

Biomonitoring and the CABIN Program in Northeast B.C.

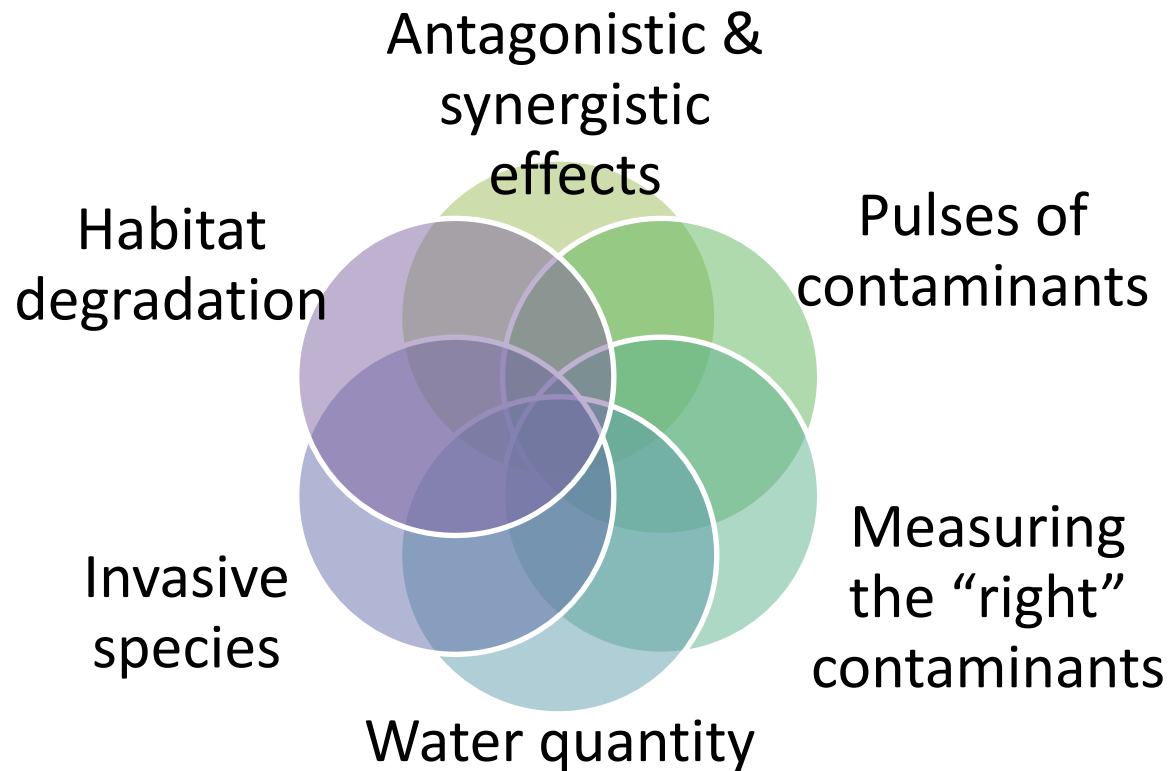
NEWS Forum
Fort St. John, B.C.
March 2018

Water Quality Monitoring



Assumption: if all WQGs are met = ecosystem is protected

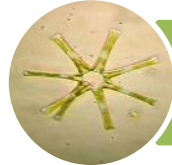
However, aquatic ecosystems may be affected by factors not measured by WQGs....



How do we know the ecosystem is protected?

Biomonitoring

- Provides a direct measure of ecological condition
- Verify findings OR identify undetected problems
- Many types of biological indicators
- Used around the world



