

**Lakes of the Carvel Pitted Delta  
-Stony Plain Region-  
Presented to the ALMS Annual Conference  
Sept 29, 2022  
David Trew**



Photo Credit: O2 Planning + Design Inc. and Parkland County

# Key messages

- ◆ Many beautiful small lakes....a unique lake district in Parkland County
- ◆ 26 “named” lakes, 50+ “unnamed” lakes
- ◆ Historic water quality exist for certain lakes\*
- ◆ Preliminary survey on 12 lakes in summer 2020
- ◆ Larger survey conducted in 2021 (44 lakes)
- ◆ Additional work in 2022 (40-50 lakes)
- ◆ Wide range of water quality conditions
- ◆ Limited information on lake hydrology/depths
- ◆ Landowners have been very interested, helpful



# Collaborators

- 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

# The People

## ◆ Alberta Lake Management Society

- Brad Peter, Caleb Sinn

## ◆ University of Alberta

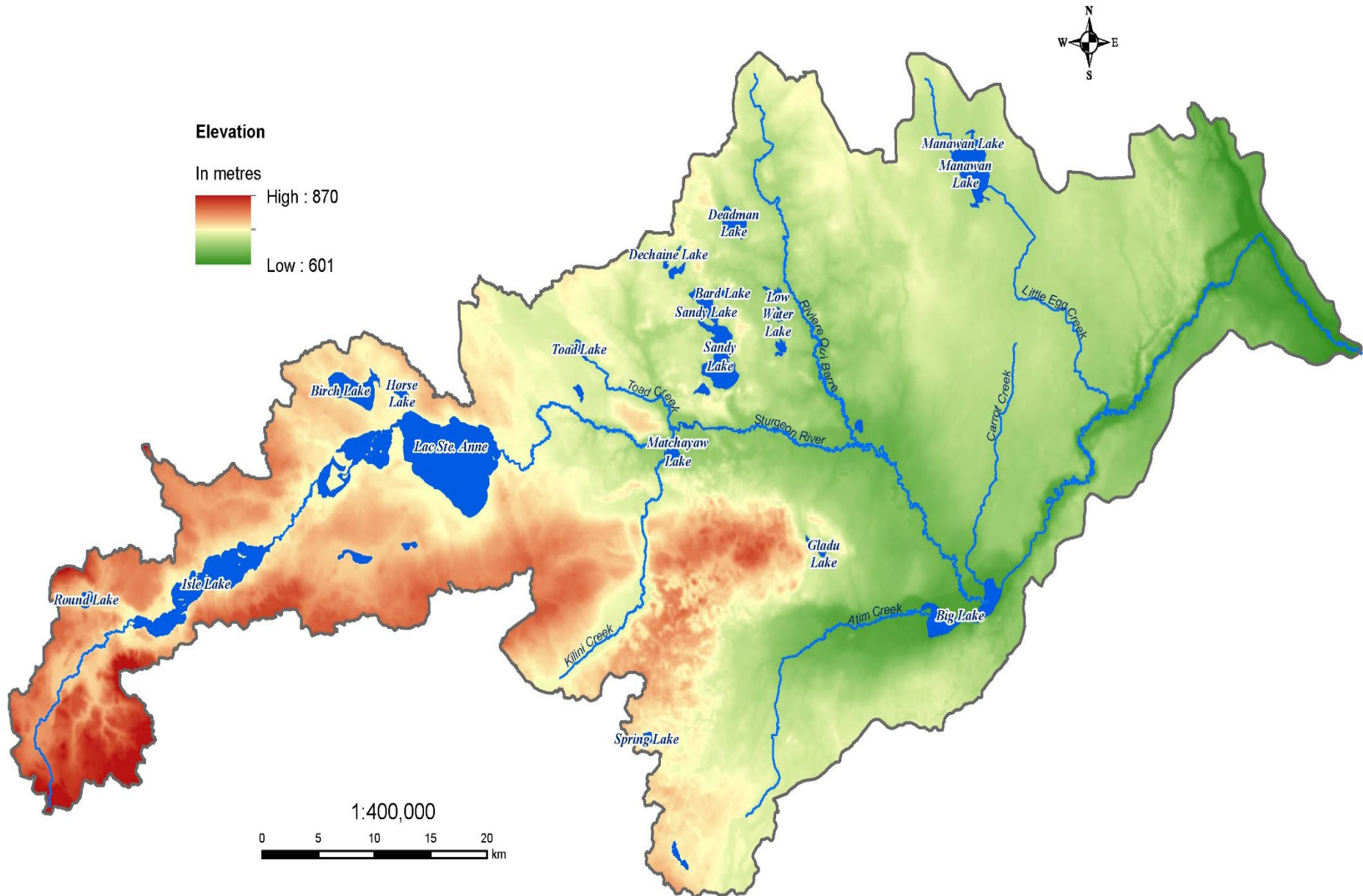
- Dr. Dan Alessi, Dr. Konstantin Von Gunten, Dr. Brian Smerdon, Jenna Maccagno

## ◆ Field Volunteers, Data Contributors/Assistance

- Alec MacDonald, Walt Neilson, Jennifer Regier, Eric Neilson, Mike Myshak, Alex Oiffer, Dale Loosemore, Tyler Shyry, Pauline Molnar, Dr. Steve Craik, Alvin Steinke, Mary Ellen Shain, Dave Mussell

