



Drinking Water & Watershed Protection

May 24, 2023 // Technical Advisory Committee Meeting

AGENDA

ROUNDTABLE

**INVITED
PRESENTATIONS**

**PROJECT UPDATE
PRESENTATIONS**

AGENDA

- Approval of the agenda
- Adoption of minutes
Minutes from February 13, 2023
- Roundtable Updates
- Invited Presentations
- Project Updates
- Adjournment

ROUNDTABLE UPDATES

All committee members

Invited Presentations

- **Snowpack Monitoring Update**
Bill Floyd, Research Hydrologist Ministry of Forests and Adjunct Professor Geography, Vancouver Island University
- **School Water Stewards Program**
Linda Brooymans, Nanaimo and Area Land Trust
- **Hydrometric Monitoring Network**
Aliandra Badger, BC Conservation Foundation

Snowpack Monitoring Update

- Plane and helicopter based Light Detection and Ranging (LiDAR) has been used to map snow depth at the watershed scale
- Developed a LiDAR based snow survey program in South Western BC and on Vancouver Island
- Main focus has been applying this method in forested watersheds to quantify uncertainty and to develop operational tools to both measure and model snow accumulation and melt.
- Entering the 5th year of the study



Fixed Wing LiDAR Snow Mapping in the Upper Englishman and Little Qualicum River Watershed: 2022 Progress Report



Prepared by:

Bill Floyd, PhD, RPF, VIU, Min. Forests
Rosie Bisset, PhD, UNBC, VIU

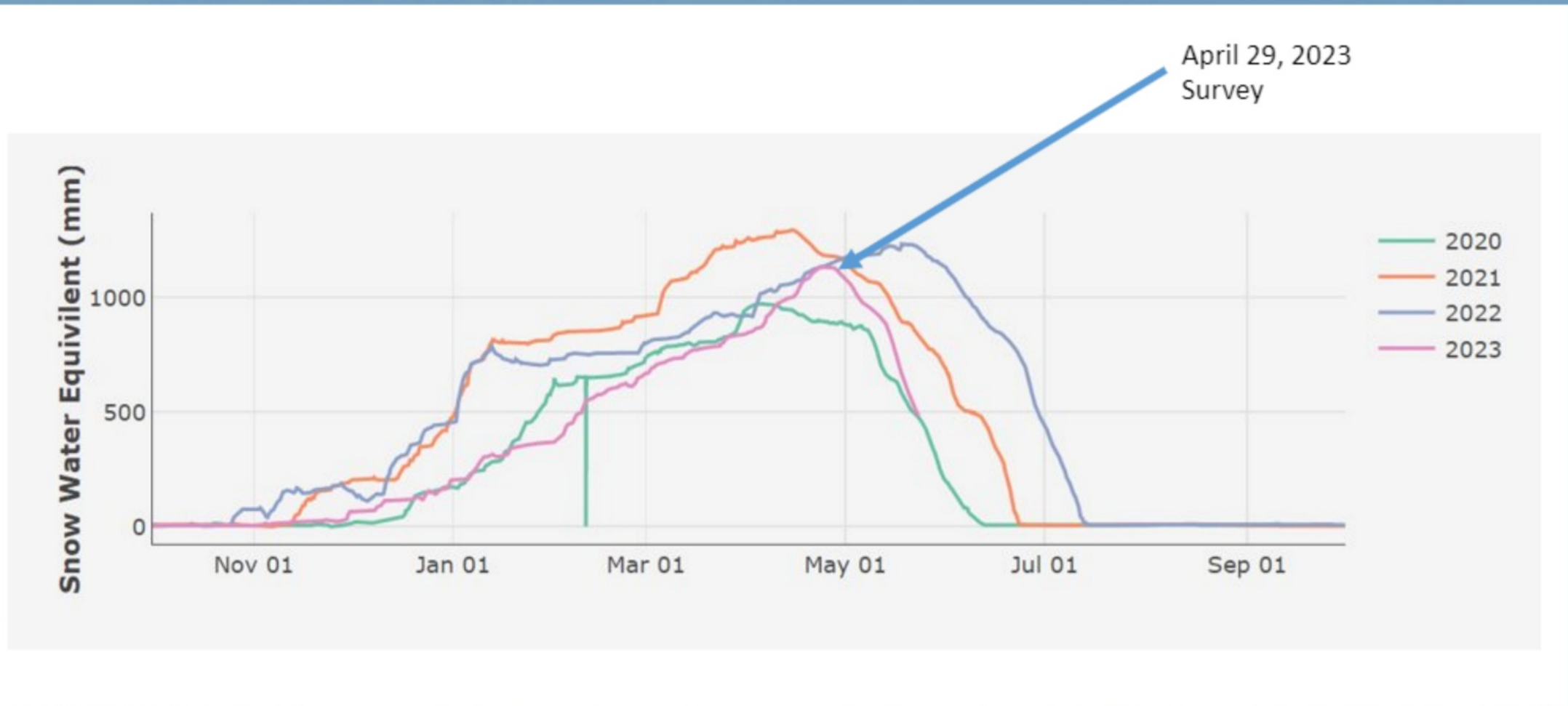
Contributions By:

Alison Bishop, BSc., VIU
Brian Menounos, PhD, UNBC
Derek Heathfield, MSc, Hakai Institute
Steven Beffort, Hakai Institute
Santiago Gonzalez Arriola, Hakai Institute

April 24, 2023

Report will be shared via the RDN Cloud Folder link

Snowpack Monitoring Update



PROJECT UPDATES

STAFF PRESENTATIONS

Awareness & Stewardship

- Team WaterSmart Events - M. Tomlinson
- Watershed Field Trips - M. Tomlinson
- Stewardship Partner Engagement Updates - C. Brugge
- Demonstration Site – RDN Admin Building Raingarden Update – C. Brugge

Information & Monitoring

- Pre-summer groundwater analysis - L. Fegan
- VOW Depth2Water webtool – L. Fegan
- Preliminary 2022 Community Watershed Monitoring Network results - L. Fegan
- French Creek Water Budget update – E. Forssman

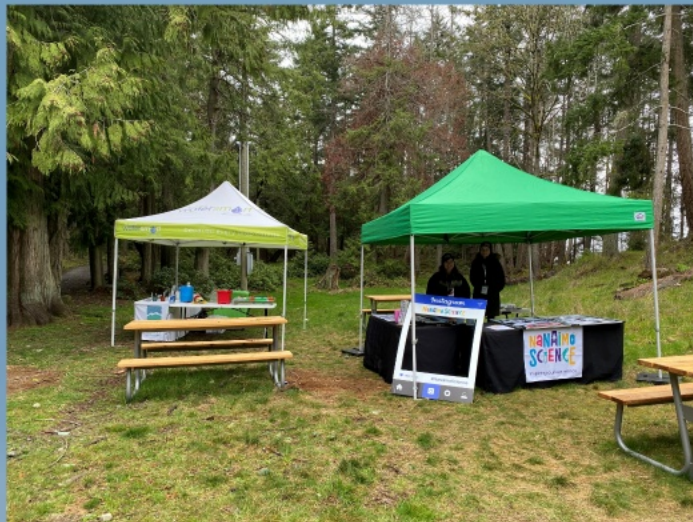
Policy & Planning

- Ecological Accounting Process Partnership Q2 – E. Forssman
- Rainwater Items - E. Forssman
 - French Creek Watersheds Performance Targets
 - Regional Climate Change Assessment

Team WaterSmart Events

Water to Earth Month

- 15 in person events across the region
- Partners included City of Nanaimo, NALT, VIU, MABBRI, Brant Festival and Nanaimo Science



