

TRAILBLAZER ADVENTURER
INNOVATOR DEFENDER CHALLENGER
ADVENTURER TRAILBLAZER DEFENDER VISIONARY
VISIONARY ADVENTURER TRAILBLAZER CHALLENGER DEFENDER VISIONARY

Manitoba Great Lakes Project

Landscape Architecture 7020 & 7102

May 1, 2019



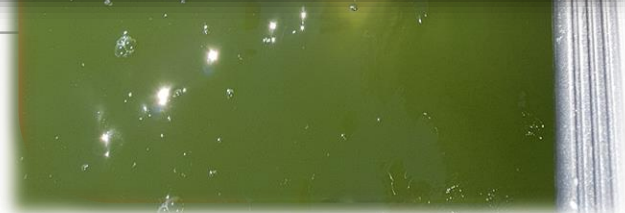
Claire Herbert



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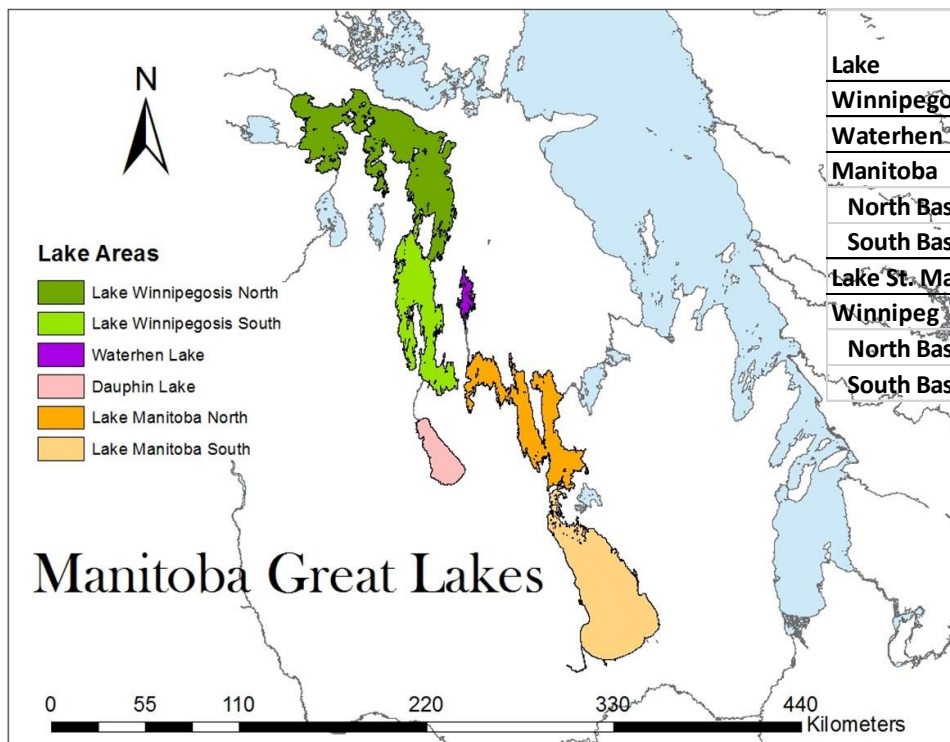
ADVENTURER TRAILBLAZER CHALLENGER DEFENDER VISIONARY INNOVATOR

TRAILBLAZER CHALLENGER DEFENDER VISIONARY INNOVATOR EXPLORER TRAILBLAZER CHALLENGER DEFENDER VISIONARY INNOVATOR EXPLORER