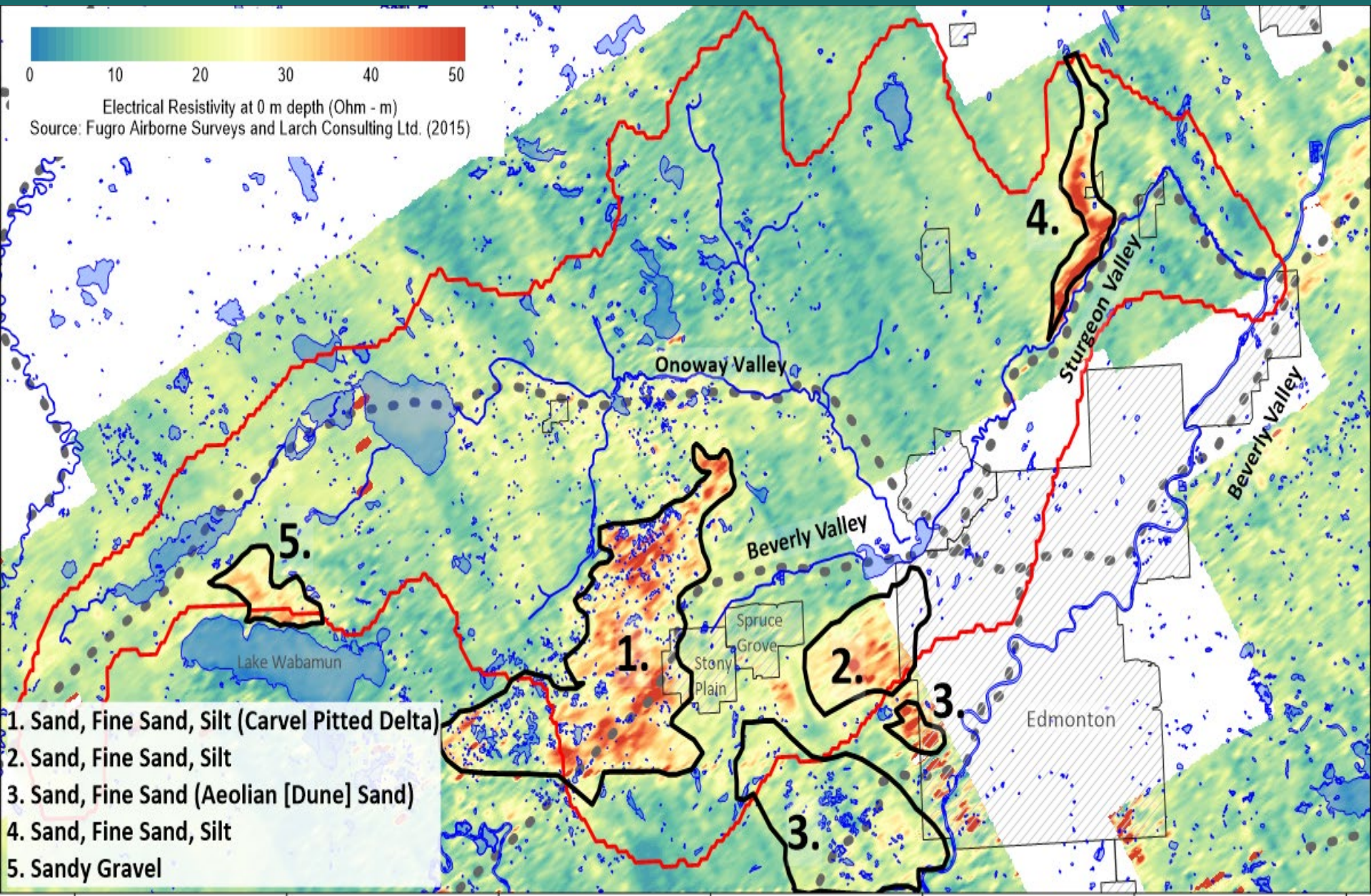


# Sturgeon River Watershed: Topography





# The Carvel Pitted Delta

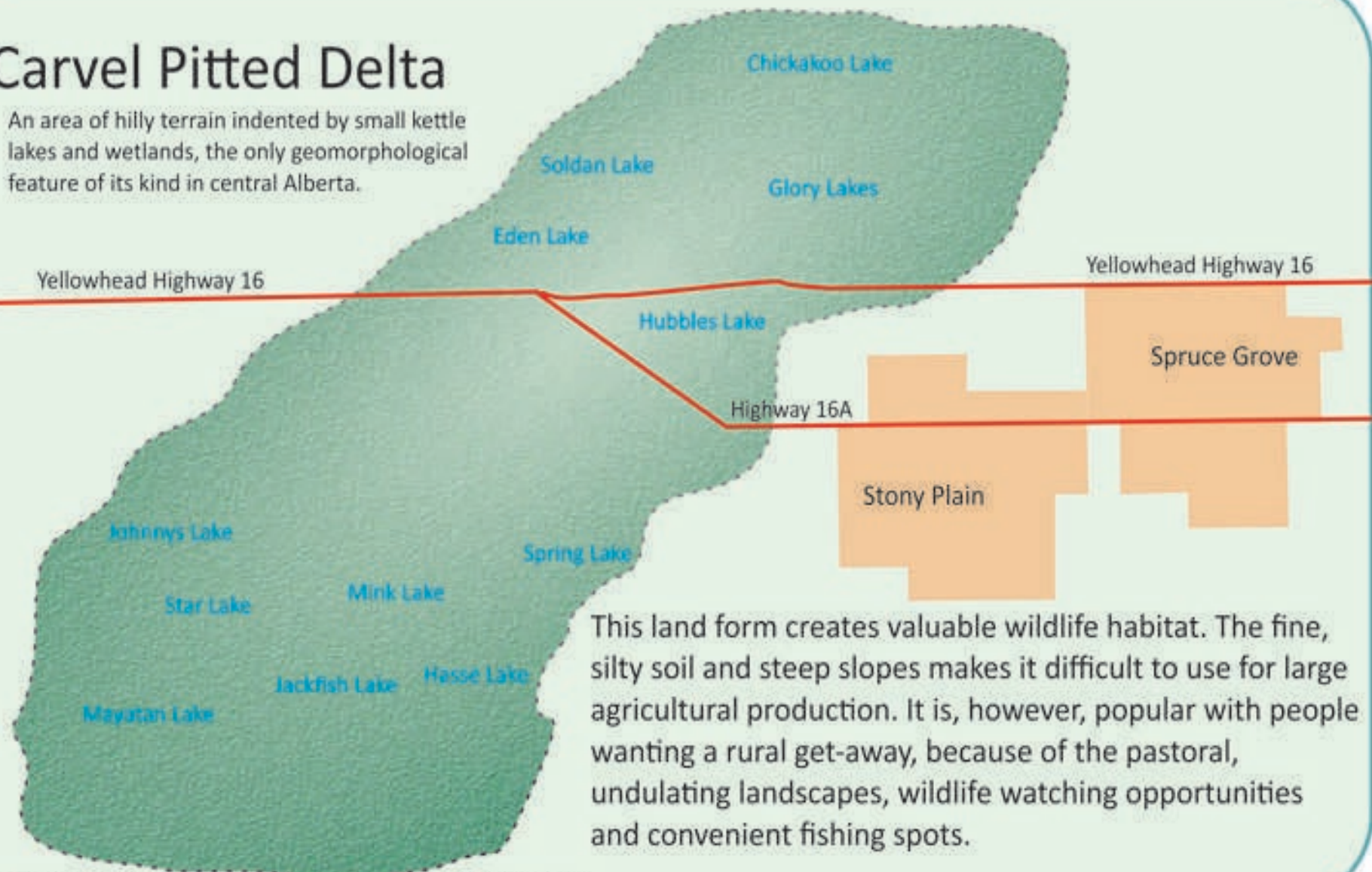




# The Carvel Pitted Delta

## 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 Pitted Delta”

More information on this post-glacial landform and its unique hydrogeology can be found in the following NSW technical report:

“Summary of Groundwater Conditions in the Sturgeon River Basin” (Alex Oiffer, 2019)

<https://www.nswa.ab.ca/resource/groundwater-conditions-sturgeon-river-basin/>



# Named Lakes (26)

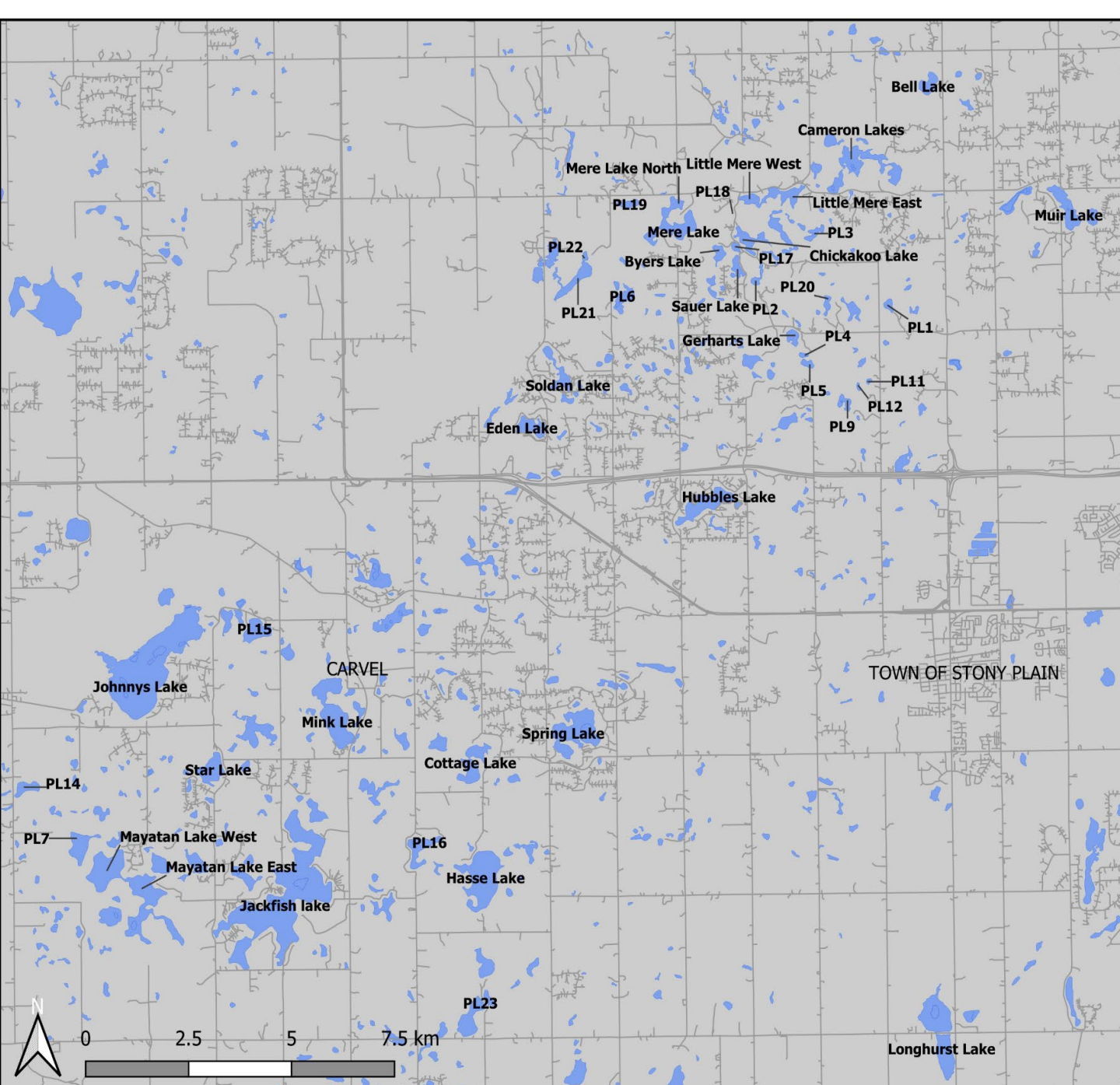
- ◆ Atim
- ◆ Bell
- ◆ Byers
- ◆ Cameron
- ◆ Chickakoo
- ◆ Cottage
- ◆ Eden
- ◆ Gerharts
- ◆ Gladu
- ◆ Glory
- ◆ Hasse
- ◆ Hubbles
- ◆ Jackfish
- ◆ Johnny's
- ◆ Kettle
- ◆ Longhurst
- ◆ Mayatan
- ◆ Mere
- ◆ Little Mere
- ◆ Mink
- ◆ Muir
- ◆ Sauer
- ◆ Soldan
- ◆ Spring
- ◆ Star
- ◆ Whale

