Petite Rivière
5-Year Water-Quality Report

Bluenose
Coastal Action
Foundation

Prepared By

Bluenose Coastal Action Foundation

February 2018

Coastal Action
The Bluenose Coastal Action Foundation
Captain Angus Walters House
37 Tannery Road PO Box 730 Lunenburg, NS B0J 2C0
Telephone: 902-634-9977 Fax: 902-634-9979

www.coastalaction.org @coastalaction

/bluenose.coastal @coastalaction

Questions or comments regarding this report can be directed to Sarah MacLeod at sarah@coastalaction.org

DISCLAIMER

This report is for information purposes only. Readers should use the data with caution and at their own risk. Coastal Action accepts no liability for the accuracy, availability, suitability, reliability, usability, completeness, or timeliness of the data or graphical depictions rendered from the data. It is the responsibility of all persons who use the data to independently confirm the accuracy of the data, information, or results obtained through its use.

Coastal Action expressly disclaim any warranties or representations, expressed or implied, including but not limited to the implied warranties of fitness for the purpose of accessing water-quality, hydrological, meteorological, climatological, or other data. In no event will Coastal Action or their employees, servants, agents, or committee members have any obligation arising from contract or tort, or be held accountable for loss of revenue or profit, or for indirect, special, incidental, or consequential damages arising from the use of this information.

TABLE OF CONTENT

ABOUT COASTAL ACTION

Coastal Action is a not-for-profit, community-based charitable organization established in 1993 to address environmental concerns throughout the south shore region of Nova Scotia. Coastal Action's mission is to restore and protect the environment through research, education, and action. Coastal Action has 13 dedicated team members and receives direction from a volunteer Board of Directors supported through a full-time Executive Director.

Coastal Action is involved with various environmental projects, with river restoration and monitoring programs incorporated in 1998; projects now encompass all of Atlantic Canada and include work inland and along the coast. The Petite Rivière water-quality monitoring program is one of the many ongoing projects in the organization. Other programs include: environmental consulting, wetland and watershed restoration, water-quality and species-at-risk monitoring, stormwater management, microplastic debris research, and environmental education programs.

EXECUTIVE SUMMARY

The Petite Rivière Water-quality monitoring Program (PRWP) was established in 2010 to monitor the health of the Petite Rivière watershed in southern Nova Scotia (NS). For the protection of freshwaters of NS, the objectives of the program are to: determine baseline water-quality values prior to any disturbances in the region, monitor and evaluate water-quality changes as they apply to aquatic life, and assess long-term trends in the Petite Rivière watershed.

The PRWP consists of 18 sites, which are monitored monthly by Coastal Action. A YSI multi-parameter water-quality probe is used at each site to measure seven water-chemistry parameters: conductivity, pH, dissolved oxygen (DO), pressure, salinity, temperature, and total dissolved solids (TDS).

Although water temperature, DO, and TDS have values that were outside the thresholds for aquatic health, recommended by the Canadian Council of Ministers of the Environment (CCME), pH appears to pose the biggest threat to watershed health. Only 13.2% of water temperatures exceeded the upper temperature threshold of 23°C. No samples were more than 4.6°C higher than the threshold limit. According to the CCME, there are no thresholds for conductivity, pressure, or salinity on the health of aquatic organisms, therefore these parameters are not considered detrimental to the Petite Rivière watershed health. Only the estuary site (Head of Tide) had TDS concentrations high enough to pose a threat to organisms; however, the potential risk is low, as only tolerant mature fish and acclimatized organisms would be found at the site. DO concentrations were greater than the minimum 6.5 mg/L concentration guideline from the CCME for >72% of samples. The DO concentrations recorded in the Petite Rivière are not low enough to affect aquatic life as long as these DO dips are not maintained for long periods of time. More than 90% of measurements taken between 2010 and 2017 from all sites were less than the minimum 6.5 pH threshold set by the Canadian Council of Resource and Environment Ministers (CCREM). Long-term and short-term exposure to acidic conditions is known to negatively affect aquatic organisms; although the degree of exposure organisms face in the Petite Rivière is unknown, it is clear that acidic conditions are a concern for aquatic health. We

hypothesize that the acidity is connected to acid rock drainage (ARD), as the region has a high potential for ARD, according to Nova Scotia's Department of Natural Resources, due to the geologic formations in the region.

To prevent degradation of the Petite Rivière watershed: additional sampling, increased sampling frequency, an investigation of geology in the region associated with ARD, the addition of more water chemistry parameters, and the proper care of water-testing instruments are recommended.

Since the creation of the PRWP in 2010, the watershed health of the Petite Rivière has been monitored. This report provides the first look at water quality measurements and potential threats to watershed life.

ACKNOWLEDGEMENTS

The success of the PRWP is the result of years of work and dedication by various individuals. Coastal Action would like to acknowledge all help provided throughout the design and implementation of the PRWP:

- All field staff who have gone into the field to gather data regardless of the weather.
- All volunteers who dedicated hours of their time to help sample.
- The Community-Based Environmental Monitoring Network (CBEMN) for donating the multi-parameter YSI.
- Our funders who have donated time and money to ensure the continuation of the PRWP.

INTRODUCTION

BACKGROUND

The Petite Rivière watershed is located along the southern shore of NS (Figure 1). The watershed covers 244 km^2 of forested and agricultural lands, in addition to rural and urban communities. The Petite Rivière provides habitat for an array of aquatic organisms, some of which are endangered or threatened. Within the Petite Rivière, populations of the American eel, Atlantic whitefish, and Southern uplands Atlantic salmon are declining. The American eel is considered "threatened", while the latter two are considered "endangered" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC: COSEWIC, 2012; COSEWIC, 2010A; COSEWIC, 2010B;); however, only the Atlantic whitefish is listed as "endangered" under the Species at Risk Act (SARA) for Nova Scotia and Canada. The Petite Rivière is home to the last population of Atlantic whitefish found on Earth.

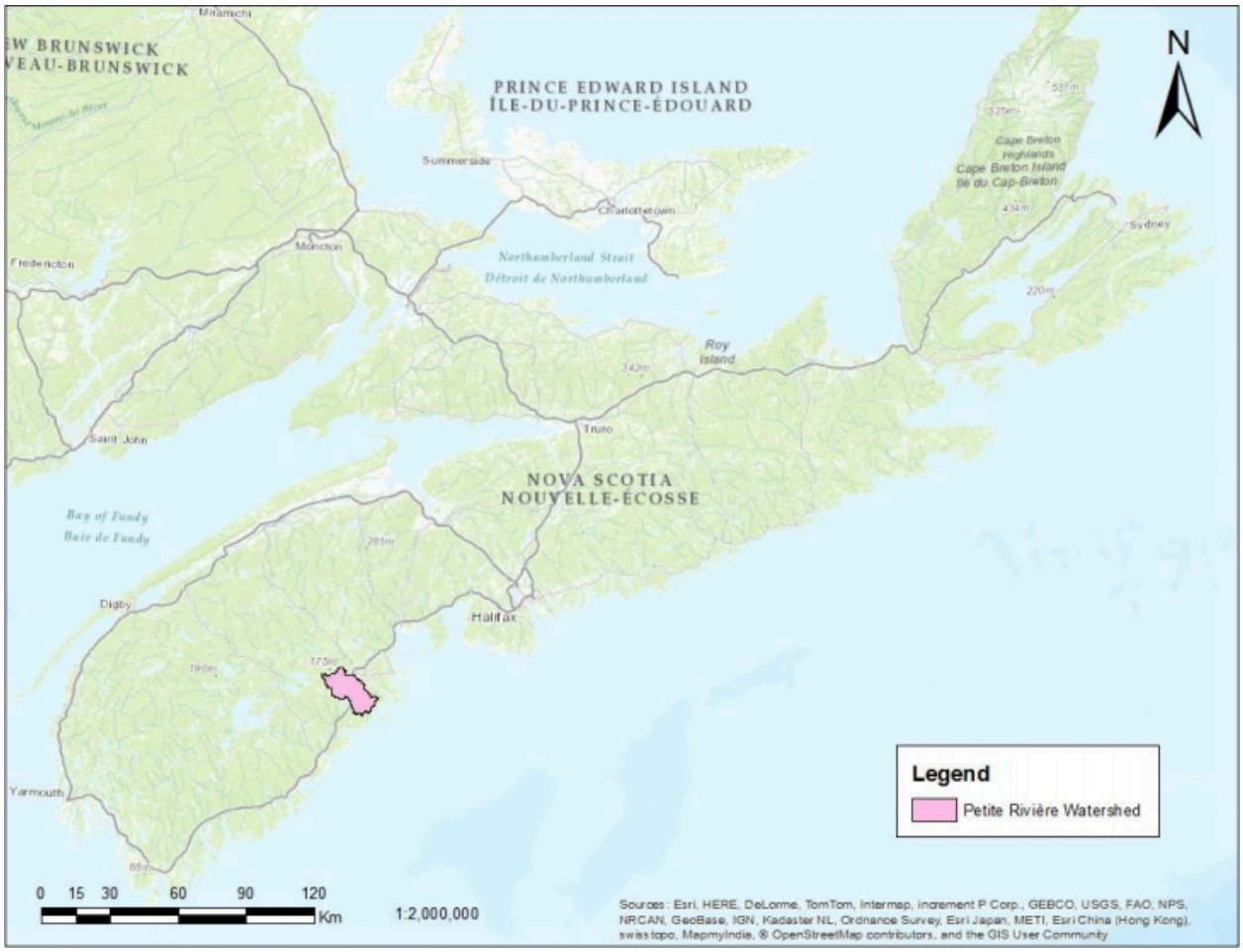

Figure 1: Map of Nova Scotia, with the Petite Rivière watershed highlighted in pink.

As an initiative to monitor the health of the Petite Rivière watershed, Coastal Action created the PRWP. The PRWP has been running continuously since its creation in 2010, with water sampling performed by Coastal Action staff and volunteers each month. Water quality parameters monitored by Coastal Action are compared to various water quality guidelines to assess the condition of the Petite Rivière watershed.

PROGRAM OBJECTIVES

In an effort to monitor and protect the health of the Petite Rivière watershed, the PRWP's goals are to:

- Create a long-term water-quality database for the watershed to help evaluate ecosystem health.
- Provide a water-quality baseline for any disturbances that occur in the region.
- Monitor and assess water-quality changes within the Petite Rivière watershed to help understand the effects on biotic - and human - health.
- Promote collaboration by uploading data to the CBEMN database.

REPORT OBJECTIVES

In an effort to assess the health of the Petite Rivière watershed, this report aims to:

- Present all water chemistry parameter data since the beginning of the program.
- Interpret water chemistry parameter trends over the course of sampling.
- Compare water chemistry values to known ranges suitable for aquatic life.
- Provide recommendations to address water chemistry concerns in the watershed.
- Summarize the current and possible future status of the Petite Rivière watershed health.

PETITE RIVIÈRE WATER-QUALITY MONITORING PROGRAM

WATERSHED DESCRIPTION

LOCATION

In southern NS, the Petite Rivière watershed is located south and southwest of the Town of Bridgewater and runs through various rural communities. The Petite Rivière runs approximately 40 km in length; the headwaters of the river are found at Birch Brook and descend 120 m in elevation to the river's mouth, located in Green Bay (Figure 2).

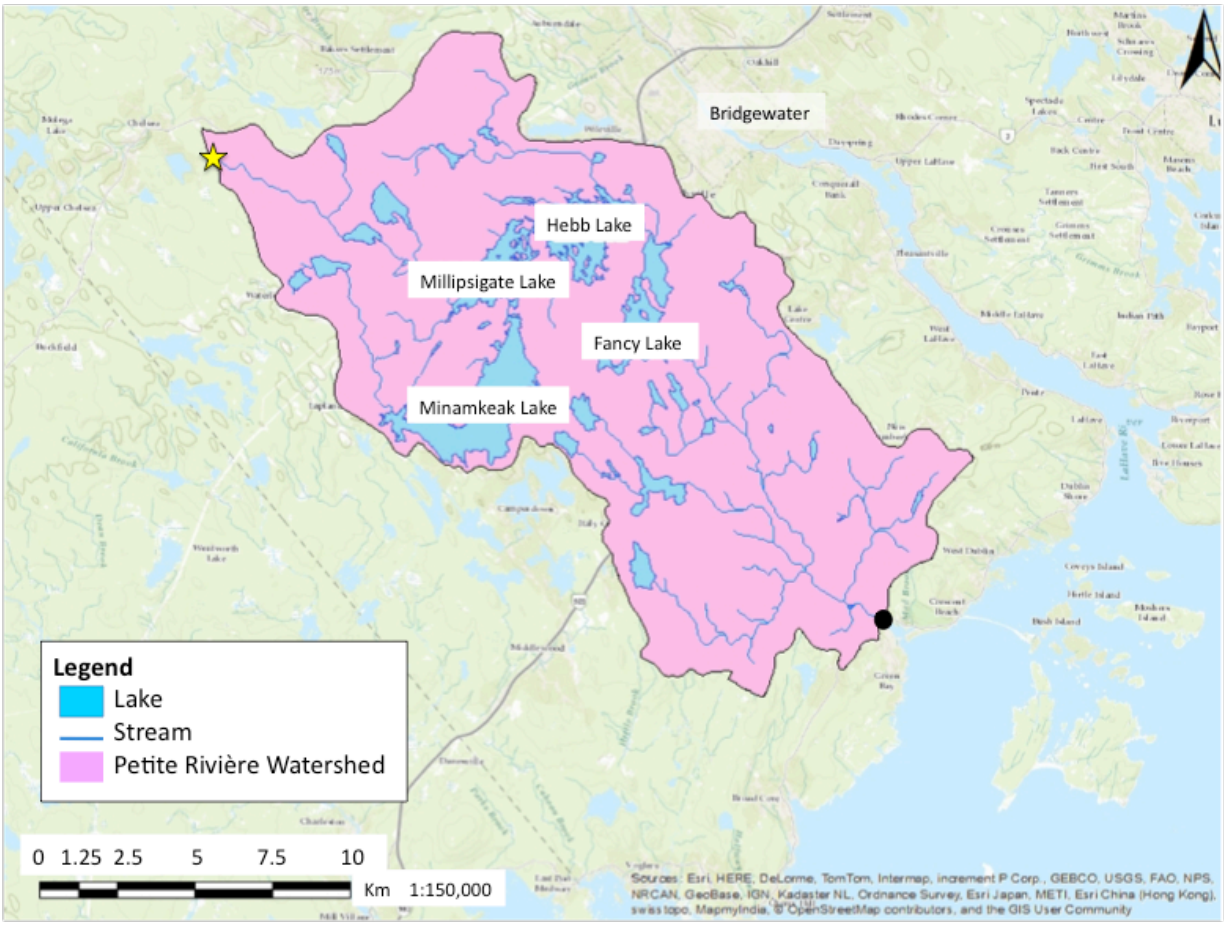

Figure 2: Outline of the Petite Rivière watershed (highlighted in pink), with regards to Birch Brook (yellow star) and Green Bay (black circle).

GEOLOGY

The Petite Rivière watershed is underlain by the Meguma Supergroup, which consists of the Halifax and Goldenville Groups. The Feltzen Formation, part of the Halifax Group, dominates the Petite Rivière watershed and contains layers of metasandstone and blue-grey slate (White, 2010). Two formations of the Goldenville Group also underlie the Petite Rivière watershed: the Government Point and Green Harbour formations; these formations are comprised mainly of metasandstones and metasiltstones (White, 2010). The Petite Rivière watershed contains areas with high potential for ARD (Figure 3; Trudell and White, 2013); rocks containing sulphide-rich minerals oxidize to form sulphuric acid, which can contaminate waters and increase acidity.

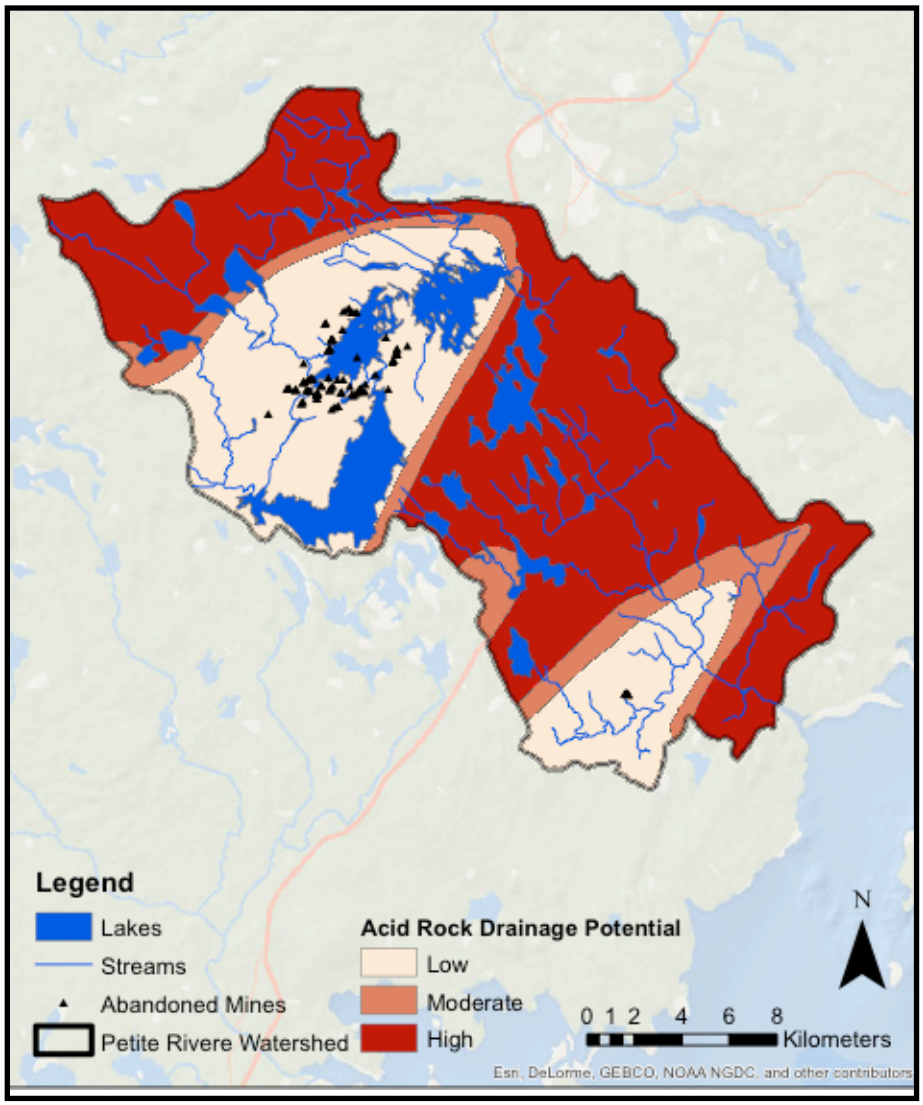

Figure 3: Abandoned mines and the potential for acid rock drainage in the Petite Rivière watershed.

BIOTA

The Petite Rivière watershed consists of Nova Scotia's 740-LaHave Drumlins and 830-South Shore Ecodistricts (NS Department of Natural Resources, 2002). The LaHave Drumlins Ecodistrict is covered by coniferous forests, composed primarily of hemlock, red spruce, black spruce, balsam fir, and white pine; smaller pockets of sugar maple, red oak and beech have been found within the ecodistrict on well-drained hills and drumlins (Neily et al., 2005). In the South Shore Ecodistrict, the forests are dominated by black and white spruce, with balsam fir found in smaller quantities (Neily et al., 2005). As the South Shore Ecodistrict is found along the coast, many trees have stunted growth due to exposure to extreme wind conditions (Neily et al., 2005).

The Petite Rivière watershed is home to several at-risk and endangered aquatic species. The American eel and Southern uplands Atlantic salmon are found within the watershed, and were listed as "threatened" in 2012, and "endangered" in 2010, respectively, by COSEWIC (COSEWIC, 2012; COSEWIC 2010B); however, there are no official SARA statuses for either species, in Nova Scotia or Canada. In addition, the Petite Rivière provides habitat for the last remaining population of the COSEWIC and SARA-listed endangered Atlantic whitefish in the world (Fisheries and Oceans Canada, 2016; COSEWIC, 2010A).

LAND USE

The land within the Petite Rivière watershed is used for various industrial, commercial, and residential exploits (Hopper et al., 2000). Industrial mines border the Petite Rivière watershed, with a number of abandoned industrial mines used for gold and aggregate quarries located near the Petite Rivière headwaters (Drage, 2015). The commercial industry in the region harvests balsam firs in the Petite Rivière watershed, as the region has a thriving Christmas Tree industry (Neily et al., 2005). Finally, the Petite Rivière watershed contains some residential areas, as the Petite Rivière runs through several rural communities, and crosses the 103 Fisherman's Highway

SAMPLE COLLECTION

Water quality was measured at 18 sites across the Petite Rivière watershed (Figure 4). Water chemistry parameters were measured in-situ (latin for 'in original place') using a YSI sonde multi-parameter water quality instrument. Sampling began in May 2010 at 11 sites (Table 1); seven more sites were added to the sampling list between May 2011 and May 2012. Measurements were obtained biweekly between 2010 and 2013; measurements have been collected on a monthly basis since 2013.