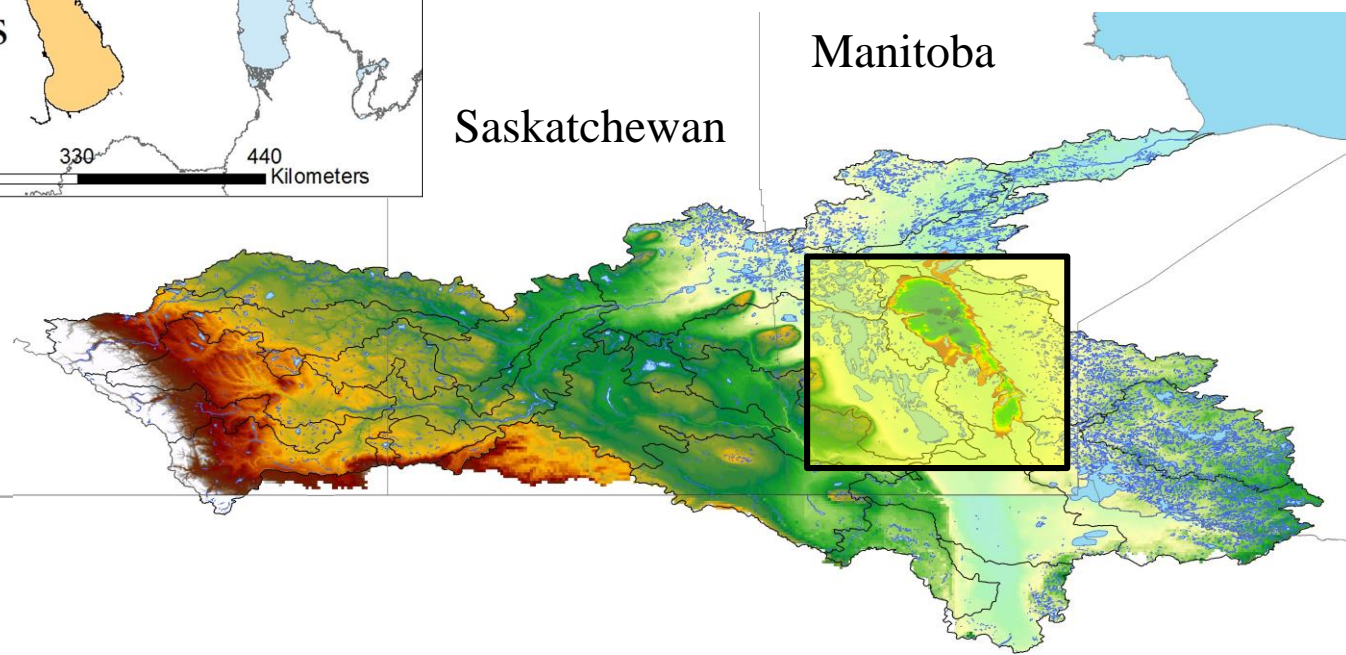


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Lake	Elevation (m. MSL)	Area (km ²)	Rank by area (Canada)	Volume (km ³)	Max. depth (m)	Drainage Area (km ²)
Winnipegosis	253.0	5,370	12th	~40	17.8 (9.1)	54,900
Waterhen	252.0	~210		~0.3	4.4	55,100
Manitoba	247.8	4,660	14th	20.2	6.6	79,800
North Basin		1,800		5.6	5.7	
South Basin		2,860		14.6	6.6	
Lake St. Martin	243.5	~380				82,200
Winnipeg	218.3	23,750	6th	284	36	953,000
North Basin		19,768		232	19	
South Basin		3,981		27.0	36 (12)	





Entrance to
L. Winnipegosis
from salt flat eco
res.



Red Deer R.
meets Salt spring



Salt Flats Eco
Reserve Aug
2018

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2012-2015

Moorings – 10 min intervals

- Ecotriplet – turbidity, chlorophyll, fluorescence, phycocyanin
- Alec CT – temperature, conductivity – 10 min intervals
- Sampled once/month
- Same chemistry suite

Station Info.