# Carvel Pitted Delta Survey 2021 Report

## Sample Sites

### Legend

- Roads
- Waterbodies



NAD83 / Alberta 10-TM (Forest)



# Project Origins

- The collaboration between NSW and local lake communities began in 2011 with a request for assistance from MLMA
- A landowner requested help in assessing a lake on their family property in 2018



# **Integrated Watershed Management Plan for the North Saskatchewan River in Alberta**



North Saskatchewan Watershed Alliance

## Mayatan Lake State of the Watershed Report



August 2012



## **Mayatan Lake Watershed Management Plan**



July 2016

**Jackfish Lake  
State of the Watershed Report**



**April 2016**

## Isle Lake and Lac Ste Anne State of the Watershed Report



May 2017



**Hubbles Lake  
State of the Watershed Report**



**December 2018**

# June 2018





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





























The lake was sampled for the first time in Aug 2019. The nutrient and algal concentrations were surprisingly low.



# Autumn 2019: Spring fed?







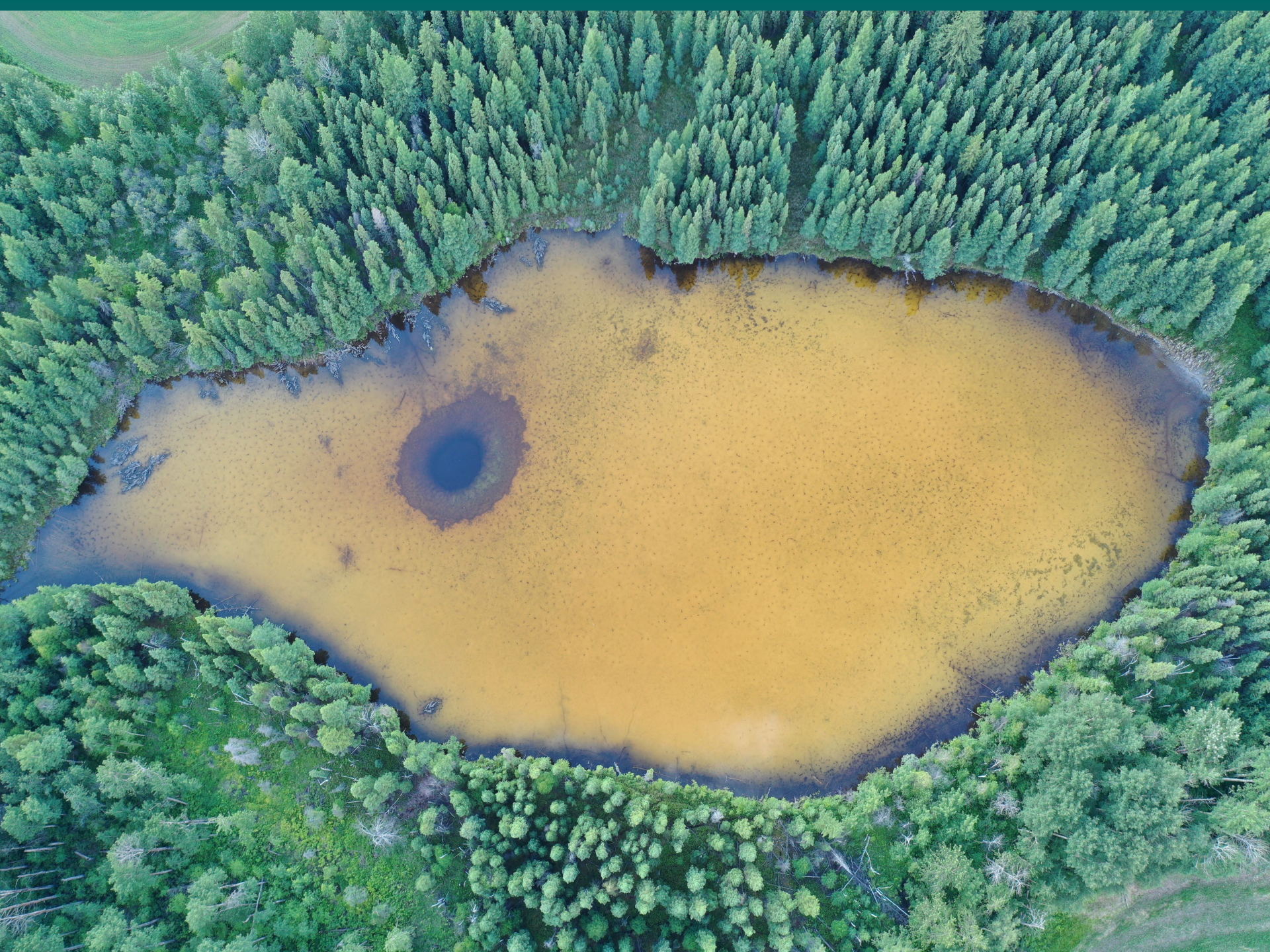


Satellite and 2020 drone images confirmed that the lake was fed by three upstream “fens”



















Question:

Are there other similar lakes in the Stony Plain Region?

