

# Provincial Water Quality Monitoring in the Elk Valley

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Environment and  
Climate Change Strategy

# Provincial-Federal Water Quality Monitoring

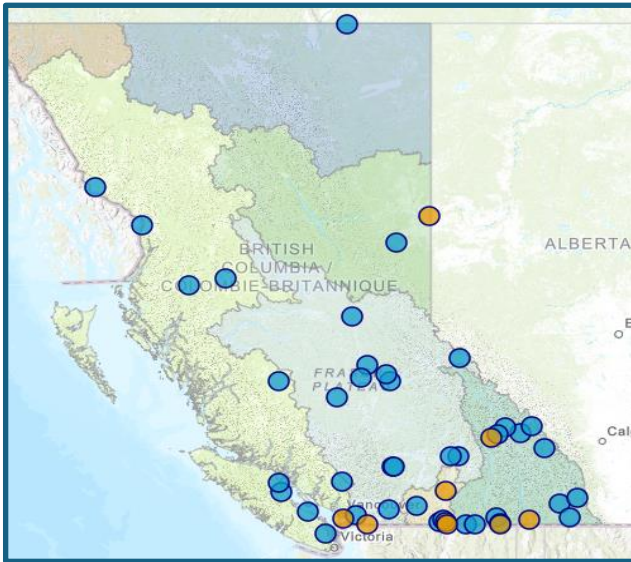
## Two complementary methods

### ➤ Canada-BC WQ Monitoring Program:

- Established under agreement in 1985
- 51 discrete & 3 continuous stations
- Evaluated using BC Water Quality Guidelines and/or Objectives
- Often co-located with hydrometric stations

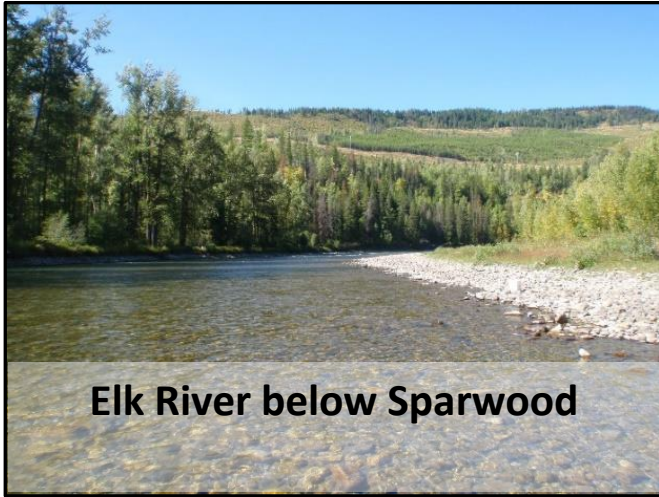
### ➤ BC Biomonitoring Program:

- Collaboration with ECCC
- Over 400 sampling locations
- Follows standardized CABIN protocol
- 7 CABIN reference models in BC

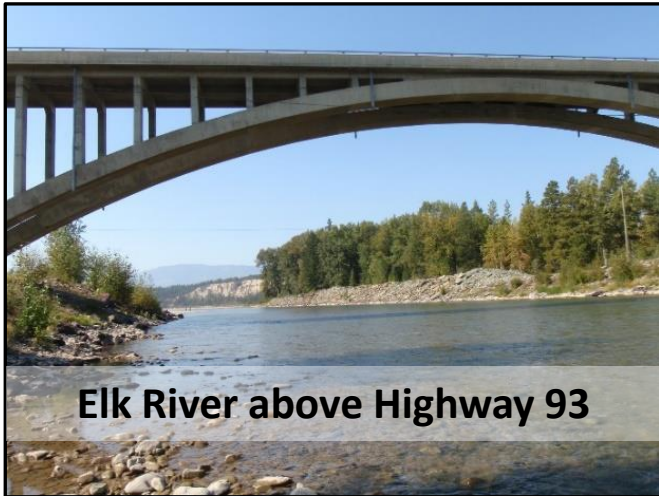




# Canada-BC WQ Monitoring Stations on the Elk River



Elk River below Sparwood



Elk River above Highway 93

## Water Quality Sampling Frequency (24x/year)

WQ  
sampling  
every two  
weeks

1 CABIN  
sample per  
station - 3  
years

### Sampling Strategy

Multi-sampler lowered from bridge or grab sample from shore

Benthic invertebrates sampled using a kick net (CABIN protocol)

