



REGIONAL
DISTRICT
OF NANAIMO

DRINKING WATER & WATERSHED PROTECTION

May 22, 2024 | Technical Advisory Committee Meeting

AGENDA

APPROVAL OF THE AGENDA

ADOPTION OF MINUTES

Add a short description

ROUNDTABLE UPDATES

INVITED PRESENTATION

STAFF PRESENTATIONS

Add a short description

NEW BUSINESS

ADJOURNMENT

ROUNDTABLE UPDATES

ALL COMMITTEE MEMBERS

*Preparing and strategizing for the
upcoming summer / drought season*

INVITED PRESENTATION

PROVINCIAL DROUGHT PORTAL UPDATES & COMMUNICATIONS

*Jessica Doyle,
Water Protection BC Ministry Water, Land
& Resource Stewardship*

DWWP PROJECT UPDATES

**REGIONAL WATERING RESTRICTION
FRAMEWORK UPDATE**

TEAM WATERSMART EVENTS

STATE OF OUR AQUIFERS REPORT UPDATE

**PRE-SUMMER GROUNDWATER LEVEL
ANALYSIS**

**COMMUNITY WATERSHED MONITORING
NETWORK**

RAIN GARDEN TOUR

Outside after meeting adjournment

REGIONAL WATERING RESTRICTIONS FRAMEWORK – UPDATE

FRAMEWORK OBJECTIVES

- Create consistently defined watering restriction stages, to minimize confusion and include all major water purveyors in the region
- Align media communication with comprehensive information on each major water system and their watering restriction stage
- Create and maintain a one window online hub for watering restrictions in the region (RDN Interactive map)

What watering restrictions are in effect where you live?

Select Your Water Service Area
-- Select Your Water Service Area --

Note: Private wells are not subject to

Water Efficiency Tips

Developed via consensus with the major water purveyors across the region

Established under **Bylaw 1654: RDN Water Use Regulation** with details regarding the framework contained within "Schedule A"

REGIONAL WATERING RESTRICTIONS FRAMEWORK – UPDATE

HOW IT WORKS:

- Stage 1 in effect between April 1 – Sept 30
- Most systems move to Stage 2 on May 1st
- Water purveyors meet regularly over the summer months to update on water system availability and communications strategies
- Each water purveyor can move through the stages at their own discretion based on their own supply and conditions
- RDN hosts an interactive map that is updated throughout the summer
 - Additional Team WaterSmart community outreach during dry season

Watering Restrictions

Please help conserve, because every drop counts!

WATERING RESTRICTION STAGE	1	2	3	4
WATERING RESTRICTIONS ARE IN EFFECT BETWEEN APRIL AND OCTOBER Go to www.teamwatersmart.ca to see your area or call 250-390-6560			Only as Required	
Frequency	Any day	Every other day: Even# houses – Even# days Odd# houses – Odd# days	VOLUNTARY HEIGHTENED REDUCTIONS ON TOP OF STAGE 2	SPRINKLING BAN: LAWN WATERING NOT PERMITTED
Watering times	Between 7 pm - 7 am	Between 7-10 am OR 7-10 pm for 2 hrs MAX		Between 7-10 am OR 7-10 pm (on your watering day)
Hand-watering, drip irrigation	ANYTIME	ANYTIME		NOT PERMITTED
Washing vehicles, boats, houses (siding)	ANYTIME	ANYTIME (on your watering day)		ONLY prior to application of paint, preservative, stucco, or sealant
Pressure washing walkways, driveways, siding	ANYTIME	ANYTIME (on your watering day)		NOT PERMITTED
Filling fountains, pools, hot tubs	ANYTIME	ANYTIME (on your watering day)		NO PERMITS ISSUED
New lawn permits	Can apply for a permit	Can apply for a permit		NO PERMITS ISSUED
Vegetable gardens and fruit trees are exempt from all watering restrictions, even in Stage 4.				

Climate change is causing our summer months to be increasingly hot and dry on Vancouver Island, which is resulting in a longer period of high water demand and more stress on our water sources.

Watering restrictions provide a framework for residents to follow in order to make efficient use of this valuable resource which we all share.

REGIONAL WATERING RESTRICTIONS FRAMEWORK – UPDATE

YEAR	Stage 1	Stage 2	Stage 3	Stage 4	downgraded	lifted
2016	April 1	May 1	N/A	N/A	Oct 1- Stage 1	Nov 1
2017	April 1	May 1	July 1	N/A	Sept 14 – Stage 2	Nov 1
2018	April 1	May 1 * had to issue urge to comply 1 week in	Aug 10	N/A	Sept 12 – Stage 2 Oct 1 – Stage 1	Nov 1
2019	April 1	May 1	June 14 <small>*province Level 3</small>	N/A	Sept. 13- Stage 2 Oct. 1 – Stage 1	Nov 1
2020	April 1	May 1	N/A	N/A	Oct 1 – Stage 1	Nov 1
2021	April 1	May 1	June 29	Aug 20 -prov Level 5	Sept. 23 - Stage 2 Oct. 1 – Stage 1	Nov 1
2022	April 1	May 1	N/A	Oct. 4 *prov Level 4	N/A	Nov 1
2023	April 1	May 1	June 15	July 5 -prov level 4 Jun 29; prov level 5 July 13	Oct 5 – Stage 3 Oct. 19 – Stage 1	Nov 1

REGIONAL WATERING RESTRICTIONS FRAMEWORK – UPDATE








PROCESS FOR UPDATING THE FRAMEWORK:

- The review and proposed updates to the framework responds to the acknowledgement of recent record-breaking summer droughts and the adaptive management approach required to respond to the impacts of those seasonal conditions.
- Hosted three meetings of regional water purveyors between December and March to determine the effectiveness, challenges, and possible improvements that could be implemented to update and adapt the original framework.
- Acknowledgement of operational differences between the water systems across the RDN

Major water service areas in our region include:

- Deep Bay Improvement District
- Bowser Waterworks
- Qualicum Bay Horne Lake Waterworks
- Town of Qualicum Beach
- City of Parksville
- RDN Water Service Areas (9 in total)
- EPCOR French Creek
- District of Lantzville
- City of Nanaimo
- North Cedar Improvement District

REGIONAL WATERING RESTRICTIONS FRAMEWORK – UPDATE

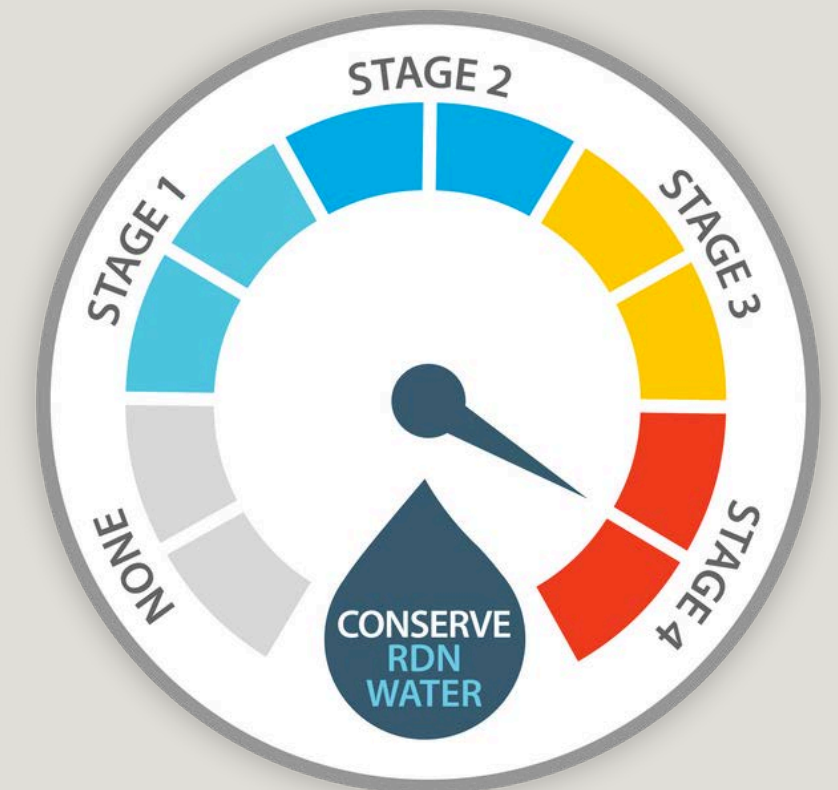
WATERING RESTRICTION STAGE	1	2	3	4
WATERING RESTRICTIONS ARE IN EFFECT BETWEEN APRIL AND OCTOBER Go to www.teamwatersmart.ca to see your area or call 250-390-6560			Only as Required	
Frequency 	Any day	Every other day: Even# houses – Even# days Odd# houses – Odd# days	↑ VOLUNTARY HEIGHTENED REDUCTIONS ON TOP OF STAGE 2 ↓	SPRINKLING BAN: LAWN WATERING NOT PERMITTED
Watering times 	Between 7pm - 7am	Between 7-10am OR 7-10pm for 2 hrs MAX		SPRINKLING BAN: LAWN WATERING NOT PERMITTED
Hand-watering, drip irrigation 	ANYTIME	ANYTIME		Between 7-10am OR 7-10pm (on your watering day)
Washing vehicles, boats, houses (siding) 	ANYTIME	ANYTIME (on your watering day)		NOT PERMITTED
Pressure washing walkways, driveways, siding 	ANYTIME	ANYTIME (on your watering day)		ONLY prior to application of paint, preservative, stucco, or sealant
Filling fountains, pools, hot tubs 	ANYTIME	ANYTIME (on your watering day)		NOT PERMITTED
New lawn permits 	Can apply for a permit	Can apply for a permit		NO PERMITS ISSUED
Vegetable gardens and fruit trees are exempt from all watering restrictions, even in Stage 4.				

Proposed Water Conservation Framework				
Water Conservation Level	1	2	3	4
Effective Dates	Begins April 1st	May 1st to October 31st	As required	
Frequency	Any day	Every other day: Even# houses = Even# days Odd# houses = Odd# days	One day per week Even# houses = Thursdays Odd# houses = Mondays	SPRINKLING BAN: LAWN WATERING NOT PERMITTED
Lawn Watering Times	Between 7pm - 7am	Between 7-10 am OR 7-10 pm for 2 hours MAX	Between 7-10 am OR 7-10 pm for 2 hours MAX	
Washing vehicles, boats, houses (siding)	ANYTIME	ANYTIME (on your watering day)	Between 7-10 am OR 7-10 pm on your watering day	
Hand-Watering, drip irrigation & micro irrigation	ANYTIME	ANYTIME	Voluntary Restrictions encouraging residents to reduce water use where they are able to	
Filling fountains, pools, hot tubs	ANYTIME	ANYTIME (on your watering day)		
Pressure washing walkways, driveways, siding	ANYTIME	ANYTIME (on your watering day)		
New lawn permits	Can apply for a permit	Can apply for a permit		
				NOT PERMITTED
				ONLY prior to application of paint, preservative, stucco, or sealant
				NO PERMITS ISSUED

REGIONAL WATERING RESTRICTIONS FRAMEWORK – UPDATE

KEY PROPOSED ADJUSTMENTS TO THE FRAMEWORK:

- **New level 3 limits to watering one day per week**
 - Current stage 3 restrictions do not function to effectively reduce water use. They are voluntary restrictions and adjusting stage 3 to include concrete and measurable water restrictions will provide clear direction for residents on how to reduce water use
- **Level 4 to include allowance of car/boat washing with shut-off nozzle**
 - Not a significant contribution to seasonal water shortages; car washes are still permitted to remain open during level 4
- **Extend restriction period from April 1 – October 31**
 - Responding to observed trend in longer and hotter summers
- **Change name to “Regional Outdoor Water Conservation Framework”**
 - Communication through a lens of collective positivist action
 - Emphasis on “outdoor” use



REGIONAL WATERING RESTRICTIONS FRAMEWORK – UPDATE

IMPLEMENTATION

- Report to the RDN Board: May 28th – proposed bylaw amendments to incorporate updates
- Support partner municipalities and water purveyors as needed with council presentations and/or staff presentations
- Update communication materials to reflect changes
- Launch throughout summer 2024
- Continue to monitor for effectiveness, clarity in communications, and response from residents, revisit the framework as needed and update to reflect changing conditions



TEAM WATERSMART EVENTS

WATER 2 EARTH MONTH IN REVIEW

- This year featured 18 in-person events, 6 hosted by RDN. Highlights included:
 - Errington WellSmart workshop
 - Intro to Raingardens workshop
 - Brant Childrens Festival
 - Nanaimo River Watershed tour
 - Streamkeepers course
 - Earth Day at Bowen Park
- Over 400 people attend our registered and drop-in events
- Online engagement: Social media contest asking people to share their "Water2Earth Month Actions"; gave away a rain barrel and zero waste prize pack



TEAM WATERSMART EVENTS

UPCOMING SEASONAL TOURS AND EVENTS



- Team WaterSmart is attending the City of Nanaimo Public Works Day today
- Each year, the team aims to attend at least one event in each municipality/area.
- Target events with local residents instead of tourists. So, for example, we will be attending the Cedar and Gabriola Farmer's Markets in September when tourism is slower, so that we can maximize our interaction time with locals.