- Atlas of Alberta Lakes-
- The Rural Community-











# The 2020 Project: (ALMS, U of A)

## 12 Lakes

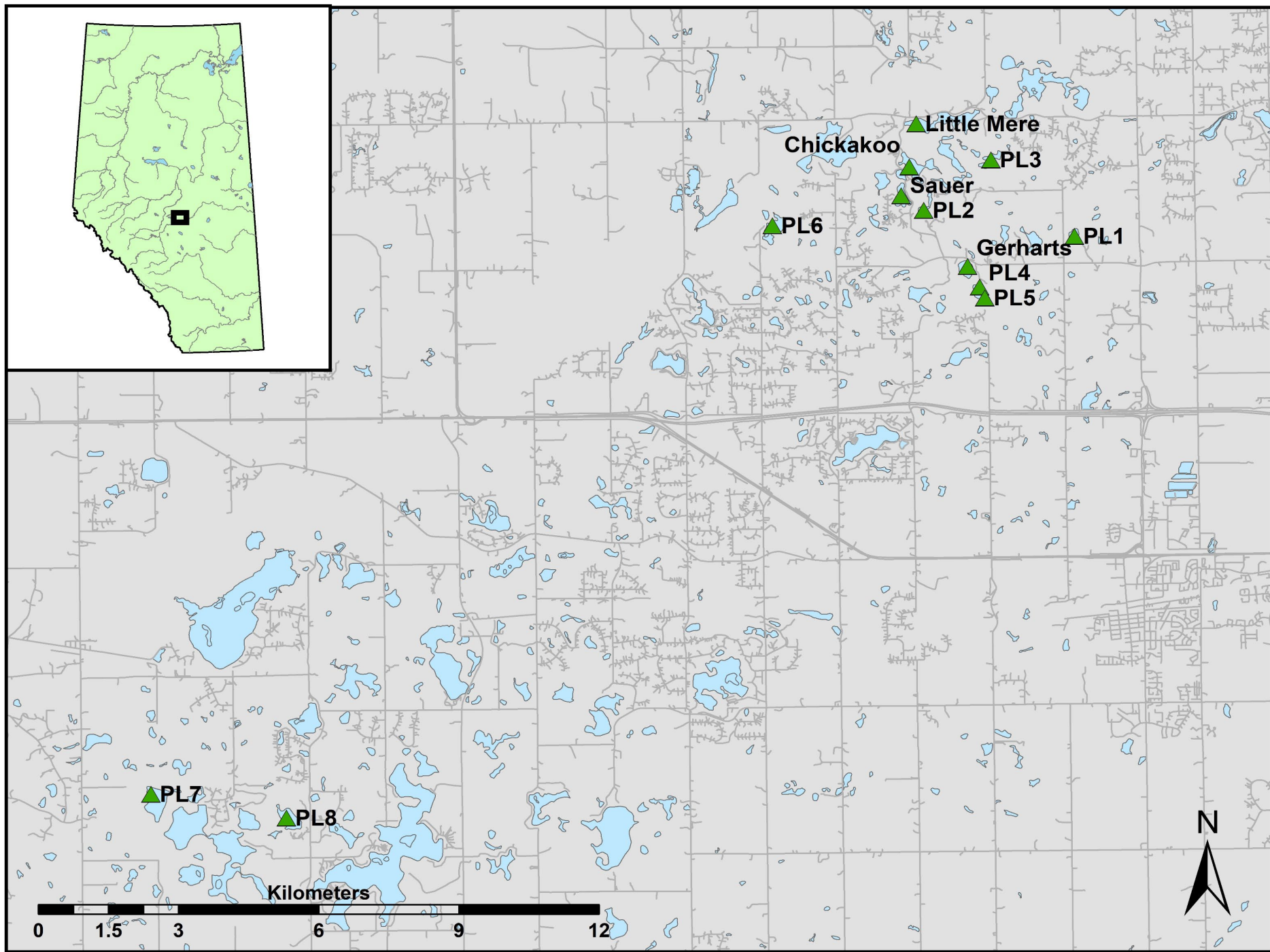
### Named Lakes

- ◆ Gerharts Lake
- ◆ Little Mere Lake
- ◆ Chickakoo Lake
- ◆ Sauer Lake

### Unnamed Lakes

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







# The 2020 Volunteer Sampling Team :

Alec MacDonald

Dr. Konstantin Von Gunten\*

Caleb Sinn

David Trew









SAUER  
LAKE

INTEX

LAKE  
SAUER











# Photos of the 2020 study lakes



PL1 Idano





# PL2 Pete's Pond





# PL3 Troudt Lake





# Gerharts Lake





# PL4 Roi Lake Middle





# PL5 Roi Lake South





# PL6 Kinsey Cove





# Little Mere Lake (west basin)





# Sauer Lake





# Chickakoo Lake





# PL7 (McMorran Lake)





# PL8 (Neilson Lake)





## New Scientific Publication:

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

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Handwritten notes on a yellow paper, likely a fishing log or checklist. The text is partially obscured but appears to include:

- Species
- Time
- Location
- Weather
- Water Temp
- Wind
- Current
- Depth
- Bottom
- Time of Day
- Time of Year
- Time of Day
- Time of Year



# The 2021 Winter Sampling Team:

Walt Neilson

Dale Loosemore

Tyler Shyry

Alvin Steinke

David Trew



MLMA and ALMS - 19 lakes tested  
for late winter dissolved oxygen  
conditions in Feb/March 2021