### Standard Sampling Parameters

#### Physical

- Temperature
- Suspended solids
- Turbidity
- Colour

#### Biological

- Fecal coliforms
- Benthic invertebrates
- *E. coli*

#### Chemical

- Nitrogen
- Phosphorus
- Carbon
- Major ions
- Total and Dissolved Metals
- Hardness
- pH
- Specific conductance

#### QA/QC

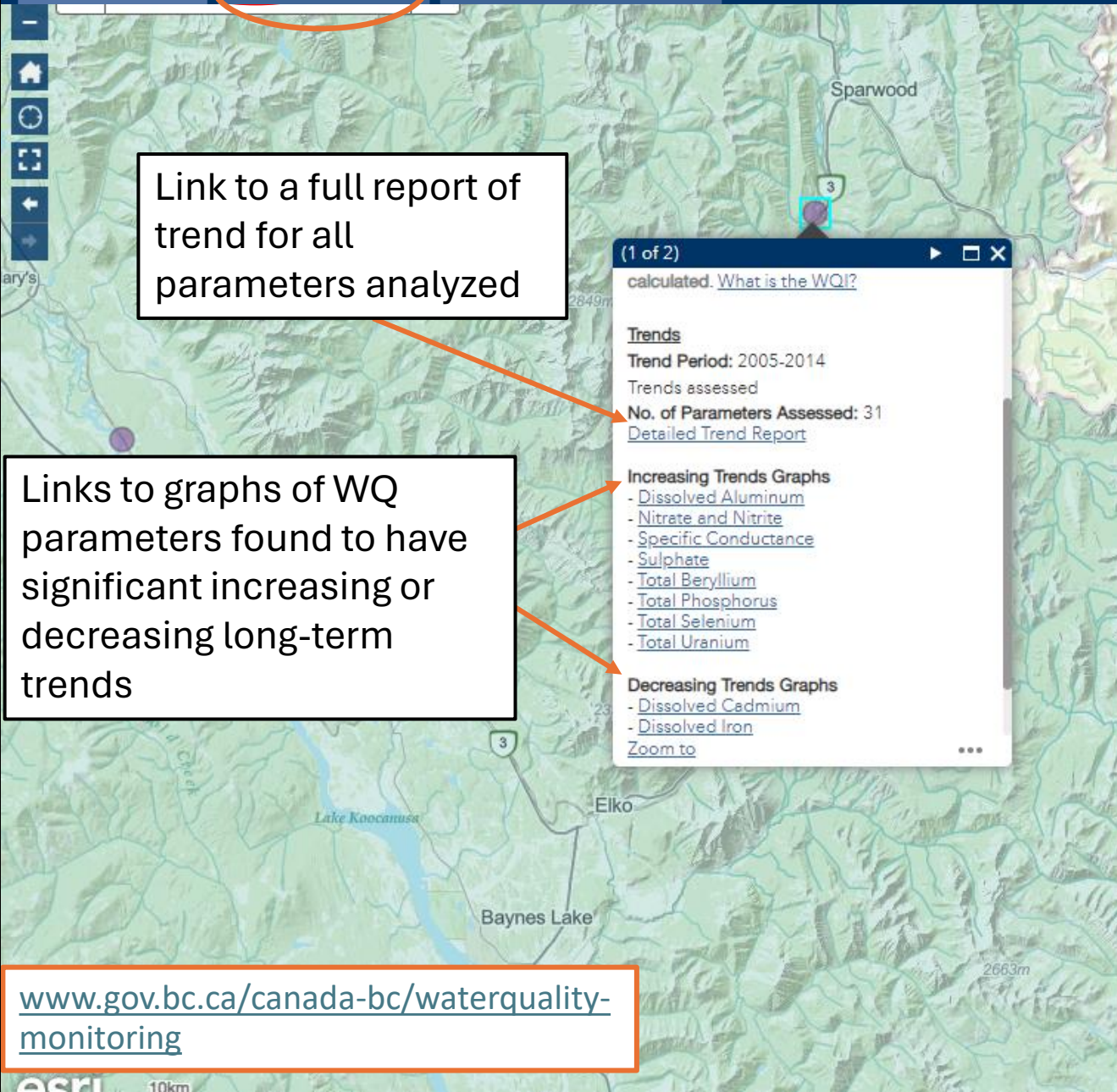
- 3X/year
- Water chemistry replicates
- Water chemistry field blanks
- Repeat reference sites (CABIN)

