Real-Time Water Quality Annual Report

Iron Ore Company of Canada
Labrador West Network

June 7 to
October 20, 2022

Newfoundland Labrador

Government of Newfoundland & Labrador
Department of Environment & Climate Change
Water Resources Management Division

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Acknowledgements

The Real-Time Water Quality Monitoring Program (RTWQ) at Wabush Lake is fully funded by the Iron Ore Company of Canada (IOC). The program is made successful by a joint partnership between IOC, Environment and Climate Change Canada (ECCC), and the Newfoundland & Labrador Department of Environment & Climate Change (ECC).

Various individuals from each sector have been diligently involved to ensure this program is a successful operation including: various WRMD staff (ECC), Jody Wentzell (IOC) and various WSC staff (ECCC). In addition to these managers, there have been a team of individuals who work together to ensure the day to day operations of these stations are providing quality data. Maria Murphy (ECC) was responsible for these water quality stations during 2022. Responsibilities included deployment and removal of instruments, maintenance and calibration of the instruments and preparation of monthly deployment reports. Brandon Mesher (ECC) is acknowledged for his assistance during deployment and removal procedures in 2022. Tara Clinton and Leona Hyde are acknowledged for their role in performing Performance Testing and Evaluation (PTE) and in-house servicing of the instruments during winter 2022-2023.

ECCC staff are essential in the operation of the data logging/communication aspect of the network. Staff of the Meteorological Service of Canada Division – Water Survey of Canada, visit the stations regularly to ensure that the data logging and data transmission equipment is working properly. ECCC is also the lead on dealing with stage and flow issues.

Introduction

- The real-time water quality-monitoring network on Wabush Lake was established during the summer of 2007 in a partnership between what was then the Newfoundland & Labrador Department of Environment and Conservation (DOEC) and the Iron Ore Company of Canada (IOC).
- This network consisted of two water quality/quantity stations, one located downstream of the IOC tailings disposal area and one located upstream of the same area.
- The official names of these two stations are *Wabush Lake at Dolomite Road* and *Wabush Lake at Lake Outlet*, hereafter referred to as the Dolomite Road station and the Julienne Narrows station.
- On June 8th, 2016, an additional station was commissioned under this agreement. This station is located at *Dumbell Stream above Dumbell Lake*, hereafter referred to as the Dumbell Stream station.
- On June 12th, 2017 a new station was commissioned under this agreement. This station is located at *Pumphouse Stream above Drum Lake*, hereafter referred to as the Pumphouse Streamstation.
- These stations measure water quality parameters including water temperature, pH, specific conductivity, dissolved oxygen and turbidity, as well as water quantity parameters stage, and flow. Measurements are recorded on an hourly basis during the deployment period.

Figure 1: RTWQ Monitoring Stations in Labrador West

- Initial deployment in 2022 was between June 7 and 8th and instruments were removed for the winter season by October 19th at Dolomite Road, Julienne Narrows and Dumbell Stream, and October 20th, 2022 at Pumphouse Stream. The following report depicts and discusses water quality events throughout this time period.
- The purpose of this network is to monitor, process, and distribute water quality/quantity data to IOC, ECC and ECCC, for assessment and management of water resources, as well as to provide an early warning for any potential or emerging water issues. Any necessary mitigative measures can then be implemented in a timely manner.
- ECC provides IOC with monthly and annual deployment reports.
- It is important to note that unless otherwise stated on the graphs, small gaps in data are due to the removal of the instrument for maintenance and calibration.

Maintenance and Calibration

- To ensure accurate data collection, maintenance and calibration of the water quality instrumentation are performed preferably on a monthly basis.
- Maintenance includes a thorough cleaning of the instrument and replacement of any small sensor parts that are damaged or unsuitable for reuse. Once the instrument is cleaned, ECC staff carefully calibrate each sensor attachment for pH, specific conductivity, dissolved oxygen and turbidity.
- Installation and removal dates for the 2022 season are summarized in the table below.

Table 1: Water quality instrument deployment start and end dates for 2022

Installation	***Removal***	***Deployment duration (days)***
June 7-8	July 20-21	43-44
July 20-21	September 7-8	48-50
September 7-9	October 19-20	40-42

Quality Assurance and Quality Control

- As part of the Quality Assurance and Quality Control protocol (QA/QC), 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.
- At deployment and removal, a QA/QC Sonde is temporarily deployed adjacent to the Field Sonde. Values for temperature, pH, conductivity, dissolved oxygen and turbidity are compared between the two instruments**.** Based on the degree of difference between parameters recorded by the Field Sonde

and QA/QC Sonde at deployment and at removal, a qualitative statement is made on the data quality (Table 2).

Table 2: Ranking classifications for deployment and removal

	Rank				
Parameter	**Excellent**	**Good**	**Fair**	**Marginal**	**Poor**
Temperature (°C)	<=+/-0.2	>+/-0.2 to 0.5	>+/-0.5 to 0.8	>+/-0.8 to 1	<+/-1
pH (unit)	<=+/-0.2	>+/-0.2 to 0.5	>+/-0.5 to 0.8	>+/-0.8 to 1	>+/-1
Sp. Conductance (µS/cm)	<=+/-3	>+/-3 to 10	>+/-10 to 15	>+/-15 to 20	>+/-20
Sp. Conductance > 35 µS/cm (%)	<=+/-3	>+/-3 to 10	>+/-10 to 15	>+/-15 to 20	>+/-20
Dissolved Oxygen (mg/L) (% Sat)	<=+/-0.3	>+/-0.3 to 0.5	>+/-0.5 to 0.8	>+/-0.8 to 1	>+/-1
Turbidity <40 NTU (NTU)	<=+/-2	>+/-2 to 5	>+/-5 to 8	>+/-8 to 10	>+/-10
Turbidity > 40 NTU (%)	<=+/-5	>+/-5 to 10	>+/-10 to 15	>+/-15 to 20	>+/-20

- It should be noted that the temperature sensor on any sonde is the most important. All other parameters can be broken down into three groups: temperature dependant, temperature compensated and temperature independent. As the temperature sensor is not isolated from the rest of the sonde, the entire sonde must be at the same temperature before the sensor will stabilize. The values may take some time to climb to the appropriate reading. If a reading is taken too soon, it may not accurately portray the water body.
- Deployment and removal comparison rankings for the IOC water quality stations for the three deployment periods from June 7 to October 20, 2022 are summarized in Table 3.
- For additional information and explanations of ranking, please refer to the monthly deployment reports.

Table 3: Comparison rankings for IOC RTWQ stations June 7 to October 19-20, 2022

Station	*Date*		*Temperature*	*pH*	*Specific Conductivity*	*Dissolved Oxygen*	*Turbidity*
Dolomite Road	07-Jun-22	Deployment	Good	Excellent	Excellent	Good	Excellent
	20-Jul-22	Removal	Good	N/A	Excellent	Excellent	Excellent
	20-Jul-22	Deployment	Excellent	Excellent	Excellent	Excellent	Excellent
	8-Sep-22	Removal	Excellent	Excellent	Excellent	Excellent	Poor
	9-Sep-22	Deployment	Excellent	Excellent	Excellent	Marginal	Excellent
	19-Oct-22	Removal	Good	Good	Good	Marginal	Excellent
Julienne Narrows	07-Jun-22	Deployment	Excellent	Marginal	Excellent	Excellent	Poor
	20-Jul-22	Removal	Excellent	Good	Excellent	Excellent	Excellent
	20-Jul-22	Deployment	Excellent	Excellent	Excellent	Excellent	Good
	8-Sep-22	Removal	Excellent	Excellent	Fair	Excellent	Excellent
	8-Sep-22	Deployment	Excellent	Good	Excellent	Good	Excellent
	19-Oct-22	Removal	Good	Good	Excellent	Fair	Good
Dumbell Stream	07-Jun-22	Deployment	Good	N/A	Excellent	Excellent	Excellent
	21-Jul-22	Removal	Good	Good	Excellent	Excellent	Poor
	21-Jul-22	Deployment	Excellent	Excellent	Excellent	Good	Poor
	7-Sep-22	Removal	Good	Good	Excellent	Fair	Good
	7-Sep-22	Deployment	Good	Good	Excellent	Excellent	Excellent
	19-Oct-22	Removal	Fair	Good	Excellent	Marginal	Excellent
Pumphouse Stream	08-Jun-22	Deployment	Excellent	Excellent	Excellent	Excellent	Good
	21-Jul-22	Removal	Excellent	Good	Good	Excellent	Excellent
	21-Jul-22	Deployment	Excellent	Excellent	Excellent	Fair	Excellent
	20-Oct-22	Removal	Excellent	Good	Good	Good	Excellent

Data Interpretation

- The following graphs and discussion illustrate water quality-related events from June 7th to October 20th, 2022 at the four IOC RTWQ stations.
- With the exception of water quantity data (stage), all data used in the preparation of the graphs and subsequent discussion below adhere to this stringent QA/QC protocol. Water Survey of Canada is responsible for QA/QC of water quantity data. Corrected data can be obtained upon request.
- Weather data is collected from a weather station near Moosehead Lake.

Wabush Lake Network

- Water temperature ranged from 4.20 to 19.70°C at Julienne Narrows during the 2022 deployment season. The median value was 11.60 °C (Figure 2).
- Water temperature ranged from 5.9 to 21.20°C at Dolomite Road during the 2022 deployment season. The median value was 13.70 °C (Figure 2).
- Water temperature steadily increases until the middle of August and correlates to air temperature. It then decreases as water temperature cools into the fall. Water temperature is typically higher at Dolomite Road then Julienne Narrows.

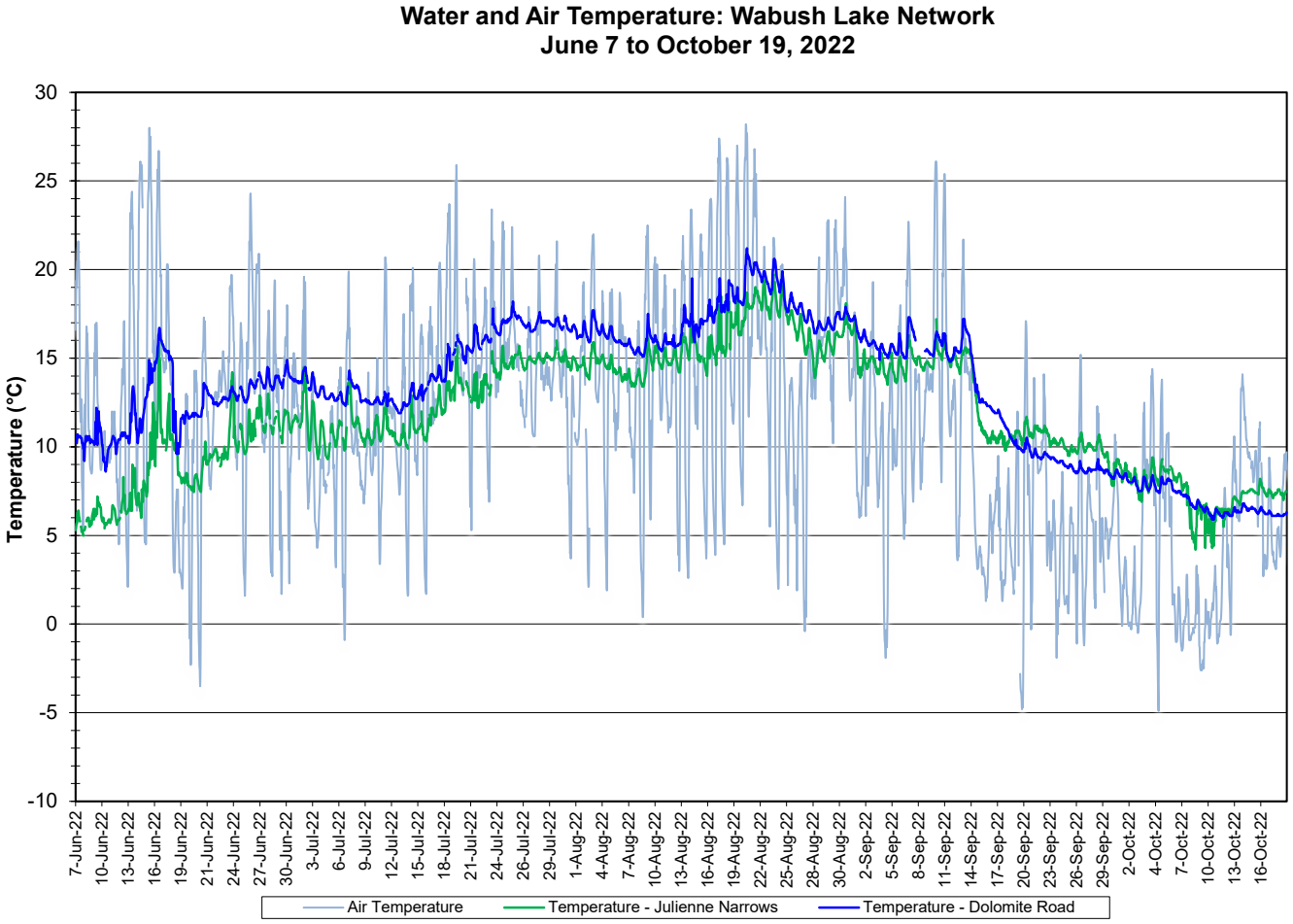


Figure 2: Water and Air Temperature – Wabush Lake Network

- pH ranged from 7.18 to 8.66 pH units at Julienne Narrows and from 6.22 to 7.89 pH units at Dolomite Road (Figure 3) during the 2022 deployment season. The median pH was 7.90 and 7.40 units respectively.
- pH fluctuates daily at both stations. Peaks are observed during late afternoon and early evening. Some decreases in pH are noted when there are increases in stage.
- The majority of values during the deployment season are within the CCME Water Quality Guidelines for the Protection of Aquatic Life (between 6.5 and 9 pH units).
- At Dolomite Road, pH decreases abnormally in August. This could be due to sensor drift.

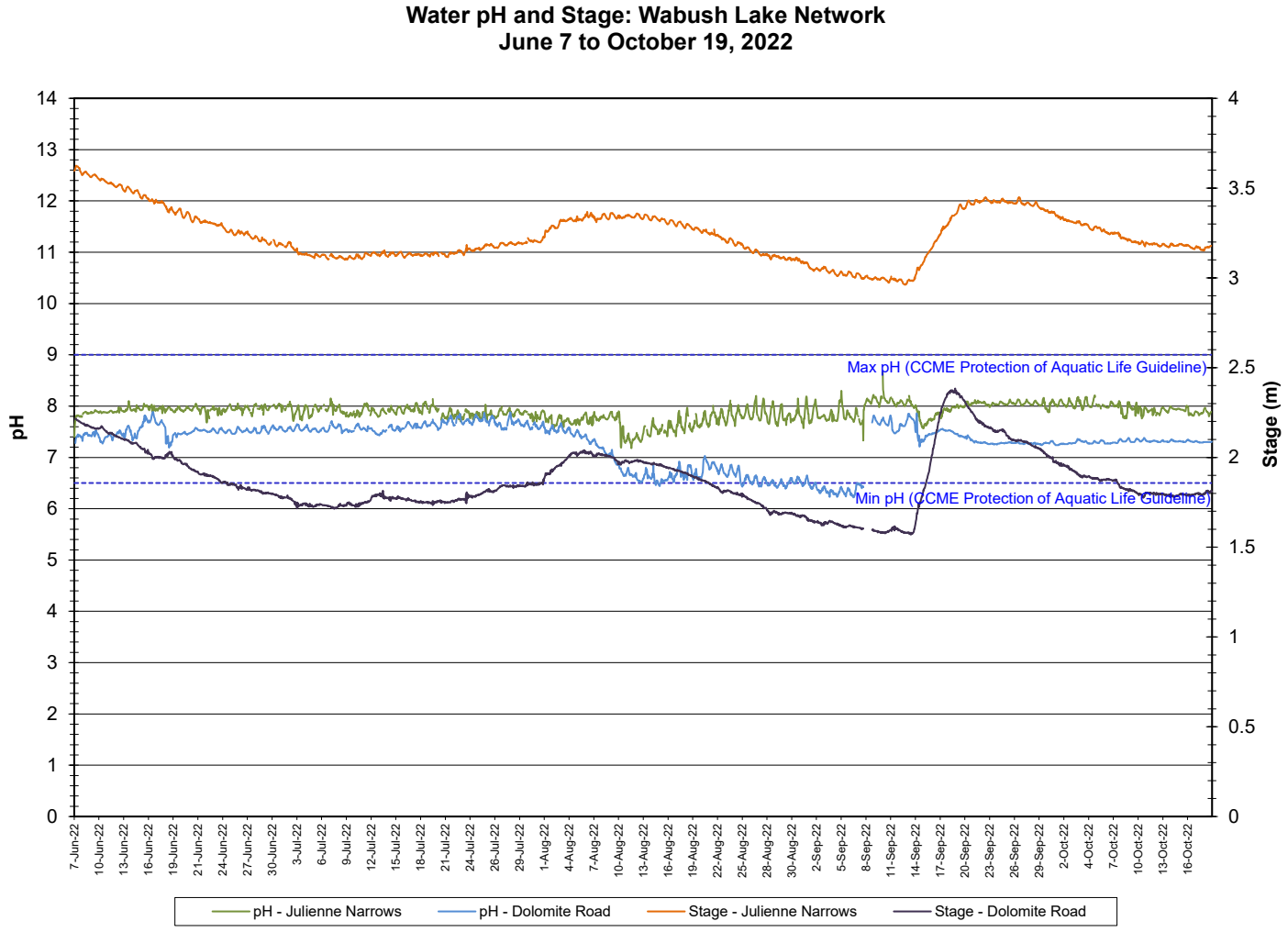


Figure 3: Water pH and Stage – Wabush Lake Network

- Throughout the 2022 deployment season, specific conductivity ranged from 62.6 to 209.0 µs/cm at Julienne Narrows and from 37.7 to 68.9 µs/cm at Dolomite Road (Figure 4).
- Daily fluctuations are evident at the Julienne Narrows station. This can be attributed to varying contributions of iron ore tailings deposited into Wabush Lake upstream of Julienne Narrows and downstream of Dolomite Road. This can also explain the difference in specific conductivity levels between the two stations.
- At Julienne Narrows, conductivity fluctuated throughout the deployment period, with an increase noted in August. This could be due to wave action near the sonde, as stage was low at this time.
- At Dolomite Road, conductivity increases gradually during the beginning of the deployment season and decreases slightly during the middle of the summer. There is a sudden decrease in September, after an increase in stage.
- With the exception of water quantity data (stage), all data used in the preparation of the graphs and subsequent discussion below adhere to this stringent QA/QC protocol. Water Survey of Canada is responsible for QA/QC of water quantity data. Corrected data can be obtained upon request.

