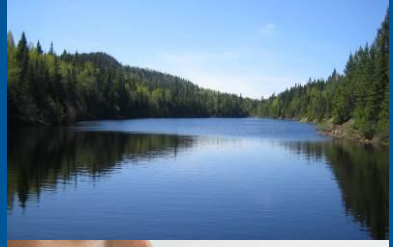








Real-Time Water Quality Deployment Report

Leary's Brook at Prince Philip Drive

March 21 to April 24, 2013

Newfoundland Labrador

Government of Newfoundland & Labrador

Department of Environment and Conservation

General

- Department of Environment and Conservation staff monitors the real-time web pages consistently.

Maintenance and Calibration of Instrument

- As part of the Quality Assurance and Quality Control protocol (QAQC), an assessment of the reliability of data recorded by an instrument is made at the beginning and end of the deployment period. The procedure is based on the approach used by the United States Geological Survey.
- Depending on the degree of difference between each parameter from the Field and QAQC sondes a qualitative rank is assigned (See Table 1). The possible ranks, from most to least desirable, are: Excellent, Good, Fair, Marginal, and Poor.

Table 1: Qualitative QAQC Ranking

Station	Date	Action	Comparison Ranking				
			Temperature	pH	Conductivity	Dissolved Oxygen	Turbidity
Leary's Brook at Prince Philip Drive	March 21,2013	Deployment	Excellent	Excellent	Excellent	Excellent	Excellent
	April 24, 2013	Removal	Good	Good	Excellent	Excellent	Poor

- All parameters ranked "Excellent" during deployment.
- All parameters except turbidity ranked from "Good" to "Excellent" during field sonde removal. The turbidity for field sonde is questionable at the time of removal likely due to bio-fouling of sensor at the end of deployment period.
- A grab sample was also taken for additional confirmation of conditions at deployment and to allow for future modelling studies. The results of the grab sample ranking in compared to field sonde data is shown in table 2.

Table 2: Comparison Grab Sample Ranking with Field Sonde Data at Deployment

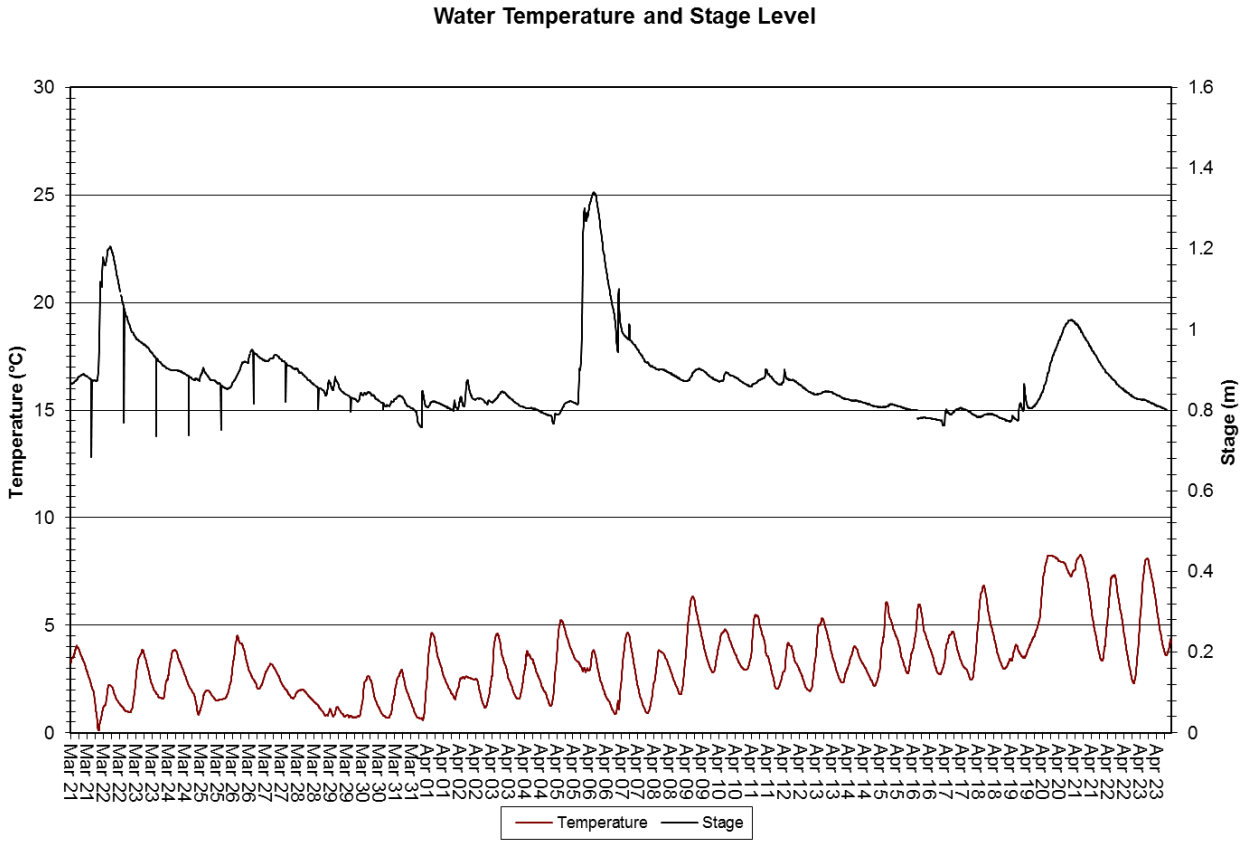
Grab Sample Date	Temperature	pH	Conductivity
March 21,2013	Excellent	Poor	Excellent

