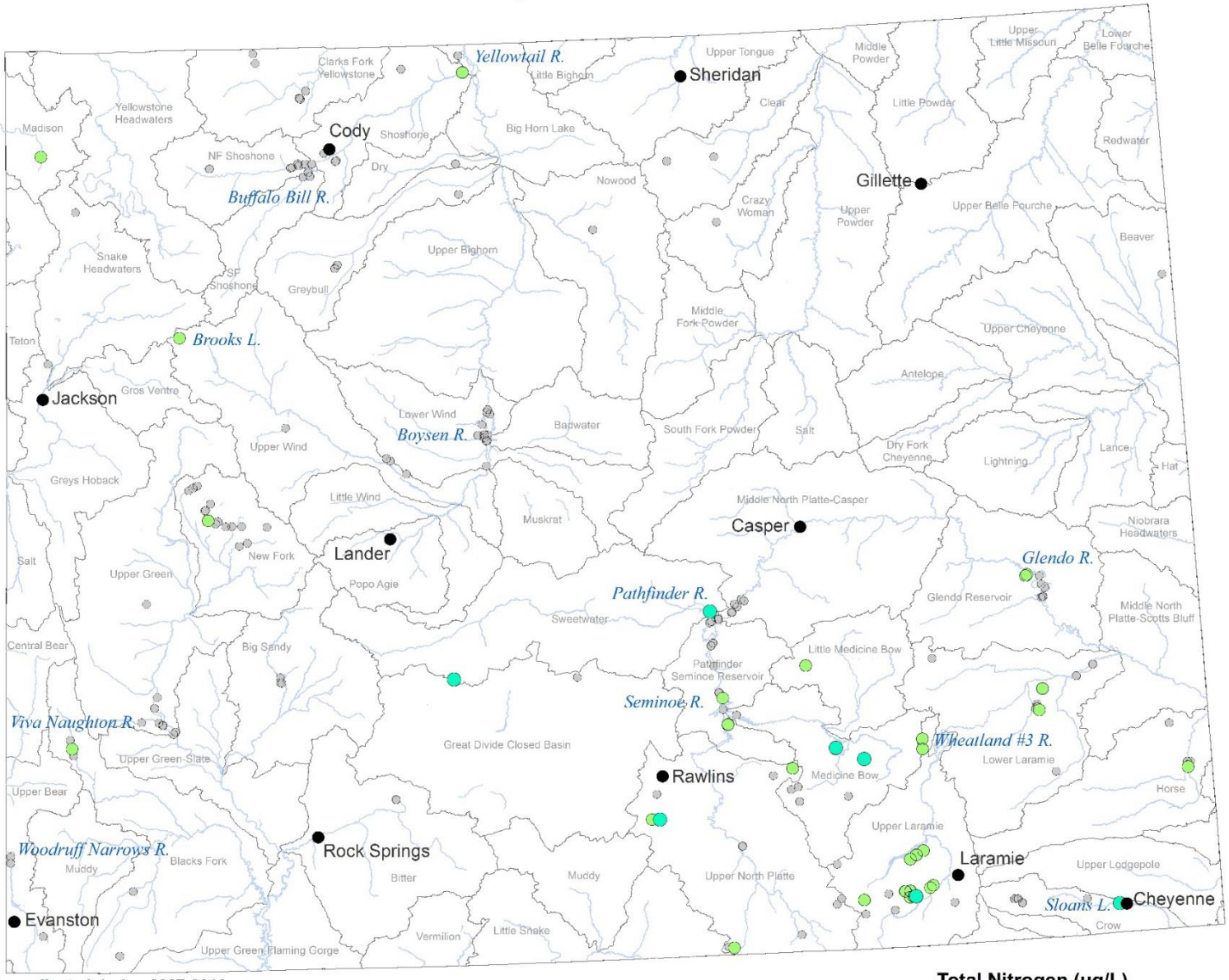
Total Nitrogen for Perennial Lakes



715 samples collected during 2007-2016
Data sources: WDEQ, USGS, EPA
Near-surface concentrations only

● Municipality

Total Nitrogen (ug/L)