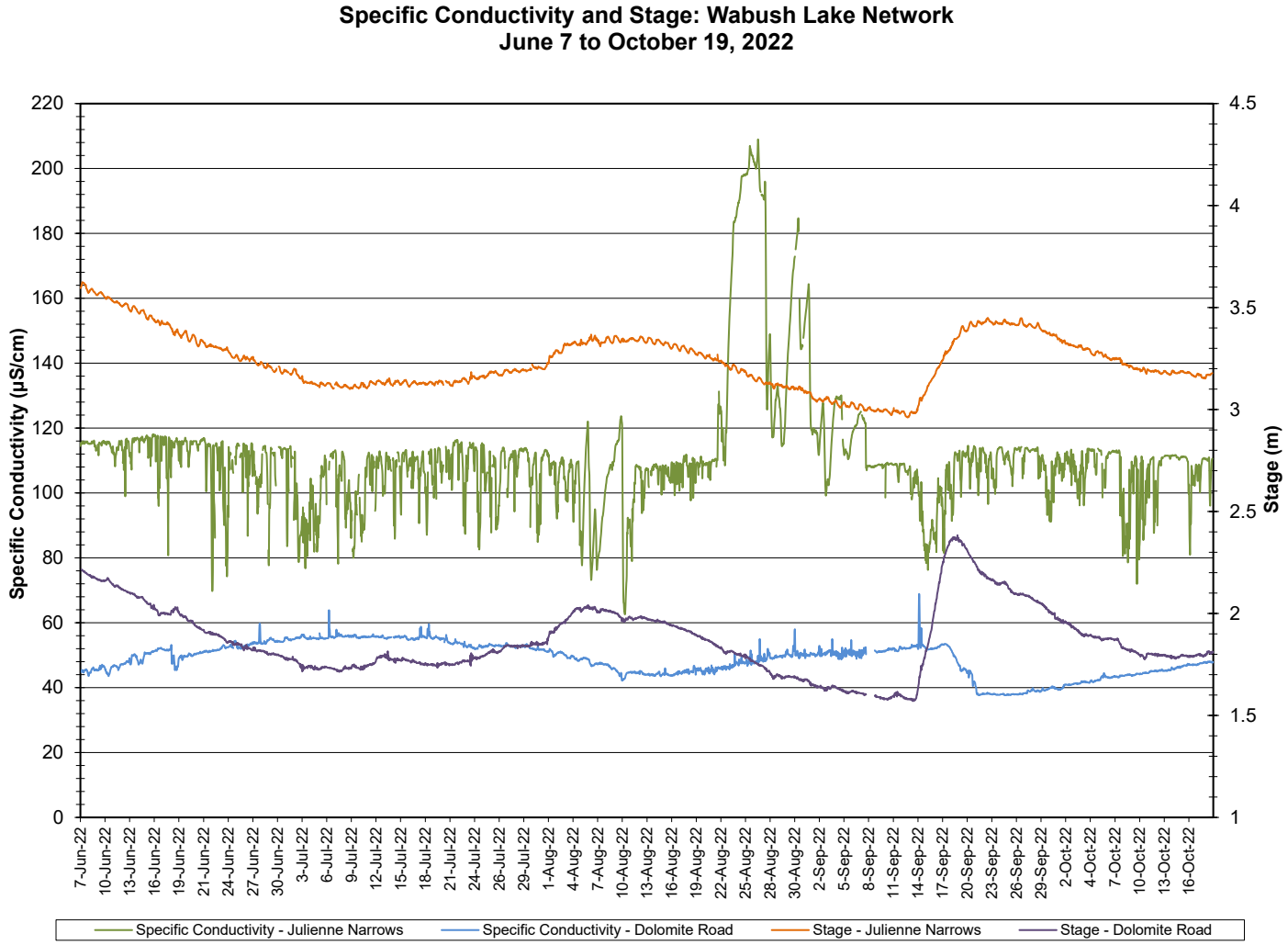


Figure 4: Specific Conductivity and Stage – Wabush Lake Network

- Dissolved oxygen ranged from 85.9 to 110.2% saturation and 8.49 to 12.21 mg/l with a median value of 10.14 mg/L at Julienne Narrows (Figure 5).
- Dissolved oxygen ranged from 77.4 to 106.6% saturation and 8.11 to 11.66 mg/l with a median value of 9.65 mg/L at Dolomite Road (Figure 5).
- Dissolved oxygen fluctuated daily at both stations with decreases observed at night.
- Dissolved oxygen decreases until the end of August, when water temperatures are at their warmest. It then increases, as water temperature decreases into the fall.
- All values were above the CCME Water Quality Guideline for the Protection of Aquatic Life for Cold Water Biota at Other Life Stages of 6.5 mg/l. The majority of values recorded were above the minimum CCME Water Quality Guideline for the Protection of Aquatic Life for Cold Water Biota at Early Life Stages of 9.5 mg/l. The guidelines are indicated in blue on Figure 5.

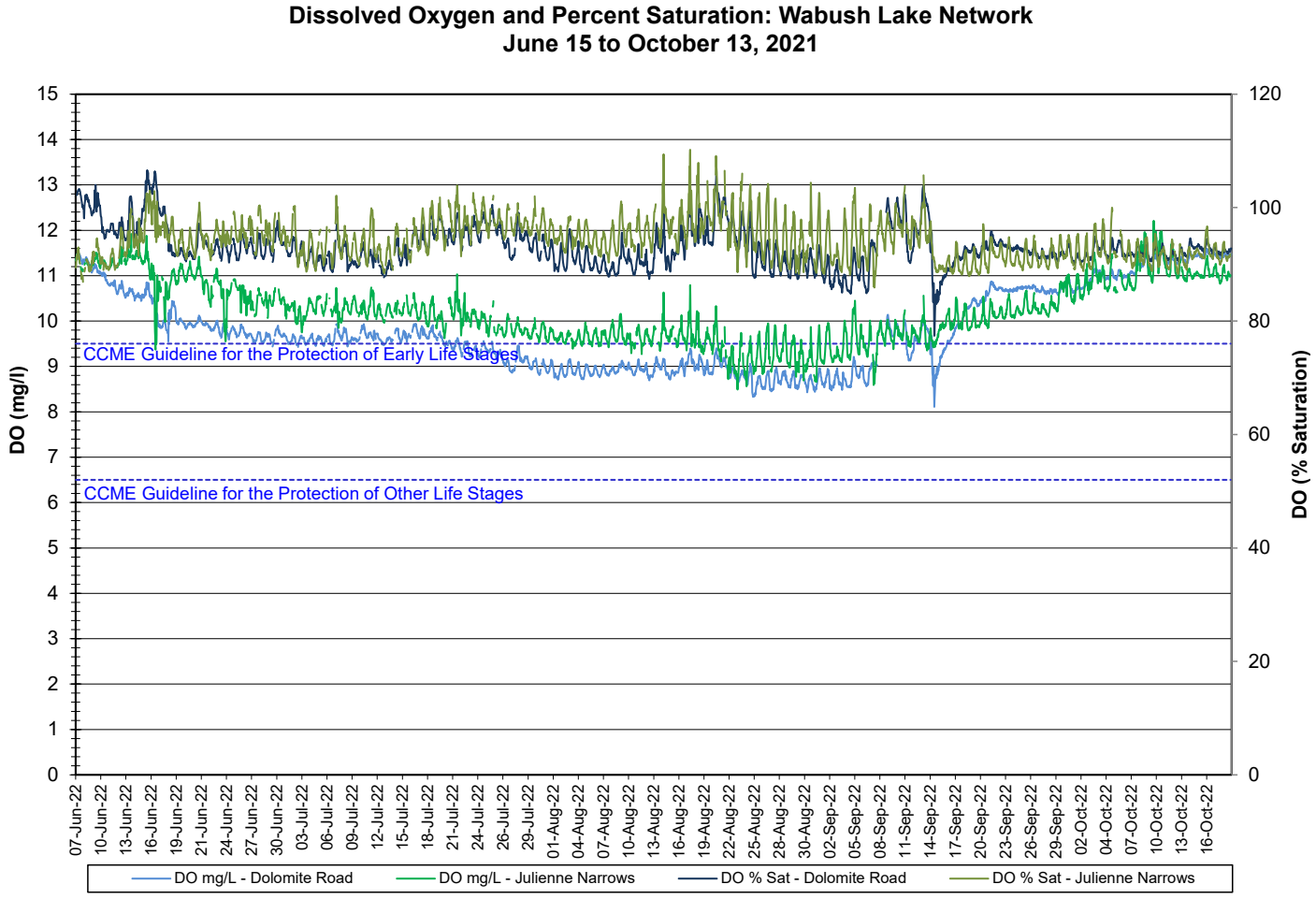


Figure 5: Dissolved Oxygen and Percent Saturation – Wabush Lake Network

- At the Julienne Narrows station, turbidity values ranged from 0.0 to 1624.0 NTU with a median value of 2.2 NTU (Figure 6a) indicating low background turbidity.
- There are occasional large spikes in turbidity during this deployment season.

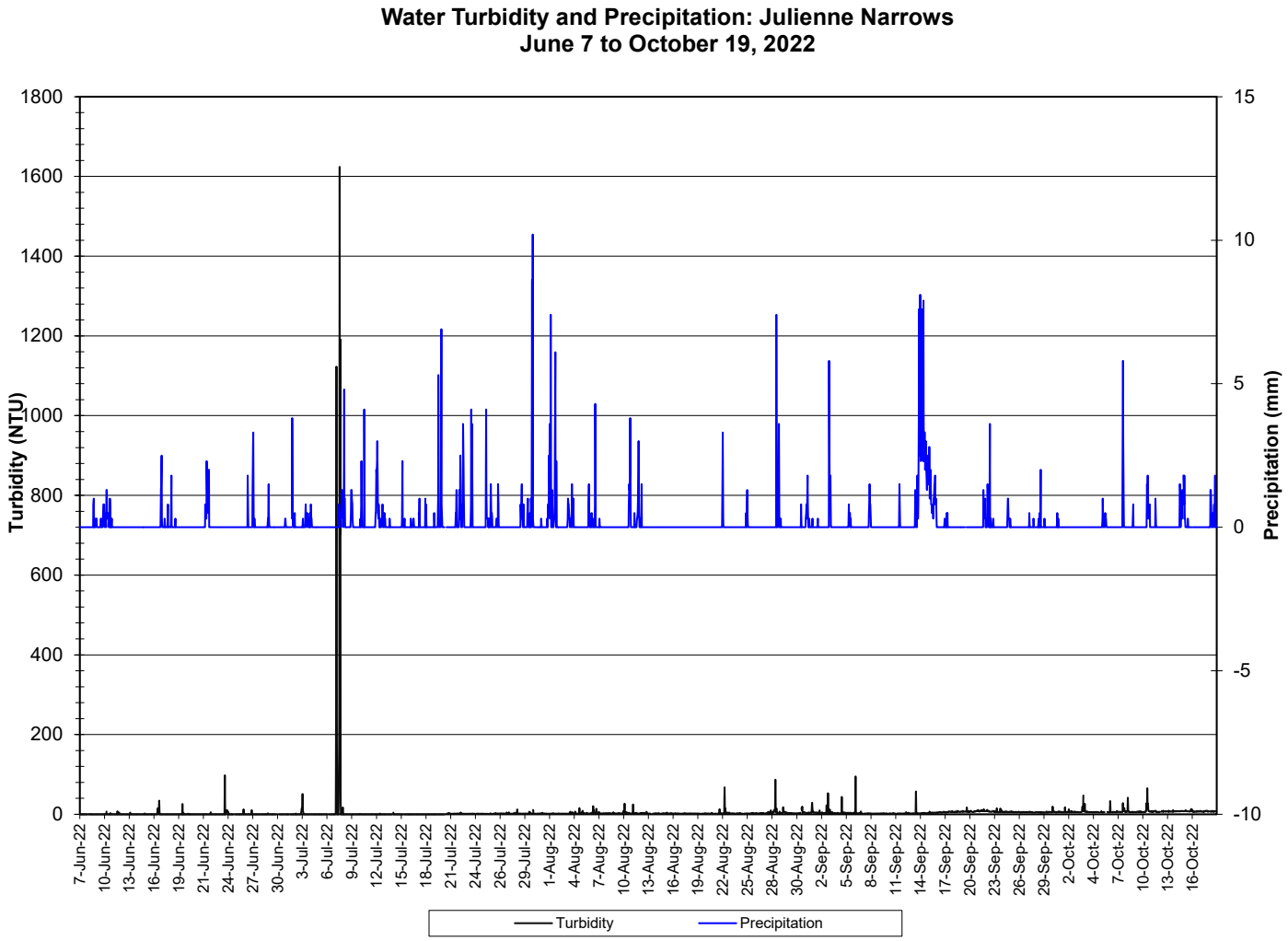
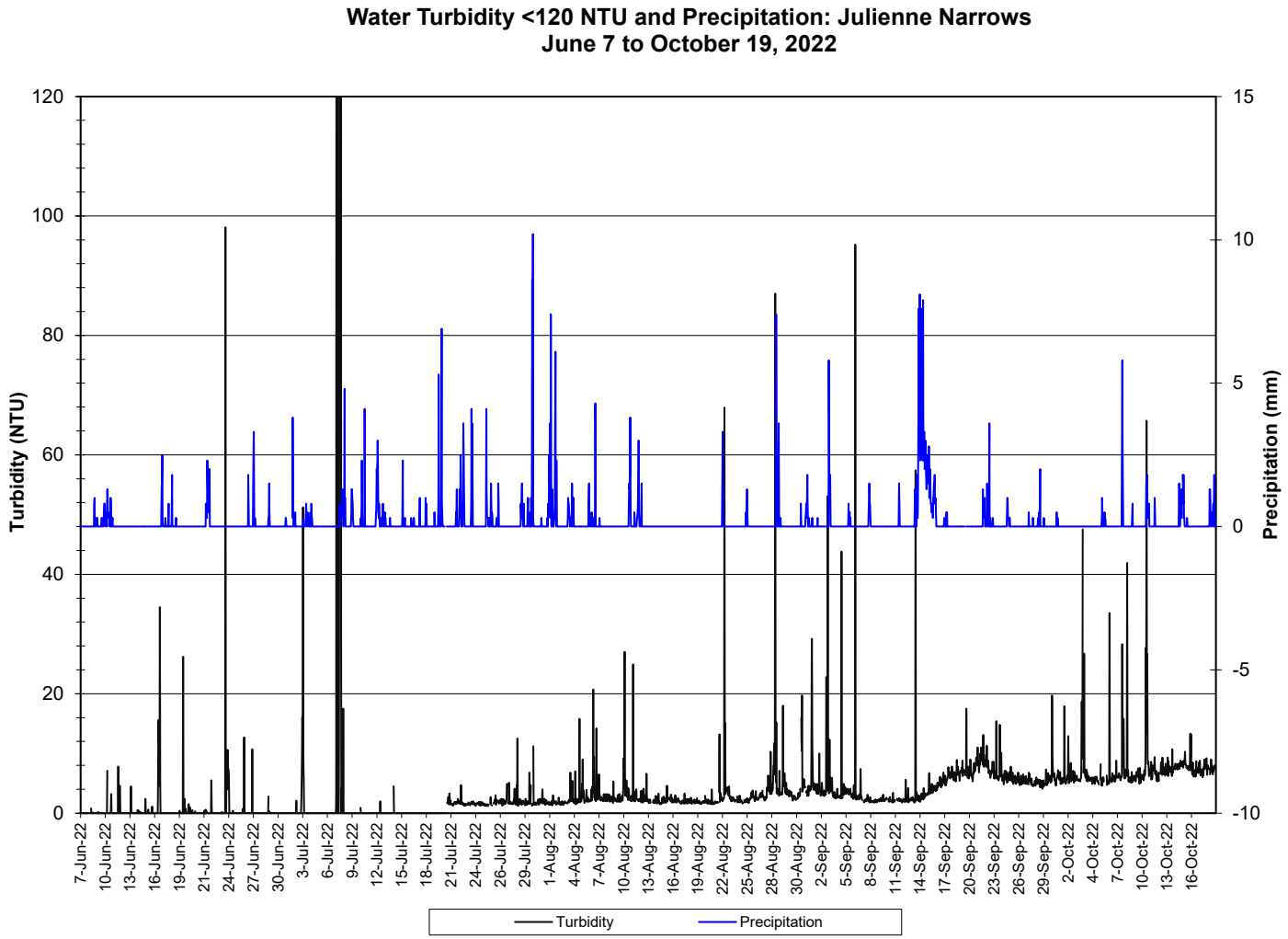