- The maximum, minimum, median and mean for Temperature, pH, Specific Conductivity, Dissolved Oxygen and Turbidity is shown below in table 3.

Table 2: Parameter Statistics during deployment period

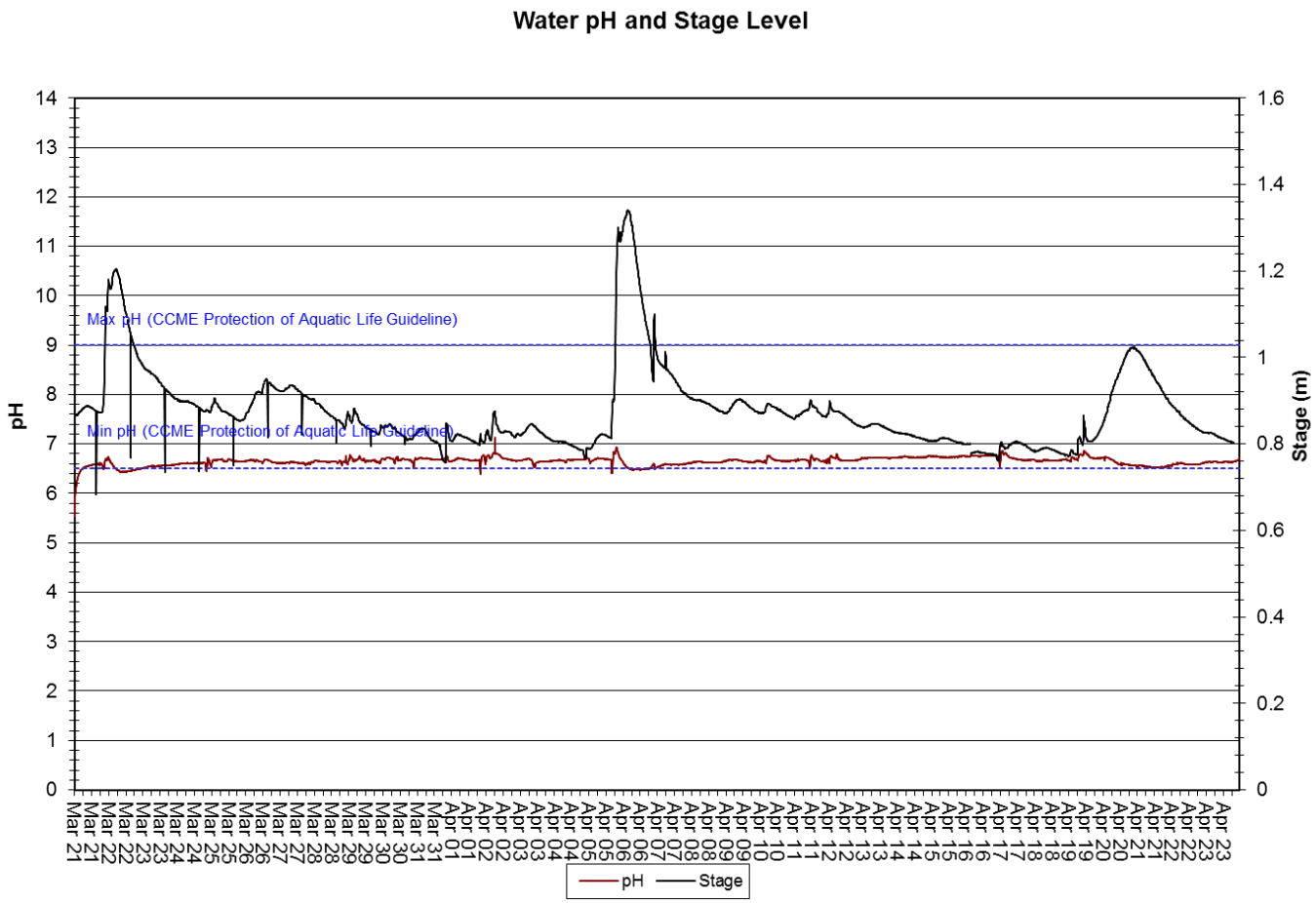
Parameter	Max	Min	Median	Mean
Temperature('C)	8.27	0.11	3.01	3.25
pH	7.13	5.53	6.66	6.65
Spec. Conductivity (µS/cm)	7402.9	277.0	647.0	889.2
TDS (g/ml)	4.7400	0.0009	0.4140	0.5686
Dissolved Oxygen (%-Sat)	295.4	92.6	95.3	95.4
Dissolved Oxygen (mg/l)	13.81	11.34	12.79	12.73
Turbidity (NTU)	290.0	0.0	4.4	12.7
Stage (m)	1.34	0.68	0.86	0.88
Flow (m)	4.69	0.37	1.04	1.19

