

**-Lakes of the Carvel Pitted Delta-
Presentation to MLMA AGM
November 24, 2024**

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Key messages

- ◆ We have a unique and beautiful “small lake district” in Parkland County
- ◆ Observations on 78 lakes sampled between 2020-2024 indicate a very wide range of water quality conditions, sizes, depths and degrees of human impact
- ◆ Includes 15 oligotrophic lakes and 20 mesotrophic lakes (very clear)
- ◆ Landowners (50+) have been very welcoming and highly value these lakes - good stewards

The Funding

- Land Stewardship Centre of Canada (LSCC)
- Alberta Lake Management Society (ALMS)
- Stony Plain Fish and Game Association (SPFGA)
- Mayatan Lake Management Association (MLMA)
- North Sask. Watershed Alliance (NSWA)
- University of Alberta/Dept. Earth Sciences
- Parkland County

The People

◆ Alberta Lake Management Society

- Brad Peter, Caleb Sinn, Brittany Onysyk, Kurstyn Cappis, Kirsten Letendre

◆ University of Alberta

- Dr. Dan Alessi, Dr. Konstantin Von Gunten, Dr. Brian Smerdon

◆ Field Volunteers, Data Contributors/Assistance

- Alec MacDonald, Jennifer Regier, Dr. Eric Neilson, Mike Myshak, Alex Oiffer, Dale Loosemore, Tyler Shyry, Pauline Molnar, Dr. Steve Craik, Alvin Steinke, Brad Tyssen, Sal Figliuzzi, Dr. Craig Emmerton, Jeremy Plonkowski

Acknowledge Previous Studies

Lake Names!

- ◆ 31 named lakes
- ◆ 100+ unnamed lakes (PL1, PL2, etc.)

Our beautiful lakes.....























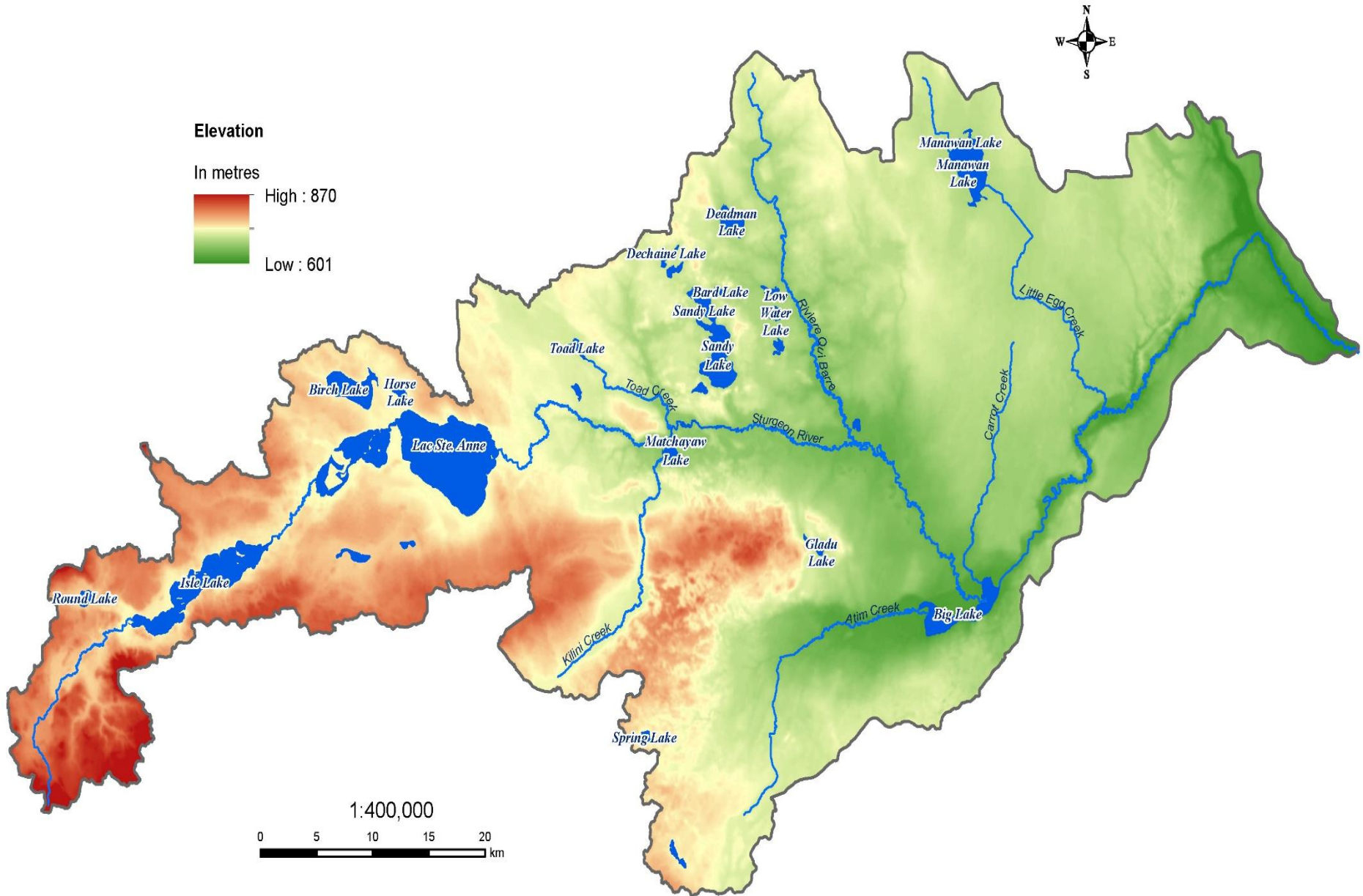




Kettle Lakes



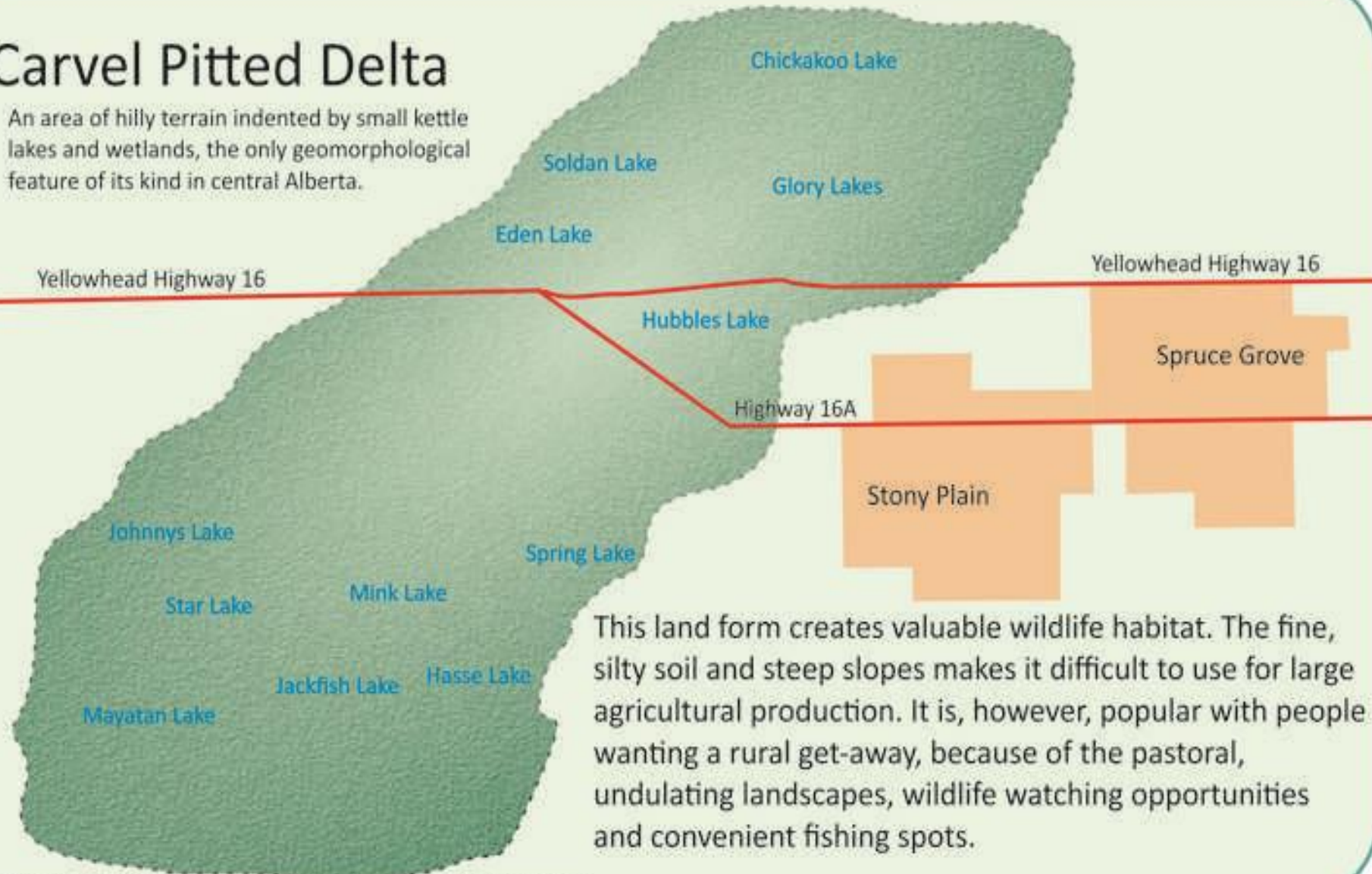
Sturgeon River Watershed: Topography



The Carvel Pitted Delta

Carvel Pitted Delta

An area of hilly terrain indented by small kettle lakes and wetlands, the only geomorphological feature of its kind in central Alberta.