Figure 6a: Water Turbidity and Precipitation: Julienne Narrows


Water Turbidity <120 NTU and Precipitation: Julienne Narrows
June 7 to October 19, 2022
Turbidity (NTU)
Precipitation (mm)
120
100
80
60
40
20
0
15
10
5
0
-5
-10
7-Jun-22
10-Jun-22
13-Jun-22
16-Jun-22
19-Jun-22
21-Jun-22
24-Jun-22
27-Jun-22
30-Jun-22
3-Jul-22
6-Jul-22
9-Jul-22
12-Jul-22
15-Jul-22
18-Jul-22
21-Jul-22
24-Jul-22
26-Jul-22
29-Jul-22
1-Aug-22
4-Aug-22
7-Aug-22
10-Aug-22
13-Aug-22
16-Aug-22
19-Aug-22
22-Aug-22
25-Aug-22
28-Aug-22
30-Aug-22
2-Sep-22
5-Sep-22
8-Sep-22
11-Sep-22
14-Sep-22
17-Sep-22
20-Sep-22
23-Sep-22
26-Sep-22
29-Sep-22
2-Oct-22
4-Oct-22
7-Oct-22
10-Oct-22
13-Oct-22
16-Oct-22
Turbidity
Precipitation

- At the Dolomite Road station, turbidity values ranged from 0.0 to 18.8 NTU, with a median value of 0.0 NTU (Figure 7).
- Turbidity readings higher than 5.0 NTU occur occasionally and are of short duration.

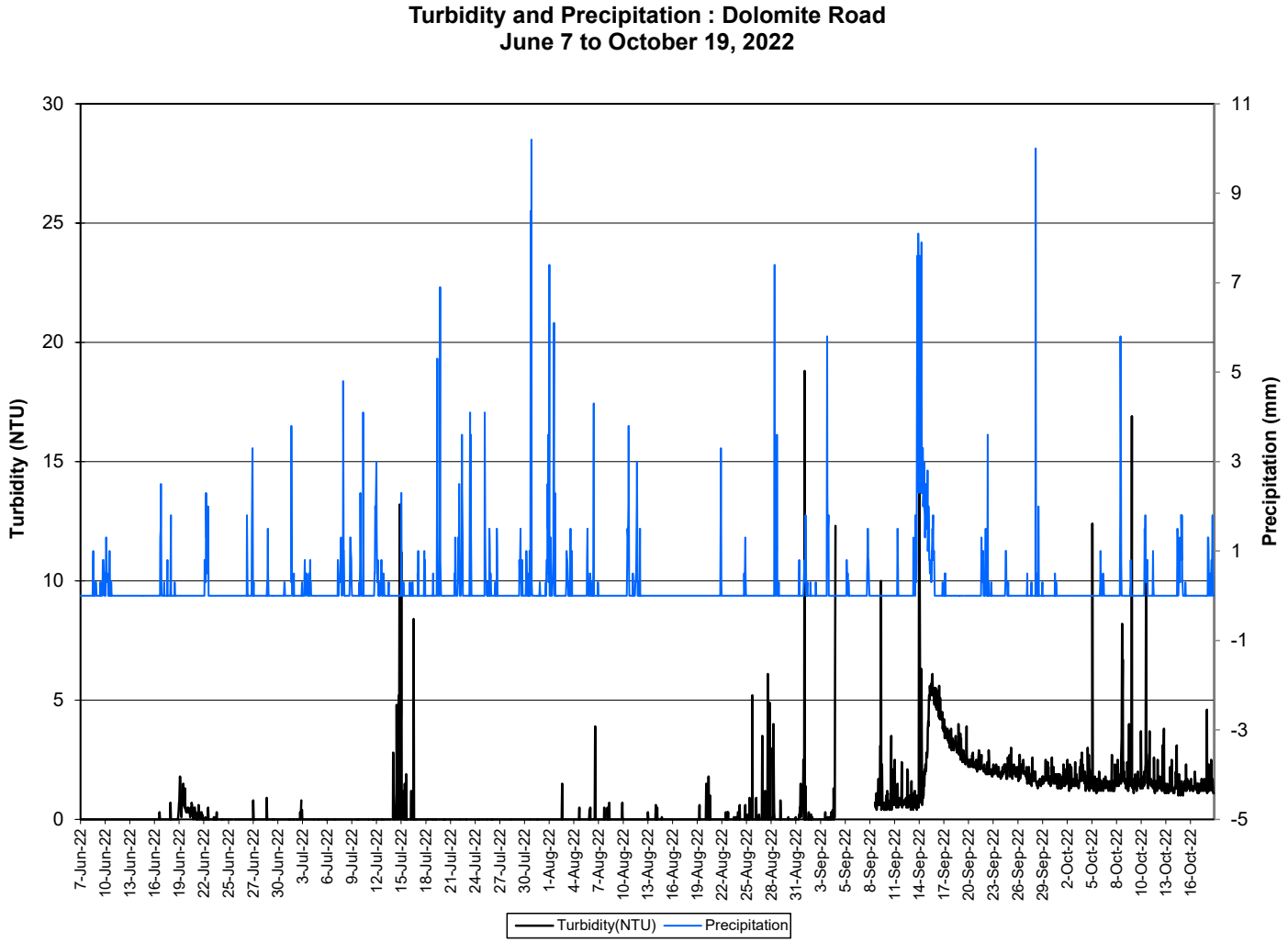


Figure 7: Turbidity and Precipitation: Dolomite Road

- Stage and precipitation are graphed below to show the relationship between rainfall and water level at Julienne Narrows and Dolomite Road (Figure 8).
- At Julienne Narrows and Dolomite Road, stage fluctuates throughout the deployment period, with increases noted after precipitation events.
- With the exception of water quantity data (stage), all data used in the preparation of the graphs and subsequent discussion below adhere to this stringent QA/QC protocol. Water Survey of Canada is responsible for QA/QC of water quantity data. Corrected data can be obtained upon request.

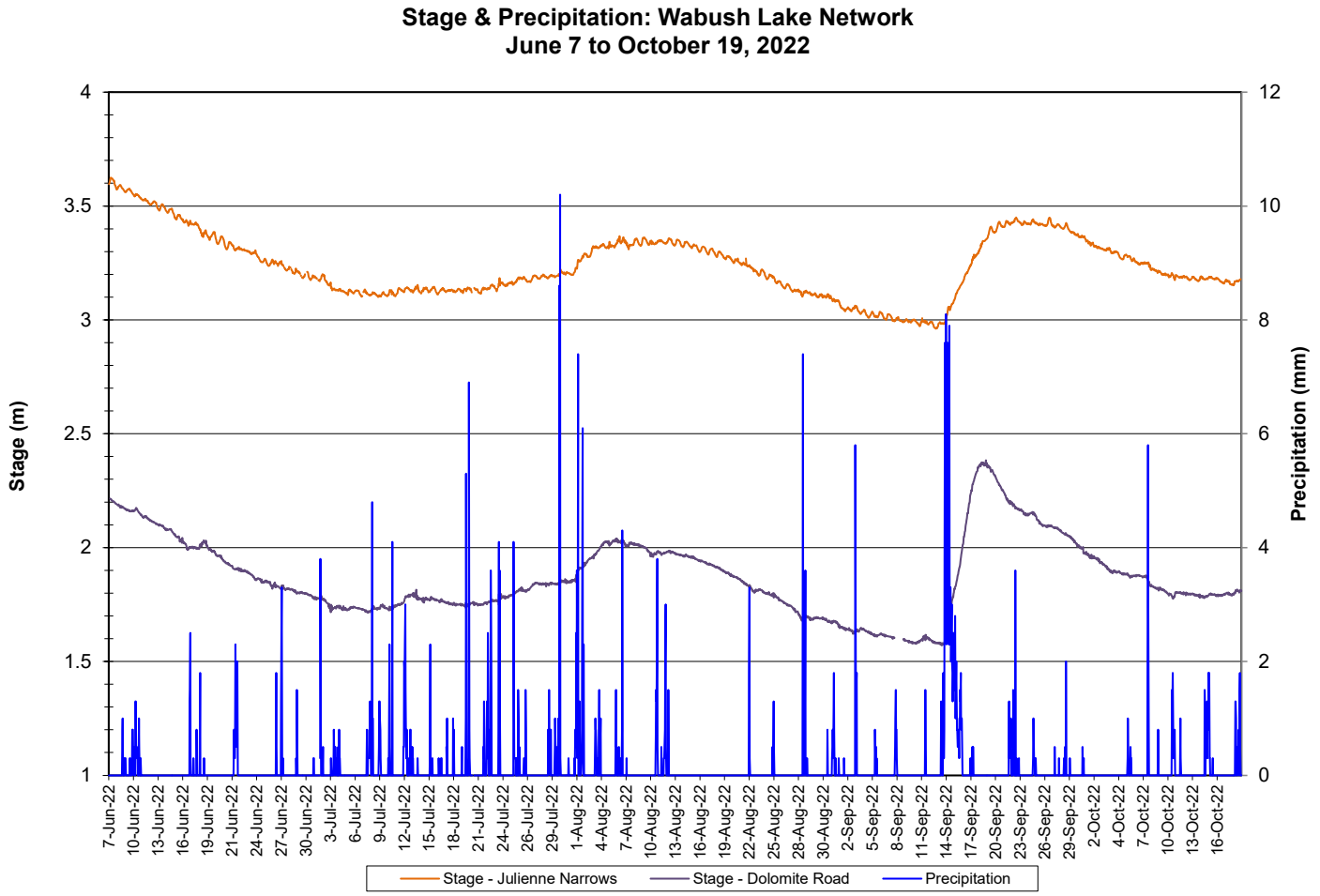


Figure 8: Stage and Precipitation: Wabush Lake Network

Dumbell Stream

- Water temperature ranged from 1.39 to 7.46ºC at Dumbell Stream during the 2022 deployment season. The median value was 3.96 ºC (Figure 9).
- Water temperature at this station remains within a small range throughout the season and is influenced less than the other stations by air temperature values.

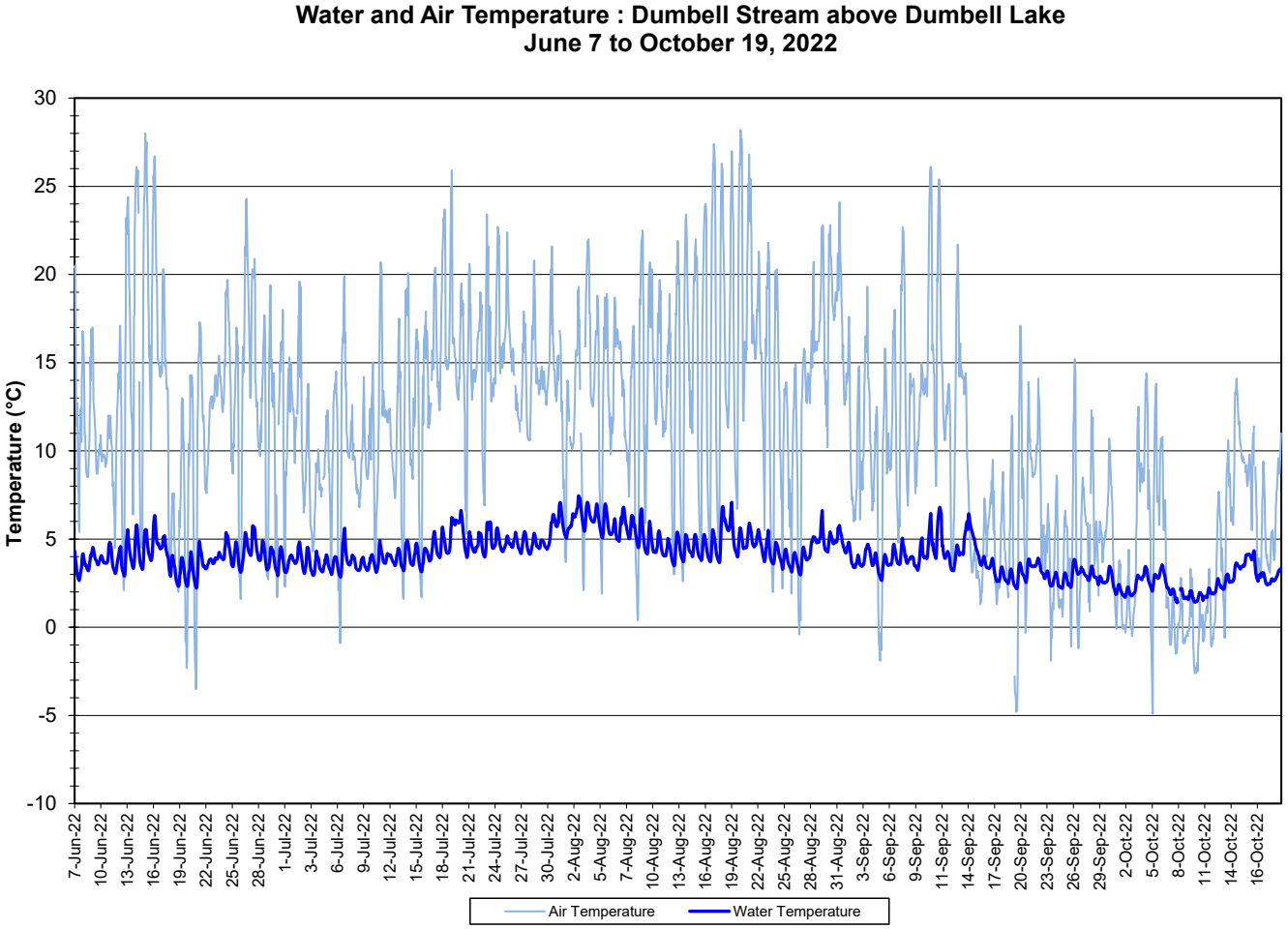


Figure 9: Water and Air Temperature – Dumbell Stream above Dumbell Lake

- pH ranges from 6.95 to 7.86 pH units at Dumbell Stream (Figure 10). The median pH is 7.60 units.
- pH fluctuates daily. Peaks are observed during late afternoon and into early evening.
- All values during the deployment are within the CCME Water Quality Guidelines for the Protection of Aquatic Life (between 6.5 and 9 pH units).
- The pH sensor drifts in the first deployment period, thus the data was removed.