Team WaterSmart Events

Date	Event	Location	Host
March 24th	Streamwalk and Hatchery Tour	Nile Creek	RDN, Dave Clough and Nile Creek Hatchery
April 1-2	Streamkeeper Course	Cat Stream	NALT
April 3rd	Rainwater Harvesting Walk/ Tour	Qualicum Beach Library	Brant Festival, VIRL, RDN
April 5th	Brant Childrens Festival	Arrowview Elementary	Brant Festival
April 5 & April 8	Englishman River Estuary Tour	Englishman River	Nature Trust of BC, Arrowsmith Naturals, Brant Festival
April 11th	WellSmart Workshop	Cedar Community Hall	RDN, Ministry of Forests and Island Health
April 14-16th	MABR Bio Blitz	iNaturalist APP	MABBRI
April 15th	WaterSmart Gardening Workshop and Tour	Beban Park	RDN, Beban Learning Gardens, Connie Kuramoto
April 15th	Garry Oak Restoration Tour	VIU	VIU
April 15th	Bottle Drive	NALT	NALT
April 15th	Hamilton Marsh Tour	Hamilton Marsh	Brant Festival, MABBRI
April 21st	Nanaimo River Watershed and Treatment Plant Tour	Nanaimo River	City of Nanaimo, Mosaic, RDN
April 22nd	Natural Landscapes and Climate Change Workshop	Fern and Feather	City of Nanaimo
April 22nd	Science in the Park	Moorecroft Park	RDN, Nanaimo Science
April 29th	Stewards in the Spotlight' event plus Departure Creek Walk	Departure Bay/ Kin Hut	RDN, City of Nanaimo, Streamkeepers



Team WaterSmart Events

Spring/Summer Events

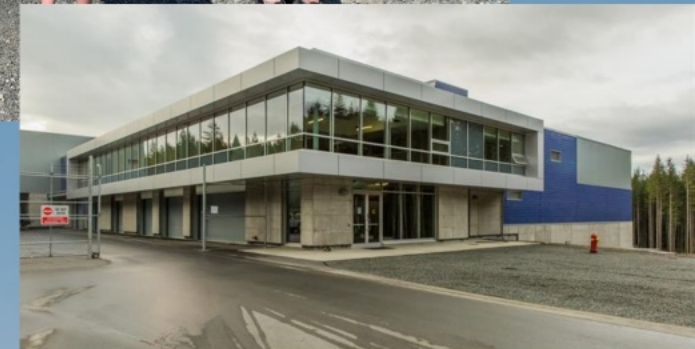
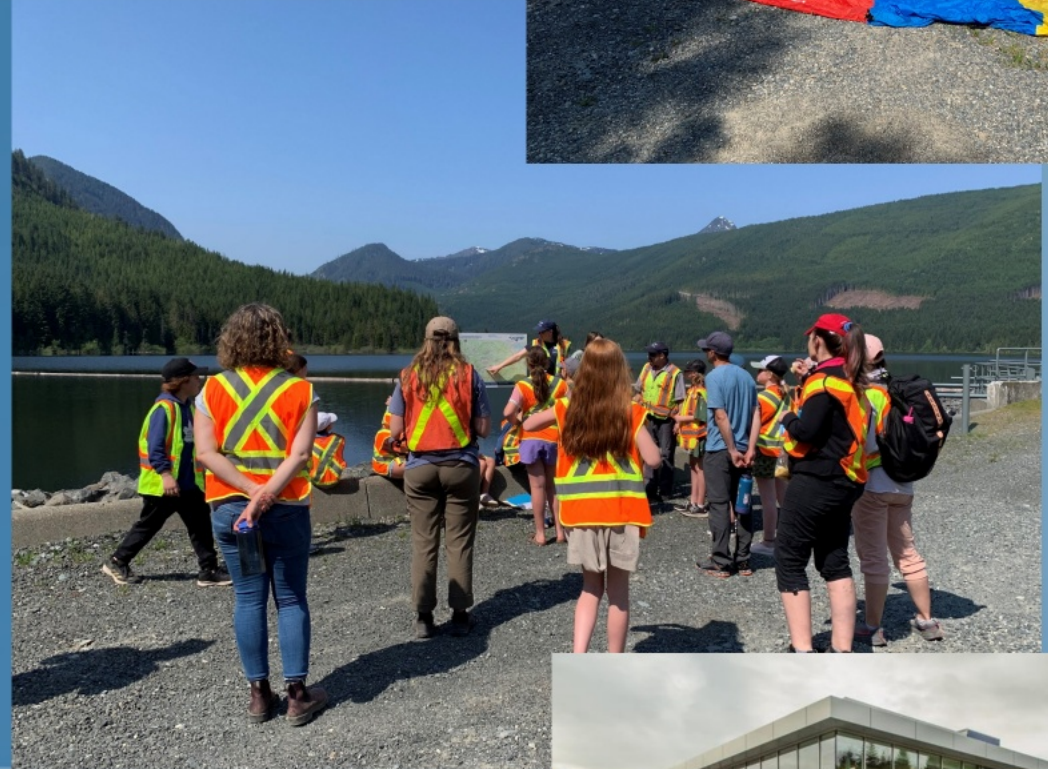
- May 7- River Never Sleeps
- May 17- Parksville Utilities Day
- May 24- City of Nanaimo Public Works Day
- July- Qualicum Beach Day
- August- Lantzville Minetown Day
- ... and more to come



Team WaterSmart Events

Watershed Field Trips

- Partnership with the City of Nanaimo, City of Parksville, Mosaic Forest Management and Nanaimo & Area Land Trust
- 3 trips to the Nanaimo River (Jump Lake)
- 4 trips to the Englishman River Regional Park
- Grades 4&5 focus curriculum focus on watershed health, water cycle, and source of drinking water



Team WaterSmart Events

Irrigation Check Ups

- Team WaterSmart's irrigation check up service have shown through water use data to be an effective way at helping residents reduce their water usage during peak summer months.
- Our check ups look for leaks and inefficiencies in the irrigation system including the control timer to determine if the appropriate amount of water is being used. A report is then issued to the homeowner outlining the findings of the check up as well as recommendations and sources of information to assist with making any changes.
- Plan to complete 12 irrigation audits this summer through the months of June and July



Stewardship Partner Engagement Updates

Engaging with stewardship groups and creating opportunities for support, connection, and volunteer recruitment

Hearing from partnered volunteer-based stewardship organizations involved in CWMN, Mid-Island Stewardship Caucus, and beyond

- CWMN Thank-you Event - piloted in 2022
- Stewards in the Spotlight Event - new this year!
- Watershed Stewardship Network Get Involved



www.getinvolved.rdn.ca/watershed-stewardship-network



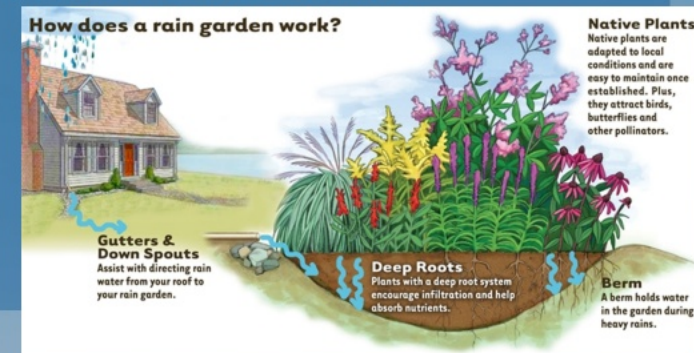
Demonstration Site – RDN Admin Building Rain Garden Update

Earlier this year, DWWP launched the **Demonstration Site & Interpretive Signage Program**, which aims to support local governments, partners, and environmental stewardship organizations with the installation or improvements to green infrastructure, such as rain gardens, and/or the installation of interpretive signage at demonstration sites or watershed features.

