

WATERSHED STEWARDSHIP PROGRAM

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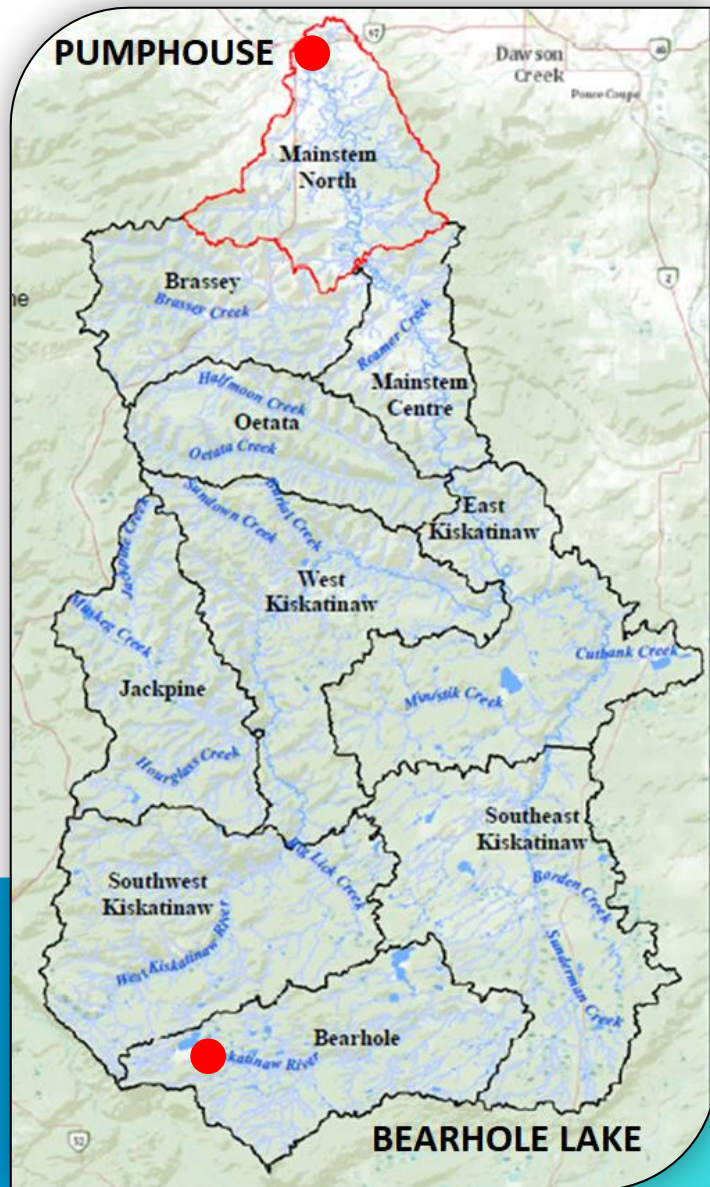
Mighty Peace Watershed Alliance

**Provincial Summit
June 2018**

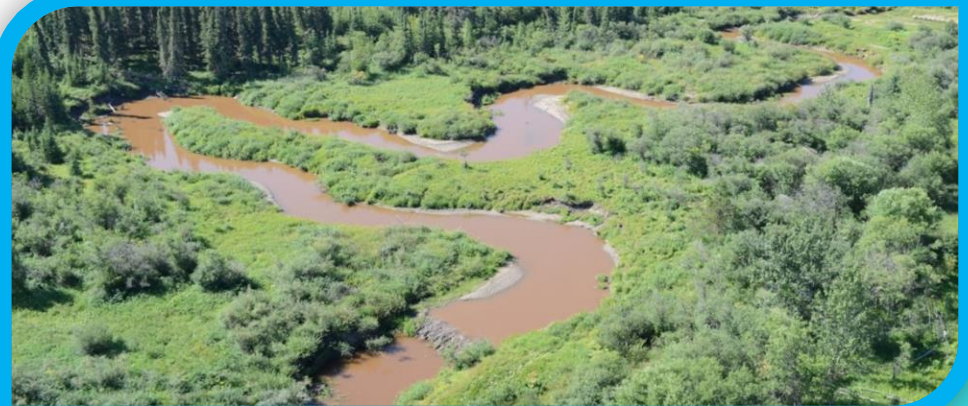


THE KISKATINAW RIVER WATERSHED

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- Upper watershed area – ~2800 km²
- 174 km from Bearhole to Arras pump house
- Naturally turbid (cloudy) water
- Highly dynamic land-use
- Only source of drinking water for Dawson Creek, Pouce Coupe, and the rural community



WHAT DO WE DO?