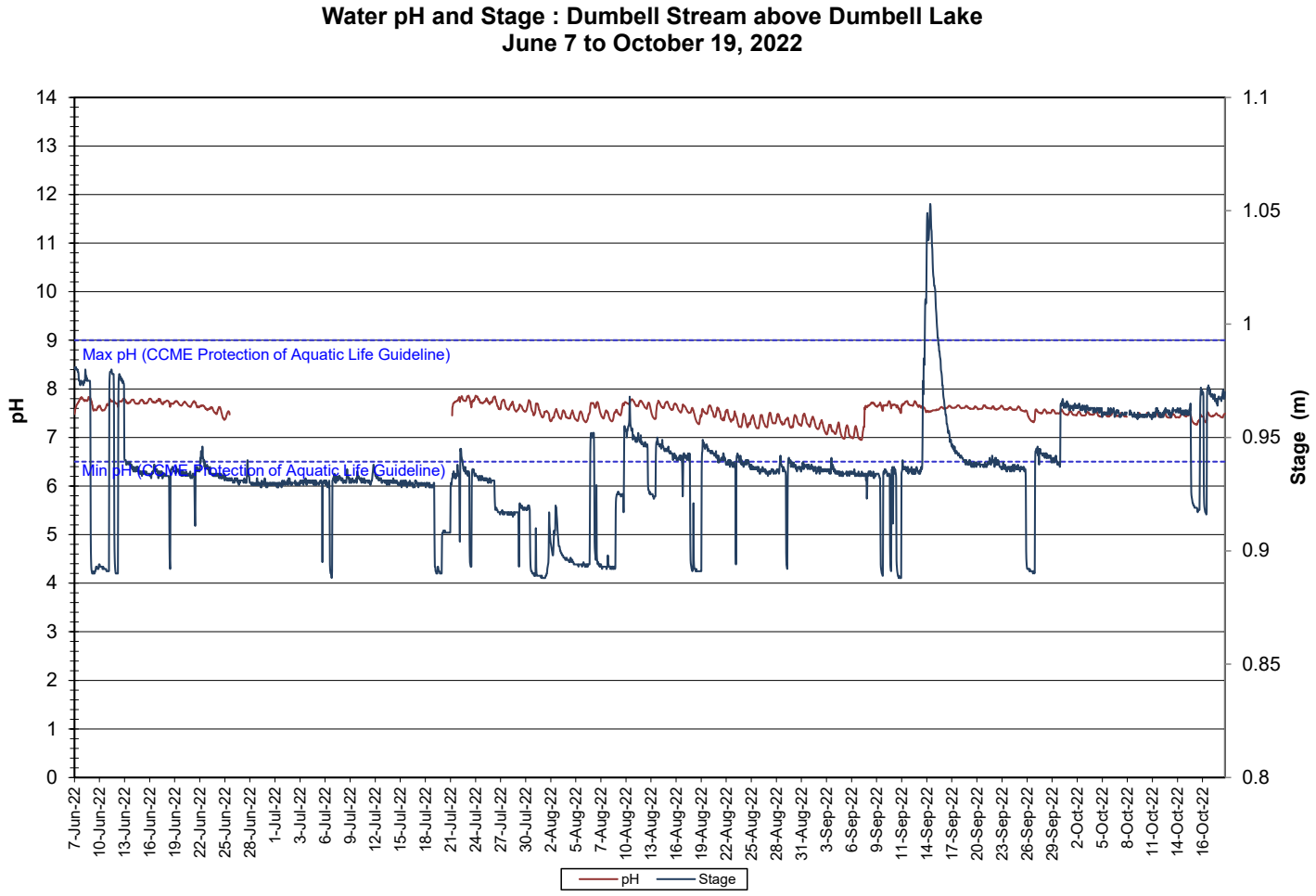


Figure 10: Water pH and Stage – Dumbell Stream above Dumbell Lake

- Throughout the 2022 deployment season, specific conductivity ranged from 65.3 to 301.0 µs/cm at Dumbell Stream (Figure 11).
- Overall, specific conductivity increased very gradually throughout the deployment season, with periodic fluctuations related to stage.
- With the exception of water quantity data (stage), all data used in the preparation of the graphs and subsequent discussion below adhere to this stringent QA/QC protocol. Water Survey of Canada is responsible for QA/QC of water quantity data. Corrected data can be obtained upon request.

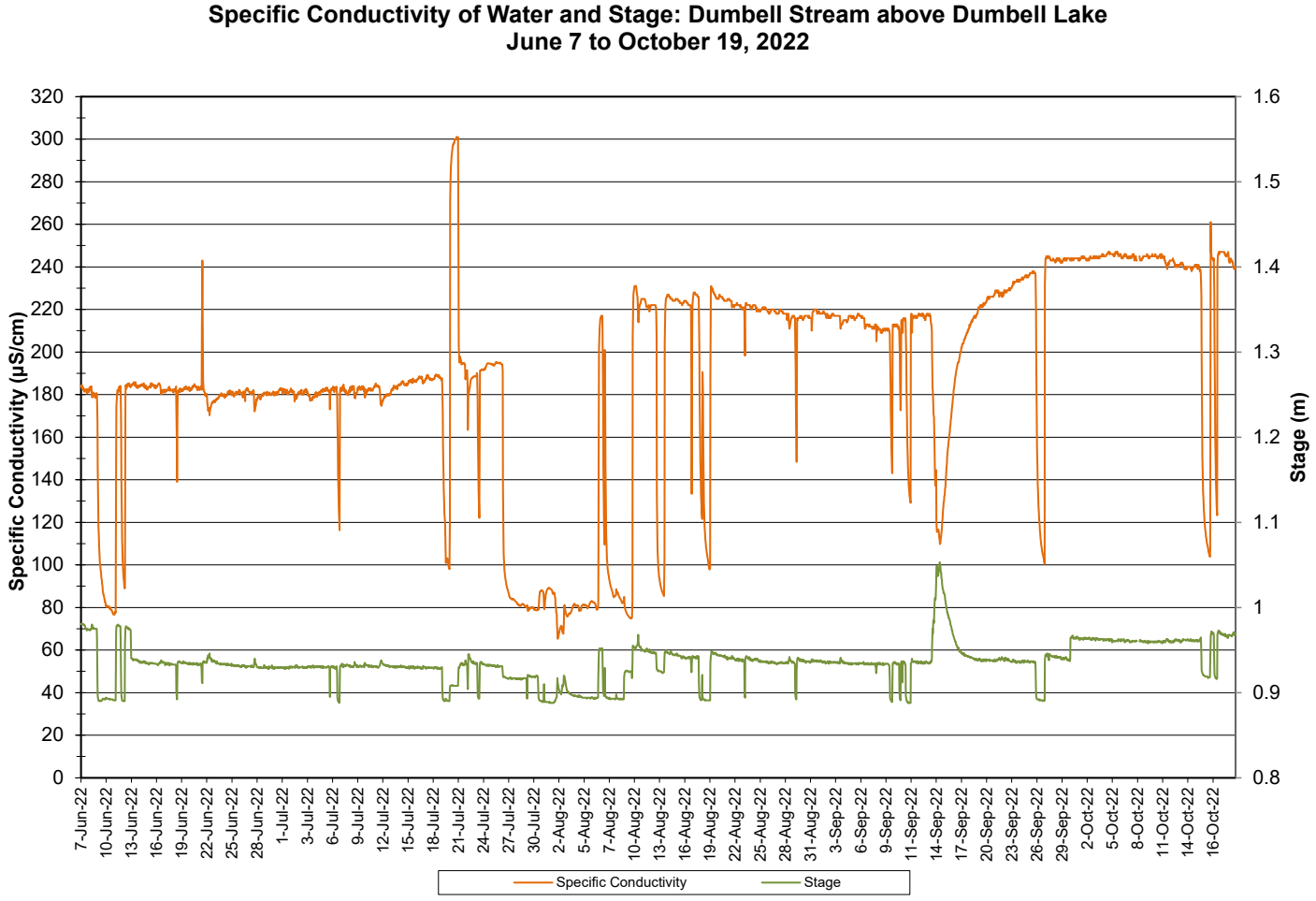


Figure 11: Specific Conductivity and Stage – Dumbell Stream above Dumbell Lake

- Dissolved oxygen ranged from 86.2 to 97.3% saturation and from 10.59 to 12.96 mg/l, with a median value of 11.94 mg/l (Figure 12).
- Dissolved oxygen fluctuated daily with decreases observed at night. Dissolved oxygen increased slightly at the end of the deployment season when water temperature was decreasing in the fall.
- The baseline of dissolved oxygen during the second deployment period is slightly higher than the period that occurs before and after it. This could be due to a slight calibration error.
- All values were above the CCME Water Quality Guidelines for the Protection of Aquatic Life for Cold Water Biota at Other Life Stages (6.5 mg/l) and Early Life Stages (9.5 mg/l). The guidelines are indicated in blue on Figure 12.

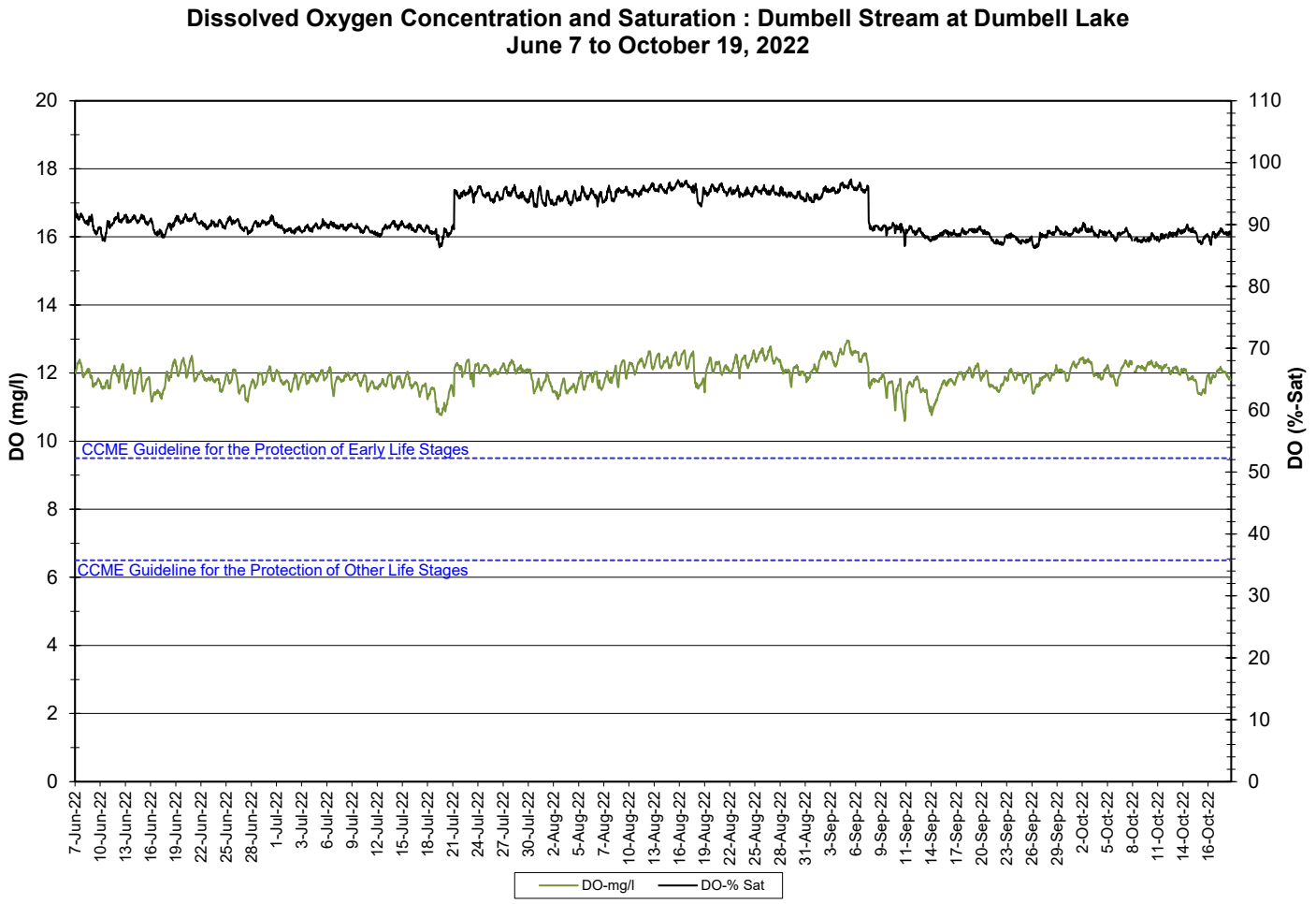


Figure 12: Dissolved Oxygen and Percent Saturation – Dumbell Stream above Dumbell Lake

- Turbidity values range from 0.0 to 35.5 NTU, with a median value of 2.3 NTU (Figure 13) indicating low background turbidity.
- Turbidity readings greater than 15.0 NTU occur occasionally and are of short duration.

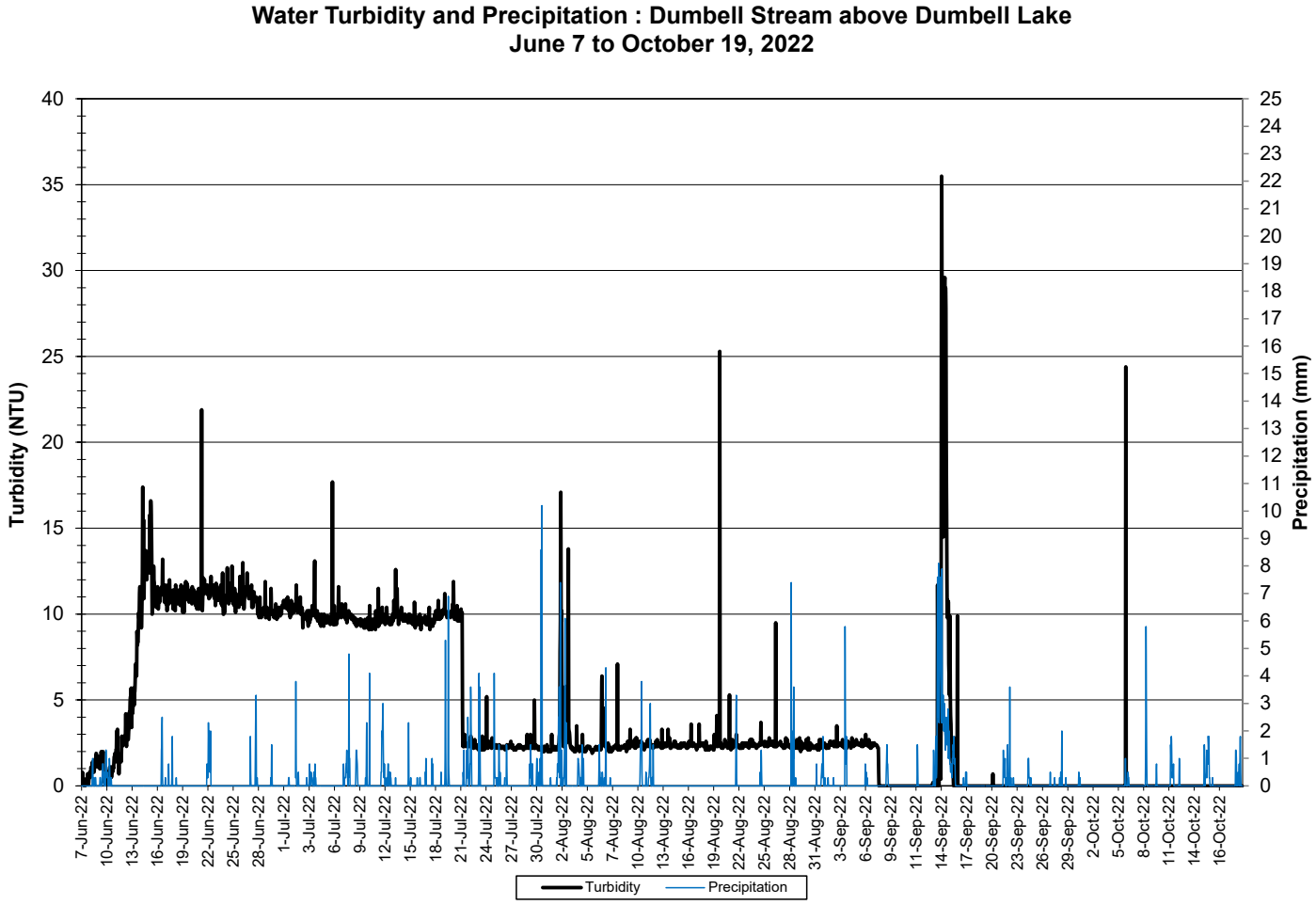


Figure 13: Turbidity and Precipitation – Dumbell Stream above Dumbell Lake

- Stage and precipitation are graphed below to show the relationship between rainfall and water level at Dumbell Stream (Figure 14). Precipitation has a direct effect on stage at this location.
- With the exception of water quantity data (stage), all data used in the preparation of the graphs and subsequent discussion below adhere to this stringent QA/QC protocol. Water Survey of Canada is responsible for QA/QC of water quantity data. Corrected data can be obtained upon request.

