



# Real-Time Monitoring in the Fraser River Estuary, British Columbia: *A Federal-Provincial Water Quality Monitoring and Surveillance Buoy*

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***Environment Canada***

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April 25-29, 2010 Denver, Colorado

# Presentation Outline

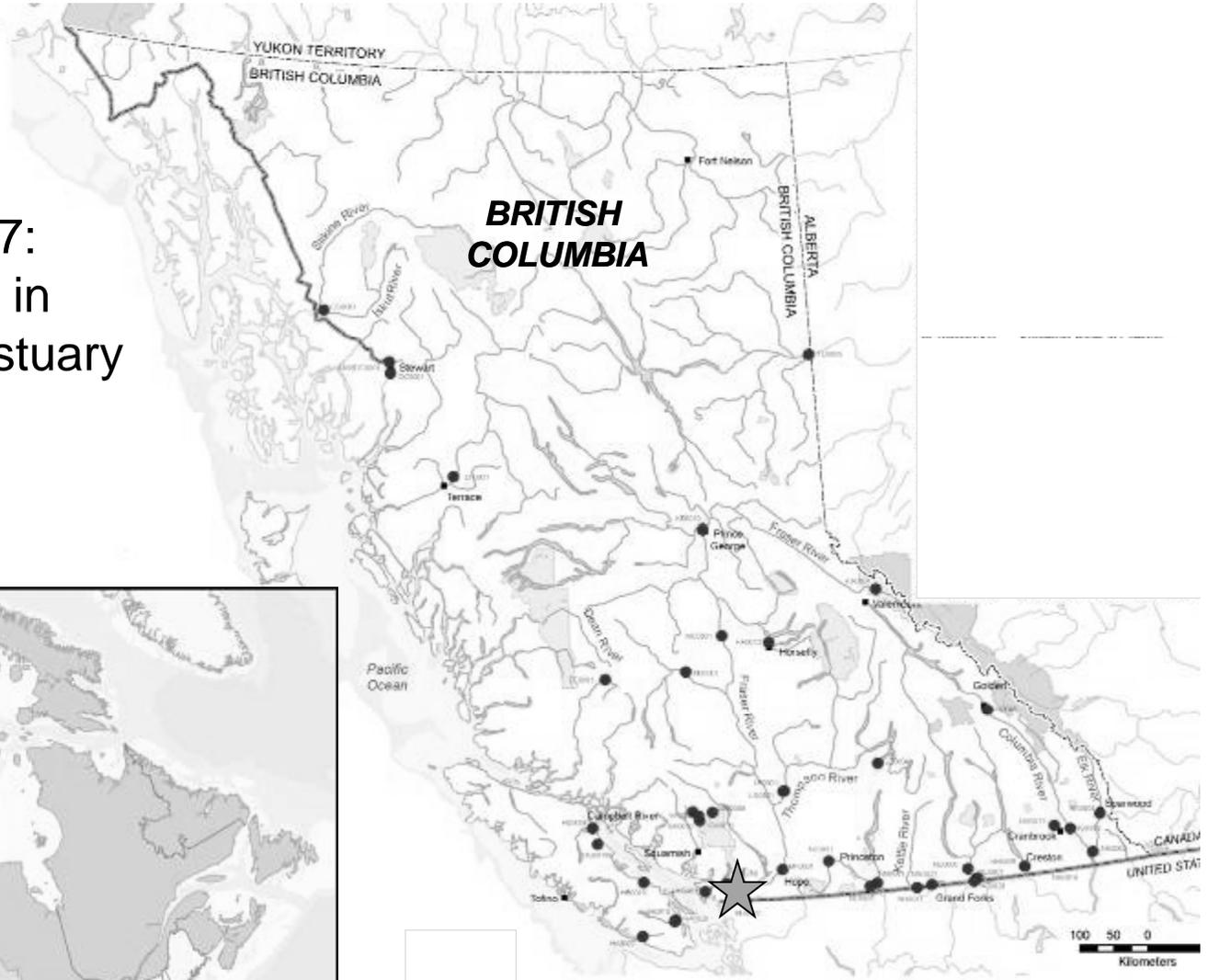
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- Project Overview & Background
- Buoy Location
  - Need and Challenges
- What does the buoy monitor?
  - Instrumentation & Capabilities
- Real-Time Web Access
  - Data Distribution and Availability
- Future Steps