Algae



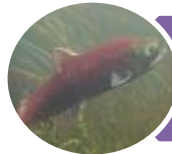
Macrophytes



Zooplankton



Benthic invertebrates



Fish

Benthic Invertebrates



Sedentary

Long-lived

Diverse

Ubiquitous

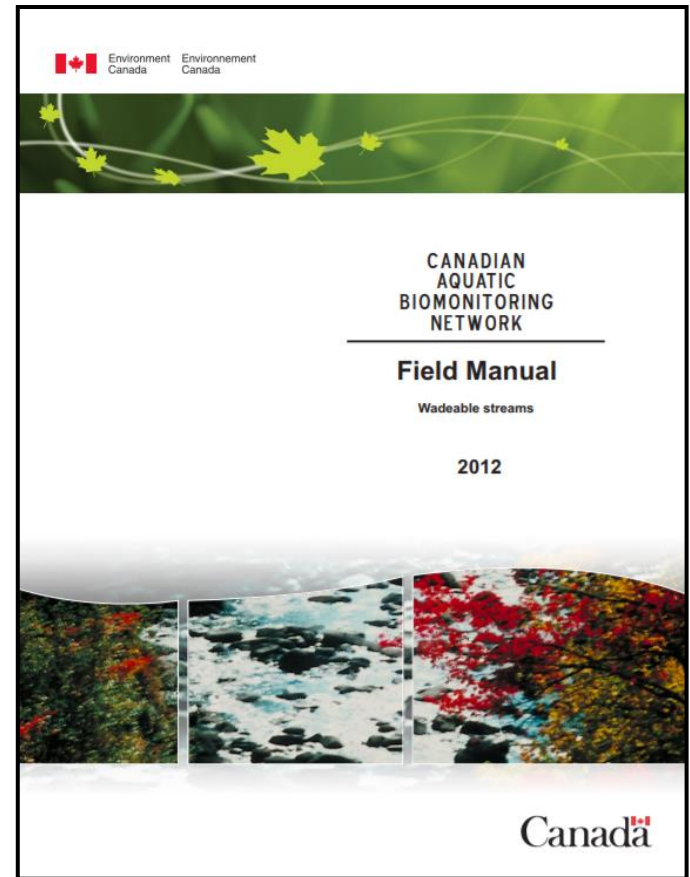
Key part of food web

Commonly used

Monitoring Approach

Canadian Aquatic Biomonitoring Network (CABIN)

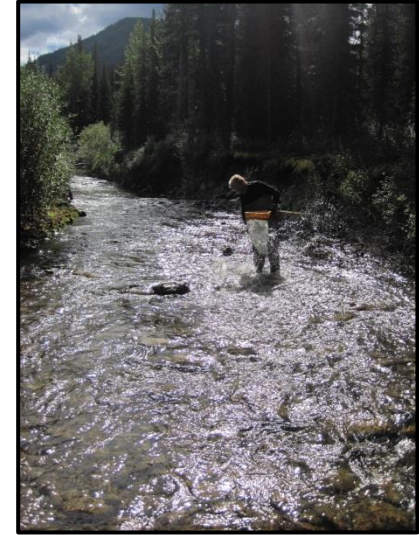
- Nationally standardized sampling protocols
- Training program
- Database and web-based analytical tools



Monitoring Approach

Field Methods

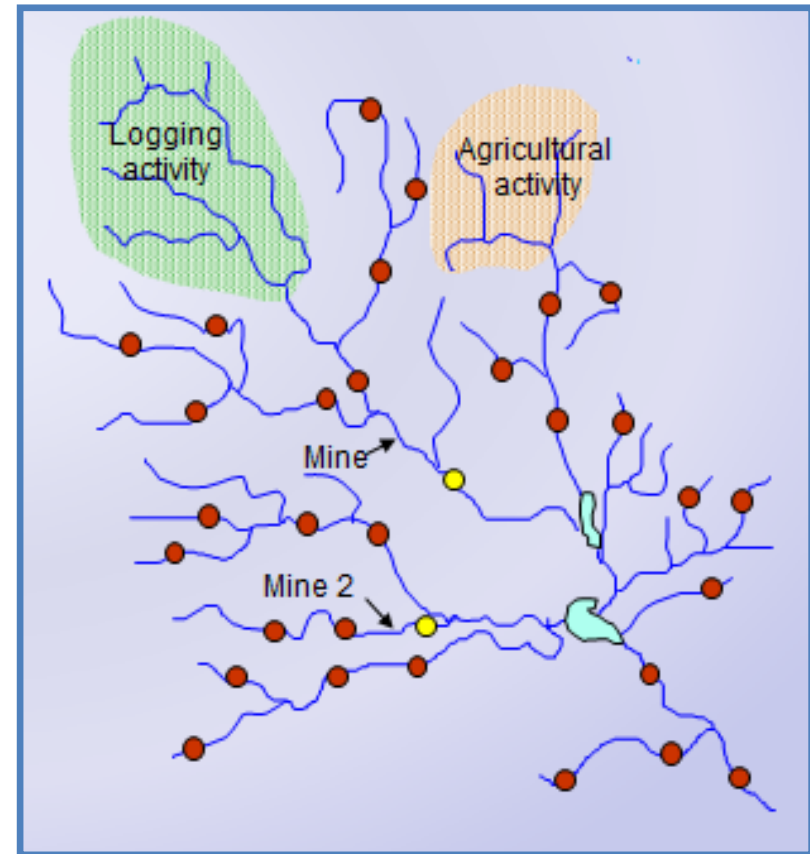
- Late summer or early fall
- Erosional riffle areas in wadeable streams and rivers
- Data collection:
 - Habitat
 - Water quality
 - Substrate
 - Benthic invertebrate community