Jul 21	QB Beach Day
Aug 17	Lantzville Minetown Day
August	Errington Hi Neighbour Day <u>or</u> Errington Farmer's Market
Sep 2	Lighthouse Fall Fair
Sep 8	Cedar Farmer's Market
Sep	Gabriola Farmer's Market <u>or</u> Gabriola Commons Fall Fair
Sep 22	River's Day

TEAM WATERSMART EVENTS

RESIDENTIAL IRRIGATION CHECKS

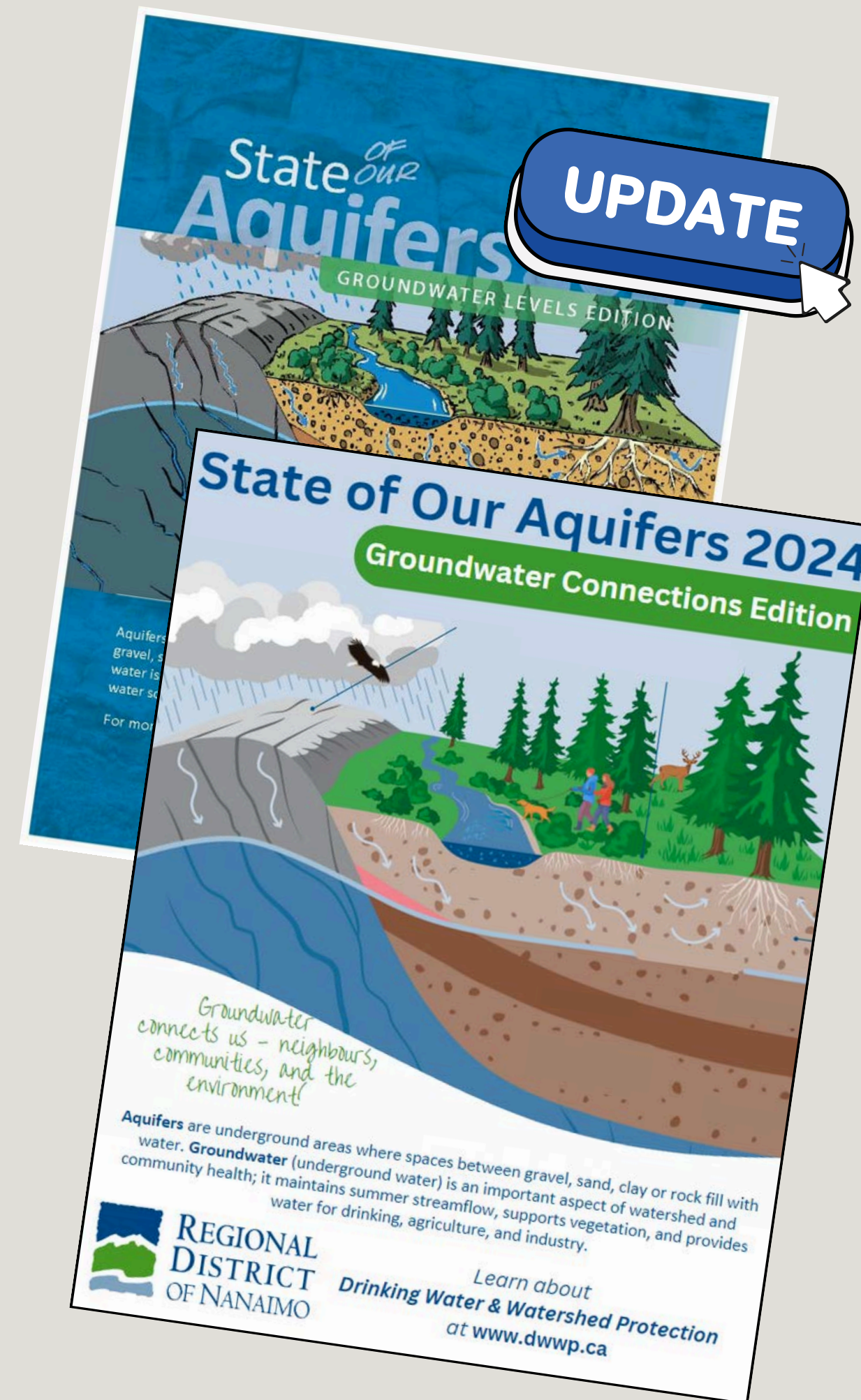
- Since 2010, hundreds of residential irrigation check-ups have been performed by Team WaterSmart staff. The program has effectively caught leaks, lowered excessive watering times and advised on water-saving techniques.
- Letters are being sent out to the top 100 water users of RDN water systems and municipalities to offer an Irrigation Check.
- In 2024 we aim complete 16 checks ups in June and July
- Report to residents includes:
 - Identification of leaks and inefficiencies with recommendations for improvement or remedy
 - Control timer settings recommendations
 - Irrigation rebate information



STATE OF OUR AQUIFERS REPORT UPDATE

PROJECT OBJECTIVES

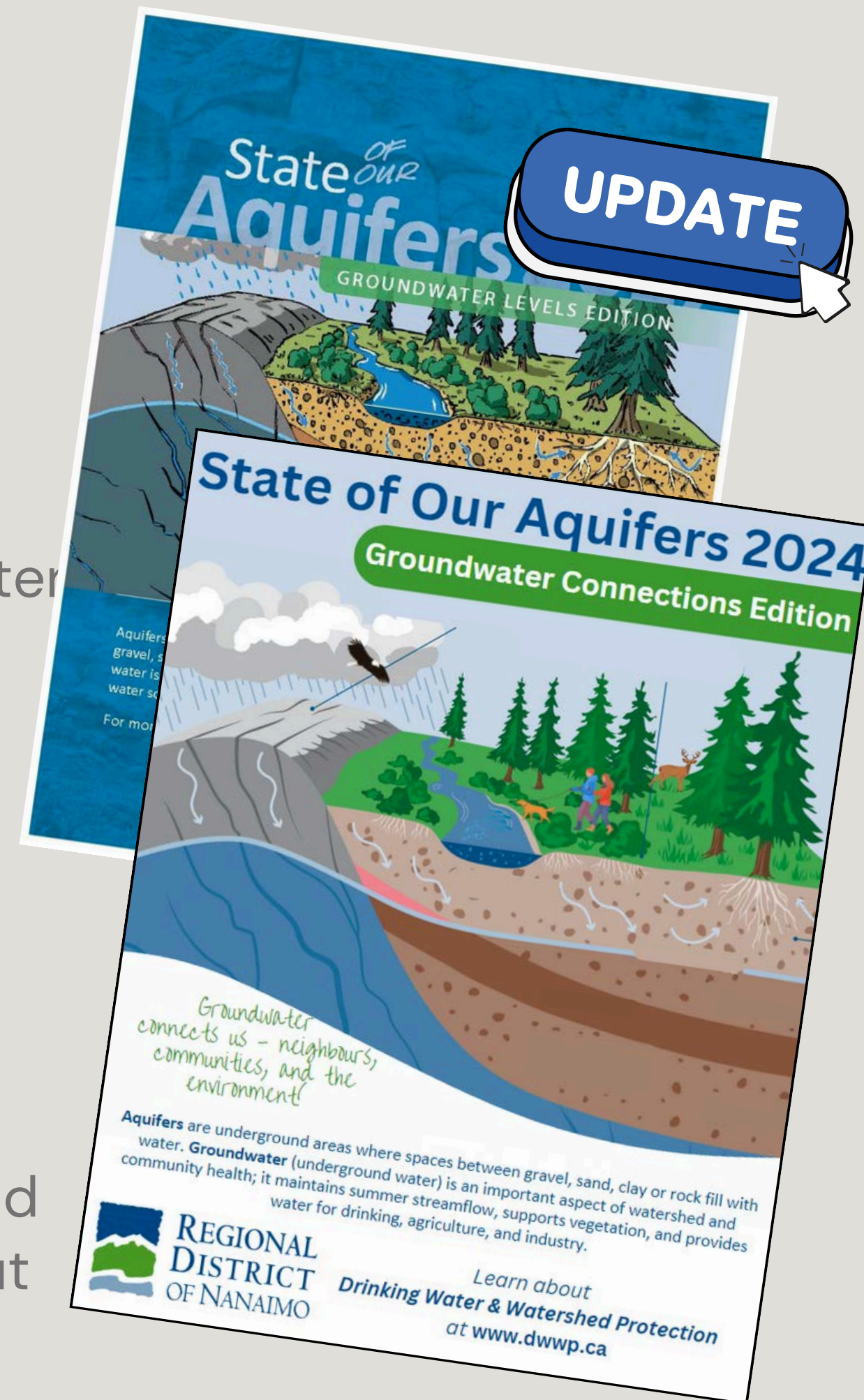
- To communicate updated groundwater science and information to residents.
- To present the information in a clear, engaging, user-friendly format.
- To incorporate:
 - Annual *Pre-Summer Groundwater Levels* analysis report;
 - Planned communications through the *Climate-Informed Best Practices for Water Supply Planning* project
 - Links to the *Regional Strategy for Rainwater Management*
 - Recently updated groundwater graphics and aquifer mapping



STATE OF OUR AQUIFERS REPORT UPDATE

PROJECT COMPONENTS

- Technical: Hydrogeological Consulting Services for groundwater data analysis, graphing and interpretation
- Visual: Graphic Design Services to generate and consolidate graphical content in a visually pleasing user-friendly newsletter
- Distribution: Printing Services and Canada Post Mailing to Residents.
 - will be mailed out to all residents who are private wells (outside of water service area boundaries)
- Survey: Directing recipients of the mail-out to a RDN GetInvolved page
 - gather information on the reception of the publication and inform future strategies for education and outreach about groundwater in the region



STATE OF OUR AQUIFERS REPORT UPDATE DRAFT OVERVIEW

State of Our Aquifers 2024

Groundwater Connections Edition

Groundwater connects us - neighbours, communities, and the environment!

Aquifers are underground areas where spaces between gravel, sand, clay or rock fill with water. Groundwater (underground water) is an important aspect of watershed and community health; it maintains summer streamflow, supports vegetation, and provides water for drinking, agriculture, and industry.

REGIONAL DISTRICT OF NANAIMO

Learn about Drinking Water & Watershed Protection at www.dwwp.ca

general definition of aquifers and groundwater

Our Regional Aquifers

The Regional District of Nanaimo (RDN) is located on the central east coast of Vancouver Island. Communities within the region include the municipalities of Nanaimo, Lantzville, Parksville, and Qualicum Beach, as well as seven unincorporated Electoral Areas.

Over (insert updated number) in our region rely on groundwater for their water supply.

Describe sand & gravel/bedrock aquifers and introduce graphic

Monitoring groundwater in the region

Groundwater is underground and not really visible. Though groundwater may be out of sight, it is not out of mind as it is crucial for sustaining communities and our local environment. Groundwater is the source of drinking water for many residents within the region and our streams and rivers rely on groundwater for base flow during the hot summer months and in times of drought.

