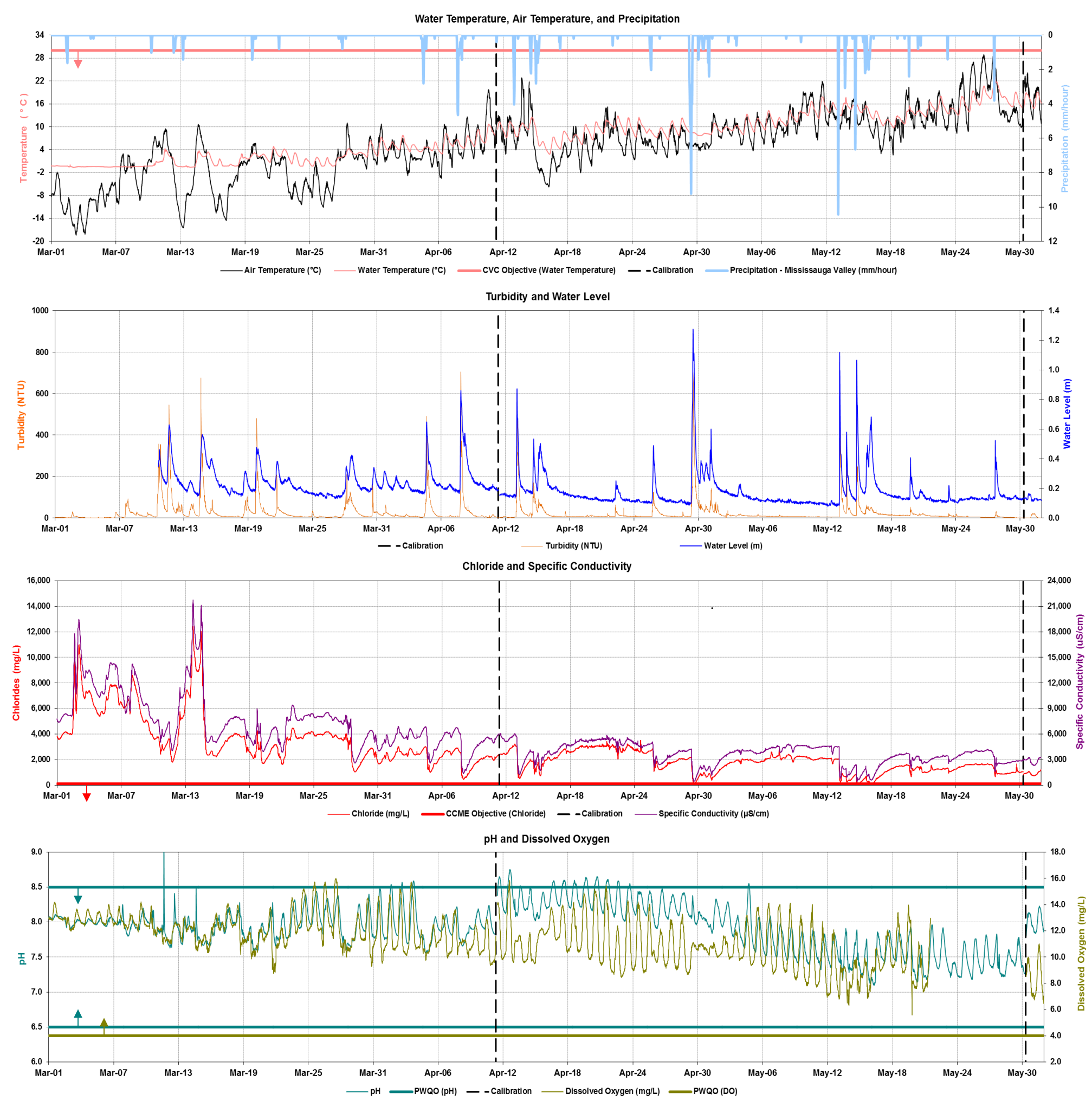
Real-Time Water Quality: Spring 2014

Cooksville Creek at King Street



↑ ↓ Coloured arrows indicate whether the given parameter should be above or below the indicated Water Quality Objective. Objective may be off-scale for some graphs.

