

Alberta's draft ambient monitoring, evaluation, and reporting (MER) plan for lakes and reservoirs

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September 18th, 2024

Alberta

The value of lakes and reservoirs



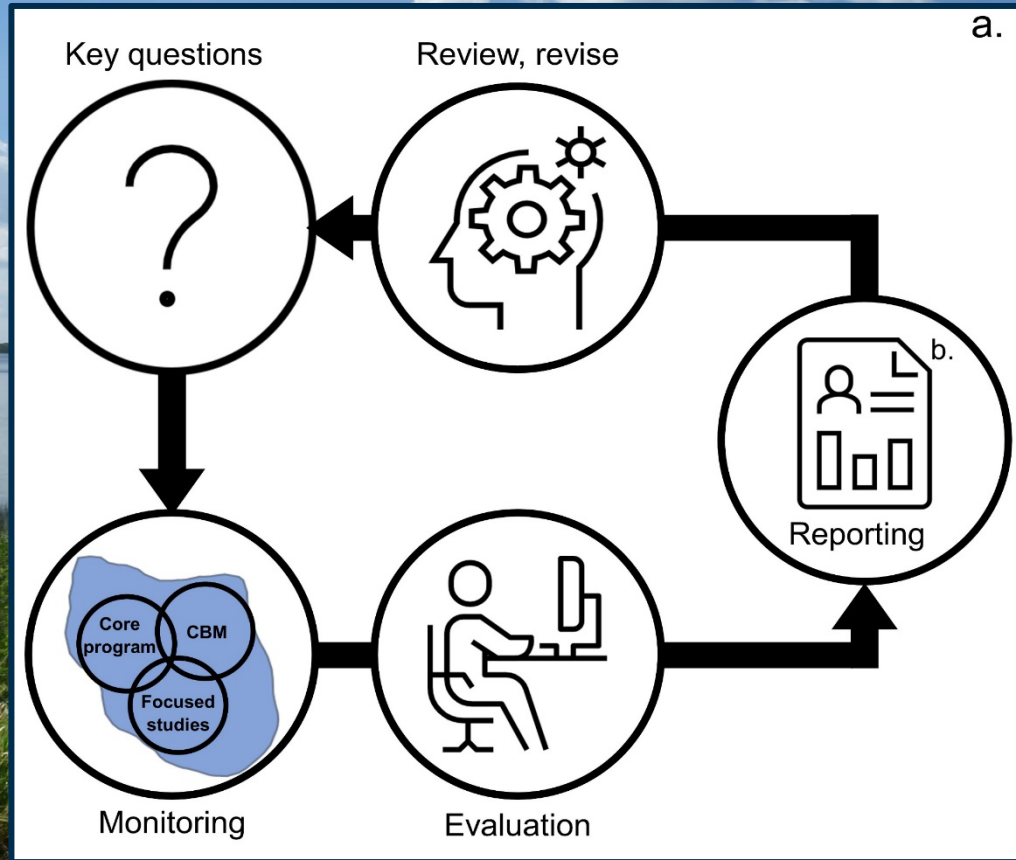
What is a healthy lake?



Stressors on lakes



The Alberta lake monitoring challenge



What are MER plans?

- Government of Alberta ambient monitoring, evaluation, and reporting (MER) plans summarize key activities that support our understanding of our environment
- MER plans aim to be:
 - Scientifically credible
 - Integrated and inclusive
 - Adaptive and transparent

Knowledge for a
Changing Environment

2019-2024 Science Strategy

MARCH 2019

Alberta
Environment
and Parks
Office of the Chief Scientist

Alberta

Alberta's draft monitoring, evaluation, and reporting (MER) plan for lakes and reservoirs

Key questions

Question 1. What are the current conditions of monitored lakes and reservoirs in Alberta and are they considered healthy?

Question 2. Have the conditions of monitored lakes and reservoirs in Alberta changed in the recent and historic past?