Summer 2021

MLMA and ALMS - 44 lakes tested  
during Aug and September

Walt Neilson

Pauline Molnar

Dave Trew

Dr. Brian Smerdon

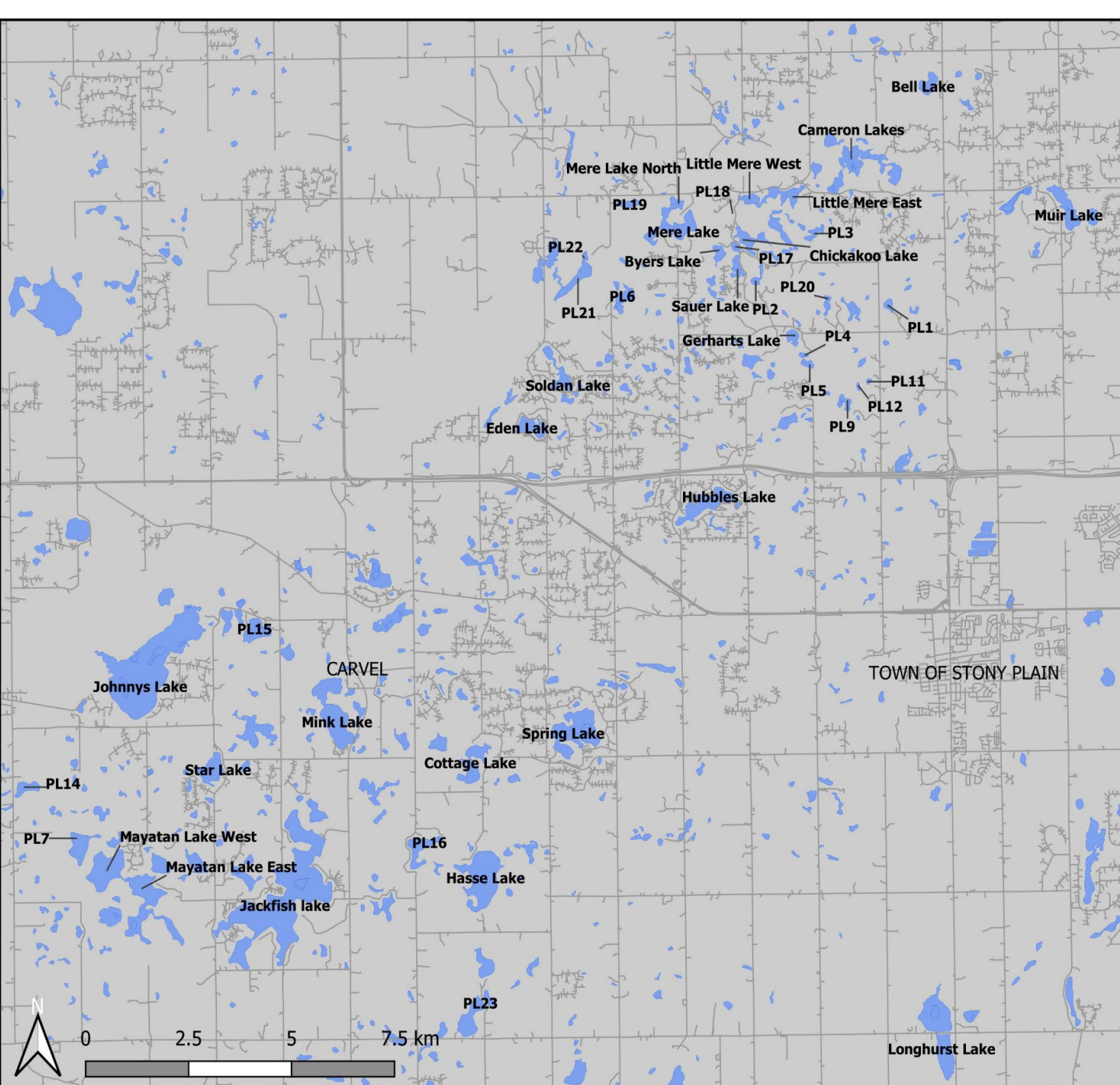


# Carvel Pitted Delta Survey 2021 Report

## Sample Sites

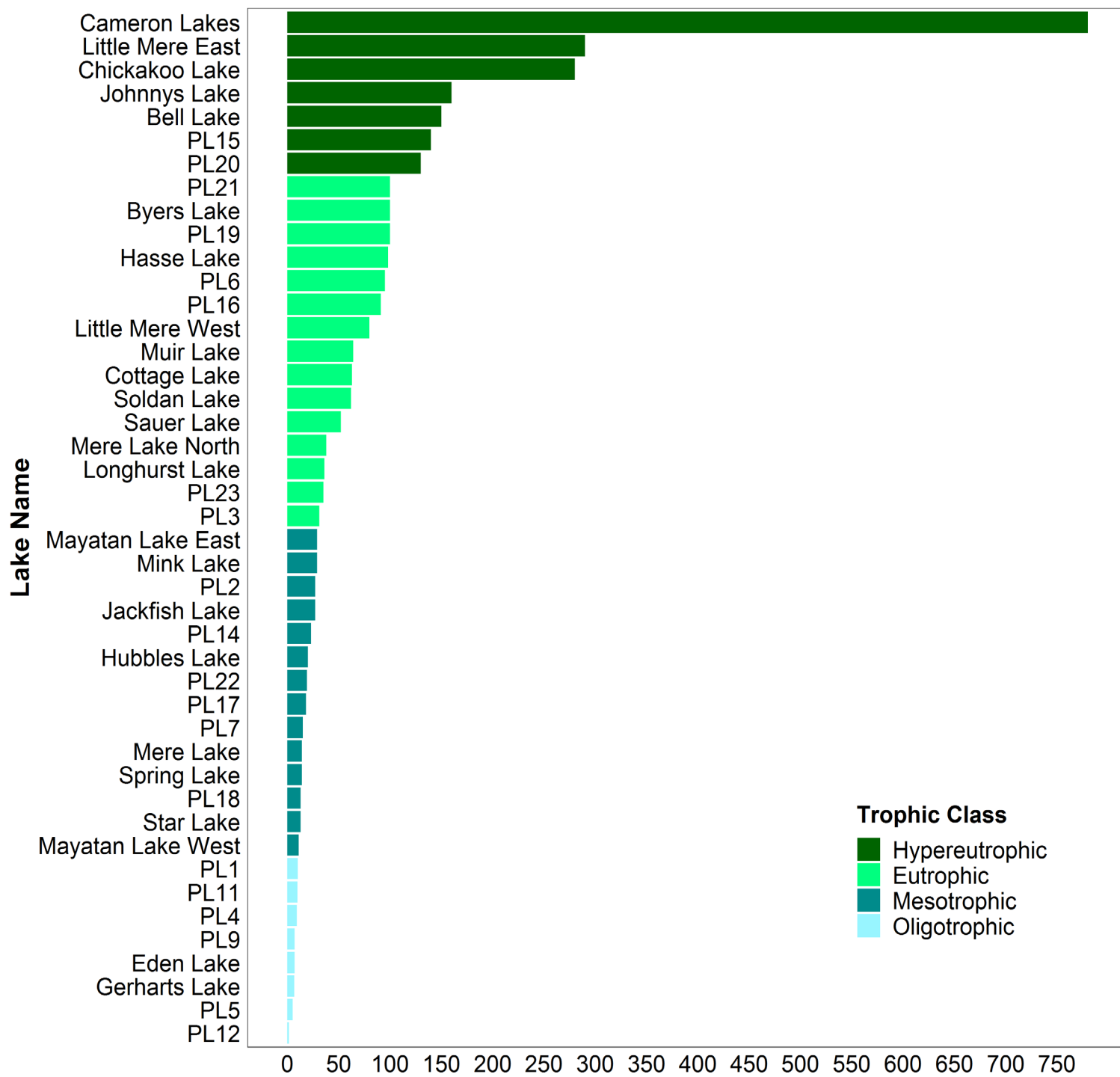
### Legend

- Roads
- Waterbodies



NAD83 / Alberta 10-TM (Forest)







# Carvel Pitted Delta Survey 2021 Report

## Surface Total Phosphorous

### Legend

— Roads

Waterbodies

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

0 - 10

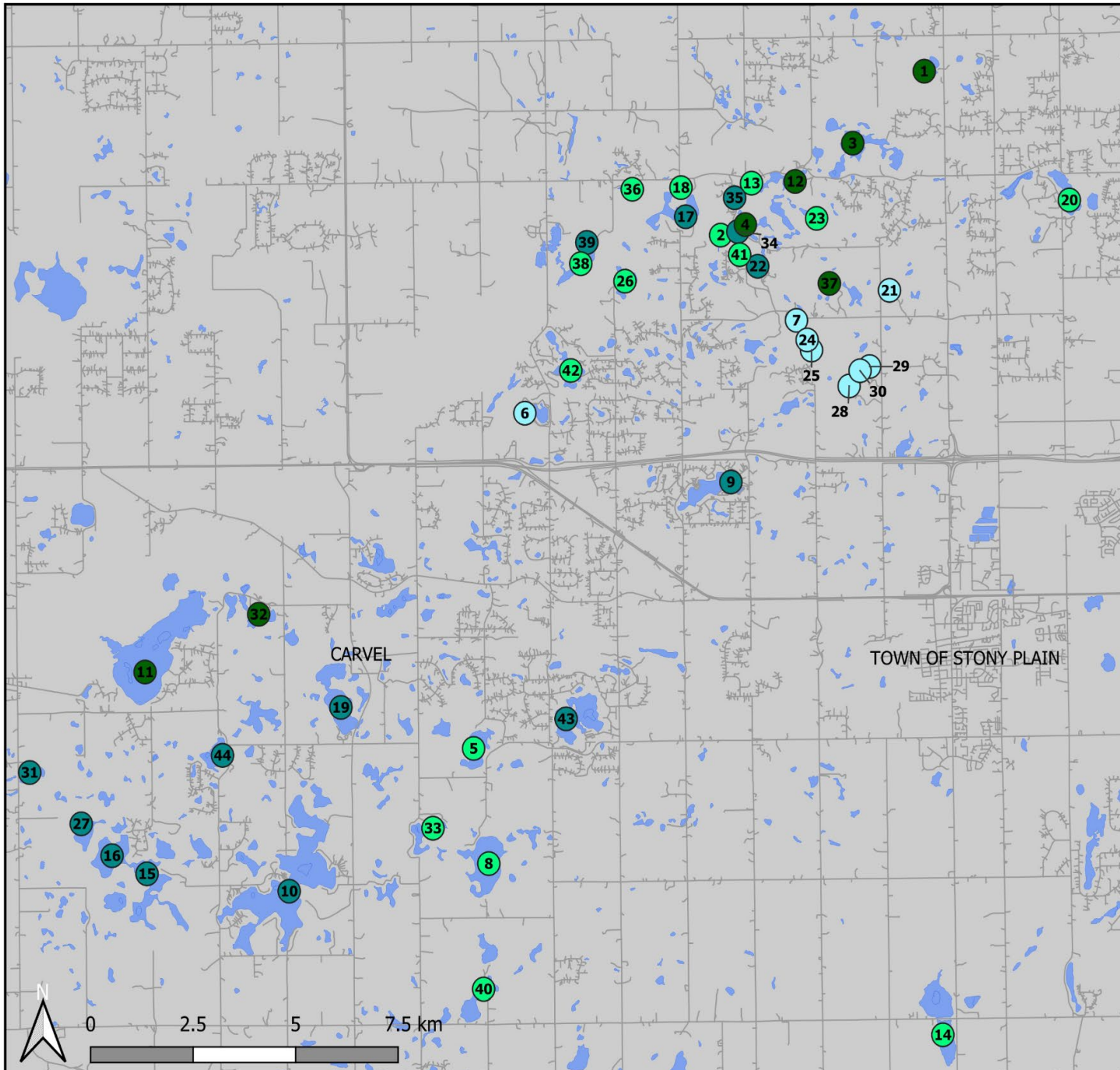
10 - 30

30 - 100

100 - 780

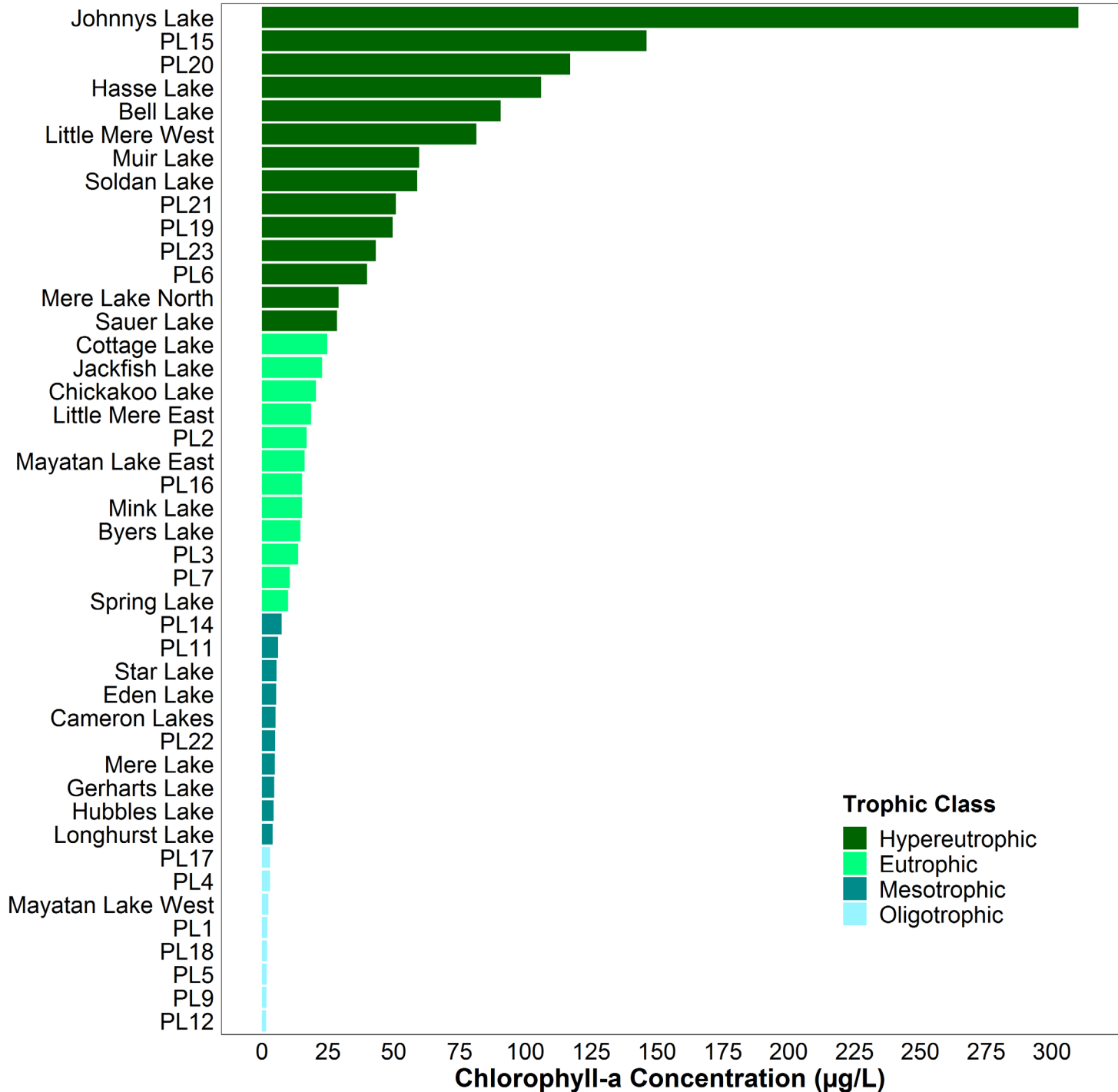


NAD83 / Alberta 10-TM (Forest)