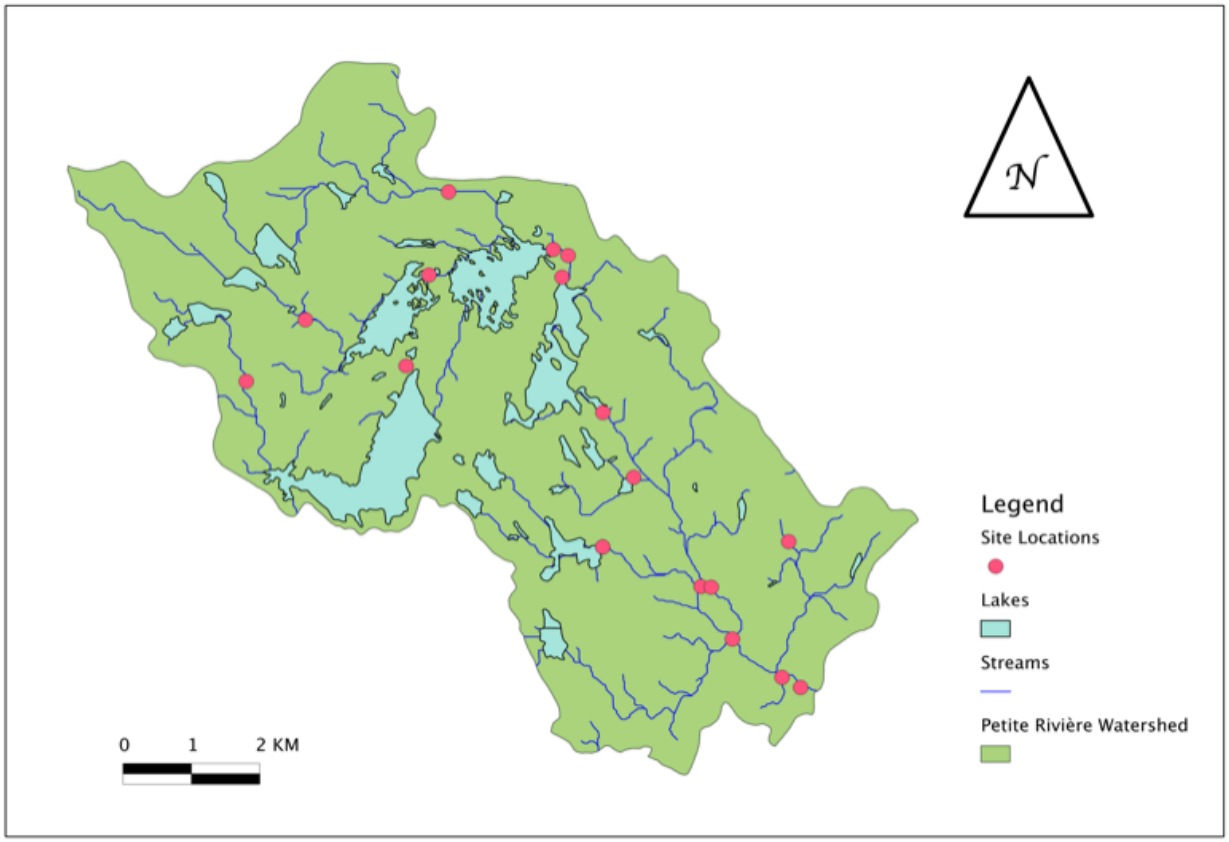

Figure 4: Sampling site locations within the Petite Rivière watershed.

Table 1: PRWP sampling start dates, and current site names, nicknames, site types, and coordinates, and site names used in previous years.

Start of Sampling	Current Site Name	Current Site Nickname	2010 Sampling Year Site Name	2011 Sampling Year Site Name	Site Type	Latitude	Longitude
May 2010	Milipsigate Dam	Milipsigate	Millipsigate Lake	Millipsigate Lake	Lake	N 44.34448	W 064.59073
	Birch Brook	Birch	Birch Brook	Birch Brook	River/Stream	N 44.33183	W 064.63570
	Minamkeak Brook	Minamkeak	Indian Garden Farms Train Bridge	Minamkeak Dam / Minamkeak Brook	Lake	N 44.31993	W 064.59843
	Hebb Lake to Fancy Lake Outlet	Fancy	Fancy Lake Outlet	Hebb Lake to Fancy Lake Outlet	River/Stream	N 44.35044	W 064.53985
	Conquerall Mills Dam	Conquerall	Fitch Lake Brook	Conquerall Mills	River/Stream	N 44.30833	W 064.52599
	Hebb Mill Brook (Publicover Lake)	HebbMill	H2O9/Crousetown Road	Hebb Mill Brook	River/Stream	N 44.29110	W 064.51426
	Italy Cross Intersection (Wallace Brook)	Italy	Conquerall Mills and Crousetown Roads Junction	Italy Cross Intersection (Wallace Brook)	Culvert	N 44.26202	W 064.48882
	Crousetown Dam	Crousetown	Crousetown Dam	Crousetown Dam	Dam	N 44.26188	W 064.48510
	Brown Branch Brook	BrownBranch	Brown Brook	Brown Branch Brook Bridge	Culvert	N 44.24802	W 064.47700
	Wamback Mill Brook	WambackMill	Wamback Mill Brook	Wamback Mill Brook	River/Stream	N 44.23883	W 064.45638
	Petite Riviere Head of Tide	HeadofTide	Petite Estuary	Petite Riviere Bridge	River Estuary	N 44.23420	W 064.44730
May 2011	Hebbville Dam	Hebbville		Hebbville Dam	Dam	N 44.35199	W 064.54532
Nov 2011	Wallace Brook (Wallace Lake)	Wallace			Culvert	N 44.27216	W 064.52512
	Weagle's Dam Outlet	Weagle			River/Stream	N 44.34456	W 064.54189
	Wildcat Brook	Wildcat			River/Stream	N 44.36694	W 064.58411
May 2012	Frederick's Brook	Frederick			Culvert	N 44.31488	W 064.65692
	Kaulback Brook	Kaulback			Culvert	N 44.27448	W 064.45704
	Fire Pond	FirePond			Lake	N 44.23794	W 064.45856

PARAMETERS

Seven water chemistry parameters are measured *in-situ* throughout the PRWP (Table 2).

Temperature

Temperature (^{o}C) is measured at all sites for the PRWP. We compare measurements to a temperature range of 5°C to 23°C, as this range addresses the specific temperature threshold for native fish (Atlantic whitefish and brook trout) in the Petite Rivière watershed (Cook et al., 2010, Hokanson et al., 1973).

Conductivity

Conductivity (mS/cm) is a measurement of the water's ability to conduct an electrical current. Here we measure conductivity via specific conductivity, which means the conductivity measurement is scaled to a standard temperature of 25°C, as temperature variations can affect the water's conductivity. There is no proposed range or threshold for conductivity on the health of aquatic organisms by the CCME.

Total Dissolved Solids

TDS (mg/L) is used as a proxy for how clear the water is. There is no proposed range or threshold for TDS on the health of aquatic organisms by the CCME; however, mature fish can survive TDS concentrations > 2000 mg/L, yet invertebrates are negatively affected at TDS >1000 mg/L (Weber-Scannell and Duffy, 2007).

Salinity

Salinity (ppt) measures the amount of salt within water. There is no proposed range or threshold for salinity on the health of aquatic organisms by the CCME.

Pressure

Pressure (mmHg) is measured using a barometer within the YSI unit. There is no proposed range or threshold for pressure on the health of aquatic organisms by the CCME.

Dissolved Oxygen

DO (mg/L and %) is measured, as it is a necessity for aquatic life. DO varies based on the time of day, season, and region. DO can increase in waters with turbulent flow, which entrap oxygen from the air and allow for highly aerated waters. The CCME has set the minimum DO concentration to 6.5 mg/L for the protection of aquatic health (CCME, 1999).

pH

pH measures the acidity of waters; the pH scale ranges from 0 (highly acidic) to 14 (highly basic), with 7 being neutral. pH is measured as the negative log of the hydrogen ion concentration. The CCREM has set a pH range of 6.5-9 for the protection of aquatic organisms (CCREM, 1987).

Table 2: Water quality parameters and units used during PRWP sampling.

Parameter	Units
Temperature	^{o}C
Pressure	mmHg
Dissolved Oxygen (DO)	% and mg/L
Conductivity	mS/cm
Total Dissolved Solids (TDS)	mg/L
Salinity	ppt
pH	pH units

Quality Assurance and Quality Control

All data collected during the PRWP were subject to quality assurance and quality control (QA/QC) measures. The DO, conductivity, and pH of the YSI were calibrated to ensure minimal instrumental error. In the field, at least three DO (%) calibrations were done per sampling day. In the lab, pH and conductivity were calibrated monthly. At each site during sampling, the YSI was left in the river for several minutes before readings were made, to ensure the instrument had time to adjust to the specific water conditions. After field sampling, the data were transferred from a hardcopy to an online database; a separate employee confirmed the online database, using a hardcopy, to ensure proper transcription. When confirmation was unavailable due to missing hardcopies, the data were removed from the database as a precaution.

Statistical Analyses

Data from all sites were analyzed using the R statistical software, version 3.1.0. As data were obtained in biweekly and monthly intervals, they were converted to a daily time-step to help address inconsistencies.

Due to the limited sample size for the PRWP, only basic statistics were performed for the water quality parameters to avoid skewed and unreliable trends.

RESULTS AND INTERPRETATION

TEMPERATURE

Temperatures found within the Petite Rivière watershed ranged between -1°C and 28°C for the 18 sites between 2010 and 2017 (Figure 5). The maximum measured temperature, 27.6°C, was recorded at Wallace Brook, while the lowest temperature, -0.1°C, was recorded at Wamback Mill Brook. The water temperature for all sites had a standard deviation between 6 and 8°C.

The Petite Rivière sites appear to provide a suitable habitat for aquatic species during the majority of the year. Using a temperature range of 5°C to 23°C, based off the temperature thresholds for the Atlantic whitefish and brook trout (Cook et al., 2010; Hokanson et al., 1973), sites exceeded the maximum suitable temperature between 0-13.2% of all measurements, with exceedances occurring during the June-September months. No site exceeded the maximum suitable water temperature by more than 4.6°C. Sites had between 23-38% of their temperatures below the minimum aquatic value. Although water temperatures for the Petite Rivière sites exceeded the suitable temperature range for Atlantic whitefish and brook trout, the limited amount by which the maximum temperature was exceeded suggests that the long-term health of aquatic species should not be affected. In addition, temperature minimums occurred during the winter months, where anadromous species have already migrated to the ocean (Hansen and Jonsson, 1991; Berg and Jonsson, 1989), therefore the low temperatures should not affect the aquatic health in the watershed.

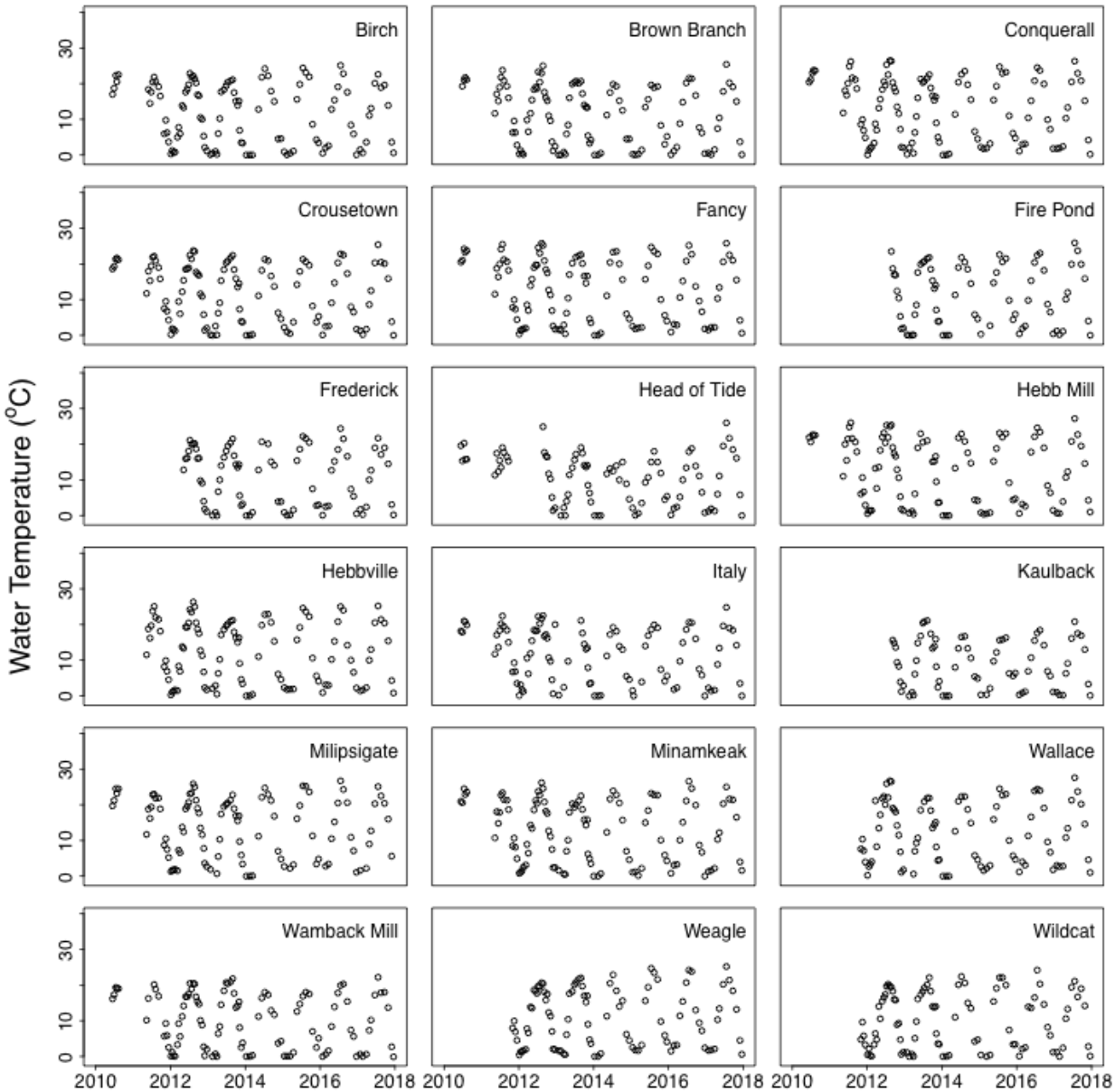

Figure 5: Water temperatures (°C) for the 18 sampling sites in the Petite Rivière watershed, from 2010 to 2017.

CONDUCTIVITY

Conductivity measurements in the Petite Rivière watershed should not negatively affect the watershed's aquatic health. The conductivity throughout Petite Rivière ranges from 0.0 mS/cm to 49 mS/cm (Figure 6). The highest conductivities are recorded at the Head of Tide site, which is expected, as it is an estuary and heavily influenced by the ocean. High conductivities (0.1- 0.3 mS/cm) were also measured at Weagle; we hypothesize that these

anomalies are due to human activities, as the site is located directly beside a parking lot for a fuel supply store. As the CCME does not have a conductivity limit for the protection of aquatic life in freshwaters, we do not believe that the conductivities recorded in the Petite Rivière pose a threat to Petite Rivière aquatic life and watershed health.

During the winter of 2013, a dip in conductivity appears to be an anomaly in the dataset. Conductivities recorded between October 18th and December 5th, 2013 were the lowest recorded conductivities throughout the entire PRWP sampling period (from 2010-2017). As the conductivity dip is consistent across all 18 sampling sites during this period, we hypothesize that the dip is due to a miscalibration of the conductivity probe. No major storm events or unusual flow activity coincided with this period; therefore, we believe this to be an artifact of sampling error and not indicative of the watershed's water quality. There is a peak in conductivity during the summer of 2016 for all 18 sites - this peak coincides with a drought event.

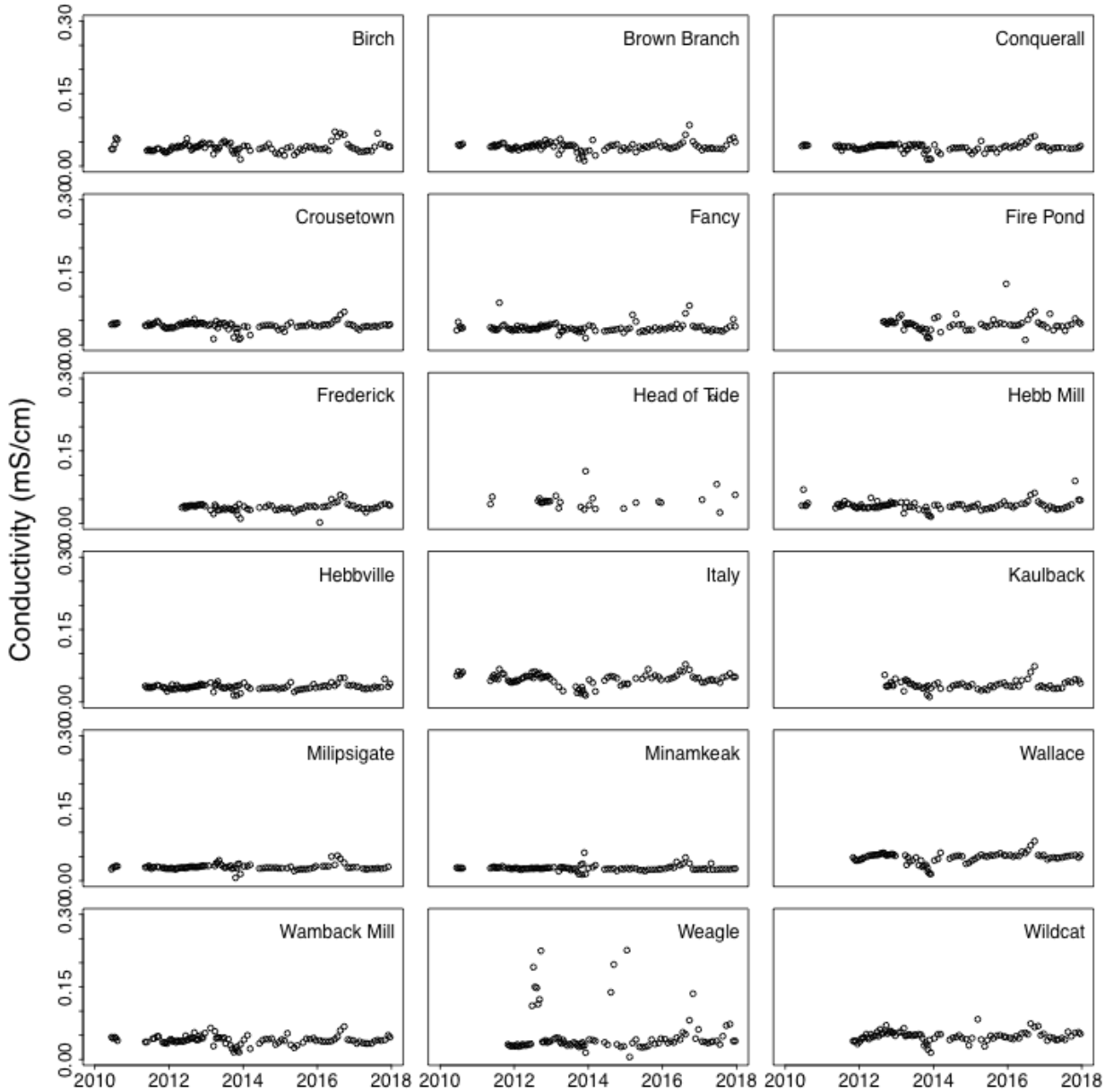

Figure 6: Conductivity (mS/cm) for the 18 sampling sites in the Petite Rivière watershed, from 2010 to 2017. Due to the same y-axis used for all 18 sites, 57 HeadofTide conductivity measurements are not shown in the above graph: 2.794 on 2010/06/14; 43.63 on 2010/06/29; 4.156 on 2010/07/16; 45.96 on 2010/07/26; 44.8 on 2010/08/11; 47.937 on 2011/06/15; 43.333 on 2011/06/27; 46.440 on 2011/07/11; 44.460 on 2011/07/25; 46.970 on 2011/08/08; 46.907 on 2011/09/07; 42.383 on 2011/09/22; 43.305 on 2013/04/11; 44.327 on 2013/04/26; 42.659 on 2013/05/09; 43.799 on 2013/06/06; 41.358 on 2013/06/28; 44.582 on 2013/07/12; 48.759 on 2013/08/30; 42.159 on 2013/09/13; 31.591 on 2013/10/01; 31.591 on 2013/10/31; 20.911 on 2013/11/06; 44.6 on 2014/06/10; 45.594 on 2014/07/10; 46.833 on 2014/08/11; 47.795 on 2014/09/09; 44.894 on 2014/10/10; 17.66 on 2014/11/17; 34.65 on 2015/01/16; 0.709 on 2015/02/12; 0.4 on 2015/03/13; 46.1 on 2015/05/20; on 33.08 on 2015/06/17; 45.42 on 2015/07/17; 42.43 on 2015/08/14; 46.17 on 2015/09/17; 44.42 on 2015/10/19; 3.42 on 2016/01/26; 0.514 on 2016/02/24; 44.47 on 2016/03/23; 42.75 on 2016/04/22; 43.74 on 2016/05/20; 45.47 on 2016/06/23; 45.69 on 2016/07/19; 46.08 on 2016/08/15; 46.56 on 2016/09/23; 45.27 on 2016/10/28; 0.9 on 2016/11/23; 0.95 on 2016/12/21; 0.415 on 2017/02/21; 42.98 on 2017/03/27; 40.43 on 2017/04/25; 1.54 on 2017/08/18; 43.17 on 2017/09/21; 40.56 on 2017/10/27; and 24.8 on 2017/11/30.

TOTAL DISSOLVED SOLIDS

TDS ranged from 1 mg/L to 113,677 mg/L throughout the sampling period at the 18 Petite Rivière sites from 2010 to 2017 (Figure 7); only the estuary site appears to pose a threat to aquatic life due to high TDS concentrations. The 17 freshwater sites along the Petite Rivière averaged 26 mg/L of TDS, with the sole estuary site, Head of Tide, averaging 17,701 mg/L. In a literature review of the effects of TDS on aquatic life, Weber-Scannell and Duffy (2007) found that the effects of high TDS depended on the life stages of fish: eggs were most vulnerable, whereas juvenile and mature Salmonidae could survive TDS exposures greater than 2,000 mg/L. For Head of Tide, 54.7% of measurements exceeded 2,000 mg/L between 2010 and 2017; however, as fish spawning occurs further upstream in freshwaters, it is likely that only mature fish would be present in the estuary site, and therefore could withstand the high TDS concentrations. For aquatic invertebrates: mayflies, caddisflies, flatworms, and diptera larvae, 30% population mortality, 50% population mortality, 100% population mortality, and 50% population mortality, respectively, required TDS concentrations >1,000 mg/L (Weber-Scannell and Duffy, 2007). For the Petite Rivière watershed, only the Head of Tide site would be unsuitable for aquatic invertebrates.

Two separate events, a dip and a spike in TDS, appear to be present at all 18 sites within the sampling period. TDS dips during the winter of 2013; however, as TDS is calculated based on conductivity measurements, and a dip in conductivity occurred during this same time, we hypothesize that this anomaly is an artifact of a miscalibrated conductivity probe. There is a peak in TDS during the summer of 2016 for all 18 sites; the peak coincides with a drought event in Southern NS.