RDN Rain Garden Project:

A pilot project to amend and install interpretive signage at the RDN's existing rain garden, located along Hammond Bay Road at the RDN's Administrative Office

- effort to learn more about associated costs and processes to fully inform the new funding program
- amend the existing swale so that it functions to slow, capture, and infiltrate rainwater run-off from the surrounding landscape
- create space for public awareness and education



Demonstration Site – RDN Admin Building Rain Garden Update

Current state:

- Turf covering hard-packed and poor soil
- Lack of vegetation
- Invasive species
- Uncovered storm drain



RDN Rain Garden – overlooking the West side of swale from RDN Admin Building



RDN Rain Garden – Overlooking the East side of swale/rain garden from RDN Admin Building



Invasive English Ivy at the East end of the rain garden



Demonstration Site – RDN Admin Building Rain Garden Update

Vision for future rain garden:

- Remove turf and amend soil - till, site soil with compost mix, mulch
- Remove invasives and plant native species throughout
- Raise and cover storm drains
- Upgrade pathways and install interpretive signage

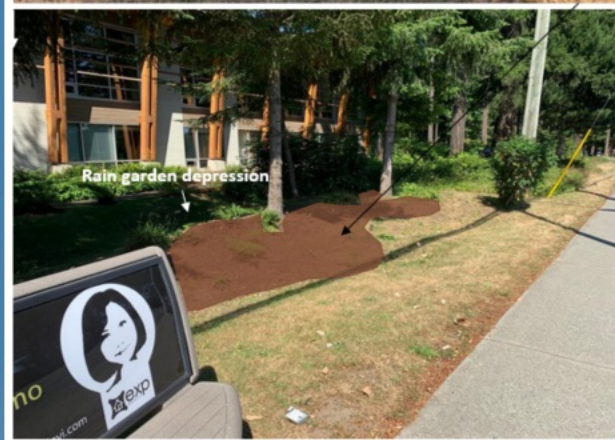


The top of the rain garden berm along Hammond Bay Road

Zone 1
The deepest and wettest part of the rain garden.

Zone 2
The bank slopes of the rain garden.

Zone 3
The driest areas along the perimeter of the rain garden.



Rain garden depression

Top of berm along rain garden at East end near Hammond Bay Rd



Rain Garden

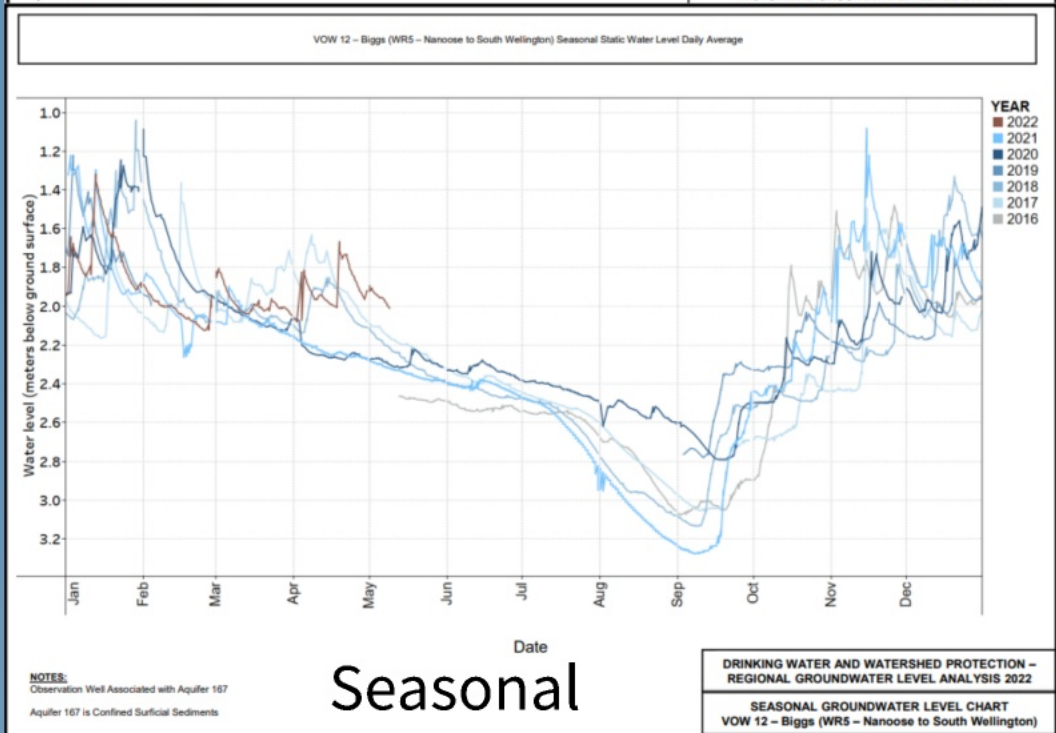
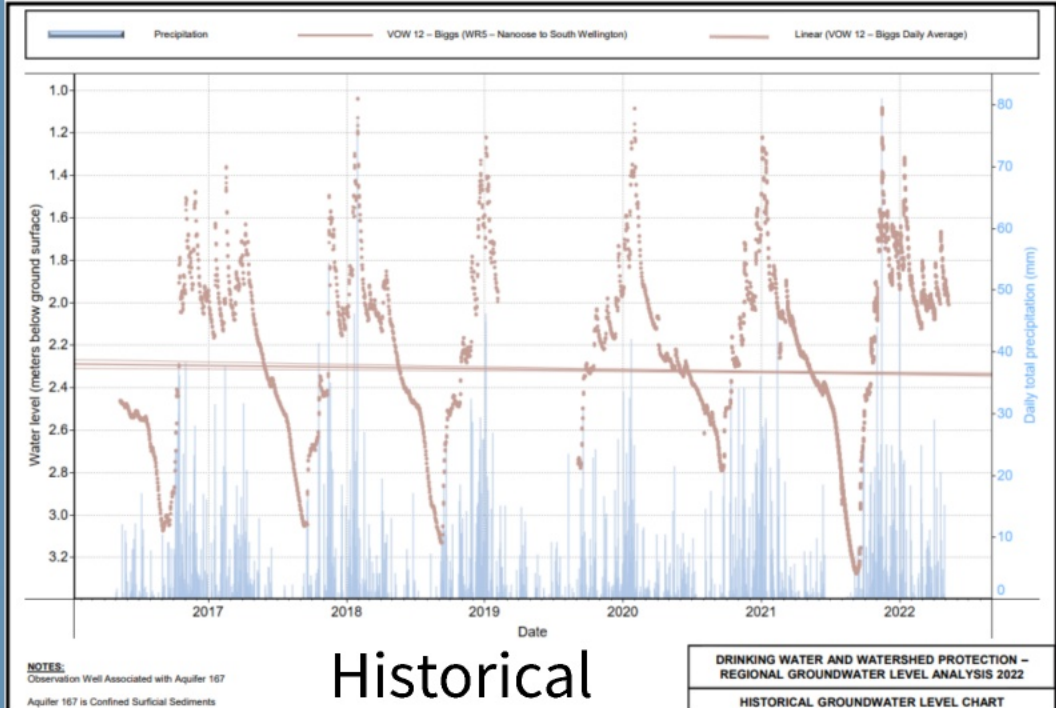
RDN Rain Garden Interpretive Sign!