This land form creates valuable wildlife habitat. The fine, silty soil and steep slopes makes it difficult to use for large agricultural production. It is, however, popular with people wanting a rural get-away, because of the pastoral, undulating landscapes, wildlife watching opportunities and convenient fishing spots.

The Carvel Lakes project with a casual introduction to “Lake Idano” in July 2018...















-2019-

ALMS sampled “Idano Lake” (PL1) for the first time in August 2019.

Total Phosphorus = 7 ug/L

Oligotrophic!

Other lakes like this?

-2020-

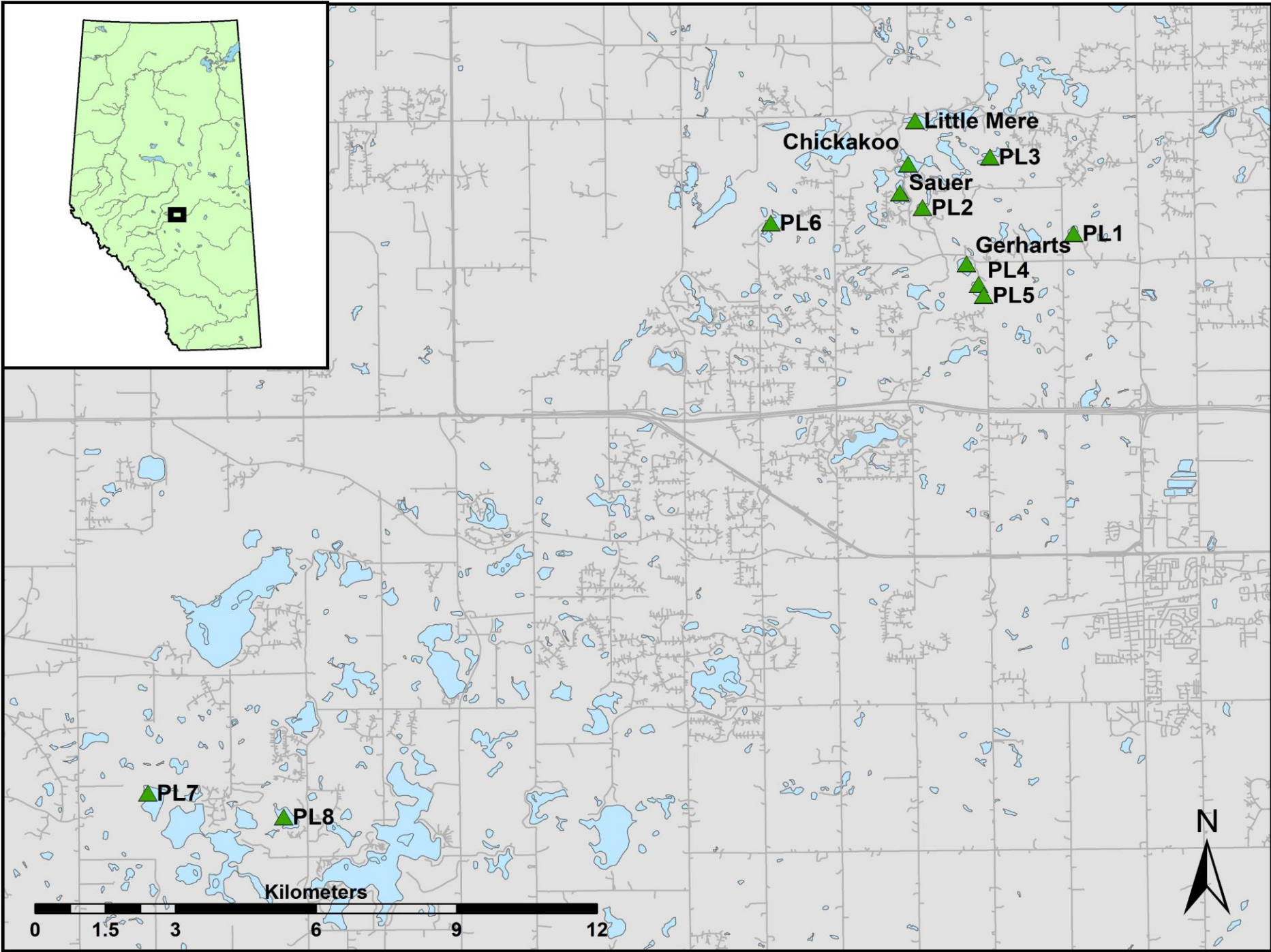
ALMS and U of A LakeKeeper Project - 13 Lakes

Named Lakes

- ◆ Gerharts Lake
- ◆ Little Mere E. (North)
- ◆ Little Mere W.
- ◆ Chickakoo Lake
- ◆ Sauer Lake

Unnamed Lakes

- ◆ PL1 (Lake Idano)
- ◆ PL2 (Pete's Pond)
- ◆ PL3 (Troudt (East))
- ◆ PL4 (Roi Lake Mid)
- ◆ PL5 (Roi Lake South)
- ◆ PL6 (Kinsey Cove)
- ◆ PL7 (McMorran Lake)
- ◆ PL8 (Neilson Lake)





New Scientific Publication:

K. Von Gunten, D. O. Trew, B. Smerdon and D. S. Alessi. (2022). Natural phosphorus controls in small lakes in central Alberta, Canada. *Canadian Water Resources Journal*.

-2021-

Regional Survey
LakeKeeper Project - 44 Lakes

MLMA Partnered with ALMS and
received support from LSCC,
SPFGA, NSWA, U. of A.