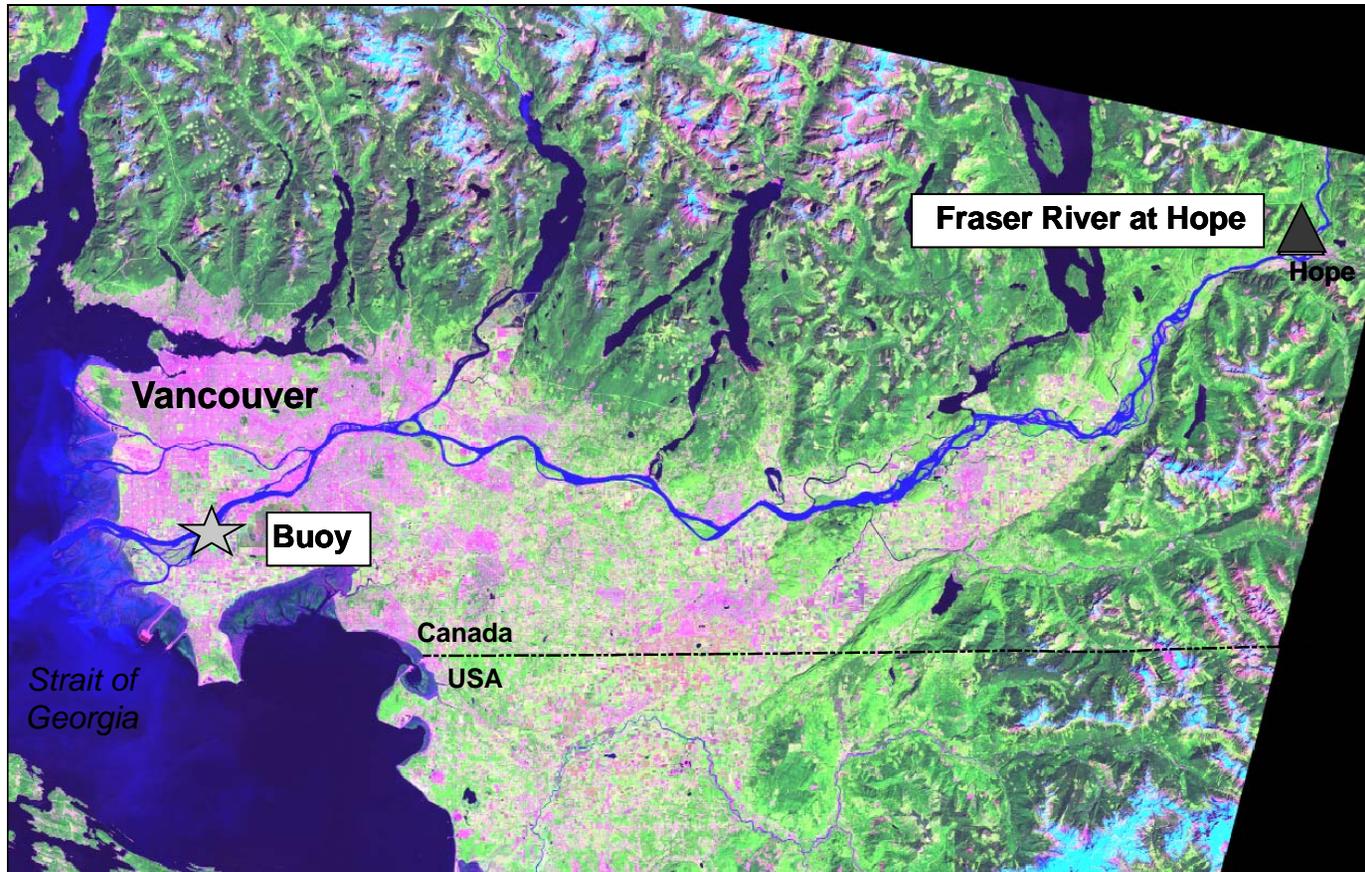
# Project Background

★ November 2007:  
Buoy deployed in  
Fraser River Estuary

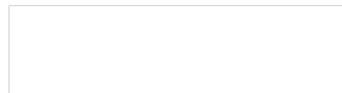


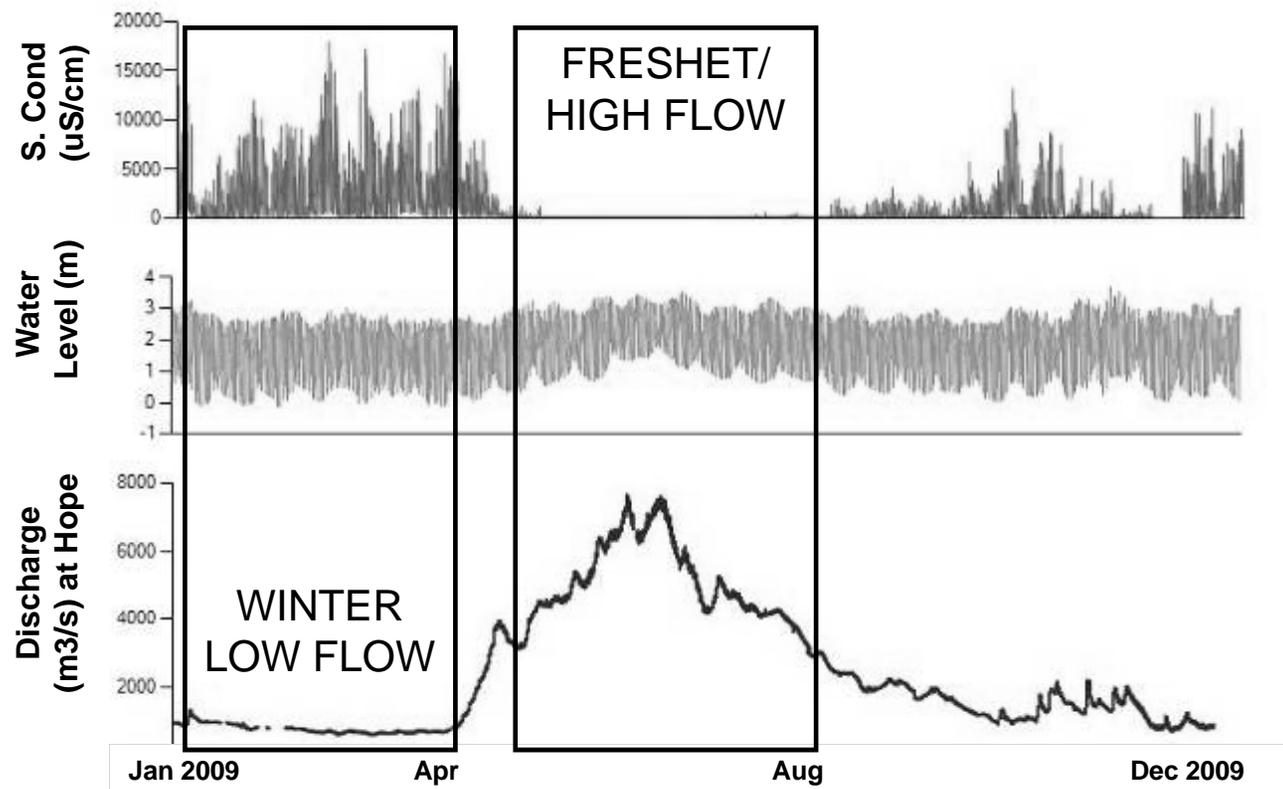
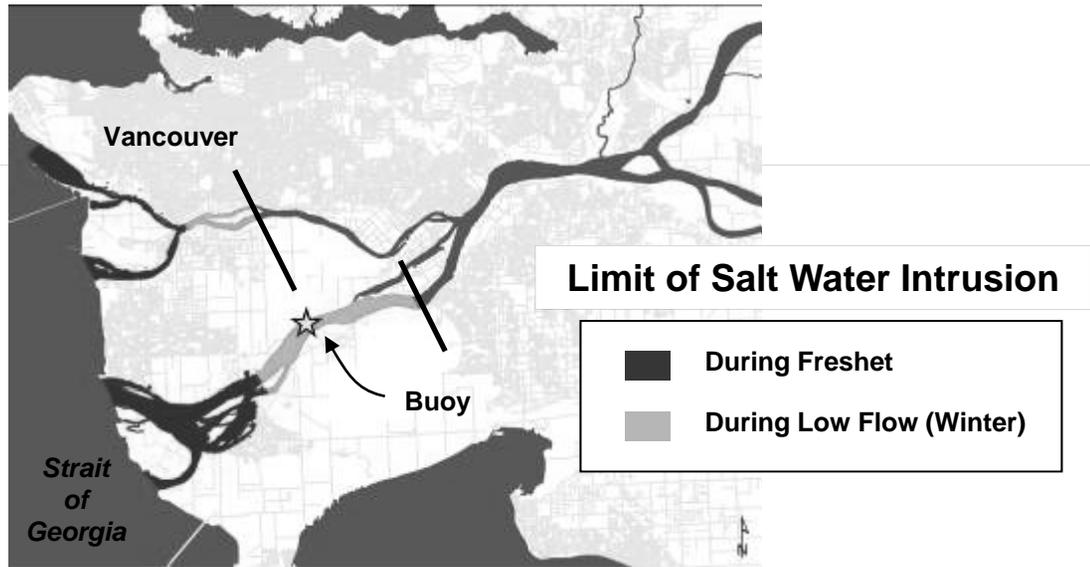
June