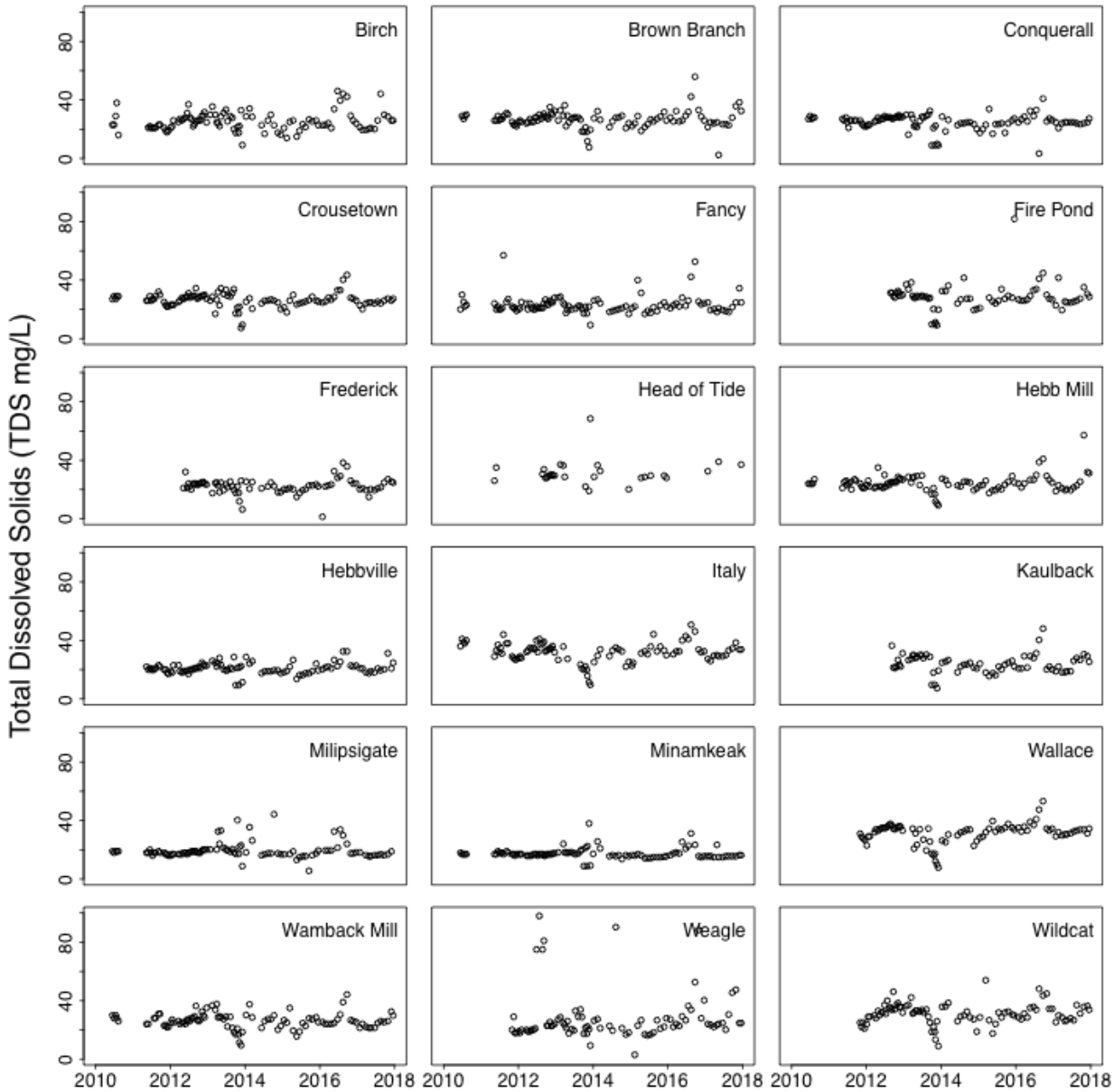

Figure 7: Total Dissolved Solids (TDS; mg/L) for the 18 sampling sites in the Petite Rivière watershed, from 2010 to 2017. Due to the same y-axis used for all 18 sites, five Weagle TDS measurements are not shown in the above graph: 124 on 2012/07/09; 116 on 2012/08/10; 145 on 2012/09/21; 127.4 on 2014/09/09; and 146.9 on 2015/01/16. 57 HeadofTide TDS measurements are not shown in the above graph: 1839 on 2010/06/14; 28360 on 2010/06/29; 2638 on 2010/07/16; 29800 on 2010/07/26; 29150 on 2010/08/11; 31210 on 2011/06/15; 28400 on 2011/06/27; 29970 on 2011/07/11; 28830 on 2011/07/25; 30560 on 2011/08/08; 30480 on 2011/09/07; 27590 on 2011/09/22; 28221 on 2013/04/11; 28840 on 2013/04/26; 27755 on 2013/05/09; 24365 on 2013/06/06; 26458 on 2013/06/28; 23564 on 2013/07/12; 32189 on 2013/08/30; 85231 on 2013/09/13; 92974 on 2013/10/01; 22971 on 2013/10/31; 113677 on 2013/11/06; 28983 on 2014/06/10; 29633 on 2014/07/10; 30439.5 on 2014/08/11; 31070 on 2014/09/09; 29191.5 on 2014/10/10; 24350 on 2014/11/17; 22574.5 on 2015/01/16; 1456 on 2015/02/12; 190 on 2015/03/13; 28015.5 on 2015/06/17; 27586 on 2015/08/14; 30004 on 2015/09/17; 28873 on 2015/10/19; 2210 on 2016/01/26; 380 on 2016/02/24; 28912 on 2016/03/23; 67742 on 2016/04/22; 28410 on 2016/05/20; 29555.5 on 2016/06/23; 29698.5 on 2016/07/19; 29958.5 on 2016/08/15; 30277 on 2016/09/23; 29425.5 on 2016/10/28; 585 on 2016/11/23; 465.4 on 2016/12/21; 269 on 2017/02/21; 28301 on 2017/03/27; 26343 on 2017/04/25; 390 on 2017/06/19; 146.25 on 2017/07/20; 864.5 on 2017/08/18; 28067 on 2017/09/21; 26370.5 on 2017/10/27; and 15600 on 2017/11/30.

SALINITY

The salinity of water in the Petite Rivière watershed does not appear to be a detriment to watershed health. The maximum salinity of the 17 freshwater sites does not exceed 0.11 ppt, while the Head of Tide estuary site has a maximum salinity of 33 ppt (Figure 8). As the CCME does not have a threshold for salinity, we conclude that the salinity of water in the Petite Rivière does not affect watershed health. In addition, as Atlantic whitefish are fully tolerant of seawater (Cook et al., 2010), and all anadromous fish migrate to the ocean at maturity, the highly saline waters found in the Head of Tide estuary should not be a detriment to fish populations in the watershed.

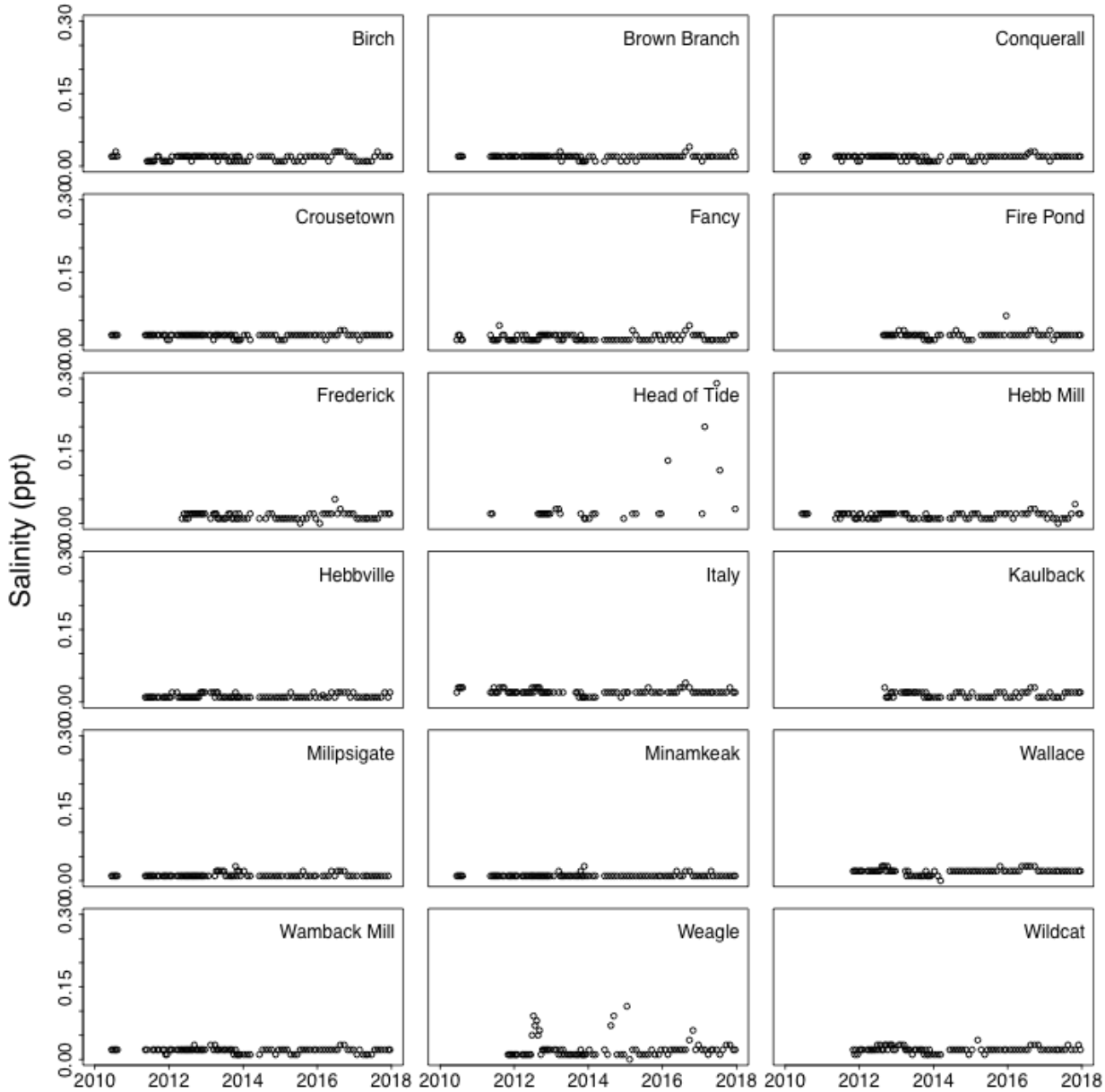

Figure 8: Salinity (ppt) for the 18 sampling sites in the Petite Rivière watershed, from 2010 to 2017. Due to the same y-axis used for all 18 sites, 55 HeadofTide salinity measurements are not shown in the above graph: 2.794 on 2010/06/14; 43.63 on 2010/06/29; 4.156 on 2010/07/16; 45.96 on 2010/07/26; 44.8 on 2010/08/11; 47.937 on 2011/06/15; 43.333 on 2011/06/27; 46.44 on 2011/07/11; 44.46 on 2011/07/25; 46.97 on 2011/08/08; 46.907 on 2011/09/07; 42.383 on 2011/09/22; 43.305 on 2013/04/11; 44.327 on 2013/04/26; 42.659 on 2013/05/09; 43.799 on 2013/06/06; 41.358 on 2013/06/28; 44.582 on 2013/07/12; 48.759 on 2013/08/30; 42.159 on 2013/09/13; 31.591 on 2013/10/01; 31.591 on 2013/10/31; 20.911 on 2013/11/06; 44.6 on 2014/06/10; 45.594 on 2014/07/10; 46.833 on 2014/08/11; 47.795 on 2014/09/09; 44.894 on 2014/10/10; 17.66 on 2014/11/17; 34.65 on 2015/01/16; 0.709 on 2015/02/12; 46.1 on 2015/05/20; 33.08 on 2015/06/17; 45.42 on 2015/07/17; 42.43 on 2015/08/14; 46.17 on 2015/09/17; 44.42 on 2015/10/19; 3.42 on 2016/01/26; 44.47 on 2016/03/23; 42.75 on 2016/04/22; 43.74 on 2016/05/20; 45.47 on 2016/06/23; 45.69 on 2016/07/19; 46.08 on 2016/08/15; 46.56 on 2016/09/23; 45.27 on 2016/10/28; 0.9 on 2016/11/23; 0.95 on 2016/12/21; 42.98 on 2017/03/27; 40.43 on 2017/04/25; 0.26 on 2017/05/12; 1.54 on 2017/08/18; 43.17 on 2017/09/21; 40.56 on 2017/10/27; and 24.8 on 2017/11/30.

PRESSURE

Pressure does not appear to influence the Petite Rivière watershed's health. The pressures measured throughout the Petite Rivière watershed range between 736 mmHg and 783.6 mmHg (Figure 9), with a maximum variance of 7.7 mmHg between all sites throughout the entire sampling period. As the CCME has no threshold for the occurrence of negative effects of pressure on aquatic life, and there is little change in measured pressure values over time and throughout the 18 sites, it appears that pressure is not a factor in the health of the Petite Rivière watershed.

Figure 9: Pressure (mmHg) for the 18 sampling sites in the Petite Rivière watershed, from 2010 to 2017; although the PRWP started in 2010, pressure was not introduced to the sampling list until 2014.

DISSOLVED OXYGEN

DO ranges from 1.2 mg/L to 21.1 mg/L at the 18 Petite Rivière sites from 2010-2017 (Figure 10). DO concentrations average 10.07 mg/L throughout the 18 sites, with standard deviations between 2.2 and 3.2 mg/L. DO concentrations follow a seasonal fluctuation, with highest DO concentrations observed during the winter months. Within the Petite Rivière, the highest DO concentrations were recorded at Hebb Mill and Milipsigate, while the lowest

DO concentrations were recorded at Birch, Fire Pond, Frederick, and Kaulback (1.2, 2.1, 1.6, and 2.5 mg/L, respectively).

Low DO concentrations observed in the Petite Rivière should not be a detriment to aquatic health in the Petite Rivière. According to the CCME, the lowest acceptable DO concentration for coldwater regions is 6.5 mg/L; in the 18 PRWP sites, samples exceeded 6.5 mg/L for >72% of the 2010-2017 sampling period. Moss and Scott (2011) found that bluegill, largemouth bass, and channel catfish could survive rapid decreases in DO to below 1.0 mg/L (at 25°C) for short periods, while Nebeker et al. (1992) saw no adverse effects on zooplankton when DO was greater than 2.1 mg/L. As our DO concentrations never fell below 1.2 mg/L, and between 0-27.3% of DO samples were less than 6.5 mg/L, it does not appear that DO concentrations in the Petite Rivière are low enough to negatively affect aquatic organisms.; however, as sampling is done monthly, it is unclear whether the DO dips are maintained for hours or days. If the latter, low DO concentrations may pose a greater threat to aquatic health. More data is required to investigate smaller DO intervals (diurnal, daily, weekly), and to capture the true length of the DO dips, which is not currently captured by the monthly sampling.

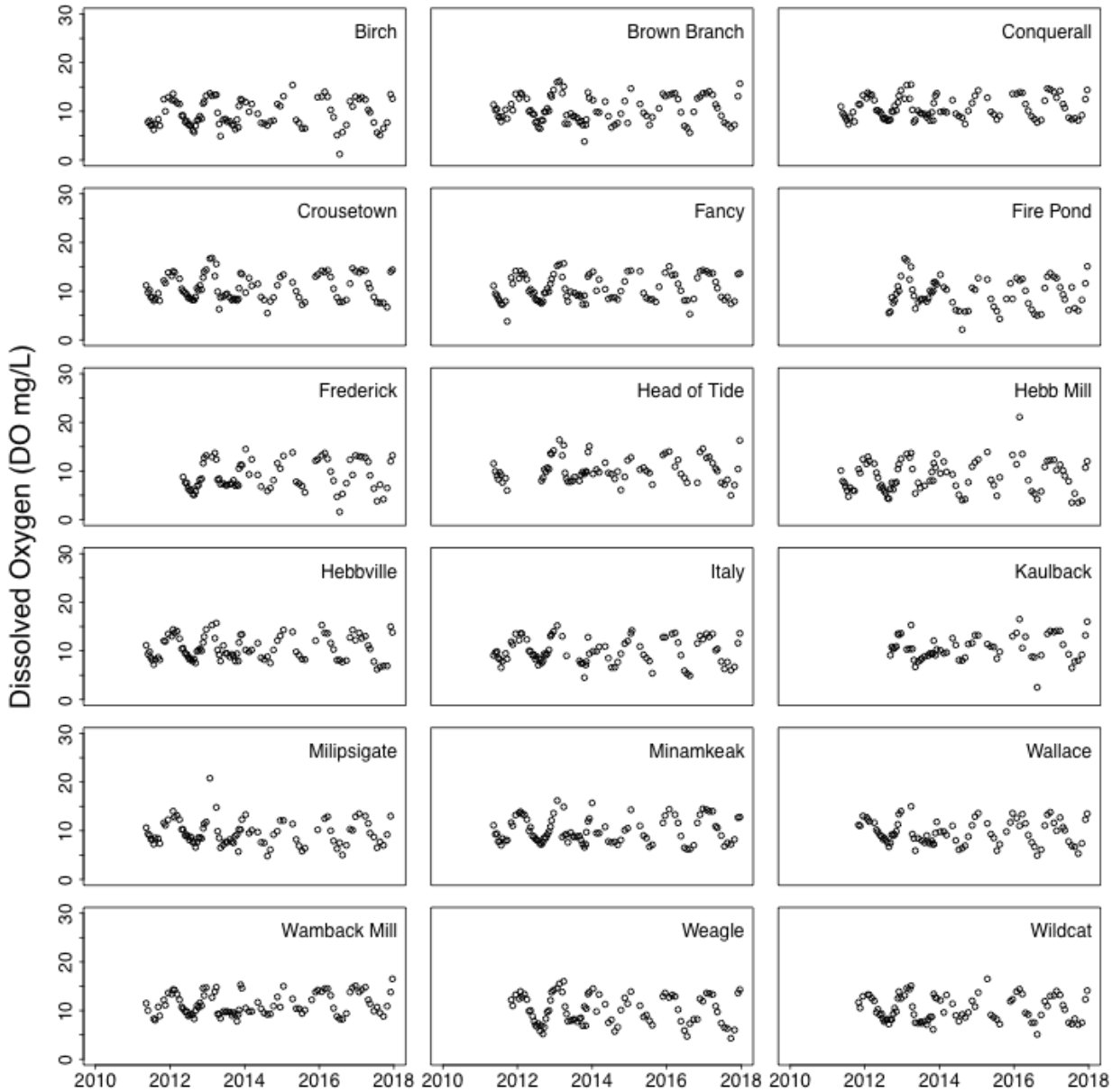

Figure 10: Dissolved Oxygen (DO; mg/L) for the 18 sampling sites in the Petite Rivière watershed, from 2010 to 2017.

pH

The variable pH recorded throughout the 18 sites appears to be a threat to aquatic life in the Petite Rivière watershed. The average pH recorded throughout the sampling period at the 18 sites was 5.6 (Figure 11), and no sites had pH values greater than the upper pH threshold for aquatic life (based off the 6.5-9 pH range suggested by CCREM in 1987). Unfortunately, all sites recorded pH values less than the 6.5 pH minimum recommended by the CCREM; >90% of pH samples for all sites were lower than 6.5 (Table 3). The lowest pH

values were recorded in Wildcat, Wamback Mill, Kaulback, Brown Branch, and Birch; these sites also had the most pH measurements below 5.0 – a pH known to decrease the survival of Atlantic whitefish eggs (Cook et al., 2010). Although short-term exposure to acidic conditions is associated with reduced seawater tolerance and marine survival for salmon (Staurnes et al., 1996), and long-term exposure to acidic conditions results in reduction of populations for phytoplankton, zooplankton, fish, and amphibians (Muniz, 1990), our data are collected in monthly intervals and therefore the length of acidic episodes is unknown, and the exposure times are unclear.

pH appears to be declining throughout the 2010-2017 sampling period for all Petite Rivière sites, except Head of Tide (Figure 11). The pH is significantly lower in the 2017 sampling year than the 2014-year for nine sites (Birch, Brown Branch, Conquerall, Crousetown, Hebbville, Italy, Minamkeak, Wamback, and Kaulback). Although the remaining eight freshwater sites do not have a significant difference in pH between 2014 and 2017, it is possible that the declines may be significant in the future. More data is required before trend analyses can be done to test whether pH is truly decreasing, and by how much.

ARD may be a factor in the extreme acidity of water throughout the Petite Rivière. The Petite Rivière is underlain with the Halifax and Goldenville Groups, two geological groups that contain sulphide-rich minerals (Fox et al., 1997). As these minerals are exposed to the elements, they oxidize and form sulphuric acid, which can leach into water supplies and increase water acidity. It is possible that pockets of these minerals have started oxidizing and increasing water acidity, as 9.4% of the Petite Rivière watershed has a high potential for ARD, while 10.0% of the watershed has a moderate potential for ARD (Figure 3; Trudell and White, 2013).

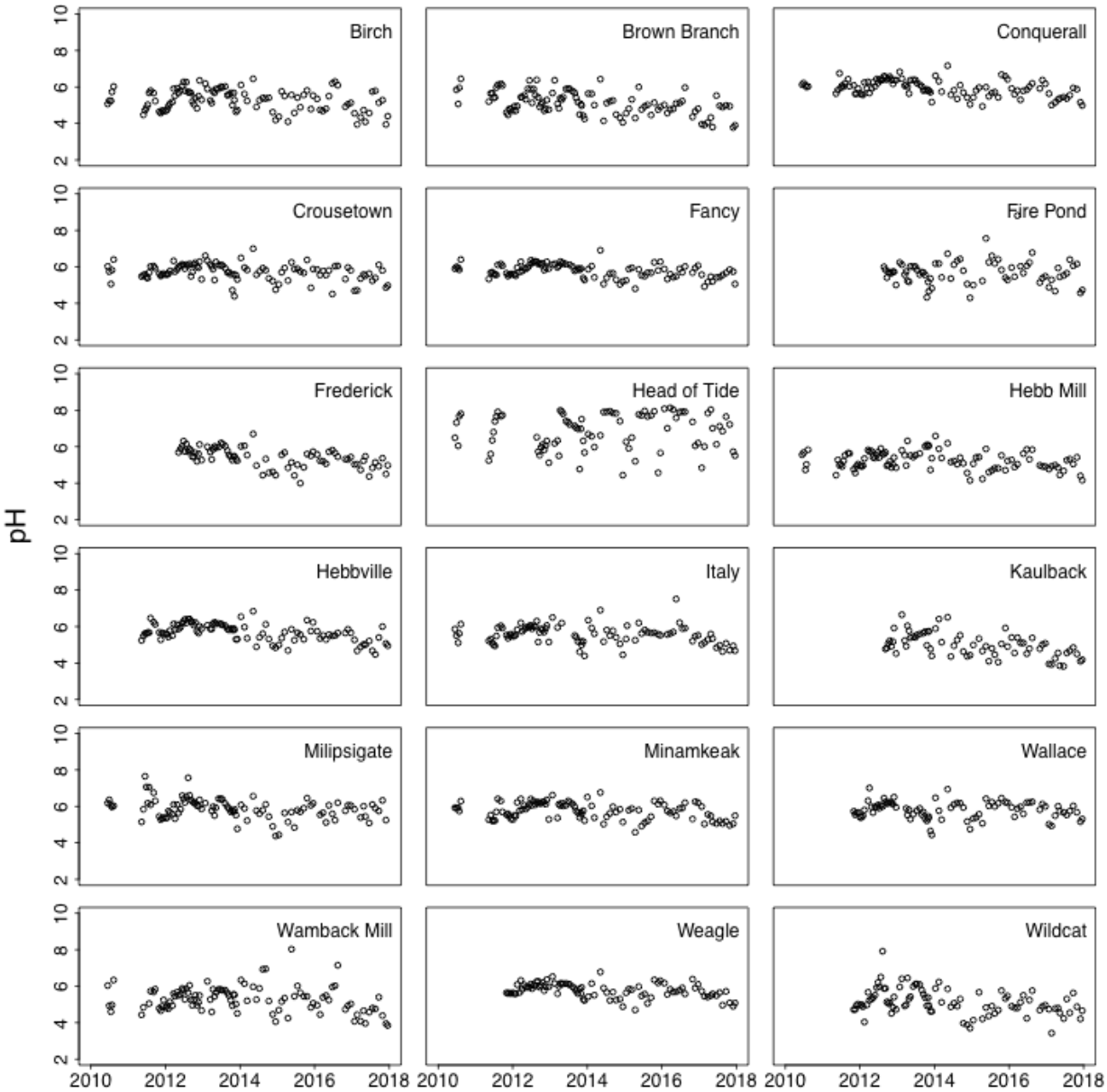

Figure 11: pH (pH units) for the 18 sampling sites in the Petite Rivière watershed, from 2010 to 2017.