Mayatan Lake State of the Watershed Report



August 2012

Mayatan Lake Watershed Management Plan



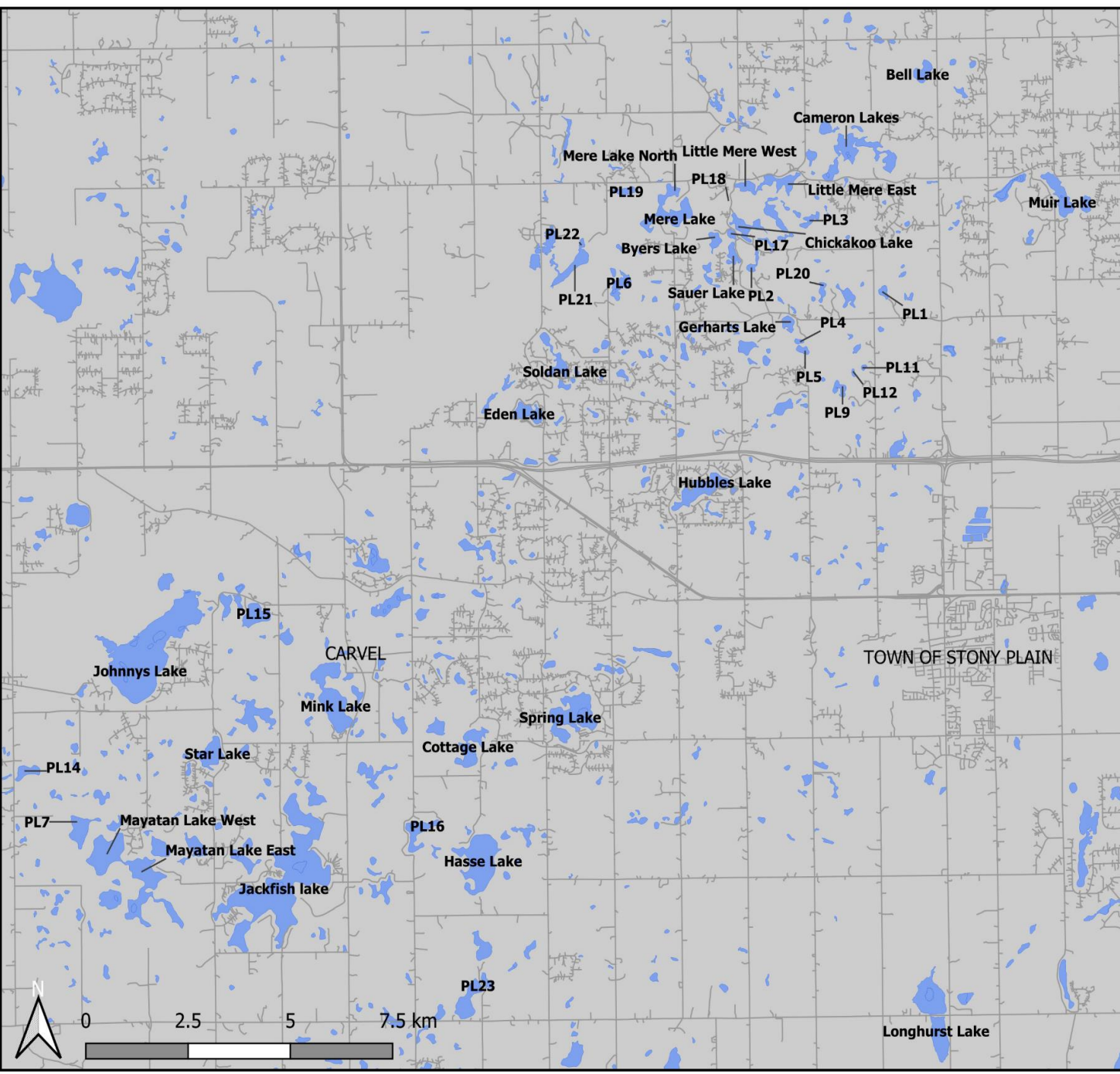
July 2016

Carvel Pitted Delta Survey 2021 Report

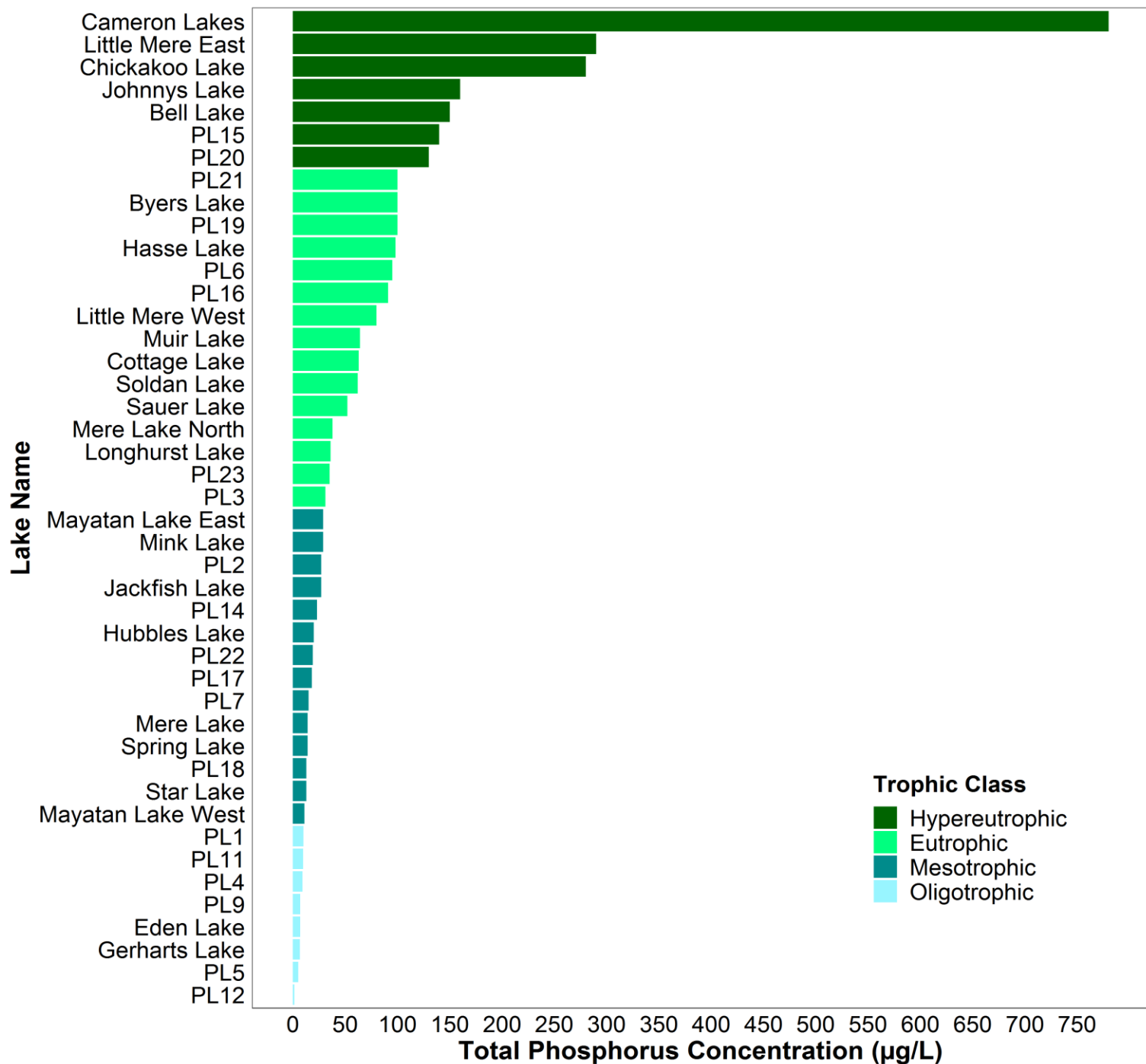
Sample Sites

Legend

- Roads
- Waterbodies



NAD83 / Alberta 10-TM (Forest)



Lakes of the Carvel Pitted Delta

-Stony Plain Region-



Summer Field Program - 2021

-2022-

**Expanded Regional Survey:
50 Lakes**

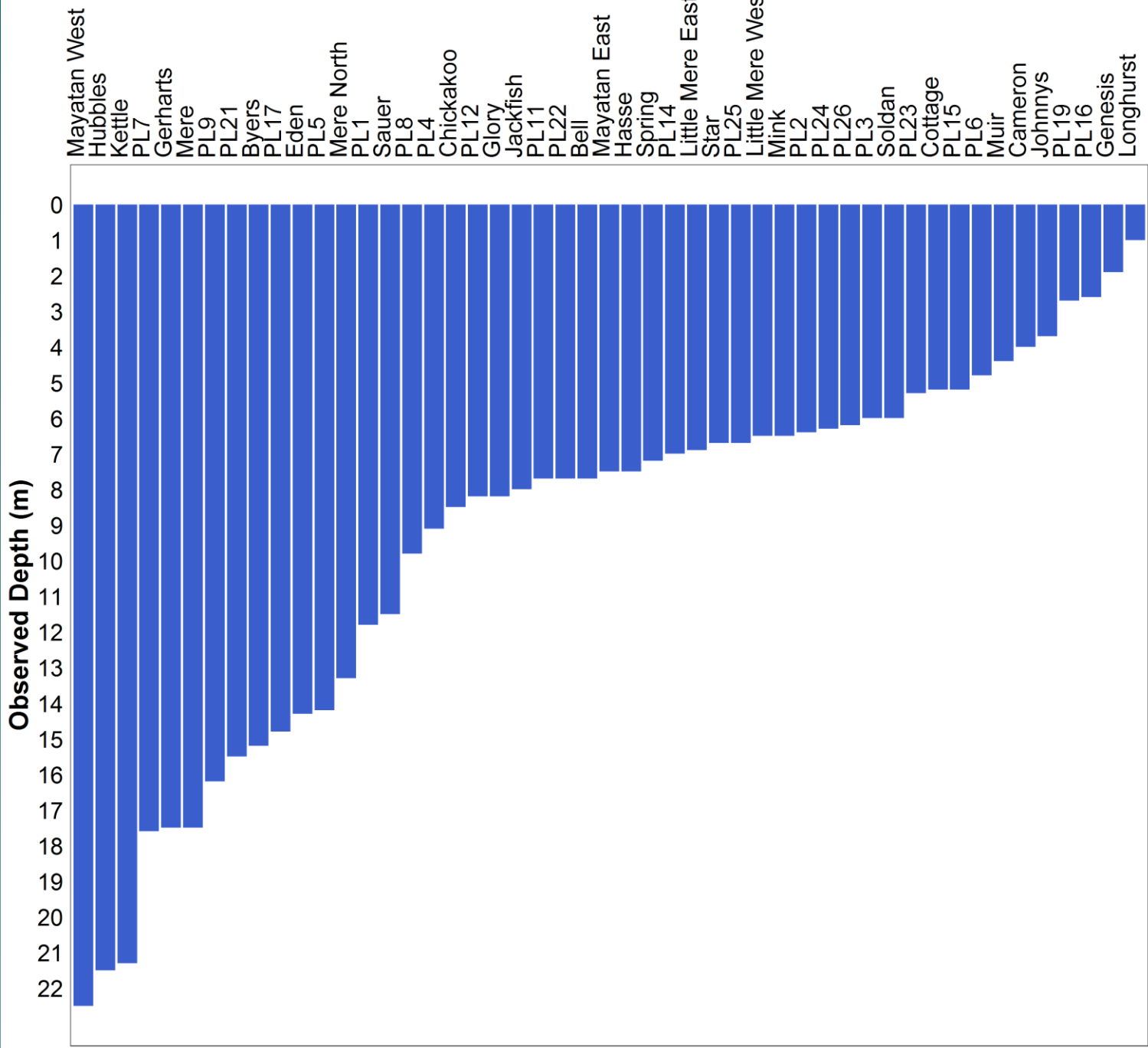
**MLMA partnered with ALMS and
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SPFGA, NSWA, U. of A., and
Parkland County**