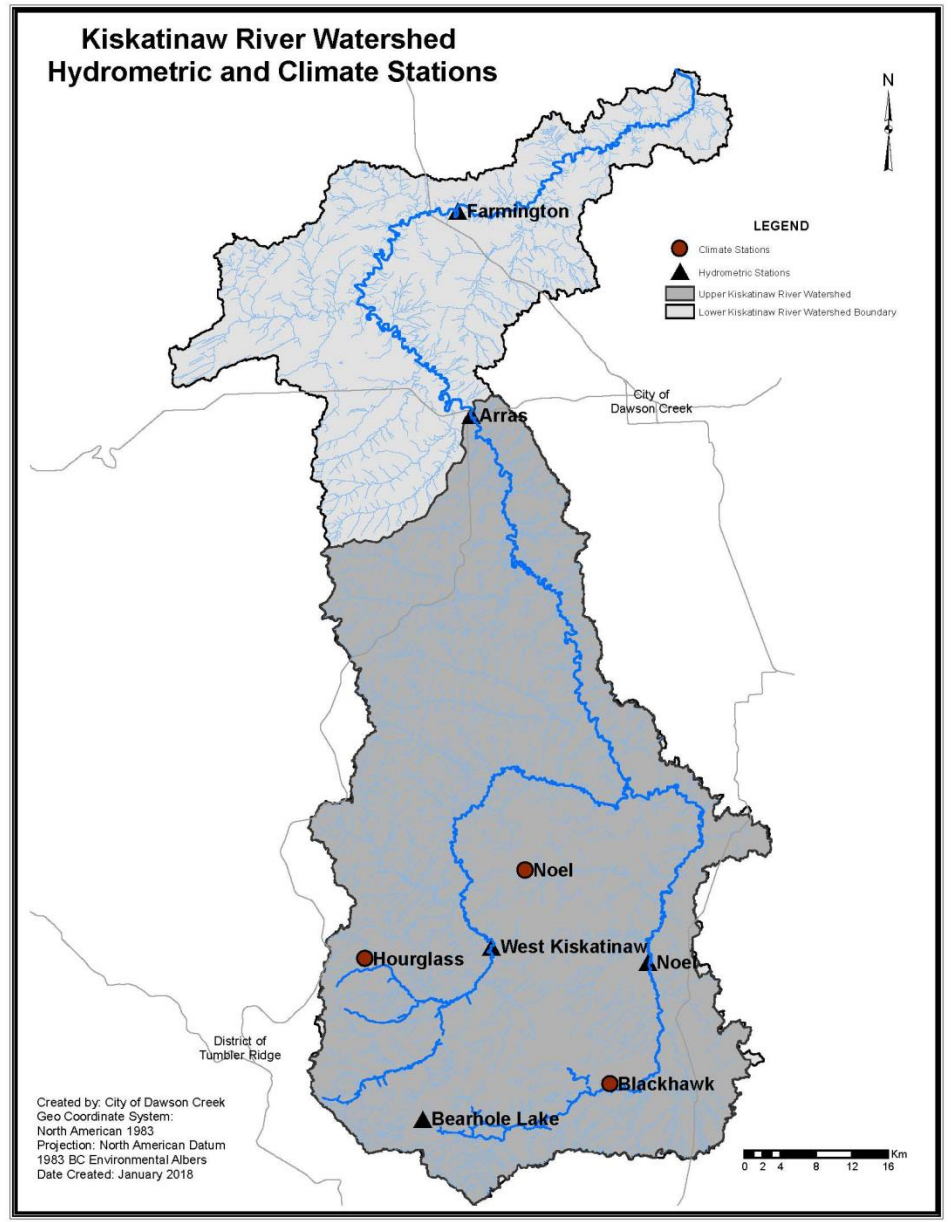
THE WATERSHED STEWARDSHIP PROGRAM

- Water [quantity](#) monitoring and prediction
- [Education](#) and community [outreach](#)
- Water [quality](#) monitoring
- Engagement with [stakeholders](#) within the Kiskatinaw River watershed
- Source water [protection](#) and security



WATER QUANTITY MONITORING

- Hydrometric and climate stations
 - **Raw** water storage
 - **Treated** water storage
1. Measure **flow** and water **level**
 2. Predict **freshet, drought, and flooding**
 3. Collect data for Bearhole Lake water balance study



CITY'S RAW WATER STORAGE

1



- Reservoirs → 128 days
- Arras weir → 48 days
- Bearhole Lake → 209 days

2



3



4



385 days!!

