Living Lakes CANADA

EXPANDING WATER MONITORING IN THE CANADIAN COLUMBIA BASIN

COLUMBIA KOOTENAY HEADWATERS HYDROLOGIC REGION INAUGURAL MEETING

SUMMARY REPORT

Templeton Creek | Photo by Nicole Trigg

Summary Report

Inaugural Columbia-Kootenay Headwaters Hydrologic Region Meeting

March 2, 2022 • Online

Hosted By Living Lakes Canada

Acknowledgements

Living Lakes Canada respectfully acknowledges that our water stewardship work is taking place in the unceded traditional territories of the Ktunaxa, Secwepemc, Sinixt and Syilx Nations who have stewarded these lands for generations. The Inaugural Mid-Columbia Kootenay Hydrologic Region Meeting was possible thanks to funding from the Healthy Watershed Initiative, a partnership between the Province of BC, Watersheds BC and the Real Estate Foundation of BC.

Executive Summary

Climate change is the most critical issue impacting water management in the Columbia River Basin. Freshwater sources for agriculture, fisheries, power generation, First Nations and urban users are dependent on glaciers and snowpacks, which are declining. Climate impacts are resulting in extreme temperature and precipitation, flooding, fire events and peak glacial melt.

Existing water monitoring networks are insufficient to track and understand these impacts. The goal of the Columbia Basin Water Monitoring Framework is to establish a unified monitoring framework based on a Priority Monitoring Matrix that reflects local priorities within a scientific water balance approach. This collaborative approach, facilitated by Living Lakes Canada, will improve and strengthen the monitoring configuration for tracking and understanding a broader range of implications of climate change on the water supply for Basin ecosystems and its people.

Using an innovative methodology developed by senior hydrologists and climate change and ecosystem experts, Living Lakes Canada is piloting this project in three areas in the Canadian Columbia Basin. These pilot areas make up three of the 10 Hydrologic Regions (HRs) in the Basin: Mid-Columbia Kootenay (North Kootenay Lake/Slocan Valley, West Kootenay), Columbia-Kootenay Headwaters (Columbia Valley, East Kootenay), and the Upper Kootenay (Elk Valley, East Kootenay).

Background

The critical issues of water resources management amid climate change impacts have been identified in the Canadian Columbia Basin going as far back as 2006 when the Pacific Climate Impacts Consortium (PCIC) published the report Preliminary Analysis of Climate Variability and Change in the Canadian Columbia River Basin: Focus on Water Resources. Acknowledging the Columbia River Basin as an extraordinarily important transboundary freshwater resource for agriculture, fisheries, power-generation, First Nations and urban users, the report highlighted

the need to balance documented climate impacts with monitoring of the region's water resources and developing a collective effort to prepare communities and industry for change.

More reports followed: Climate Extremes in the Canadian Columbia Basin: A Preliminary Assessment published in 2013 by the PCIC predicted many of the climate change impacts currently being experienced in the Columbia Basin; Water Monitoring and Climate in the Upper Columbia Basin, Summary of Current Status and Opportunities published in 2017 by the Columbia Basin Trust (CBT) highlighted important water data gaps in the Upper Columbia Basin (UCB), a need for a coordinated monitoring effort, and a "streamlined archival and retrieval technologies" for water data.

Following the CBT report, Living Lakes Canada took action. A non-profit organization founded in the Columbia Basin with the mission to foster citizen-based water stewardship through science-driven community-based water monitoring, assessment and restoration programs, Living Lakes Canada co-convened a conference in late 2017 with the Gordon Foundation and WWF-Canada, bringing together 120 water data experts from across North America to discuss what a water monitoring framework and data hub would look like for the UCB.

Following the conference, Living Lakes Canada led the collaborative approach to determining the best solution for water data collection, analysis, sharing and storage, a multi-year process that culminated in the development of a database using a CKAN instance in early 2020. Launched in March 2021, the Columbia Basin Water Hub is used by over 40 stewardship groups; municipal, regional and Indigenous governments; environmental professionals and industry to share and access current and historical water data. Data can also be linked to existing databases that are openly available online. The Water Hub is also one of the hosts of the main database for Foreshore Integrated Management Planning data collected in partnership with the Department of Fisheries and Oceans.

To lay the groundwork for a Priority Monitoring Matrix, Living Lakes Canada convened a meeting in June 2020 of senior hydrologists from government, consultants and academia who reached consensus that a water balance approach was needed to fill the water data gaps in the UCB. That same month, the University of British Columbia published a 30-year study suggesting the glacier-melt contributions to runoff have already passed peak water for summer stream flows in the Canadian Columbia Basin.