Data Interpretation

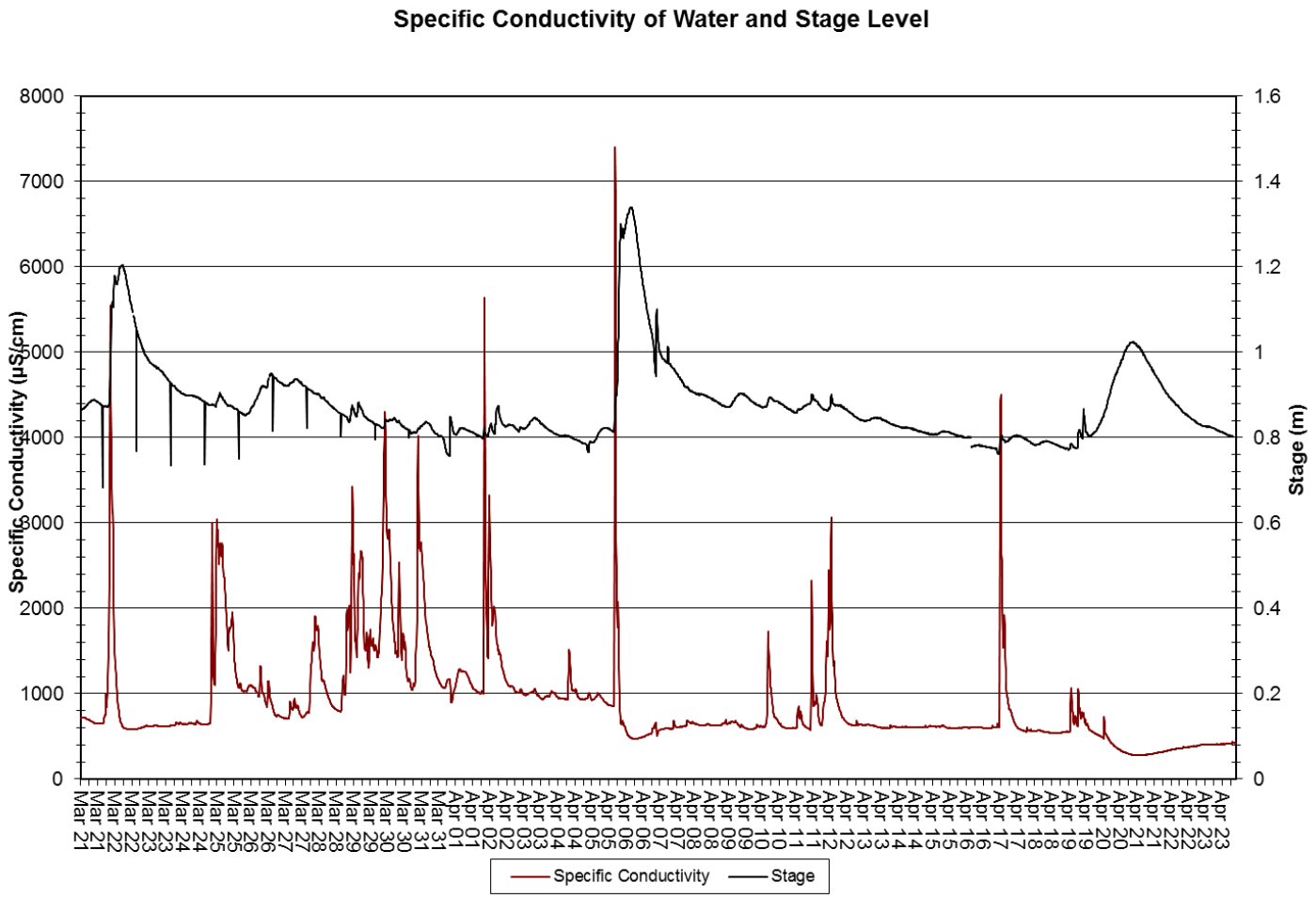


- Overall, an expected increase in water temperature was observed at Leary's Brook