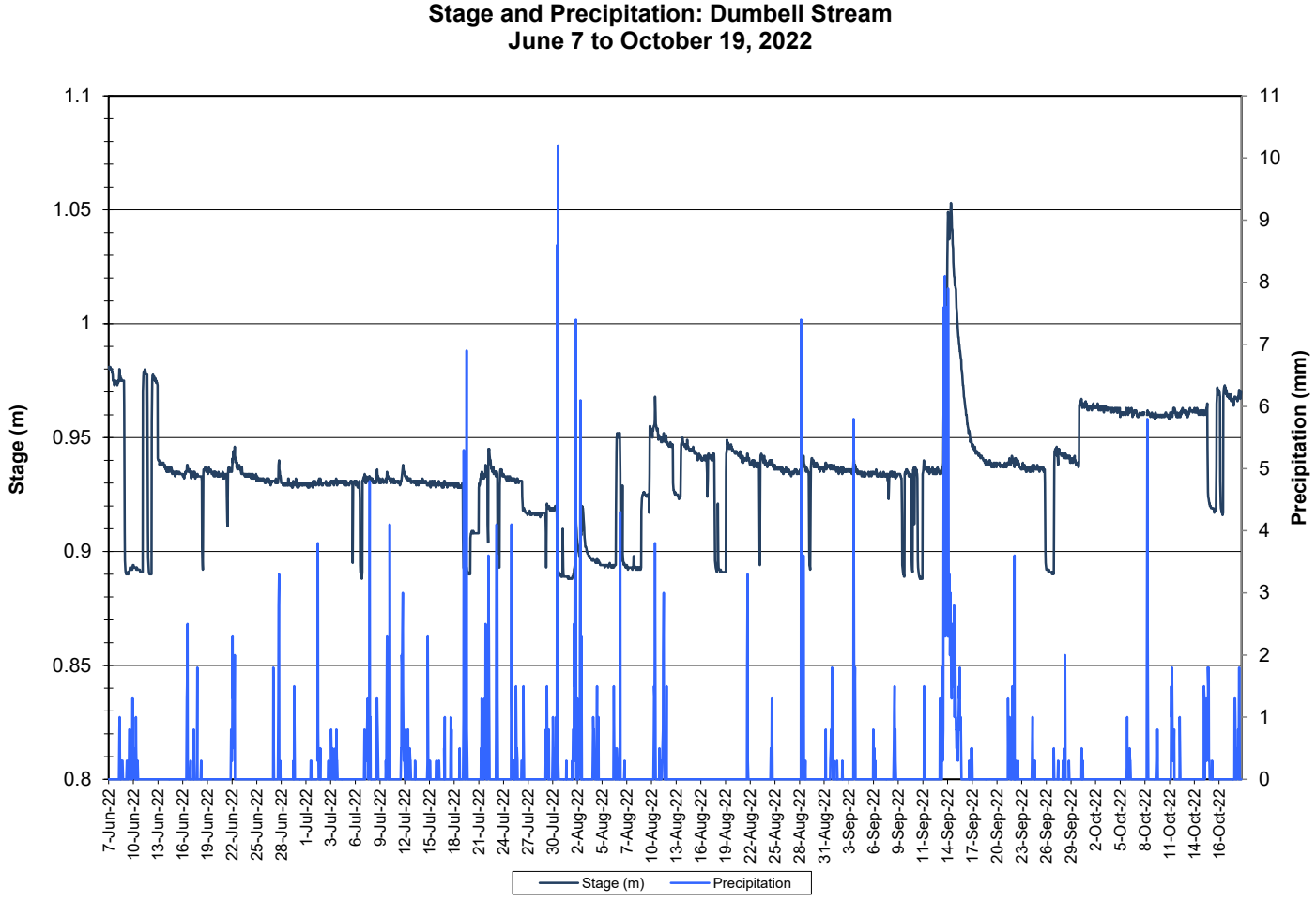


Figure 14: Stage and Precipitation – Dumbell Stream above Dumbell Lake

Pumphouse Stream

- Water temperature ranged from 1.20 to 19.40°C at Pumphouse Stream during the 2022 deployment season. The median value was 12.00°C (Figure 15).
- Water temperature corresponded closely with air temperature fluctuations, decreasing steadily after August as air temperature cooled in to the fall. There a slight increase during the last week of deployment, again, corresponding with air temperature.

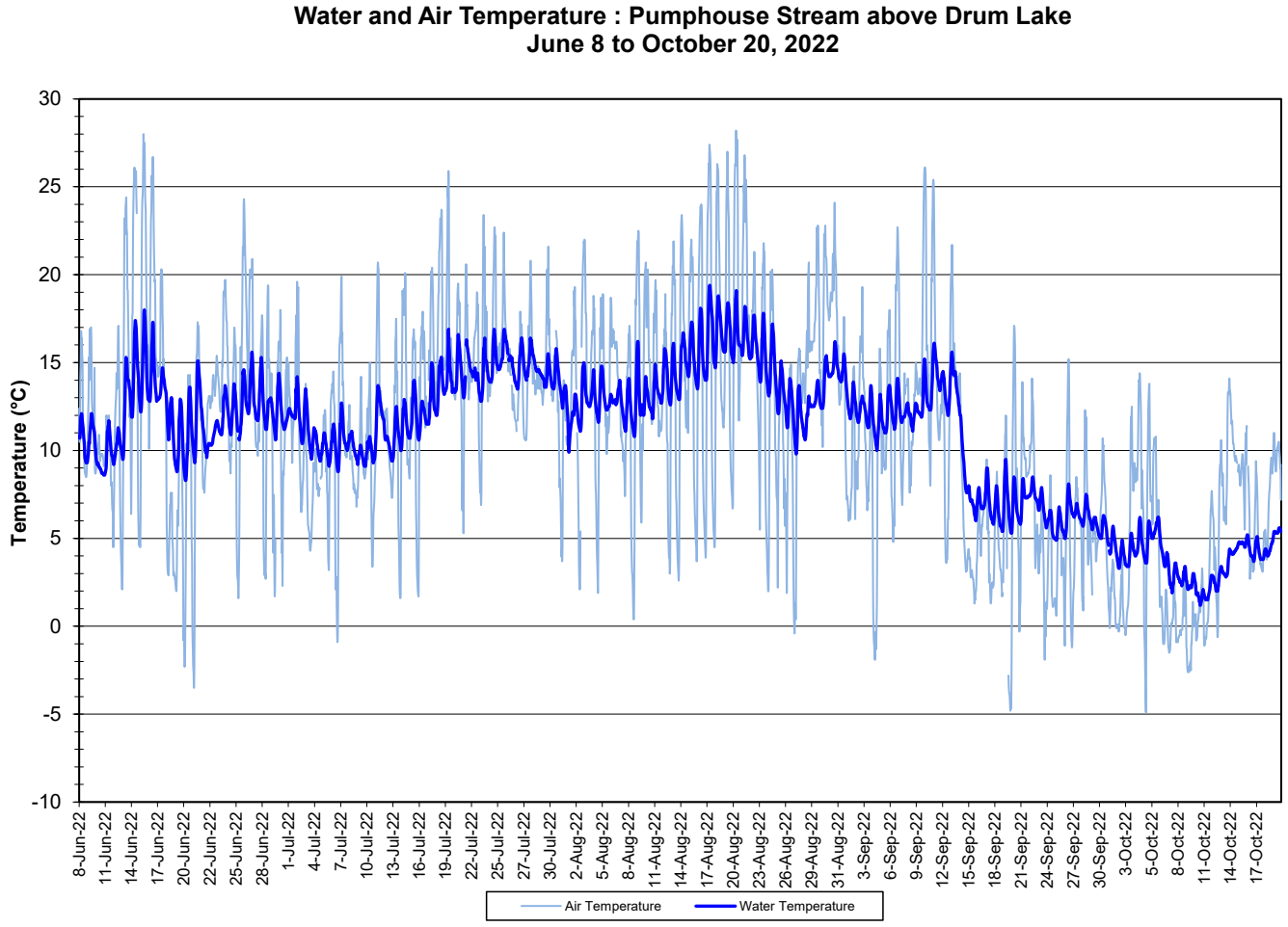


Figure 15: Water and Air Temperature – Pumphouse Stream above Drum Lake

- pH ranged from 6.92 to 8.07 pH units at Dumbell Stream (Figure 16). The median pH was 7.83 units.
- pH fluctuated daily. Peaks were observed during late afternoon into the early evening. pH decreases during rainfall events. The pH sensor drifted during the first deployment period, thus the data was removed.
- All values during the deployment are within the CCME Water Quality Guidelines for the Protection of Aquatic Life (between 6.5 and 9 pH units).

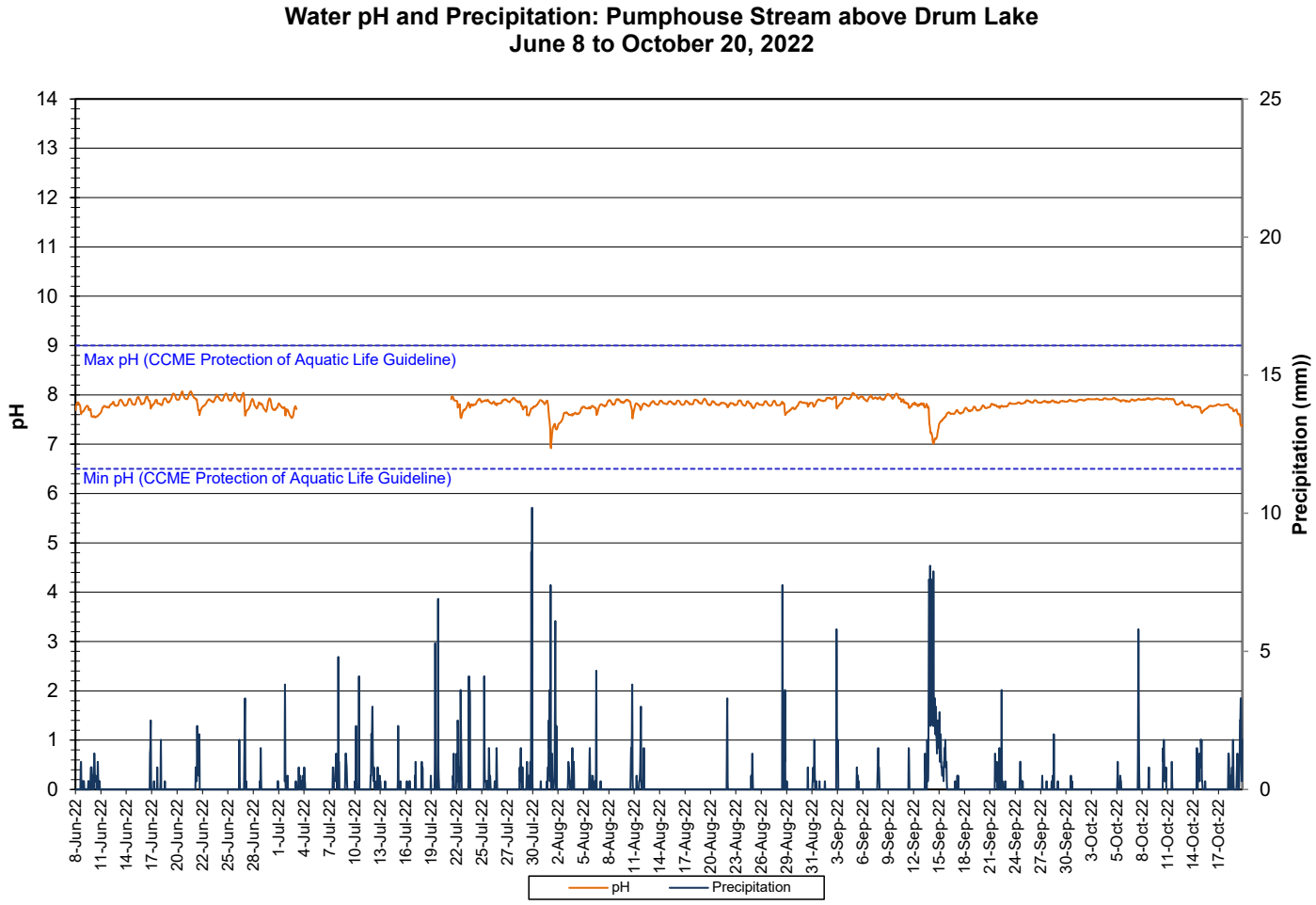


Figure 16: Water pH and Precipitation – Pumphouse Stream above Drum Lake

- Throughout the 2022 deployment season, specific conductivity ranged from 63.5 to 238.0 µs/cm at Pumphouse Stream (Figure 17).
- Drops in specific conductivity frequently correspond to increases in stage. As more water is added to the system from precipitation, the solids in the water are diluted, decreasing conductivity.
- With the exception of water quantity data (stage), all data used in the preparation of the graphs and subsequent discussion below adhere to this stringent QA/QC protocol. Water Survey of Canada is responsible for QA/QC of water quantity data. Corrected data can be obtained upon request.

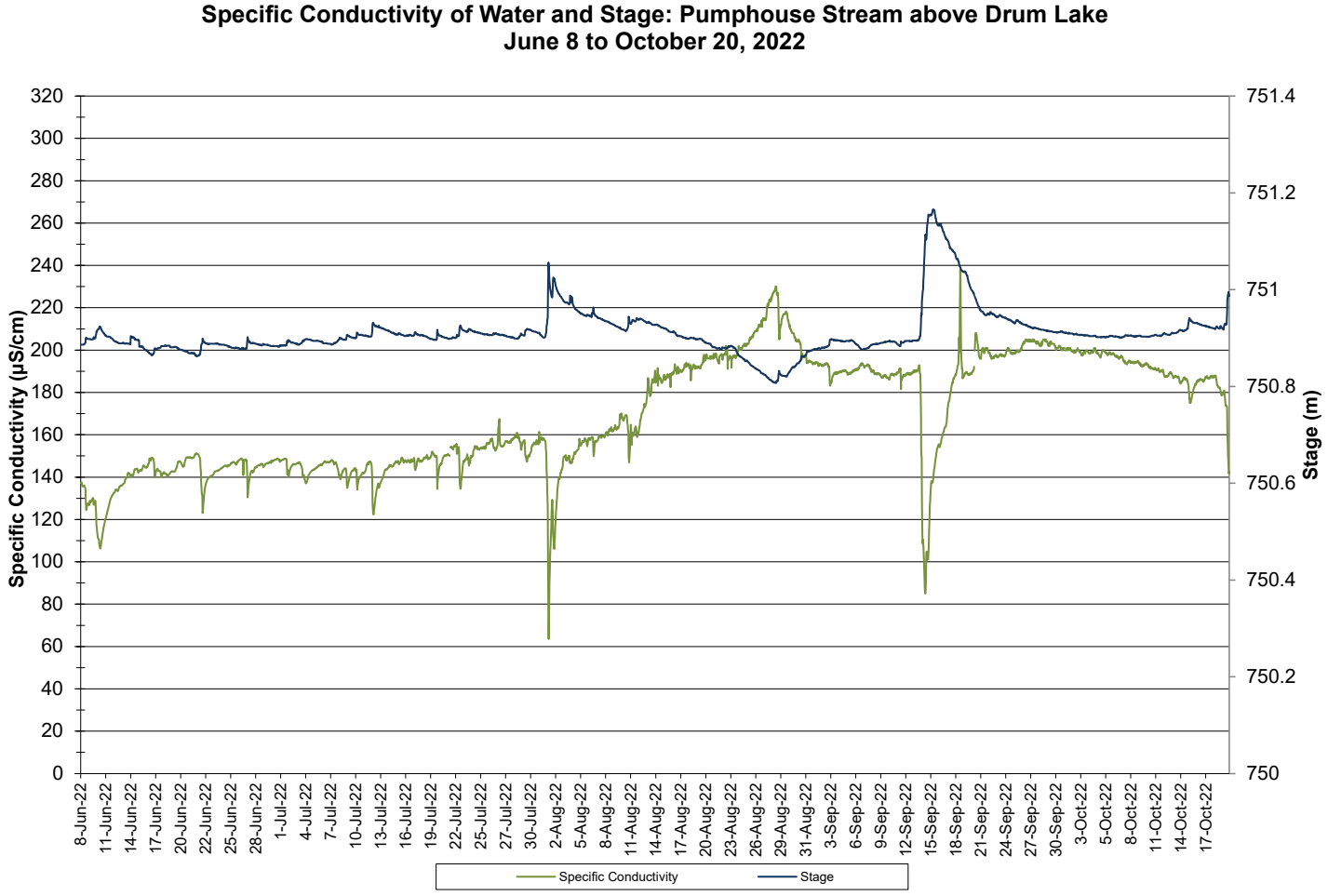


Figure 17: Specific Conductivity and Precipitation – Pumphouse Stream above Drum Lake

- Dissolved oxygen ranged from 75.7 to 102.1% saturation and 8.17 to 11.09 mg/l with a median value of 9.24 mg/l (Figure 18).
- Dissolved oxygen fluctuated diurnally with decreases observed at night.
- Dissolved oxygen displayed an inverse relationship to increases/decreases in water temperature. A portion of data was removed towards the end of the deployment season, due to unreliable data.
- All values were above the CCME Water Quality Guideline for the Protection of Aquatic Life for Cold Water Biota at Other Life Stages of 6.5 mg/l. Most values recorded were below the minimum guideline for early life stages of 9.5 mg/l until water temperatures dropped and oxygen levels began to rise in September. The guidelines are indicated in blue on Figure 18.