# Why the Fraser River Estuary?

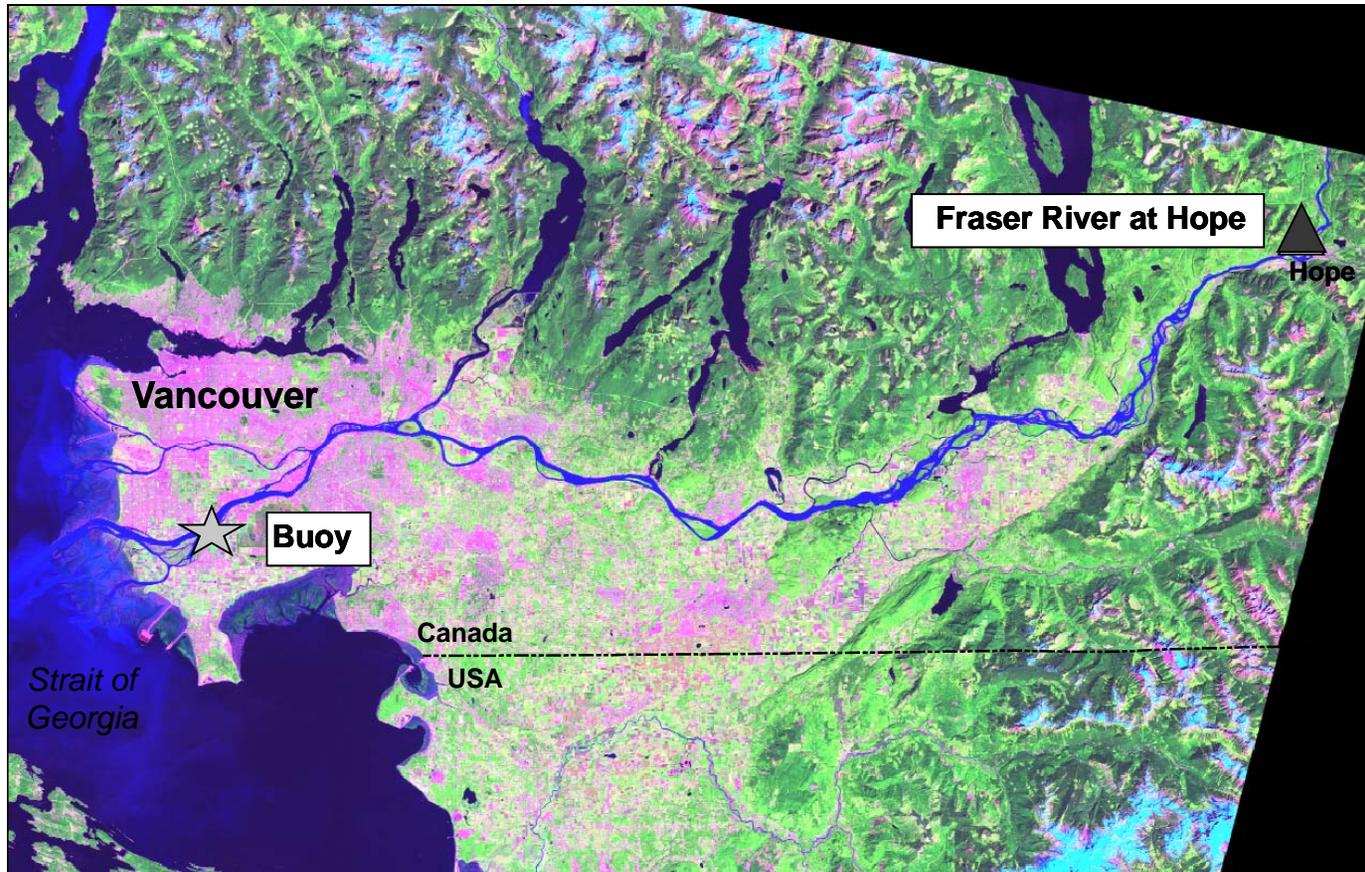


- ▲ Water Quality Monitoring Station
- ★ Fraser River Buoy Station



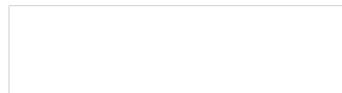


# Why the Fraser River Estuary?



▲ Water Quality Monitoring Station

★ Fraser River Buoy Station



# Station Location

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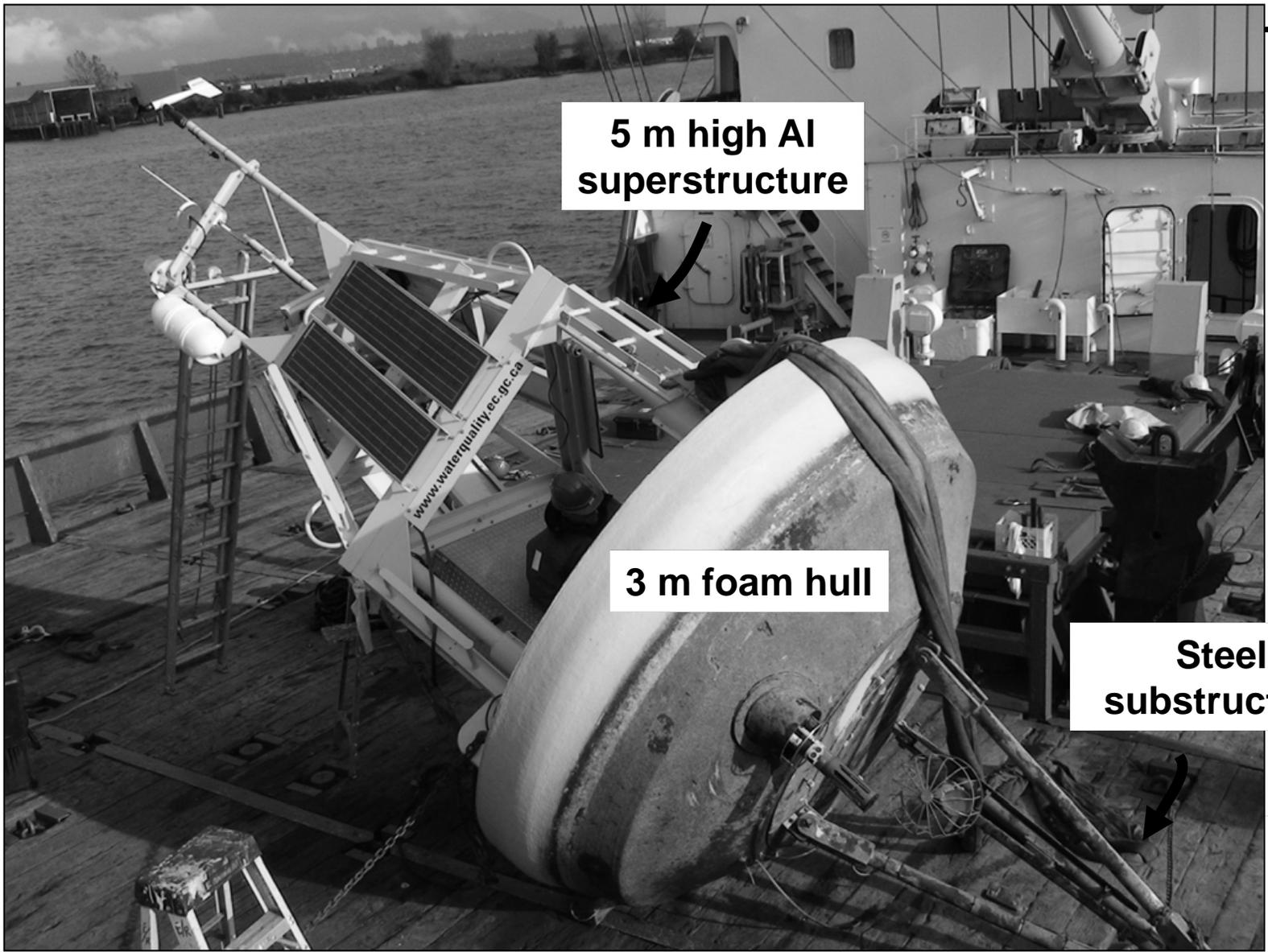


