Data Interpretation Guide:

UNDERSTANDING SURFACE WATER LEVEL AND FLOW

A guide to what the data is, what it means, and how to use it responsibly.

WHAT THIS DATA IS

Surface water level (stage) and flow (discharge) data records how high the water is and how much water is moving at specific locations (monitoring stations) in rivers, lakes, or streams over time. It represents continuous measurements of surface water elevation in metres. This data helps describe how water bodies respond to rainfall, snowmelt, drought, seasonal changes, and other environmental conditions.

WHY THIS DATA IS COLLECTED

Surface water level/flow monitoring helps support:

- Understanding of river and lake conditions across Nova Scotia
- Flood and drought awareness
- Water resource management and planning
- Environmental and ecosystem monitoring
- Infrastructure and land-use planning
- Long-term climate and hydrological studies
- Public awareness of changing water conditions

Long-term monitoring allows trends and seasonal patterns to be compared over time

WHERE THE DATA COMES FROM

Surface water level and flow data in Nova Scotia are collected by Environment and Climate Change Canada (ECCC) through the National Hydrometric Program.

Environment and Climate Change Canada (ECCC), Nova Scotia Environment and Climate Change (ECC), and third-party organizations share ownership of several of these stations and collaborate to support ECCC in operating and maintaining 39 hydrometric monitoring stations across the province.

WHAT THE DATA CAN TELL YOU

Surface water level data help show how rivers, streams, and lakes naturally change over time and in response to current conditions. Water levels rise and fall throughout the year in response to seasonal conditions such as rainfall, snowmelt, dry weather, and freezing conditions.

This data can help identify:

- Seasonal patterns, such as higher water levels during spring snowmelt or after large rainfall events
- Lower water levels or flows during dry summer periods or extended dry weather
- Short-term changes caused by storms or rapid snowmelt
- Whether current conditions are generally higher, lower, or within the typical historical range for a station
- Long-term variability and changing patterns over time

WHAT THE DATA CANNOT TELL YOU

Surface water level and flow data cannot determine:

- Reflect groundwater conditions or what is stored below the surface
- Predict future river levels/flows without weather or climate forecasting
- Provide direct information about water use, withdrawals, or ecosystem health
- Be directly compared across very different rivers without additional context (e.g., river size, watershed area)

Therefore, hydrometric data is best used as a supporting indicator, helping to identify unusual or extreme conditions, which are then evaluated alongside other information (e.g., meteorological data, groundwater levels, and impact reports) to assess flood or drought conditions more accurately.

How to Interpret the Data

Interpret water levels and flows by examining trends over time, comparing seasonal patterns, and considering recent weather conditions. Levels should not be compared directly between stations, as local conditions and station characteristics affect measurements. Higher than usual water levels may indicate a potential flood risk, but this must be evaluated against established flood thresholds and observed impacts. Similarly, lower water levels do not necessarily indicate drought, as local factors like lakes or dams can influence readings. Overall, water data should be interpreted using trends, seasonal context, and site-specific conditions, not in isolation.

Percentiles are calculated from historical data and used to compare current flow or water level conditions to past observations. These comparisons will result in a clearer understanding of whether current conditions are low, normal, or high compared to historical patterns.

Important Limitations and Caveats

Users should be aware of the following limitations:

- Monitoring stations are unevenly distributed across the province.
- Some stations may have shorter or incomplete records.
- Equipment maintenance, ice conditions, storms, or communication interruptions can create data gaps.
- Differences in local geography and watershed characteristics affect how water bodies respond to precipitation.
- Results are site-specific and do not represent conditions elsewhere in the watershed.

Interpretation should always consider local context and supporting information where available.

Common Misunderstandings

- “High water level/flows mean flooding is occurring.” ⇨ Water levels and flows can be elevated without causing flooding. Flood impacts depend on local topography, infrastructure, drainage, and the rate of change.
- “Low water level/flows means a water body is unhealthy.” ⇨ Low levels and flows may occur naturally during seasonal dry periods and do not automatically indicate environmental damage.
- “Conditions at one station apply to the whole river system.” ⇨ Hydrometric stations reflect conditions at a specific location and do not represent nearby rivers or lakes.

Where to Learn More or Get Help

Additional information can be found:

- Environment and Climate Change Canada National Hydrometric Program
- Maritime Coastal Flood Risk Map
- Weather Information - Environment Canada
- Water shortages: safety information for well owners - Government of Nova Scotia, Canada
- Canadian Drought Monitor - agriculture.canada.ca