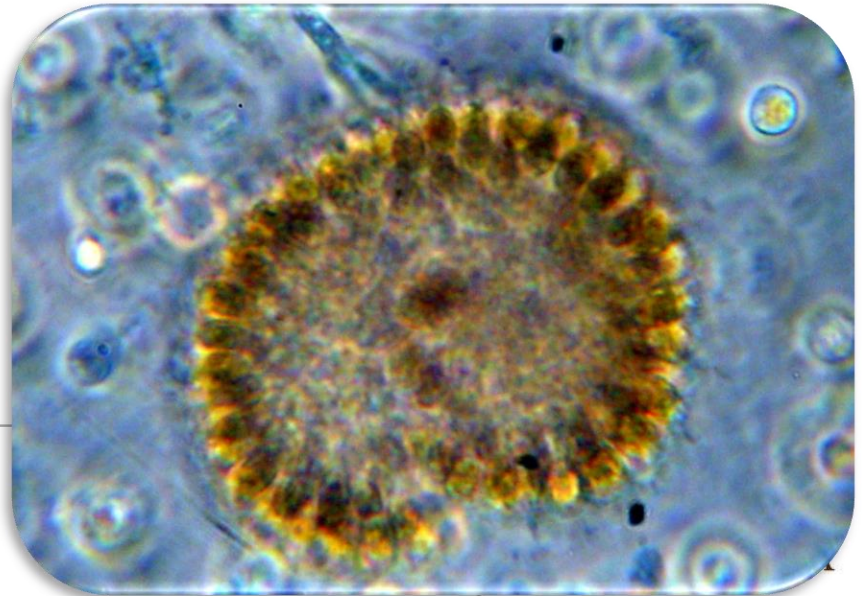
- Wind speed
- Wind direction
- Wave height
- Cloud cover
- Garmin GPS



2016

Whole lake survey for Claire Master Thesis

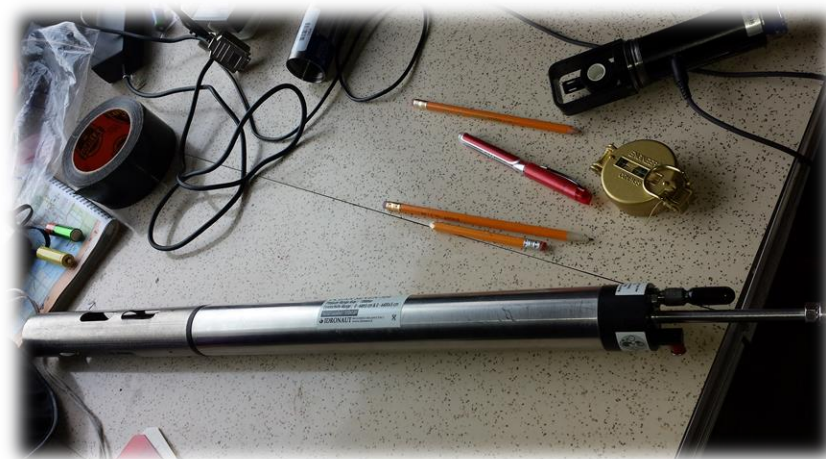
- Spring, summer, fall surveys
- Chemistry
- CDOM, αP
- Algae: chlorophyll, N fixation, toxins, genetics
- Zooplankton



Physical

Idronaut Ocean Seven 304

- Temperature
- depth



Seabird

- Temperature
- Depth
- Oxygen
- Salinity (PSU)
- Turbidity
- Fluorescence
- Irradiance (PAR)

16 ft boat

- Station depth (sonar)
- Station temp (sonar)

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Nethaul - LWPO6, 26 Aug 2016
35 – 40 genus