from late March to late April.

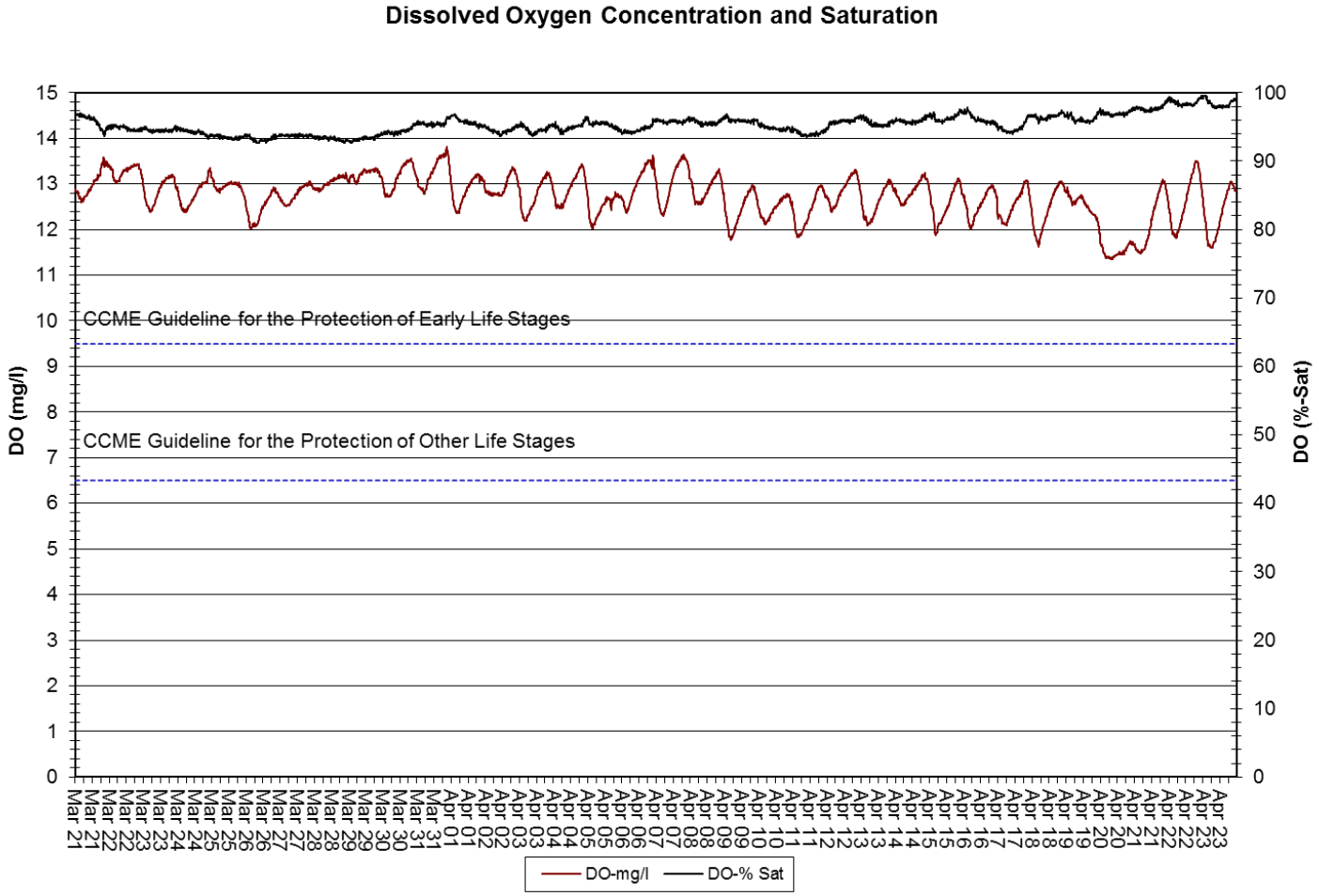
- Water temperature ranged from -0.11°C to 8.27°C (median value: 3.01°C).