Monitoring groundwater is crucial to track the health of this precious resource. Observation wells provide a window into the aquifer and a means of monitoring groundwater levels. Add description of observation wells that corresponds to graphic. Add info about monitoring to better understand connectivity. Using data loggers installed in observation wells, we can track seasonal fluctuations and yearly changes in the water table. This provides oversight to help guide water management.

Within the RDN, X observation wells are operated by the Province and X are coordinated by the RDN's Drinking Water & Watershed Protection program, through partnerships with volunteer well owners who agree to have a data logger installed in their private well. Add brief intro to VOW and link to webpage.

Groundwater data is best observed over the long term, for a minimum of 10 years, to meaningfully understand trends and connections. We care because groundwater is an important drinking water source in our communities and plays a key role in contributing to streamflow that supports aquatic habitat and environmental health.

Page 2

how we monitor with a description and graphic of an observation well

regional mapped aquifers with monitoring locations

The following table lists aquifers in our region where there are observation wells monitoring groundwater levels. Bedrock aquifers and overburden (sand and gravel) aquifers behave differently so it is important to monitor both. Bedrock aquifers in our region are generally lower yielding and more vulnerable to drought. In sand and gravel aquifers it is variable – some are high yielding, with lots of storage; others are more moderate yielding and more susceptible to overpumping and drought.

Aquifer Location	Aquifer #	RDW Water Region	# of Observation Wells	Water Level Trend (last 5 years)	Water Level Trend (>5 years)
Deep Bay, Bowser	416	1	1	INCREASING +0.089m observed per year	STABLE
Qualicum Bay, Dashwood	662	1	3	NOT ENOUGH DATA	NOT ENOUGH DATA
Little Qualicum River Valley	664	2	1	STABLE	STABLE
Errington, Coombs	220	3	1	DECLINING -0.32m observed per year	DECLINING -0.11m observed per year
Qualicum Beach, Coombs	217	3	4	DECLINING -0.095 to -0.68 observed per year	VARIABLE +0.34 and -0.091 to -0.31 observed per year
Parksville, French Creek	216	3 & 4	5	DECLINING -0.18 to -0.32m observed per year	DECLINING -0.03 to -0.29m observed per year
East Wellington, Westwood Lake	167	5	1	NOT ENOUGH DATA	NOT ENOUGH DATA
Benson Meadows, Jingle Pot	211	5	1	DECLINING -0.94m observed per year	DECLINING -0.66m observed per year
Lantzville	213	5	3	NOT ENOUGH DATA	NOT ENOUGH DATA
Lantzville	215	5	2	VARIABLE +0.17 to -0.17m observed per year	VARIABLE +0.17 to -0.17m observed per year
Central Nanoose (upper)	219	5	4	VARIABLE ±0.02 to -0.04m observed per year	NOT ENOUGH DATA
Central Nanoose (mid)	1098	5	1	STABLE	NOT ENOUGH DATA
Cassidy (lower)	160	6	3	STABLE	STABLE
Cassidy (upper)	161	6	2	DECLINING -0.05m observed per year	STABLE
Cedar, Yellowpoint	162	6	4	INCREASING +0.08 to 1.32m observed per year	DECLINING -0.43m observed per year
South Wellington	165	6	2	NOT ENOUGH DATA	NOT ENOUGH DATA
Gabriola Island	709	7	6	DECLINING -0.04 to -0.32m observed per year	VARIABLE ±0.02 to -0.05m observed per year

3

Legend: Sand & Gravel, Bedrock

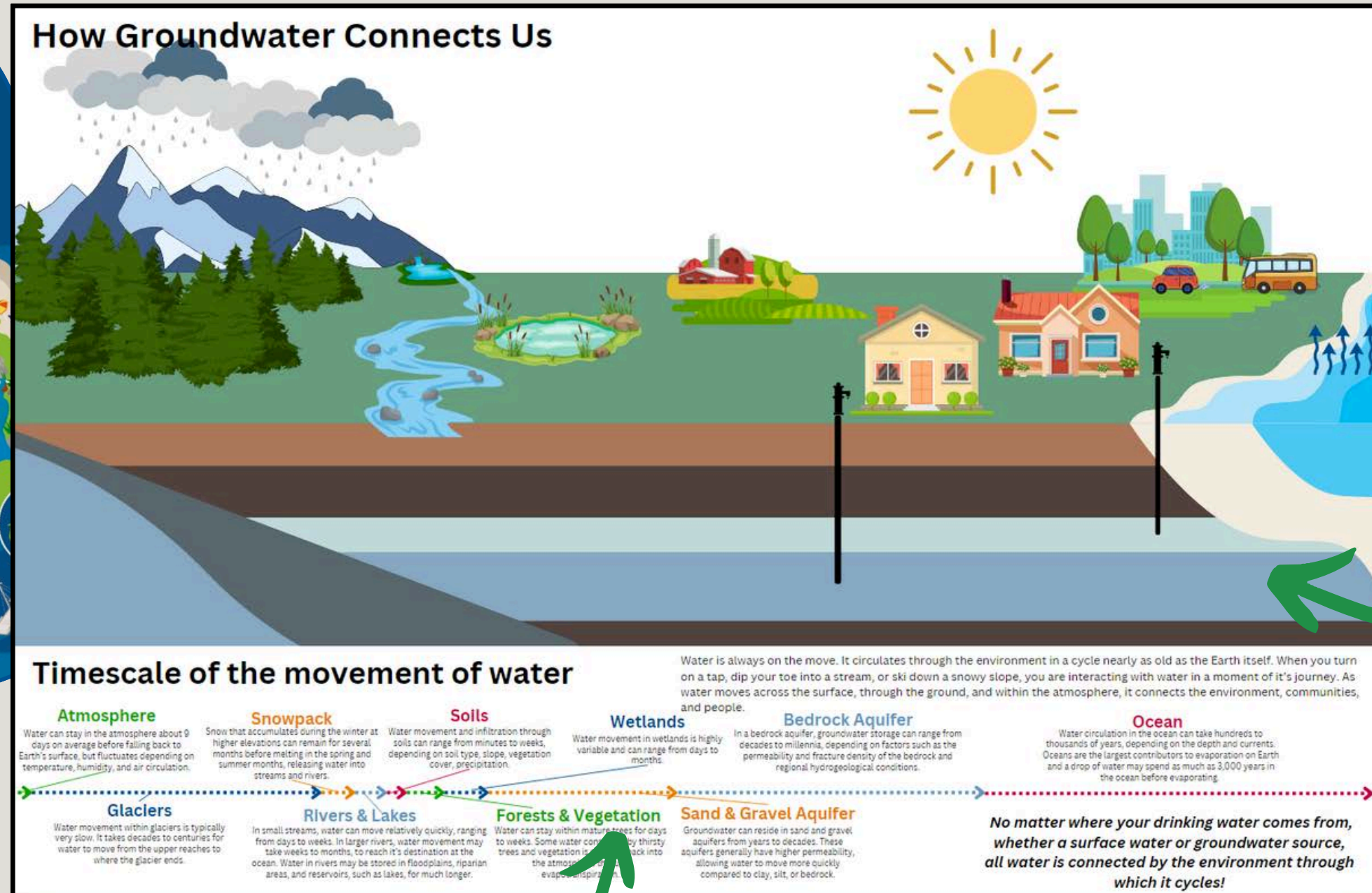
Page 3

table to be updated with current data and new mapped aquifers added

STATE OF OUR AQUIFERS REPORT UPDATE DRAFT OVERVIEW



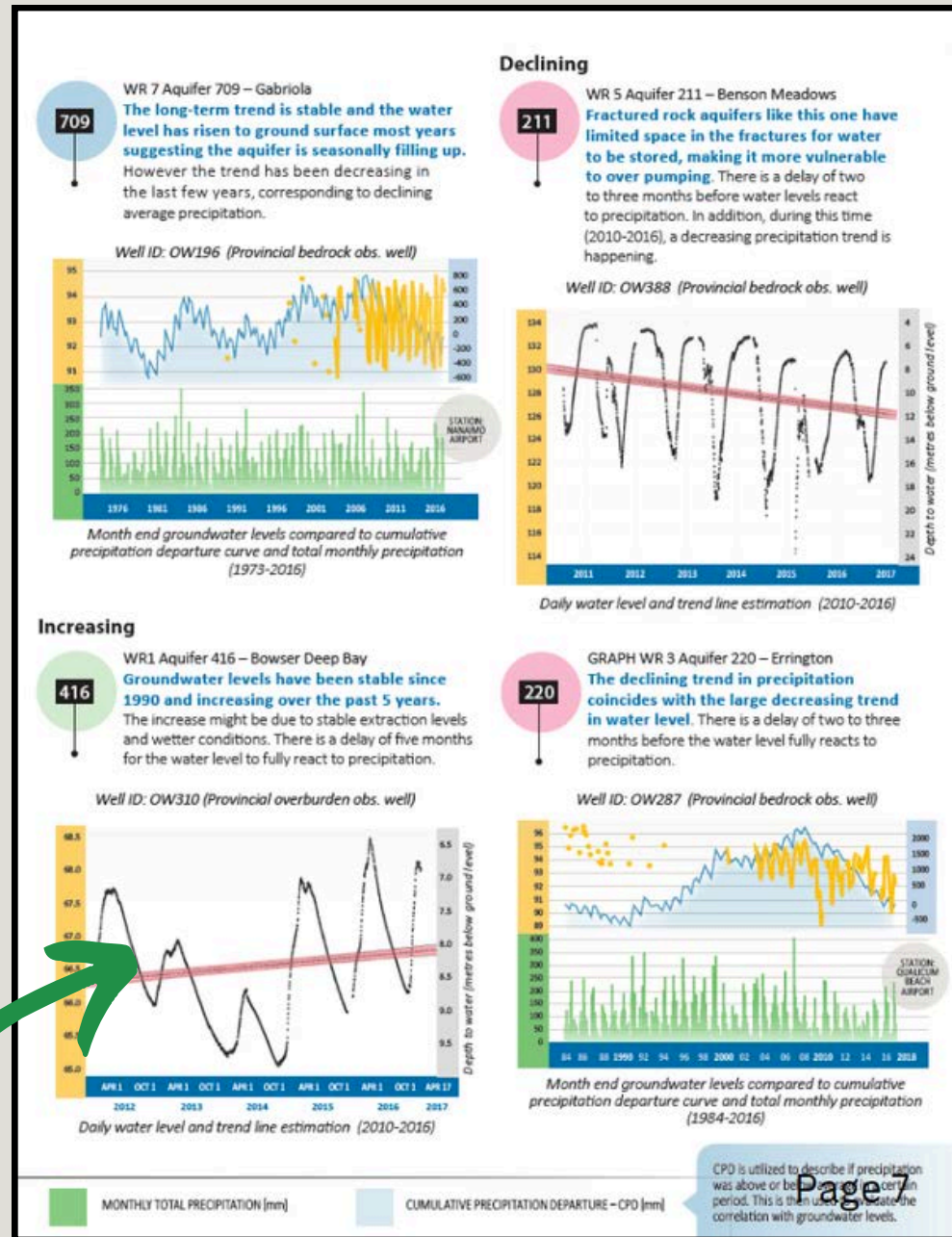
example graphic; this one prioritizes watershed connections



Developing a new large-scale graphic that shows interactions of groundwater across the landscape, surface water connections, and how it flows through our environment

Timescale of water movement, illustrating where water lingers and where it flows, with a contrast shown between sand & gravel versus bedrock aquifers

STATE OF OUR AQUIFERS REPORT UPDATE DRAFT OVERVIEW



Highlights four sites that illustrate connectivity, such as saltwater intrusion, surface water connections, and wetlands

Opportunity here to further reinforce trends and groundwater connection in more detail.

How climate change and human impacts disrupt or alter groundwater connections

eg. drought and increased temperatures (down-scaled climate connections study), changes in precipitation, land use changes and development (agricultural growth, urban sprawl, and densification changes), extraction, pollution and water quality, loss of habitat



Key messages from CIWSP:

1. Climate change will impact drinking water supplies in the Nanaimo region, and we need to be prepared.
2. Drinking water providers in the Nanaimo region are already responding to the current and anticipated impacts of climate change and are actively planning for the future.
3. Large and small drinking water providers in the Nanaimo region work together to ensure safe and sufficient water supplies for the long term.
4. Large and small operators are responsible for operating their own systems, however may draw from the same source. The Provincial Government manages water allocation from those sources.
5. Water service providers and the Provincial Government are working collaboratively to address information gaps and ensure a timely response to climate-related risks.
6. Everyone has a role to play in protecting our drinking water supplies.