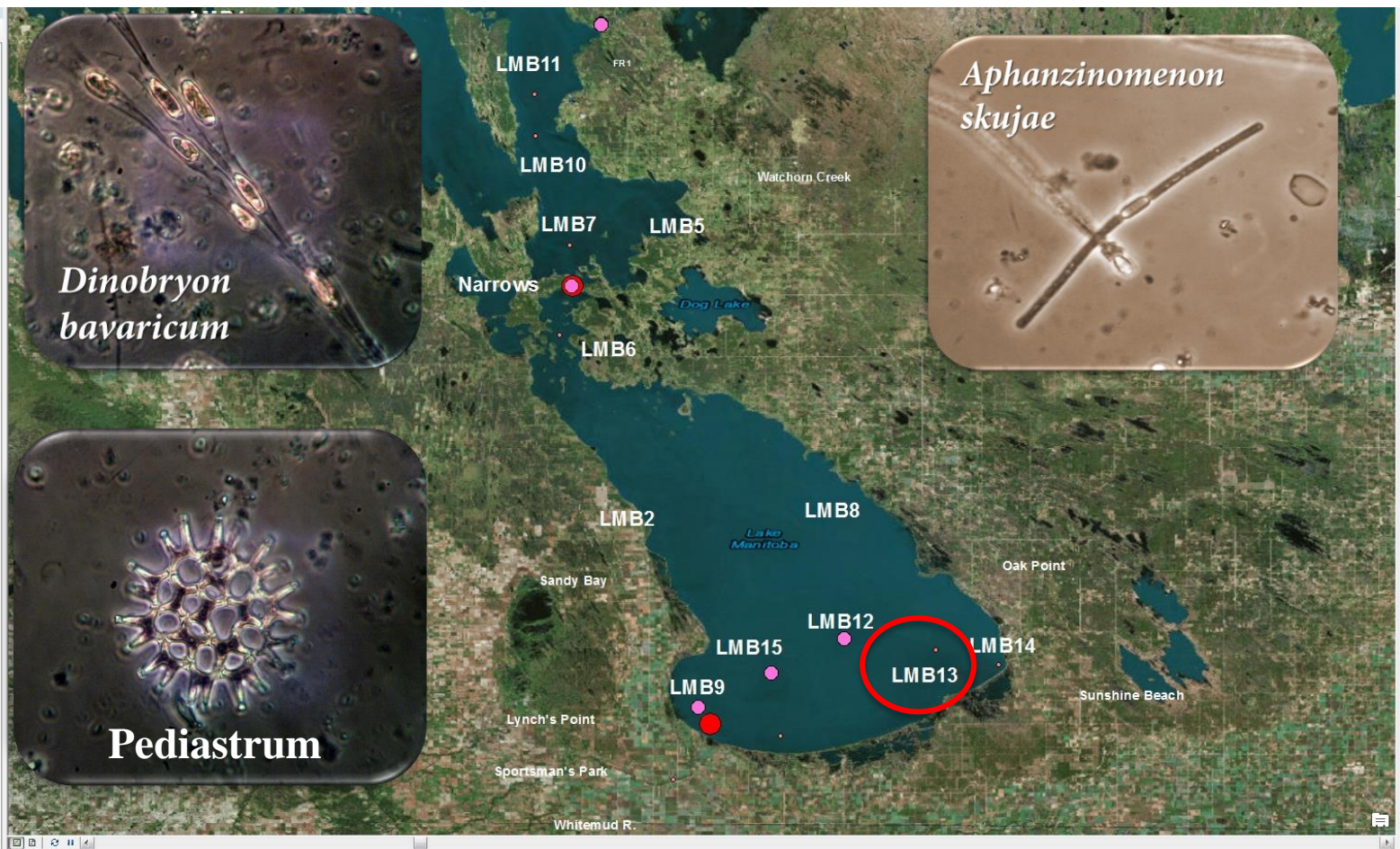
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