# Canada-B.C. Water Quality Monitoring Program - Interactive Map

Program Overview

Water Quality Trends

Biomonitoring Assessments



Link to a full report of trend for all parameters analyzed

Links to graphs of WQ parameters found to have significant increasing or decreasing long-term trends

[www.gov.bc.ca/canada-bc/waterquality-monitoring](http://www.gov.bc.ca/canada-bc/waterquality-monitoring)

## Layer List



### Layers

Water Quality Monitoring Stations

- Trends assessed
- Insufficient data for trend analysis
- Trend analysis in progress

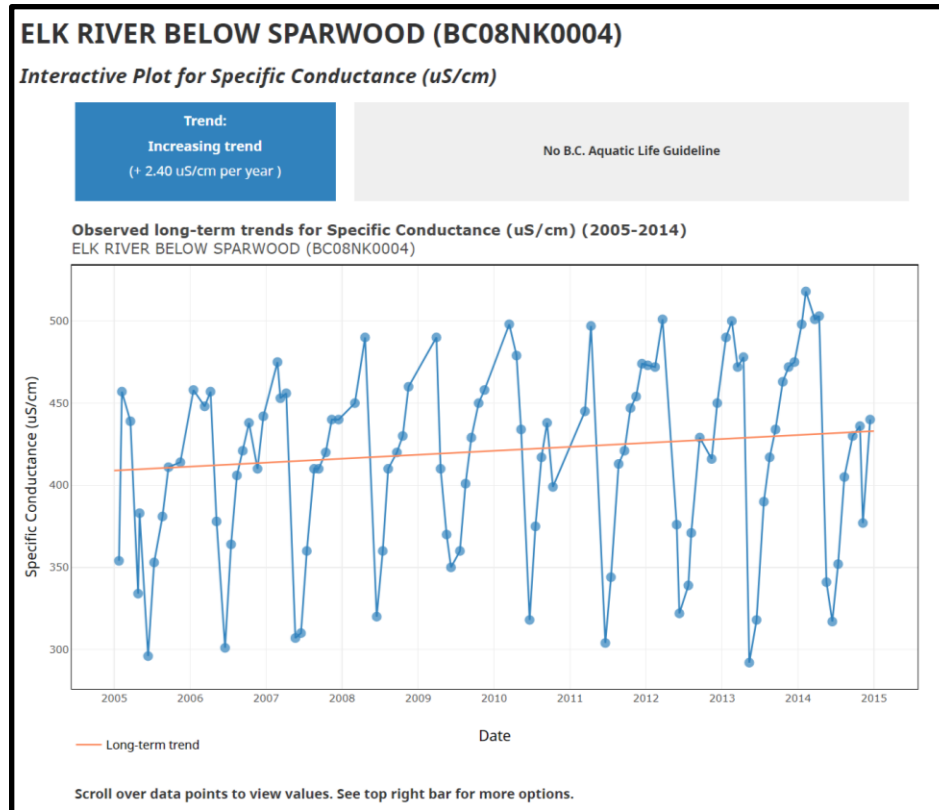
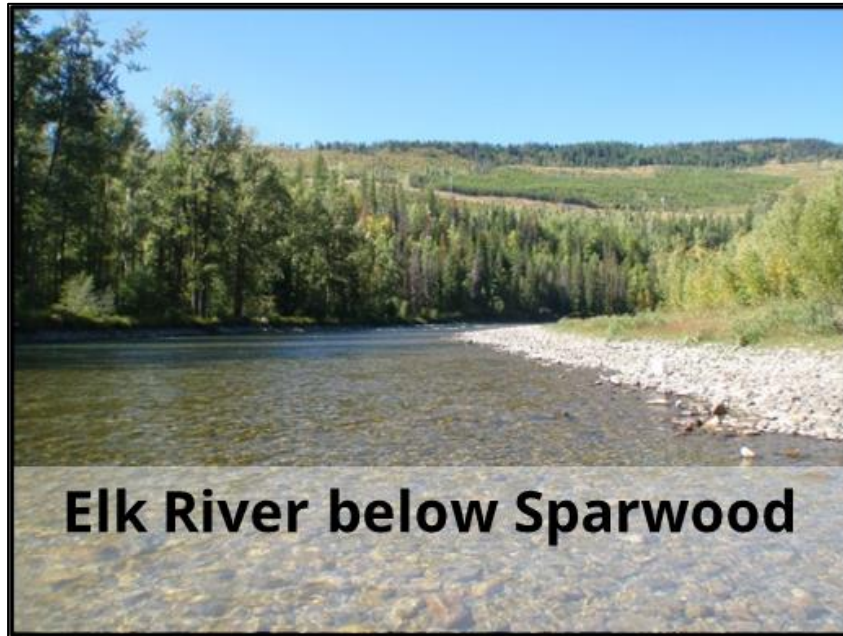
## Reporting