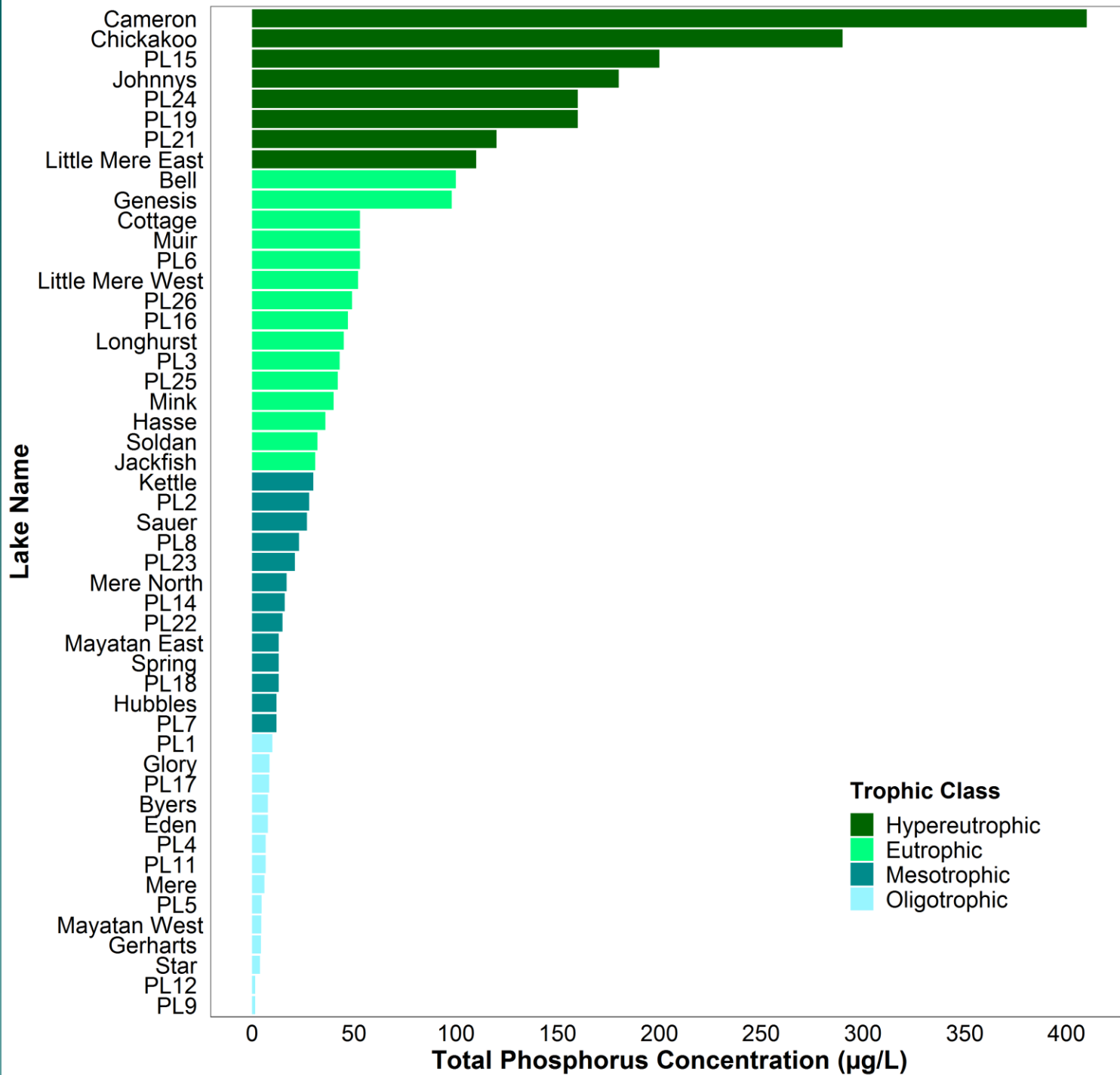
Expanded Sampling Scope - 2022

- ◆ Bathymetry
- ◆ Expanded Groundwater Isotopes, Mapping
- ◆ Aquatic Invasive Species
- ◆ Microcystin
- ◆ Light Extinction
- ◆ Composite sampling**
- ◆ Video!



Lake Name

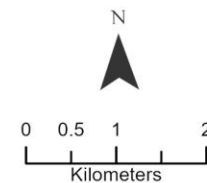




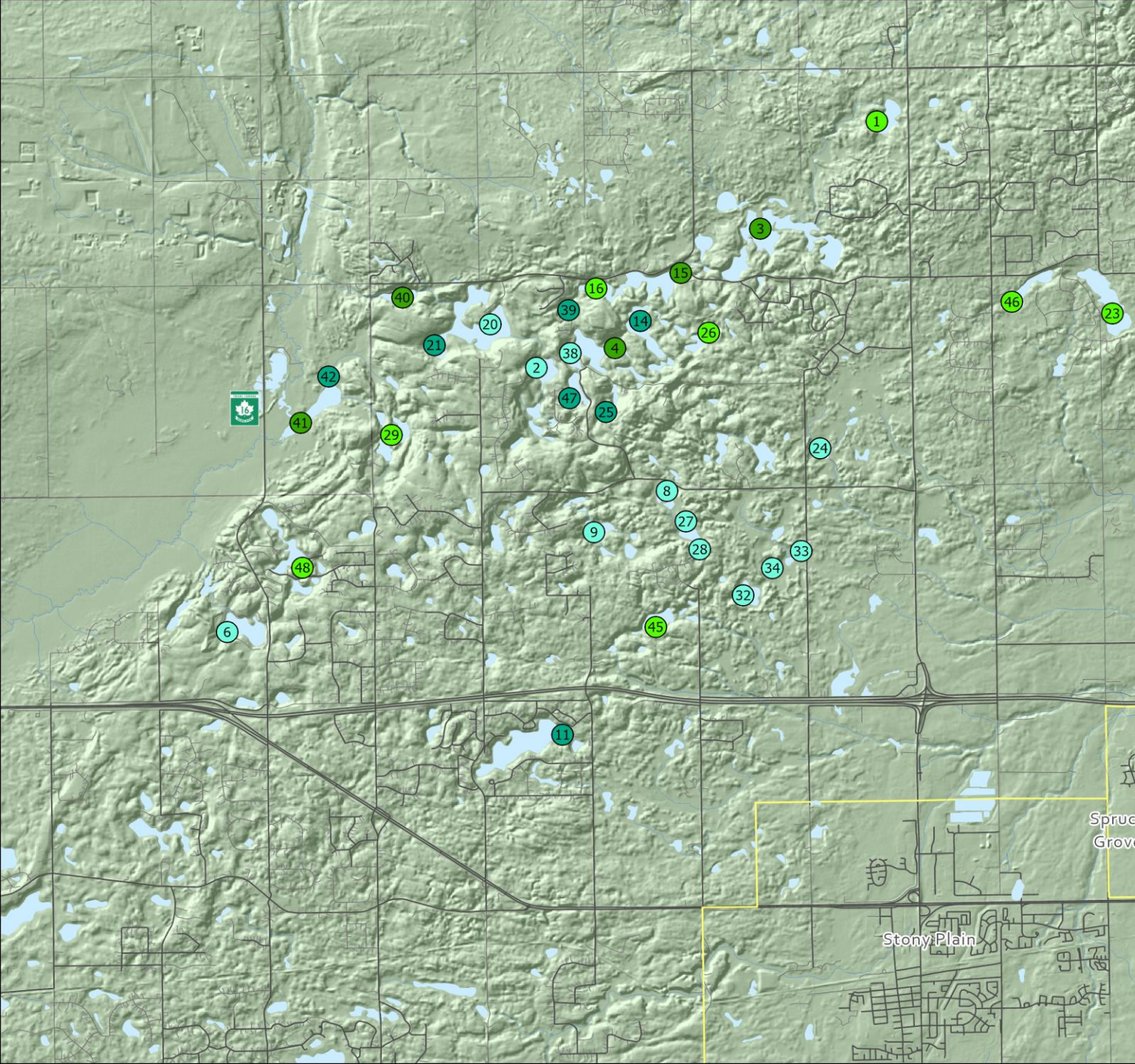
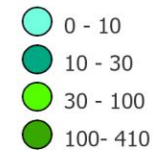
Carvel Pitted Delta 2022 Survey Report

Northern Region

Surface Total Phosphorus ($\mu\text{g/L}$)



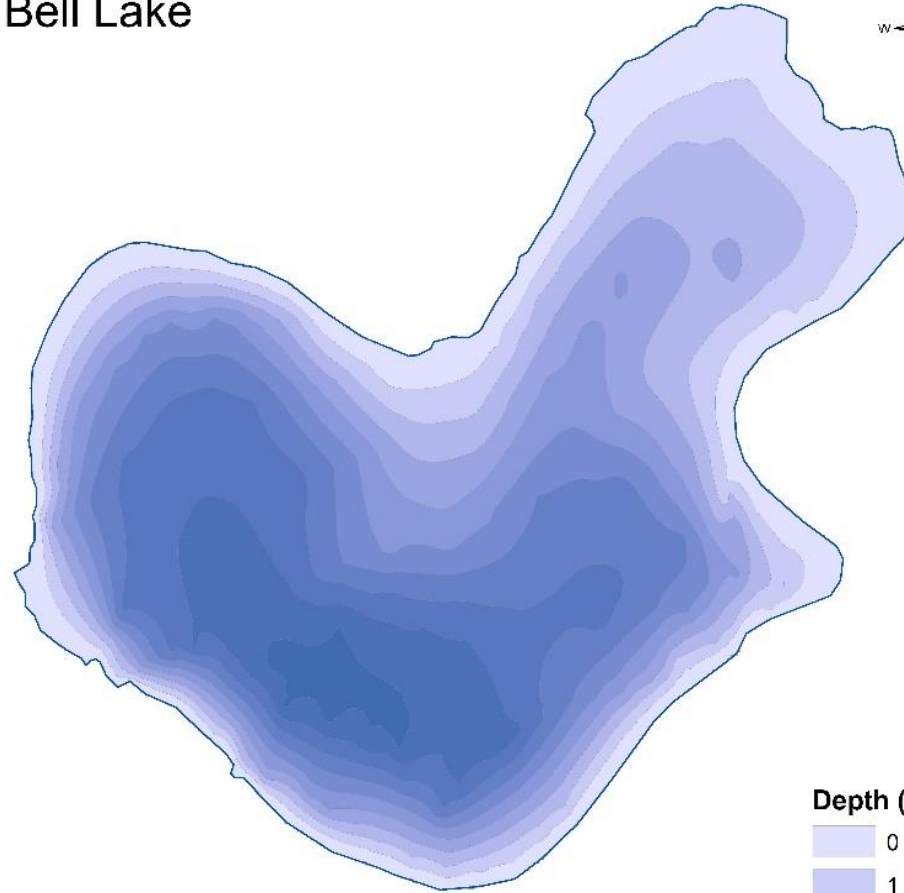
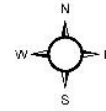
Surface Total Phosphorus ($\mu\text{g/L}$)