Lake Name





# Carvel Pitted Delta Survey 2021 Report

## Chlorophyll-a Concentration

### Legend

Roads

Waterbodies

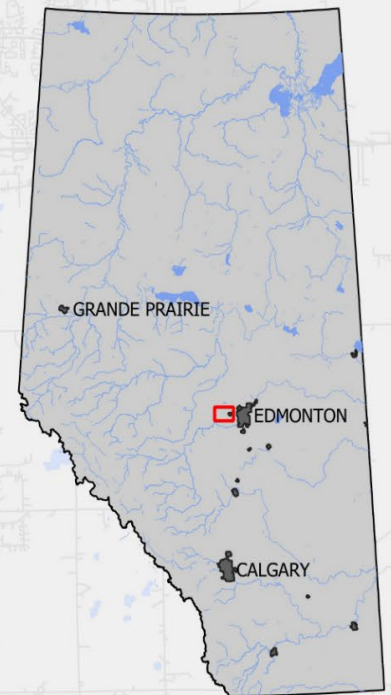
Chlorophyll-a Concentration ( $\mu\text{g/L}$ )

0 - 3.5

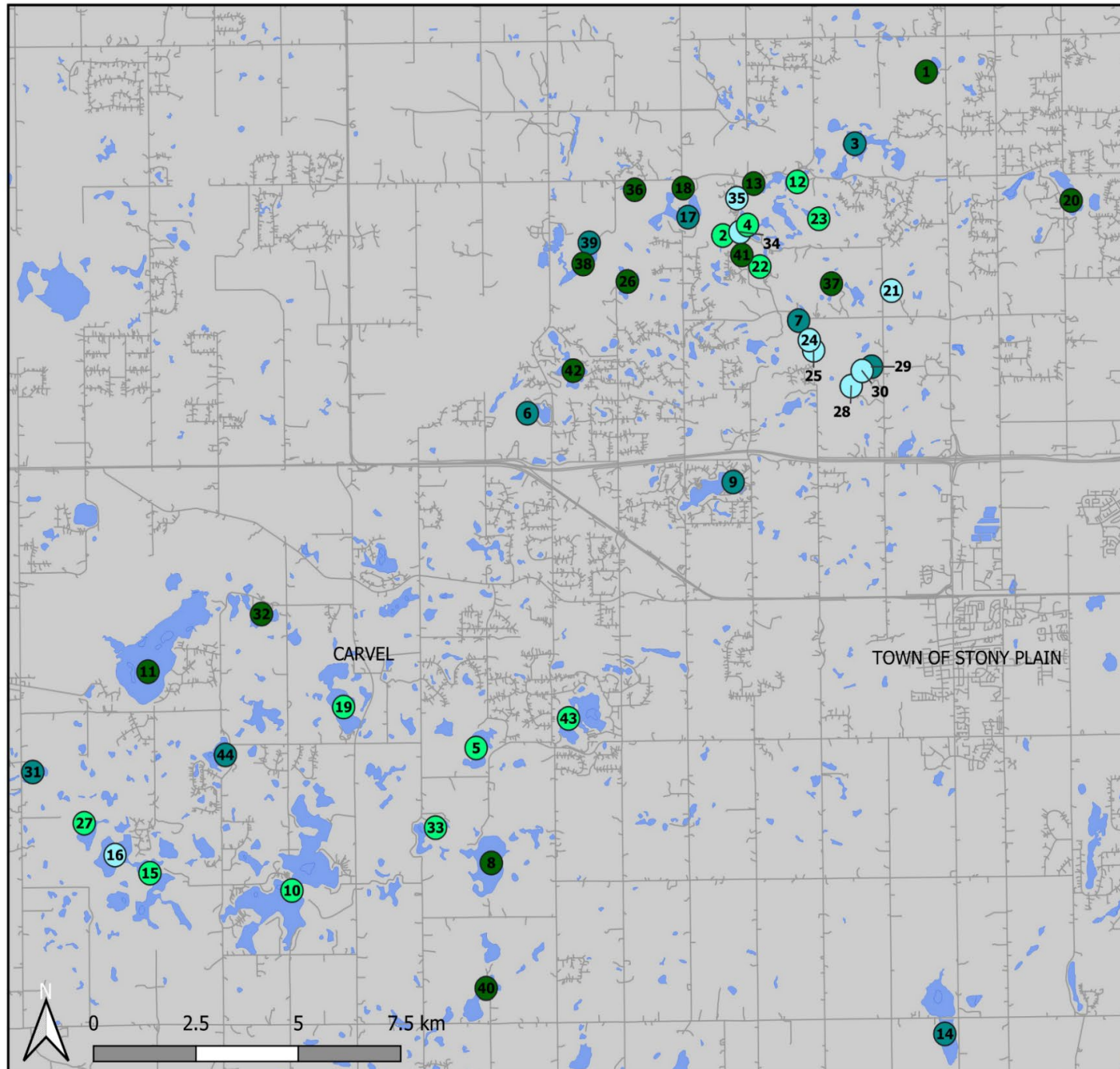
3.5 - 9

9 - 25

25 - 310



NAD83 / Alberta 10-TM (Forest)