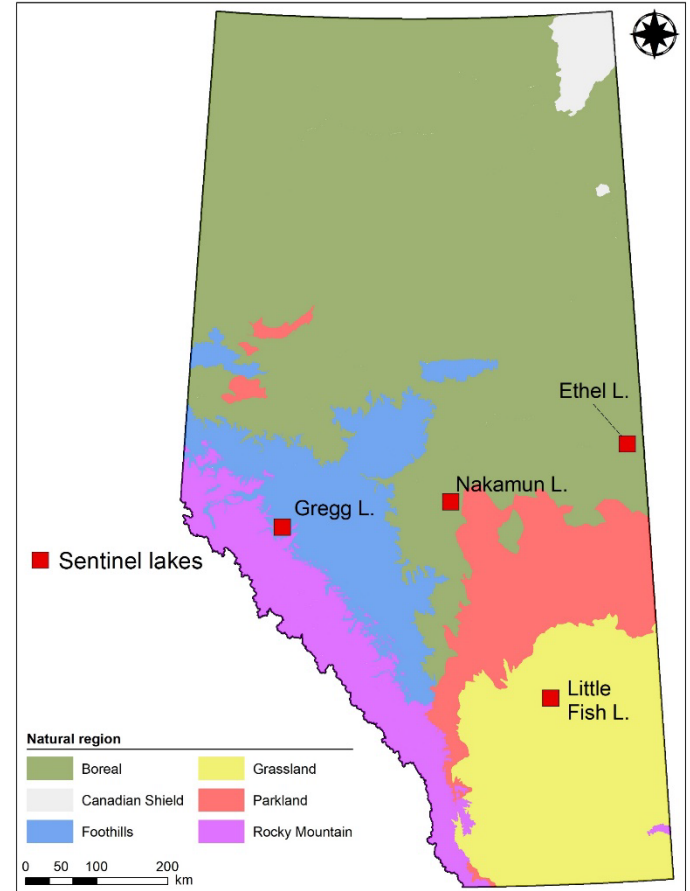
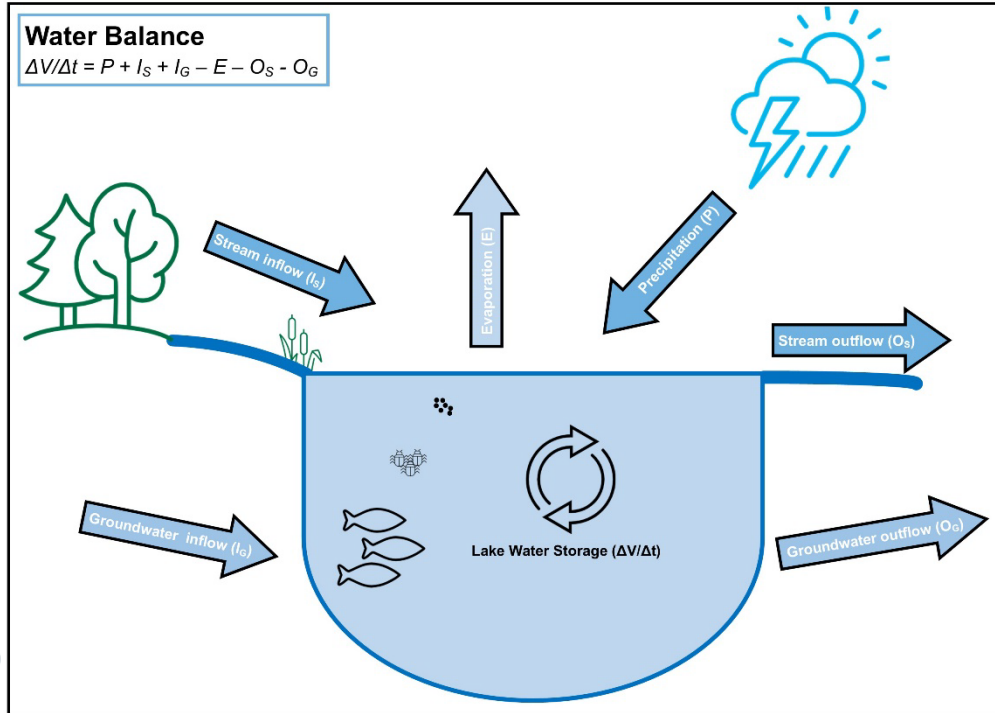
Question 3. What are the causes of change in lakes and reservoirs of Alberta?

Monitoring: Core programs

- Sentinel lakes program (whole-ecosystem monitoring)
- Long-term lakes program (long-term monitoring)
 - Quality Assurance \ Quality Control program
- Aquatic invasive species program (invasive mussels)