## Main Arm of the Fraser River

- 85% of flow from Fraser River
- Minimal variability with depth
- Major shipping channel



# Buoy Platform

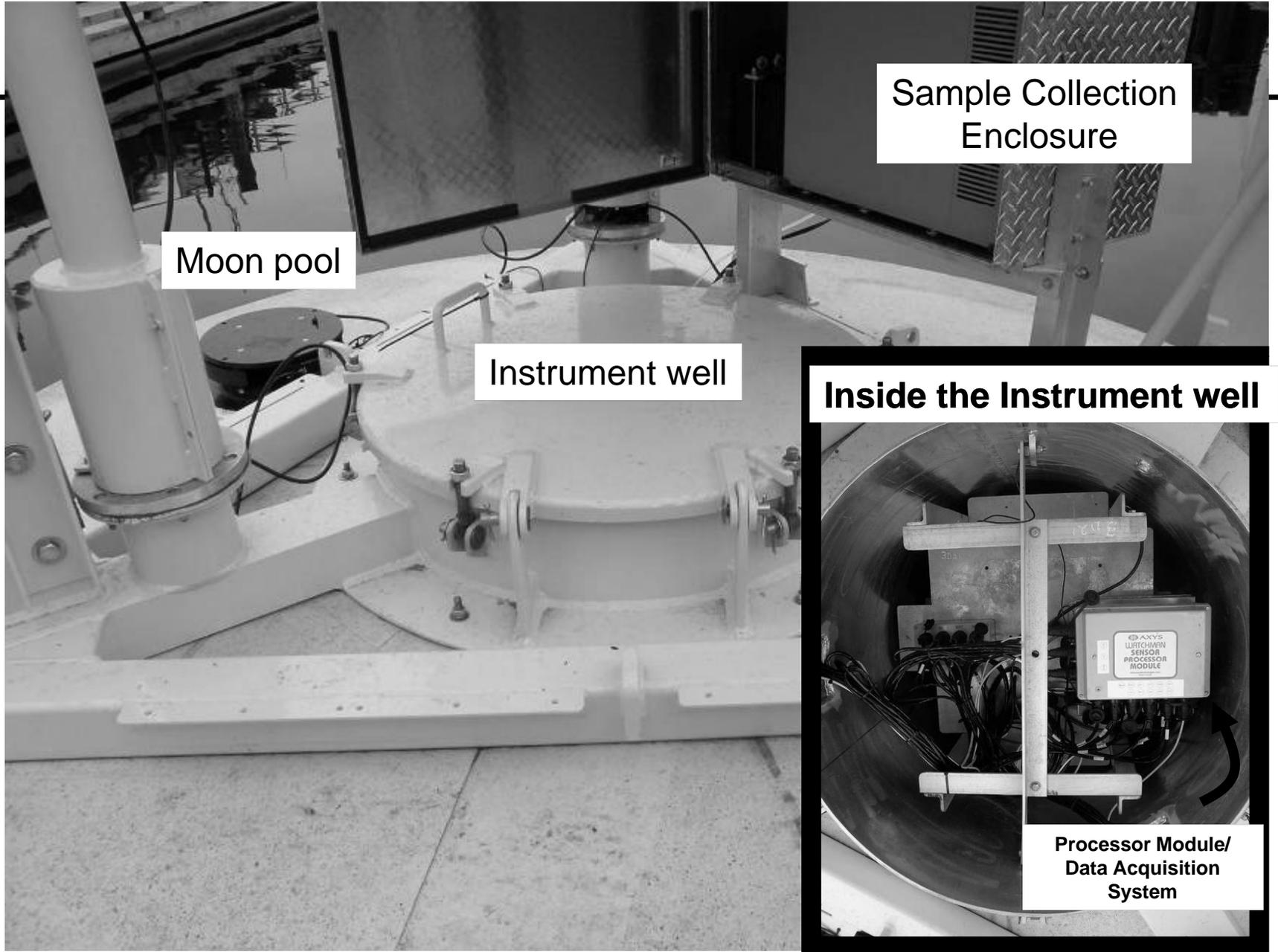


5 m high Al  
superstructure

3 m foam hull

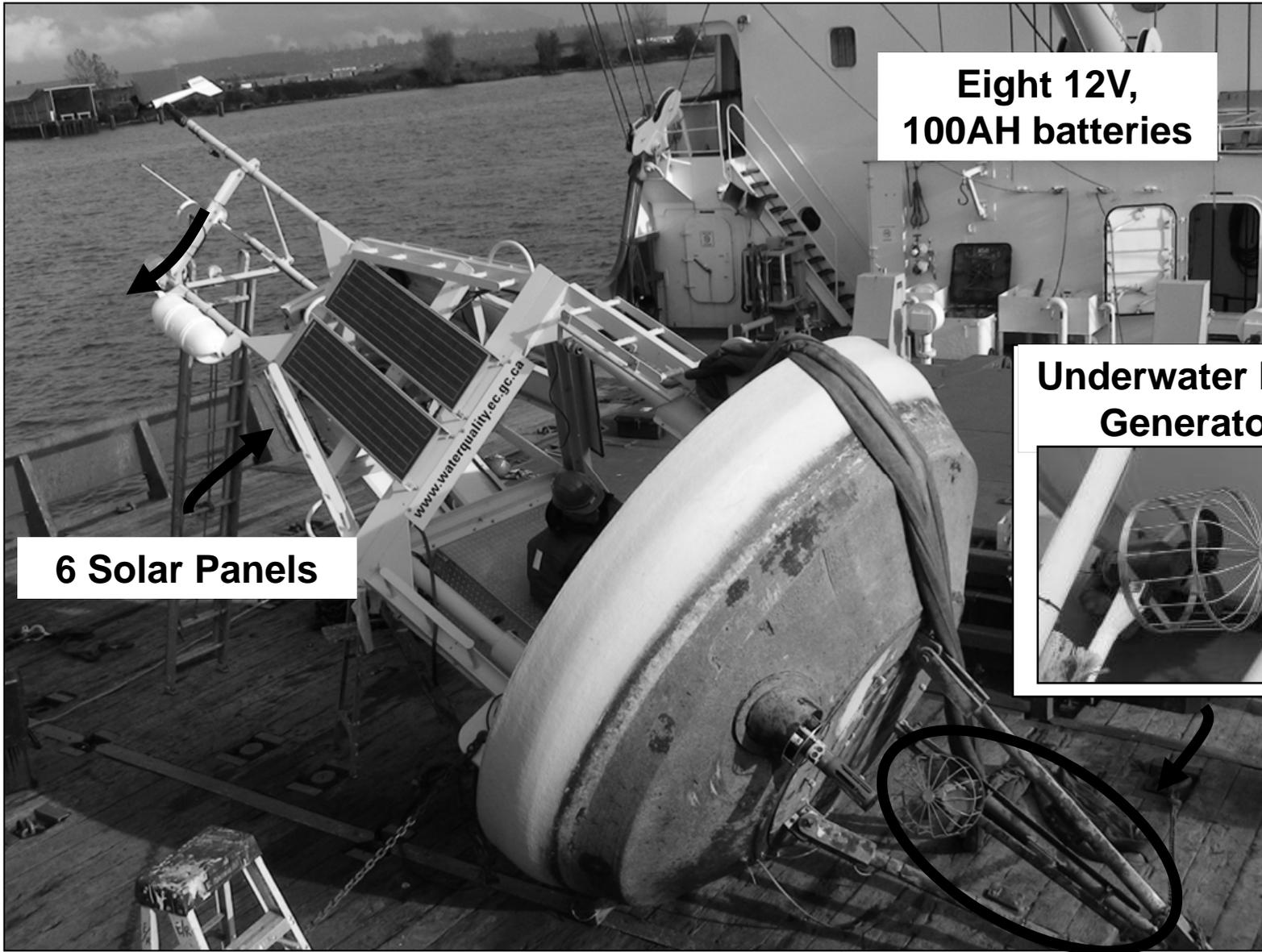
Steel  
substructure

# Buoy Platform



# Power Systems

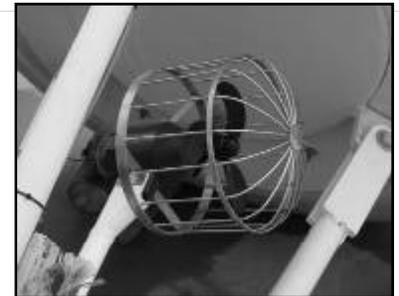
Buoy Platform



Eight 12V,  
100AH batteries

6 Solar Panels

Underwater Flow  
Generator



# What information is being collected?

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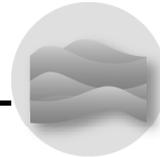
## Meteorology

- *wind speed*
- *wind direction*
- *wind gust speed*
- *air temperature*
- *relative humidity*
- *barometric pressure*