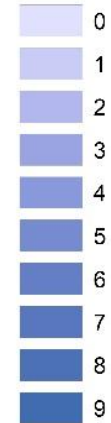
2022 Bathymetry:
33 Lakes sounded, many for the
first time with
Garmin technology



Bell Lake



Depth (m)



Depth (m)	Surface area (m ²)	Volume (m ³)
0	96,488	407,801
1	82,324	319,467
2	70,755	243,311
3	58,496	178,744
4	48,408	125,721
5	39,815	81,996
6	31,279	46,502
7	20,598	20,313
8	9,405	5,387
9	1,727	270

114 00 40 W

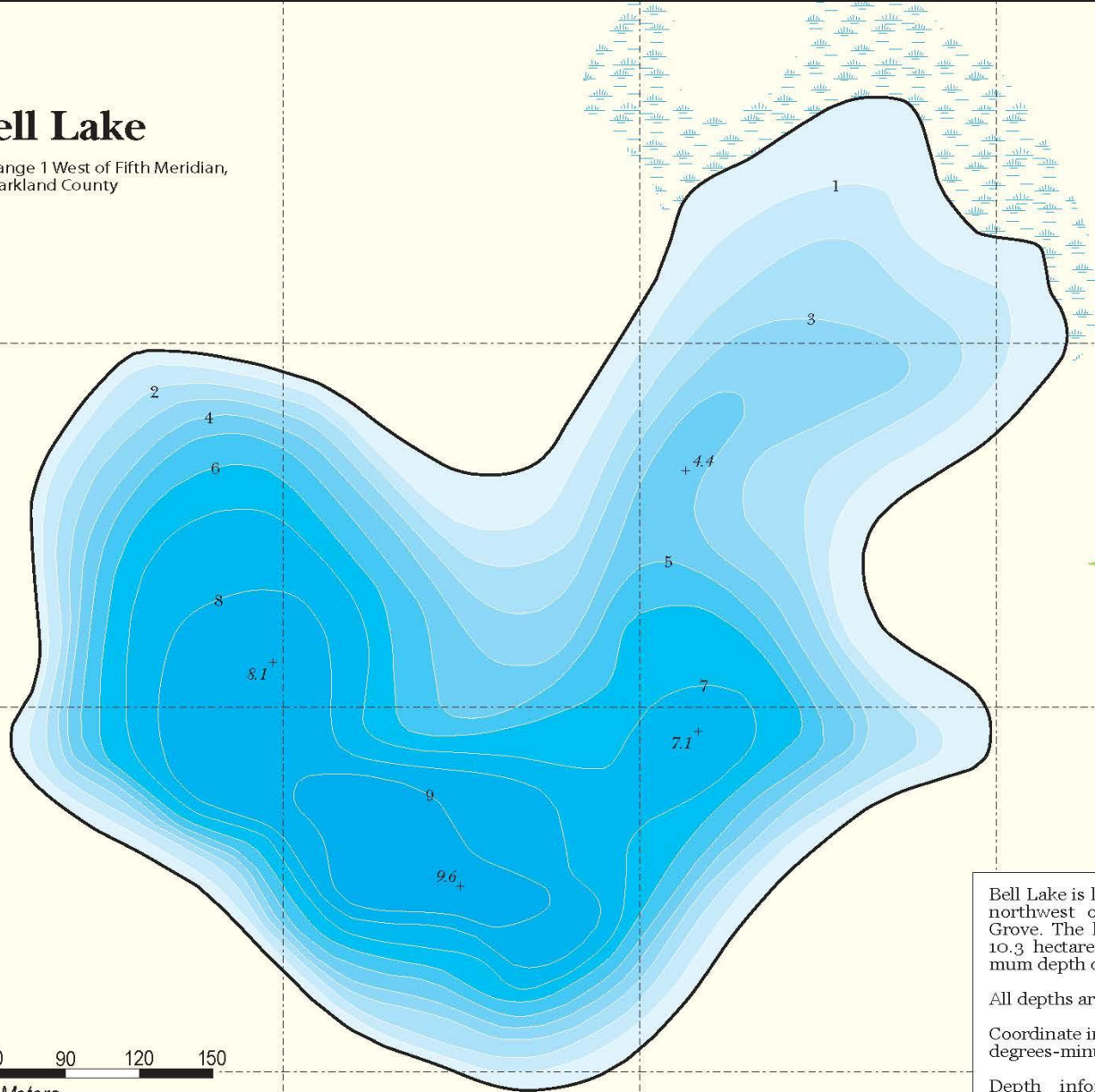
114 00 32 W

114 00 24 W

114 00 16 W

Bell Lake

Township 54, Range 1 West of Fifth Meridian,
Parkland County



Bell Lake is located 13 $\frac{3}{4}$ km north-northwest of the city of Spruce Grove. The lake covers an area of 10.3 hectares and attains a maximum depth of 9.6 meters.

All depths are in meters.

Coordinate information is given in degrees-minutes-seconds.

Depth information from 2022 Alberta Lake Management Society bathymetric survey.