Page 6

Incorporates key messaging established through the Climate Informed Water Supply Planning report completed last year

Create web of groundwater connectivity and water sustainability practices
Include: permeable surfaces, alternatives to pesticides, water conservation, rainwater harvesting, rain gardens, watersmart gardening



Call to action; share examples of where residents can repair or protect their relationship with groundwater / their role in maintaining this common resource

STATE OF OUR AQUIFERS REPORT UPDATE **TIMELINE**

Finalize Scope ✓

- Input from TAC
- DWWP team collaborate on final scope

IN PROGRESS Content Development

- Draft first text and layout for publication
- Engage graphic designer

Data Collection and Review ✓

- Site visits to download data
- Data review and cleaning
- Engage hydrologist

Data Interpretation

- Hydrologist review and report trends seen in data
- selected graphs to graphic designer

Report and Publish

- Report 2024 Regional Groundwater Analysis Pre-summer to RDN Board
- Finalize SooA publication for July direct mail-out and online

Early March

Late March

April

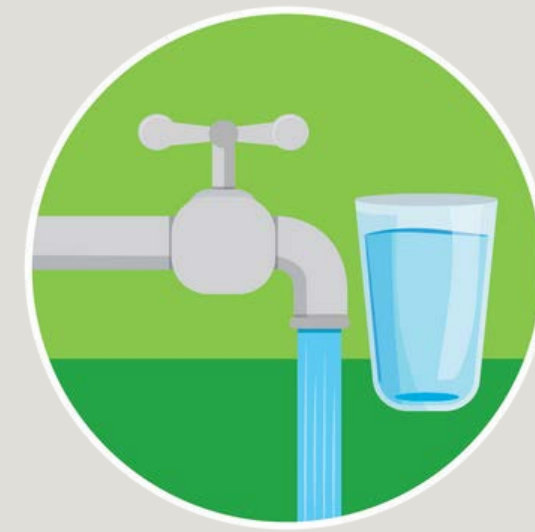
May

June

WE'RE HERE



PRE-SUMMER GROUNDWATER LEVEL ANALYSIS



- Annual June Report since 2020
- A snapshot in time
- Informs summer water supply planning

DRINKING WATER AND WATERSHED
PROTECTION - REGIONAL GROUNDWATER
LEVEL ANALYSIS FOR SUMMER 2020

Submitted To:



Water Services
6300 Hammond Bay Road
Nanaimo, BC
V9T 6N

Submitted By:

Waterline Resources Inc.
Nanaimo, British Columbia
May 25, 2020
2590-20-001

Region-Wide Reports

Reports

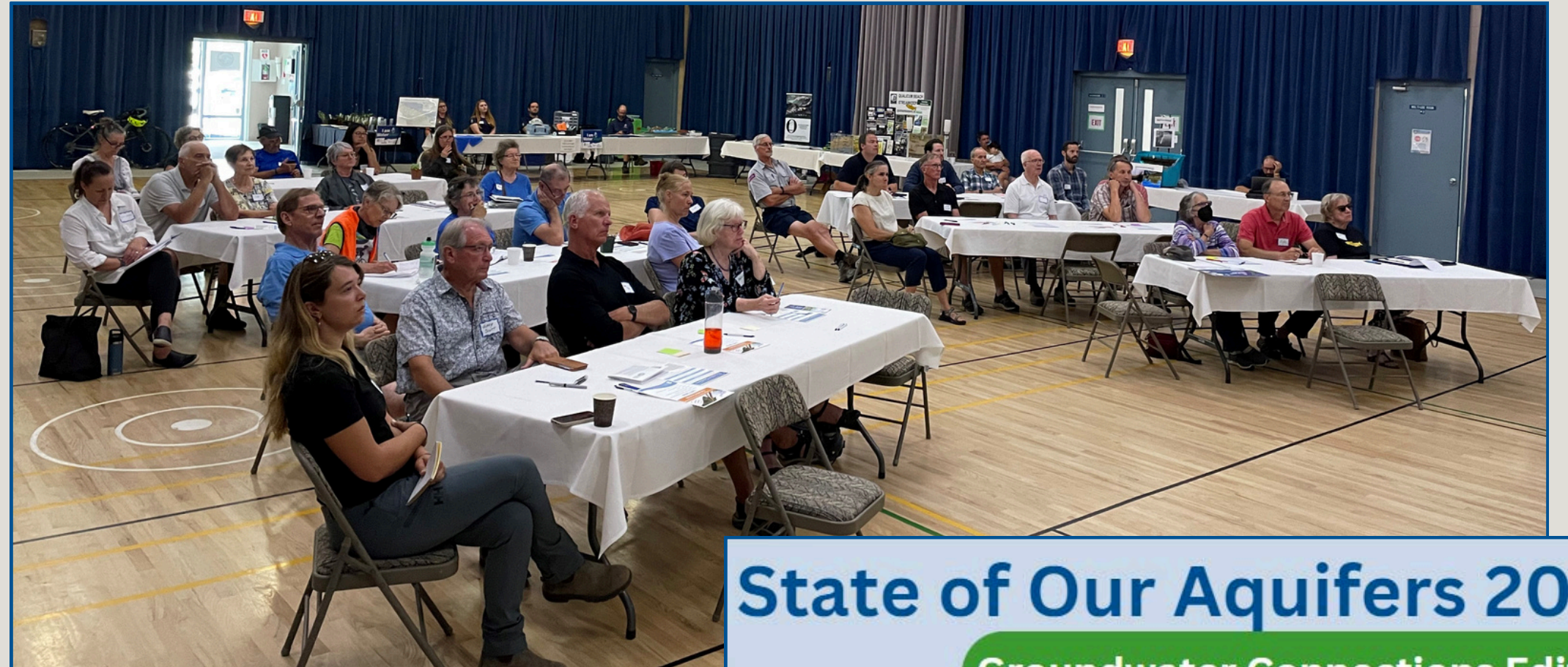
- ▶ 2023 Community Watershed Monitoring Network Data Analysis Technical Memorandum
- ▶ Regional Groundwater Level Analysis Pre-Summer 2023 (MEMO) + Tables and Graphs (APPENDICES)
- ▶ Regional Groundwater Level Analysis Pre-Summer 2022 (MEMO) + Tables and Graphs (APPENDICES)
- ▶ RDN Regional Strategy for Rainwater Management - 2022
- ▶ RDN Freshwater Perspectives Public Benchmark Survey Results - 2021
- ▶ Regional Groundwater Level Analysis Pre-Summer 2021 (MEMO) + Tables and Graphs (APPENDICES)
- ▶ 2021 Community Watershed Monitoring Network Data Analysis (2011-2020)
- ▶ Wetland Mapping and Monitoring in the Regional District of Nanaimo- 5-Year Research Project with VIU (link to Get Involved Page with all the project reports)
- ▶ Regional Groundwater Level Analysis Pre-Summer 2020
- ▶ Water Conservation Plan - RDN Water Service Areas Only - 2020



PRE-SUMMER GROUNDWATER LEVEL ANALYSIS

Intended audience:

- Water purveyors
- Partner agencies
- Volunteers of the VOW program
- Community stewards and citizen scientists
- Outreach and education publications
- Available online at www.rdn.bc.ca/dwwp-reports



PRE-SUMMER GROUNDWATER LEVEL ANALYSIS

- Data collection nearly complete



- Next...
 - data upload, review, and cleaning

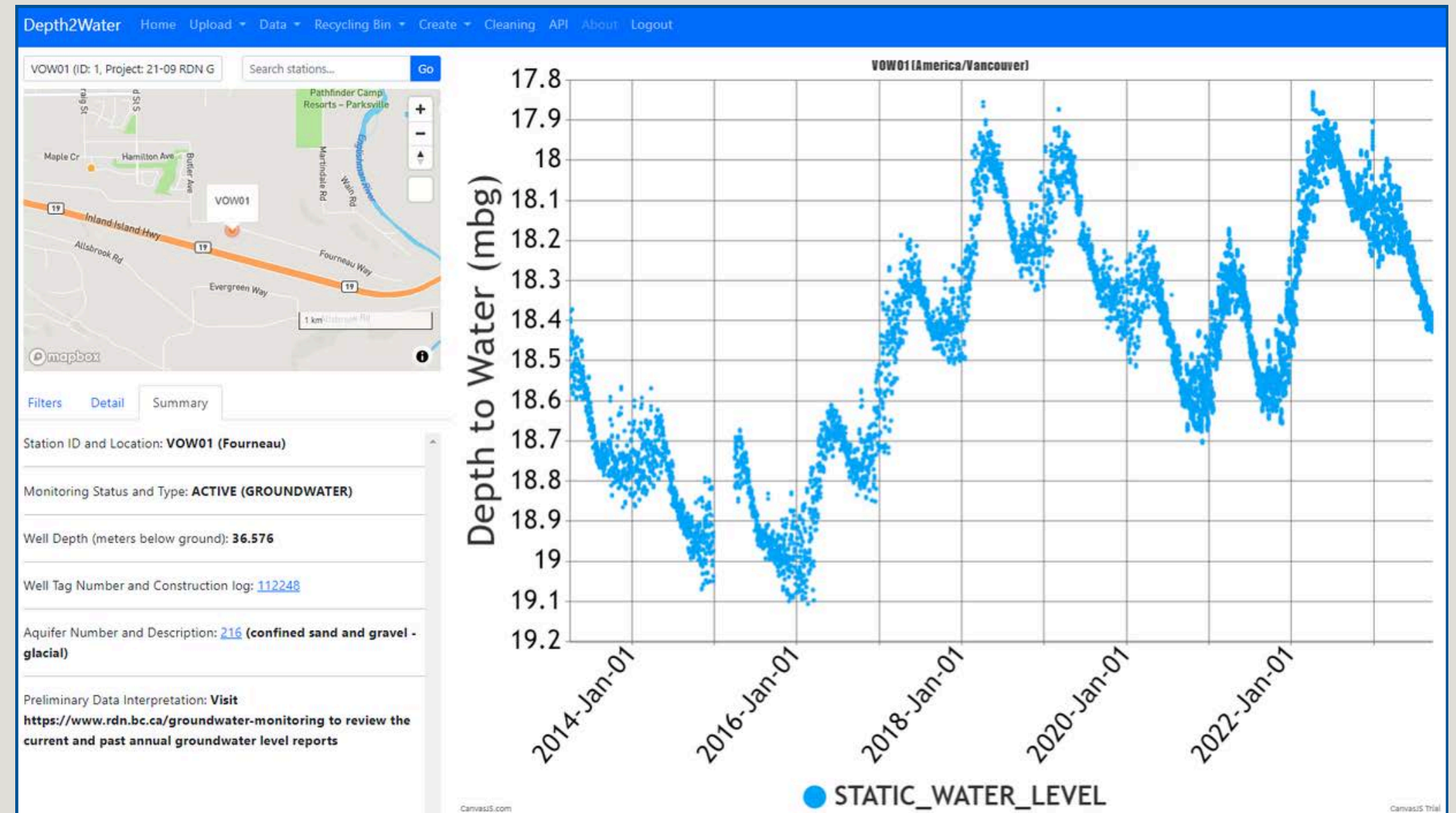
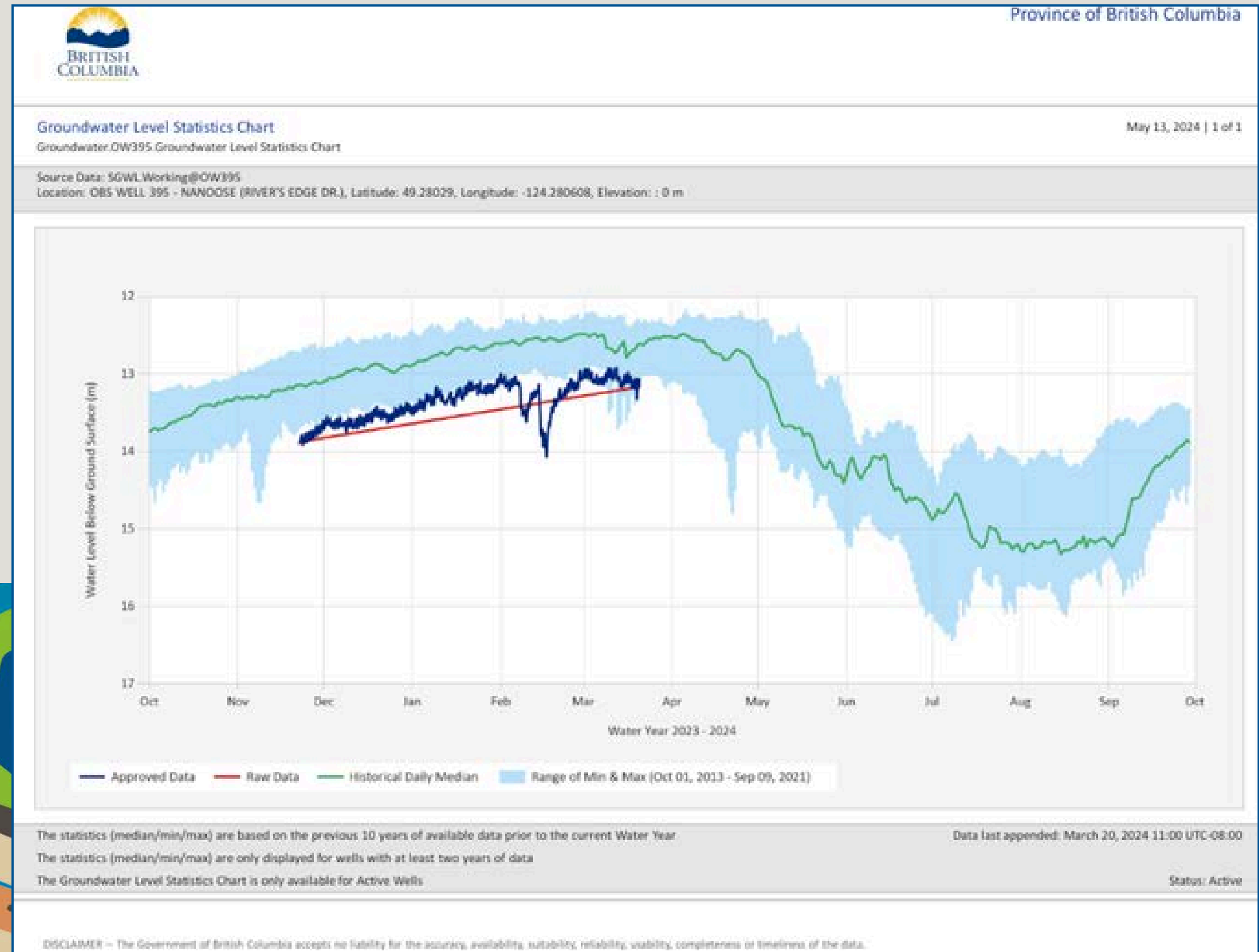