Seasonal Exceedance of Water Quality Objectives

	Water Temperature			Dissolved Oxygen		pH		Chloride
	Cold	Mixed	Warm	Cold	Warm	Lower limit	Upper limit	Upper limit
Objective/Guideline	26 ºC	28 ºC	30 ºC	5 mg/L	4 mg/L	6.5	8.5	120 mg/L
Number of Days	0	0	0	0	0	0	16	92
Percent of Readings	0.00	0.00	0.00	0.0	0.00	0.00	3.92	99.63

Water Temperature — Aquatic organisms, especially fish, are sensitive to extreme highs in river water temperature. If the water temperature exceeds CVC's maximum objective, fish will suffer. CVC has set an absolute maximum water temperature objective of no greater than 30 °C for warm streams such as Cooksville Creek.

Water Level — The water level at each site is essential to translate parameter concentrations to loadings. Water level also allows us to determine when a rain event has occurred and how fast the water level increased, and returned to normal during and after a storm, respectively.

Dissolved Oxygen — Aquatic habitats need sufficient oxygen in water to survive and thrive. DO fluctuates over a diurnal cycle; high during the day and lower during the night, and with temperature (colder water holds more oxygen). Provincial Water Quality Objective for cold water fish is greater than 5 mg/L, and for warm water fish is greater than 4mg/L. Cooksville Creek represents a warm water fish habitat.

Turbidity — Turbidity is a measurement of water clarity. A high turbidity indicates the presence of solids, sediments, or pollutants. Turbidity is used to estimate total suspended solid concentration.

Specific Conductivity — Conductivity measures the ability of water to pass an electrical current. Higher conductivity indicates a higher concentration of salts and other ions in the water.

Chloride — Chlorides are often elevated in highly urbanized areas as a result of road salt application and the drainage of swimming pools, or water softeners. The CCME guideline for chlorides is 120mg/L.

pH — pH level is a measurement of the acidity or alkalinity of water. The pH scale ranges from 0 to 14. Extreme levels of both alkalinity and acidity can be detrimental to aquatic life. The MOE has set a Provincial Water Quality Objective of in between 6.5 and 8.5 units.

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Water Temperature, Air Temperature, and Daily Precipitation

- Air temperature ranged from -18.36 °C to 28.91 °C. The maximum air temperature was observed on May 26th.
- Air temperature dropped below freezing on 36% of the days measured this spring.
- Water temperature ranged from -0.65 °C to 23.74 °C, remaining below the upper objective of 30 °C.
- Water temperature dropped to or below freezing on 23% of the days measured this spring.
- At this location* a total of 181.6 mm of precipitation was recorded this spring.
- The largest event this spring saw 33 mm of rain fall on April 29th over 8 hours. The average precipitation event was 4.2 mm, and there were 6 events this season of 10 mm or more. An event is defined as any amount of precipitation separated by 6 hours or more.

*Measured at the Mississauga Valley Park climate station, roughly 2km from the water quality station, and inside its drainage area.

Water Level and Turbidity

- Ambient water level remained fairly consistent throughout the spring, increasing with precipitation events, and melting snow. It reached its peak of 1.275 m following the large rain event on April 29th.
- Turbidity followed the same pattern, increasing with precipitation and melting snow.

Chloride and Specific Conductivity

- Chloride ranged from 232 mg/L to 3822 mg/L.
- Chloride values drop from their peak in early March to ambient levels at the end of March as temperatures rise consistently above the freezing point, and road salt is no longer in use.

pH and Dissolved Oxygen

- Dissolved oxygen ranged from 5.58 mg/L to 16 mg/L this spring, staying above the 4 mg/L Provincial Water Quality Objective (PWQO) 100% of the time.
- pH ranged from 7.1 to 9.1 this spring, exceeding the upper objective of 8.5 on 16 days.

Quality Control Issues

- Water level data were removed until March 10th; ice formation results in pressure changes which affect readings, and cannot be corrected.
- A linear drift correction was applied to turbidity values from May 12th to 30th in order to line up data with accurate, post-calibration values.

Figure 1: Cooksville Creek station on April 11th, 2014

Deployment Information

- Deployment Period 1: November 21st, 2013 to April 11th, 2014 (141 days)
- Deployment Period 2: April 11th, 2014 to May 30th, 2014 (49 days)
- Deployment Period 3: May 30th, 2014 to July 17th, 2014 (48 days)
- Monitoring equipment used:
  - Water quality parameters: Hydrolab DS5X
  - Air Temperature: 5600-0025-1 thermistor
  - Water Level: Hydrolab DS5X
  - Precipitation: Mississauga Valley Park climate station

Figure 2: Cooksville Creek station on May 30th, 2014

Questions or Comments?

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