ADDITIONAL STORAGE!!

- Construction of new South Dawson Reservoir (Cell #1)
- 154 days



**Expected
539 Days
Total**

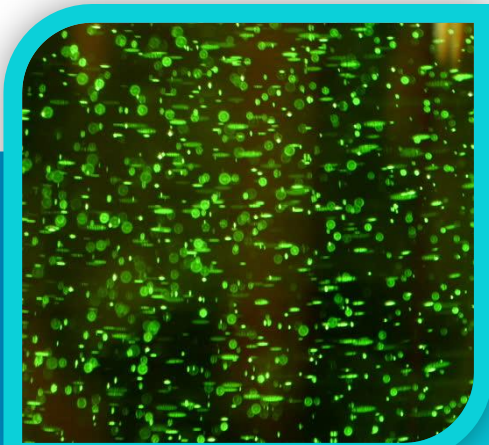
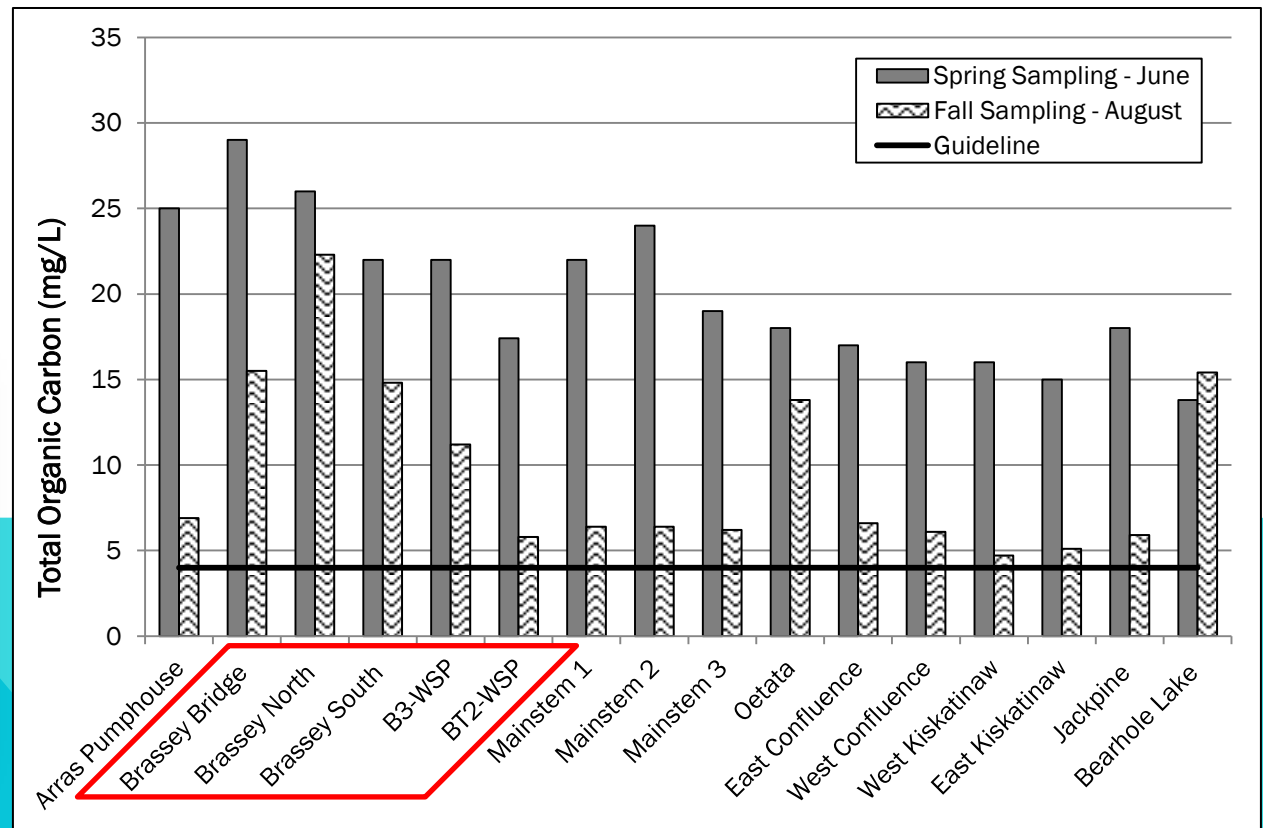
WATER QUALITY MONITORING