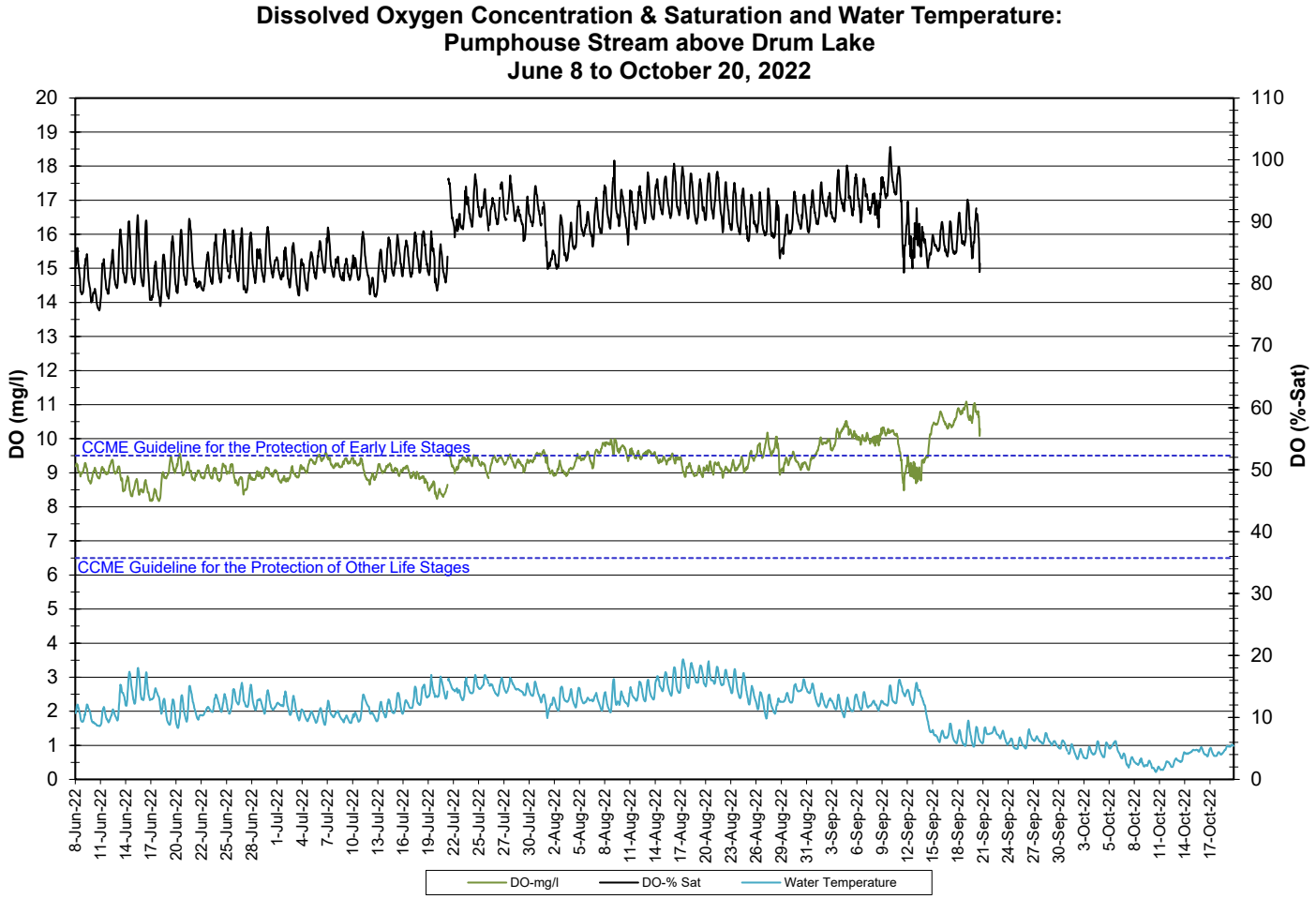


Figure 18: Dissolved Oxygen and Percent Saturation – Pumphouse Stream above Drum Lake

- Turbidity values range from 0.0 to 124.6 NTU, with a median value of 3.4 NTU (Figure 19a & 19b).
- The median turbidity value is 3.4 NTU, indicating that there is low background turbidity. There are a few large spikes, but turbidity values greater than 40.0 NTU occur infrequently and for short periods.
- Turbidity data is not available for the last deployment period, as the sensor failed.

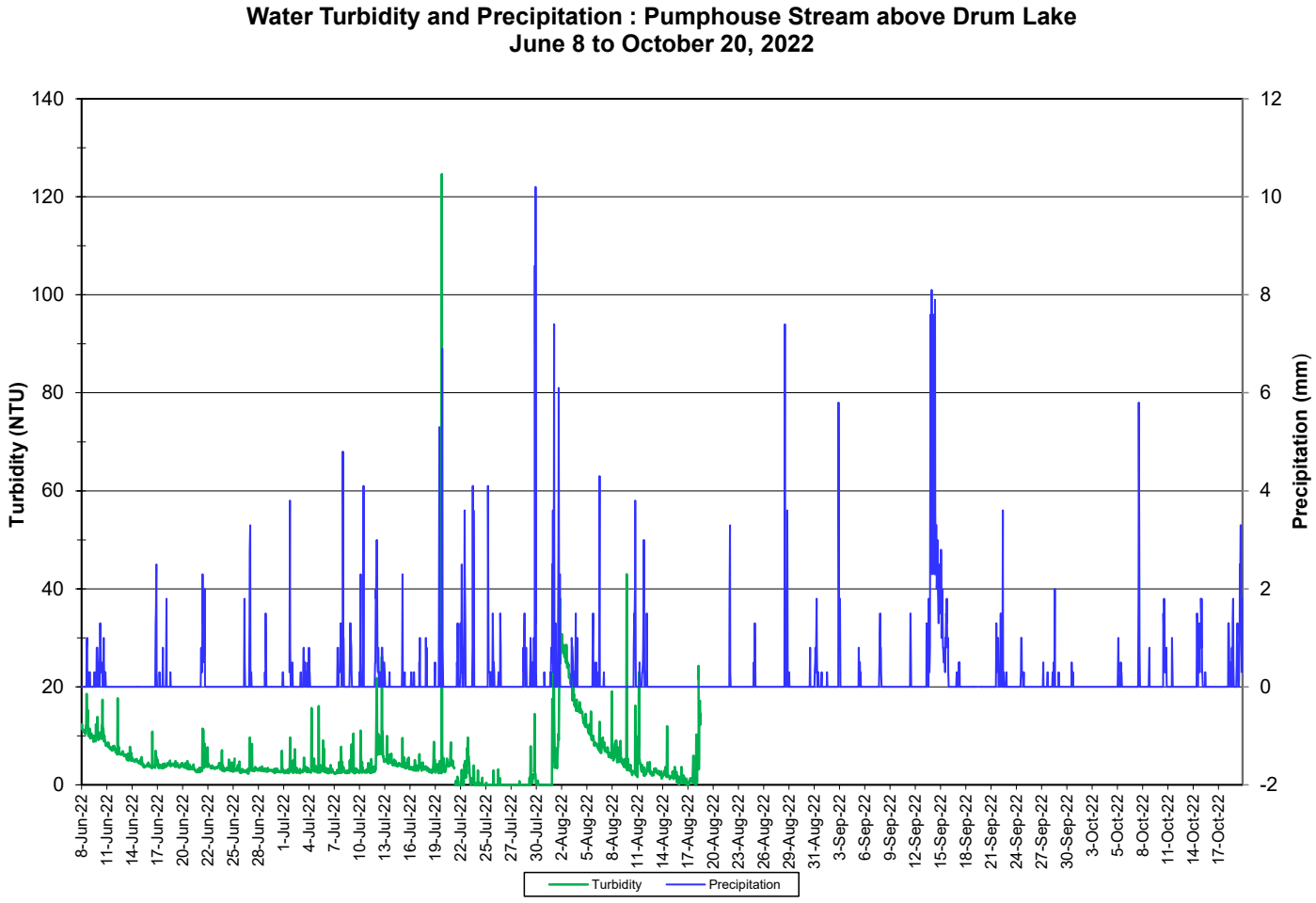


Figure 19a: Turbidity and Precipitation – Pumphouse Stream above Drum Lake

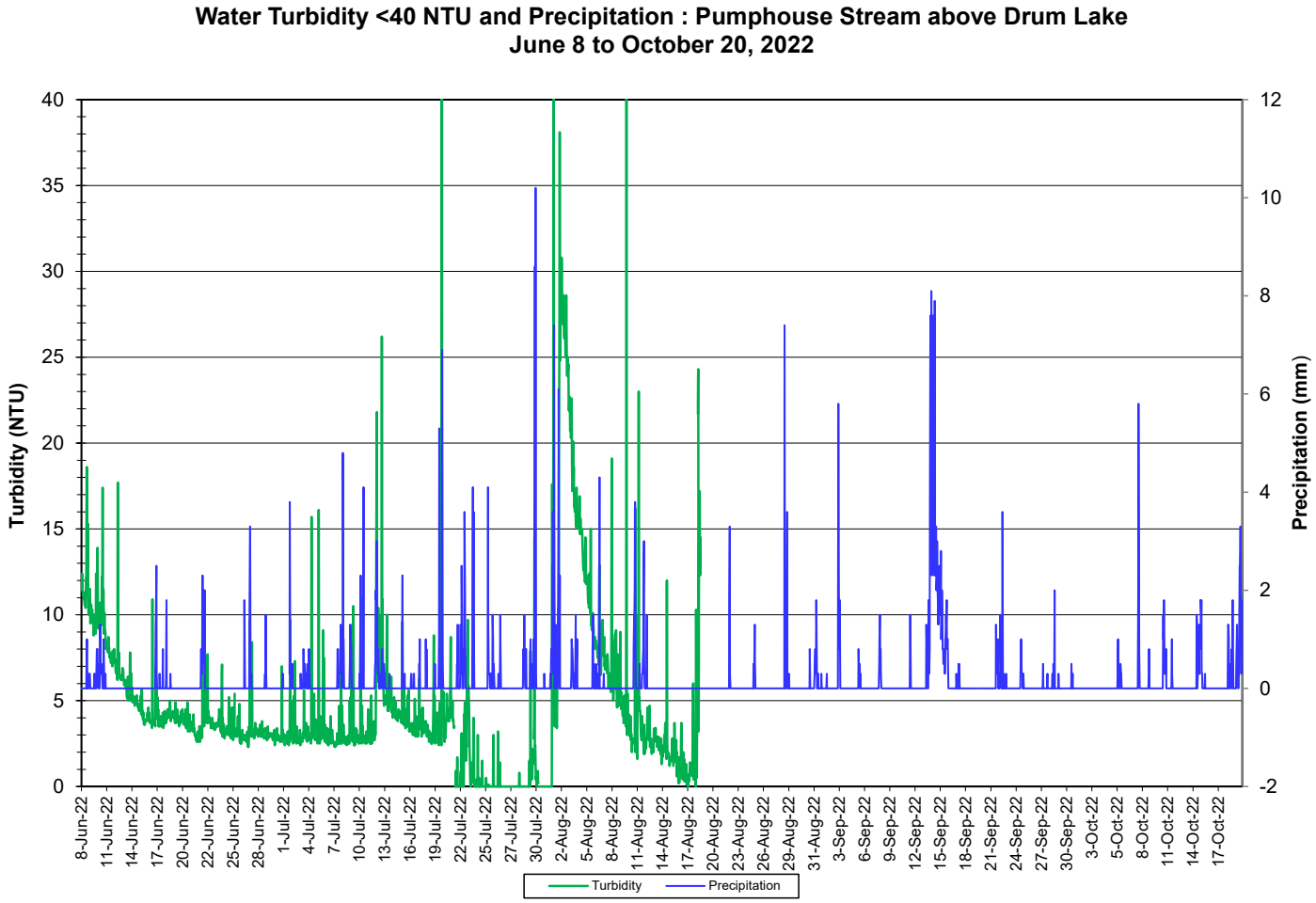


Figure 19b: Turbidity <40 NTU and Precipitation – Pumphouse Stream above Drum lake

- Stage and precipitation are graphed below to show the relationship between rainfall and water level at Pumphouse Stream (Figure 20).
- Stage data shows slight increases after precipitation events.
- With the exception of water quantity data (stage), all data used in the preparation of the graphs and subsequent discussion below adhere to this stringent QA/QC protocol. Water Survey of Canada is responsible for QA/QC of water quantity data. Corrected data can be obtained upon request.