## Water Quality

- *Conductivity*
- *Water temperature*
- *Turbidity*
- *Dissolved Oxygen*
- *pH*



## Water Quantity

- *Surface water  
\_speed & direction*
- *Water depth*

## *River webcam images*



**CONTINUOUS, REAL-TIME DATA**

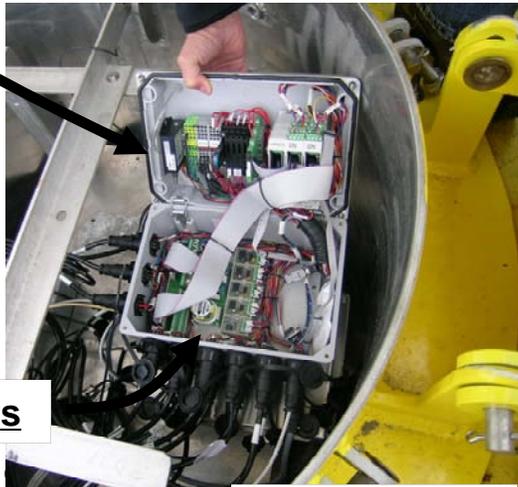




# Meteorological

## Instrumentation

Digital Barometer  
*Air Pressure*



Compass

*Instrument Well*

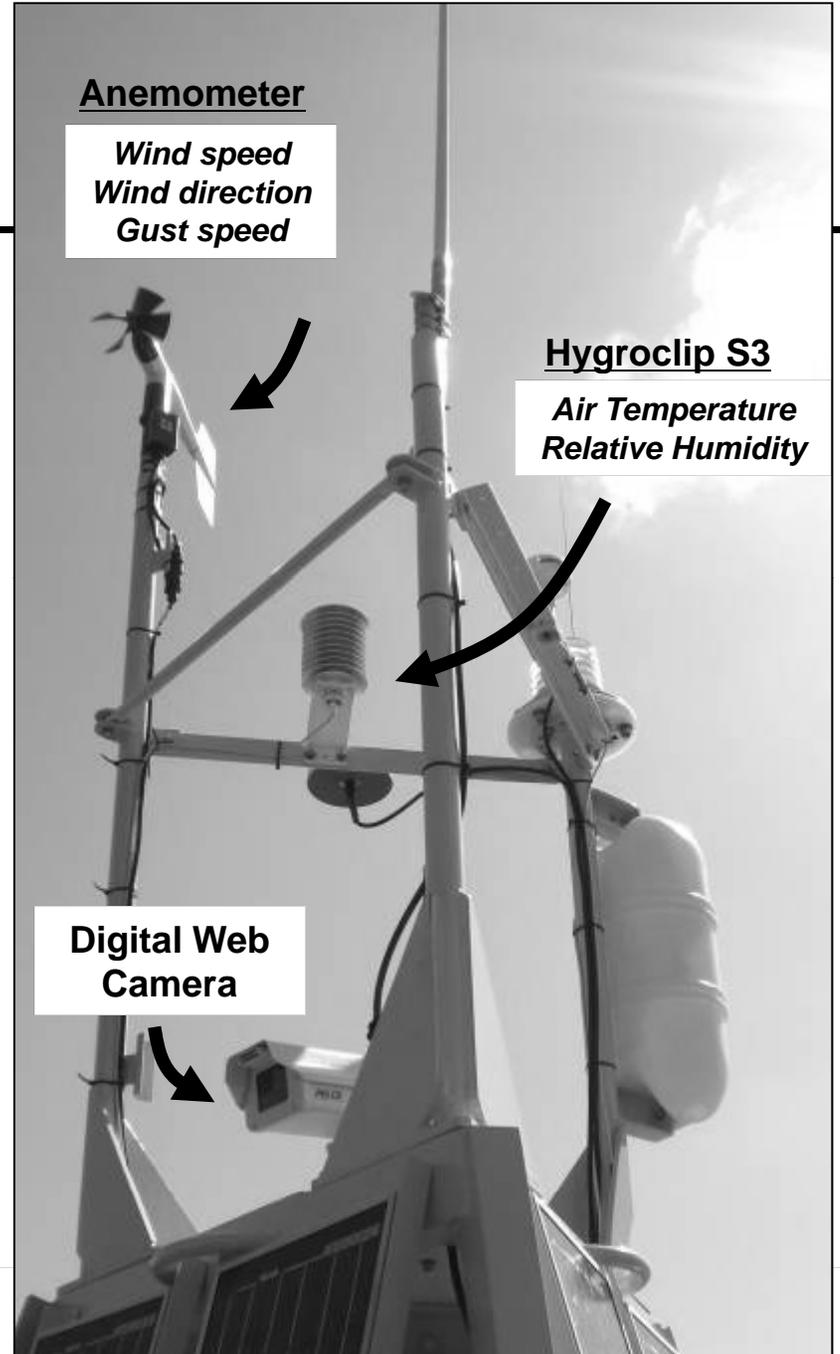
Anemometer

*Wind speed  
Wind direction  
Gust speed*

Hygroclip S3

*Air Temperature  
Relative Humidity*

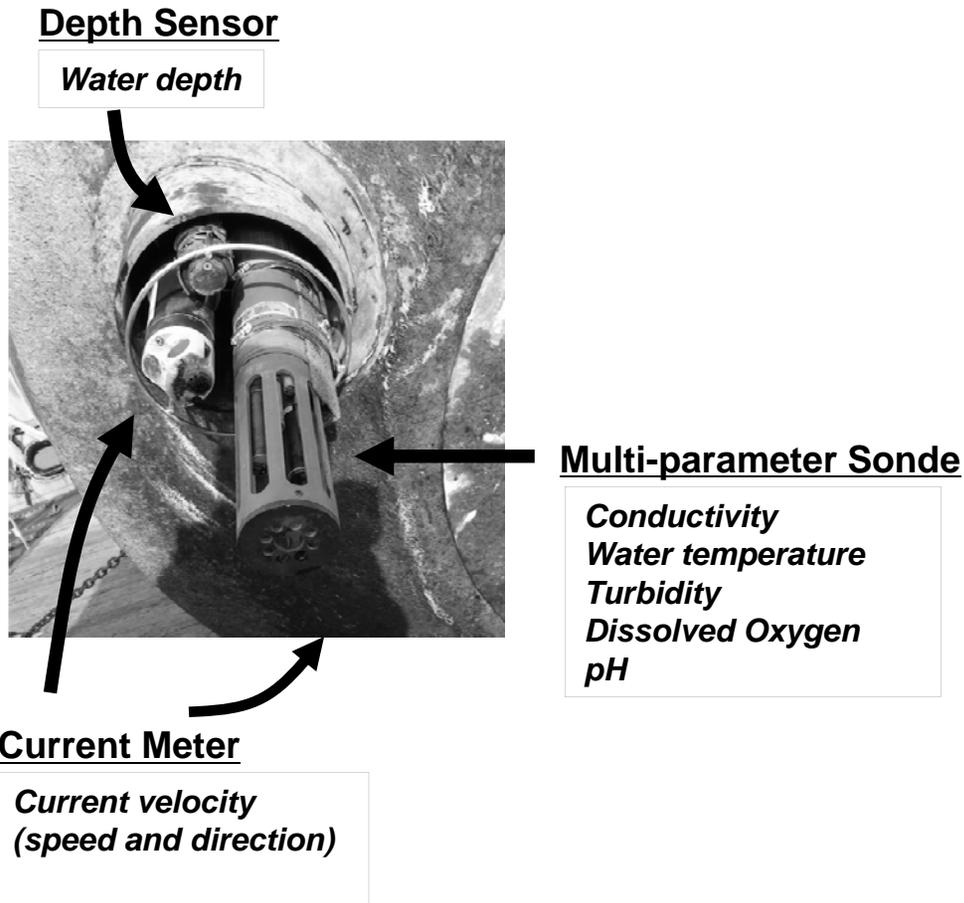