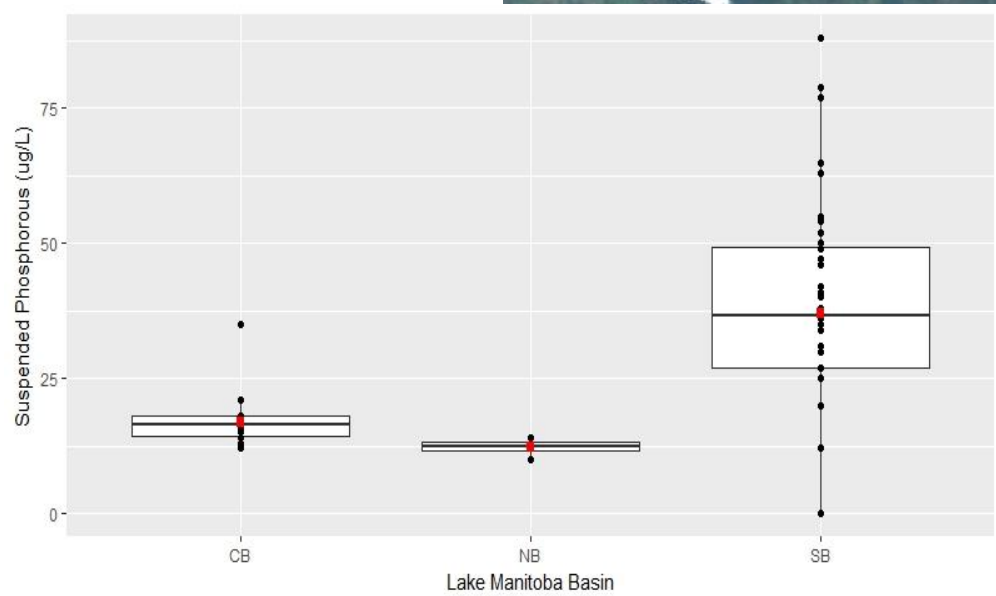
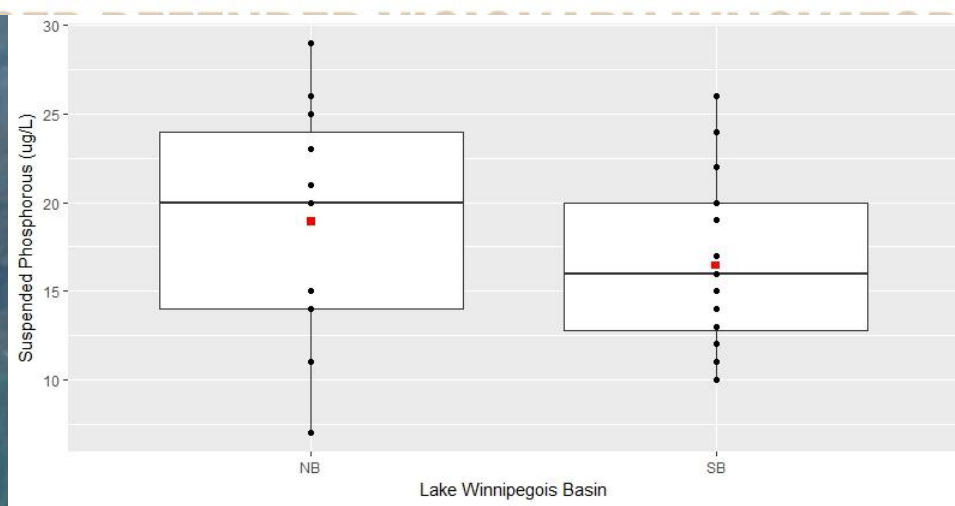
able: UR Contents