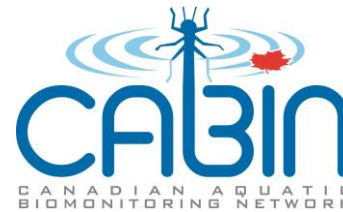
Monitoring Approach

Reference Condition Approach

- Numerous reference sites define natural variability of benthic communities
- Data used to build predictive models, which can evaluate conditions at test sites
- Initial cost high, but data sharing = cost effective



Predictive Models



Establish reference
database for area of
concern

Classify benthic
communities



Establish relationship
between benthic
invertebrates and habitat



Sample test site

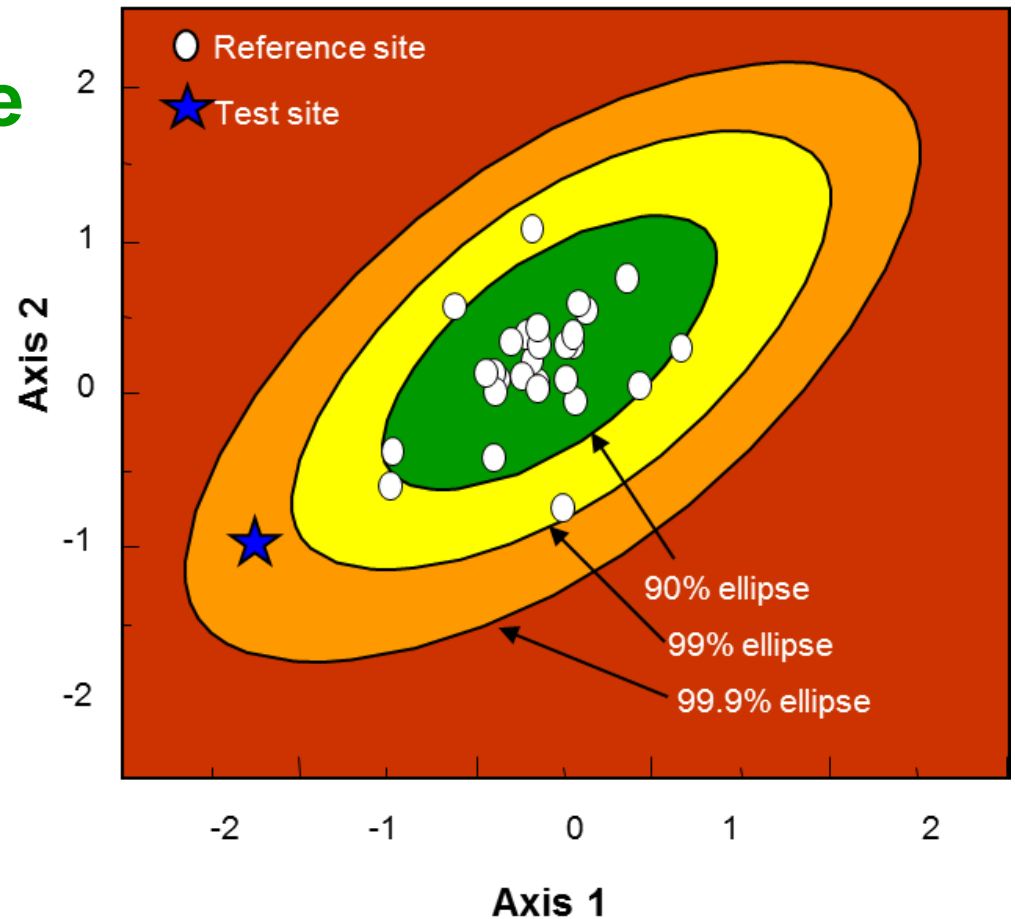


Compare biota from test
site to reference group



Predictive Models

- **Similar to Reference**
- **Mildly divergent**
- **Divergent**
- **Highly divergent**



CABIN Models in B.C.