Image from the RDN Depth2Water Application developed by GW Solutions

PRE-SUMMER GROUNDWATER LEVEL ANALYSIS

Hydrogeologist support for annual report

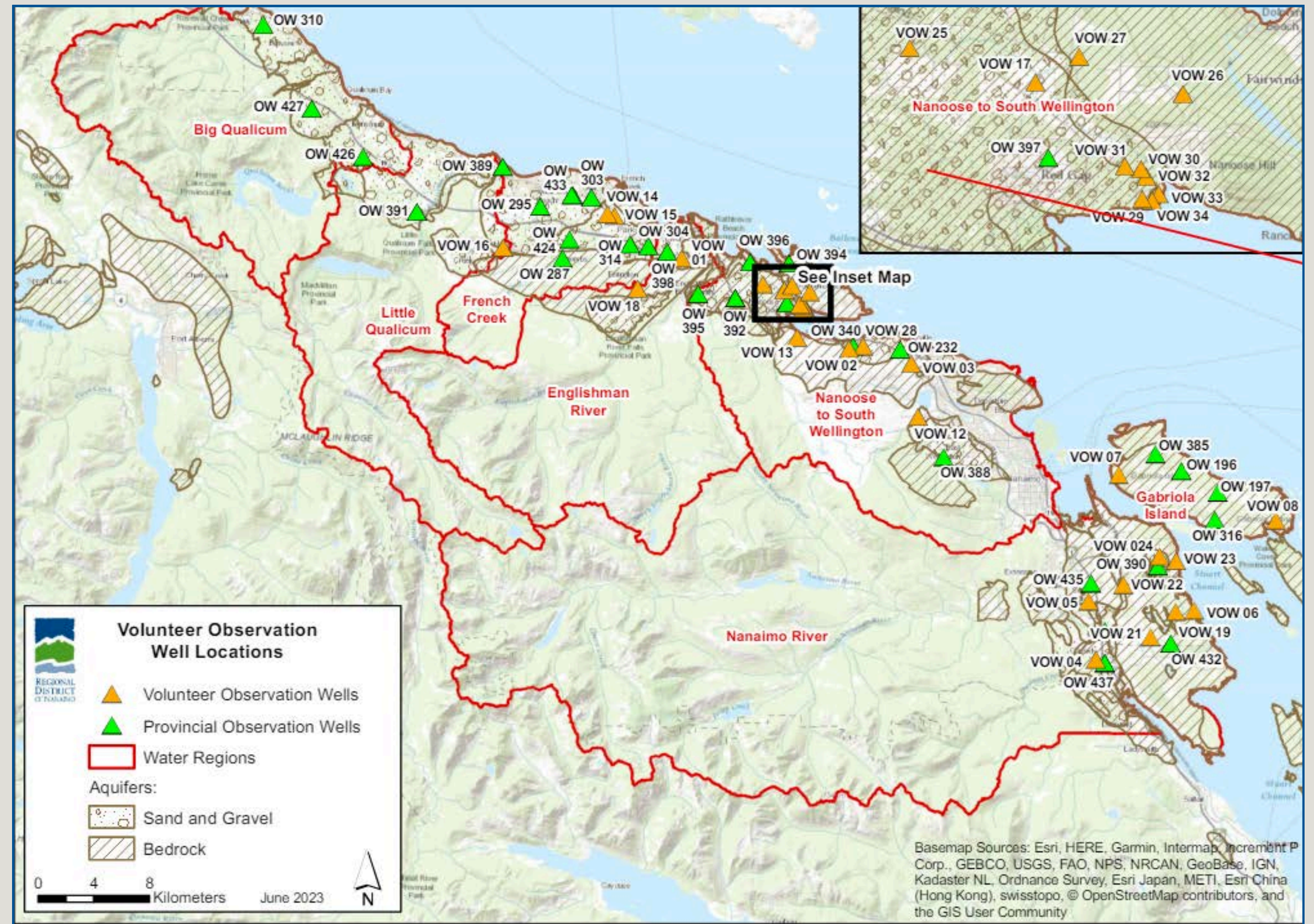
- *Develop a template for a groundwater level statistics chart*
- *Review all charts for readability and completeness*



PRE-SUMMER GROUNDWATER LEVEL ANALYSIS

- 2024 report will include:

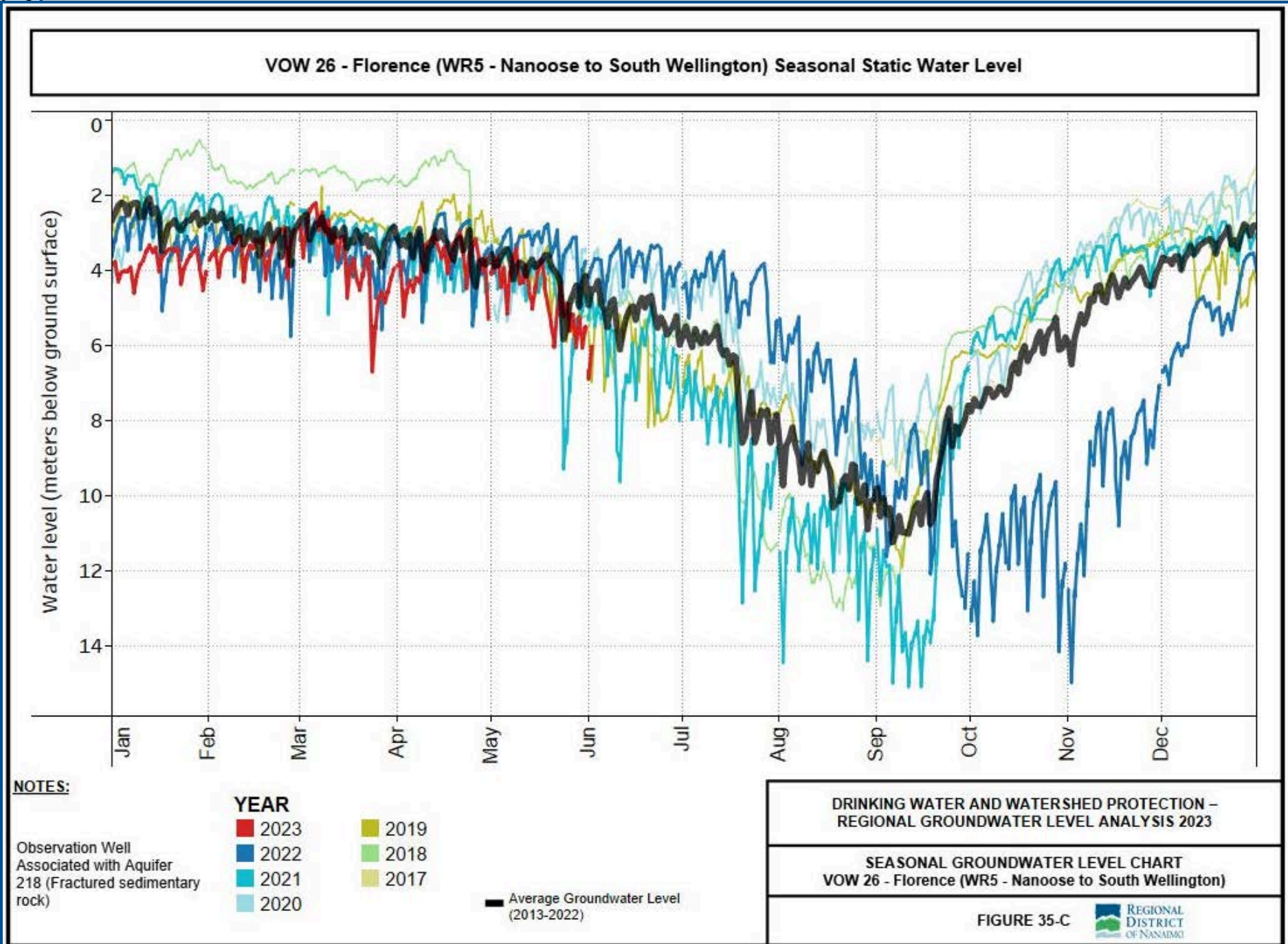
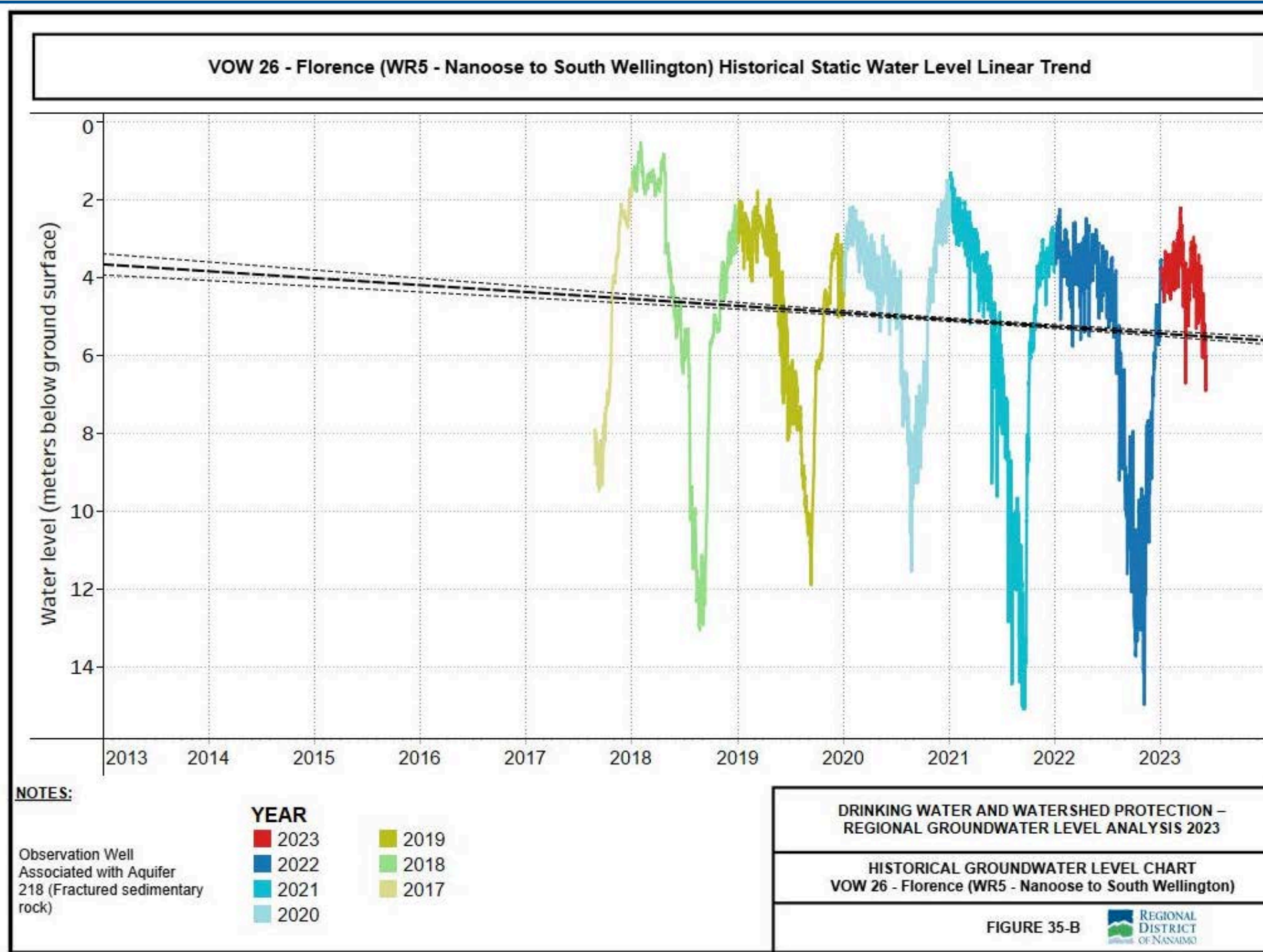
- Executive summary of monitoring results to date
- Summary tables – aquifer information, trends, and results
- Map of VOW and PGOWN sites included in the report