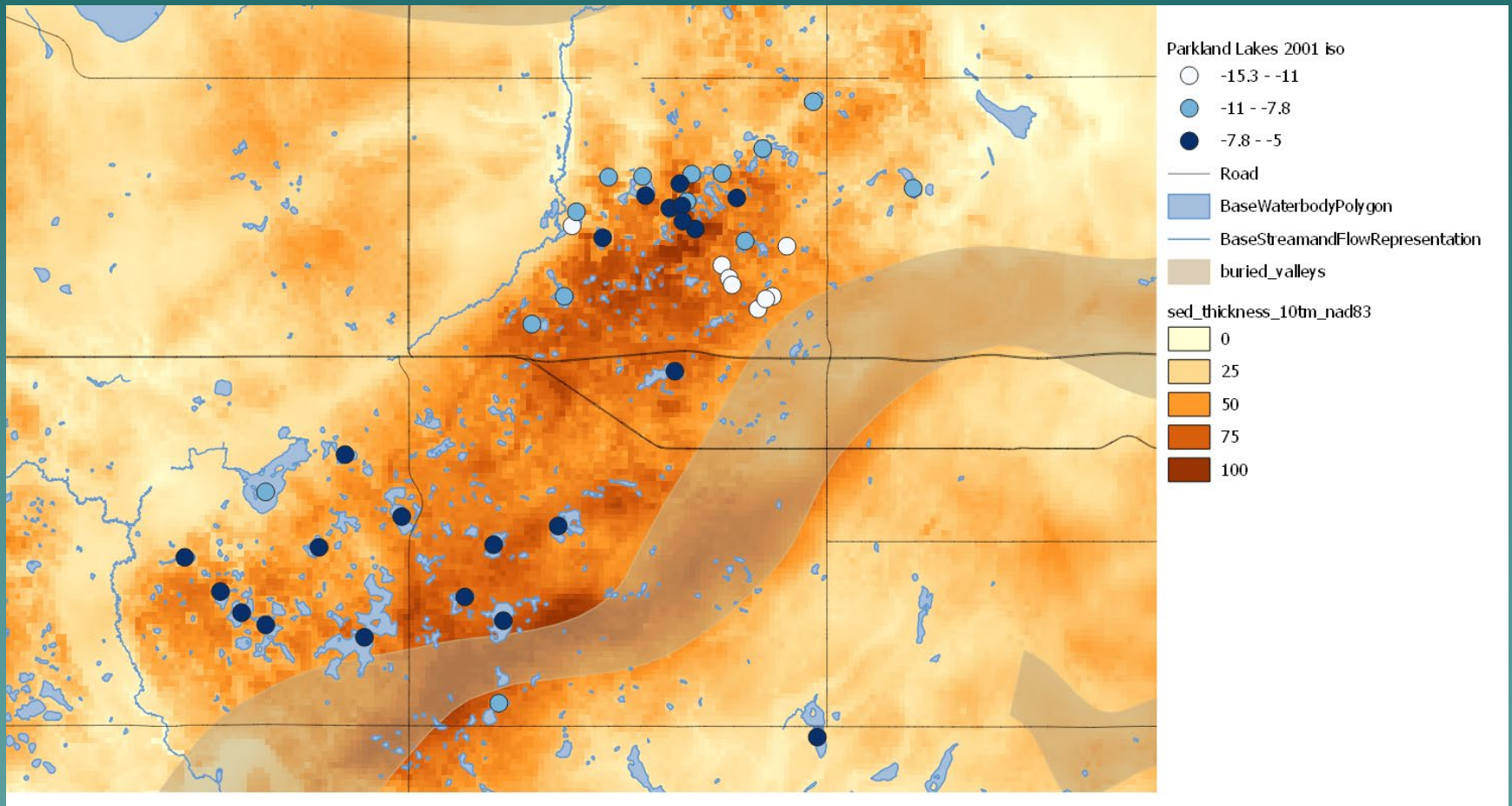








# Dr. Brian Smerdon





PL2 2020





PL2 2020





PL2 2021





Summer 2022

MLMA and ALMS – 40-50 lakes  
tested during Aug and September

Walt Neilson

Dave Trew

Dr. Brian Smerdon

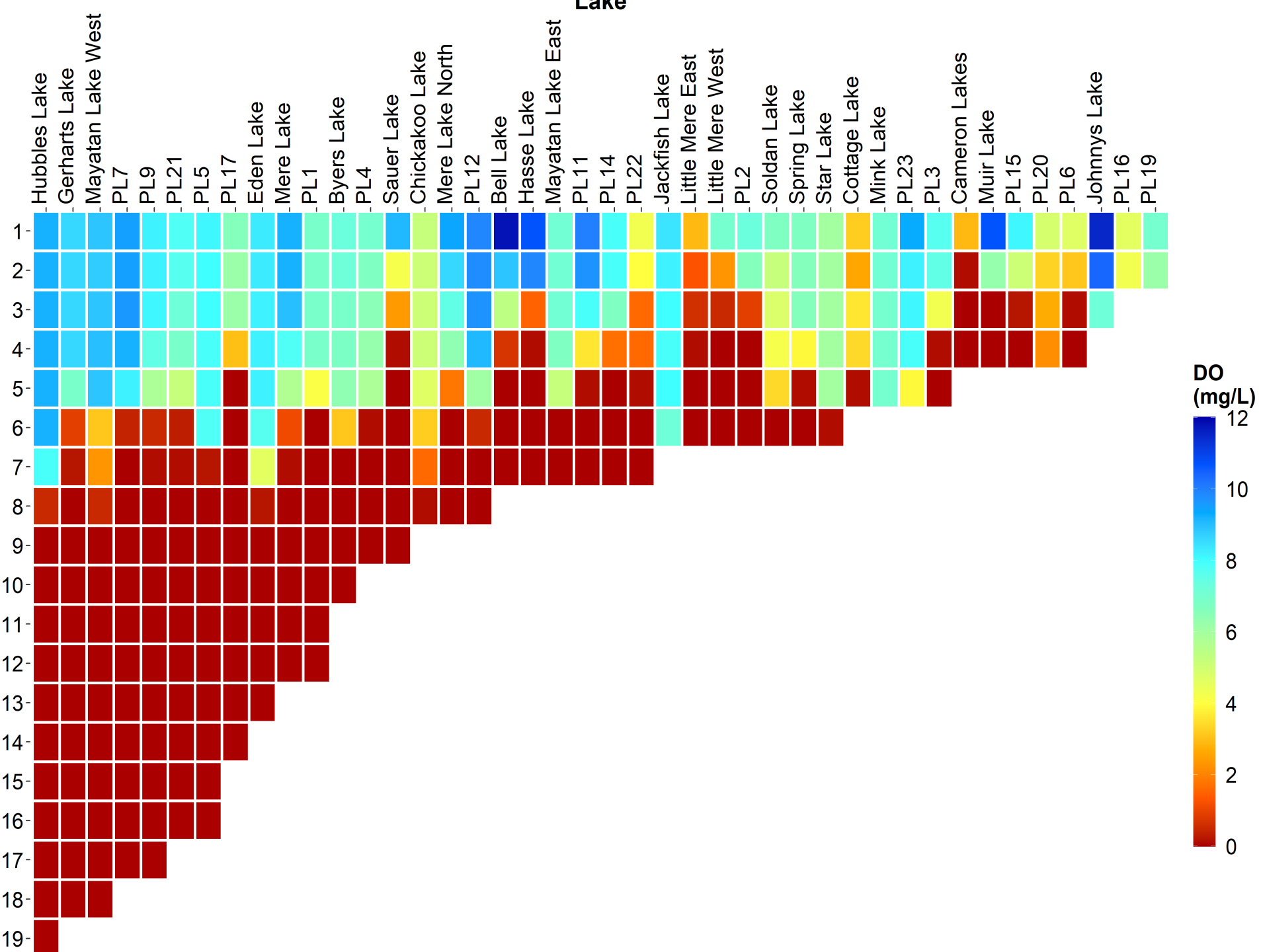
Dave Mussell



# 2022 Additional Work

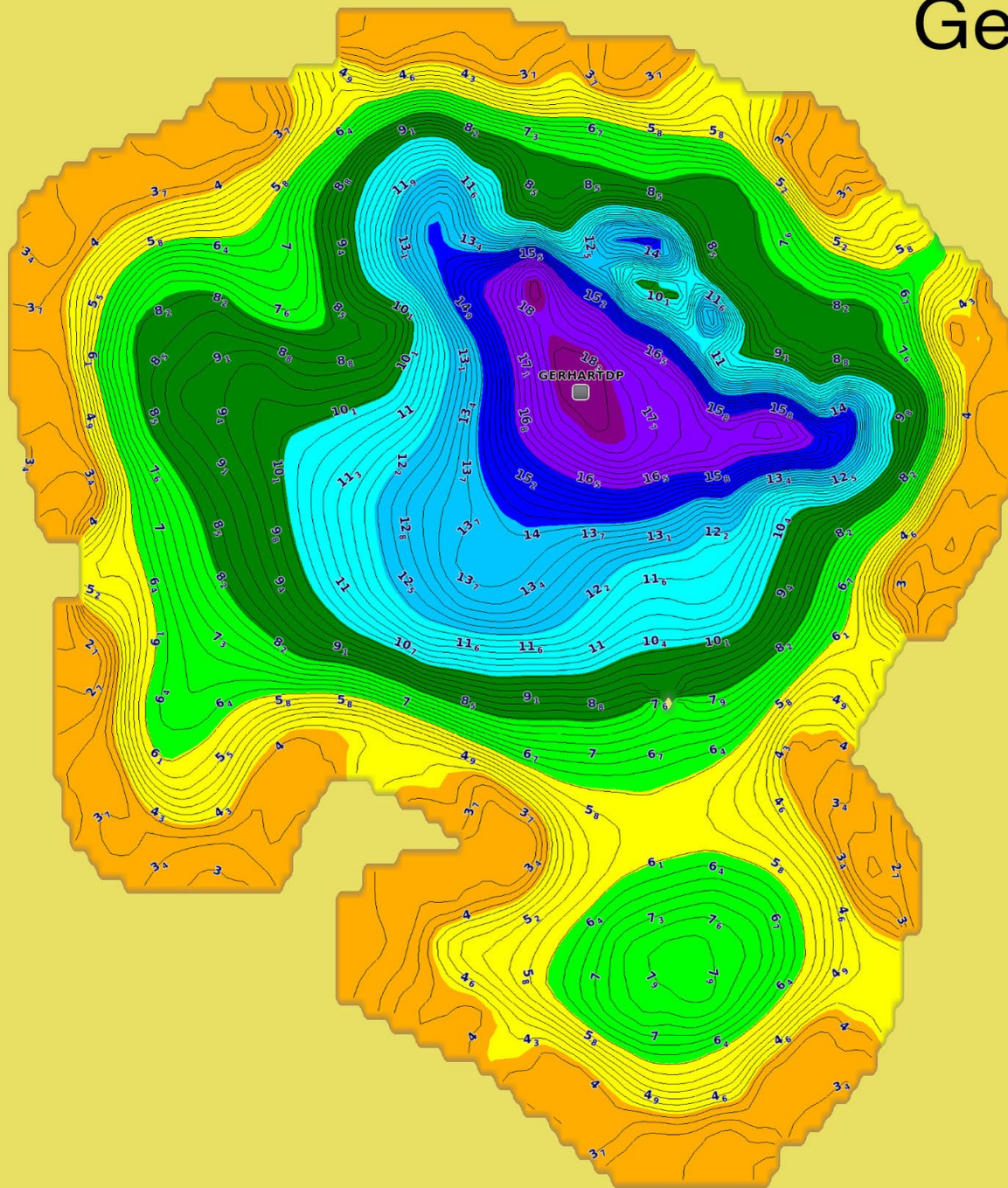
- ◆ Aquatic Invasive Species (AEP)
- ◆ Total and dissolved metals (U of A)
- ◆ Isotopes - Groundwater
- ◆ Bathymetry - Garmin
- ◆ Overhead Drone images
- ◆ GoPro for underwater images
- ◆ Composite sampling (0 -2.5m)\*
- ◆ Sub-surface light profiles (PAR) Apogee