Digital Web  
Camera



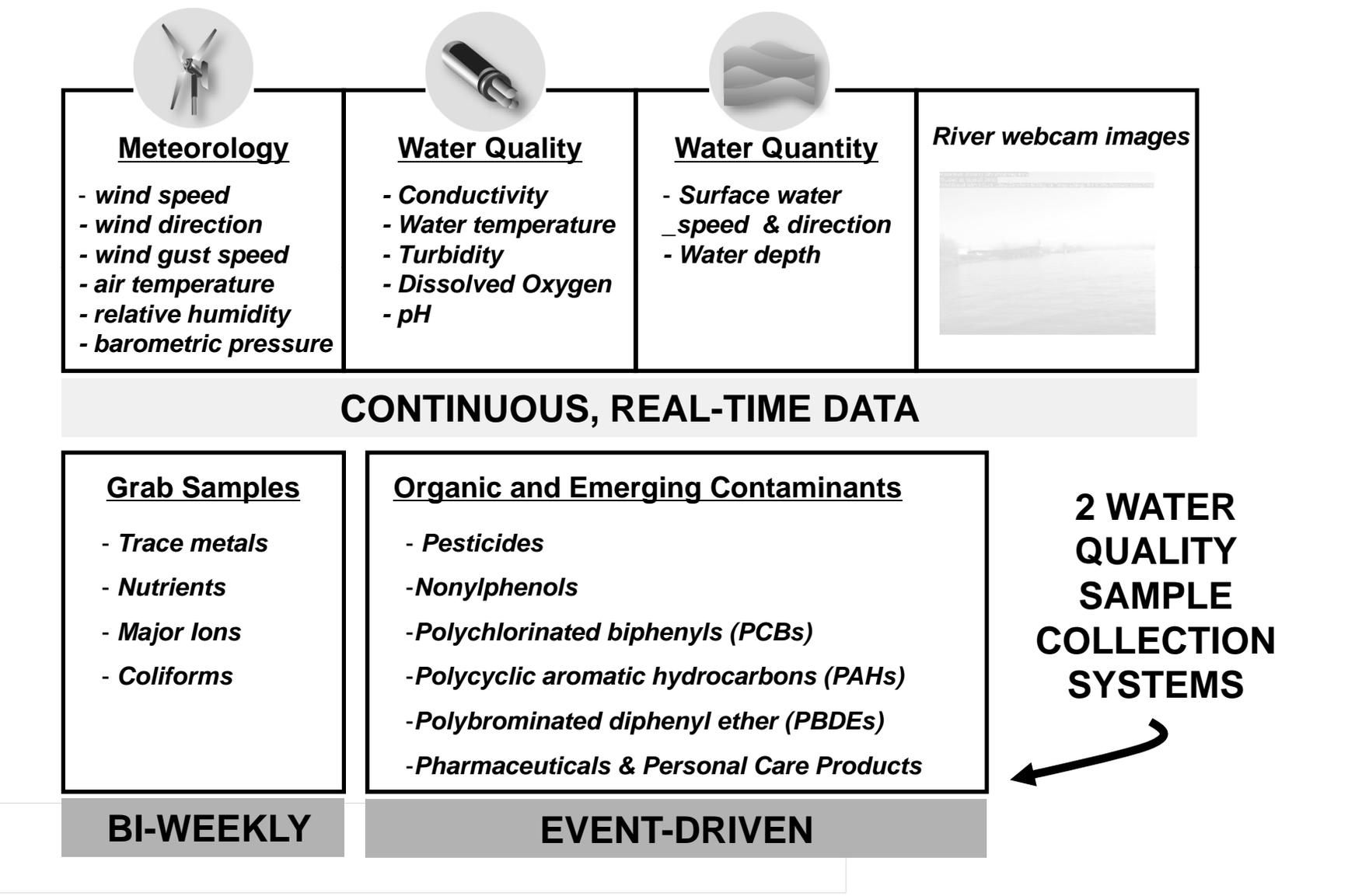


# Real-Time Water Quality & Quantity

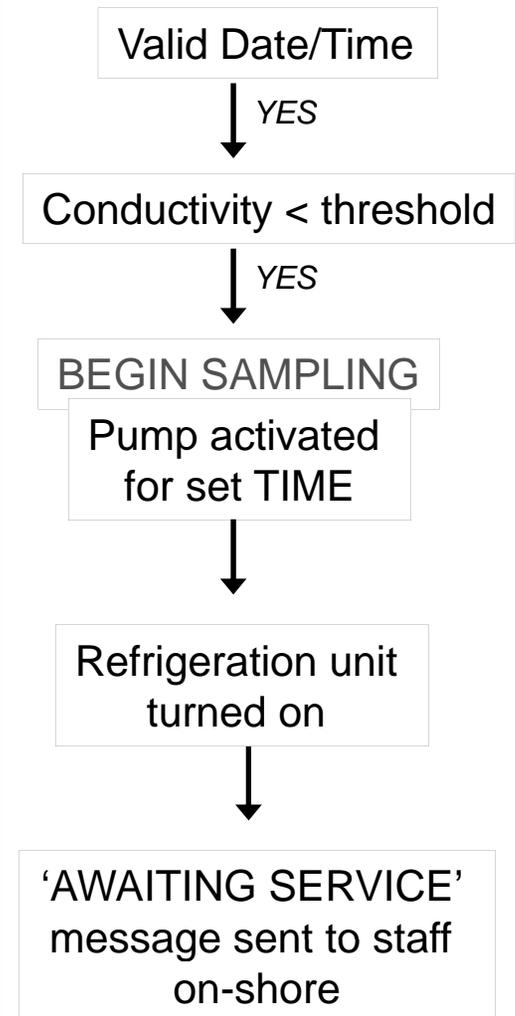
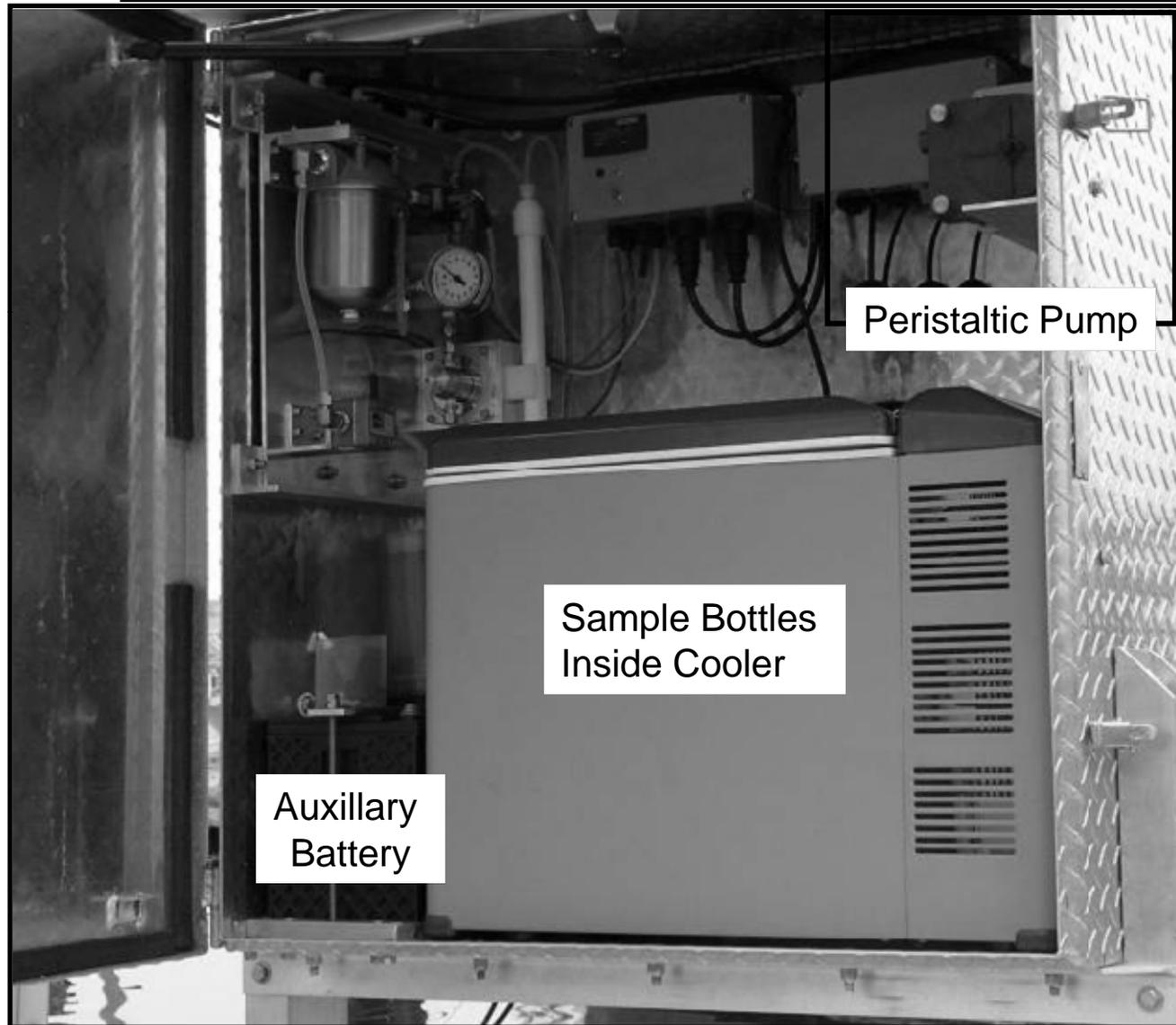
## Instrumentation



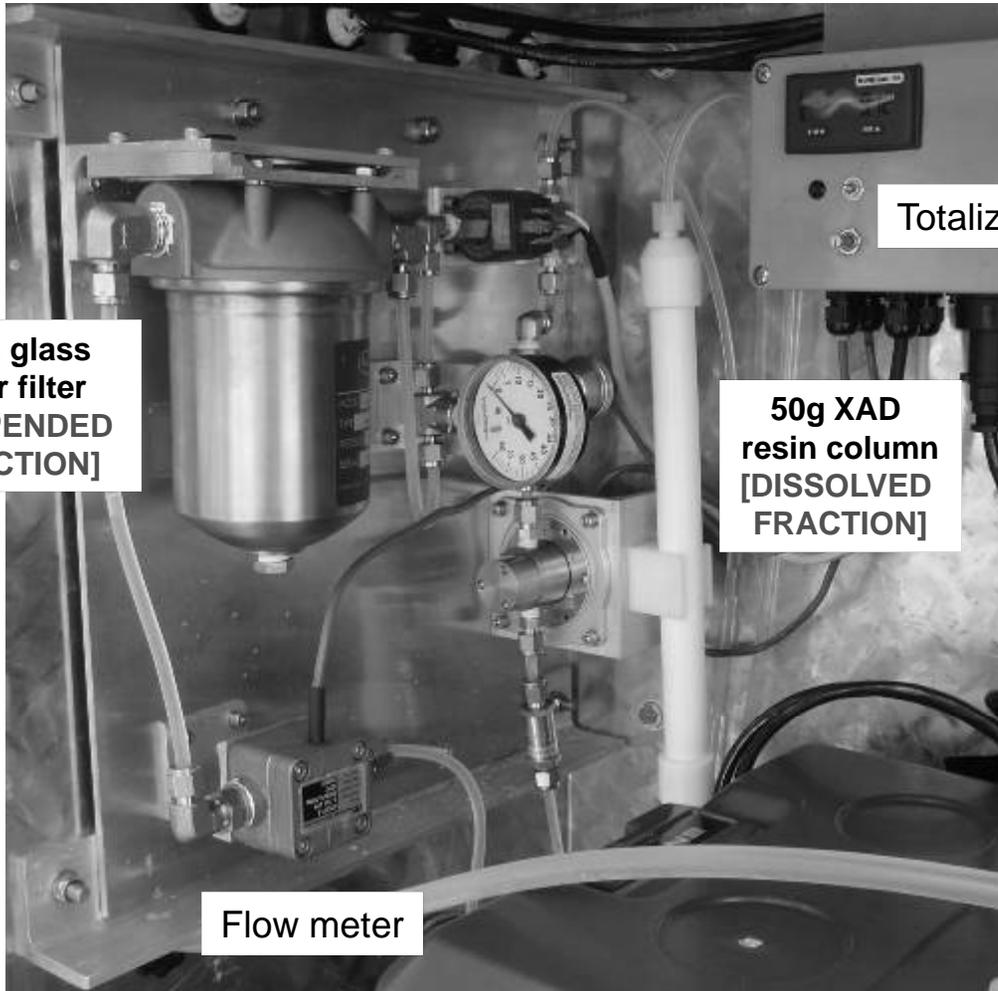
# What information is being collected?