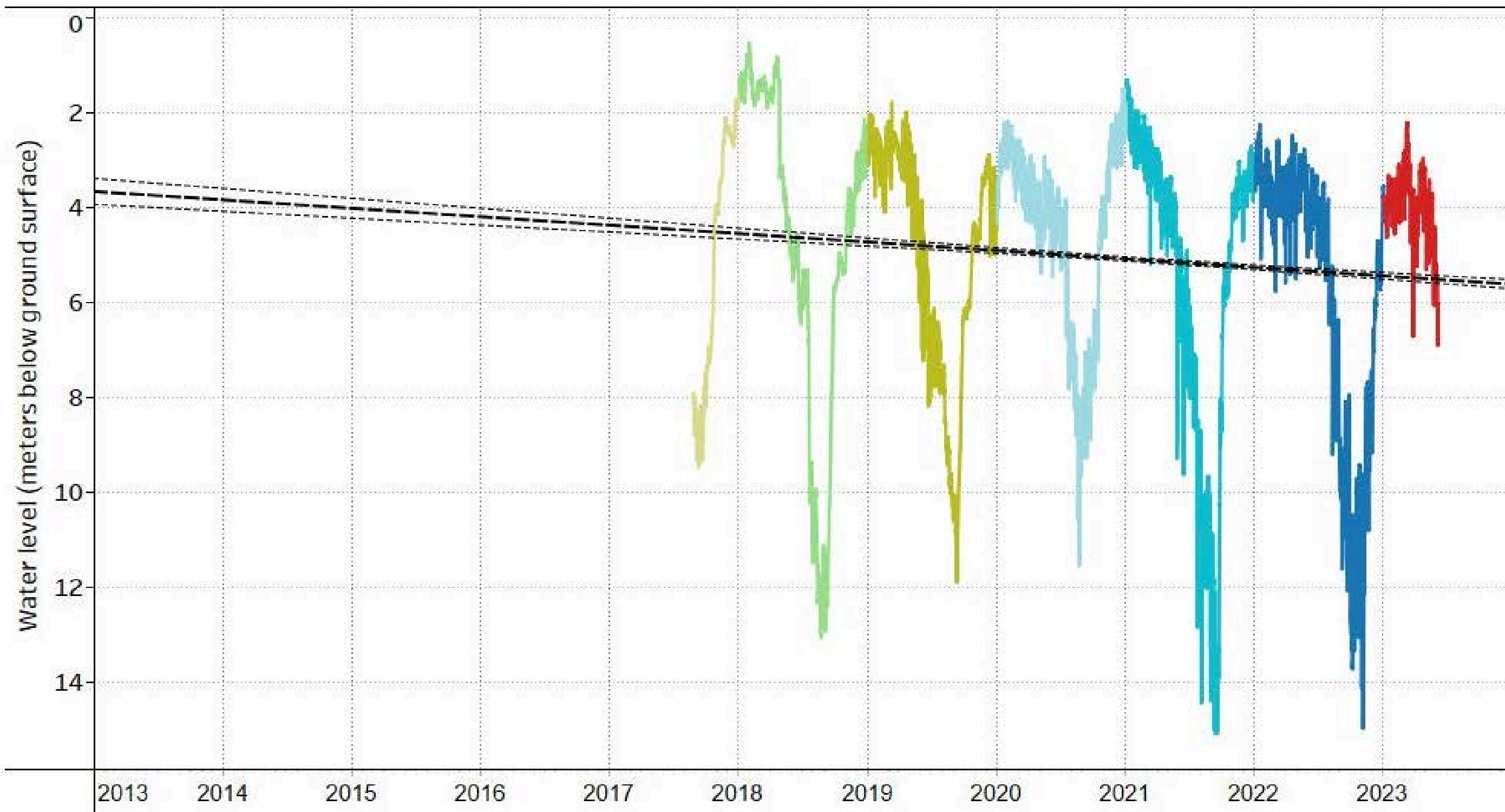
PRE-SUMMER GROUNDWATER LEVEL ANALYSIS

- 2024 report will include:
 - Historical hydrographs

- Seasonal hydrographs



VOW 26 - Florence (WR5 - Nanoose to South Wellington) Historical Static Water Level Linear Trend



NOTES:

Observation Well
Associated with Aquifer
218 (Fractured sedimentary
rock)

YEAR

- | | |
|---|--|
| ■ 2023 | ■ 2019 |
| ■ 2022 | ■ 2018 |
| ■ 2021 | ■ 2017 |
| ■ 2020 | |

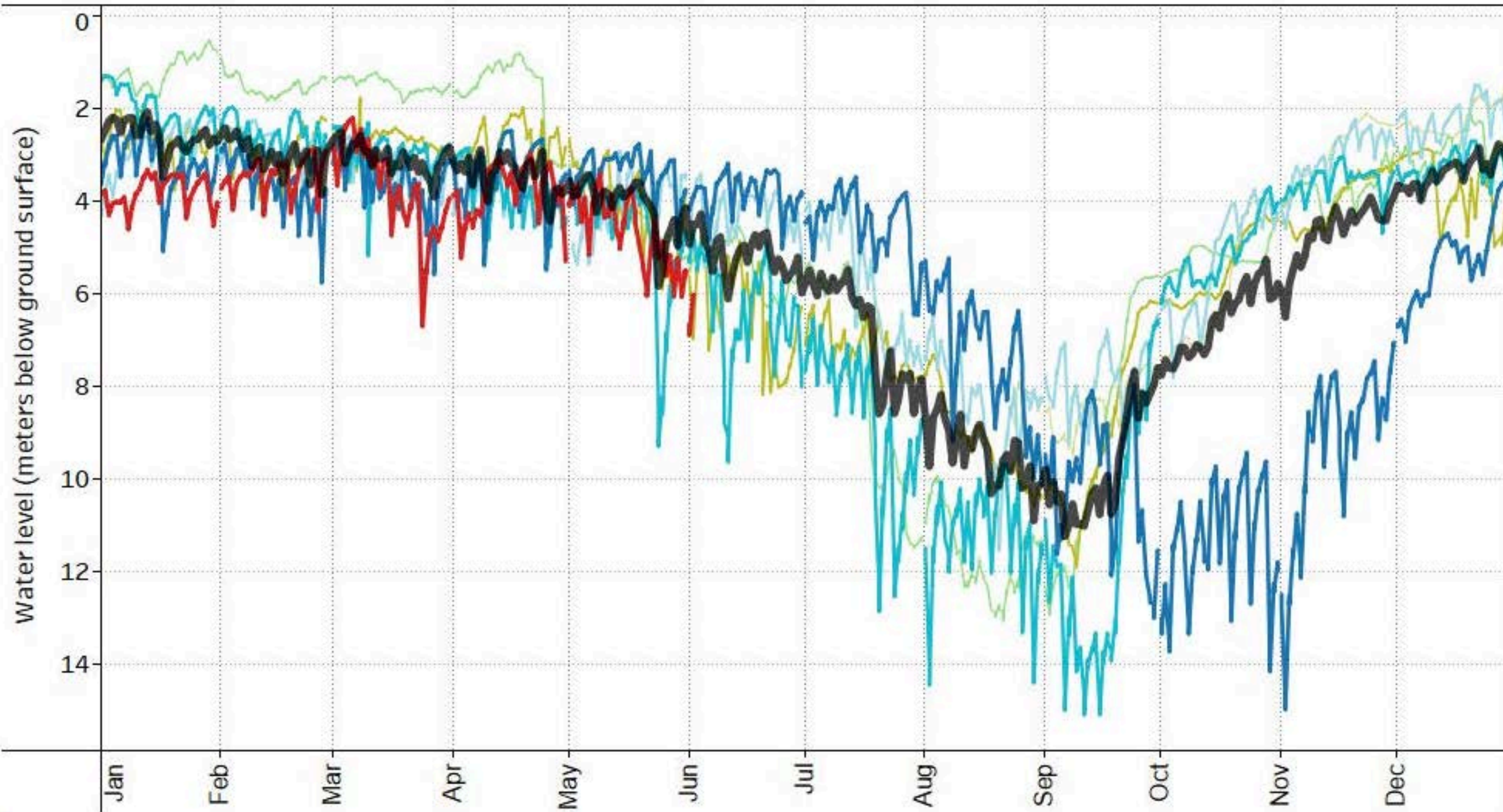
DRINKING WATER AND WATERSHED PROTECTION –
REGIONAL GROUNDWATER LEVEL ANALYSIS 2023

HISTORICAL GROUNDWATER LEVEL CHART
VOW 26 - Florence (WR5 - Nanoose to South Wellington)

FIGURE 35-B



VOW 26 - Florence (WR5 - Nanoose to South Wellington) Seasonal Static Water Level



NOTES:

Observation Well
Associated with Aquifer
218 (Fractured sedimentary
rock)

YEAR

- 2023
- 2022
- 2021
- 2020
- 2019
- 2018
- 2017

— Average Groundwater Level
(2013-2022)

DRINKING WATER AND WATERSHED PROTECTION –
REGIONAL GROUNDWATER LEVEL ANALYSIS 2023


SEASONAL GROUNDWATER LEVEL CHART
VOW 26 - Florence (WR5 - Nanoose to South Wellington)

FIGURE 35-C



PRE-SUMMER GROUNDWATER LEVEL ANALYSIS

- 2024 report will go to the board June 25th
- Once the RDN Board approves:
 - The report will be published on our website
 - Emailed to community stewards
 - Shared directly with VOW program volunteers



REGIONAL DISTRICT OF NANAIMO

STAFF REPORT TO
Regional District of Nanaimo Board
June 28, 2022

REGIONAL GROUNDWATER LEVELS ANALYSIS – PRE-SUMMER 2022

RECOMMENDATION

That the Board receives this report for information.