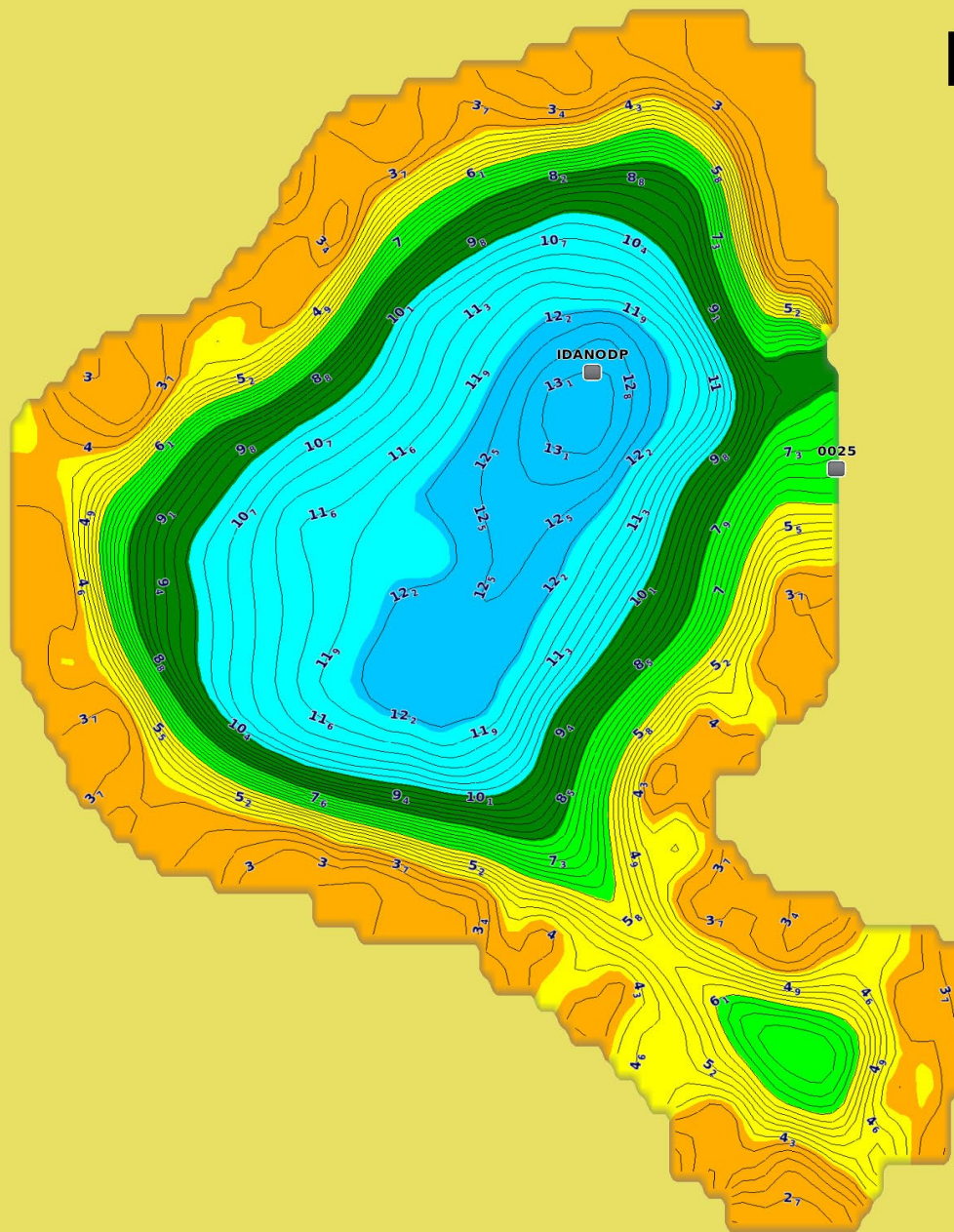
# Gerharts Lake



12m



# Idano Lake



12m



# Additional Information (RL&L)

- ◆ "County of Parkland Fisheries Inventory Reports" (1987)



For more information on this project  
please go to the ALMS website:

<https://alms.ca/carvel-pitted-delta/>

- Report: Lakes of the Carvel Pitted Delta (2021)
- Photo gallery of lakes (2021)– beautiful\*\*
- Presentation to Stony Plain Fish and Game Association January 2022\*\*



Thank you





Thanks again!





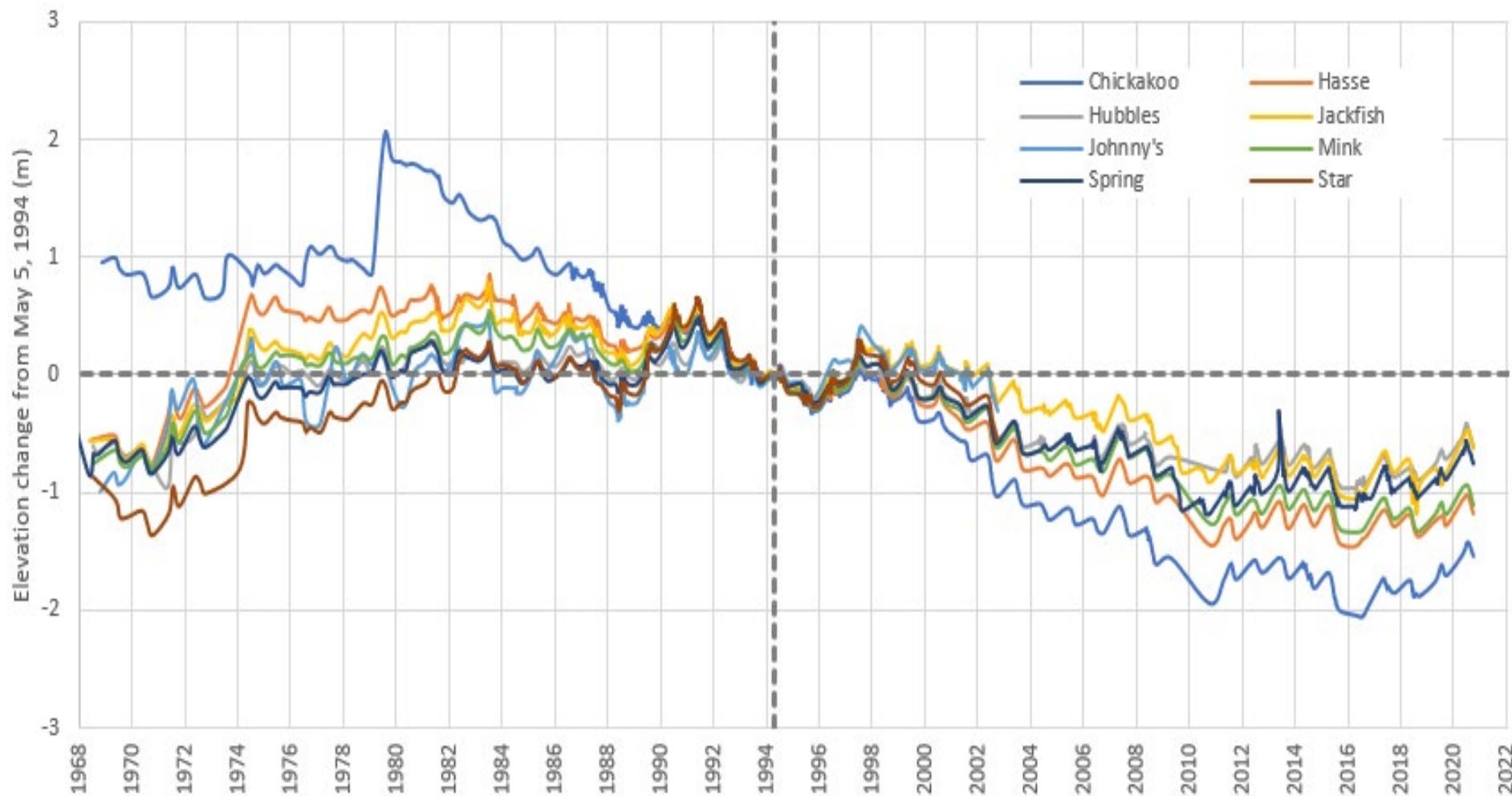








(1968-2020)





# Lake Level Trends at Jackfish Lake Compared with Climate Data (1968-2020)