Table 3: Number of measurements and percentage that each site's measured pH values were lower than 6.5 and 5.0.

Site	# Measurements	% Less than 6.5 pH	% Less than 5.0 pH
Birch	106	100	31
BrownBranch	105	100	44
Conquerall	107	92	2
Crousetown	106	98	8
Fancy	105	99	2
FirePond	72	93	11
Frederick	78	99	19
HeadofTide	86	38	5
HebbMill	100	99	35
Hebbville	101	98	10
Italy	96	97	11
Kaulback	70	97	53
Milipsigate	101	91	5
Minamkeak	105	97	3
Wallace	88	97	5
WambackMill	103	96	37
Weagle	93	98	4
Wildcat	92	98	50

RECOMMENDATIONS

To help ensure the maintained health of the Petite Rivière watershed, we suggest:

- The PRWP be continued so more samples can be gathered. Continuing sampling will:
    - Provide a reliable long-term water chemistry database
    - Provide enough data for statistically significant trend analyses
    - Provide a solid background for future studies
- Increase sampling frequency to capture smaller chemistry fluctuations and determine exposure-times for organisms during extreme conditions – if required, some sites may be removed to help make sampling more efficient.
- An investigation of the geology of the Wildcat, Wamback Mill, Kaulback, Brown Branch, and Birch sites for influence from ARD.
- The addition of further water chemistry variables to allow a better understanding of water chemistry interactions, effects, and trends.
    - Nutrients should be added to the sampling protocol, such as nitrogen and phosphorus, as the Petite Rivière incorporates several farmed and cleared lands, which may be causing algal blooms due to nutrient loading.
    - Due to low pH values, metals should be added to the sampling list, as certain metals increase in toxicity in higher acidic conditions.
    - Organic carbon should be added to the sampling protocol, as organic carbon may be present as organic acids. The presence of organic acids will provide insight into the acidity of sites within the PRWP.
- Calibration and proper care of YSI multi-parameter probes should be maintained to avoid artificial trends in the data

CONCLUSION

In 2010, the PRWP was implemented to monitor the health of the Petite Rivière watershed. Using a multi-parameter water chemistry instrument, water chemistry was measured monthly at 18 sites across the Petite Rivière.

No CCME guidelines are set for pressure, salinity, or conductivity; therefore, these parameters are not believed to be detrimental to watershed health.

Measurements outside of the recommended range for temperature should not negatively affect watershed health. Temperatures exceeded the maximum temperature (23°C) suitable for Atlantic whitefish and brook trout; however, as these exceedances were rare (0-13.2%) and never exceeded 23°C by more than 4.6°C, we do not believe high temperatures will negatively affect aquatic organisms. In addition, although temperatures fell below the 5°C minimum, these temperatures only occurred during the winter months, when fish have already migrated to the ocean, or have gone dormant.

High TDS concentrations measured in the estuary site do not pose a threat to aquatic organisms. TDS concentrations in the 17 freshwater sites averaged 26 mg/L, while the estuary site averaged 17,701 mg/L between 2010 and 2017. As TDS concentrations >1,000 mg/L are known to cause invertebrate mortalities, only the estuary site exceeded this threshold. In addition, various fish species have been found to survive in waters with >2,000 mg/L of TDS; therefore, the estuary site may only pose a threat to freshwater invertebrates - not fish.

DO dips throughout the 2010 to 2017 sampling period throughout the Petite Rivière watershed may pose a threat to aquatic life, if sustained for long periods of time. Although >72% of DO concentrations were greater than the 6.5 mg/L minimum guideline set by the CCME, DO was recorded as low as 1.2 mg/L. Fish can survive in low DO (<1.0 mg/L) environments during short exposures, and zooplankton remain undisturbed in waters as low as 2.1 mg/L of DO. As Petite Rivière measurements were never lower than 1.2 mg/L, it

is possible that aquatic organisms may not be affected; however, the exposure time of organisms to low DO concentrations is unknown due to the monthly sampling interval, and long-term low DO exposure can be lethal.

Acidic waters measured throughout the Petite Rivière watershed pose the greatest threat to aquatic life. More than 90% of samples measured between 2010 and 2017 were less than the 6.5-pH minimum set by the CCREM. Although the length of pH dips is unknown due to the monthly sampling interval, both long-term and short-term exposures to acidic environments are known to negatively affect aquatic organisms. In addition, pH values are significantly lower in 2017 than 2014 for 50% of sites; more sampling is required to allow a trend analysis for pH changes throughout the PRWP.

As the first report published since the creation of the PRWP in 2010, this report provides an insight into water chemistry values across the Petite Rivière, an indication of watershed health based on the water chemistry parameters and provides several recommendations for successfully maintaining Petite Rivière's watershed health. Further sampling is recommended, in addition to increased sampling frequency, an investigation of the Petite Rivière geology with regards to ARD, the addition of more water chemistry parameters, and the maintained calibration and care of water-testing instruments.

REFERENCES

Berg, O. K., and Jonsson, B. 1989. Migratory patterns of anadromous Atlantic salmon, brown trout, and Arctic charr from the Vardnes River in northern Norway. In *Proceedings of the salmonid migration and distribution symposium* (pp. 106-115). School of Fisheries, University of Washington Seattle, WA.

Canadian Council of Resource and Environment Ministers. 1987. Canadian water quality guidelines. Prepared by the Task Force on Water Quality Guidelines of the Canadian Council of Resource and Environment Ministers.

Canadian Council of Ministers of the Environment. 1999. Canadian water quality guidelines for the protection of aquatic life: Dissolved oxygen (freshwater). In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

Cook, A.M., R.G. Bradford, B. Hubley, and P. Bentzen. 2010. Effects of pH, temperature and salinity on age-0+ Atlantic Whitefish (Coregonus huntsmani) with implications for recovery potential. Department of Fisheries and Oceans: Canadian Science Advisory Secretariat Research Document 2010/055. 47 pp.

COSEWIC. 2010A. COSEWIC assessment and status report on the Atlantic Whitefish Coregonus huntsmani in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 31 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2010B. COSEWIC assessment and status report on the Atlantic Salmon Salmo salar (Nunavik population, Labrador population, Northeast Newfoundland population, South Newfoundland population, Southwest Newfoundland population, Northwest Newfoundland population, Quebec Eastern North Shore population, Quebec Western North Shore population, Anticosti Island population, Inner St. Lawrence population, Lake Ontario population, Gaspé-Southern Gulf of St. Lawrence population, Eastern Cape Breton population, Nova Scotia Southern Upland population, Inner Bay of Fundy population, Outer Bay of Fundy population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xlvii + 136 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2012. COSEWIC assessment and status report on the American Eel Anguilla rostrata in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 109 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Drage, J. 2015: Review of the environmental impacts of historic gold mine tailings in Nova Scotia; Nova Scotia Department of Natural Resources, Mineral Resources Branch, Open File Report ME 2015-004; http://novascotia.ca/natr/meb/data/pubs/15ofr04/ofr_me_2015-004.pdf January 9th, 2017.

Fisheries and Oceans Canada. 2016. Amended Recovery Strategy for the Atlantic Whitefish (Coregonus huntsmani) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. 60 pp.

Fox, D., Robinson, C., and Zentilli, M. 1997. Pyrrhotite and associated sulphides and their relationship to acid rock drainage in the Halifax Formation, Meguma Group, Nova Scotia.

Hansen, L. P., and Jonsson, B. 1991. Evidence of a genetic component in the seasonal return pattern of Atlantic salmon, Salmo salar L. *Journal of Fish Biology*, 38(2): 251-258.

Hokanson, K. E., McCormick, J. H., Jones, B. R., and Tucker, J. H. 1973. Thermal requirements for maturation, spawning, and embryo survival of the brook trout, Salvelinus fontinalis. *Journal of the Fisheries Board of Canada*, 30(7): 975-984.

Hopper, D.B., Bonner, F.J., Fisher, B.E., and Murphy, A.N. 2000. Mineral Resources Land-Use Atlas; Nova Scotia Department of Natural Resources, Mineral Resources Branch; https://novascotia.ca/natr/meb/data/mg/ofm/pdf/ofm_2000-004_21a07_d047v2_dp.pdf Accessed January 9th, 2017.

Moss, D. D., and Scott, D. C. 1961. Dissolved-oxygen requirements of three species of fish. *Transactions of the American Fisheries Society*, 90(4): 377-393.

Muniz, I. P. 1990. Freshwater acidification: its effects on species and communities of freshwater microbes, plants and animals. *Proceedings of the Royal Society of Edinburgh, Section B: Biological Sciences*, 97: 227-254.

Nebeker, A. V., Dominguez, S. E., Chapman, G. A., Onjukka, S. T. and Stevens, D. G. 1992. Effects of low dissolved oxygen on survival, growth and reproduction of *Daphnia, Hyalella* and *Gammarus*. *Environmental Toxicology and Chemistry*, 11(3): 373–379. doi: 10.1002/etc.5620110311

Neily, P., Quigley, E., Benjamin, L., Stewart, B., and Duke, T. 2005. Ecological Land Classification for Nova Scotia. Department of Natural Resources, Renewable Resources Branch Report.

NS Department of Natural Resources. 2002. Provincial Landscape Viewer. https://nsgi.novascotia.ca/plv/ Accessed January 9th, 2017.

Staurnes, M., Hansen, L. P., Fugelli, K., and Haraldstad, Ø. 1996. Short-term exposure to acid water impairs osmoregulation, seawater tolerance, and subsequent marine survival of smolts of Altantic salmon (Salmo salar). *Canadian Journal of Fisheries and Aquatic Sciences*, 53(8): 1695-1704.

Trudell, L. L. and White, C. E. 2013. Overview map showing locations of bedrock acid rock drainage potential maps for the southwestern area of Nova Scotia; Nova Scotia Department of Natural Resources, Open File Map ME 2013-002, scale 1:250 000.

Weber-Scannell, P. K., and Duffy, L. K. 2007. Effects of total dissolved solids on aquatic organism: a review of literature and recommendation for salmonid species. *American Journal of Environmental Sciences*, 1: 1-6.

White, C.E. 2010. Stratigraphy of the lower Paleozoic Goldenville and Halifax groups in southwestern Nova Scotia. *Atlantic Geology*, 46(1): 136-154.

APPENDIX A

Birch Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		17		14.8		0.035	23	0.02	5.07
06/29/10	13:58	18.71		76.6		0.035	23	0.02	5.25
07/16/10	11:48	22.29		76.7		0.045	29	0.02	5.24
07/26/10	9:41	20.52		76.4		0.058	38	0.03	5.73
08/11/10	12:13	22.5		90.5		0.055	16	0.02	6.03
05/12/11									
05/30/11	10:22	18.36		82.7	7.77	0.032	21	0.01	4.47
06/15/11	11:28	14.48		79.3	8.09	0.034	22	0.01	4.72
06/27/11	10:45	17.66		74.1	7.07	0.032	21	0.01	4.85
07/11/11	11:54	20.44		81.5	7.34	0.032	21	0.01	5.03
07/25/11	10:32	21.82		70.4	6.22	0.032	21	0.01	5.68
08/08/11	16:09	20.63		82.3	7.39	0.032	21	0.01	5.8
09/07/11	11:09	19.15		89.6	8.39	0.036	23	0.02	5.67
09/23/11	9:45	16.5		72.2	7.05	0.036	23	0.02	5.23
11/01/11		5.95		101	12.48	0.032	21	0.01	4.65
11/16/11		9.76		88	10	0.03	19	0.01	4.57
11/28/11		6.26				0.028	18	0.01	4.71
12/14/11		3.65		97.3	12.88	0.029	19	0.01	4.68
01/05/12		0.29				0.032	21	0.01	4.69
01/18/12		1.25		87.5	12.36	0.034	22	0.01	4.78
01/31/12		0.71		95.8	13.62	0.04	26	0.02	4.95
02/14/12		0.79		85.7	12.28	0.0377			5.09
03/09/12		4.98		91.7	11.72	0.039			5.18
03/21/12		7.77				0.038	25	0.02	5.91
04/03/12		5.97		92.7	11.5	0.042	27	0.02	5.52
04/24/12		13.87		88.1	9.11	0.04	26	0.02	5.93
05/08/12		13.28		87.2	9.13	0.041	27	0.02	5.67
05/28/12		17.64		82.4	7.82	0.044	28	0.02	5.81
06/13/12		18.45		85.4	8	0.047	31	0.02	6.05
06/26/12		19.71		80.8	7.38	0.057	37	0.02	6.28
07/09/12		22.86		82.7	7.13	0.043	28	0.02	5.8
07/24/12		21.86		81.5	7.15	0.042	27	0.02	6.27
08/10/12		22.15		69.3	6.04	0.033	22	0.01	5.72
08/24/12		21.3		64	5.7	0.0359	23.4	0.02	5.71
09/07/12		20.2		77	7	0.0389	25.33	0.02	5.67
09/21/12		16.9		83	8.1	0.0396	26	0.02	5.21
10/05/12		16.6		82	8.3	0.04	26	0.02	5.05
10/19/12		10.5		81	9	0.0406	26	0.02	5.39
11/05/12		10		75	8.5	0.0448	29.25	0.02	4.83
11/20/12		5.3		91	11.6	0.0446	29.25	0.02	5.5
11/30/12		2.1		87	12	0.0488	31.65	0.02	6.36
12/20/12		1.2		93	13.2	0.0381	24.7	0.02	5.3
01/25/13		0.1		95	13.7	0.0461	29.9	0.02	6.19
02/15/13		0.4		91	13.2	0.0466	35.5	0.02	5.9
03/15/13		1		96	13.4	0.0247	29.9	0.02	5.26
03/29/13		0.2		94	13.4	0.0378	24.7	0.02	5.12
04/11/13		6		78	9.7	0.0374	24.05	0.02	5.77
04/26/13		10.2		66	7.4	0.0344	22.1	0.01	5.68
05/09/13		17.7		51	4.9	0.0383	28.6	0.02	5.89

06/06/13		18.3		84.6	8.3	0.048	31.2	0.02	5.91
06/28/13		19.4		83.2	8.4	0.052	33.4	0.02	6.02
07/12/13		20.4		79.6	7.9	0.049	25.4	0.02	5.98
08/09/13		20.8		78.5	7.9	0.044	28.9	0.01	6.03
08/30/13		21.1		74.1	7.3	0.048	27.8	0.01	5.55
09/13/13		17.5		70.5	7.1	0.032	20.1	0.02	5.58
10/01/13		15.1		63	6.3	0.027	17.6	0.01	5.68
10/18/13		13.9		81	8.3	0.0331	21.5	0.02	5
10/31/13		15.1		63	6.7	0.027	17.6	0.01	5.68
11/06/13		6.9		91	11.1	0.034	22.1	0.02	5.29
11/22/13		3.5		94	12.5	0.036	33	0.02	4.64
12/05/13		3.3		93	12.3	0.014	9.2	0.01	4.73
01/10/14		0		94.8	11.9	0.042	28.74	0.01	6.11
02/13/14		0		96.5	9.9	0.041	34.12	0.01	5.62
03/11/14		0		98.2	11.5	0.032	28.47	0.02	5.24
04/11/14	9:15:00								
05/09/14	9:12:00	12.8		90	9.5				6.45
06/10/14	12:56:00	21.8		87	7.6	0.0354	22.75	0.02	4.91
07/10/14	13:32:00	24.2		84	7.5	0.0371	16.9	0.02	5.28
08/11/14	14:41	22.2	756.7	81	7.1	0.0401	26	0.02	5.4
09/09/14	12:54	17.9	764.6	85	7.9	0.0459	29.9	0.02	5.37
10/10/14	14:41	15	752.7	81	8.1	0.0354	22.75	0.02	5.41
11/17/14	10:51	4.5	755.2	89	11.5	0.027	17.55	0.01	4.62
12/15/14	11:36	4.6	750.7	84	11.1	0.025	16.25	0.01	4.19
01/16/15	10:55	0.9	742.3	92	13.1	0.032	20.8	0.01	4.37
02/12/15	8:45	0.04	743.9			0.022	14	0.01	5.76
03/13/15	10:45	0.41	760.1			0.038	25	0.02	5.51
04/15/15	10:46	1.1	754.2	109	15.4	0.04	26	0.02	4.1
05/20/15	13:38	15.6	741.7	82	8.2	0.023	14.95	0.01	5.57
06/17/15	12:32	19.8	752.6	83	7.6	0.029	18.85	0.01	4.58
07/17/15	14:30	24.4	754.8	76	6.5	0.036	23.4	0.02	5.42
08/14/15	13:26	23.1	757	76	6.5	0.033	21.5	0.01	4.89
09/17/15	15:50	21.9	753.9			0.041	26.65	0.02	5.57
10/19/15	9:55	8.6	758.8			0.039	25.35	0.02	5.81
11/26/15	11:27	4.3	778			0.04	26	0.02	4.79
12/17/15	14:14	3.4	758.3	97	12.9	0.035	22.75	0.02	5.53
01/26/16	14:18	0.5	753.8	90	13	0.035	22.75	0.02	5.35
02/24/16	13:21	2	759.8	101	14	0.035	22.75	0.02	4.75
03/23/16	12:47	2.6	749.4	96	13	0.037	24.05	0.02	4.69
04/22/16	13:08	12.8	749.8	98	10.3	0.032	20.8	0.01	4.81
05/20/16	9:21	15.4	757.1	88	8.8	0.052	33.8	0.02	5.5
06/23/16	8:21	19.1	749.8	55	5.1	0.071	46.15	0.03	6.2
07/19/16	14:14	25.1	751.2	15	1.2	0.061	39.65	0.03	6.3
08/15/16	10:50	22.8	754.5	67	5.7	0.068	44.2	0.03	6.1
09/23/16	11:05	17.6	754.2	75	7.2	0.065	42.25	0.03	
10/28/16	12:06	8.4	760.7	103	12.06	0.045	29.25	0.02	4.92
11/23/16	9:50	5.9	749.3	89	11	0.04	26	0.02	5.06
12/21/16	11:57	0.06	751.3	90	13	0.037	24.05	0.02	5.13
01/26/17	14:10	1.5	736	89	12.5	0.034	21.45	0.01	4.56
02/21/17	11:28	0.6	760.6	90	12.9	0.03	19.5	0.01	3.95
03/27/17	12:32	3.6	763.8	94	12.4	0.03	19.5	0.01	4.34
04/25/17	11:34	11.1	766	94	10.3	0.031	20.15	0.01	4.73
05/12/17	13:18	13.1	752.7	93	9.8	0.032	20.8	0.01	4.09
06/19/17	11:31	20.1	753	84	7.7	0.031	20.15	0.01	4.57
07/20/17	10:36	22.6	751.3	64	5.6	0.04	26	0.02	5.75
08/18/17	11:50	18.9	754.6	55	5.1	0.068	44.2	0.03	5.79
09/21/17	13:31	19.6	755.9	72	6.5	0.046	29.9	0.02	5.14

10/27/17	9:38	13.9	751.2	75	7.7	0.044	28.6	0.02	5.28
11/30/17	13:48	3.6	760.4	102	13.5	0.04	26	0.02	3.95
12/18/17	12:41	0.6	756.8	87	12.6	0.04	26	0.02	4.4

BrownBranch Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10									
06/29/10	10:21	19.28		94.7		0.044	29	0.02	5.85
07/16/10	13:39	21.05		103.2		0.042	27	0.02	5.07
07/26/10	11:34	21.72		106.2		0.044	29	0.02	5.96
08/11/10	10:10	21.14		107.2		0.046	30	0.02	6.45
05/12/11	15:26	11.65		104.7	11.37	0.04	26	0.02	5.2
05/30/11	13:36	17.06		107.4	10.25	0.041	26	0.02	5.65
06/15/11	14:20	15.12		104.3	10.47	0.044	29	0.02	5.66
06/27/11	13:57	18.97		96.3	8.94	0.04	26	0.02	5.4
07/11/11	14:39	21.78		99.7	8.76	0.042	27	0.02	5.43
07/25/11	14:16	23.77		93.2	7.88	0.042	27	0.02	5.97
08/08/11	13:30	20.8		99.8	8.93	0.045	29	0.02	6.12
09/07/11	14:38	19.29		112.2	10.35	0.048	31	0.02	6.18
09/22/11	15:17	16.01		85.9	8.48	0.047	30	0.02	6.08
11/01/11		6.3		93	11.49	0.038	25	0.02	4.6
11/16/11		9.54		95.1	10.21	0.036	23	0.02	4.47
11/28/11		6.3				0.035	23	0.02	4.8
12/14/11		2.78		100.1	13.57	0.034	22	0.02	4.8
01/05/12		0.26				0.038	25	0.02	4.71
01/18/12		1.32		89.7	12.68	0.04	26	0.02	4.94
01/31/12		0.5		95.6	13.78	0.038	25	0.02	4.7
02/14/12		0.16		92.8	13.5	0.0328			4.96
03/09/12									
03/21/12		9.82				0.037	24	0.02	5.44
04/03/12		6.52		102.7	12.61	0.038	25	0.02	5.45
04/24/12		11.66		92.3	10.01	0.041	27	0.02	5.54
05/08/12		15.41		102.1	10.2	0.04	25	0.02	5.32
05/28/12		18.35		100.9	9.49	0.038	25	0.02	5.9
06/13/12		19.02		101.1	9.38	0.043	28	0.02	6.36
06/26/12		18.6		82.8	7.72	0.043	28	0.02	5.88
07/09/12		23.3		90.7	7.92	0.04	26	0.02	5.13
07/24/12		20.41		74.3	6.67	0.046	30	0.02	5.89
08/10/12		22.94		75	6.45	0.042	27	0.02	5.55
08/24/12		25		97	8.2	0.0442	28.6	0.02	6.39
09/07/12		17.6		85	8.1	0.0471	30.55	0.02	5.43
09/21/12		16		100	9.9	0.0344	28.6	0.02	4.91
10/05/12		15.2		99	9.9	0.043	28	0.02	5.06
10/19/12		11		96	10.6	0.041	27	0.02	5.17
11/05/12		9.6		89	10.1	0.0542	35.1	0.02	4.7
11/20/12		3.7		102	13.4	0.0479	31.2	0.02	4.81
11/30/12		1.2		92	13	0.0455	29.9	0.02	5.29
12/20/12		2.4		106	14.4	0.05	32.5	0.02	4.76
01/25/13		0		108	16	0.0403	26	0.02	5.67
02/15/13		0		114	16.2	0.0495	32.85	0.02	6.37
03/15/13		0.8		97	13.7	0.024	29.25	0.02	5.08
03/29/13		0.2		104	15.1	0.056	36.4	0.03	4.83
04/11/13		5.9		60	7.5	0.0336	22.1	0.01	5.39