BACKGROUND

Most communities within our region rely on groundwater for their water supply. This includes water service areas operated by the Regional District of Nanaimo (RDN) as well as District of Lantzville, City of Parksville and Town of Qualicum Beach. Four improvement districts also source groundwater for their waterworks systems, including Deep Bay Improvement District, Bowser Waterworks, Qualicum Bay Horne Lake Waterworks and North Cedar Improvement District. Additionally, Snaw-naw-as First Nation and Stz'uminus First Nation operate water supply systems that rely on groundwater from regional aquifers. EPCOR is a private water system that provides groundwater for residents in French Creek.

The RDN Drinking Water and Watershed Protection (DWWP) program monitors groundwater levels in aquifers across the region, through the RDN Volunteer Observation Well Network, in order to understand water availability and assess trend changes over time. This supplements the monitoring done by the Province in Provincial Observation Wells within the region.

Since 2020, the RDN DWWP program has completed an annual regional analysis of groundwater levels to support water managers in the region in preparation for the summer period ahead. In 2020 and 2021, technical reports from Waterline Resources Inc. (Waterline) provided an update on longer-term and seasonal trends observed in the aquifers within our region. The [Regional Groundwater Level Analysis for Summer 2020](#) report summarized current conditions and related that back to community water service areas and un-served areas alike. Waterline updated the [tables and hydrographs for 2021](#) to provide an abbreviated analysis to the reporting done in 2020.

For 2022, the DWWP program has completed this groundwater level analysis internally, to allow for greater access to the data, flexibility on reporting timelines and methods, and to reduce some financial implications associated with contracting out this service. The DWWP program has established an agreement with GW Solutions Inc. for data housing through a service-oriented application developed to manage groundwater data and supports analysis and visualization using Tableau and PostgreSQL software.

As in prior updates, there are some gaps in available data, so the analysis only represents the data available at time of reporting. The data available for and used in the 2022 analysis includes 30 RDN Volunteer Observation Wells (VOW) and 9 Provincial Groundwater Observation Network Wells (OW). This update covers 18 (of the 22)

Author: Erica Forssman, Drinking Water & Watershed Protection Program Coordinator
File No. 5280-22

COMMUNITY WATERSHED MONITORING NETWORK

2023 ANALYSIS

Surface water quality sampling *since 2011*

- Collected by trained community stewards
- In 2023, 66 sites, 40 streams, and 27 watersheds were monitored
- Two 5-in-30 sample periods
 - Summer low flow
 - Fall flush
- Provincial methodology used supports comparison to Ambient Water Quality Objectives/Guidelines
- Data publicly available