- Regular reporting includes statistical trend analysis:
- Minimum of 10 years of data
- Updated every 5 years
- Available trend report for 2004 – 2015
- In process of finalizing 2004 – 2019 trend analysis



# Canada-BC WQ Monitoring Stations

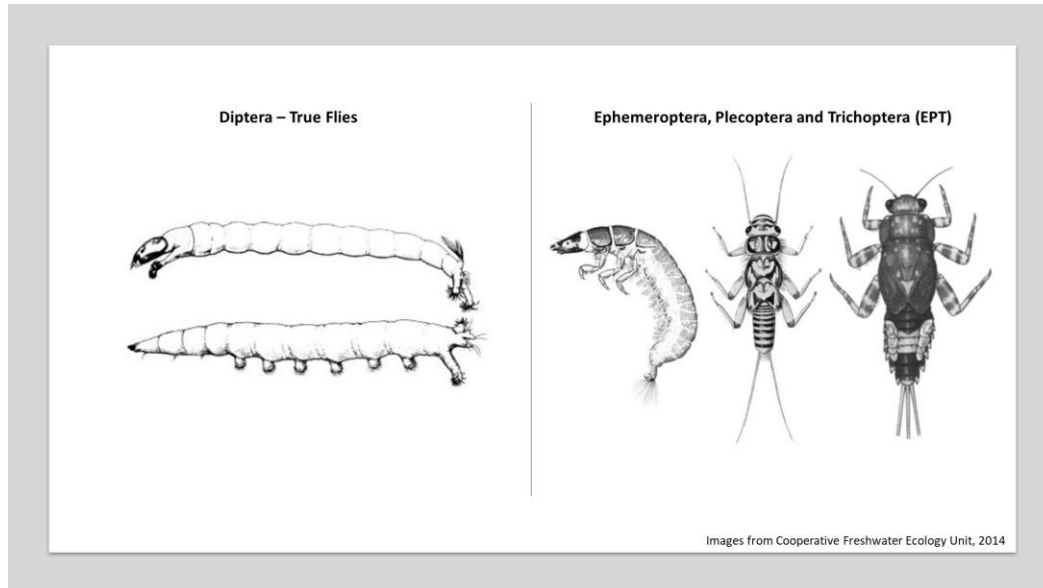
## Trend Analysis Example



# BC Biomonitoring Program

## Canadian Aquatic Biomonitoring Network (CABIN) Monitoring Approach:

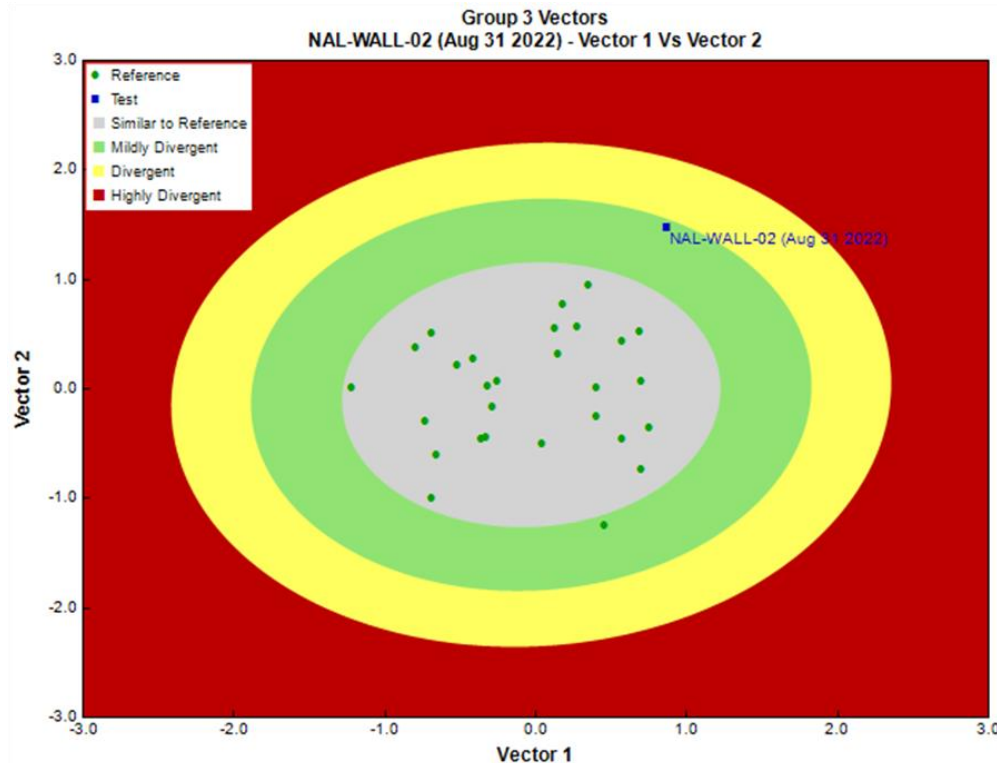
- Kick-net sample for benthic invertebrates
- Water sample for basic WQ parameters
- Physical stream characteristics