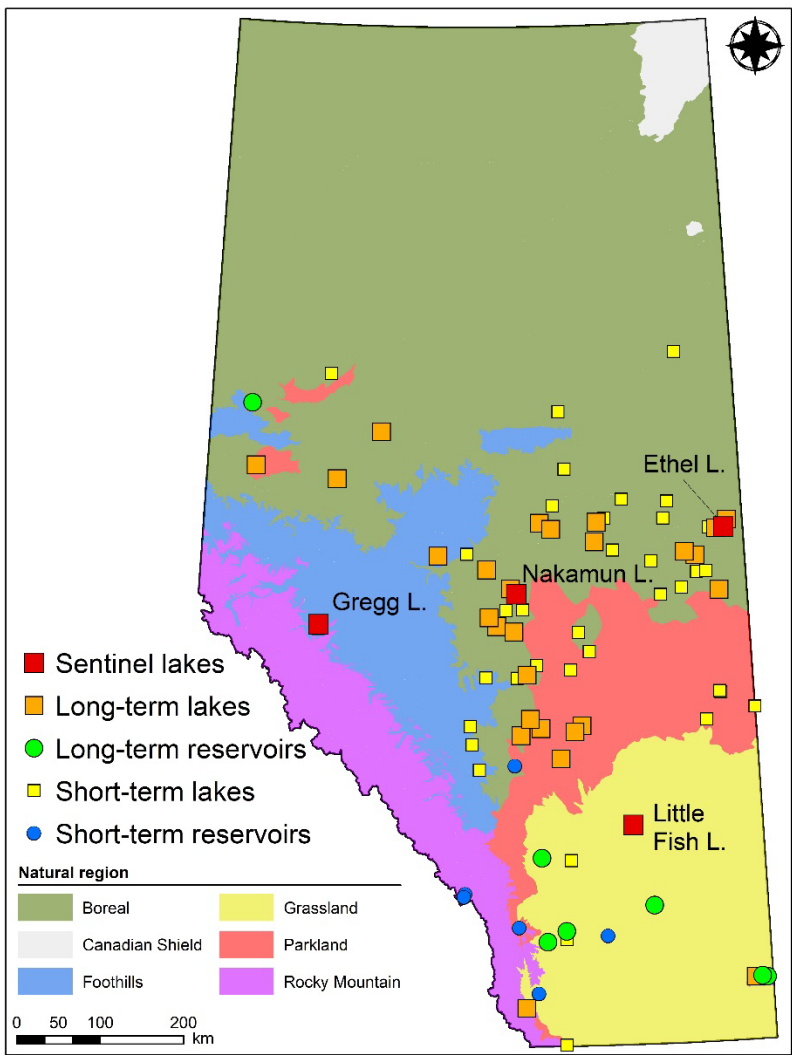
Sentinel lakes program

- Whole ecosystem monitoring



Long-term lakes, reservoirs

Long-term
3x/year, 10+ years



Parkland

- Alix
- Buffalo
- Gull
- Lacombe
- Pine

Rocky Mountain

- Beauvais
- Reesor (R)***
- Elkwater***
- Spruce Coulee (R)***

Foothills

- McLeod

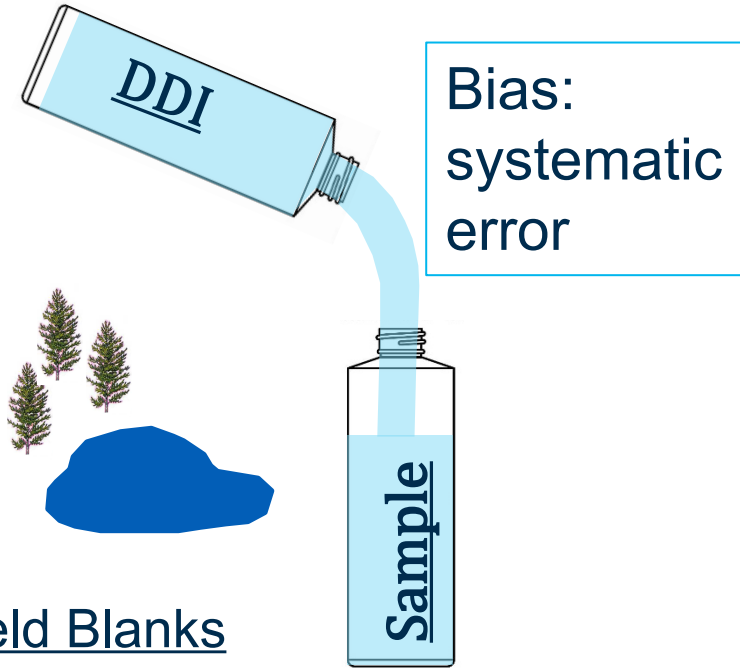
Grassland

- Chestermere (R)
- Newell (R)
- Pine Coulee (R)
- Twin Valley (R)