04/26/13		8.4		79	9.2	0.0453	29.25	0.02	5.31
05/09/13		16		75	7.4	0.0425	24.7	0.02	5.45
06/06/13		19.9		99.7	9.56	0.042	27	0.02	5.89
06/28/13		20.3		90.3	8.9	0.043	28	0.02	5.91
07/12/13		20.7		89.7	9.01	0.043	28	0.02	5.89
08/09/13		20.1		87.7	8.66	0.043	28	0.02	5.77
08/30/13		20.7		78.9	7.78	0.039	26.5	0.02	5.69
09/13/13		17.2		82	8.01	0.028	18.5	0.02	5.41
10/01/13		14		69	7.2	0.015	18.2	0.01	5.17
10/18/13		13.4		37	3.8	0.032	21.3	0.02	4.49
10/31/13		13.3		69	7.2	0.028	18.2	0.01	5.06
11/06/13		5.4		66	8.3	0.018	11.7	0.01	4.98
11/22/13		3.3		104	13.9	0.011	7.6	0.01	4.43
12/05/13		4.2		78	12.7	0.03	19.6	0.01	4.25
01/10/14		0		101.3	12.3	0.032	27.48	0.02	5.64
02/13/14		0		95.7	9.9	0.054	32.31	0.02	5.63
03/11/14		0.5		96.8	9.78	0.022	26.39	0.01	5.01
04/11/14	12:35:00								
05/09/14	11:52:00	11.2		110	12				6.43
06/10/14	9:43:00	17.5		94	9	0.033	21.45	0.01	4.14
07/10/14	10:34:00	19.8		74	6.7	0.0389	25.35	0.02	5.12
08/11/14	11:14	19.3	763.3	78	7.2	0.0428	27.95	0.02	5.22
09/09/14	9:33	15.2	772	75	7.6	0.0426	27.95	0.02	5.26
10/10/14	11:00	12.5	760.2	89	9.5	0.0451	29.25	0.02	4.49
11/17/14	13:38	4.5	759.3	94	12.1	0.032	20.8	0.01	4.32
12/15/14	14:46	4.5	758.7	59	7.6	0.038	24.05	0.02	4.06
01/16/15	14:29	0.2	747	101	14.7	0.034	22.1	0.01	4.56
02/12/15	12:56	0.04	749.7			0.037	24	0.02	4.81
03/13/15	13:41	0.21	766.2			0.045	29	0.02	5.32
04/15/15	14:03	1.4	759.4	85	11.5	0.029	18.85	0.01	4.3
05/20/15	10:20	13.4	750.7	93	9.7	0.04	21.45	0.02	6
06/17/15	8:50	15.6	757.2	91	9.1	0.036	23.4	0.02	4.77
07/17/15	10:34	19.6	762.2	78	7.2	0.041	26.65	0.02	4.94
08/14/15	9:16	18.9	763.5	95	8.8	0.039	25.35	0.02	5.02
09/17/15	12:32	19.2	761.3			0.043	27.05	0.02	4.46
10/19/15	13:29	8.3	765.2	90	10.6	0.044	28.6	0.02	5.14
11/26/15	14:38	3	782.5	105	13.6	0.05	31.85	0.02	4.76
12/18/15	10:19	5.2	747.3	103	13.1	0.04	26	0.02	4.91
01/26/16	10:35	0.1	765.1	92	13.4	0.042	27.95	0.02	5.02
02/24/16	9:39	1.1	770.6	96	13.6	0.038	25.35	0.02	4.57
03/23/16	9:46	2.2	756.2	99	13.7	0.036	32.4	0.02	4.77
04/22/16	10:00	8.8	757	109	12.5	0.039	25.35	0.02	4.8
05/20/16	12:50	14.8	762.9	97	9.8	0.04	26	0.02	5.1
06/23/16	11:57	20.2	756.6	77	7	0.045	29.25	0.02	5.12
07/19/16	9:30	21.5	757.5	74	6.6	0.049	31.85	0.02	5.23
08/15/16	7:54	21.4	759.8	63	5.6	0.065	42.25	0.03	5.97
09/23/16	13:30	16.7	759.2	100	9.9	0.085	55.9	0.04	
10/28/16	8:20	7.7	769.9	106.4	12.67	0.051	33.15	0.02	4.36
11/23/16	12:25	6.2	756.1	104	13	0.044	28.6	0.02	4.66
12/21/16	14:20	0.4	757.6	95	13.7	0.04	26	0.02	4.81
01/26/17	10:55	0.5	745.2	95	13.7	0.033	21.45	0.01	3.96
02/21/17	14:40	0.1	765.6	97	14.1	0.038	24.7	0.02	3.92
03/27/17	9:27	1.5	771.7	96	13.4	0.036	24.05	0.02	4.06
04/25/17	8:47	7.4	772.5	95	11.4	0.038	24.7	0.02	4.33
05/12/17	10:47	10.4	760.1	96	10.7	0.036	2.4	0.02	3.8
06/19/17	14:25	17.8	759.9	95	9.1	0.036	23.4	0.02	5.53
07/20/17	13:58	25.4	756.5	96	7.7	0.036	23.4	0.02	4.97

08/18/17	14:55	20.2	760.9	80	7.3	0.035	22.75	0.02	4.9
09/21/17	10:35	19.1	761.7	71	6.6	0.043	27.95	0.02	4.99
10/27/17	13:25	15	758.6	72	7.2	0.055	35.75	0.02	4.95
11/30/17	16:10	3.7	767.3	100	13.1	0.059	38.35	0.03	3.78
12/18/17	9:46	0.1	765	108	15.7	0.05	32.5	0.02	3.9

Conquerall Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		20.41		102.8		0.041	27	0.02	6.13
06/29/10	9:53	21.13		93.1		0.044	29	0.01	6.22
07/16/10	13:13	22.96		103.2		0.042	27	0.02	6.09
07/26/10	11:04	23.74		103.9		0.043	28	0.02	6
08/11/10	10:43	23.66		105.9		0.043	28	0.02	6.03
05/12/11	14:49	11.78		101.7	11.01	0.042	27	0.02	5.64
05/30/11	12:57	18.04		101.5	9.6	0.04	26	0.02	5.83
06/15/11	13:49	16.77		99.4	9.16	0.043	28	0.02	6.75
06/27/11	13:25	20.07		94.8	8.61	0.039	25	0.02	5.96
07/11/11	14:06	24.85		97.9	8.12	0.032	21	0.01	6.08
07/25/11	13:44	26.2		90.9	7.34	0.04	26	0.02	6.02
08/08/11	14:09	21.61		99.4	8.78	0.04	26	0.02	6.2
09/07/11	13:57	21.13		110.9	9.86	0.04	26	0.02	6.43
09/22/11	16:14	18.59		84	7.86	0.04	26	0.02	6.04
11/01/11		8.56		98.1	11.45	0.04	26	0.02	6.09
11/16/11		9.91		100.8	11.41	0.036	24	0.02	5.63
11/28/11		6.87				0.035	23	0.02	5.63
12/14/11		4.84		103.8	13.29	0.034	22	0.01	5.92
01/05/12		0.06				0.034	22	0.01	5.64
01/18/12		1.28		90	12.7	0.035	23	0.02	5.6
01/31/12		1.89		100	13.85	0.036	23	0.02	5.57
02/14/12		2.24		97.6	13.41	0.0354			6.25
03/09/12		3.36		100.6	13.41	0.0371			5.92
03/21/12		8.75				0.038	25	0.02	6.28
04/03/12		6.97		101.1	12.29	0.04	26	0.02	5.67
04/24/12		13.13		97.4	10.23	0.043	28	0.02	5.92
05/08/12		15.62		101.7	10.14	0.04	26	0.02	6.25
05/28/12		18.34		106	9.94	0.041	27	0.02	6.03
06/13/12		20.58		105	9.45	0.042	27	0.02	6.44
06/26/12		19.55		94.7	8.65	0.044	29	0.02	6.23
07/09/12		25.32		101.8	8.36	0.043	28	0.02	6.41
07/24/12		22.5		99	8.57	0.043	28	0.02	6.37
08/10/12		26.47		100.8	8.11	0.043	28	0.02	6.38
08/24/12		26.3		101	8.1	0.0429	28	0.02	6.6
09/07/12		20.3		95	8.3	0.0423	27.3	0.02	6.54
09/21/12		18.8		107	10	0.0418	27.3	0.02	6.41
10/05/12		17.8		104	9.9	0.0434	28	0.02	6.47
10/19/12		13.5		107	11.1	0.044	28	0.02	6.57
11/05/12		11.6		93	10.2	0.0452	29.25	0.02	6.4
11/20/12		7.2		98	11.8	0.0447	29.25	0.02	6.17
11/30/12		2.2		96	13.2	0.0435	27.95	0.02	6.38
12/20/12		2		103	14.3	0.0444	28.6	0.02	6.37
01/25/13		0.2		86	12.6	0.046	29.9	0.02	6.83
02/15/13		2		116	15.4	0.0345	16.25	0.01	6.46
03/15/13		3.4		95	12.6	0.0264	29.9	0.02	6.07

03/29/13		0.5		108	15.5	0.0416	27.3	0.02	6.12
04/11/13		6.3		84	10.3	0.0335	22.1	0.01	6
04/26/13		10.8		69	7.8	0.0353	22.75	0.02	5.64
05/09/13		16		83	8.2	0.0446	21.45	0.02	6.37
06/06/13		21.3		103	10.1	0.043	25.6	0.02	6.39
06/28/13		20.3		95.3	9.63	0.045	28.6	0.02	6.38
07/12/13		20.7		94.6	9.56	0.04	27.89	0.02	6.22
08/09/13		21.6		96.5	9.41	0.045	29.1	0.01	6.13
08/30/13		22.5		89.9	8.79	0.042	30.1	0.01	6.03
09/13/13		18.8		91.1	9.33	0.044	32.5	0.02	5.81
10/01/13		16.6		83	8.1	0.026	9	0.01	5.82
10/18/13		15.3		98	9.8	0.032	20.8	0.02	5.87
10/31/13		16.3		83	8.1	0.014	9	0.01	5.82
11/06/13		9		101	11.7	0.034	22.4	0.01	5.78
11/22/13		5		103	13.2	0.015	9.9	0.01	5.71
12/05/13		3.6		101	13.7	0.014	9	0.01	5.17
01/10/14		0		90.1	9.9	0.044	28.61	0.01	6.62
02/13/14		0		101.2	10	0.03	18.52	0.01	6.32
03/11/14		0.3		94.2	9.8	0.025	26.35	0.02	5.74
04/11/14	11:30:00								
05/09/14	10:49:00	11.4		113	12.3				7.17
06/10/14	10:34:00	20.4		105	9.5	0.0345	22.75	0.01	5.57
07/10/14	10:51:00	22.6		105	9	0.0378	24.05	0.02	5.82
08/11/14	12:41	23.5	759.6	102	8.7	0.0372	24.05	0.02	5.35
09/09/14	10:41	19.7	768.3	81	7.4	0.0378	24.7	0.02	6.1
10/10/14	12:09	15.5	756.5	101	10.1	0.0384	24.7	0.02	5.7
11/17/14	12:35	6.6	757	96	11.7	0.038	23.4	0.02	5.42
12/15/14	13:56	4.5	754.2	104	13.2	0.031	20.15	0.01	5.05
01/16/15	13:24	2.2	743.7	104	14.3	0.025	17.55	0.01	5.43
02/12/15	12:21	1.75	746			0.031	20	0.01	5.81
03/13/15	12:34	1.9	762.8			0.036	23	0.02	5.97
04/15/15	12:41	3.2	756.4	96	12.8	0.052	33.8	0.02	4.94
05/20/15	11:35	15.4	746.5	99	9.9	0.026	16.9	0.01	5.99
06/17/15	10:10	19.3	754.3	102	9.4	0.036	23.4	0.02	5.49
07/17/15	12:02	24.7	758.5	100	8.3	0.036	23.4	0.02	5.67
08/14/15	10:57	22.9	759.9	95	9.1	0.037	24.05	0.02	5.72
09/17/15	13:56	23.2	757.7			0.028	17.55	0.02	5.43
10/19/15	11:38	11	762.1			0.036	24.05	0.02	6.68
11/24/15	13:32	6.1	779.6			0.04	26	0.02	6.59
12/18/15	9:14	4.7	744.1	106	13.6	0.042	27.3	0.02	6.42
01/26/16	11:51	1.1	760.1	96	13.6	0.038	24.7	0.02	5.92
02/24/16	11:14	3	765.6	104	13.9	0.041	26.65	0.02	5.6
03/23/16	10:58	3.1	752.8	103	13.8	0.043	28.6	0.02	5.8
04/22/16	11:14	10.4	753.6	103	11.5	0.039	25.35	0.02	5.3
05/20/16	11:23	15.2	759.7	101	10.1	0.05	32.5	0.02	5.79
06/23/16	10:32	20.8	752.8	98	8.9	0.046	29	0.02	5.85
07/19/16	11:09	24.5	754	101	8.4	0.051	33.15	0.026	6.02
08/15/16	9:10	23.7	757	91	7.7	0.059	3.35	0.03	6.2
09/23/16	14:52	19.9	753.9	90	8.2	0.062	40.95	0.03	
10/28/16	9:24	9.9	766.1	107.6	12.2	0.039	25.35	0.02	5.92
11/23/16	11:16	7.2	752.6	122	14.7	0.042	27.3	0.02	6.38
12/21/16	13:20	1.8	753.9	104	14.5	0.041	26.26	0.02	6.18
01/26/17	12:26	1.8	740.5	100	14	0.038	24.7	0.02	5.64
02/21/17	13:28	1.9	762.3	92	12.8	0.032	20.8	0.01	5.01
03/27/17	10:24	2.4	767.6	104	14.2	0.037	24.05	0.02	5.15
04/25/17	9:55	10.3	769.2	103	11.5	0.038	24.7	0.02	5.31
05/12/17	11:43	13.3	756.6	102	10.7	0.038	24.7	0.02	5.38

06/19/17	13:13	20.5	756	98	8.7	0.038	24.7	0.02	5.44
07/20/17	12:35	26.3	753.6	103	8.3	0.38	24.7	0.02	5.37
08/18/17	13:43	22.9	757.6	99	8.6	0.037	24.05	0.02	5.55
09/21/17	11:47	20.8	758.6	91	8.1	0.036	23.4	0.02	5.95
10/27/17	11:22	15.2	755	92	9.2	0.037	24.05	0.02	5.88
11/30/17	15:17	4.2	763.5	96	12.5	0.038	24.7	0.02	5.16
12/18/17	10:53	0.2	760.9	98	14.4	0.042	27.3	0.02	4.99

Crousetown Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		18.6		97.7		0.042	27	0.02	6.03
06/29/10	10:15	19.3		91.5		0.044	29	0.02	5.74
07/16/10	13:33	21.3		101.9		0.042	27	0.02	5.06
07/26/10	11:27	21.64		103.9		0.044	29	0.02	5.82
08/11/10	10:19	21.17		102.8		0.045	29	0.02	6.4
05/12/11	15:10	11.73		103.2	11.2	0.04	26	0.02	5.47
05/30/11	13:28	17.96		102.2	9.72	0.039	26	0.02	5.54
06/15/11	14:12	15.28		101.3	10.21	0.044	29	0.02	5.59
06/27/11	13:50	19.44		95.2	8.75	0.04	26	0.02	5.44
07/11/11	14:31	21.86		99.6	8.74	0.042	27	0.02	5.38
07/25/11	14:08	22.15		92.3	8.05	0.042	27	0.02	5.69
08/08/11	13:41	20.91		94.1	8.4	0.045	29	0.02	6.03
09/07/11	14:31	18.99		103.1	9.56	0.049	32	0.02	6.04
09/22/11	15:50	15.82		81	8.03	0.046	30	0.02	5.93
11/01/11		7.51		101.8	12.18	0.039	25	0.02	5.63
11/16/11		9.5		102.3	11.68	0.036	23	0.02	5.5
11/28/11		6.77				0.035	22	0.02	5.56
12/14/11		4.26		106.3	13.81	0.034	22	0.01	5.63
01/05/12		0.21				0.035	23	0.01	5.59
01/18/12		1.85		94.6	13.13	0.036	23	0.02	5.58
01/31/12		1.6		100.6	14.06	0.036	23	0.02	5.63
02/14/12		1.22		98	13.86	0.0349			5.78
03/09/12									
03/21/12		9.45				0.038	25	0.02	6.33
04/03/12		6.02		101.2	12.56	0.041	26	0.02	5.74
04/24/12		12.19		97.7	10.47	0.044	28	0.02	5.86
05/08/12		15.39		99.8	9.98	0.041	27	0.02	6.01
05/28/12		18.48		103.2	9.67	0.043	28	0.02	6.06
06/13/12		18.64		99.6	9.29	0.044	29	0.02	6.14
06/26/12		18.9		90.3	8.65	0.048	31	0.02	6.1
07/09/12		22.44		99.5	8.62	0.043	28	0.02	5.9
07/24/12		21.42		95	8.39	0.045	29	0.02	6.12
08/10/12		23.73		96.7	8.18	0.045	29	0.02	6.07
08/24/12		23.5		97	8.16	0.0455	29.25	0.02	6.16
09/07/12		17.7		92	8.8	0.0531	34.45	0.02	5.48
09/21/12		17.2		111	10.6	0.0414	27.3	0.02	5.72
10/05/12		16.8		105	10.2	0.043	28	0.02	6.13
10/19/12		11.6		104	11.2	0.0451	29	0.02	6.23
11/05/12		10.9		93	10.3	0.0454	29.25	0.02	6.02
11/20/12		5.8		102	12.8	0.0445	29.25	0.02	5.95
11/30/12		1.4		100	14	0.045	29.9	0.02	6.29
12/20/12		2		105	14.4	0.0419	27.3	0.02	5.32

01/25/13		0.1		116	16.7	0.0399	26	0.02	6.61
02/15/13		0		118	16.8	0.0428	28.56	0.02	6.34
03/15/13		2.6		97	13.1	0.012	16.95	0.01	6.14
03/29/13		0.1		107	15.6	0.0398	26.6	0.02	6.02
04/11/13		6.2		79	9.9	0.049	31.85	0.02	5.87
04/26/13		9.1		53	6.3	0.0348	22.75	0.02	5.28
05/09/13		15.3		86	8.7	0.0441	34.45	0.02	6.27
06/06/13		18.4		91.2	8.9	0.044	30.5	0.02	6.1
06/28/13		20.3		89.6	9.3	0.045	33.4	0.02	6.09
07/12/13		20.8		95.2	9.45	0.039	29.3	0.02	6.08
08/09/13		21.7		87.5	8.66	0.032	28.8	0.02	5.92
08/30/13		22.4		79.6	8.15	0.044	31.2	0.02	5.69
09/13/13		18.4		83.3	8.44	0.042	33.8	0.02	5.71
10/01/13		15.9		82	8.4	0.015	17.2	0.01	5.59
10/18/13		13.5		78	8.1	0.033	21.2	0.02	4.72
10/31/13		14.5		8	8.4	0.026	17.2	0.01	5.59
11/06/13		7.3		88	10.6	0.034	21.8	0.01	4.39
11/22/13		3.9		105	13.7	0.011	7.3	0.01	5.54
12/05/13		3.7		73	13.5	0.014	9.4	0.01	5.31
01/10/14		0		96.3	9.7	0.038	25.22	0.02	6.49
02/13/14		0		98.8	12.7	0.037	27.51	0.02	5.96
03/11/14		0.2		96.7	11.1	0.02	20.46	0.01	5.83
04/11/14	12:08:00								
05/09/14	11:23:00	11.1		105	11.5				7
06/10/14	9:14:00	18.2		94	8.8	0.0369	24.05	0.02	5.57
07/10/14	10:10:00	21.3		92	8.2	0.0397	26	0.02	5.75
08/11/14	11:58	20.9	761.8	61	5.5	0.0401	26	0.02	5.93
09/09/14	9:59	16.6	770.4	81	7.9	0.0405	26.65	0.02	5.82
10/10/14	11:23	13.7	758.7	84	8.7	0.0403	26	0.02	5.37
11/17/14	13:12	6.3	758.5	91	11.2	0.038	24.7	0.02	5.22
12/15/14	14:50	4.6	756.6	100	12.9	0.031	20.15	0.01	4.75
01/16/15	14:02	2.2	745.6	97	13.4	0.033	21.45	0.01	5.04
02/12/15	12:48	0.96	748.6			0.027	18	0.01	5.7
03/13/15	13:14	0.46	764.7			0.041	26	0.02	5.94
04/15/15	13:32	3.7	758.1	89	11.8	0.046	29.9	0.02	5.25
05/20/15	10:50	14.2	748.9	97	10	0.36	23.4	0.02	6.25
06/17/15	9:22	17.9	756	92	8.7	0.037	24.05	0.02	5.88
07/17/15	11:10	21.3	760.4	82	7.2	0.039	24.7	0.02	5.9
08/14/15	9:46	20.6	762	86	7.7	0.039	25.35	0.02	5.75
09/17/15	13:09	19.6	760.2			0.039	26.35	0.02	5.67
10/19/15	12:27	8.2	763.9			0.044	28.6	0.02	6.38
11/26/15	14:16	3.7	780.6	98	13	0.04	26	0.02	4.85
12/18/15	10:11	5.3	745.9	108	13.4	0.039	25.35	0.02	5.88
01/26/16	11:04	0.1	763	97	14.2	0.038	24.7	0.02	5.85
02/24/16	10:15	2.5	768.5	102	13.9	0.041	25.35	0.02	5.55
03/25/16	10:16	2.6	754.8	105	14.3	0.042	27.95	0.01	5.77
04/22/16	10.29	9.1	755.4	112	12.9	0.041	26.65	0.02	5.55
05/20/16	12:40	14.7	761.5	105	10.5	0.044	28.5	0.02	5.8
06/23/16	13:27	20.3	754.7	96	8.7	0.051	33.15	0.02	4.51
07/19/16	10:04	22.8	756	91	7.8	0.052	33.15	0.02	6.04
08/15/16	8:26	22.5	758.6	90	7.8	0.062	40.3	0.03	6.05
09/23/16	14:07	17.3	757	85	8.2	0.068	43.55	0.03	
10/28/16	8:44	8	768.5	97.4	11.55	0.043	27.95	0.02	5.33
11/23/16	11:50	6.5	754.9	120	14.7	0.042	27.3	0.02	5.97
12/21/16	14:41	1.7	756	101	14.1	0.04	26	0.02	5.81
01/26/17	11:20	1.3	743.6	98	13.8	0.034	22.75	0.02	4.69
02/21/17	14:20	0.2	763.6	100	14.4	0.031	20.15	0.01	4.71