- Collect and analyze **water** samples from ~17 sites
- Measure many different **parameters**
- Identify **contaminants** of concern
- Identify **risk** associated with contaminants

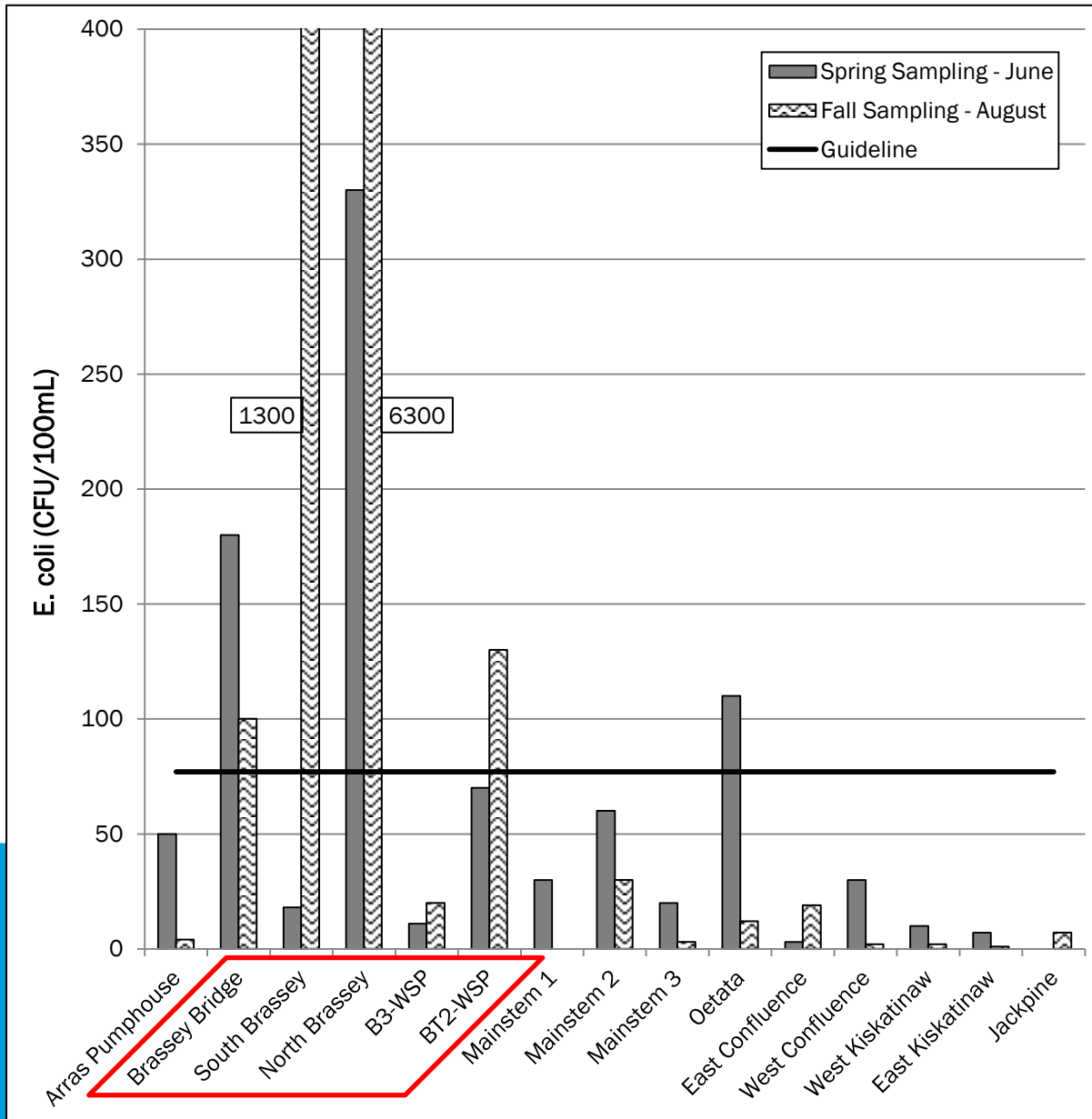


2017 SAMPLING RESULTS – TOTAL ORGANIC CARBON (TOC)

- All sampling sites from 2017 have **exceeded** TOC limits
- Drinking water quality guideline = **4 mg/L**
- TOC can **interfere** with water **treatment** processes