# Grab sampling system



# Infiltrax sampling system



1 um glass  
fiber filter  
[SUSPENDED  
FRACTION]

50g XAD  
resin column  
[DISSOLVED  
FRACTION]

Flow meter

Totalizer

Time integrated sample

**Sample taken if:**

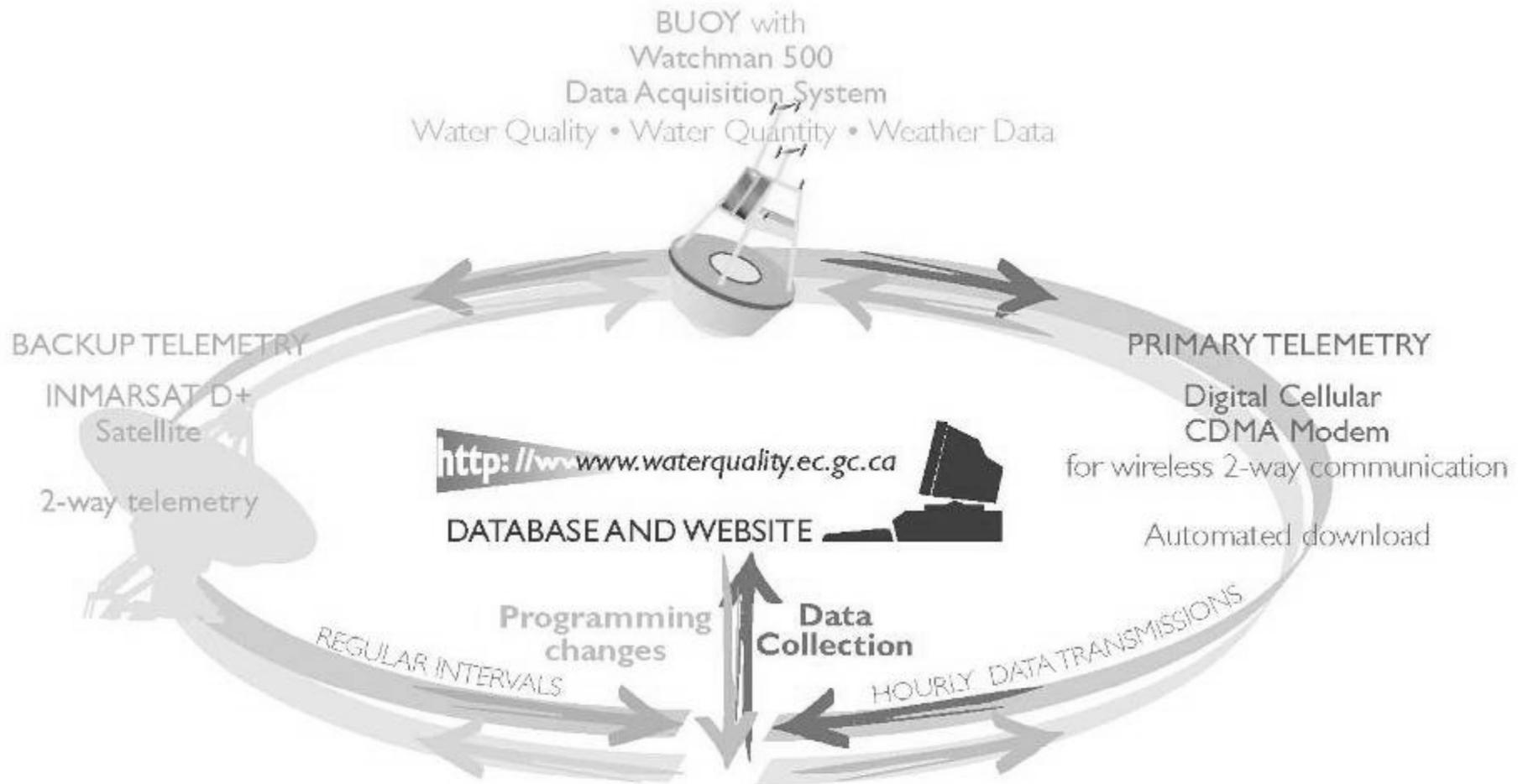
conductivity < threshold  
AND  
between specific date/times

**Sampling is stopped if:**

pressure > threshold  
OR IF  
flow rate < threshold

# Communication Systems

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Home

Fraser River Water Quality Buoy Overview

About the Project

Buoy Location

Buoy Instrumentation

Protocols

Data Online

Online Resources

Publications

Photo Gallery

FAQ

 **Fraser River Water Quality Buoy**   
Federal-Provincial Automated Monitoring Station



08/01/18 14:10 PST



Live Image (Click to enlarge)

### Real-Time Fraser River Buoy Readings

#### Water Quality Observations

|                       |          |
|-----------------------|----------|
| Turbidity             | 4.6NTU   |
| Specific Conductivity | 207uS/cm |
| Water Temperature     | 2.97°C   |
| pH                    | 7.6      |
| Dissolved Oxygen      | 97.2%    |

#### Water Depth and Flow

|                 |       |
|-----------------|-------|
| Water Depth     | 15.8m |
| Stream Velocity | N/A   |

#### Meteorological Observations

|                   |               |
|-------------------|---------------|
| Wind Speed        | 2.1km/h       |
| Wind Direction    | From NE (58°) |
| Air Temperature   | 3.3°C         |
| Relative Humidity | 72.1%         |
| Pressure          | 1032.45mb     |

Current Time: 08/01/18 14:54 PST

Last Updated: 08/01/18 14:14 PST

For more information on the location of the buoy click [here](#)

Environment Canada, in partnership with the BC Ministry of Environment, has deployed a new water quality monitoring and surveillance buoy in the Main Arm of the Fraser River. The buoy has a variety of instrumentation that will collect water quality, water quantity and meteorological information.

The data and information collected are transmitted via cellular telemetry and will be available to the public in real-time on this website. The data can also be viewed on your cellphone, Blackberry or other Internet-enabled mobile device at <http://www.waterquality.ec.gc.ca/waterqualityweb/rtwq.aspx>



This buoy has been deployed in partnership with the British Columbia Ministry of Environment



# Real-Time Web Access

[www.waterquality.ec.gc.ca](http://www.waterquality.ec.gc.ca)

# Benefits

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- Provide the public and local decision-makers with online water quality information regarding the effects of urban, agricultural and industrial activities on Fraser River water quality.
- Restrict both grab and SPE sampling events to periods of fresh-water flow by distinguishing salt-water from fresh-water;
- Ability to collect continuous, real-time data on water quality and weather conditions in the estuary;
- Operate autonomously to allow personnel to schedule sample collection and other maintenance under conditions that optimized safety, logistics and efficiency
- Better resource allocation of technical staff

# Acknowledgements

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- Meteorological Services of Canada (Marine Services)
- Canadian Coast Guard in Victoria
- AXYS Technologies in Victoria
  
- Canadian Environmental Sustainability Initiative (CESI)
- Canada-BC WQ Monitoring Agreement
- Georgia Basin Action Plan





**Thank You**  
**[www.waterquality.ec.gc.ca](http://www.waterquality.ec.gc.ca)**