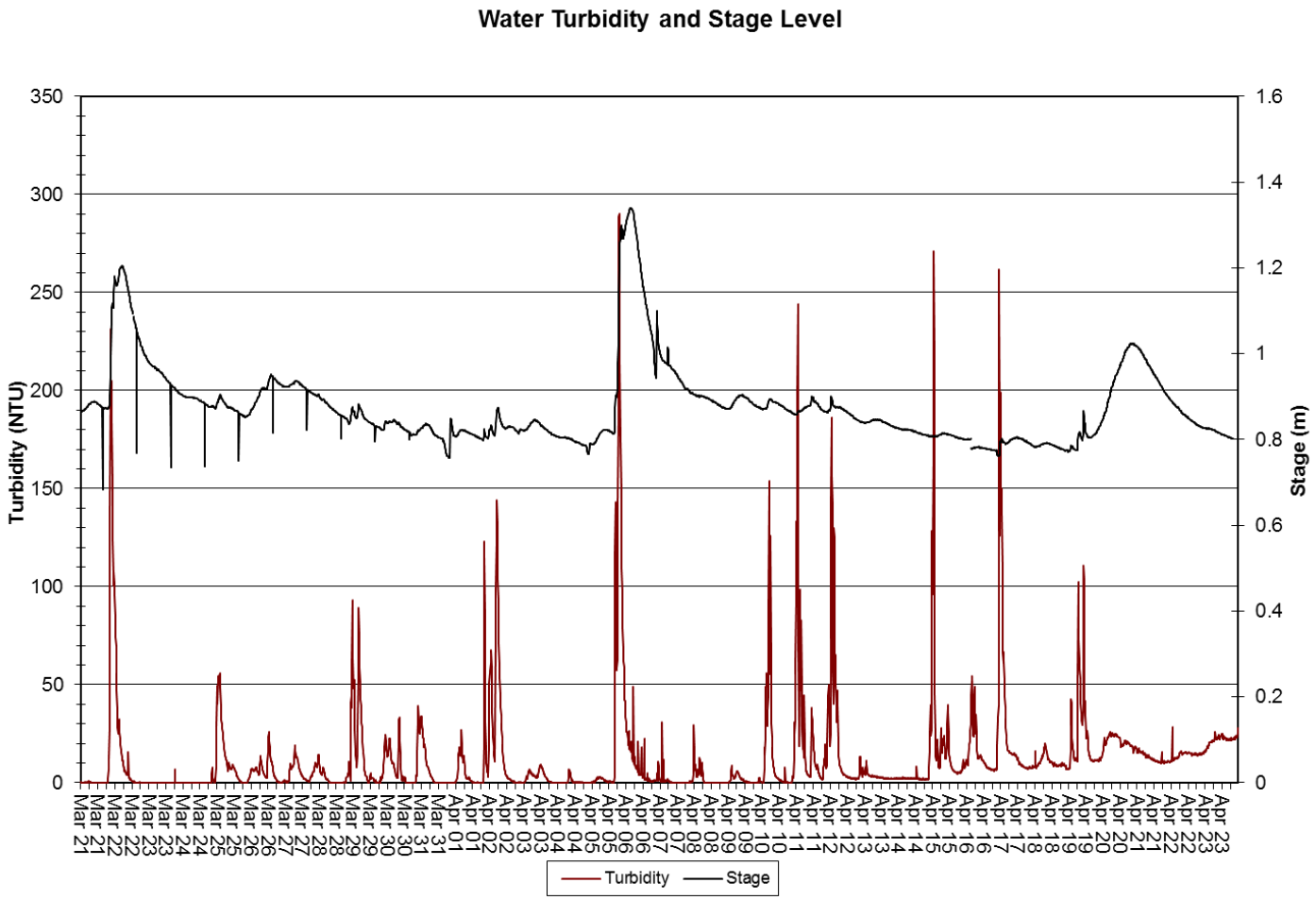
- Generally speaking, NL waters are slightly acidic which is reflected in the pH values lying closer to the lower CCME Protection of Aquatic Life guideline value of 6.5
- A decrease in pH value is observed on March 21st. During the same time, no appreciable amount of precipitation was observed. There was some transmission loss in data values before the drop. The decrease was most likely due to the fact that it needed some time to get adjusted.
- During the period of April 6-8 and also on April 20-23, there was an increase in stage level with corresponding noticeable decrease in pH value.
- pH ranged from 5.53 to 7.13 (Median: 6.66).