LOW MODERATE HIGH

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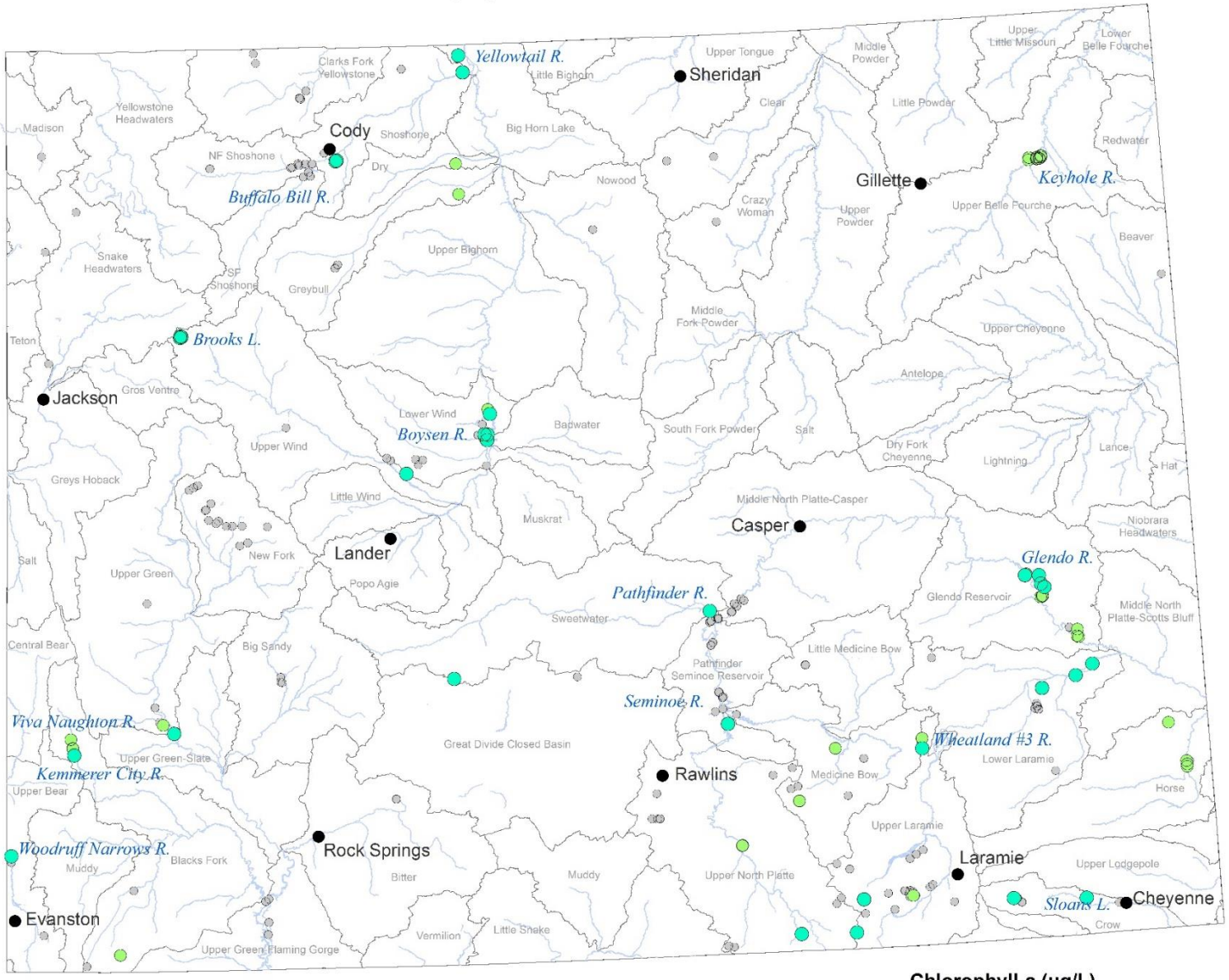
Chlorophyll-a for Perennial Lakes



933 samples collected during 2000-2016
Data sources: WDEQ, USGS, EPA

● Municipality

Chlorophyll-a (ug/L)