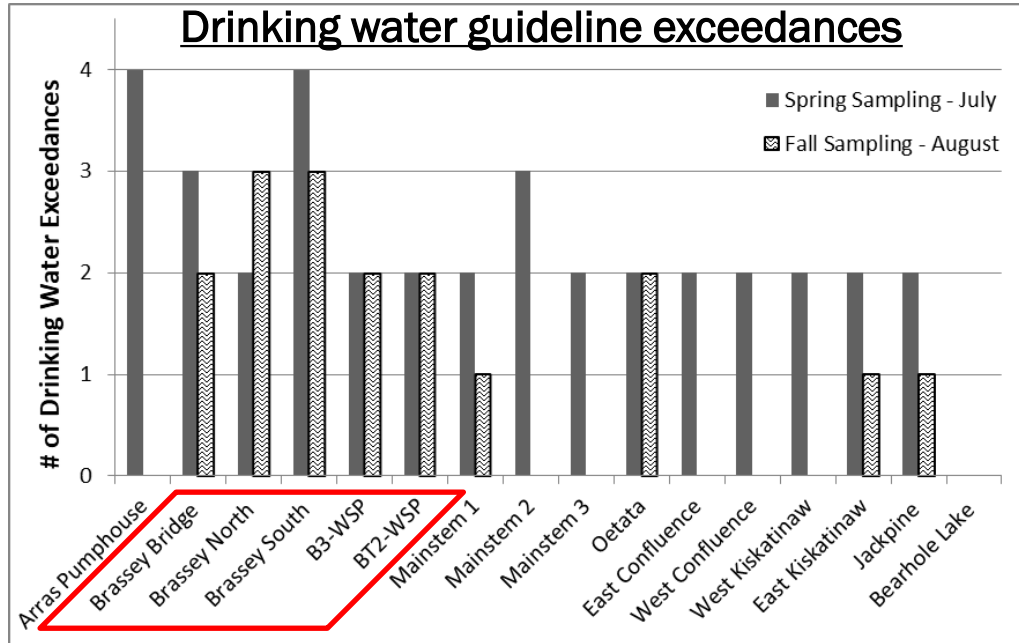
2017 SAMPLING RESULTS – E.COLI



- 7 exceedances
- 2 above 1000 CFU/100mL



2017 SAMPLING RESULTS - METALS



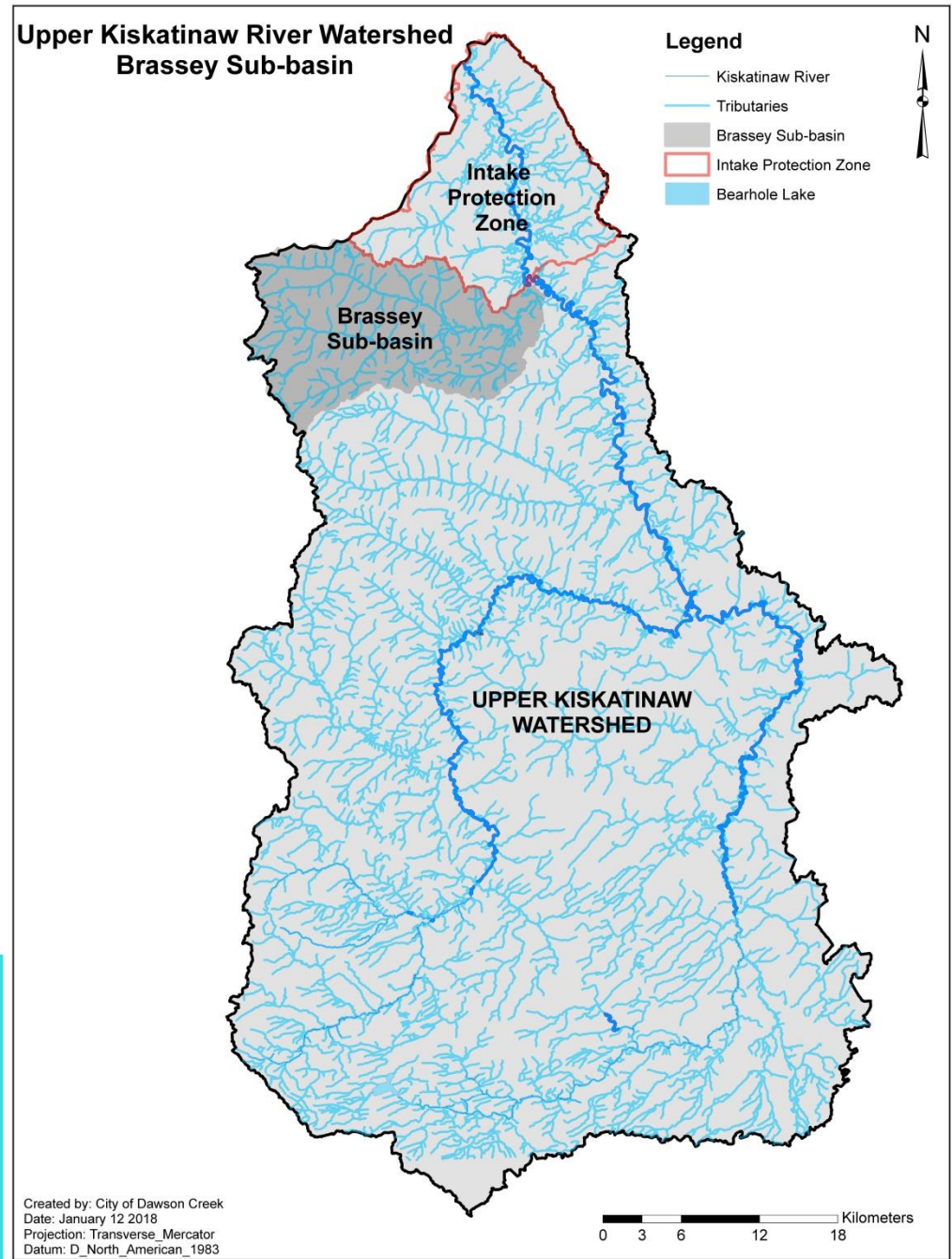
- Exceedances for drinking water guidelines include:
aluminum, iron,
manganese, titanium, and
lithium

- Metals can cause
aesthetic quality issues



BRASSEY SUB-BASIN

- 5 sites within the sub-basin
- Most water quality exceedances and highest values
- Brassey is the closest sub-basin to the “intake protection zone”



WHAT ARE THE CHALLENGES WE FACE?

CLIMATE CHANGE

- Fire Hazard
- Disease
- Insects
- Extreme Events
- Unpredictability



WATER QUANTITY

↑ Peak flows

↓ Unpredictable snowpack

↑ Extreme events (ex. 100 year flood)

↓ Summer stream flows

↑ Freshet shift – earlier in the spring



WATER QUALITY

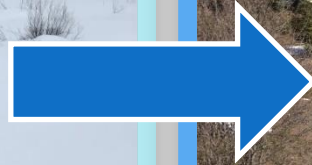
- ↑ Turbidity (sediment load)
- ↑ Contamination
- ↑ Disturbance



OUR PROJECTS

MASTER'S RESEARCH PROJECT

- Goal of the project:
 - Predict the **timing** of spring runoff
- City Contribution: **\$50, 000**
- Partners:
 - UNBC
 - MoE
 - FLNRORD



SPRING RUNOFF PREDICTIONS

- Increased flow hinders the use of pumps
 - Turbid water

Year	Peak Runoff Date
2013	May 7
2014	April 23
2015	April 23
2016	April 1
2017	May 3
2018	Predicted: April 29 th Actual: May 4 th

- Predictions allow for preparedness
 - Fill reservoirs
 - Possible flood conditions