- Layers
 - Chemistry
 - Chl_spring2016
 - Chlorophyll (ug/L)
 - Oligo - 0.69-2.99
 - Meso - 2.99-7.0
 - Eutrop - 7.00-38.74
 - Chl_summer2016
 - Chlorophyll (ug/L)
 - Oligo - 0.69-2.99
 - Meso - 2.99-7.0
 - Eutrop - 7.00-38.74
 - Nitrogen
 - spring2016
 - summer2016
 - Fall2016
 - SUSPN
 - 0.0 - 400.0
 - 400 - 600
 - 600 - 1170
 - canrivers
 - Reference
 - Stations
 - monitoringStations
 - Places
 - FirstNations
 - Manitoba_aboriginal_lands
 - Landsat8
 - 2015Stations
 - Water
 - RiversNAexp
 - canadlake_p
 - MBRivers
 - MBGLRivers3
 - MBGLRivers2
 - MBGLRivers



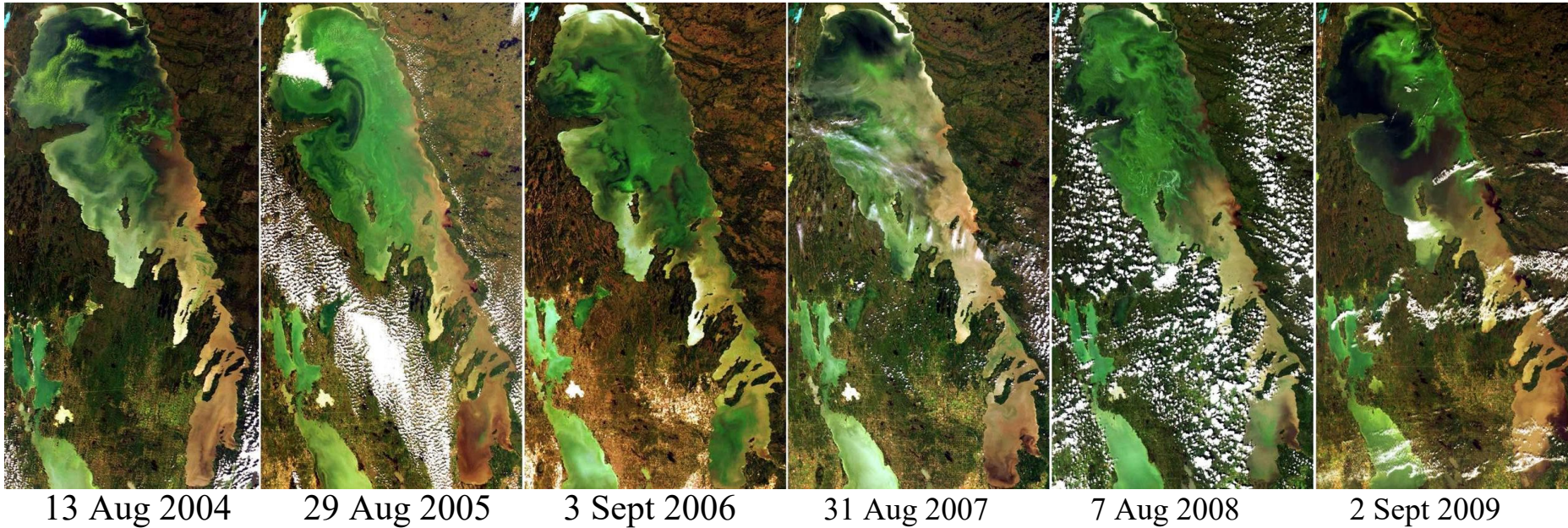
Surface- LMB13, 24 Oct. 2016
30 – 40 genus

Suspended P (ug/L)