1. BC Central/North Coast

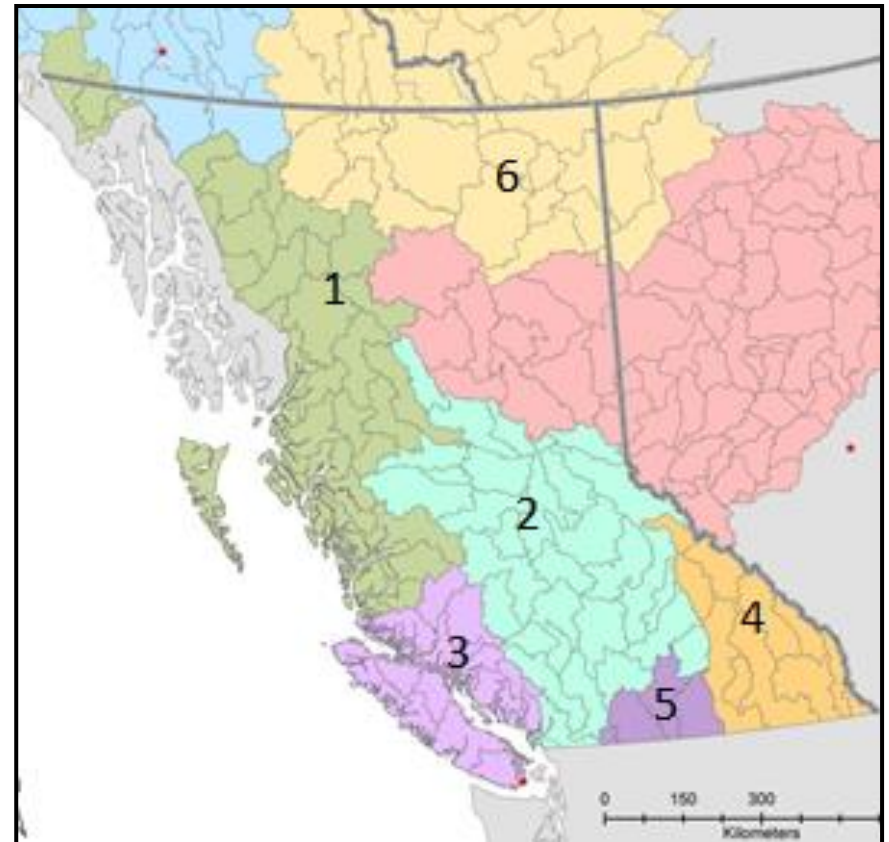
2. Fraser Basin

3. Vancouver Island & South Coast

4. Columbia Basin

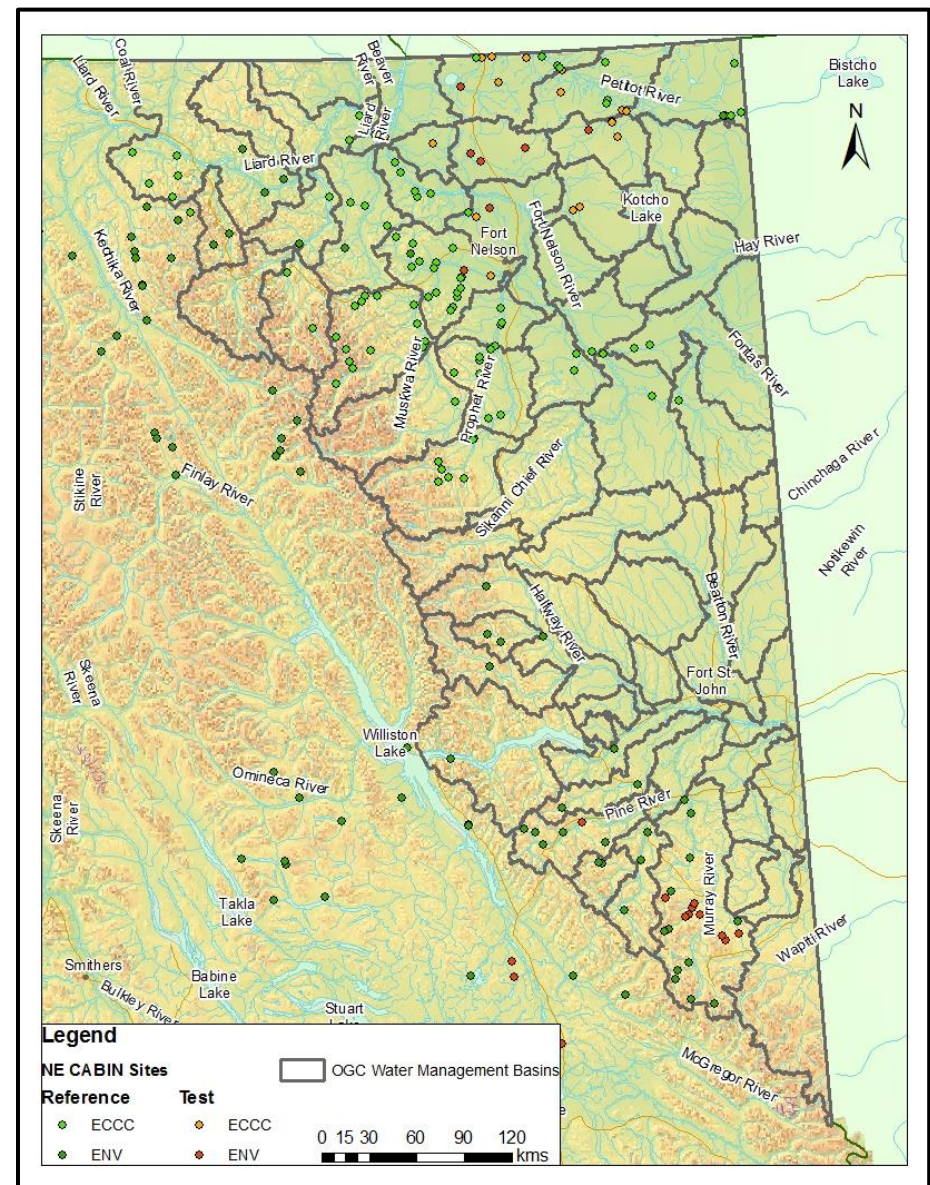
5. Okanagan Basin

6. Northeast BC



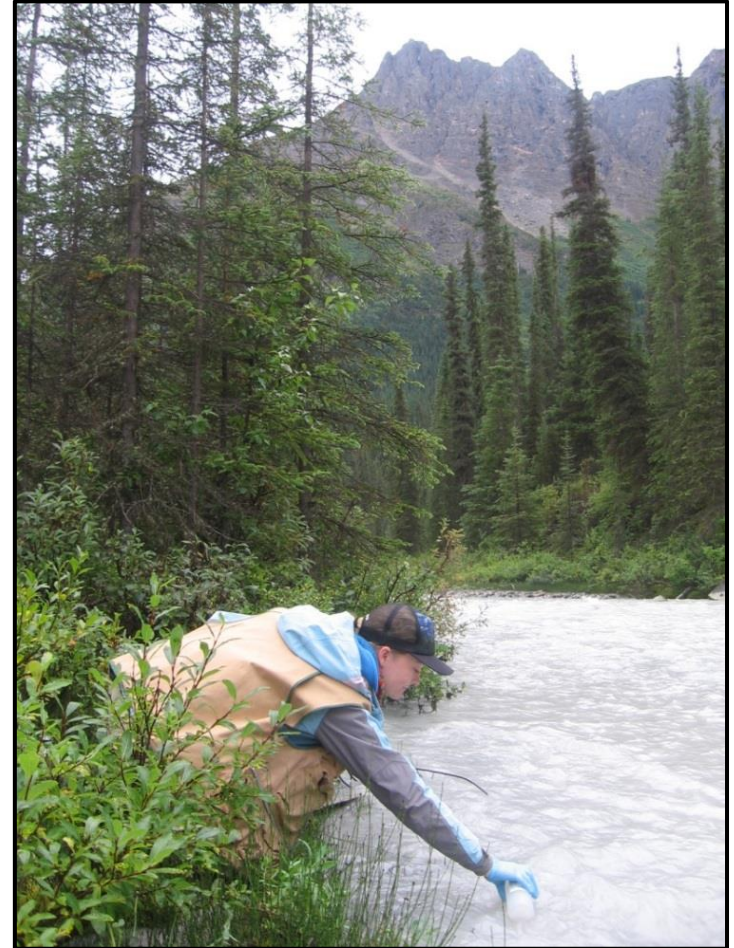
CABIN in Northeast B.C.

- Preliminary model
 - Fort Nelson, Petitot, Central Liard
- New reference sites sampled 2016 & 2017
- Updated model – Summer 2018?



CABIN in Northeast B.C.

- No model in Williston and Peace watersheds
- Approximately 40 new reference sites needed
- ENV and ECCC collaboration (2018) to fill spatial and habitat gaps and develop Peace River model



How Will CABIN Support NEWS?

- Effective tool for water resource management
 - Promotes data sharing
 - Contributes to decision making
 - Provides user-friendly analytical and reporting tools
- Provides data to characterize background and assess cumulative effects, current condition, and trends



Helpful CABIN Links

- CABIN training
 - <http://canadianriversinstitute.com/training/cabin/>
- ECCC Resources
 - <https://www.ec.gc.ca/rcba-cabin/>
- CABIN field manual
 - http://publications.gc.ca/collections/collection_2012/ec/En84-87-2012-eng.pdf
- ENV Resources
 - <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/monitoring-water-quality/cabin>



Jolene.Raggett@gov.bc.ca
(250) 354-6387