114 00 40 W

114 00 32 W

114 00 24 W

114 00 16 W

53 39 05 N

53 39 00 N

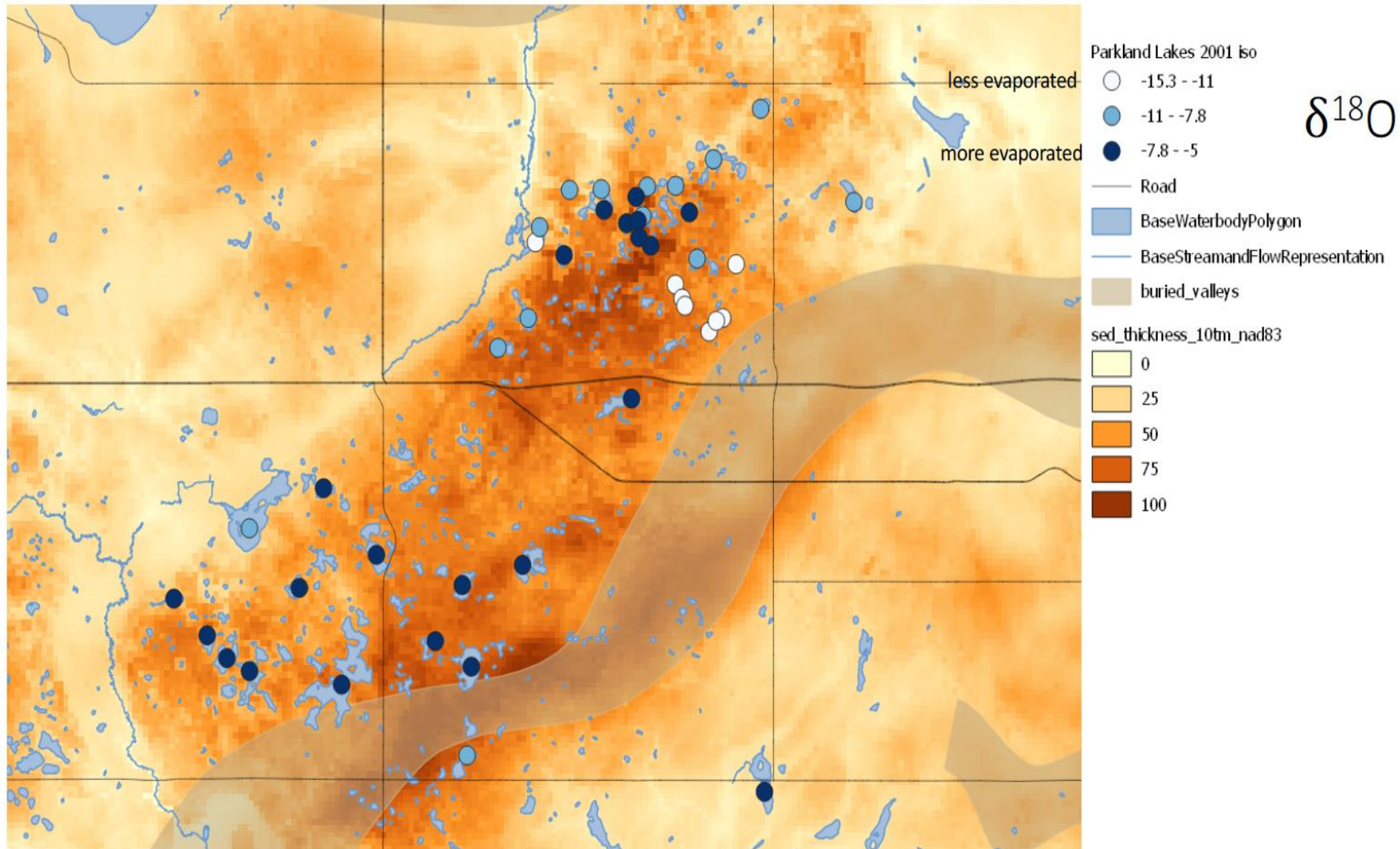
53 38 55 N

53 39 05 N

53 39 00 N

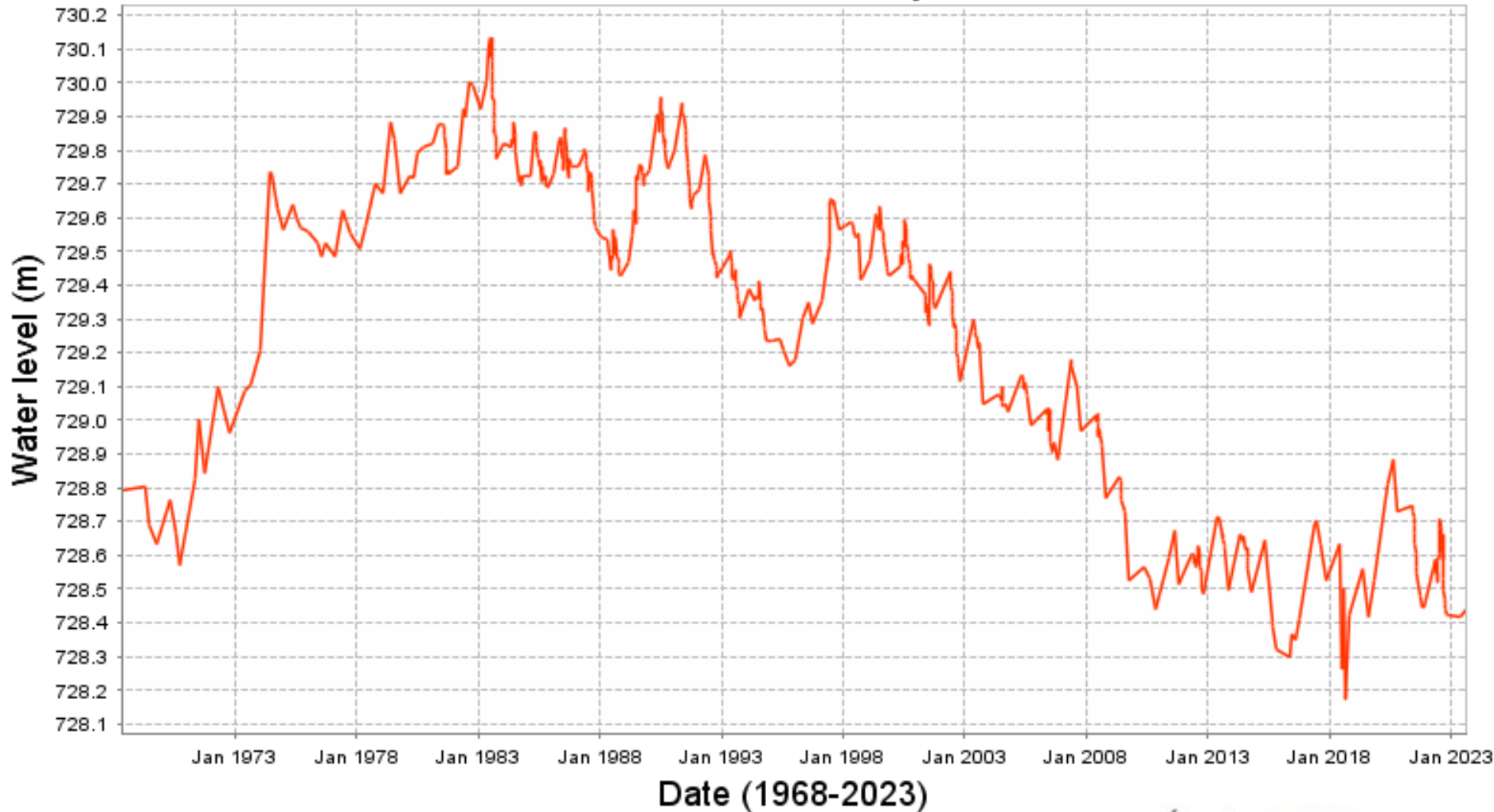
53 38 55 N

Groundwater- Lake Connections



Lake Levels

Measured water level for 05DE902
Jackfish Lake Near Stony Plain