- There were several high spikes in specific conductance of which some related to increased stage level while others related to increased precipitation and runoff at the same time period.
- Mid ranged spikes (2000 - 6000 µs/cm) were observed throughout the deployment period.
- Conductivity ranged 277 µs/cm to 7402.9 µs/cm (the median is 647 µs/cm).



- DO values remained stable and did not drop below the Guideline for the Protection of Other Life Stage biota or Protection of Early Life Stages.
- Concentrations ranged from 11.34 mg/l to 13.81 mg/l (median value: 12.79 mg/l) for DO while 92.6% to 99.6% (median value 95.3%) for percent saturation.



- The turbidity spikes are related to a combination of increased stage level increased precipitation due to snow and rainfall as well as snowmelt due to rise in temperature.
- A slight increasing calibration / bio-fouling drift can be noticed towards the end of the deployment period.
- Turbidity ranged between 0.0 NTU and 290 NTU (median value: 4.4 NTU) during this deployment period.

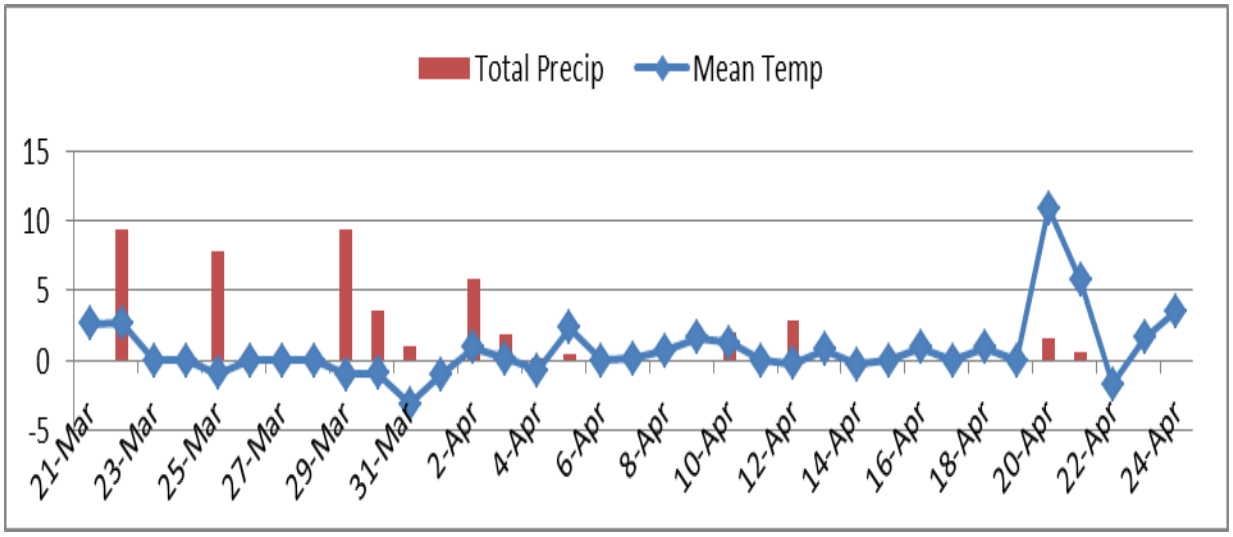
Conclusions

- The turbidity values were questionable on the last week of the deployment period due to increased calibration / bio-fouling drift in turbidity sensor.

- There was an increase in stage level with corresponding noticeable decrease in pH value during the period of April 6-8 and also on April 20-23.

Appendix

The graph below shows the daily temperature and total precipitation taken from Environment Canada for St. John's (Airport Station).



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