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Remote Sensing



MODIS images showing mid-summer surface blooms
Lake Winnipeg, 2004-2009

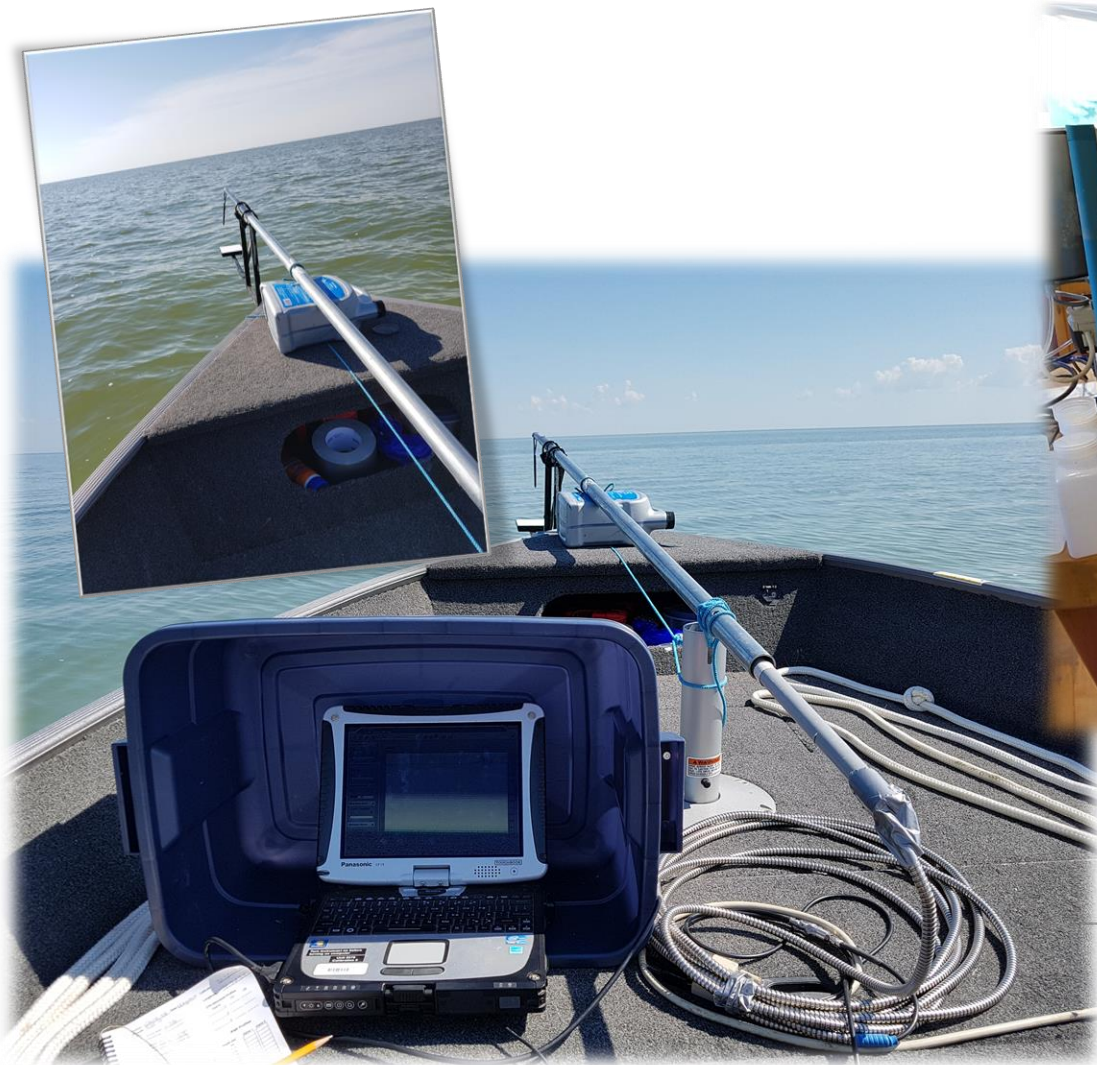
- bright green = surface phytoplankton blooms
- brown = high in suspended silt and clay
- red-brown = rich in dissolved organic matter
- dark = relatively clear water (Secchi > 2 m)