Lakes of the Carvel Pitted Delta

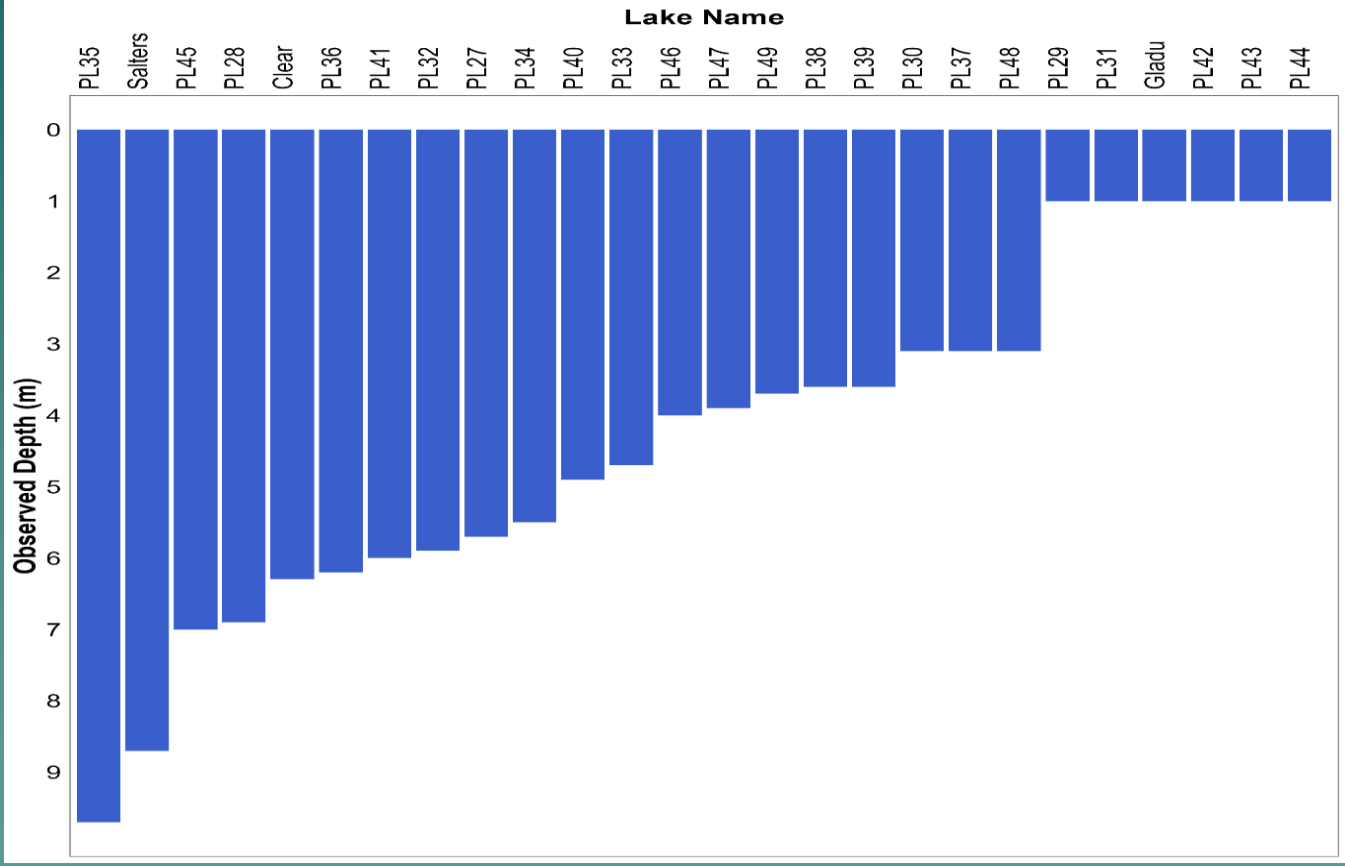
-Stony Plain Region-



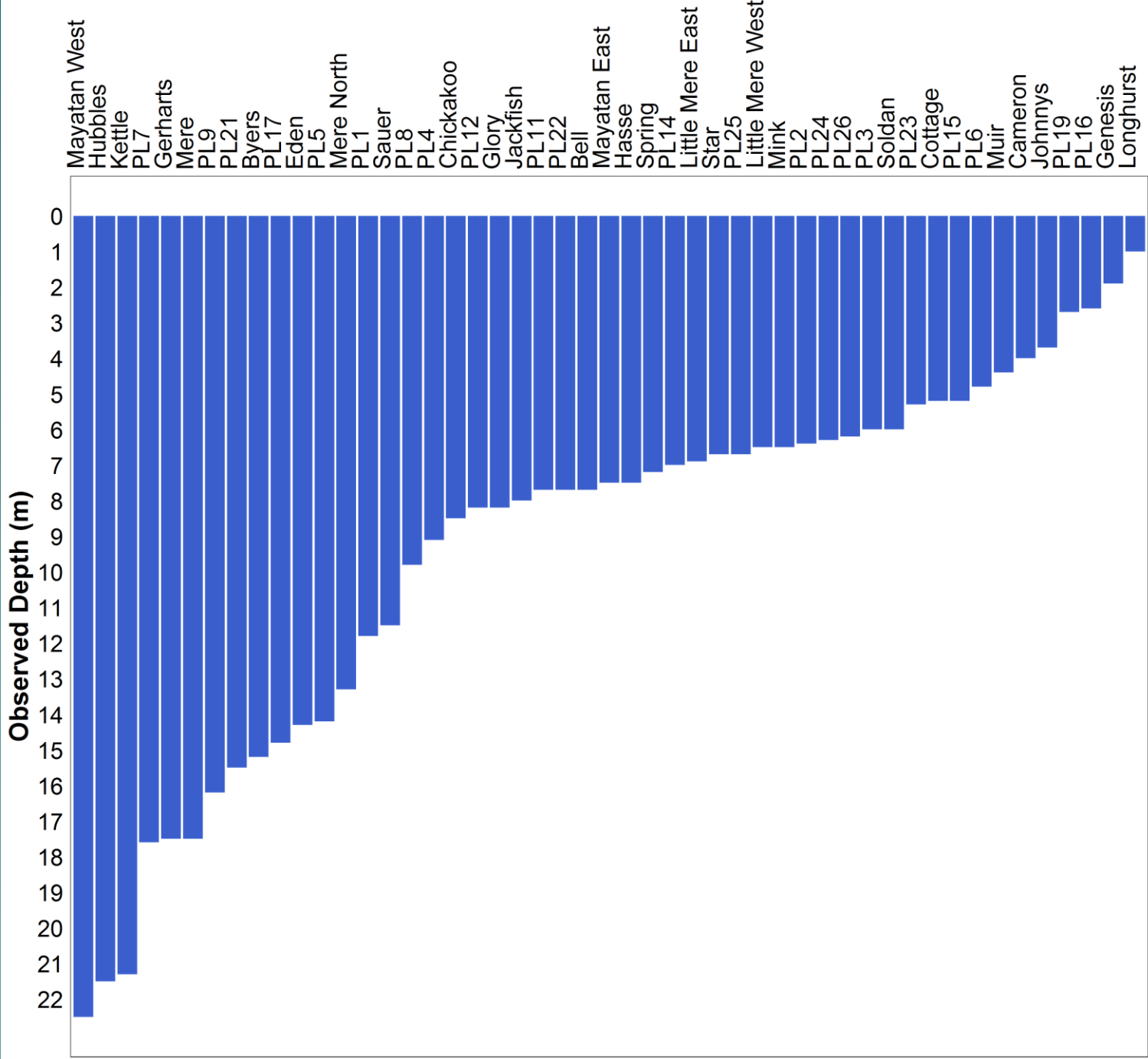
Summer Field Program - 2022

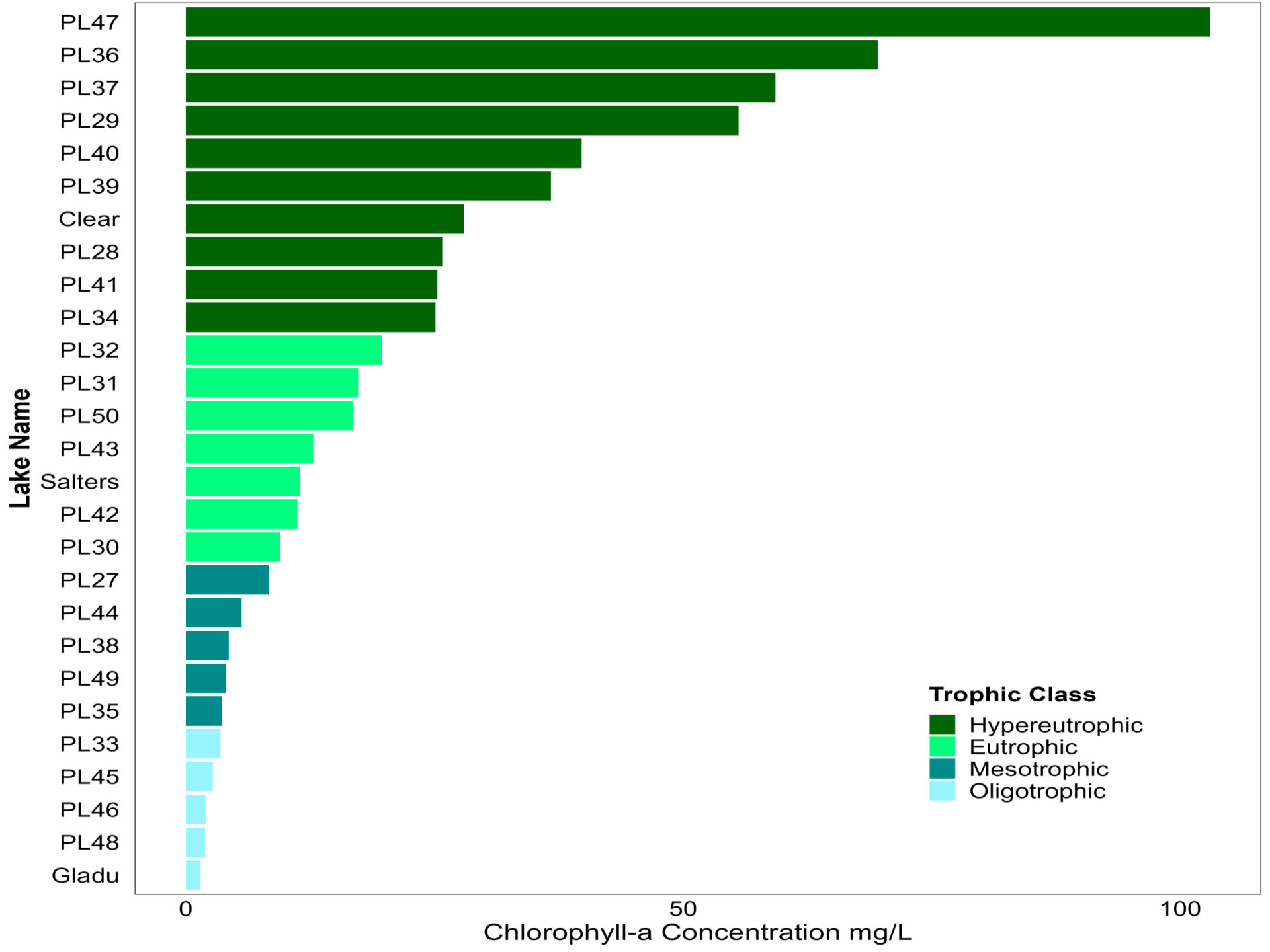
-2023-

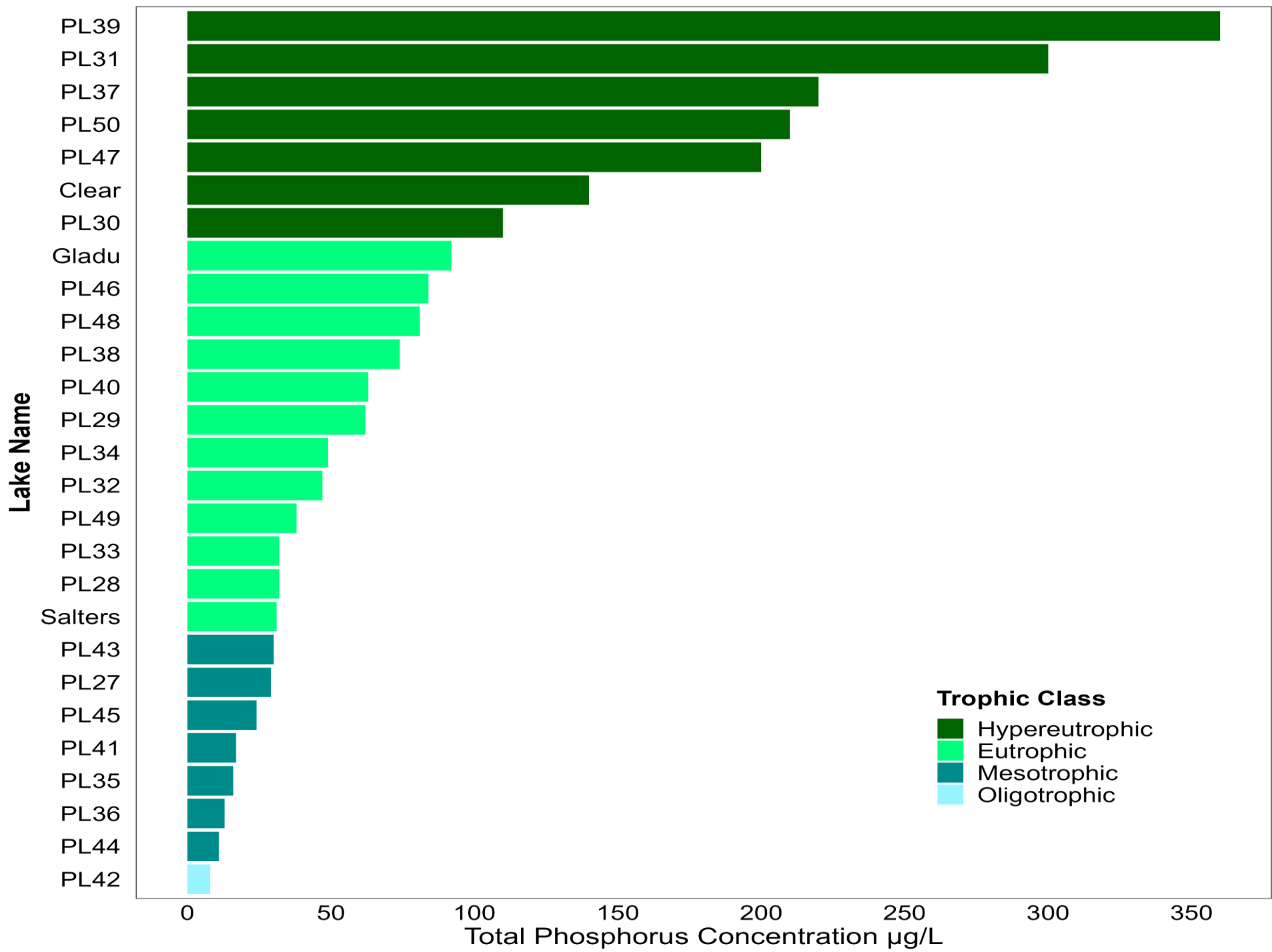
Expanded Regional Survey:
Additional 27 Lakes Sampled
(Report in Preparation)