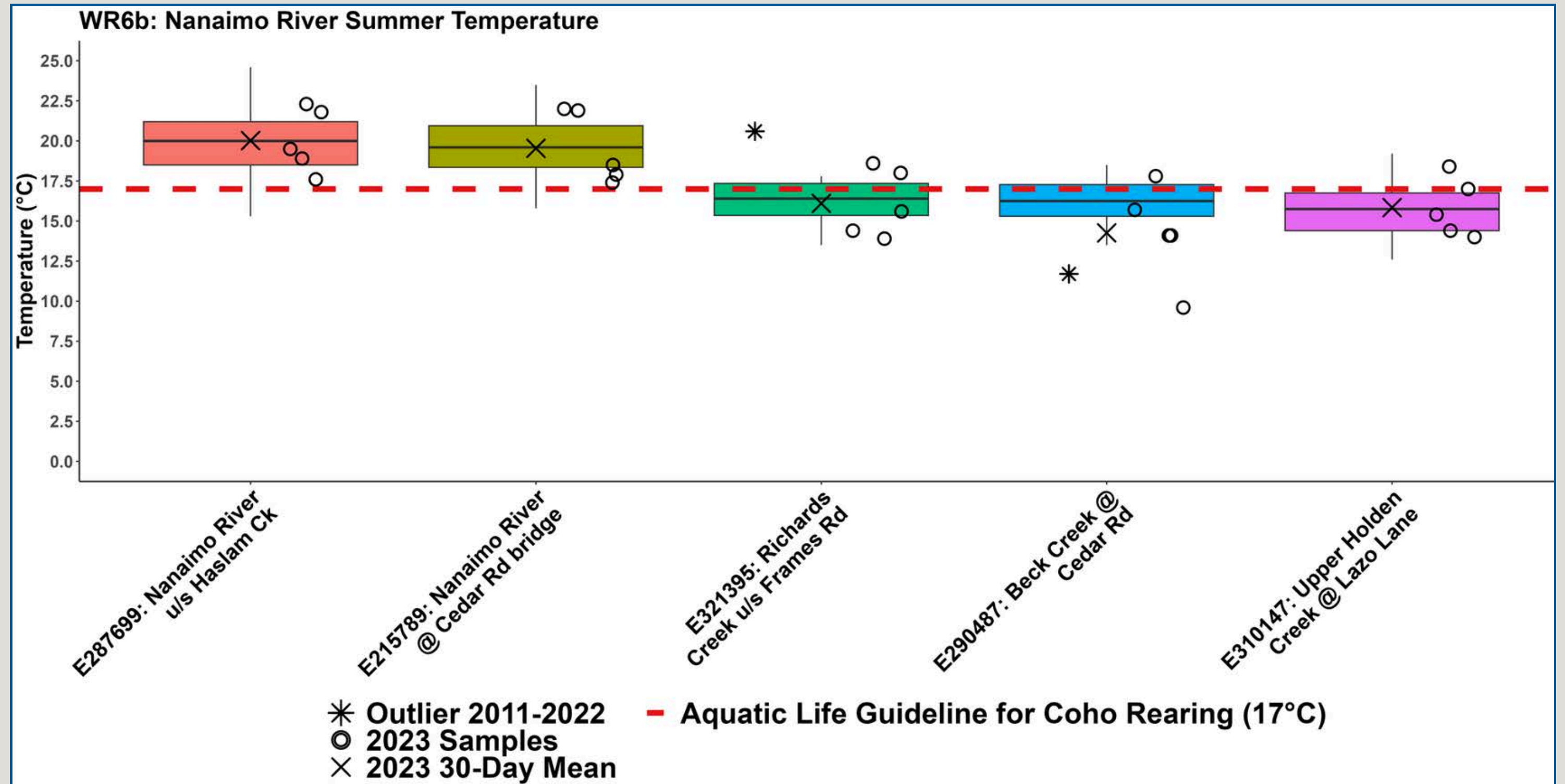
Annie Creek water quality sampling

COMMUNITY WATERSHED MONITORING NETWORK

2023 ANALYSIS

Statistical analysis of CWMN data 2011 – 2023

- Consultant engaged
- Review and validate of 2023 data
- Update box plots

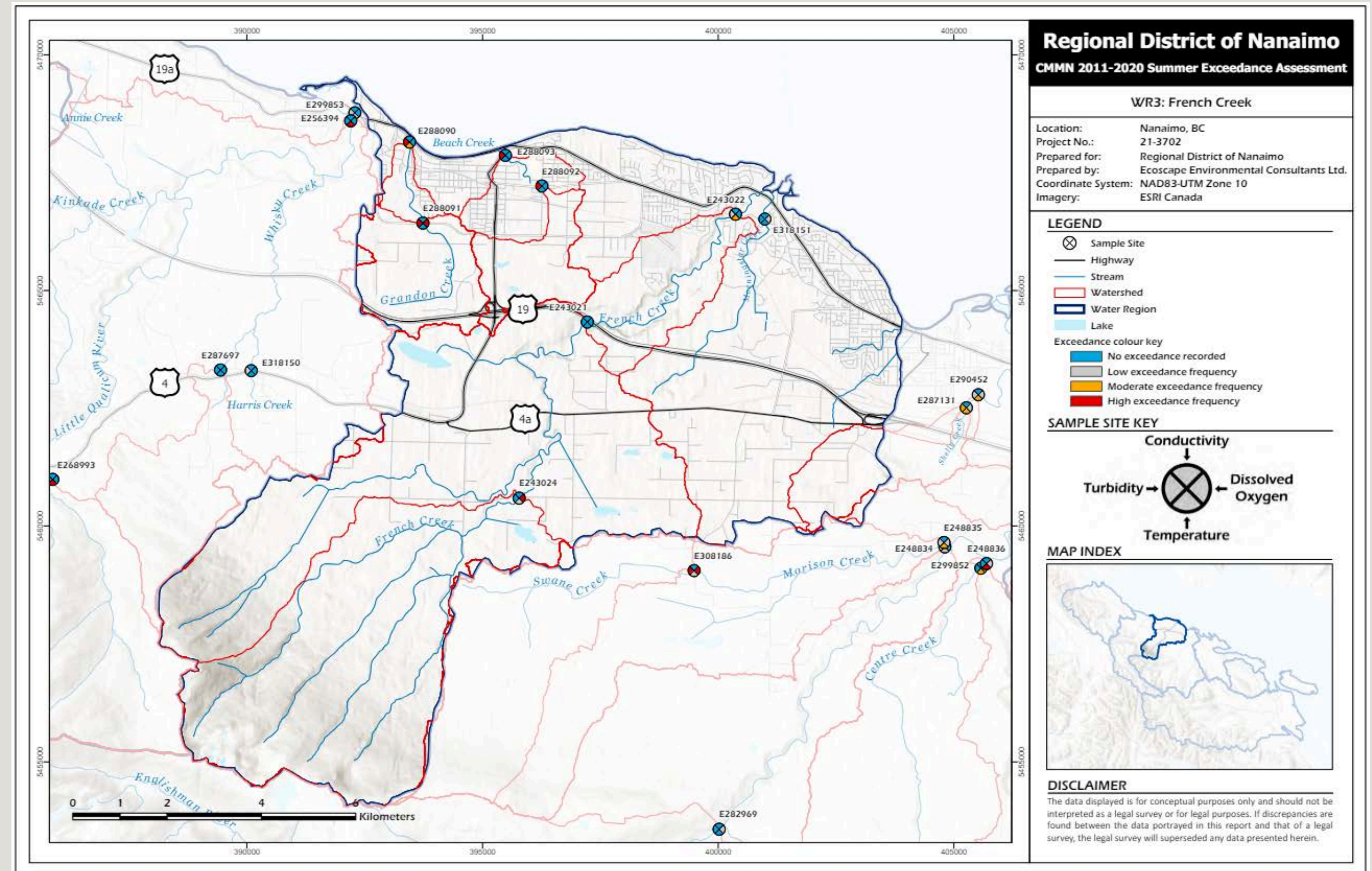


2023 box plot created by Ecoscape Environmental Consulting

COMMUNITY WATERSHED MONITORING NETWORK

2023 ADDITIONAL ANALYSIS

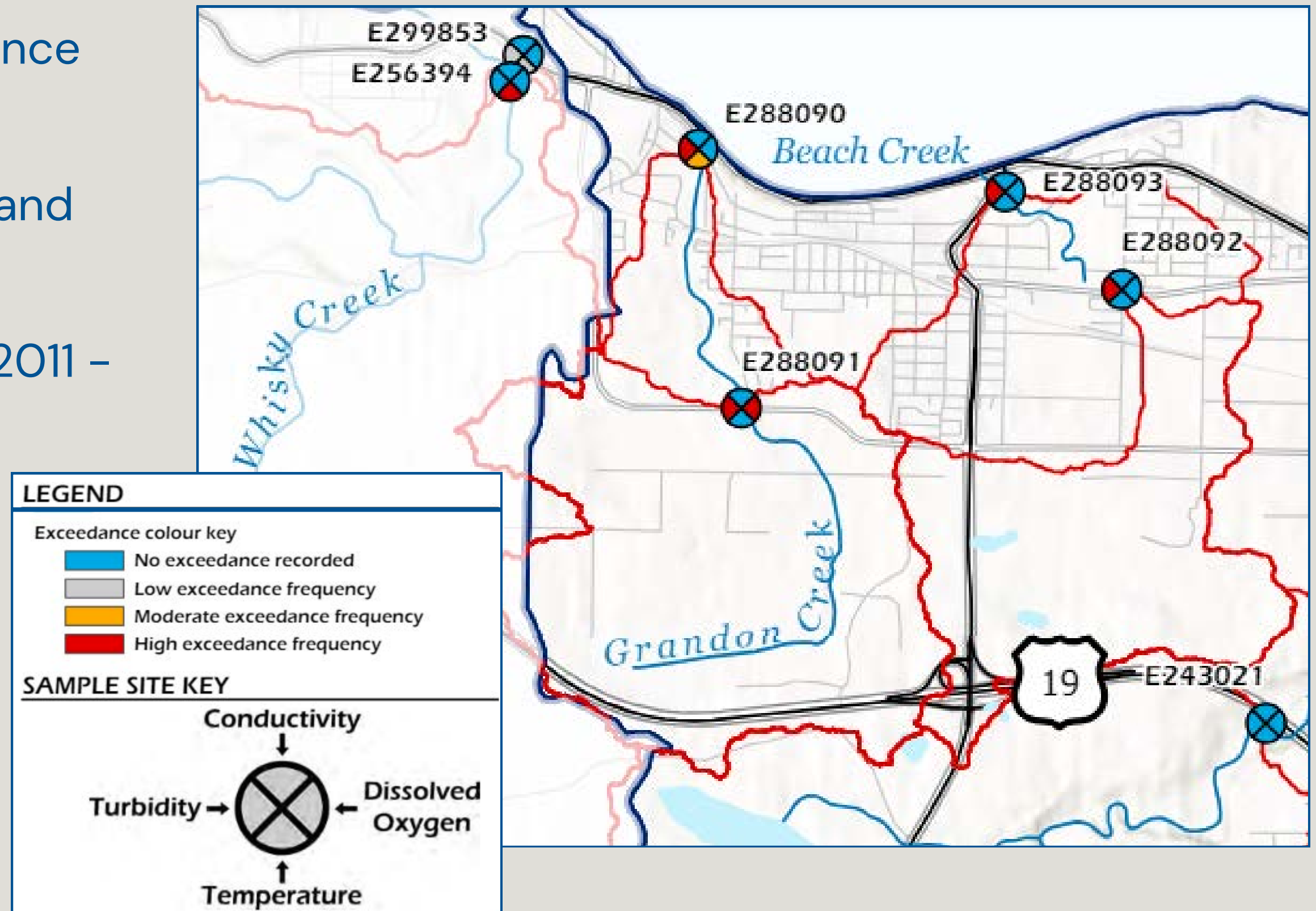
- Exceedance maps developed in 2021 include data 2011 – 2020
- Topographic basin delineations for each site
- Water quality parameters by crosshairs location



COMMUNITY WATERSHED MONITORING NETWORK

2023 ADDITIONAL ANALYSIS

- Colours represent exceedance category
- Map for each water region and sample period
- Update in 2024 to display 2011 – 2023 data
- Basins will incorporate stormwater data layers
- Maps and analysis results presented at the annual results session



COMMUNITY WATERSHED MONITORING NETWORK

2023 PRELIMINARY ANALYSIS

Year	Parameter	Guideline	Sites within WQG/O (%)	Percent change between current and previous year
2021	dissolved oxygen	5 mg/L + 8 mg/L	68.8	-4.0
2022	dissolved oxygen	5 mg/L + 8 mg/L	64.2	-6.6
2023	dissolved oxygen	5 mg/L + 8 mg/L	51.5	-19.7
2021	temperature	17°C	40.6	-36.7
2022	temperature	17°C	41.8	2.9
2023	temperature	17°C	33.3	-20.2
2021	turbidity	2 NTU + 5 NTU	50.0	109.4
2022	turbidity	2 NTU + 5 NTU	53.7	7.5
2023	turbidity	2 NTU + 5 NTU	40.9	-23.9

Very low flows summer and into the fall last year

Sampling started two weeks later than normal

In 2020, two large flushes were captured, in 2021 one small event captured

Sampling time and environmental conditions influence results

Data interpretation and reporting communicate nuances and utilize the application of collected data

COMMUNITY WATERSHED MONITORING NETWORK

RESULTS SESSION PLANNING

- July 9, 2024
- Nanoose Place
- Catered lunch
- Guest speakers
- 2023 data summary
- First look at CWMN strategic planning framework



Annie Creek turbidity reading of 24.1 NTU

COMMUNITY WATERSHED MONITORING NETWORK

STRATEGIC PLANNING

Purpose:

To review the RDN Community Watershed Monitoring Network and refresh its strategic direction for the next 5 years, based on past learnings, current momentum, and related priorities.

As stated within the DWWP Action Plan, the vision for the network is not to be limited to surface water quality only, but to extend the concept to all water monitoring in the region's watersheds that involves the RDN and community partners.

The monitoring network encompasses:

- Surface water quality
- Hydrometric
- Lake Levels
- Lake Water Quality
- Groundwater Levels
- Groundwater Quality
- Assessments / Mapping
- Biological Monitoring
- Wetlands
- Snowpack



COMMUNITY WATERSHED MONITORING NETWORK

REPORTING



ACTION

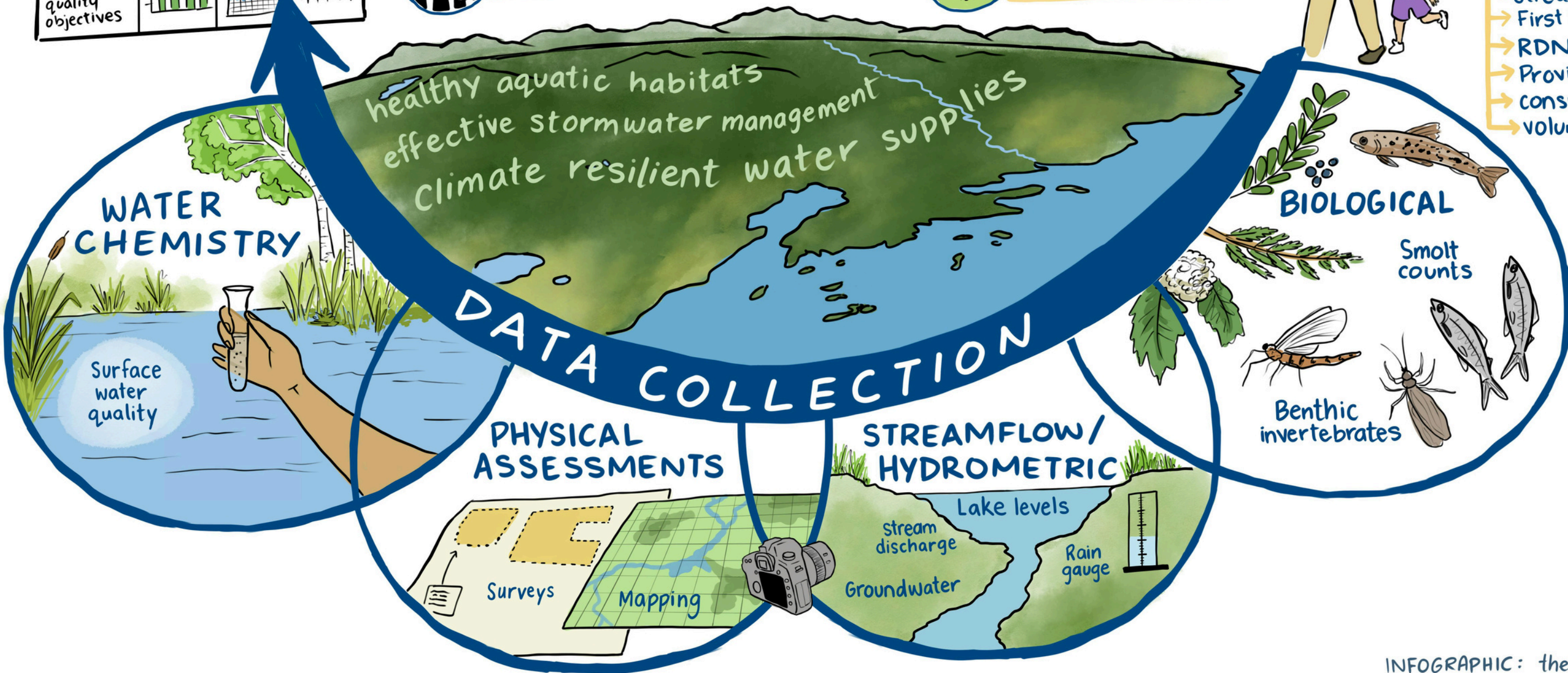
STEWARDSHIP, OUTREACH, POLICY

- Stream/riparian enhancement & restoration
- Green infrastructure
- Licensing/permitting
- Education & Outreach
- Development review
- Best management practices



ENGAGEMENT

- Stream keepers
- First Nations
- RDN
- Province
- consultants
- volunteers



COMMUNITY WATERSHED MONITORING NETWORK STRATEGIC PLAN – WHAT WOULD IT INCLUDE?

- What is being done: An inventory of what monitoring / stewardship is being done (or has been done) per group in which systems
- What has been found so far:
 - Summary of what monitoring findings point towards, what issues need to be addressed, determine what is outside of the scope of the network
 - Ideas on what should continue / where to focus next
- What are possible next steps: Detailed and implementable next steps
 - A roadmap of how implementation occurs
 - General timelines
 - Identification of leadership, resources, partners, etc.
- Map out a framework for implementation
 - produce clear direction for CWMN Strategy for DWWP staff work planning and an approach for the next 5+ year horizon



Drafted by DWWP staff but co-developed through engagement with stewards & partners

COMMUNITY WATERSHED MONITORING NETWORK

STRATEGIC PLANNING – PROPOSED APPROACH

Pilot the concept across the network in 2024; pause the surface water quality sampling in 2025 to roll out the strategic planning across the network

- Internal planning 2024– ongoing to refine this concept “planning for the planning”
- Share with stewards and partners – July results session (share concept) and at November appreciation event (begin engagement / gather input)
- Implement Strategic Planning efforts in 2025 across the network;
 - Temporary DWWP staff to collect data at stations that need additional years;
 - Stewards will be engaged in strategic planning and other events to maintain their interest (i.e. Streamkeepers courses, photo monitoring)
- At 2026 results session, present the CWMN Strategic Plan
- Relaunch! 2026 monitoring resumes with Strategic Plan recommendations implemented

COMMUNITY WATERSHED MONITORING NETWORK

STRATEGIC PLANNING – DISCUSSION

How do you think we should develop this plan? What are your thoughts on the proposed approach?

What do you think should be prioritized within the plan?

How should streamkeepers be brought in for feedback? What about the general public?

Should we create a subcommittee within the DWWP TAC to support this process?

Other thoughts or comments?



WATERSHED SECURITY FUND PROVINCIAL ANNOUNCEMENT

Our Priorities and Funding Streams

In this first year of the program, grant funding will support projects and initiatives that prioritize reconciliation, ecosystems health and climate resilience. Across a range of themes, funded projects will support healthy communities and sustainable economies. We recognize the holistic, interwoven aspects of watershed work and understand that most projects will connect across several areas.

Three different funding streams with varying maximum grant sizes from \$50 up to \$500k

Eligible organizations include registered non-profits, educational institutions, social enterprises, local/regional governments, and First Nations

Funding Themes (Areas of work) include:

- Watershed Collaboration, Planning and Governance
- Watershed and Ecosystems Restoration
- Nature-based infrastructure
- Watersheds & Food Systems
- Monitoring and Assessment
- Land & Water-based Learning, Intergenerational Knowledge

watersecurityfund.ca/grants



A scenic view of a rushing river through a narrow, moss-covered canyon in a dense forest. The river flows through a narrow channel between steep, moss-covered rock walls. The surrounding forest is lush with green trees and hanging moss. The water is white and turbulent, indicating rapids. The overall atmosphere is serene and natural.

THANK YOU

**Next Meeting:
September 11, 2024**