Boreal

Baptiste	Moose
Ethel	Nakamun
Isle	Pigeon
Jackfish	Saskatoon
La Nonne	Skeleton
Laurier	Steele/Cross
Long	Sturgeon
Marie	Sylvan
Minnie	Thunder
Moore/Crane	Wabamun
Moonshine (R)	Winagami

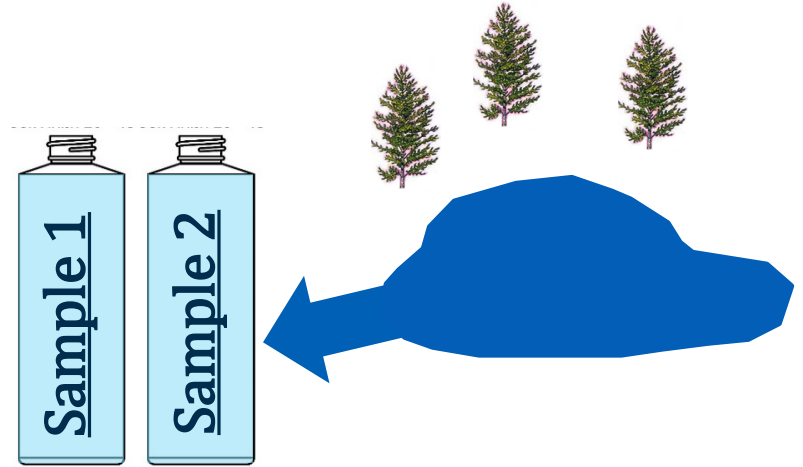
QA/QC program



Field Blanks

Dissolved, de-ionized water poured in field like sample

Variability:
random error



Duplicates

Two samples taken close in space and time

Aquatic invasive species program



Zebra mussel
(*Dreissena polymorpha*)



Quagga mussel
(*Dreissena rostriformis bugensis*)

- Initiated in 2013
- Mussel veliger (larvae) samples collected at all monitored lakes in July/August each year
- Partners include:
 - ALMS (Lakewatch)
 - Alberta Irrigation Districts (AIDA)
 - Lesser Slave Watershed Council
 - Parks Canada (Elk Island NP)
- Watercraft Inspection training and support

ZEBRA AND QUAGGA MUSSELS
(DREISSENA SPP.)

1 MILLION EGGS
One female mussel can produce up to one million eggs a year.

\$75,000,000
An invasion causes millions of dollars in damage to water-operated infrastructure – one estimate predicts it could cost Albertans over \$75 million dollars annually.

NO NATIVE PREDATORS IN ALBERTA

CLEAN • DRAIN • DRY YOUR BOAT to prevent the spread of invasive mussels.

PULL PLUG

Originated in the Black and Caspian Seas, brought to North America in the ballast of large cargo ships.

Transferred between water bodies on watercraft and equipment that is stored in the water.

Invasive mussels can disrupt natural food chains, create toxic algal blooms and reduce recreational enjoyment of natural areas.

Standing water in bilges, ballasts and live wells can harbour hitchhikers, parasites and disease:

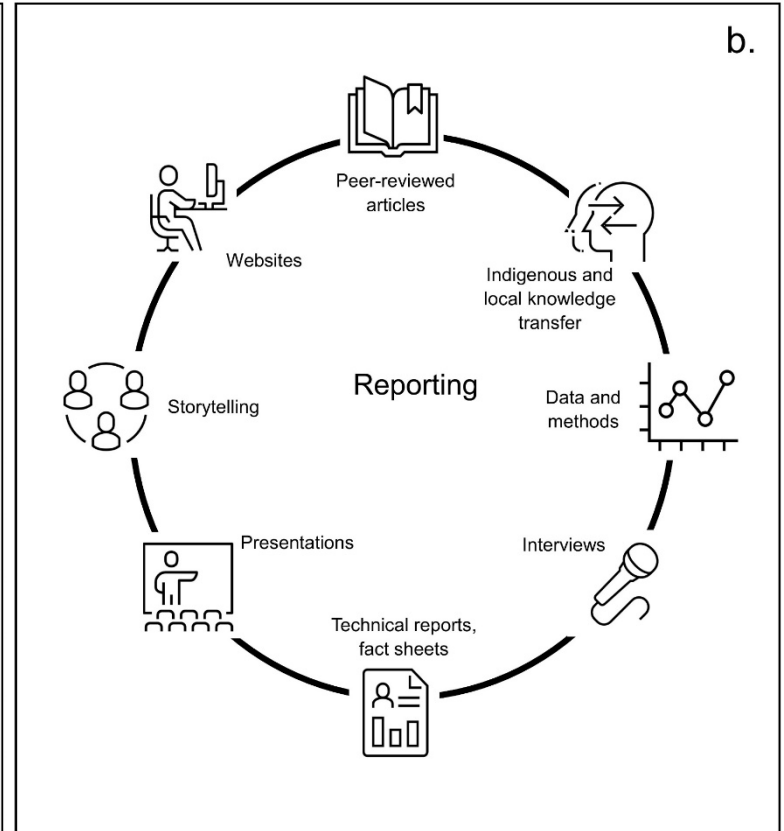
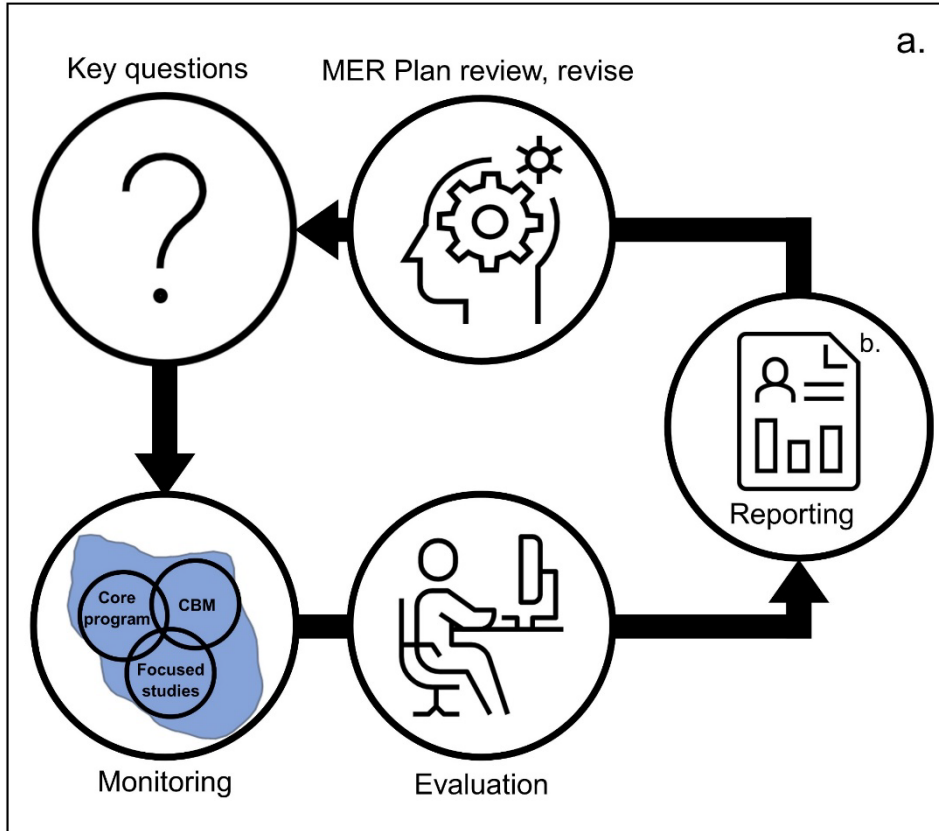
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Focused studies

- Focused studies are targeted, short-term projects designed to help answer MER plan questions that core programs cannot address.
- Collaborations with public agencies, academia, non-governmental organizations, indigenous communities, etc.
- Often depend on external funding outside of core monitoring
- Address research gaps (methodology, emerging technology, cultural and novel scientific indicators, catastrophic events)
- e.g. Alberta Innovates WIP eDNA Study.

Evaluation and reporting



2025-30 Lentic MER Plan - Specific objectives

Operation & Design



- Core program addressing questions?
- Parameters, frequency, locations?
- Refine long-term lakes list
- Establish Gregg Lake as SL
- Work with Indigenous partners to develop lake health indicators

Evaluation & Reporting



- Summarize, publish SL results
- Summarize LT lakes and reservoirs historic data
- Provincial Parks Lakes Trend Assessment
- Conclude AI WIP Satellite algae bloom project
- Conclude AI WIP eDNA project
- Publicly post SL buoy data
- Document and share learnings



Monitoring

- Complete annual monitoring and QA/QC
- Install GW wells at Nakamun
- Complete satellite project monitoring
- Complete eDNA AIS project monitoring

Acknowledgements

- GoA field staff and ALMS staff and other partners
- GoA management
- GoA watershed sciences and community-based monitoring and knowledge teams