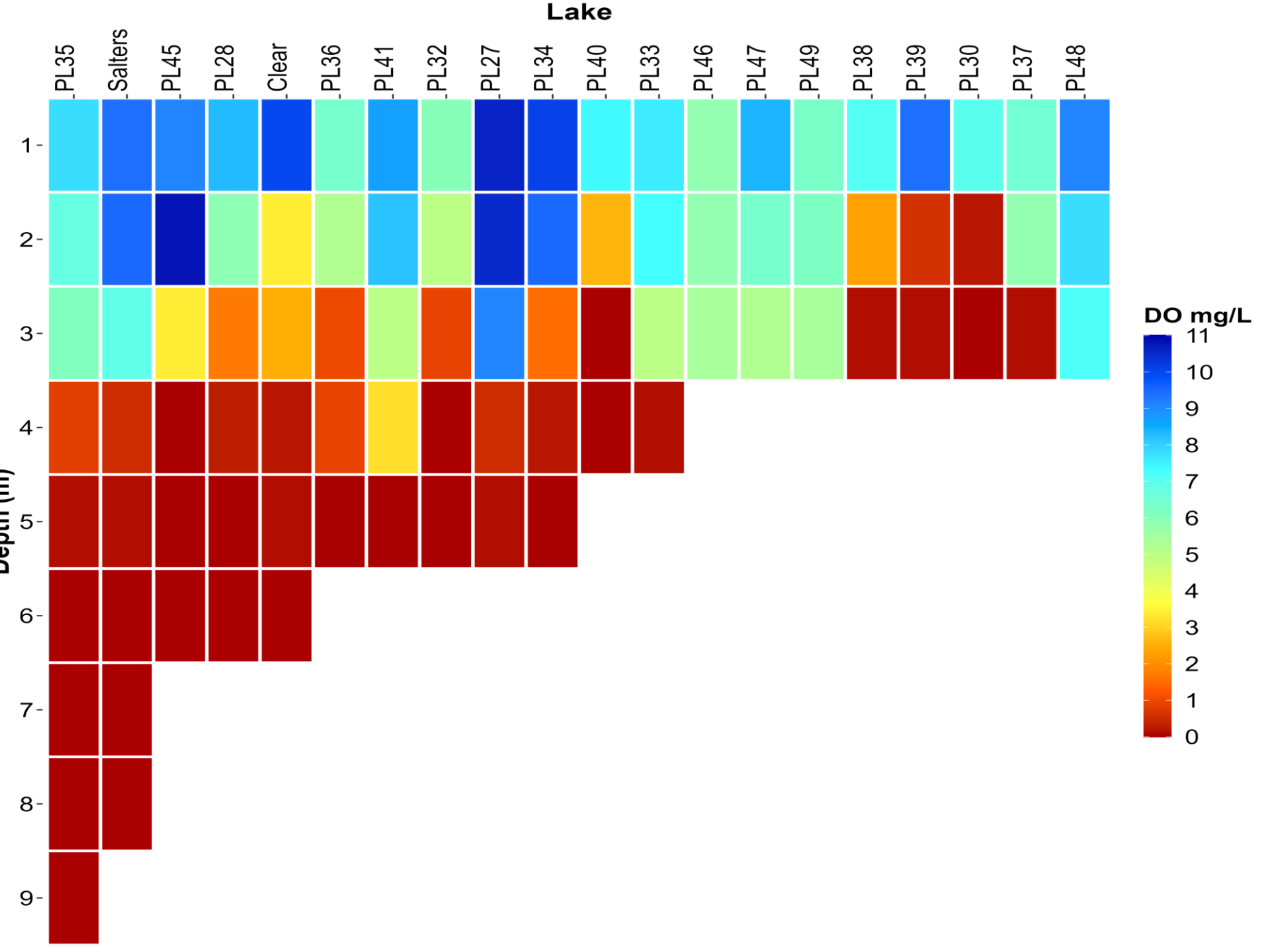


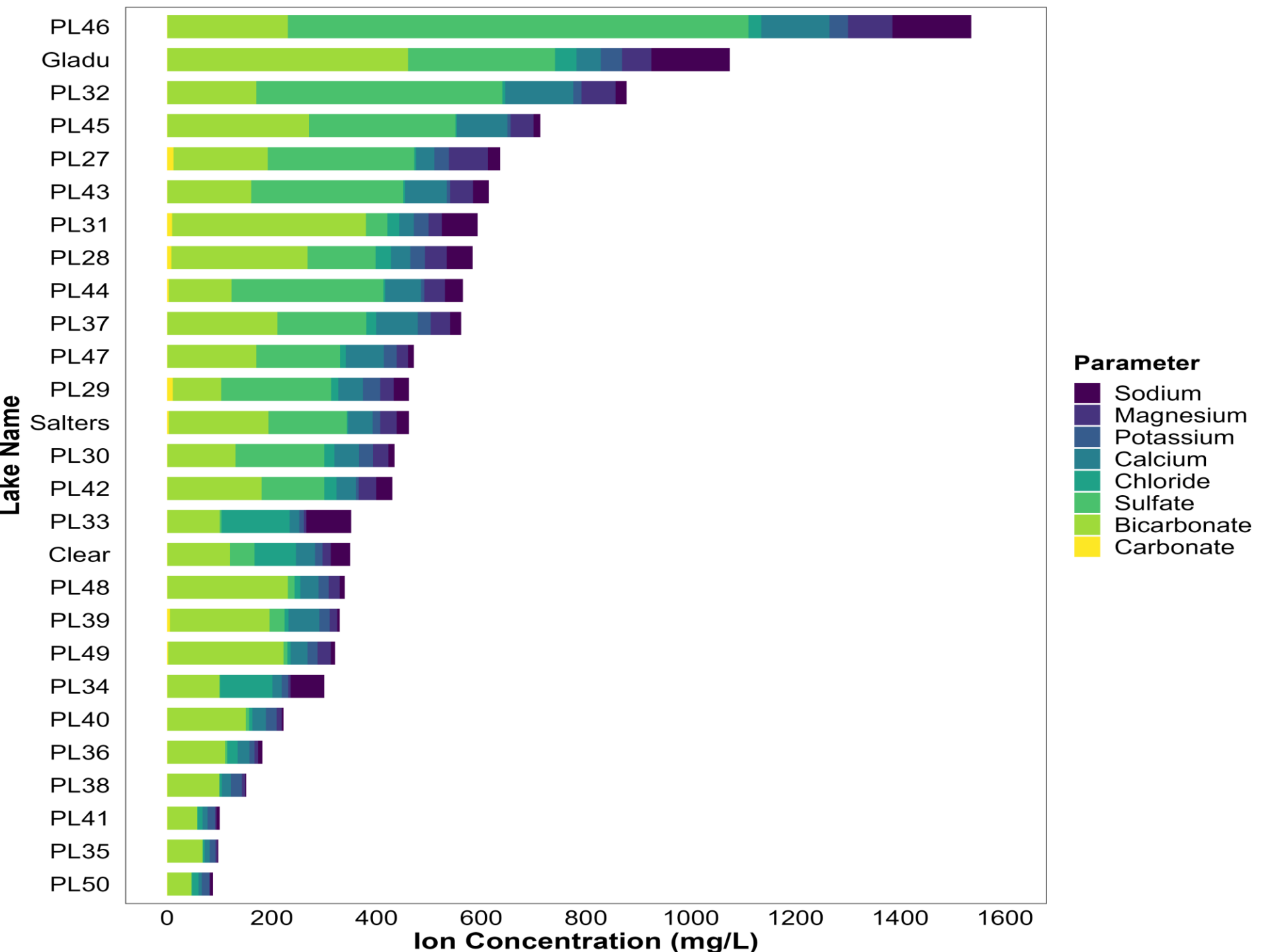
Lake Name











-2024-

Limited Field Program

- ◆ Spring/fall sampling on 3 deepest lakes
 - (Mayatan West, Gerharts, Hubbles)
- ◆ Summer sampling on 5 lakes
 - Byers, Leo's (PL9), Gerharts, PL4 + PL5 (Roi lakes)
- ◆ Fall sampling on one unique lake (PL51)
- ◆ Extensive new drone footage
- ◆ Total = 78 Lakes
- ◆ (Data in preparation)

PL9 (Leo's Lake) Oct 6 2022



PL9 (Leo's Lake) Aug 20, 2024





-2025-

- ◆ Community awareness and education
 - Enhanced video
 - Educational lake overview report (78 lakes)
- ◆ Collaboration with Parkland County
- ◆ Groundwater overview (Dr. Brian Smerdon)
- ◆ New technical analyses
 - Fisheries surveys (eDNA)
 - Sampling more new lakes (10+?)
 - Watershed delineation, land cover, riparian health
 - Vulnerabilities, expanding human population, water quantity/climate issues

For more information on this project
please go to the ALMS web site

- Look under “Programs”
- “Lakes of the Carvel Pitted Delta”
- Summary Report - 2021 Lake Survey Project
- Summary Report - 2022 Lake Survey Project
- Drone videos produced by Dave Mussell
- 2023 Report – finalized
- 2024 Report – to be prepared
- <https://alms.ca/carvel-pitted-delta/>

Thank you!