Guided by these reports and proceedings, Living Lakes Canada contracted local experts to develop the Priority Monitoring Matrix methodology in 2021, outlined in Developing a Priority Matrix to Expand Water Monitoring in the Upper Canadian Columbia Basin: Steps for Pilot Implementation (referred to internally as the "Terms of Reference") in which the role of Local Reference Groups is introduced and explained (for further explanation please refer to the Local Reference Group information sheet). Local Reference Groups are being created in each of the three pilot areas. Hydrologic modeling and data gap analysis is also being completed in the target hydrologic regions. Local Reference Group participants will identify key community concerns and priorities and this information will complement the scientific rationale for choosing

which watersheds to monitor, creating a complete Priority Monitoring Matrix to ensure that monitoring addresses both community and scientific needs in a nested, cost-effective manner.

Meeting Goals

The goals of this inaugural meeting for the Columbia-Kootenay Headwaters Hydrologic Region were to:

- bring potential Local Reference Group participants together to introduce them to the Columbia Basin Water Monitoring Framework concept;
- explain the role of the Local Reference Group in the development of the Priority Monitoring Matrix for their particular hydrologic region; and
- hold a group brainstorm on watershed values and issues to kick off a preliminary discussion around local water monitoring priorities within the watershed.

Meeting Overview

The meeting began with a Land Acknowledgement recognizing that Living Lakes Canada's water stewardship work is taking place in the unceded traditional territories of the Ktunaxa, Secwepemc, Sinixt and Syilx Nations.

Meeting participants were then provided with an overview of Living Lakes Canada followed by a brief explanation of the premise for the Columbia Basin Water Monitoring Framework (explained in full in the above Background section) and the project timeline since its inception in 2017 (explained in full in the above Background section). Additional context was provided with a reference to B.C.'s first Watershed Security Strategy and Fund and newly established Ministry of Land, Water and Resource Stewardship as well as the new Canada Water Agency to demonstrate the timeliness and relevance of this pilot project.

Next, Living Lakes Canada's ongoing consultation with interested Indigenous groups outside the Indigenous representation at the meeting was explained. Living Lakes Canada is concurrently working to (1) incorporate Indigenous voices in the Local Reference Group consultation process based on interest by those wanting to present their water priorities; (2) to create meaningful engagement on these issues; and (3) to apply the information obtained through consultation to influence and guide our regional monitoring sites based on Indigenous water monitoring priorities.

Next, a local overview of the Framework was provided and the purpose of the Local Reference Groups was explained. This was followed by an overview of the technical aspect of the project (i.e. the setting of monitoring priorities within the scientific framework), which will eventually be

complemented by input from the Local Reference Group to create a complete Priority Monitoring Matrix that reflects both community and scientific values.

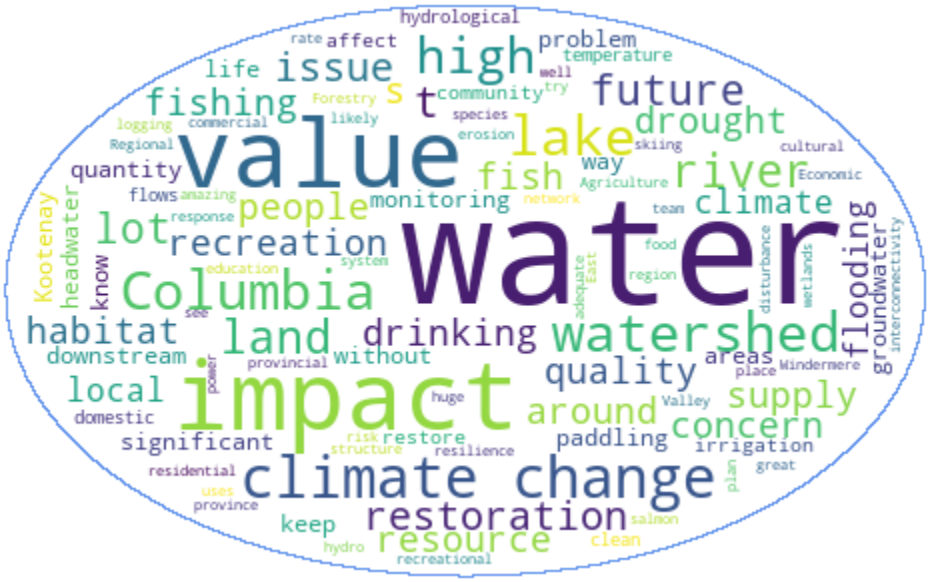
Finally, a more in-depth explanation of the Priority Monitoring Matrix and how community priorities could be incorporated was offered.