New gravel path from RDN Admin building to Hammond Bay Road near bus stop

Groundwater Data Analysis

Annual report of data collected through the Volunteer Observation Well Network (VOW)

- Historical and seasonal data to May 2023
- Indication of groundwater levels going into summer period



Pre-summer Groundwater Analysis

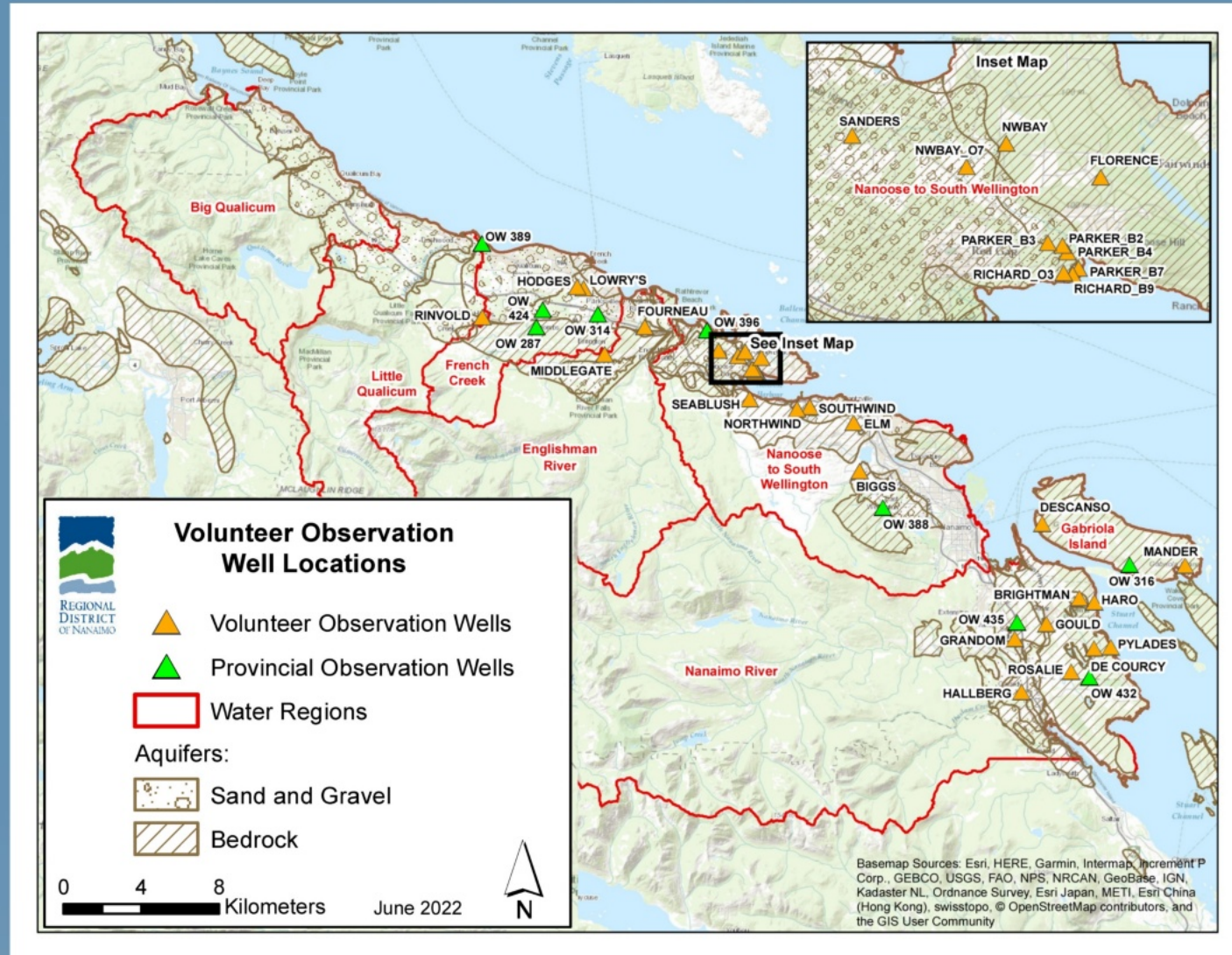
Included in 2023 report:

- 30 VOW sites
- 9 B.C. OW sites

Helps to inform:

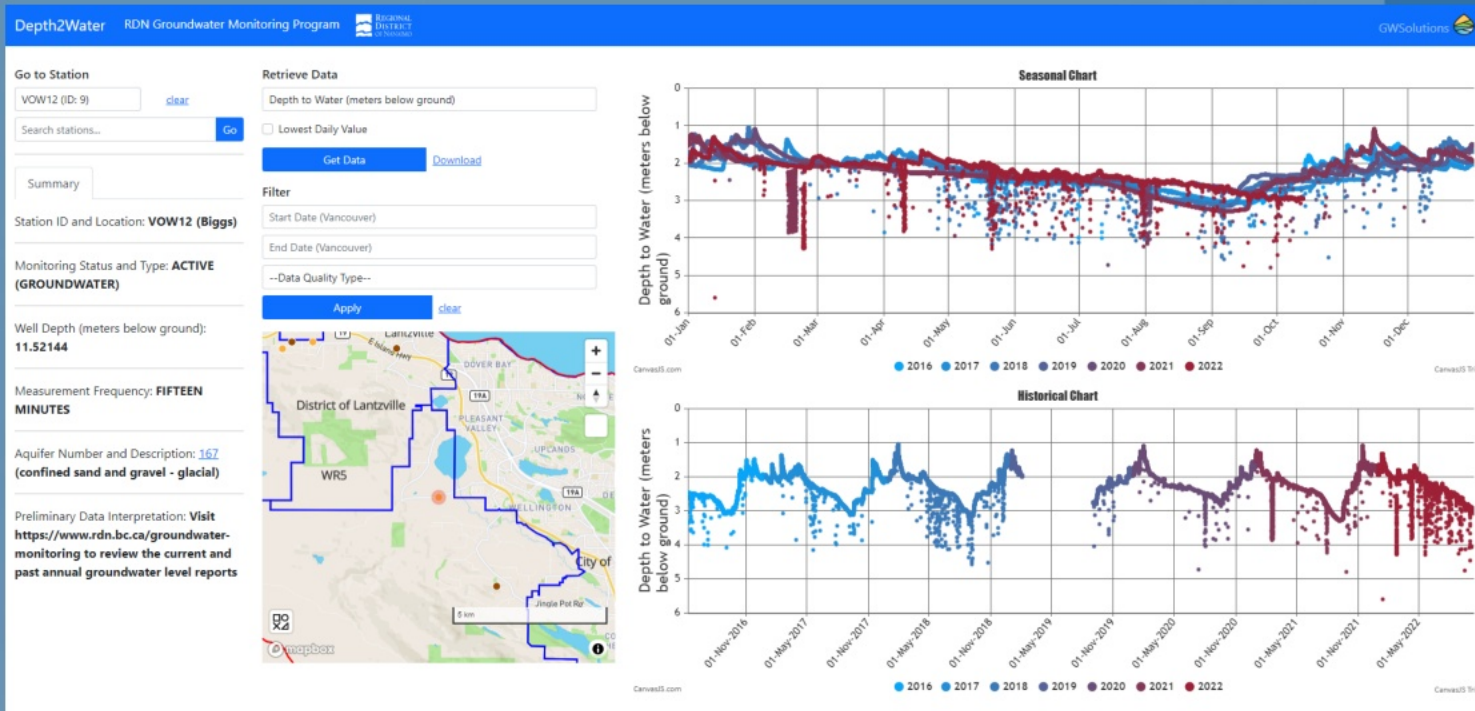
- decision makers
- program volunteers

Results available
June 2023



Depth2Water Webtool

- Depth2Water is a web based application used for VOW data storage and processing
- The application is desktop, laptop, and mobile friendly
- Internal site for data storage, cleaning, and export
- External reader for volunteers to view and download data



External reader example

Go to Station

VOW12 (ID: 9) [clear](#)

Search stations... [Go](#)

Summary

Station ID and Location: **VOW12 (Biggs)**

Monitoring Status and Type: **ACTIVE (GROUNDWATER)**

Well Depth (meters below ground): **11.52144**

Measurement Frequency: **FIFTEEN MINUTES**

Aquifer Number and Description: [167 \(confined sand and gravel - glacial\)](#)

Preliminary Data Interpretation: **Visit <https://www.rdn.bc.ca/groundwater-monitoring> to review the current and past annual groundwater level reports**

Retrieve Data

Depth to Water (meters below ground)

Lowest Daily Value

[Get Data](#)

[Download](#)