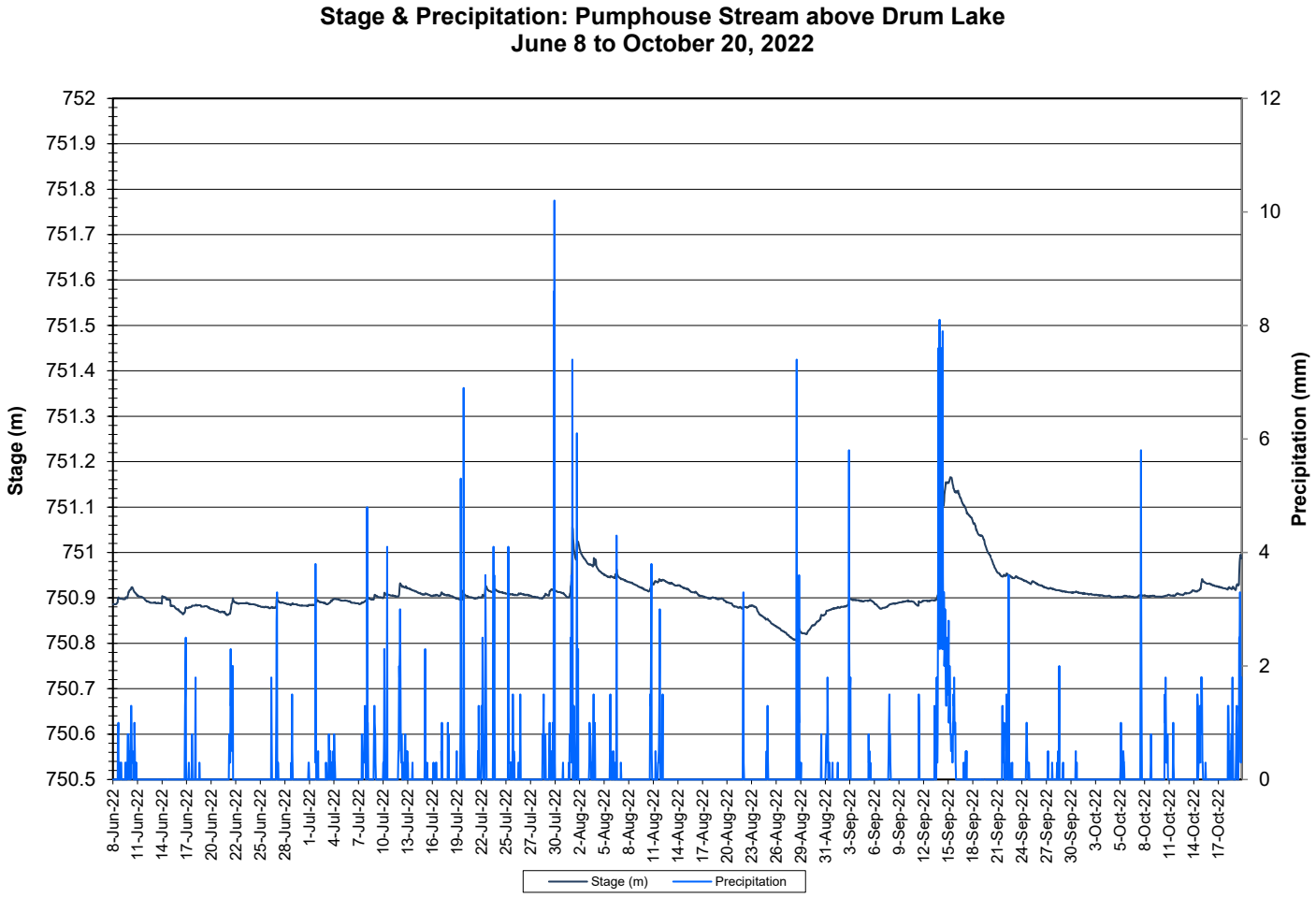


Figure 20: Stage and Precipitation – Pumphouse Stream above Drum Lake

Conclusions

- Instruments at the water quality monitoring stations in Labrador West were deployed on June 7-8th and removed on October 19-20th, 2022. They were removed for the winter season.
- Instruments were deployed for periods of 40 to 50 days before maintenance and calibration.
- In most cases, weather related events or increases/decreases in water level could be used to explain the fluctuations.
- Most values recorded were within ranges as suggested by the CCME Water Quality Guidelines for the Protection of Aquatic Life.
- There were a number of issues with the instruments this year. These instruments will undergo PTE's during the winter, but discussions will take place about the purchase of new instrumentation to ensure the monitoring network is collecting reliable data.
- Water temperature followed the seasonal trend of increasing during the summer and decreasing into the fall. Water temperature was cooler at Dumbell Stream, but increases/decreases followed the same trends as air temperature.
- Most pH values were within the acceptable range of the CCME Water Quality Guidelines for Protection of Aquatic Life. Some data was removed due to sensor drift. At Dolomite Road, there were some values below the acceptable range. This could be due to sensor drift.
- Specific conductivity differed between the two Wabush Lake stations. This can be attributed to varying concentrations of iron ore tailings, which are deposited into Wabush Lake downstream of Dolomite Road and upstream of Julienne Narrows. Dumbell Stream and Pumphouse Stream are small streams in which conductivity values decreased in response to increases in stage.
- For the minimum dissolved oxygen CCME Water Quality Guideline for the Protection of Aquatic Life for Cold Water Biota at Early Life Stages of 9.5 mg/l, the majority of values at the two Wabush Lake stations were above the guideline. At Dumbell Stream, all values were above this guideline. At Pumphouse Stream, the majority of values were below this guideline.
- All values were above the CCME Water Quality Guideline for the Protection of Aquatic Life for Cold water Biota at Other Life Stages of 6.5 mg/l at all stations.
- Turbidity values varied greatly between the two Wabush Lake stations with values remaining lower at Dolomite road. Background turbidity levels at Dolomite Road, Dumbell Stream and Pumphouse Stream were both low, with median values of 0.0, 2.3 and 3.4 NTU, respectively.

Path Forward

- All field instruments will undergo Performance Testing, and Evaluations (PTEs) during the winter of 2022-2023. ECC will inform IOC of any instrument performance issues.
- ECC will begin discussions with IOC in respect to the purchase of new water quality monitoring instruments, as current instrumentation has reached the end of its life cycle.
- ECC staff will deploy real time water quality instruments in spring 2023 when ice conditions allow and perform regular site visits throughout the 2023 deployment season for calibration and maintenance of the instruments.
- If necessary, deployment techniques will be evaluated and adapted to each site, ensuring secure and suitable conditions for RTWQ monitoring.
- ECC will update IOC staff on any changes to procedures with handling, maintenance and calibration of the real-time instruments.
- ECC will continue to work on its Automatic Data Retrieval System, to incorporate new capabilities in data management and data display.
- Open communication will continue to be maintained between ECC, ECCC and IOC employees involved with the agreement, in order to respond to emerging issues on a proactive basis.
- IOC will continue to be informed of data trends and any significant water quality events in the form of email and/or monthly deployment reports, when the deployment season begins. IOC will also receive an annual report, summarizing the events of the deployment season.

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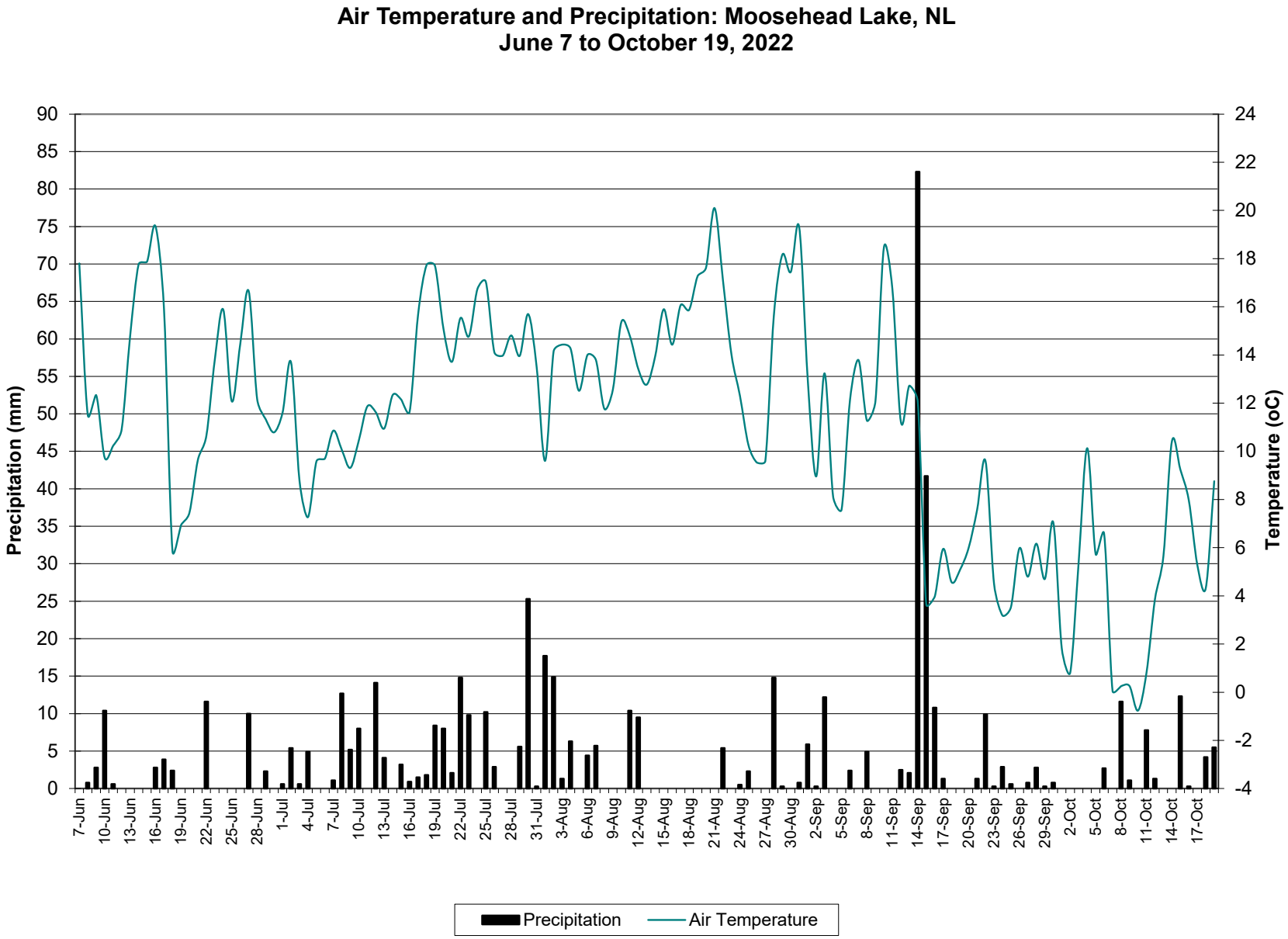
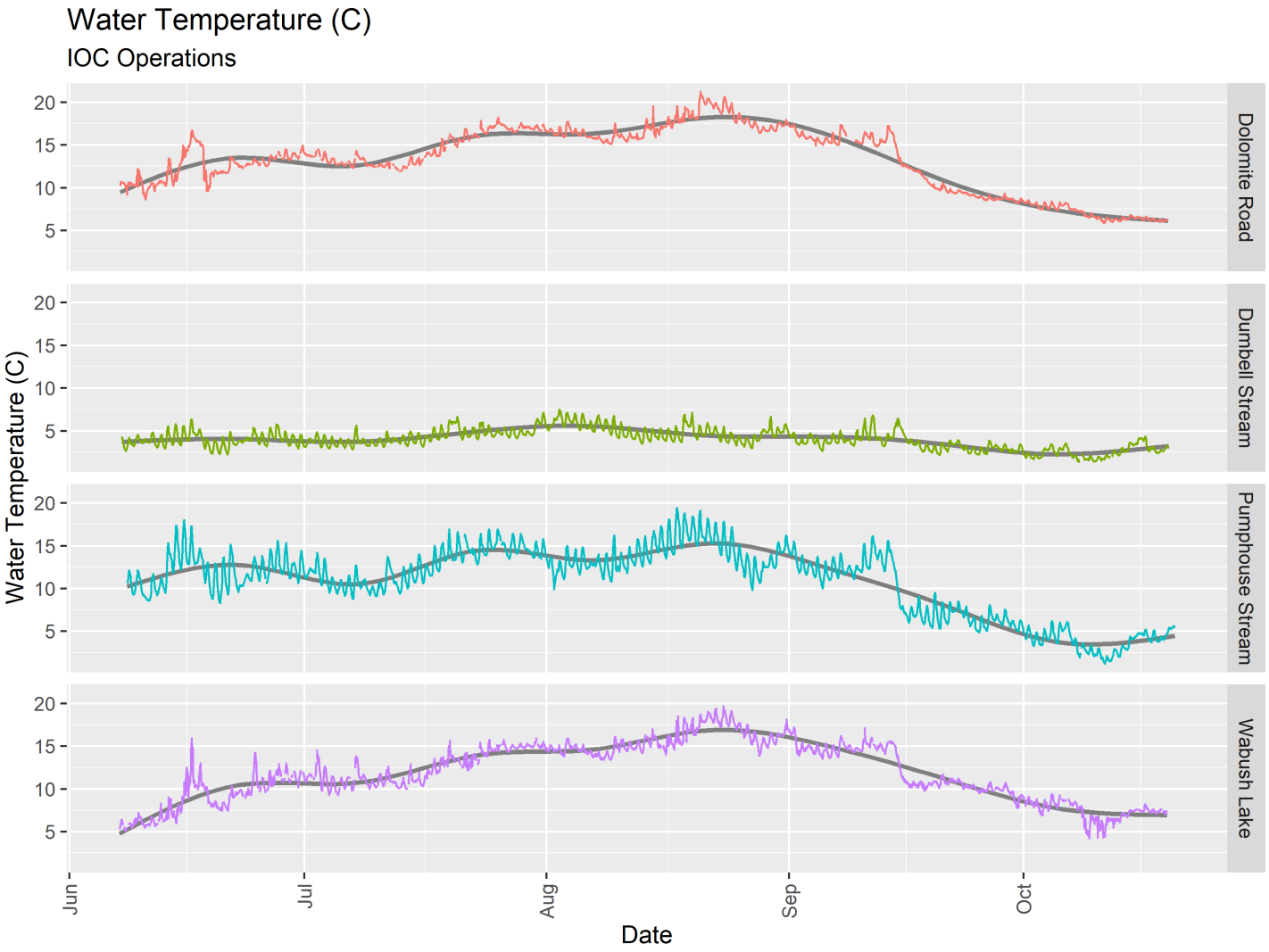
Appendix 1

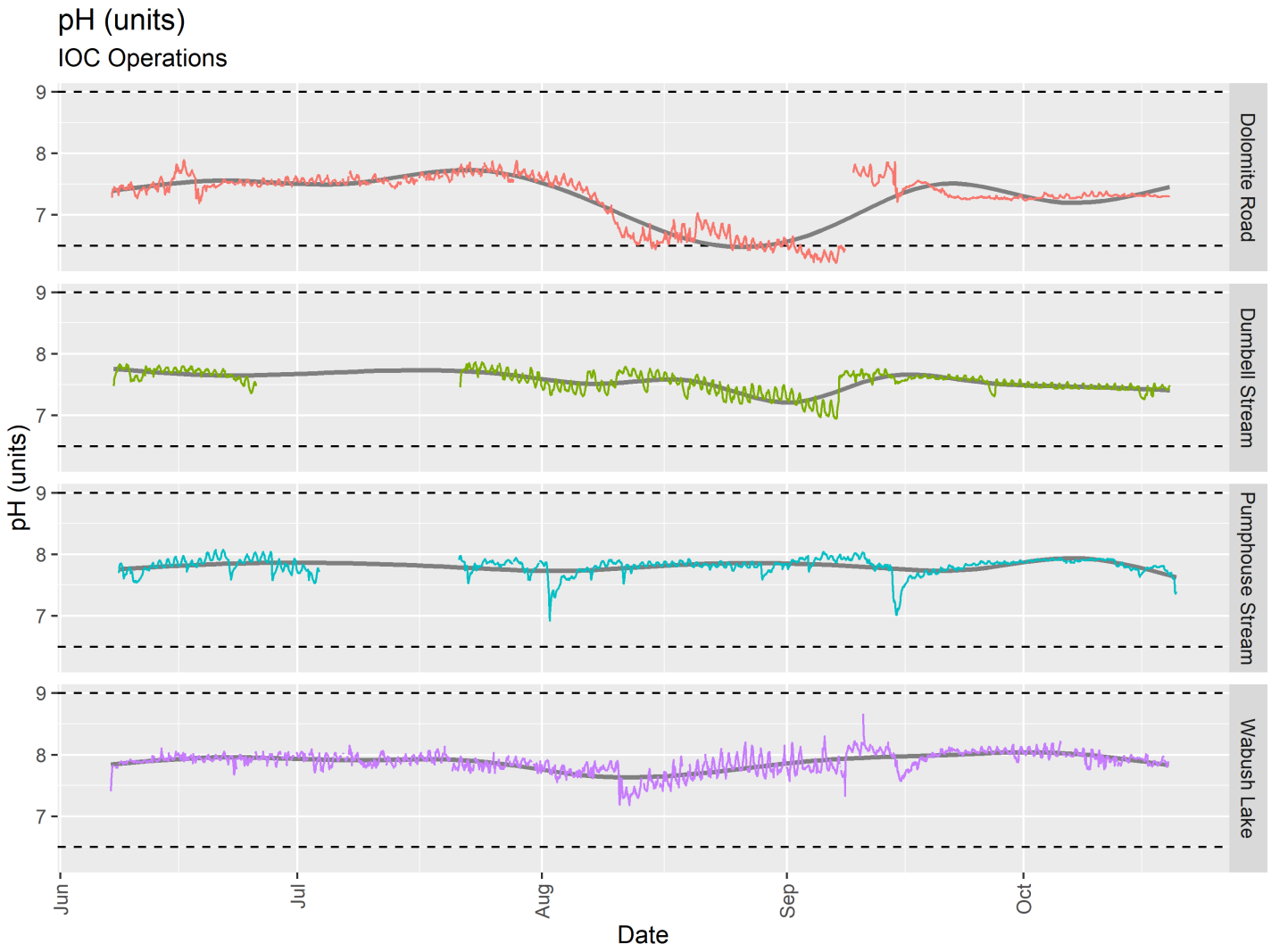

Air Temperature and Precipitation: Moosehead Lake, NL
June 7 to October 19, 2022
Precipitation (mm)
Temperature (oC)
Precipitation
Air Temperature