03/27/17	9:48	1.7	770.3	102	14.2	0.037	24.05	0.02	5.36
04/25/17	9:16	8.6	771.1	100	11.6	0.038	24.7	0.02	5.58
05/12/17	1:13	12.5	758.7	99	10.6	0.038	24.7	0.02	5.51
06/19/17	14:18	20.3	758.4	98	8.8	0.037	24.05	0.02	5.63
07/20/17	13:26	25.4	755.3	94	7.7	0.039	25.25	0.02	5.24
08/18/17	14:30	20.5	759.6	84	7.6	0.037	24.05	0.02	5.39
09/21/17	11:05	20.1	760.1	84	7.6	0.04	26	0.02	6.11
10/27/17	12:15	15.9	757	67	6.7	0.042	27.3	0.02	5.8
11/30/17	16:03	3.8	765.7	107	14	0.04	26	0.02	4.86
12/18/17	10:08	0	763.3	98	14.4	0.042	27.3	0.02	4.98

Fancy Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		20.48		94.1		0.03	20	0.01	5.9
06/29/10	15:08	21.03		93.7		0.047	30	0.02	6
07/16/10	12:46	24.24		100.5		0.038	25	0.02	5.95
07/26/10	10:39	23.23		102.6		0.034	22	0.01	5.84
08/11/10	11:09	23.74		104.7		0.035	23	0.01	6.4
05/12/11	14:11	11.54		102.1	11.12	0.036	24	0.02	5.33
05/30/11	11:54	18.75		101.8	9.49	0.032	20	0.01	5.68
06/15/11	12:44	16.36		99.3	9.13	0.034	22	0.01	5.71
06/27/11	12:38	19.93		93.1	8.47	0.031	20	0.01	5.6
07/11/11	13:14	24.15		95	7.98	0.031	20	0.01	5.59
07/25/11	12:42	25.49		89.7	7.35	0.032	21	0.01	5.56
08/08/11	14:49	21.21		82.2	7.25	0.087	57	0.04	6.11
09/07/11	12:48	20.64		88.5	7.92	0.039	25	0.02	6.16
09/23/11	10:47	18.18		42.6	3.79	0.041	27	0.02	6.06
11/01/11		7.82		107.7	12.79	0.034	22	0.01	5.65
11/16/11		9.93		101.9	11.52	0.032	21	0.01	5.49
11/28/11		7.31				0.032	21	0.01	5.58
12/14/11		4.4		109.5	14.14	0.029	19	0.01	5.61
01/05/12		0.32				0.031	20	0.01	5.61
01/18/12		1.41		89.6	12.61	0.032	21	0.01	5.58
01/31/12		1.46		101	14.14	0.039	25	0.02	5.51
02/14/12		1.83		97.2	13.47	0.0304			5.96
03/09/12		1.97		97.9	13.57	0.0363			5.72
03/21/12		8.51				0.037	24	0.02	6.28
04/03/12		6.95		102.4	12.43	0.031	20	0.01	5.77
04/24/12		13.9		98.3	9.97	0.037	24	0.02	5.94
05/08/12		15.73		100.4	10.41	0.032	21	0.01	5.88
05/28/12		18.97		100.5	9.32	0.031	20	0.01	5.97
06/13/12		19.74		106.5	9.72	0.031	20	0.01	6.11
06/26/12		19.65		91.2	8.33	0.033	22	0.01	6.36
07/09/12		24.6		97.4	8.1	0.033	21	0.01	6.21
07/24/12		23		93.7	8.04	0.033	21	0.01	6.29
08/10/12		25.78		95.7	7.79	0.032	21	0.01	6.31
08/24/12		25.2		92	7.5	0.0325	20.8	0.01	6.28
09/07/12		20.9		88	7.9	0.037	24.05	0.02	6.17
09/21/12		18.4		103	9.6	0.0406	26.65	0.02	6.2
10/05/12		17.5		102	9.7	0.038	24	0.02	6.11
10/19/12		12.7		100	10.5	0.0364	23	0.02	6.19
11/05/12		11.3		91	9.9	0.0401	26	0.02	5.82
11/20/12		6.9		93	11.5	0.0386	25.35	0.02	5.95

11/30/12		2.6		93	12.5	0.0384	24.7	0.02	6.28
12/20/12		1.7		97	13.5	0.0429	27.95	0.02	5.91
01/25/13		1.6		110	15.2	0.0426	27.95	0.02	6.12
02/15/13		1.5		109	15.5	0.0449	28.6	0.02	6.16
03/15/13		2.9		96	12.9	0.0195	24.3	0.01	5.97
03/29/13		0.4		109	15.7	0.0364	23.1	0.02	6.07
04/11/13		6.2		85	10.5	0.0268	17.55	0.01	6.29
04/26/13		10.4		81	9	0.0293	19.5	0.01	6.17
05/09/13		17		81	7.9	0.0356	22.1	0.02	6.22
06/06/13		20.2		99.8	9.87	0.032	20	0.02	6.15
06/28/13									
07/12/13		21.9		97.5	9.65	0.034	20.46	0.02	6.11
08/09/13		22.3		90.5	9.11	0.032	22.31	0.02	6.02
08/30/13		22.6		92.3	9.23	0.029	22.15	0.01	5.78
09/13/13		20.1		88.8	8.87	0.031	20.65	0.01	5.84
10/01/13		16.6		75	7.3	0.026	17.2	0.01	5.91
10/18/13		14.6		90	9.1	0.033	21.8	0.02	5.84
10/31/13		16.6		75	7.3	0.027	17.2	0.01	5.91
11/06/13									
11/22/13		4.6		101	13	0.034	21.9	0.01	5.39
12/05/13		3.5		104	13.5	0.014	9.3	0.01	5.28
01/10/14		0		99.1	14	0.04	26.12	0.01	5.87
02/13/14		0		99.8	10.1	0.038	26.58	0.01	6.04
03/11/14		0.6		97.1	12.4	0.029	24.2	0.01	5.42
04/11/14	10:46:00								
05/09/14	10:22:00	11.1		105	10.4				6.91
06/10/14	11:16:00	20.4		93	8.4	0.0283	18.2	0.01	5.06
07/10/14	11:20:00	23.3		102	8.7	0.0292	18.85	0.01	5.4
08/11/14	13:14	23.5	758.9	102	8.7	0.0303	19.5	0.01	5.64
09/09/14	11:07	20	767.3	91	8.3	0.0308	20.15	0.01	5.65
10/10/14	12:42	15.6	755.5	100	10	0.0321	20.8	0.01	5.3
11/17/14	12:08	6	756.5	95	12	0.034	22.1	0.01	5.04
12/15/14	1:35	4.6	753.3	107	14.1	0.025	16.9	0.01	5.2
01/16/15	12:06	2.5	743.7	102	14.2	0.032	20.8	0.01	5.26
02/12/15	11:08	1.8	745.2			0.034	22	0.01	5.88
03/13/15	12:02	2.04	762			0.062	40	0.03	5.95
04/15/15	12:15	2.2	755.6	103	14.1	0.048	31.2	0.02	4.8
05/20/15	12:15	15.7	745	97	9.6	0.026	16.9	0.01	5.86
06/17/15	10:40	19.5	753.6	94	8.6	0.029	18.85	0.01	5.53
07/17/15	12:42	24.7	757.5	100	8.3	0.027	17.55	0.01	5.49
08/14/15	11:35	23.5	759.1	97	8.3	0.032	21.45	0.01	5.68
09/17/15	14:27	22.8	756.5	90	7.8	0.029	18.85	0.01	5.67
10/19/15	11:09	10	761	97	10.9	0.035	22.75	0.02	6.25
11/26/15	12:39	5.6	779.1			0.03	24.7	0.02	5.8
12/17/15	15:21	4	759.7	106	13.8	0.034	22.1	0.01	6.28
01/26/16	12:18	0.9	758.3	105	15.1	0.032	20.8	0.01	5.88
02/24/16	11:52	3.1	764	99	13.3	0.035	22.75	0.02	5.33
03/23/16	11:26	2.9	751.8	99	13.4	0.037	24.05	0.02	5.6
04/22/16	11:45	10.6	752.4	103	11.5	0.034	22.1	0.01	5.43
05/20/16	10:55	15.2	759	101	10.1	0.043	27.95	0.02	5.48
06/23/16	10:00	20.8	752.5	90	8.1	0.034	22.45	0.01	5.89
07/19/16	11:47	25.2	753.3	98	8.1	0.04	26	0.02	5.7
08/15/16	9:40	22.7	756.7	61	5.3	0.065	42.25	0.03	6.02
09/23/16	8:50	13.7	757.9	82	8.4	0.081	52.65	0.04	
10/28/16	10:52	9.6	764	112.4	12.75	0.039	25.35	0.02	5.68
11/23/16	10:55	6.6	757.9	115	14.1	0.036	23.4	0.02	5.94
12/21/16	12:56	1.8	753.2	103	14.3	0.037	24.05	0.02	6.07

01/26/17	12:50	1.5	739.4	100	14.1	0.038	24.7	0.02	5.57
02/21/17	12:58	2.2	761.8	100	13.7	0.03	19.5	0.01	4.92
03/27/17	10:45	2.2	767	99	13.7	0.031	20.15	0.01	5.17
04/25/17	10:19	10.3	768.5	107	11.9	0.028	18.2	0.01	5.46
05/12/17	12:10	13.4	755.5	102	10.6	0.032	20.8	0.01	5.2
06/19/17	12:44	20.6	755.3	98	8.8	0.03	19.5	0.01	5.42
07/20/17	11:57	25.8	753.2	101	8.2	0.029	18.85	0.01	5.43
08/18/17	12:57	22.5	756.7	102	8.8	0.028	18.2	0.01	5.55
09/21/17	12:13	21	757.9	83	7.4	0.033	21.45	0.01	5.67
10/27/17	10:59	15.5	754.3	80	7.9	0.038	24.7	0.02	5.85
11/30/17	14:50	4.2	762.9	104	13.5	0.053	34.45	0.02	5.74
12/18/17	11:18	0.6	759.7	95	13.7	0.038	24.7	0.02	5.06

FirePond Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10									
06/29/10									
07/16/10									
07/26/10									
08/11/10									
05/12/11									
05/30/11									
06/15/11									
06/27/11									
07/11/11									
07/25/11									
08/08/11									
09/07/11									
09/23/11									
08/24/12		23.5		67	5.5	0.0479	31.29	0.02	6
09/07/12		18.7		63	5.8	0.0476	31.2	0.02	5.84
09/21/12		17		86	8.7	0.0446	29.25	0.02	5.41
10/05/12		16.9		79	7.6	0.043	28	0.02	5.7
10/19/12		12.4		76	8.1	0.047	31	0.02	5.71
11/05/12		10.4		86	9.5	0.0496	32.5	0.02	5.65
11/20/12		5.3		87	11	0.0475	31.2	0.02	5.73
11/30/12		1.8		76	10.05	0.0449	29.25	0.02	5.73
12/20/12		2		94	13.1	0.0455	29.9	0.02	5.01
01/25/13		0.1		113	16.7	0.0569	37.05	0.03	6.24
02/15/13		0		109	16.3	0.0619	33.8	0.02	6.12
03/15/13		0.03		86	12.4	0.0309	38.35	0.03	5.57
03/29/13		0.1		103	15	0.045	29.25	0.02	5.74
04/11/13		5.8		82	10.3	0.0424	27.95	0.02	5.23
04/26/13		8.5		77	9	0.043	27.95	0.02	5.18
05/09/13		17.6		67	6.4	0.045	29.25	0.02	6.03
06/06/13		19.9		78.9	7.7	0.043	28.7	0.02	6.01
06/28/13		20.4		81	8.2	0.04	29.3	0.02	6.01
07/12/13		20.7		83.3	8.41	0.039	28.75	0.02	5.84
08/09/13		21.5		84	8.32	0.033	28.54	0.02	5.58
08/30/13		21.8		79	7.88	0.031	27.45	0.02	5.71
09/13/13		18.5		86.2	8.52	0.034	27.85	0.02	5.69
10/01/13		15.3		99	10.1	0.026	9.8	0.01	5.56
10/18/13		13.1		94	9.7	0.032	20.2	0.02	4.33

10/31/13		14		99	10.1	0.015	9.8	0.01	5.17
11/06/13		7.1		98	11.8	0.017	11.1	0.01	4.66
11/22/13		3.9		91	11.8	0.014	9.2	0.01	5.36
12/05/13		3.9		97	11.4	0.031	19.8	0.01	4.82
01/10/14		0		102.4	13.4	0.055	32.54	0.01	6.18
02/13/14		0		96.6	10.8	0.058	32.44	0.02	6.18
03/11/14		0		92.2	10.31	0.026	36.22	0.02	5.42
04/11/14	12:42:00								
05/09/14	12:00:00	11.3		71	7.7				6.72
06/10/14	9:51:00	19		67	6.1	0.0369	24.05	0.02	5.36
07/10/14	9:37:00	21.8		68	5.9	0.0413	26.65	0.02	6.12
08/11/14	11:06	20.5	764	23	2.1	0.0637	41.6	0.03	6.33
09/09/14	9:24	18.5	772.6	62	5.8	0.0416	27.3	0.02	6.43
10/10/14	10:48	14.5	761	58	5.9	0.0422	27.3	0.02	5.79
11/17/14	13:52	5.8	759.8	85	10.7	0.03	19.5	0.01	5.06
12/15/14	14:35	4.6	759.3	80	10.3	0.031	20.15	0.01	4.3
01/16/15	14:40	0.3	747.3	87	12.7	0.031	20.9	0.01	5
02/12/15									
03/13/15									
04/15/15	14:12	2.7	760.1	88	12.4	0.043	27.95	0.02	5.23
05/20/15	10:08	14.7	751.5	83	8.4	0.039	25.35	0.02	7.56
06/17/15	8:45	17.6	757.6	71	6.8	0.037	24.05	0.02	6.25
07/17/15	10:17	22.6	762.7	68	5.9	0.04	26	0.02	6.6
08/14/15	9:05	20.6	764.2	48	4.3	0.052	33.8	0.02	6.19
09/17/15	12:19	21.5	762.7			0.042	27.3	0.02	6.41
10/19/15	13:21	9.8	766	74	8.4	0.045	29.25	0.02	5.83
11/26/15	14:46	4.4	783.2	90	11.6	0.043	27.95	0.02	5.4
12/18/15	10:29	5.9	748.2	68	8.4	0.126	81.9	0.06	5.28
01/26/16	10:21	0.4	765.9	88	12.7	0.041	26.65	0.02	5.96
02/24/16	9:24	1.9	771.4	88	12.2	0.04	26	0.02	5.46
03/23/16	9:25	2.6	757.1	92	12.5	0.04	26	0.02	8.81
04/22/16	9:51	9.8	757.6	89	10.1	0.041	26.65	0.02	6.03
05/20/16	13:02	15.3	763.6	75	7.5	0.045	29.25	0.02	5.66
06/23/16	11:43	20.4	757.2	69	6.2	0.01	33.15	0.02	6.06
07/19/16	9:20	22.4	758.1	61	5.3	0.052	33.8	0.02	6.24
08/15/16	7:45	23	760.6	58	5	0.063	40.95	0.03	6.78
09/23/16	13:20	18.2	760.1	56	5.2	0.069	44.85	0.03	
10/28/16	8:12	8.7	770.8	91.4	10.64	0.046	29.9	0.02	5.14
11/23/16	12:30	6.5	756.9	106	13	0.042	27.3	0.02	5.38
12/21/16	14:11	0.4	758	95	13.7	0.041	26.65	0.02	5.48
01/26/17	10:47	1.2	746	93	13	0.035	22.75	0.02	4.88
02/21/17	14:57	0.2	766.2	88	12.7	0.064	41.6	0.03	5.29
03/27/17	9:07	1.1	772.3	76	10.8	0.03	19.5	0.01	4.67
04/25/17	6:43	10.1	773	83	9.3	0.039	25.35	0.02	5.94
05/12/17	10:36	12	760.4	77	8.3	0.038	24.7	0.02	5.45
06/19/17	14:33	19.9	760.4	67	6.1	0.038	24.7	0.02	5.53
07/20/17	14:15	25.9	756.8	132	10.8	0.029	25.25	0.02	5.65
08/18/17	15:11	23.7	761.3	77	6.5	0.04	26	0.02	6.4
09/21/17	10:22	19.9	762.1	66	6	0.042	27.3	0.02	6.06
10/27/17	13:12	15.9	759.2	83	8.2	0.054	35.1	0.02	6.16
11/30/17	16:15	4	767.8	89	11.6	0.047	30.55	0.02	4.57
12/19/17	8:00	0	755.8	103	15.1	0.044	28.6	0.02	4.73

Frederick Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10									
06/29/10									
07/16/10									
07/26/10									
08/11/10									
05/12/11									
05/30/11									
06/15/11									
06/27/11									
07/11/11									
07/25/11									
08/08/11									
09/07/11									
09/23/11									
05/08/12		12.82		83	8.78	0.033	21	0.01	5.69
05/28/12		15.93		77.6	7.64	0.036	32	0.02	5.88
06/13/12		16.15		76.9	7.56	0.032	21	0.01	6.03
06/26/12		18.07		63.9	6.48	0.036	24	0.02	6.31
07/09/12		21.11		67.5	6.07	0.034	22	0.01	5.74
07/24/12		20.02		68.5	6.17	0.037	20	0.02	6.15
08/10/12		20.17		57.5	5.21	0.037	24	0.02	5.72
08/24/12		20.2		57	5.1	0.0366	24	0.02	5.87
09/07/12		18.7		62	5.8	0.0366	24	0.02	5.79
09/21/12		16		70	6.9	0.0353	23	0.02	5.45
10/05/12		16.1		72	7.1	0.038	24	0.02	5.45
10/19/12		9.8		72	8.2	0.038	24	0.02	5.66
11/05/12		9.1		73	8.4	0.0391	25	0.02	5.2
11/20/12		4		89	11.6	0.0394	25	0.02	5.61
11/30/12		1.8		93	12.7	0.0384	24	0.02	6.12
12/20/12		1.1		93	13.2	0.0359	23.4	0.02	5.27
01/25/13									
02/15/13		0		88	12.9	0.0275	17.55	0.01	6
03/15/13		0.9		97	13.7	0.0198	24.4	0.02	5.71
03/29/13		0		85	12.4	0.0384	24.7	0.02	5.3
04/11/13		6.7		67	8.2	0.0345	22.75	0.02	5.85
04/26/13		10		72	8.4	0.0277	18.2	0.01	6.01
05/09/13		14		71	7.3	0.0275	24.7	0.01	5.95
06/06/13		16.3		75.2	7.4	0.029	19.6	0.01	5.98
06/28/13		18.1		72.3	7.1	0.032	23.5	0.01	6.21
07/14/13		19.5		70.9	7.1	0.029	21.6	0.01	6.14
08/09/13		20.4		71.5	7.3	0.031	25.4	0.02	6.03
08/30/13		21.5		75.5	7.4	0.03	22.2	0.02	5.78
09/13/13		16.8		79.9	8.1	0.028	19.7	0.01	5.55
10/01/13		14.3		68	7	0.027	17.6	0.01	5.46
10/18/13		13.5		71	7.3	0.034	22.1	0.02	5.26
10/31/13		14.3		68	7	0.027	17.7	0.01	5.46
11/06/13		5.6		84	10.5	0.018	11.9	0.01	5.48
11/22/13		2.8		84	11.3	0.04	26	0.02	5.33
12/05/13		3.3		84	11.2	0.0099	6.4	0.01	5.23
01/10/14		0		99.8	14.5	0.035	25.41	0.01	6.02
02/13/14		0		92.4	9.3	0.03	20.45	0.01	6.05
03/11/14		0.9		97.8	12.4	0.028	25.11	0.02	5.54
04/11/14	9:28:00								