Filter

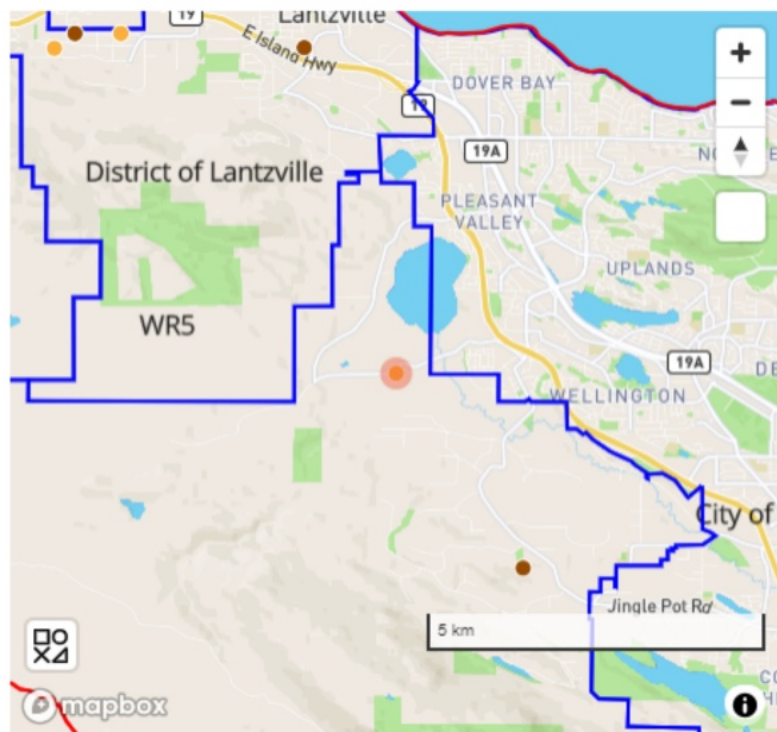
Start Date (Vancouver)

End Date (Vancouver)

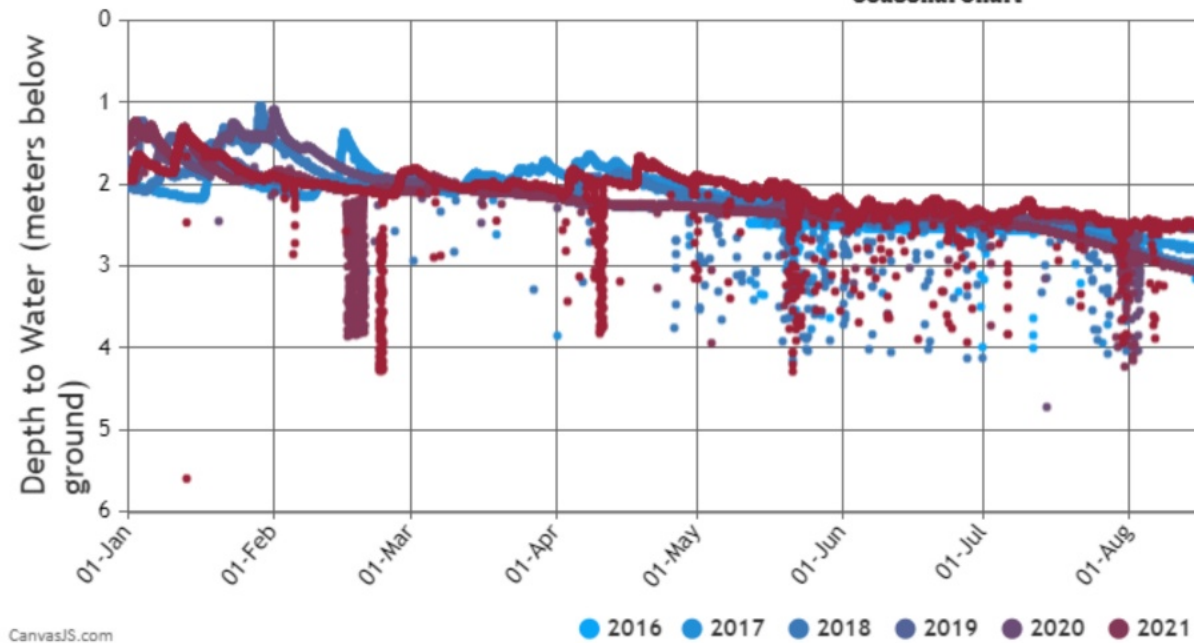
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[Apply](#)

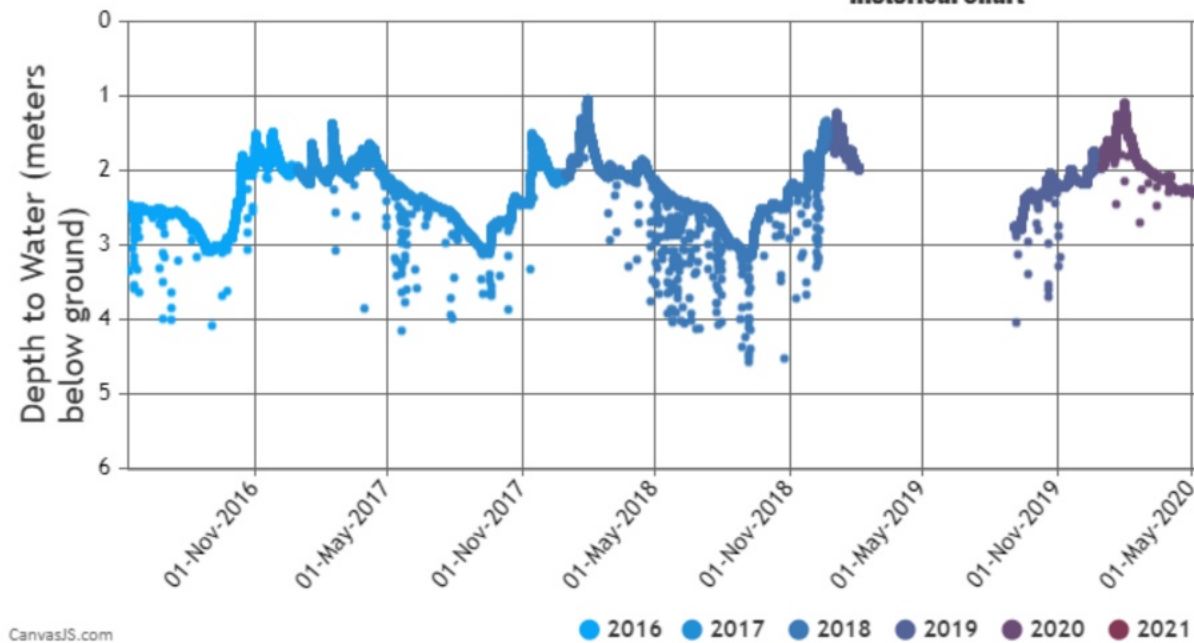
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Seasonal Chart