Appendix 2

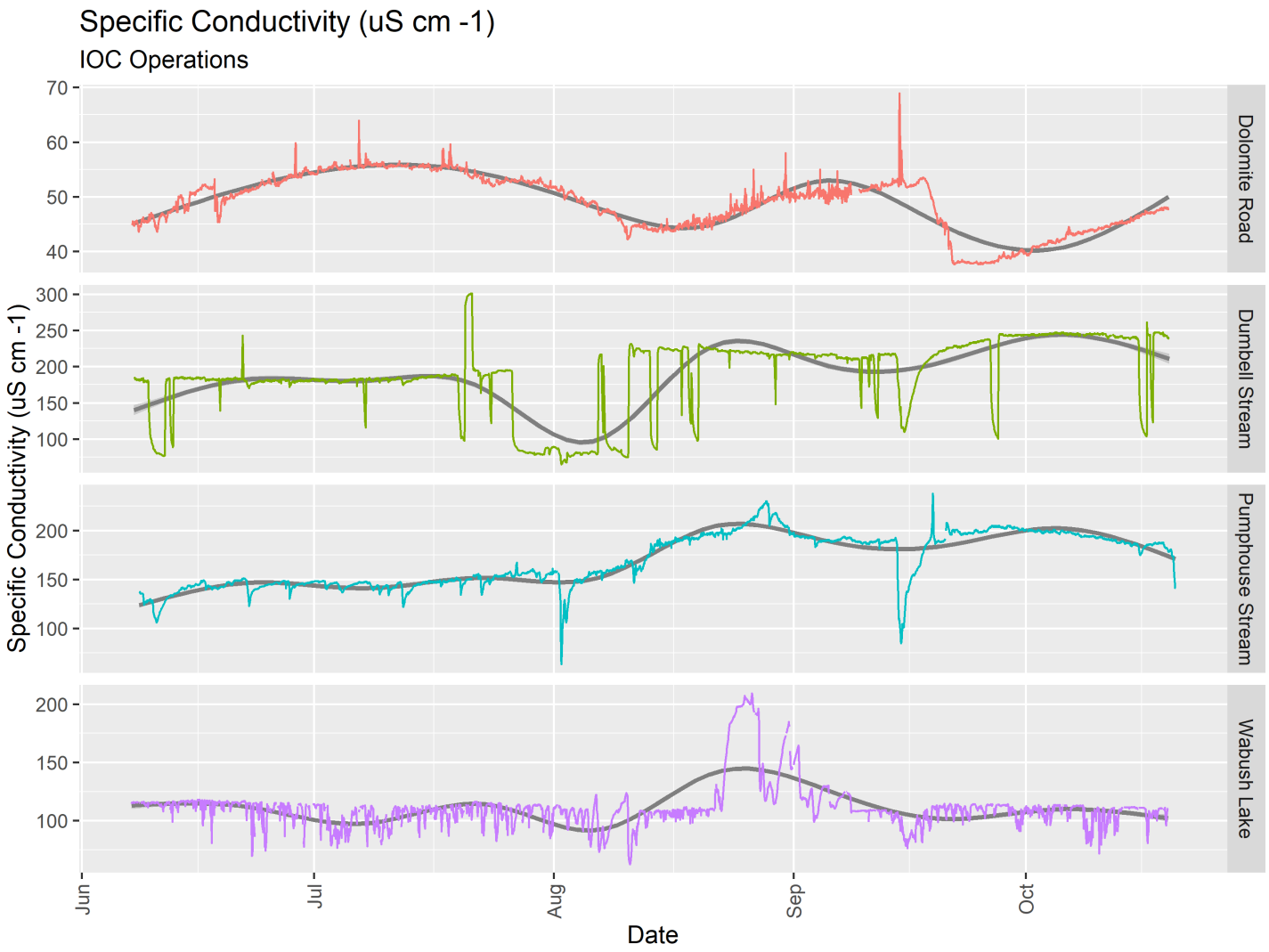
Station to Station Quick View



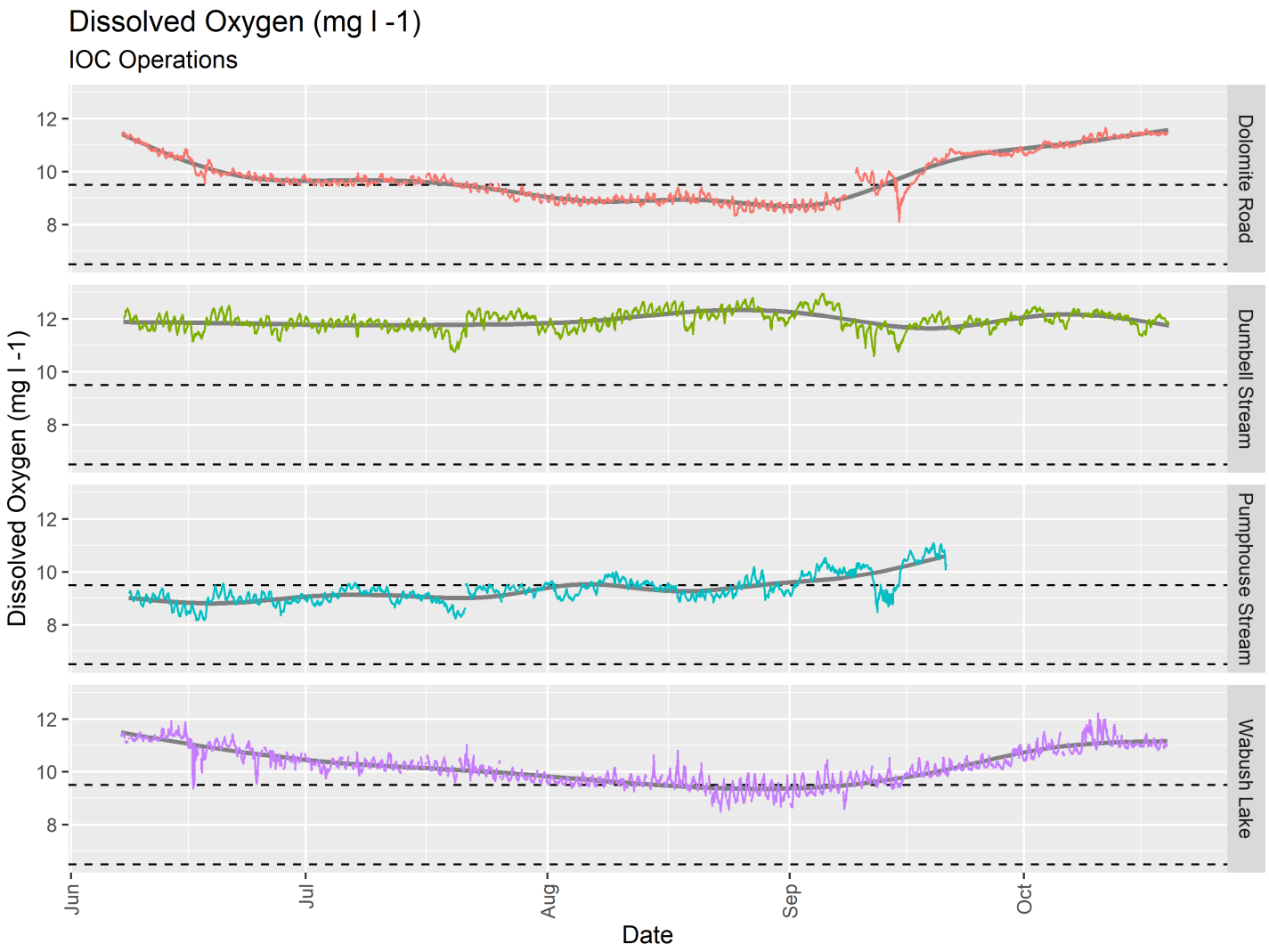
Temperature (°C)				
	Dolomite Road	**Dumbell Stream**	**Pumphouse Stream**	**Julienne Narrows (Wabush Lake)**
Min	5.9	1.39	1.2	4.2
Max	21.2	7.46	19.4	19.7
Median	13.7	3.96	12	11.6



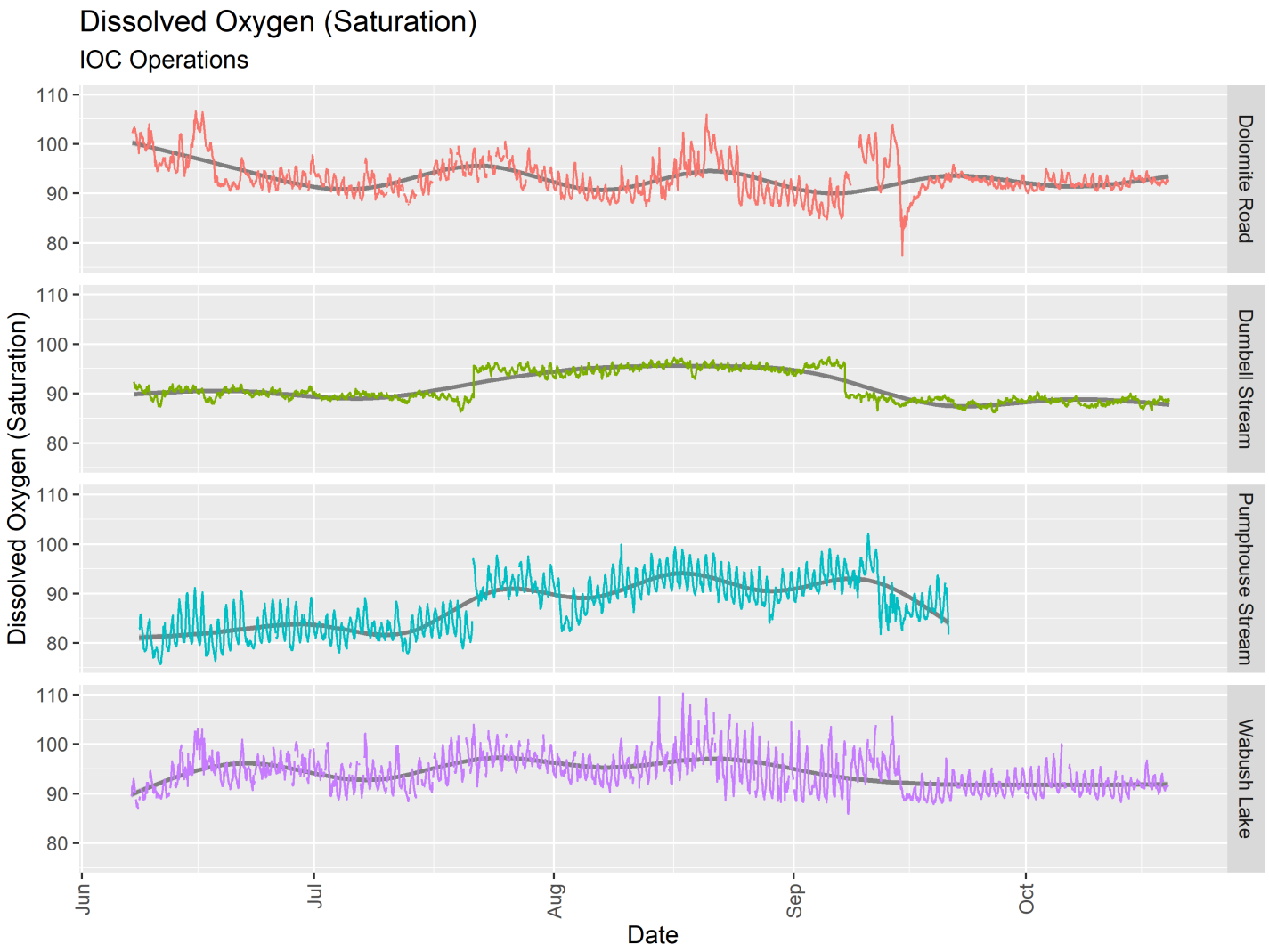
	pH			
	Dolomite Road	**Dumbell Stream**	**Pumphouse Stream**	**Julienne Narrows (Wabush Lake)**
Min	6.22	6.95	6.92	7.18
Max	7.89	7.86	8.07	8.66
Median	7.4	7.55	7.83	7.9



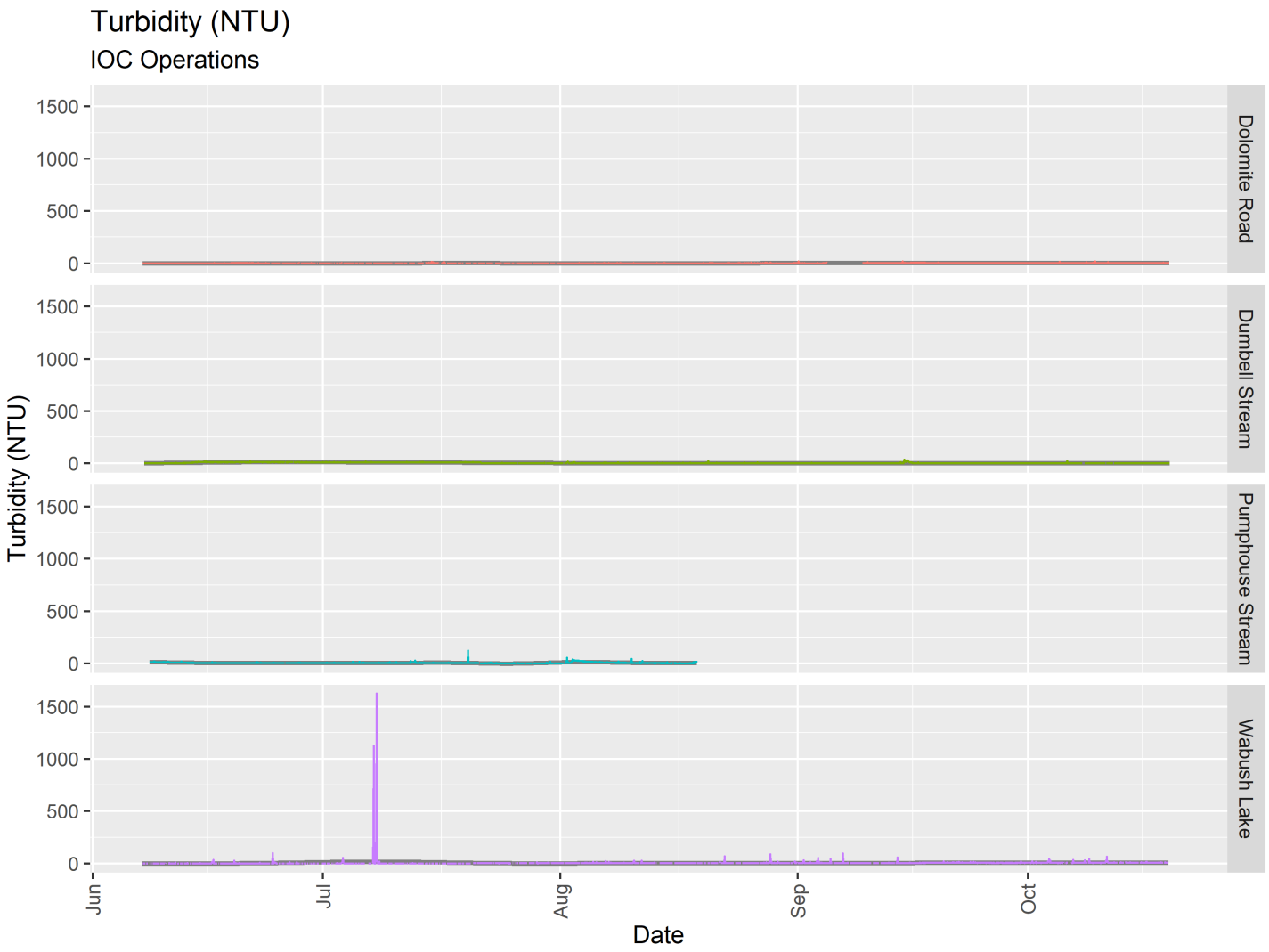
Specific Conductivity (µs/cm)				
	Dolomite Road	**Dumbell Stream**	**Pumphouse Stream**	**Julienne Narrows (Wabush Lake)**
Min	37.7	65.3	63.5	62.6
Max	68.9	301.0	238.0	209.0
Median	49.8	189.2	163.85	110.1



Dissolved Oxygen (mg/l)				
	Dolomite Road	**Dumbell Stream**	**Pumphouse Stream**	**Julienne Narrows (Wabush Lake)**
Min	8.11	10.59	8.17	8.49
Max	11.66	12.96	11.09	12.21
Median	9.65	11.96	9.25	10.14



Dissolved Oxygen (% Sat)				
	Dolomite Road	**Dumbell Stream**	**Pumphouse Stream**	**Julienne Narrows (Wabush Lake)**
Min	77.4	86.2	75.7	85.9
Max	106.6	97.3	102.1	110.2
Median	92.5	90.0	88.0	93.8



Turbidity (NTU)				
	Dolomite Road	**Dumbell Stream**	**Pumphouse Stream**	**Julienne Narrows (Wabush Lake)**
Min	0.0	0	0.0	0.0
Max	18.8	35.5	124.6	1624.0
Median	0.0	2.3	3.4	2.2