## Why benthic invertebrates?

- Sedentary
- Long-lived
- Diverse
- Ubiquitous
- Key part of food web
- Commonly used

# RCA Model Output Example



- Gray – Similar to Reference condition (90% SE)
  - Green – Mildly Divergent from Reference (99% SE)
  - Yellow – Divergent from Reference (99.9% SE)
  - Red – Highly Divergent from Reference (> 99.9% SE)
- \* SE = Standard Ellipse

# Other Resources

## Elk Valley Water Quality Hub

Monitoring	Details
Surface Water Quality	132 locations
Benthic Invertebrate Tissue Selenium	Annual sampling at 87 locations
Benthic Invertebrate Community	Annual sampling at 86 locations
Acute & Chronic Toxicity Testing	~260 toxicity tests/year
Groundwater Quality	131 wells



# Other Resources

## Elk Valley Water Quality Dashboard

**BRITISH COLUMBIA Elk Valley Water Quality Hub** Water Quality Data Dashboard

**Data Selection** Information

### Elk Valley Watershed Aquatic Health Monitoring Data

**Instructions:**

- » In the layer list below:
- » **Step 1:** Click on the dropdown arrow ▾.
- » **Step 2:** Select the checkbox next to Aquatic Health Data .
- » **Step 3:** Select the Aquatic Health Data  that you would like to view.
- » **Step 4:** Select mainstem and/or tributary monitoring locations .

» Learn more about Aquatic Health Monitoring by clicking on the Information tab above.

- >  Elk Valley Watershed Aquatic Health Monitoring Data
- >  Permit & Trend Monitoring Locations
- >  Elk Valley Information

**Water Quality Trend & Compliance Data** **All Surface Water Monitoring Locations** **Aquatic Health Monitoring Data**

[elkvalleywaterquality.gov.bc.ca/pages/water-quality-dashboard](http://elkvalleywaterquality.gov.bc.ca/pages/water-quality-dashboard)

**Legend:**

- Possible change and/or possible low-level effect
- Probable change and/or probable effect
- Likely change and/or likely effect

**Aquatic Insect Community Tributaries**

- ▲ No apparent change and/or no effect
- ▲ Possible change and/or possible low-level effect
- ▲ Probable change and/or probable effect
- ▲ Likely change and/or likely effect

**Permit & Trend Monitoring Locations**

- Compliance Point
- Order Station
- Trend Site
- Order Station & Compliance Point

**Elk Valley Information**

Elk Valley Water Quality Plan Designated Area

# Summary and Questions

## Resources:



### **BC Streamflow Inventory Map**

<https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=9ac7f138fcf9437b90d3304f7eff600c>

- **ENV Monitoring**

<https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring>

- **Canada – BC WQ monitoring program**

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-monitoring/canada-bc-water-quality-monitoring-program>

<https://www.canada.ca/en/environment-climate-change/services/freshwater-quality-monitoring/online-data.html>

- **BC Biomonitoring Program**

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-monitoring/biomonitoring>

<https://www.canada.ca/en/environment-climate-change/services/canadian-aquatic-biomonitoring-network.html>

- **Elk Valley Water Quality Hub**

<https://elkvalleywaterquality.gov.bc.ca/>

Email [elkvalleywaterquality@gov.bc.ca](mailto:elkvalleywaterquality@gov.bc.ca)