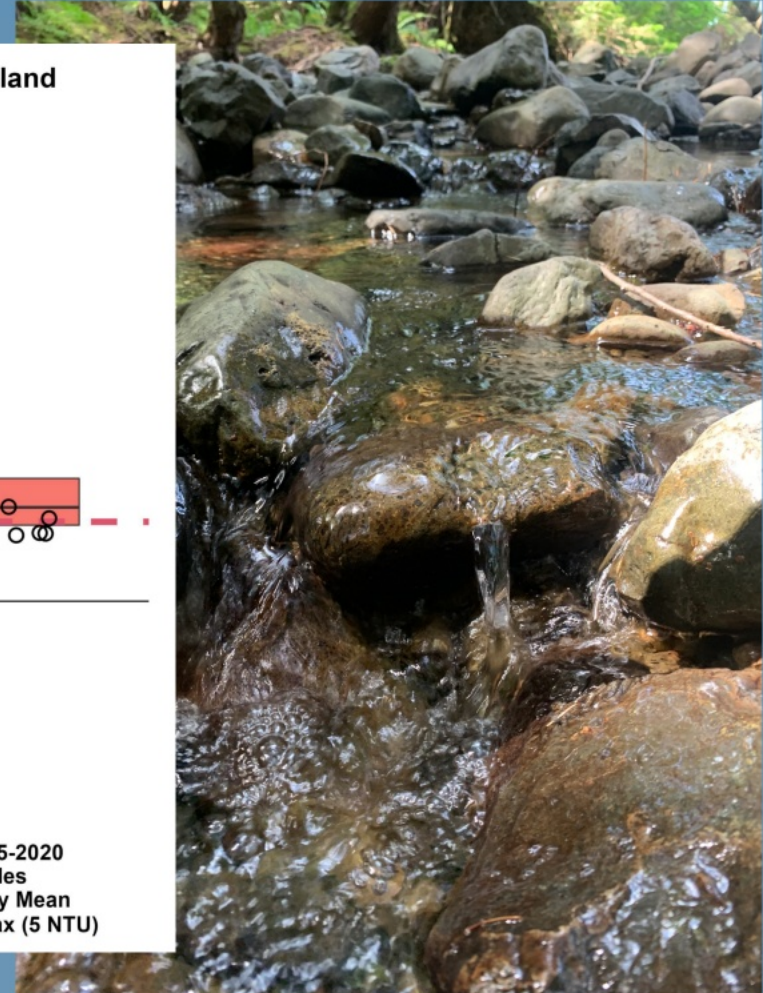
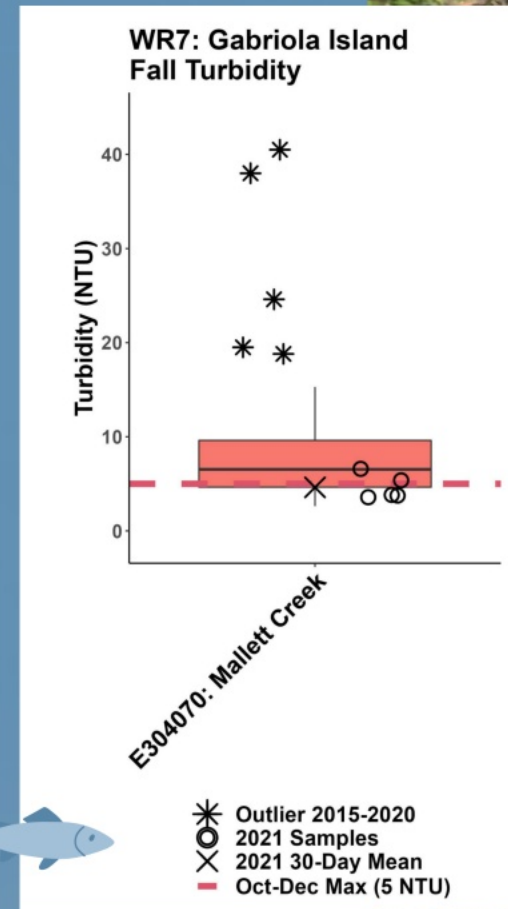
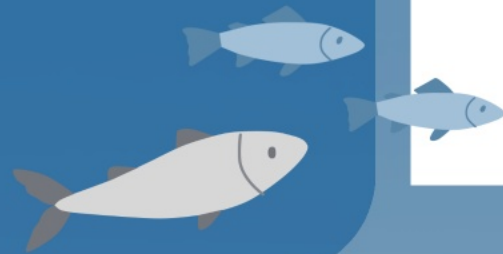
Historical Chart



Community Watershed Monitoring Network Results

Ecoscope Environmental engaged to complete 2023 data analysis

- Box plot updates
- Drainage delineations
- 500 m upstream area of influence
- Trend analysis
- Data interpretation and recommendations



Community Watershed Monitoring Network Results Session

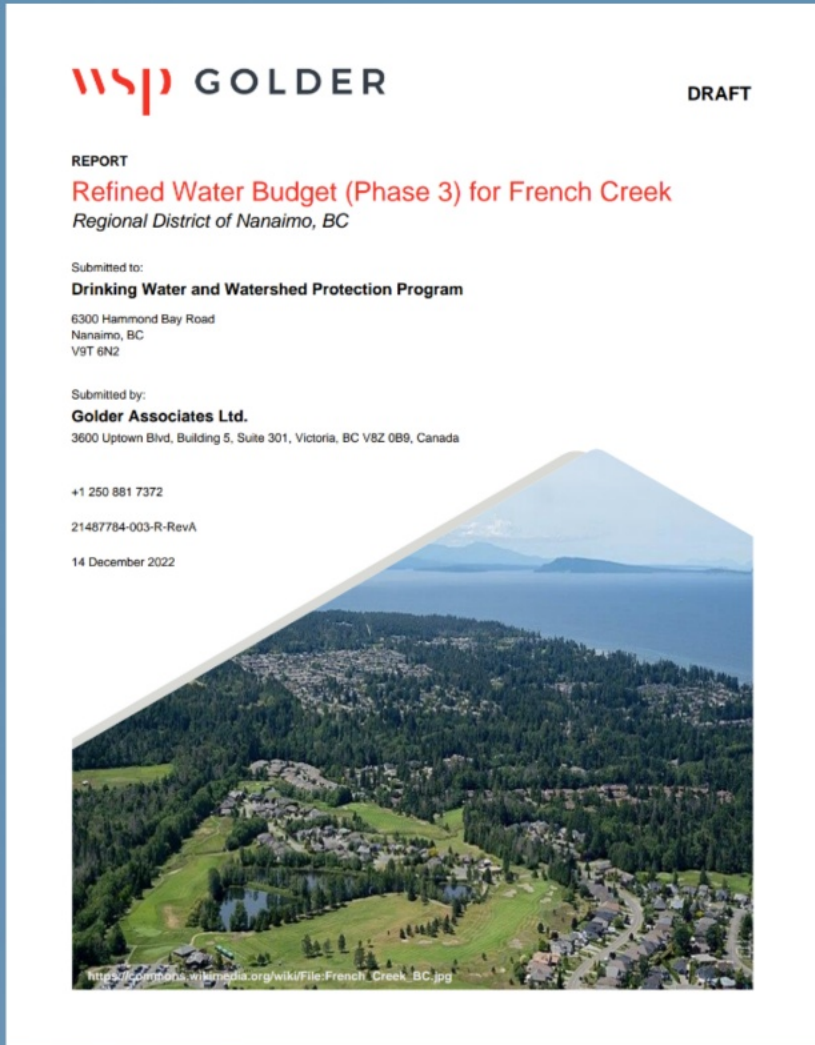
July 12 from 11 am – 2:30 pm (Nanoose Place)



- 2023 focus on data to action
- Results of data collected to date
- Guest presenters
- Facilitate networking



French Creek Water Budget - Project Updates



- Draft report was received in late 2022 and went to project partners and select members of the DWWP Technical Advisory Committee for edits and review
- A reference study that informed the report led by the Province redefining some aquifer boundaries went under review; new aquifer delineations have now been finalized.
- To avoid inconsistencies, we're holding off on finalizing the Water Budget report until the Province has incorporated new aquifer boundaries into GWELLS
- Golder/WSP has reviewed the (unpublished) aquifer updates and is preparing a quote / timeline for updating changes in the model and the report and figures
- Funding for project scope extension - TBD

Ecological Accounting Process Partnership Q2 update

The Ecological Accounting Process (EAP) is a methodology and set of metrics that can help local governments operationalize **maintenance** and **management** of natural assets such as streams

Stream systems are considered a **natural commons** asset, providing a range of uses or ecological services to the community

The EAP informs communities about the condition of their natural commons, the investment that has been made, and the value of the land underlying these spaces.

The EAP Partnership is working to embed the process within MABRRI at VIU to train student land planners, GIS analysts, and natural science students in the process through the application of EAPs supported through RDN, CoN and MNC.