Watershed Discussion Groups

At this point in the meeting, participants broke into four different groups to discuss watershed values and issues in their region. One note taker was assigned to each group to record the ensuing discussions and share highlights in a brief roundtable format. Each group was asked to answer the following two questions:

1. What do you personally value about your watershed? (e.g., clean drinking water, water for fish, spiritual value)
2. What are the issues facing fresh water in your watershed, now and into the future?

The objective of this exercise was to encourage “big picture” thinking about the state of watersheds and create context for the need for a unified water monitoring network in this particular hydrologic region.



Columbia-Kootenay Headwaters Discussion Group Word Cloud

Watershed Values

Overall, participants expressed similar values around their watershed with an emphasis on water supply, clean drinking water, Indigenous relationships with water, healthy ecosystems, water's role in community health and well-being, and the economic benefits of water.

The full range of values noted in these discussions are listed below.

Water as a Value

- Water as the highest value
- Water as a connecting force between people
- Water as a peacekeeping force
- Power of water, something to be respected, we can't control it (e.g., flooding)
- Cool and clean water

Indigenous Relationships with Water

- Water as its own entity, not just a value (completely different from Eurocentric approach)
- Water is life, without it we would not exist (i.e., provides food, habitat)
- Water for ceremony

Appreciation and Connection

- Spiritual and cultural values from local watershed, sense of place
- Contributes to overall health of communities
- Recreation (e.g., skiing, paddling, fishing)
- Education (e.g., paddling on the water as a venue for education)
- Amazing geography (i.e., big watershed where rivers converge)

Community Benefits

- Water supply (e.g., abundant clean water for consumption, water for local farms)
- Clean, safe drinking water (e.g., Columbia Lake)
- Groundwater recharge for wells.

Healthy Ecosystems

- Habitat for fish
- Significant ecological values beyond human use (i.e., aquatic and riparian habitats for birds, fish, invertebrates and other mammal species)
- Columbia River Wetlands
- Environmental value
- High ecological value
- Biodiversity

Economic Benefits

- Hydro power (i.e., the headwater lakes hold a lot of power, affect the dam system downstream)
- Columbia Basin Trust (i.e., significant portion of financial resources generated from the dams are redirected back to the region)
- Tourism (e.g., lakes, rivers, golfing, skiing, even dams draw visitors like Mica Dam in Revelstoke)
- Provides economic opportunities
- Commercial use
- Water for agriculture

Watershed Issues

The issues affecting watersheds that participants identified were focused primarily around human activity and management approach, followed by concerns related directly to water and climate impacts. Overall, the concerns shared demonstrate the complexities of watershed management and the range of monitoring priorities that need to be considered when developing a complete Priority Monitoring Matrix in order to adequately address community concerns.

The full range of issues noted in these discussions are listed below.

Management Approach

- Data scarcity (more monitoring needed for risk analysis)
- Need for more community-based water monitoring
- Uncertainty around downstream impacts beyond the Columbia Valley (not all impacts are local)
- Salmon reintroduction in the watershed (how that will benefit First Nations from a cultural point of view)
- Taking water for granted (people abuse it, overuse it, pollute it)
- Water jurisdiction and access to water (disentangling governance structures)
- Water use planning and allocation (residential and agricultural)
- Watershed planning (problems around design, setback for dykes, weirs)
- Lack of awareness around climate change impacts on water
- Lack of awareness around connectivity (relationship between groundwater and surface water supply, especially lakes)
- Lack of guidance
- Lack of education (many people still overlooking the importance of respecting water usage re: land use and irrigation)
- Current fragmented approach to water management (multi-jurisdictional gridlock and results in lack of coordination)
- Need for more meaningful and vested interest in the health of our landscape
- Flooding damaging existing infrastructure, need for response plans
- Treatment of water as a resource (unnatural)

- Need for climate resilient restoration (can't restore to what it was before when climate change is a moving target)
- Invasive species control (impacts of Aquatic Invasive Species to hydro, recreation)