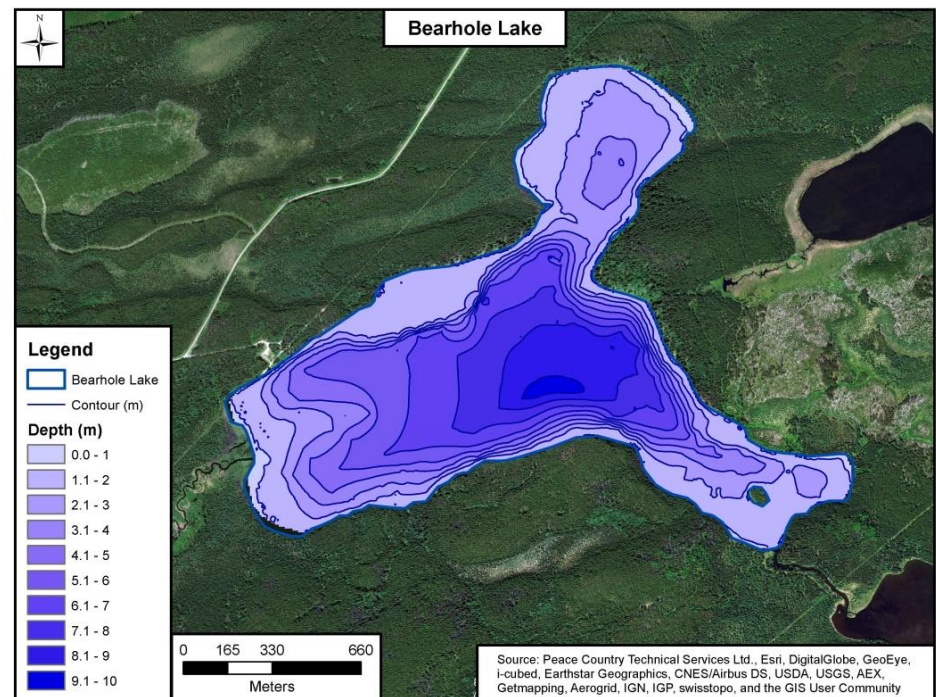
BEARHOLE LAKE WATER BALANCE STUDY

- Collect **hydrometric** and **climate** data
- Study the lake's **inflows** and **outflows**



BEARHOLE LAKE BATHYMETRIC SURVEY

- First bathymetric survey since 1977

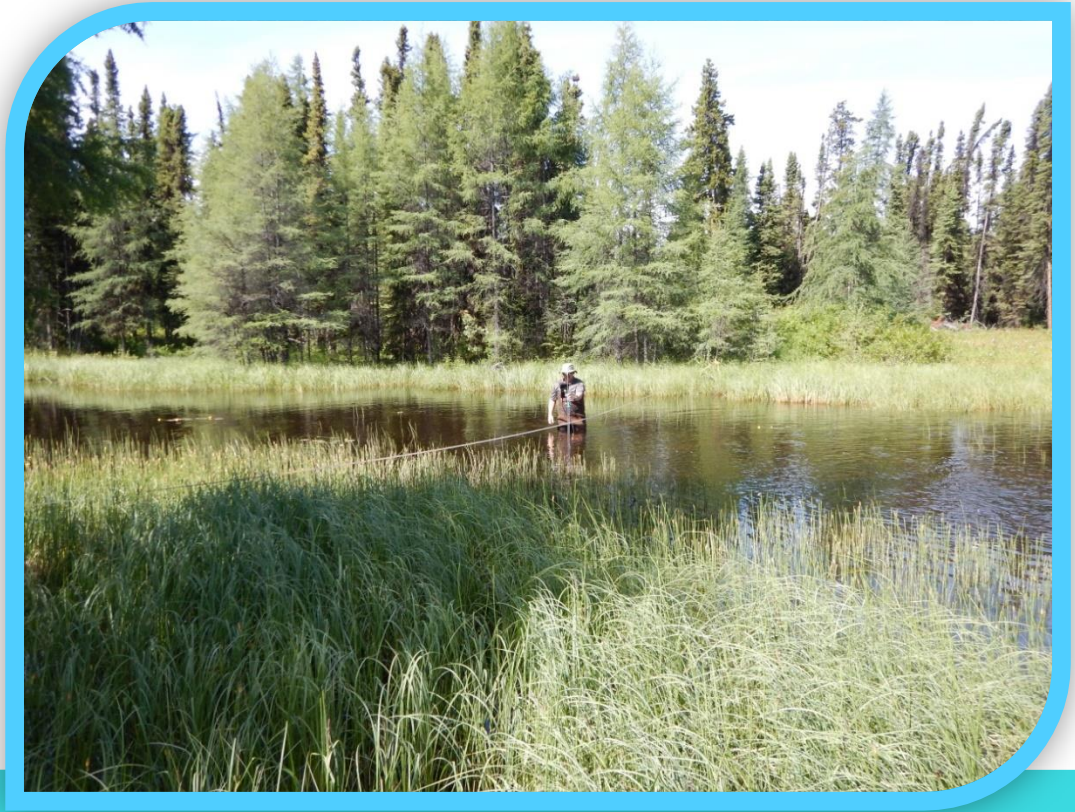


BEARHOLE LAKE VEGETATION ASSESSMENT

- Completed every other year as part of the City's Park Use Permit
- To identify health of current vegetation

2017 Results:

- Vegetation is [adjusting](#) to the change in water level
- Nearing stabilization



FISH HABITAT ASSESSMENT

To determine if the habitat in the small lake below the weir is suitable for target species to carry out their life processes.