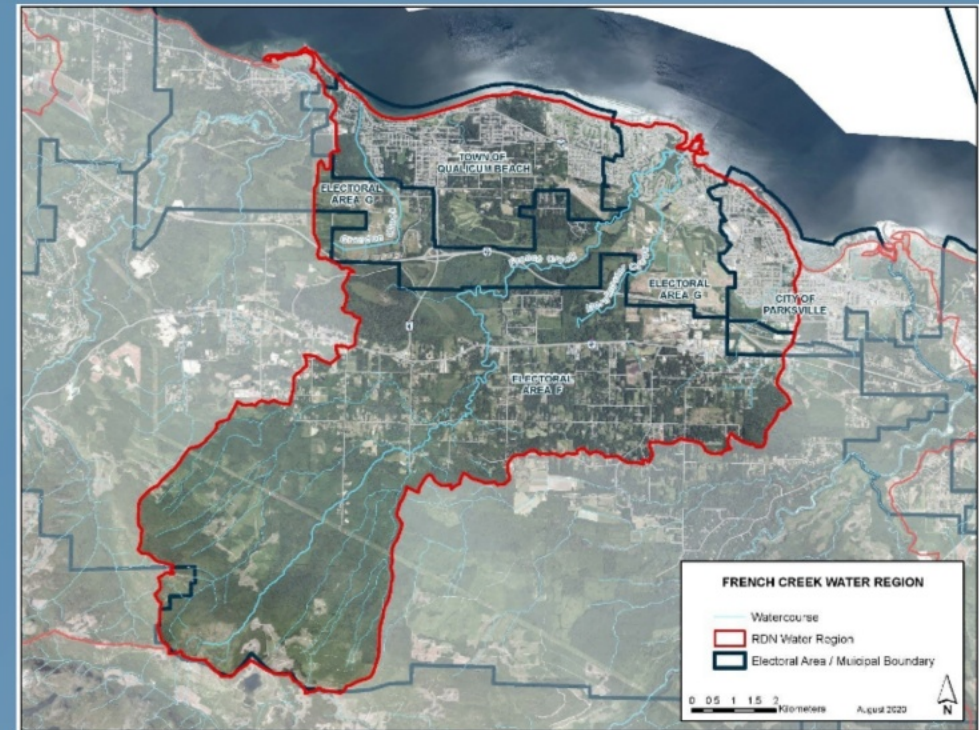
Ecological Accounting Process Partnership Q2 update

2023 RDN EAP Focus Stream: **French Creek**

Describe and quantify the alterations of rainwater pathways in the 230m riparian and upland areas along the stream and identify areas of high priority that contribute to water balance.

The outcome of this research question could be :

- 1) to provide recommendations of possible areas for protection, or
- 2) determine the approximate cost of riparian restoration in those high priority areas by basing it on examples from other areas with specific work over a specific time period.



Ecological Accounting Process Partnership Q2 update

Menu of EAP Analytical Steps

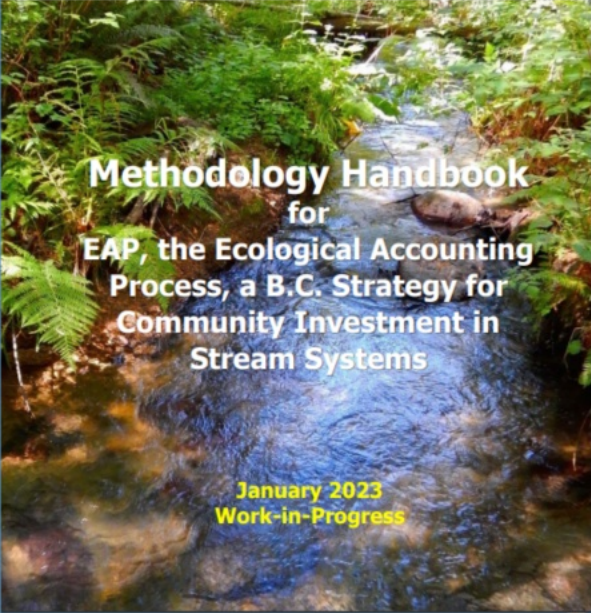
The summary below presents the “7 EAP steps” in probable order of importance. The seven evolved through the building blocks process that characterized development of the EAP methodology and metrics.

- **Step 1** - the calculation of the Natural Capital Asset (NCA) financial value is the primary EAP methodological step.
- **Step 2** - finds the annual investment at 1% of the NCA financial value required for M&M of the stream system.
- **Step 3** - stating the Riparian Deficit, provides a view of the extent of land use intrusions and alterations of the inner riparian zone (stream setback area of 30m on each side of the stream).
- **Steps 4 and 5** - quantify and describe aspects of the riparian condition (Riparian Deficit) in the inner setback zone, extending 30m away from the centre of the stream, and in the upland area extending a further 200m from the centre of the stream. These steps may be critical for planning M&M works and establishing priorities.
- **Step 6** – describes and quantifies the alterations of rainwater pathways in the 230m riparian and upland areas along the stream.
- **Step 7** - will find the premium (or discount) that buyers may pay to acquire residential parcels abutting and adjacent to a stream system.

The first three steps are the minimum for an EAP analysis. Application of steps 4 through 7 would reflect the stream-specific research question.



the partnership
for water sustainability in bc



Methodology Handbook
for
EAP, the Ecological Accounting Process, a B.C. Strategy for Community Investment in Stream Systems

January 2023
Work-in-Progress

Ecological Accounting Process Partnership Q2 update

One of the key objectives of this project, while centered on conducting an analysis on select streams within the region, is also to support the **knowledge transfer process** through educational pathways that include:

- Student-led research projects
- Technical training
- Mentorship opportunities
- Invitations / inclusion of additional municipalities for information sessions and update meetings
- and more..



EAP MABRRI Information Session:

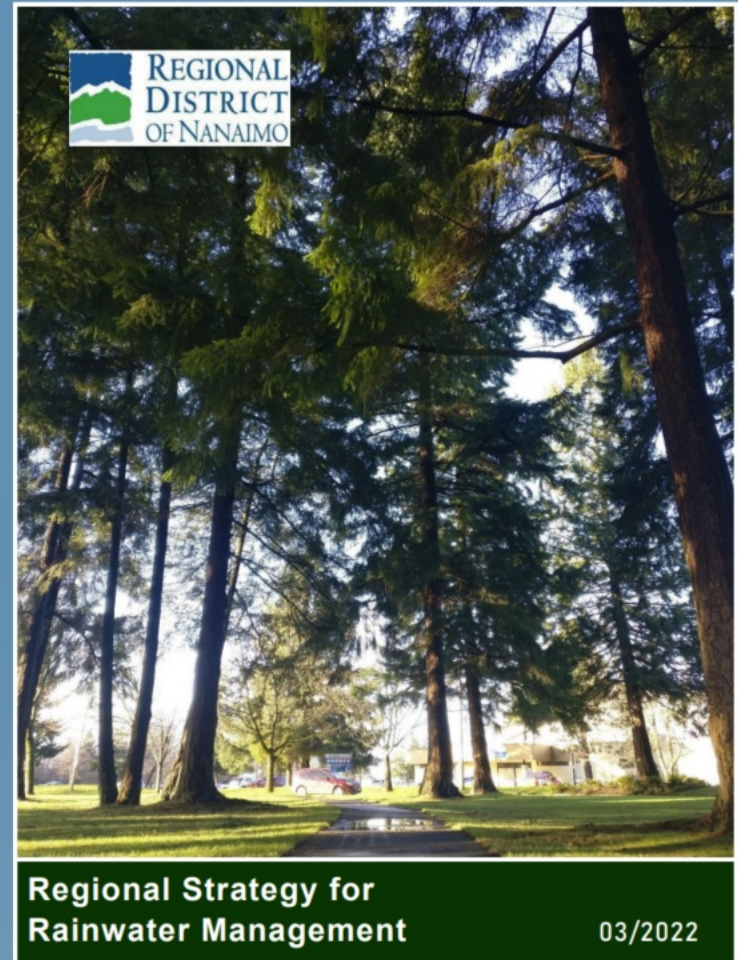
June 12, 9am-2pm.