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ASD & AOL



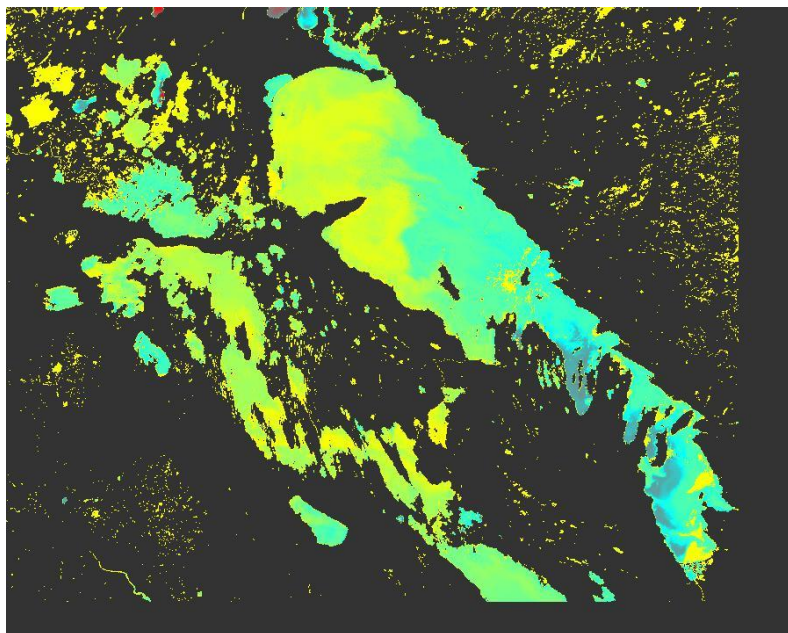
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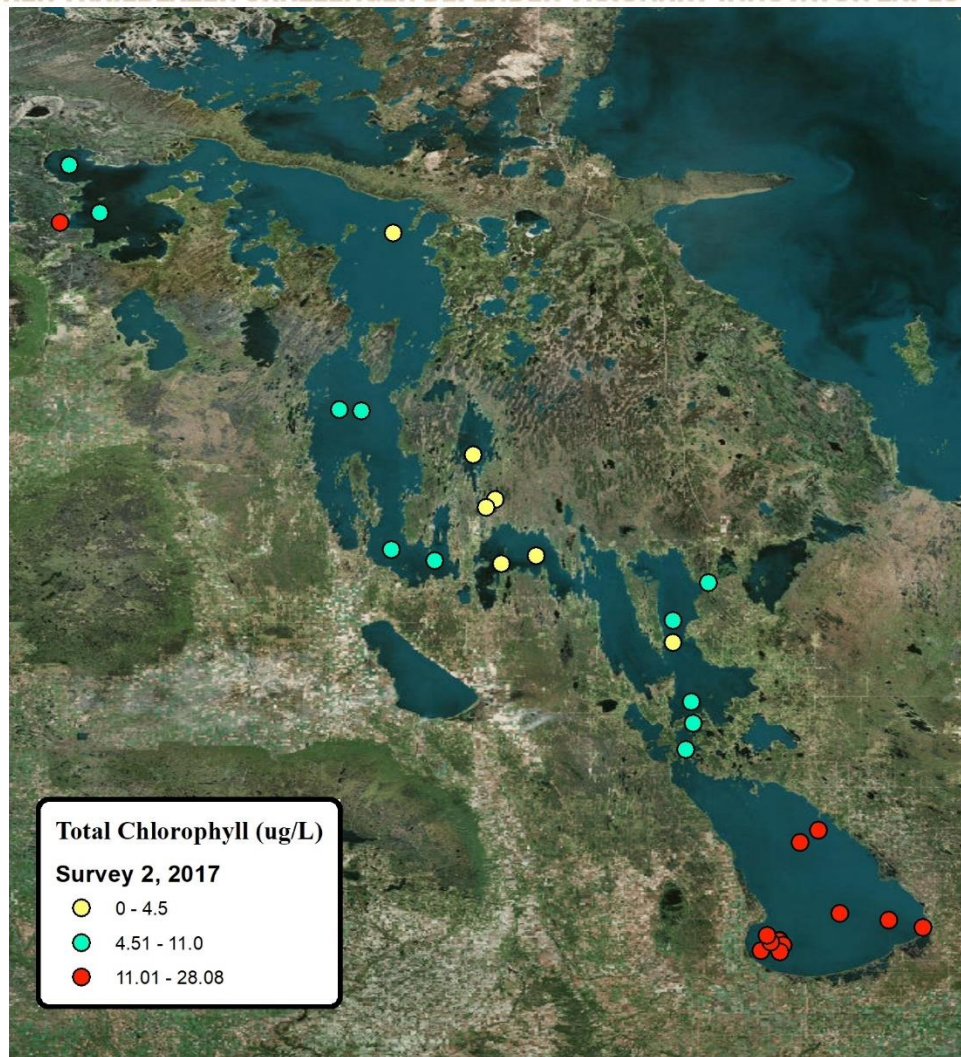
Sentinel 3 OLCI Image



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Yellow = 0 – 4.5 $\mu\text{g L}^{-1}$,
Green = 4.5 – 6 $\mu\text{g L}^{-1}$.



2018 - 2019

2018: Sampled Lake
Winnipeg for GHG

2019: Weather Station

- Community Based
Monitoring
- Partnerships



This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada



LAKE
WINNIPEG
FOUNDATION



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