2017 Results:

- Offers **spawning** and **rearing** habitat
- 3 locations were identified as possible **overwintering** habitat



Eco Web, 2017: Yellow Perch



Eco Web, 2017: Northern Pike

WHAT DO WE HAVE PLANNED?

BEARHOLE LAKE FISH ASSESSMENT



- To determine if the age class for **target species** is well structured
- Results will aid in fish ladder **modification** decisions



CREATE A WATERSHED STAKEHOLDER ADVISORY GROUP

- Identify current **risks** within the watershed
- Assess risk **categories**
- Rank the risks based on **hazard potential**
- Update the 2007 Source Water Protection Plan



WHY WE ARE PASSIONATE ABOUT WHAT WE DO?

OUR FRESH WATER SUPPLY

- Only drinking water source for
~20 000 people
- Recreational opportunities
- Healthy ecosystem for plants and
animals (and humans!)
- Encouraging others to be
stewards of their own watershed



STAKEHOLDER RELATIONSHIPS & OUTREACH

- Information sharing
- Partnerships

- Events
- Presentations
- Contests



Special thanks to:



PEACE RIVER REGIONAL DISTRICT



WHAT CAN YOU DO?

BE A STEWARD, YOURSELF!

Advocate

Participate

Explore

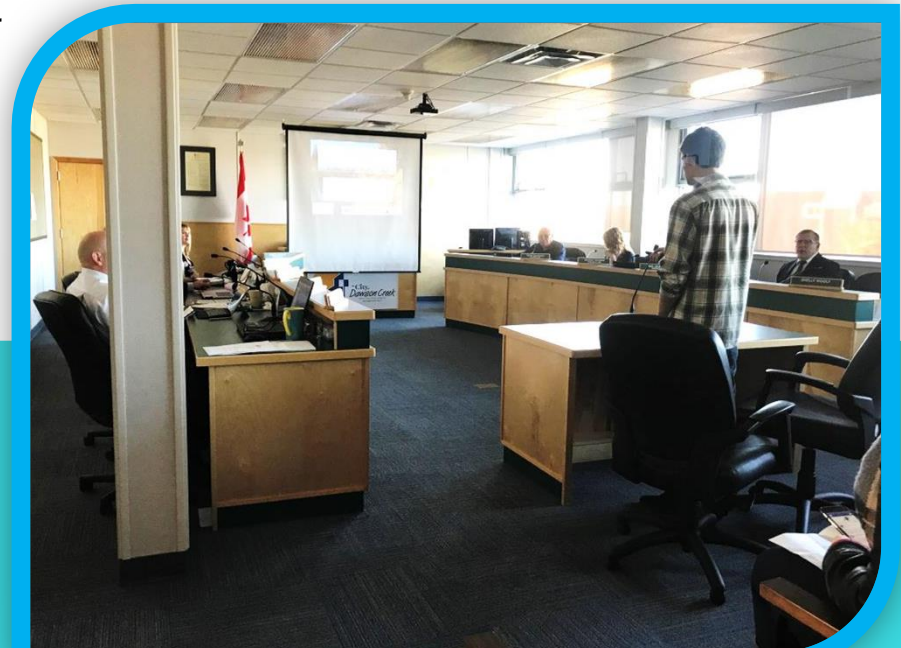
Partnership

Live sustainably



PARTNERSHIPS AND STAKEHOLDER COLLABORATION

- University of Northern British Columbia
- FLNRORD
- Oil and Gas Commission
- Pioneer Village
- Peace River Regional District
- Northern Health
- Water Survey of Canada (WSC)
- Dawson Creek Watershed Society
- Ministry of Environment



OUR NEXT STEPS...

Continue to improve the Watershed Stewardship Program by:

- Expanding **knowledge** and professional development
- Enhancing monitoring and sampling **databases**
- Building new **partnerships** and stakeholder relationships
- Providing public **education** and awareness
- Increasing **preparedness** for extreme events



THANK YOU!!



ANY QUESTIONS?