The session will be recorded and can be distributed to interested partners / DWWP TAC members

Rainwater Management Projects

1. French Creek Watershed Performance Targets

2. Regional Climate Change Assessment



Rainwater Management Projects

Watershed Performance Targets for Rainwater Management French Creek Water region

Purpose: **Mitigate the effects of development by mimicking the natural water balance of a watershed, ensuring no increase in the magnitude of flood events while also maintaining the groundwater component of the water balance**



Recommendations within the report for implementation:

- 1. Identify and Standardize Technical Information in Stormwater Plans**
- 2. Water Quality & Hydrometric Monitoring**

Rainwater Management Projects

Watershed Performance Targets for Rainwater Management French Creek Water region

Identify and Standardize Technical Information in Stormwater Plans

Elements to check for in review :

- Summary of the assumed pre-development (i.e., natural), existing site conditions, and post-development site conditions, including the area of different land covers, the total impervious area, and the impervious area coverage as a percentage of the developed area.
- Summary of site conditions, land covers, impervious area coverage
- Overview of rainwater features proposed
- Presence of retention and detention facilities
- Inclusion of features that encourage filtration

Area F OCP Update

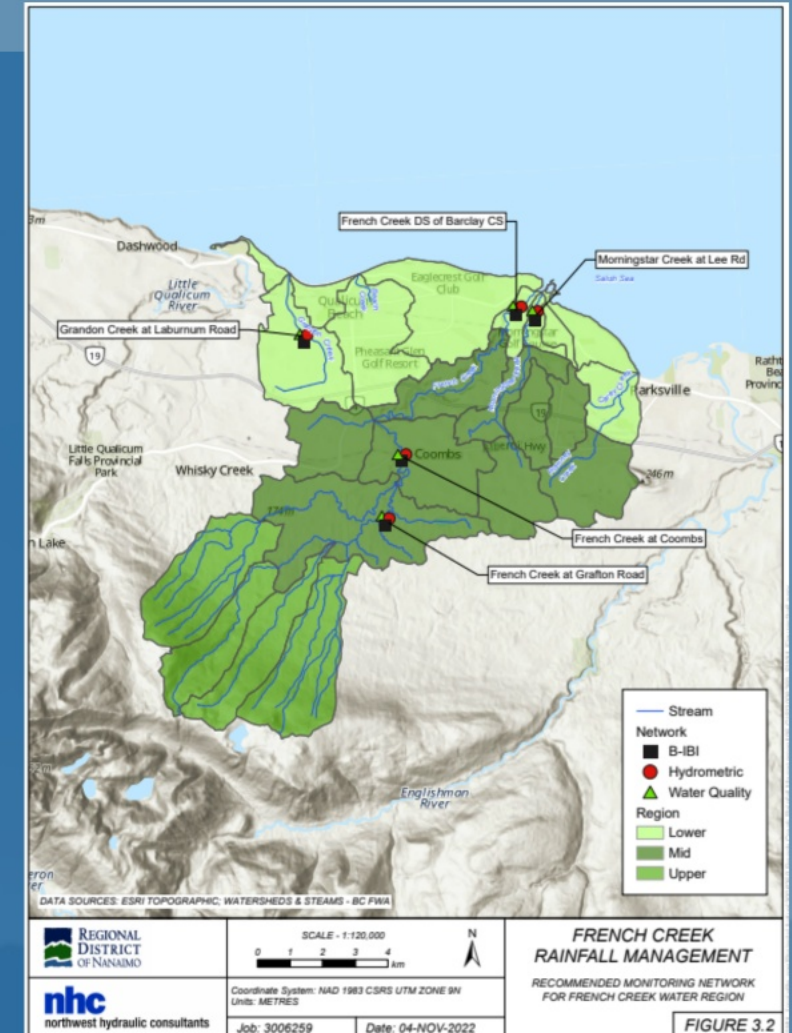
Aquifer Protection DPA

Rainwater Management Projects

Watershed Performance Targets for Rainwater Management French Creek Water Region

Monitoring

- Integration within existing Community Watershed Monitoring Network with opportunities for new community partnerships for hydrometric monitoring
- Currently in conversation with BCCF and the Province for integration of new hydrometric sites on French Creek
- Using recommendations from the report as well as past studies to select sites for monitoring
- Establishing a matrix for prioritization that may include consideration of:
 - overlap of recommended sites from past reports
 - site access (public / private land considerations)
 - proximity to other monitoring locations (water quality, biotic, climate stations, etc)
 - areas of groundwater / surface water interaction
 - ...and more

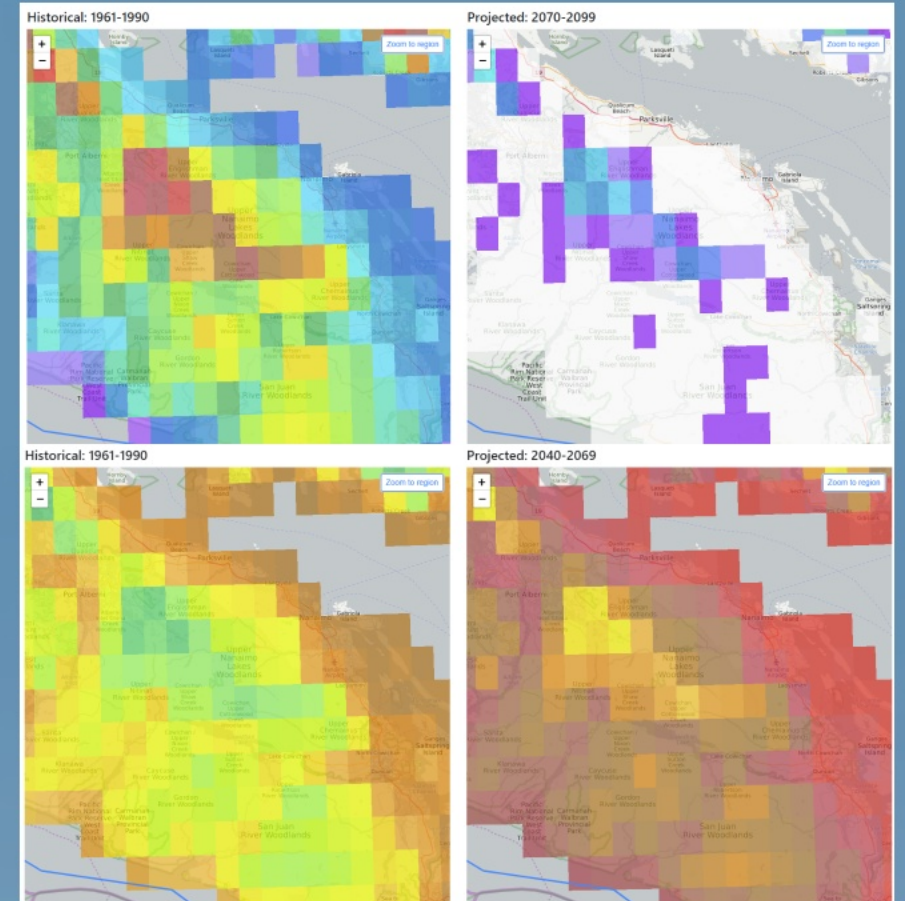


Rainwater Management Projects

Regional Climate Change Assessment

Project Objectives:

- Deliver regionally downscaled climate projections, including raster maps of indices (TBD which indices) for the entire Regional District
- Provide a concise report with highly useable/extractable images and messages and communications documents for municipal stakeholders & RDN departments as well as data sets that can be applied to regional projects (GIS, exportable)
- Produce a common data set that users can reference, allowing consistency of assumptions across projects and disciplines and improving user understanding of more localized climate risks anticipated for our area.



Rainwater Management Projects

Regional Climate Change Assessment

Project Updates:

- Collaborative effort between the RDN Energy and Sustainability Group and the Drinking Water and Watershed Protection Program. Also working alongside CRD as they do an update to their 2017 climate assessment
- Workplan with PCIC is finalized to begin producing downscaled climate projections for the region
- Hosting two, 1.5 hour workshops with stakeholders, focusing on potential product users; intention is to provide an orientation to the project and its potential products, set expectations for scope, and understand how the project fits in with existing data sets and projection products
- Workshops will also gather preliminary stakeholder feedback regarding what would be useful to include in the report and potential uses.

Thank you!

See you at our next meeting:
September 13, 2023