05/09/14	9:22:00	12.8		88	9.2				6.7
06/10/14	12:40:00	20.7		76	6.8	0.0327	20.8	0.01	4.97
07/10/14									
08/11/14	14:30	20.1	756.6	66	5.9	0.0339	22.1	0.01	4.44
09/09/14	12:37	15.1	764.7	65	6.5	0.038	24.7	0.02	5.33
10/10/14	14:50	14.1	752.7	79	8.1	0.0361	22.4	0.02	4.57
11/17/14	11:00	3.9	755.2	88	11.6	0.028	18.2	0.01	4.62
12/15/14	11:42	3.9	750.8	80	10.5	0.028	18.2	0.01	4.44
01/16/15	11:07	0.9	742.3	92	13.1	0.032	20.15	0.01	
02/12/15	9:10	0.07	743.5			0.03	20	0.01	5.55
03/13/15	10:57	0.15	760.3			0.032	21	0.01	5.68
04/15/15	10:58	1.6	754.2	98	13.8	0.031	20.15	0.01	4.84
05/20/15	13:25	15.4	741.8	78	7.8	0.023	14.95	0.01	5.14
06/17/15	12:15	18.6	752.5	79	7.4	0.027	17.55	0.01	4.42
07/17/15	14:11	22.2	754.9	78	6.9	0.03	19.5	0	5.01
08/14/15	13:14	21.6	756	63	5.6	0.031	20.15	0.01	4
09/17/15	15:40	20.5	754			0.036	22.75	0.01	4.87
10/19/15	10:06	7.5	758.9			0.035	22.75	0.02	5.6
11/26/15	11:36	2.8	777.8	89	12.1	0.036	23.4	0.02	5.5
12/17/15	14:24	3	757.8	93	12.4	0.034	22.1	0.01	5.73
01/26/16	14:29	0.1	753.4	91	13.2	0.002	1.3	0	5.58
02/24/16	13:07	2.5	760.1	100	13.7	0.034	22.1	0.02	5.23
03/23/16	12:59	2.7	749.4	92	12.5	0.035	22.75	0.02	5.2
04/22/16	12:57	12.7	750	94	9.9	0.036	23.4	0.02	5.07
05/20/16	9:34	15.2	757.1	79	8	0.05	32.5	0.02	5.72
06/23/16	8:36	18.5	750.1	50	4.7	0.043	27.95	0.05	5.81
07/19/16	13:50	24.4	751.2	17	1.6	0.045	29.25	0.02	5.66
08/15/16	11:02	21.5	754.4	61	5.3	0.059	38.35	0.03	5.45
09/23/16	11:18	16.6	754.2	76	7.5	0.055	35.75	0.02	
10/28/16	11:57	7.4	760.9	102.7	12.33	0.04	26	0.02	5.32
11/23/16	9:55	5.4	749.6	73	9.2	0.037	24.05	0.02	5.3
12/21/16	12:05	0.5	751	92	13.2	0.037	24.05	0.02	5.43
01/26/17	14:00	1.7	736.1	93	13	0.031	20.15	0.01	5.03
02/21/17	11:40	0.3	760.6	90	12.9	0.033	20.8	0.01	5.04
03/27/17	12:19	2.4	763.9	94	12.8	0.03	19.5	0.01	4.73
04/25/17	10:47	10	767.1	105	11.9	0.023	14.95	0.01	5.23
05/12/17	13:10	12.7	752.8	85	9.1	0.031	20.15	0.01	5.47
06/19/17	11:41	19	753.1	69	6.4	0.03	19.5	0.01	4.37
07/20/17	10:50	21.7	751.2	43	3.8	0.032	20.8	0.01	4.84
08/18/17	12:00	17.1	754.7	75	7.2	0.033	21.45	0.01	5.14
09/21/17	13:43	19	755.7	45	4.2	0.038	24.7	0.02	4.93
10/27/17	9:55	14.5	751.4	64	6.5	0.041	27	0.02	5.37
11/30/17	13:57	3.1	760.5	90	12	0.039	25.35	0.02	4.5
12/18/17	12:34	0.2	756.6	91	13.2	0.037	24.7	0.02	4.98

HeadofTide Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		19.6		103.3		2.794	1839	1.44	6.49
06/29/10	10:38	15.33		99.7		43.63	28360	28.16	7.32
07/16/10	13:53	20.28		104.8		4.156	2638	2.03	6.05
07/26/10	11:51	15.8		121.6		45.96	29800	29.84	7.67
08/11/10	9:55	15.78		112.8		44.8	29150	29.03	7.81
05/12/11	15:45	11.33		105.5	11.54	0.04	26	0.02	5.24

05/30/11	14:00	17.45		103.6	9.92	0.055	35	0.02	5.6
06/15/11	14:35	12.32		102.5	9.07	47.937	31210	31.27	6.35
06/27/11	14:07	15.45		98.4	8.3	43.333	28400	28.27	6.8
07/11/11	14:47	13.51		112.3	9.7	46.44	29970	29.9	7.39
07/25/11	15:30	19.05		118	9.21	44.46	28830	28.83	7.66
08/08/11	12:51	17.7		96.4	7.65	46.97	30560	30.68	7.91
09/07/11	15:00	16.47		104.8	8.5	46.907	30480	30.54	7.67
09/22/11	14:46	15.25		70.7	6	42.383	27590	27.33	7.73
08/24/12		24.9		97	8	0.0465	30.55	0.02	6.52
09/07/12		17.7		90	8.6	0.0517	33.8	0.02	5.73
09/21/12		16.7		106	10.3	0.0429	27.95	0.02	5.53
10/05/12		16.4		100	9.8	0.043	28	0.02	5.96
10/19/12		11.7		99	10.7	0.0446	29	0.02	6.11
11/05/12		10.3		93	10.4	0.0464	29.9	0.02	5.82
11/20/12		5.1		107	13.6	0.0456	29.9	0.02	6.07
11/30/12		1.4		96	13.5	0.0457	29.9	0.02	6.32
12/20/12		2.1		103	14.2	0.0459	29.5	0.02	5.12
01/25/13									
02/15/13		0		109	16.4	0.0571	37.05	0.03	6.18
03/15/13		2.2		96	13.2	0.0317	36.4	0.03	6.34
03/29/13		0		104	15.3	0.044	28.6	0.02	5.5
04/11/13		4		88	9.6	43.305	28221	27.54	7.99
04/26/13		5.9		80	8.4	44.327	28840	28.22	7.92
05/09/13		11.4		85	7.8	42.659	27755	27.4	7.8
06/06/13		13.4		79.5	7.8	43.799	24365	25.1	7.4
06/28/13		15.6		81.2	8	41.358	26458	24.33	7.35
07/12/13		17.2		86.6	8.77	44.582	23564	25.6	7.22
08/09/13									
08/30/13		19.1		77.4	7.98	48.759	32189	22.32	7.14
09/13/13		17.5		89.9	9.2	42.159	85231	25.85	7.04
10/01/13		14.1		101	9.8	31.591	92974	21.92	6.98
10/18/13		13.6		90	9.4	0.034	22	0.02	4.77
10/31/13		14.1		101	9.8	31.591	22971	21.92	6.98
11/06/13		8.5		91	9.9	20.911	113677	12.54	7.51
11/22/13		6.3		113	13.9	0.029	19	0.01	6.32
12/05/13		3.8		115	15.1	0.1081	68.5	0.01	5.68
01/10/14		0		97.4	9.4	0.038	28.65	0.01	6.69
02/13/14		0		97.9	10.3	0.052	36.61	0.02	6.57
03/11/14		0		93.4	9.74	0.03	32.64	0.02	5.98
04/11/14	13:30:00								
05/09/14	12:28:00	11.7		108	11.7				6.62
06/10/14	8:45:00	13.2		110	9.6	44.6	28983	28.78	7.9
07/10/14	9:21:00	12.5		106	9.4	45.594	29633	29.49	7.91
08/11/14	10:43	14	764.6	98	8.4	46.833	30439.5	30.43	7.94
09/09/14	9:05	10	773.1	107	9.9	47.795	31070	30.95	7.85
10/10/14	10:05	15	761.5	73	6.1	44.894	29191.5	29.16	7.83
11/17/14	14:43	8.9	759.5	76	8.8	17.66	24350	23	7.4
12/15/14	15:15	4.6	759.6	95	12.2	0.031	20.15	0.01	4.44
01/16/15	14:54	2.1	749.4	108	12.8	34.65	22574.5	21.24	6.27
02/12/15	13:06	0.09	750.7			0.709	1456	33	5.91
03/13/15	14:02	0.64	767.2			0.4	190	0.02	6.5
04/15/15	14:26	3.5	760.7	78	10.3	0.043	27.95	0.02	5.2
05/20/15	9:50	9.3	752.3	112	10.7	46.1	28.515	28.2	7.77
06/17/15	8:25	10.7	757.7	107	10	33.08	28015.5	27.64	7.71
07/17/15	9:50	15	763.1	115	9.6	45.42	29.523	29.44	7.96
08/14/15	8:45	18	764.4	90	7.2	42.43	27586	27.29	7.66
09/17/15	11:47	15	763.3			46.17	30004	29.8	7.71

10/19/15	12:56	11.9	766.4			44.42	28873	28.63	7.94
11/26/15	15:00	4.5	783.6	102	13.3	0.045	29.45	0.02	4.57
12/18/15	10:44	5.4	748.7	108	13.7	0.043	27.95	0.02	5.66
01/26/16	9:39	0.2	766.9	99	14	3.42	2210	1.75	8.08
02/24/16	9:03	2	772.2			0.514	380	0.13	7.01
03/23/16	9:13	2.4	758	96	10.9	44.47	28912	27.83	8.13
04/22/16	9:25	5.2	758.1	116	12.3	42.75	67742	27	8.03
05/20/16	13:20	10	764	100	9.4	43.74	28410	28.04	7.58
06/23/16	11:15	13.4	757.7	99	8.6	45.47	29555.5	29.41	7.89
07/19/16	8:51	17.9	758.4	96	7.6	45.69	29698.5	29.66	7.92
08/15/16	9:15	18.8	760.9			46.08	29958.5	29.96	7.91
09/23/16	12:55	13.9	760.8			46.56	30277	30.25	
10/28/16	7:42	11.1	771.2	82	7.59	45.27	29425.5	29.17	7.36
11/23/16	14:30	6.5	758.5	114	13.9	0.9	585	0.45	6.05
12/21/16	13:55	0.8	758.7	103	14.6	0.95	465.4	0.34	6.2
01/26/17	10:30	1.2	746.8	90	12.7	0.049	32.5	0.02	4.84
02/21/17	15:12	1.9	767.1	92	12.9	0.415	269	0.2	6.01
03/27/17	8:53	1.3	773	98	11.6	42.98	28301	27.5	7.84
04/25/17	8:19	6	773.4	101	10.5	40.43	26343	22.91	8.03
05/12/17	10:10	11.1	761.3	93	10	0.26	39	3.24	7.01
06/19/17	14:47	19.5	761.1	82	7.6	0.081	390	0.29	6.13
07/20/17	14:32	26	757.7	88	7.2	0.0225	146.25	0.11	7.12
08/18/17	15:18	21.7	767	94	8.2	1.54	864.5	0.66	6.85
09/21/17	10:02	18.5	763.1	62	5	43.17	28067	27.86	7.65
10/27/17	13:06	16.1	759.9	85	7.1	40.56	26370.5	25.82	7.22
11/30/17	16:22	5.8	768.6	90	10.4	24.8	15600	14.47	5.73
12/18/17	9:21	0	766.5	112	16.3	0.059	37.05	0.03	5.51

HebbMill Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		21.89		75.5		0.037	24	0.02	5.56
06/29/10	10:00	20.66		61.2		0.07	24	0.02	5.68
07/16/10	13:19	22.63		66.6		0.037	24	0.02	4.73
07/26/10	11:12	22.34		48.5		0.037	24	0.02	5.03
08/11/10	10:35	22.53		81.5		0.042	27	0.02	5.83
05/12/11	15:02	11.01		91.5	10.09	0.032	21	0.01	4.44
05/30/11	13:06	19.99		87.1	7.92	0.039	25	0.02	5.28
06/15/11	13:57	15.47		76	7.58	0.04	26	0.02	4.98
06/27/11	13:32	21.5		76.5	6.75	0.035	23	0.01	5.06
07/11/11	14:14	24.83		72.2	5.98	0.037	24	0.02	4.92
07/25/11	13:50	26.02		58.6	4.75	0.038	25	0.02	5.22
08/08/11	14:00	21.59		74.9	6.61	0.046	20	0.02	5.53
09/07/11	14:05	20.63		67	6.02	0.041	27	0.02	5.65
09/22/11	16:04	17.88		62.4	5.9	0.04	26	0.02	5.63
11/01/11		6.07		83.5	10.38	0.037	24	0.02	4.76
11/16/11		10.65		86.4	9.59	0.034	22	0.01	4.56
11/28/11		6.66				0.033	21	0.01	4.92
12/14/11		2.93		92.2	12.44	0.032	21	0.01	5.05
01/05/12		0.53				0.035	23	0.02	4.96
01/18/12		1.4		81.5	11.46	0.039	26	0.02	4.92
01/31/12		1.35		91.8	12.93	0.033	22	0.01	4.96
02/14/12		1.43		85.8	12.05	0.0324			5.35
03/09/12									
03/21/12		13.25				0.032	21	0.01	5.82

04/03/12		7.62		96.4	11.52	0.033	22	0.01	5.74
04/24/12		13.58		92.8	9.64	0.053	35	0.02	5.76
05/08/12		18.3		91.5	8.61	0.034	22	0.01	5.42
05/28/12		21.98		76.7	6.72	0.033	22	0.01	5.38
06/13/12		23.16		82.8	7.08	0.033	21	0.01	5.53
06/26/12		20.41		72.1	6.47	0.046	30	0.02	5.7
07/09/12		25.32		71.5	5.87	0.033	22	0.01	5.41
07/24/12		21.89		62.5	5.45	0.036	24	0.02	5.9
08/10/12		24.98		53.5	4.42	0.036	23	0.02	5.61
08/24/12		25.4		54	4.3	0.0377	25	0.02	5.6
09/07/12		19.1		67	6.3	0.0369	25	0.02	5.69
09/21/12		17.4		79	7.6	0.0376	25	0.02	4.96
10/05/12		16.6		64	6.2	0.038	25	0.02	5
10/19/12		12.9		71	7.5	0.038	25	0.02	5.18
11/05/12		10.6		70	7.7	0.0444	28.6	0.02	4.86
11/20/12		5.3		81	10.4	0.0422	27.3	0.02	5.02
11/30/12		1.8		83	11.4	0.0418	27.3	0.02	5.41
12/20/12		1.4		89	12.5	0.0414	26.66	0.02	4.85
01/25/13									
02/15/13		0.7		101	13.5	0.0437	28.6	0.02	5.8
03/15/13		1.2		92	12.8	0.0209	24.7	0.02	5.53
03/29/13		0.4		95	13.7	0.0328	27.95	0.02	4.97
04/11/13		6.1		84	10.4	0.0438	28.6	0.02	6.32
04/26/13									
05/09/13		19		58	5.4	0.0346	29.25	0.01	5.52
06/06/13		22.96		79.5	7.6	0.034	23	0.01	5.43
06/28/13		20.56		69.2	6.5	0.042	29.6	0.01	5.54
07/12/13									
08/09/13		20.98		68.9	6.98	0.029	19.62	0.01	5.63
08/30/13									
09/13/13									
10/01/13		15.1		82	8	0.027	16.8	0.01	6.02
10/18/13		15.2		98	9.8	0.034	20.9	0.02	6.1
10/31/13		16.6		82	8	0.026	16.8	0.01	6.02
11/06/13		9.5		102	11.6	0.018	11.8	0.01	6.07
11/22/13		3.6		81	10.7	0.016	10.4	0.01	4.73
12/05/13		3.7		103	13.5	0.014	9.2	0.01	5.37
01/10/14		0		99.5	9.5	0.038	27.41	0.01	6.59
02/13/14		0		99.8	11.9	0.038	26.47	0.01	5.88
03/11/14		0		94.9	9.81	0.03	23.23	0.01	5.38
04/11/14	11:40:00								
05/09/14	10:57:00	13.3		89	9.3				6.19
06/10/14	10:24:00	21.8		79	7	0.0346	22.75	0.01	5.16
07/10/14	10:41:00	22.9		60	5.1	0.034	22.1	0.01	5.21
08/11/14	12:31	20.8	759.9	45	4	0.0389	25.35	0.02	5.04
09/09/14	10:33	17.6	768.5	44	4.2	0.0393	25.35	0.02	5.4
10/10/14	11:59:00	14.7	756.8	77	7.7	0.0384	24.7	0.02	5.09
11/17/14	12:43	4.4	757.2	84	10.9	0.03	19.5	0.01	4.56
12/15/14	14:15	4.2	754.6	91	11.8	0.032	20.8	0.01	4.15
01/16/15	13:32	0.8	743.9	87	12.4	0.035	22.75	0.02	5.07
02/12/15	12:27	0.4	746.4			0.035	23	0.02	5.41
03/13/15	12:46	0.53	762.8			0.04	26	0.02	5.43
04/15/15	12:57	0.8	756.7	97	13.9	0.027	17.55	0.01	4.23
05/20/15	11:28	15.2	747	82	8.2	0.03	19.5	0.01	5.88
06/17/15	9:57	18.8	754.5	76	7.1	0.03	19.5	0.01	4.6
07/17/15	11:53	23.1	758.8	57	4.9	0.033	21.45	0.01	4.7
08/14/15	10:39	22	760.4	65	8.7	0.031	20.15	0.01	4.82

09/17/15	13:48	23	753			0.036	23.4	0.02	4.82
10/19/15	11:49	9.2	762.1			0.039	25.35	0.02	5.52
11/26/15	13:41	4.4	779.8			0.045	29.25	0.02	4.71
12/18/15	9:24	4.7	744.7	102	13.3	0.038	24.7	0.02	5.22
01/26/16	11:41	0.6	760.4	79	11.4	0.037	24.05	0.02	5.28
02/24/16	11:02	3.2	766.1	91	21.1	0.033	21.45	0.01	4.88
03/23/16	10:47	2.6	753.1	99	13.5	0.037	24.05	0.02	5.04
05/20/16	11:34	17.8	759.8	86	8.1	0.041	26.65	0.02	5.62
06/23/16	10:51	22.1	753.3	68	5.8	0.041	26.65	0.02	5.85
07/19/16	10:56	24.6	754.4	65	5.4	0.046	29.9	0.02	5.31
08/15/16	9:01	23.4	757.2	49	4.2	0.059	38.7	0.03	5.84
09/23/16	14:48	19	754.5	63	5.8	0.063	40.95	0.03	
10/28/16	9:15	8.4	766.4	92.6	10.85	0.045	29.29	0.02	4.98
11/23/16	11:26	6.4	752.7	99	12.1	0.041	26.65	0.02	4.92
12/21/16	13:30	1.5	754	87	12.2	0.038	24.7	0.02	4.91
01/26/17	12:15	0.7	740.5	86	12.3	0.029	18.85	0.01	4.77
02/21/17	13:38	0.6	762.6	70	10.2	0.035	22.75	0.02	4.93
03/27/17	10:12	3.9	767.9	86	11.3	0.032	20.8	0.01	4.99
04/25/17	9:44	10.7	769.3	90	10.1	0.029	19.5	0.01	4.85
05/12/17	11:38	12.3	756.7	84	9	0.03	20.15	0	4.45
06/19/17	13:23	20.8	756.4	88	7.9	0.03	19.5	0.01	4.67
07/20/17	12:46	27.2	753.6	45	3.5	0.033	21.45	0.01	5.26
08/18/17	13:55	22.7	757.8	62	5.4	0.035	22.75	0.01	5.32
09/21/17	11:38	19.5	758.5	38	3.5	0.039	25.35	0.02	5.05
10/27/17	11:30	14.6	755	38	3.9	0.088	57.2	0.04	5.42
11/30/17	15:24	4.3	763.7	82	10.7	0.049	31.85	0.02	4.4
12/18/17	10:44	1	760.9	85	12	0.048	31.2	0.02	4.16

Hebbville Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10									
06/29/10									
07/16/10									
07/26/10									
08/11/10									
05/12/11		11.52		102.3	11.15	0.033	22	0.01	5.24
05/30/11	12:13	18.76		102.2	9.33	0.03	20	0.01	5.48
06/15/11	12:58	16.19		99.3	9.8	0.032	21	0.01	5.62
06/27/11	12:47	19.68		93.5	8.55	0.03	20	0.01	5.62
07/11/11	13:23	23.75		95.8	8.11	0.031	20	0.01	5.67
07/25/11	12:53	25.07		87.2	7.2	0.031	20	0.01	5.67
08/08/11	14:39	21.98		93.9	8.21	0.032	21	0.01	6.46
09/07/11	13:23	21.45		98.2	8.68	0.035	23	0.01	6.24
09/23/11	10:53	18.13		87.2	8.18	0.034	22	0.01	6.12
11/01/11		8.19		102.1	12.06	0.031	20	0.01	5.68
11/16/11		9.89		105.5	11.95	0.03	20	0.01	5.28
11/28/11		6.89				0.028	18	0.01	5.66
12/14/11		4.52		104.3	13.46	0.022	17	0.01	5.62
01/05/12		0.27				0.029	19	0.01	5.59
01/18/12		1.04		91.7	13.01	0.027	18	0.01	5.58
01/31/12		1.36		102.8	14.39	0.036	23	0.02	5.43
02/14/12		1.66		98	13.71	0.0264			5.78
03/09/12		1.47		100	14.05	0.027			5.5

03/21/12		8.33				0.035	23	0.02	6.14
04/03/12		6.88		103.1	12.52	0.03	19	0.01	5.83
04/24/12		13.78		99.5	10.41	0.028	18	0.01	6.1
05/08/12		13.33		100.6	10.54	0.03	19	0.01	5.86
05/28/12		19.3		102.8	9.48	0.029	19	0.01	5.97
06/13/12		19.26		107	9.29	0.029	19	0.01	6.18
06/26/12		20.45		97.5	8.78	0.027	17	0.01	6.28
07/09/12		24.22		98.4	8.25	0.031	20	0.01	6.39
07/24/12		23.46		98	8.34	0.031	20	0.01	6.19
08/10/12		26.3		97.7	7.88	0.031	20	0.01	6.41
08/24/12		25		101	8.3	0.0315	21	0.01	6.41
09/07/12		20.5		89	7.51	0.0322	21	0.01	6.3
09/21/12		18.7		106	9.9	0.0326	21	0.01	6.24
10/05/12		17.5		106	10.1	0.034	22	0.01	6.07
10/19/12		12.7		98	10.4	0.033	21	0.01	6.22
11/05/12		11.3		94	10.03	0.0377	24.7	0.02	5.74
11/20/12		6.7		95	11.7	0.0357	23.4	0.02	5.64
11/30/12		2.3		94	12.9	0.0351	22.75	0.02	6.02
12/20/12		1.7		103	14.4	0.0352	22.75	0.02	5.88
01/25/13									
02/15/13		2.1		111	15.3	0.0403	26	0.02	6.07
03/15/13		2.9		93	12.6	0.0208	24.7	0.02	5.88
03/29/13		0.5		109	15.7	0.0344	22.1	0.01	5.86
04/11/13		6.3		93	10.2	0.0373	24.05	0.02	6.15
04/26/13		10.2		81	9.2	0.0427	27.95	0.02	6.24
05/09/13		17.1		81	7.9	0.0338	23.4	0.01	6.15
06/06/13		18.6		101	11.1	0.03	20.1	0.01	6.17
06/28/13		19.6		96.4	9.5	0.029	19.5	0.01	6.14
07/12/13		20.1		95.4	9.45	0.029	19.6	0.01	6.09
08/09/13		20.9		87.5	8.77	0.032	21.3	0.01	6.04
08/30/13		21.2		91.5	9.26	0.031	20.5	0.01	5.87
09/13/13		17.9		89.8	9.01	0.028	28.6	0.01	5.82
10/01/13		16.3		80	7.9	0.014	9.4	0.01	5.89
10/18/13		15		94	9.4	0.033	21.2	0.02	5.81
10/31/13		16.3		80	7.9	0.014	9.4	0.01	5.89
11/06/13		9.1		102	11.7	0.033	21.5	0.01	5.82
11/22/13		4.6		103	13.3	0.035	22.4	0.01	5.3
12/05/13		3.4		99	13.4	0.018	11.3	0.01	5.31
01/10/14		0		90.2	10.2	0.04	28.65	0.01	6.54
02/13/14		0		99.7	9.8	0.032	24.13	0.01	5.97
03/11/14		0.4		96.4	10.2	0.028	25.82	0.01	5.36
04/11/14	10:55:00								
05/09/14	10:30:00	11		107	11.6				6.84
06/10/14	11:24:00	19.8		94	8.6	0.0274	17.55	0.01	4.89
07/10/14	11:12:00	22.8		96	8.2	0.0293	18.85	0.01	5.41
08/11/14	13:05	22.9	758.9	101	8.8	0.0286	18.85	0.01	5.61
09/09/14	10:56	20.6	767.4	83	7.5	0.029	18.85	0.01	6.12
10/10/14	12:33	15.3	755.6	102	10.2	0.0301	19.5	0.01	5.32
11/17/14	12:19	6.1	756.4	97	12.1	0.03	19.5	0.01	4.94
12/15/14	13:42	4.6	753.4	102	13.1	0.027	17.55	0.01	4.84
01/16/15	12:14	2.3	743.5	105	14.3	0.029	18.2	0.01	4.99
02/12/15	11:14	1.78	745.4			0.029	19	0.01	5.37
03/13/15	12:08	1.86	761.8			0.033	22	0.01	5.7
04/15/15	12:24	1.9	755.6	101	13.9	0.041	26.65	0.02	4.69
05/20/15	11:51	15.7	745.3	99	9.8	0.021	13.65	0.01	5.85
06/17/15	10:30	19.2	753.7	99	9.1	0.025	16.25	0.01	5.25
07/17/15	12:32	24.6	757.6	99	8.3	0.026	16.25	0.01	5.66

