

Understanding Lake Science

The scientific study of lakes helps us assess lake conditions and monitor changes over time. This is especially important as we are seeing increased pressure on lakes due to shoreline development, agricultural practices, vegetation removal, intensive land-use and increased recreational use. Climatic variability also affects water quality and quantity. Through ongoing lake monitoring, we can track the state of our lakes and inform lake management planning for the long-term benefit of lakes.

Lake Water Quality in Alberta

Lake monitoring in Alberta has shown that most lakes in Central Alberta tend to be shallow, turbid, warm, alkaline, productive and capable of supporting a variety of aquatic plants and animals. While productive lakes can be good for things like fish productivity, very high levels of nutrients can negatively impact aquatic health and can cause harmful blue-green algal (cyanobacterial) blooms that affect fish, wildlife and people.

It can be difficult to separate human from natural contributions to changes in lake water quality. Reconstructions of lake productivity in Central Alberta show that human settlement and land-use changes have increased nutrient and contaminant loading to lakes. This deterioration mainly occurred before our current long-term monitoring programs started in the early 1980s.

Measuring Lake Water Quality

Scientists who monitor lake water quality typically test for the following:

1. Physical indicators such as water clarity, water depth, water temperature and dissolved oxygen
2. Chemical indicators like pH (the presence of hydrogen ions), alkalinity (the capacity of water to resist changes in pH) and conductivity/salinity (dissolved ions in water)
3. Biological indicators like algae and aquatic invertebrates. Fish sampling can occur to evaluate effects on growth and reproduction of species, as well as risks to human health from consumption of fish tissue. Recreational health concerns (fecal coliforms and E. coli) are monitored by public health
4. Trophic status is determined through the measurement of common indicators of productivity, namely: **Phosphorous** – a nutrient that controls levels of algae and plant growth and **Chlorophyll a** – a light gathering pigment found in algae

Trophic status is described in the following terms:

- Low productivity = oligotrophic lake
- Moderate productivity = mesotrophic lake
- High productivity = eutrophic lake
- Very high productivity = hypereutrophic lake

The more natural you keep your property the healthier your lake will be.



Measuring Lake Water Quantity

Lake levels as a measure of water quantity are also routinely measured by scientists who monitor lakes in Alberta. Findings indicate that water levels have historically varied considerably due to fluctuations in precipitation and evaporation. Lakes in Central Alberta are generally experiencing stable or decreasing water levels, but there has been no overall trend in terms of decreasing water quantity since current monitoring programs started. Of the 41 Central Alberta Lakes evaluated:

- 44% had no trend
- 51% had a decreasing trend
- 5% had an increasing trend in water level

What Can You Do to Protect Lakes?

There are many things lake residents or visitors can do to help protect the water quality of our lakes:

- Leave your shoreline and aquatic vegetation in its natural condition – in fact it is illegal to do any shoreline modifications or aquatic vegetation removal without written approval from Alberta Environment and Sustainable Resource Development
- Plant native plants and shrubs where shorelines have been cleared
- Avoid use of fertilizers or use only organic, slow-release fertilizers placed well away from the shoreline
- Refuel your boat using spill control devices or fill tanks well away from water
- Have your septic system inspected regularly and empty septic tanks as recommended
- Watch for invasive aquatic species and report or remove as appropriate

Respect Our Lakes

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For More Information

For more information about lake health,
lake stewardship or the approval process:

Alberta Environment
and Sustainable Resource Development

www.esrd.alberta.ca (search 'Respect our Lakes')
ESRD.Info-Centre@gov.ab.ca

Or call: 310-ESRD

For environmental complaints/emergencies
call the 24-hour environmental hotline:

1-800-222-6514

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