Water Concerns

- Uncertainty around future of water supply in changing conditions (quality and quantity)
- Resiliency of water supply and water quality to climate/disturbance
- Increasing temperature of high elevation lakes (could invite AIS)
- Water temperature in general
- Climate change affecting timing of high flows and intensity of high flows
- Low flows
- Need for groundwater protection
- Negative aspects of water related to oversupply (e.g., flooding, debris torrents, landslides)

Climate Disruption

- Climate change impacts
- Extreme events (droughts and floods) and their impacts on communities
- Regional drought (such a dry climate)
- Receding glaciers
- Wildfire
- Erosion
- Changing hydrological courses

Human Activity

- Forestry impacts, logging
- Expanding land uses impacting future water quality (everything we do on the land ends up in the water)
- CP Rail activity on Lake Windermere
- Unauthorized water extraction from streams on private land (e.g., residential, farming)
- Industrial activities
- Irrigation overuse
- Discharge of sewage during drought (need to know more about loading rate coming down into the wetlands)
- Diversion affecting downstream water supply (e.g., a commercial operator has been diverting water into a waterslide structure)
- Foreshore development impacting habitat (e.g., lakeshore walls to prevent erosion)
- Development
- Hydroactivity on Columbia River impacting animals' and plants' ability to thrive
- Bottled water companies (need to keep out)

Biodiversity Crisis

- Species at risk decline

Follow-up Survey

In the meeting's closing remarks, participants were told to expect a follow-up email comprised of:

- A link to the recording of the meeting
- A summary report with an overview of the breakout discussions as well as next steps
- A follow-up survey (to be completed by April 8, 2022)

The intention of this survey (Survey #1) is to invite existing participants (those who attended the meeting as well as those who were unable to attend but have expressed interest in participating or receiving updates) to:

- suggest other individuals or institutions who should be included in the Local Reference Group;
- determine the preferred methods for engagement; and
- identify any additional sources of data which could be uploaded to the Columbia Basin Water Hub to support this pilot project.

Next Steps

In the next phase of the engagement process, a second, more in-depth, survey will be developed with the purpose of collecting local knowledge to answer questions around water monitoring priorities within the scientific framework. Survey #2 will be the main tool for consulting Local Reference Group participants to share their water monitoring priorities, and provide local knowledge about past disturbances, culturally significant sites, changes that have been observed, and other important information to inform the design of the monitoring network.

A second Columbia-Kootenay Headwaters Hydrologic Region meeting will take place early May to introduce a preliminary version of this long-form survey to an expanded network of Local Reference Group participants and collect their feedback.

Once feedback has been incorporated, a final version of Survey #2 will be circulated among Local Reference Group participants between roughly mid-May and June 30, 2022 (in addition to other forms of engagement identified in Survey #1 and based on participants' confirmed level of participation).

Using the findings from Survey #2, a preliminary monitoring network will be designed, taking into account the local priorities and knowledge, Indigenous priorities and the results of the data gap analysis and watershed stratification. This preliminary network will be presented to the Local

Reference Group participants for comment and adjusted as required. The goal is to operationalize the monitoring network in August 2022.

➔ April 8	Survey 1 closes
➔ Early May	2nd Local Reference Group meeting takes place, Survey 2 (data collection survey) introduced, feedback received
➔ Mid-May to June 30	Survey 2 data collection
➔ June 30	Survey 2 closes
➔ End of July	Survey findings and proposed monitoring network proposed to Local Reference Group for comment
➔ August	Installation of preliminary monitoring network

Questions? Contact Wendy Booth, Local Reference Group coordinator for the Columbia-Kootenay Headwaters Hydrologic Region: eklrg@livinglakescanada.ca

Resources

Use the hyperlinks to access the listed resources.

Presentation on the Columbia Basin Water Monitoring Framework pilot project to the Living Lakes Canada Board of Directors (16-minute video)

Information Sheet for Local Reference Group participants

Inaugural Mid-Columbia Kootenay Hydrologic Region Meeting: Recording

Developing a Priority Matrix to Expand Water Monitoring in the Upper Canadian Columbia Basin: Steps for Pilot Implementation: Terms of Reference for the Pilot Project

Columbia Basin Water Monitoring Framework Project Page

Columbia Basin Water Hub: the central repository for water-related data in the Columbia Basin launched by Living Lakes Canada in March 2021 that will house all data from the pilot project

Columbia Basin Water Hub Film: part of Living Lakes Canada's Community-Based Water Monitoring Film Series (3-minute video)

Groundwater Film: part of Living Lakes Canada's Community-Based Water Monitoring Film Series (3-minute video)