LOW MODERATE HIGH

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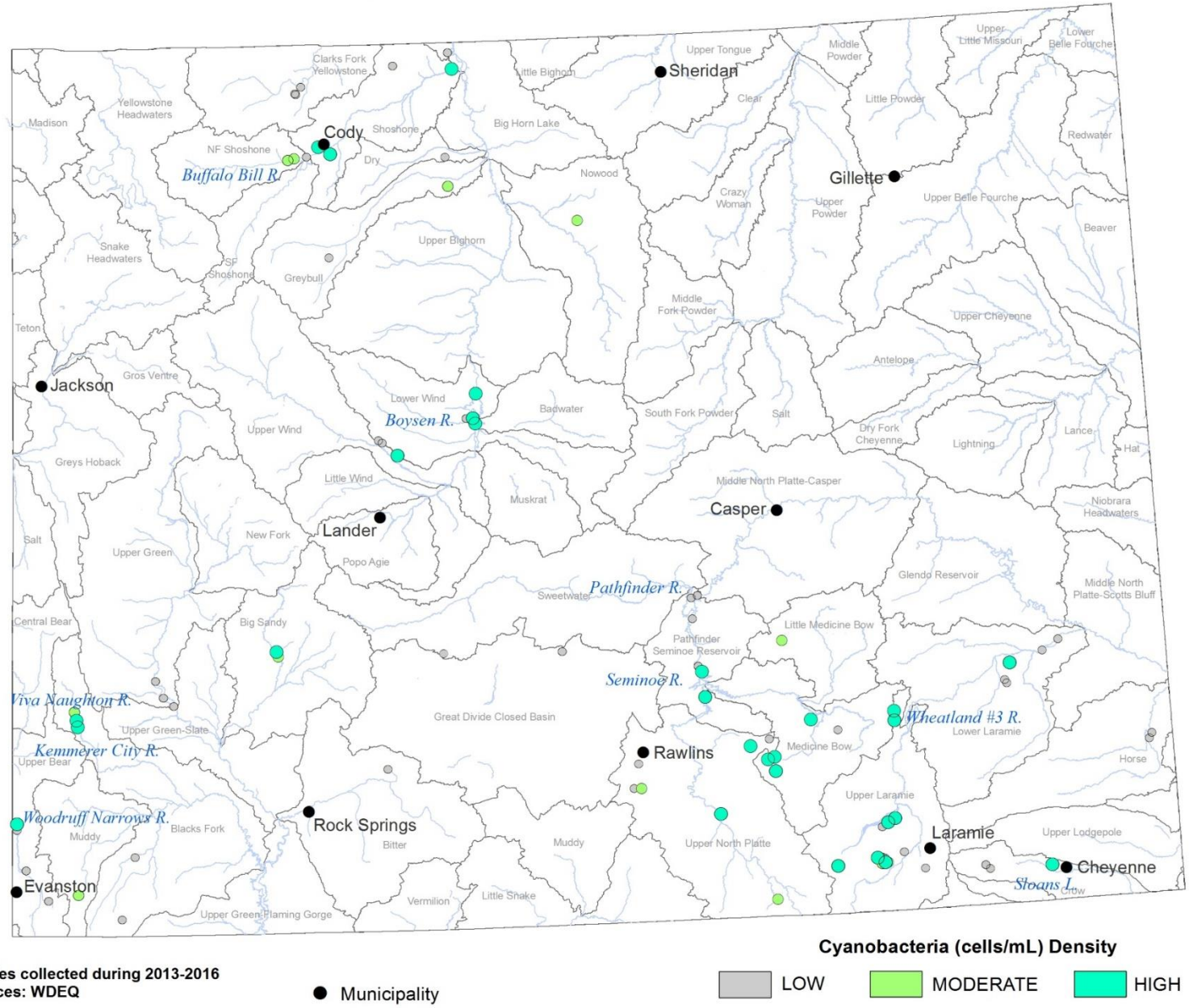
Cyanobacteria for Perennial Lakes



370 samples collected during 2013-2016
Data sources: WDEQ

● Municipality

Cyanobacteria (cells/mL) Density

LOW | MODERATE | HIGH

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