08/14/15	11:15	23.6	759.1	97	8.2	0.027	17.55	0.01	5.56
09/17/15	14:15	22.2	757.7			0.028	17.55	0.01	5.3
10/19/15	11:20	10.6	761.2			0.029	18.95	0.01	6.35
11/26/15	12:47	5.6	779.1	104	12.1	0.037	24.05	0.02	5.75
12/17/15	15:30	4.1	759.9			0.03	19.5	0.01	6.23
01/26/16	12:27	0.9	758	107	15.3	0.031	20.15	0.01	5.74
02/24/16	11:33	3.1	764.6	103	13.7	0.033	21.45	0.014	5.35
03/23/16	11:35	3	751.8	101	13.6	0.034	22.1	0.01	5.51
04/22/16	11:33	10.2	752.5	103	11.6	0.032	20.8	0.01	5.29
05/20/16	11:05	15.3	759	103	10.3	0.041	26.65	0.02	5.56
06/23/16	10:15	20.8	752	91	8.1	0.034	22.45	0.01	5.49
07/19/16	12:01	25	753.3	98	8.1	0.039	25.35	0.02	5.5
08/15/16	9:51	24	756.5	91	7.7	0.05	32.5	0.02	5.65
09/23/16	9:10	14.2	757.6	79	8	0.05	32.5	0.02	
10/28/16	10:45	10	764.2	113.4	12.75	0.035	22.75	0.02	5.65
11/23/16	11:03	6.6	751.8	117	14.3	0.034	22.1	0.01	5.85
12/21/16	13:05	2.2	753	89	12.2	0.035	22.75	0.02	5.66
01/26/17	12:41	1.4	739.4	98	13.7	0.032	20.8	0.01	5.27
02/21/17	13:06	1.6	761.8	90	12.6	0.032	20.8	0.01	4.67
03/27/17	10:36	2.3	766.9	95	13	0.028	18.2	0.01	4.88
04/25/17	10:10	10	768.5	98	11.1	0.027	17.55	0.01	5.02
05/12/17	12:03	13	755.4	98	10.4	0.029	18.85	0.01	5
06/19/17	12:53	20.5	755.2	87	7.8	0.028	18.2	0.01	5.21
07/20/17	12:20	25.2	753.2	74	6.2	0.032	20.8	0.01	4.67
08/18/17	13:30	21.4	757.1	75	6.7	0.03	19.5	0.01	4.47
09/21/17	12:01	20.4	757.8	76	6.9	0.031	20.15	0.01	5.4
10/27/17	11:10	15.4	754.2	69	6.9	0.048	31.2	0.02	6
11/30/17	15:03	4.3	762.4	115	15	0.032	20.8	0.01	5.07
12/18/17	11:11	0.8	759.6	97	13.8	0.038	24.7	0.02	4.95

Italy Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		18.18		92.3		0.055	36	0.02	5.86
06/29/10	10:09	17.84		84		0.063	41	0.03	5.5
07/16/10	13:28	20.97		95.1		0.056	39	0.03	5.11
07/26/10	11:21	20.73		96.6		0.059	38	0.03	5.62
08/11/10	10:25	19.88		91.7		0.062	40	0.03	6.13
05/12/11		11.73		84.2	9.08	0.044	29	0.02	5.21
05/30/11	13:21	17.08		90.8	9.67	0.051	33	0.02	5.31
06/15/11	14:06	13.61		94.8	9.85	0.056	37	0.03	5.1
06/27/11	13:44	18.31		90.4	8.5	0.049	32	0.02	5
07/11/11	14:24	20.14		91.1	8.28	0.053	35	0.02	4.94
07/25/11	14:02	22.4		74.1	6.56	0.047	31	0.02	5.48
08/08/11	13:51	19.44		85.6	7.88	0.068	44	0.03	5.94
09/07/11	14:26	18.41		100.9	9.46	0.059	38	0.03	6.04
09/22/11	15:56	15		82.7	8.33	0.058	38	0.03	5.92
11/01/11		6.72		97.8	11.85	0.045	29	0.02	5.53
11/16/11		9.28		98.6	11.32	0.043	28	0.02	5.36
11/28/11		6.81				0.041	27	0.02	5.51
12/14/11		3.49		101.9	13.51	0.041	27	0.02	5.58
01/05/12		0.1				0.042	28	0.02	5.47
01/18/12		3.1		90.9	12.2	0.045	29	0.02	5.49
01/31/12		1.79		98	13.63	0.043	28	0.02	5.55
02/14/12		1.25		95.8	13.54	0.045			5.83

03/09/12									
03/21/12		10.57				0.049	32	0.02	6.2
04/03/12		6.2		99.7	12.34	0.051	33	0.02	5.73
04/24/12		11.89		92.5	9.99	0.054	35	0.02	5.85
05/08/12		15.44		100	9.9	0.053	34	0.02	5.95
05/28/12		18.44		97	9.1	0.054	35	0.02	5.95
06/13/12		18.19		97.7	9.14	0.053	34	0.02	6.04
06/26/12		18.26		87.6	8.24	0.062	40	0.03	6.05
07/09/12		22.28		101.1	8.8	0.05	32	0.02	5.88
07/24/12		20.23		78.9	7.04	0.063	41	0.03	6.02
08/10/12		21.62		94.2	8.3	0.057	37	0.03	6
08/24/12		22.5		84	7.5	0.0575	38	0.03	6.3
09/07/12		16.7		81	7.9	0.0604	39	0.03	5.15
09/21/12		17.2		98	9.4	0.0496	32.5	0.02	5.68
10/05/12		16.2		93	9.1	0.051	33	0.02	5.87
10/19/12		10.7		84	9.4	0.0522	34	0.02	5.82
11/05/12		9.7		90	10.2	0.0531	34.45	0.02	5.7
11/20/12		4.5		101	13	0.0535	34.45	0.02	5.9
11/30/12		0.6		94	13.4	0.0539	36.1	0.02	6.06
12/20/12		20		101	14	0.0488	31.85	0.02	5.15
01/25/13		0.2		104	15.2	0.0423	26.65	0.02	6.5
02/15/13									
03/15/13		2.4		95	13	0.0317	35.75	0.02	5.95
03/29/13									
04/11/13									
04/26/13		9.7		80	9	0.0229	27.3	0.02	6.19
05/09/13									
06/06/13									
06/28/13									
07/12/13									
08/09/13									
08/30/13		21.1		77.9	7.98	0.032	23.5	0.02	5.51
09/13/13		17.6		75.4	7.44	0.019	20.8	0.02	5.43
10/01/13		14.5		72	7.4	0.026	20	0.01	5.18
10/18/13		13.1		43	4.5	0.018	22.2	0.02	4.61
10/31/13		13.5		72	7.1	0.031	20	0.01	5.18
11/06/13		7.9		66	7.8	0.024	15.7	0.01	4.99
11/22/13		3.4		97	12.8	0.017	11.3	0.01	5.18
12/05/13		3.6		90	9.4	0.014	9.6	0.01	4.39
01/10/14		0		97.5	9.9	0.046	25.14	0.01	6.35
02/13/14		0		96.7	9.9	0.04	29.56	0.01	5.92
03/11/14		0.1		96.8	10.8	0.022	33.87	0.01	5.61
04/11/14	12:01:00								
05/09/14	11:17:00	11.2		101	10.9				6.9
06/10/14	10:04:00	17.2		88	8.5	0.0447	29.25	0.02	5.17
07/10/14	10:17:00	19.2		72	6.6	0.0513	33.15	0.02	5.81
08/11/14	12:05	18.1	761.6	70	6.6	0.0537	35.1	0.02	5.5
09/09/14	10:09	13.9	770.2	75	7.7	0.0525	33.8	0.02	5.77
10/10/14	11:29	13	758.4	89	9.4	0.0494	32.5	0.02	5.41
11/17/14	13:05	5.5	758.3	91	11.5	0.034	22.1	0.01	5.05
12/15/14	14:45	4.6	756.5	93	12	0.038	25.35	0.02	4.45
01/16/15	13:54	1.5	745.3	96	13.6	0.037	22.75	0.02	5.32
02/12/15	12:45								
03/13/15									
04/15/15	13:24	3.9	758	83	10.9	0.049	31.2	0.02	5.25
05/20/15	10:58	14	748.6	90	9.2	0.5	32.5	0.02	6.2
06/17/15	9:30	16.9	755.9	88	8.5	0.048	30.55	0.02	5.62

07/17/15	11:19	18.6	760.2	83	7.9	0.055	35.75	0.02	5.81
08/14/15	10:11	19.9	761.8	60	5.4	0.068	44.2	0.03	5.7
09/17/15	13:19	19.1	760			0.05	32.5	0.02	5.65
10/19/15	12:18	7.4	763.9			0.055	35.75	0.02	5.66
11/26/15	14:04	4.1	771	98	12.8	0.052	33.15	0.02	5.58
12/18/15	9:48	5.6	746.6	102	12.8	0.046	29.9	0.02	5.52
01/26/15	11:14	0	763	97	14.2	0.038	24.7	0.02	6.05
02/24/16	10:23	1.8	768	97	13.5	0.047	30.55	0.02	5.57
03/24/16	10:23	2.3	754.7	100	13.7	0.049	32.5	0.02	5.62
04/22/16	10:36:00	9.7	755.3	102	11.7	0.051	32.5	0.02	5.7
05/20/16	12:05	14.9	761.3	90	9.1	0.055	40	0.02	7.51
06/23/16	13:33	18.6	754.5	64	5.9	0.065	42.9	0.03	6.21
07/19/16	10:13	20.6	755.8	60	5.3	0.063	40.95	0.03	5.89
08/15/16	8:33	20.5	758.6	54	4.9	0.078	50.7	0.04	5.91
09/23/16	13:18	16	756.9			0.067	46.15	0.03	
10/28/16	8:51	7.5	768.3	97.1	11.54	0.052	33.8	0.02	5.2
11/23/16	11:45	5.8	754.4	105	13.1	0.049	31.85	0.02	5.47
12/21/16	14:50	0	756	85	12.4	0.05	32.5	0.02	5.52
01/26/17	11:40	2.2	742.7	97	13.5	0.041	27.3	0.02	5.02
02/21/17	14:06	1.4	764.2	92	12.9	0.041	26	0.02	5.12
03/27/17	9:55	1.6	769.8	96	13.5	0.045	29.58	0.02	5.28
04/25/17	9:21	8.8	770.8	87	10.1	0.047	29.9	0.02	5.59
05/12/17	11:27	13.4	756.2	96	10.4	0.045	29.25	0.02	5.34
06/19/17	13:53:00	19.6	757.9	86	7.8	0.045	29.25	0.02	4.84
07/20/17	13:15:00	24.8	755	75	6.3	0.04	29.9	0.02	4.97
08/18/17	14:22:00	19	759.1	83	7.7	0.051	33.15	0.02	4.63
09/21/17	11:18	18.4	760	64	6	0.053	34.45	0.02	5.08
10/27/17	11:59	14.2	756.7	64	6.7	0.059	38.5	0.03	4.7
11/30/17	15:45	3.5	765.6	88	11.6	0.052	33.8	0.02	4.94
12/18/17	10:15	0	762.9	94	13.6	0.052	33.8	0.02	4.68

Kaulback Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10									
06/29/10									
07/16/10									
07/26/10									
08/11/10									
05/12/11									
05/30/11									
06/15/11									
06/27/11									
07/11/11									
07/25/11									
08/08/11									
09/07/11									
09/23/11									
09/07/12		15.6		91	9.1	0.0562	36.4	0.03	4.77
09/21/12		14.8		106	10.8	0.033	21.45	0.01	4.82
10/05/12		13.6		100	10.4	0.033	21	0.01	5.08
10/19/12		9.4		96	10.6	0.034	22	0.01	5.22
11/05/12		8.3		93	10.9	0.0408	26.65	0.02	4.92
11/20/12		3.9		103	13.5	0.0359	23.4	0.02	5.17
11/30/12		1.2		94	13.3	0.0338	22.1	0.01	5.92

12/20/12		2.9		101	13.6	0.0483	31.2	0.02	4.52
01/25/13									
02/15/13		0		73	10.3	0.0415	26.5	0.02	6.65
03/15/13		1		73	10.4	0.0226	27.3	0.02	5.23
03/29/13		0.2		105	15.3	0.0458	29.9	0.02	4.92
04/11/13		6.1		83	10.4	0.045	29.9	0.02	6.04
04/26/13		9.9		70	8.1	0.0432	27.95	0.02	5.77
05/09/13		14.8		67	6.7	0.0379	28.6	0.02	5.39
06/06/13		16.8		79.2	7.8	0.037	30.1	0.02	5.44
06/28/13		20.4		81.3	8.1	0.034	29.8	0.02	5.41
07/12/13		20.8		83.3	8.44	0.032	27.8	0.02	5.54
08/09/13		21.1		87.6	8.87	0.033	30.25	0.02	5.59
08/30/13									
09/13/13		17.4		93.4	9.01	0.029	28.78	0.02	5.64
10/01/13		13.3		96	9.5	0.028	9.6	0.01	5.73
10/18/13		13.9		91	9.4	0.031	18	0.02	4.97
10/31/13		15.9		96	9.5	0.015	9.6	0.01	5.73
11/06/13		8.2		103	12.1	0.034	217	0.01	5.74
11/22/13		2.4		67	9.1	0.011	7.3	0.01	4.77
12/05/13		4.1		102	10.3	0.029	19.3	0.01	4.39
01/10/14		0		99.8	10.1	0.036	24.75	0.01	5.89
02/13/14		0		94.2	9.5	0.04	25.47	0.01	6.41
03/11/14		0		82.7	9.66	0.028	26.52	0.01	5.14
04/11/14	12:22:00								
05/09/14	11:35:00	8		110	12.6				6.51
06/10/14	9:27:00	13.3		107	11.2	0.0278	18.2	0.01	4.36
07/10/14	10:00:00	16.5		83	8.1	0.0337	22.1	0.01	4.95
08/11/14	11:30	16.7	761.3	82	8	0.0357	23.4	0.02	5.27
09/09/14	9:48	13.3	770	82	8.6	0.0362	23.4	0.02	5.52
10/10/14	11:13	10.6	758.1	103	11.4	0.0385	24.7	0.02	4.63
11/17/14	13:25	5.4	757.5	93	11.6	0.033	21.45	0.01	4.37
12/15/14	15:00	4.9	756.5	103	13.2	0.032	20.8	0.01	4.43
01/16/15	14:16	0.3	745	100	13.2	0.037	24.05	0.02	4.99
02/12/15									
03/13/15	13:27	0.36	764.2			0.027	18	0.01	5.34
04/15/15	13:47	2.1	757.4	82	11.4	0.024	15.6	0.01	4.66
05/20/15	10:35	9.7	748.5	96	10.9	0.027	17.55	0.01	4.92
06/17/15	9:09	12.2	755.4	101	10.8	0.025	16.25	0.01	4.1
07/17/15	10:55	15.6	760.1	84	8.4	0.034	22.1	0.01	4.8
08/14/15	9:35	15.8	761.5	98	9.8	0.031	20.15	0.01	4.46
09/17/15	12:52	16.3	759.8			0.036	23.4	0.02	4.05
10/19/15	12:39	6.3	763.3			0.038	24.7	0.02	5.05
11/26/15	14:28	5.6	780			0.04	26	0.02	5.92
12/18/15	10:01	6.4	745.8	106	13	0.034	22.1	0.01	4.9
01/26/16	10:52	0.3	762.8	95	13.7	0.033	20.8	0.01	5.4
02/24/16	10:02	0.8	768.1	115	16.5	0.032	20.8	0.01	4.55
03/23/16	10:10	1.2	752.4	75	10.6	0.045	29.25	0.02	5.39
04/22/16	10.18	6.9	755	106	12.9	0.033	21.45	0.01	5.11
05/20/16	12:21	10.7	761.2			0.045	29.25	0.02	5.1
06/23/16	12:22	15.5	754.4	89	8.8	0.43	27.95	0.02	4.51
07/19/16	9:56	17.6	755.6	91	8.7	0.048	31.2	0.02	4.79
08/15/16	8:12	18.4	758	26	2.5	0.062	40.3	0.03	5.38
09/23/16	13:50	14.2	757	90	9.1	0.074	48.1	0.03	
10/28/16	8:31	6.9	768			0.031	20.15	0.01	4.78
11/23/16	12:15	5.6	754.1	107	13.5	0.034	22.1	0.01	5.01
12/21/16	14:32	1.1	755.4	99	14.1	0.031	20.15	0.01	5.08
01/26/17	11:10	1	743	98	13.9	0.029	18.85	0.01	3.95

02/21/17	14:33	0.3	764.1	103	14.1	0.034	22.1	0.02	3.92
03/27/17	9:40	0.2	769.5	97	14.1	0.028	18.2	0.01	4.25
04/25/17	9:04	6.3	770.3	92	11.3	0.028	18.2	0.01	4.55
05/12/17	11:00	9.1	758			0.029	18.85	0.01	3.85
06/19/17	14:08	16.1	757.6	94	9.3	0.029	18.85	0.01	3.82
07/20/17	13:42	20.8	754.4	73	6.5	0.04	26	0.02	4.55
08/18/17	14:42	17.5	758.7	82	7.8	0.043	27.95	0.02	4.67
09/21/17	10:52	16.9	759.7	83	8	0.041	26.65	0.02	4.85
10/27/17	12:34	13	756.5	87	9.2	0.047	30.55	0.02	4.5
11/30/17	15:55	3.3	765.1	99	13.2	0.045	29.25	0.02	4.1
12/18/17	9:58	0.1	762.5	110	16	0.039	25.35	0.02	4.18

Milipsigate Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		19.7		96.5		0.024	19	0.01	6.18
06/29/10	13:36	21.21		99.6		0.028	18	0.01	6.36
07/16/10	11:31	24.52		101.2		0.029	19	0.01	6.07
07/26/10	9:28	23.15		101.2		0.03	19	0.01	5.97
08/11/10	12:24	24.48		93.4		0.03	19	0.01	6.03
05/12/11	10:40	11.7		97.7	10.62	0.028	18	0.01	5.15
05/30/11	10:10	18.75		99.9	9.32	0.028	18	0.01	5.84
06/15/11	11:05	16.19		92.3	9.08	0.031	20	0.01	7.65
06/27/11	10:24	19.38		89.8	8.27	0.028	18	0.01	7.06
07/11/11	11:30	22.84		94.6	8.13	0.025	16	0.01	6.18
07/25/11	10:00	22.96		84.4	7.24	0.028	18	0.01	7.05
08/08/11	16:27	21.84		96.6	8.48	0.028	18	0.01	6.09
09/07/11	10:45	21.89		96.2	8.4	0.029	19	0.01	6.75
09/23/11	9:19	18.84		79.2	7.37	0.028	18	0.01	6.3
11/01/11		8.7		99.8	11.61	0.027	18	0.01	5.45
11/16/11		10.5		99.7	11.12	0.026	17	0.01	5.27
11/28/11		7.54				0.026	17	0.01	5.35
12/14/11		5.22		96.5	12.26	0.025	16	0.01	5.38
01/05/12		1.31				0.025	16	0.01	5.35
01/18/12		1.69				0.026	17	0.01	5.39
01/31/12		1.67		100.9	14.02	0.026	17	0.01	5.75
02/14/12		1.92		92.4	12.78	0.0247			5.66
03/09/12		1.55		94.2	13.12	0.0234			5.58
03/21/12		7.28				0.026	17	0.01	6.1
04/03/12		6.57		100.4	12.29	0.026	17	0.01	5.33
04/24/12		13.72		99	10.27	0.027	17	0.01	6.09
05/08/12		12.43		96.1	10.26	0.027	18	0.01	5.64
05/28/12		18.84		98.9	9.01	0.027	18	0.01	5.84
06/13/12		19.6		99.5	9.13	0.026	17	0.01	6.59
06/26/12		20.67		98	8.78	0.028	18	0.01	6.41
07/09/12		23.05		94.6	8.08	0.028	18	0.01	6.21
07/24/12		23.33		94.6	8.7	0.029	19	0.01	6.54
08/10/12		25.88		94.6	7.69	0.029	19	0.01	7.57
08/24/12		25		90	7.5	0.0288	18.85	0.01	6.61
09/07/12		21.3		75	6.6	0.0287	18.85	0.01	6.34
09/21/12		19		82	7.6	0.0284	18.2	0.01	6.29
10/05/12		17.7		90	8.6	0.0286	18	0.01	6.21
10/19/12		13.5		83	8.6	0.0288	18	0.01	6.16
11/05/12		11.6		77	8.4	0.0297	19.5	0.01	6.05

11/21/12		7.8		85	10.5	0.0306	20.15	0.01	6.01
11/30/12		3.6		86	11.4	0.0306	20.15	0.01	6.36
12/20/12		2.7		87	11.8	0.0308	20.15	0.01	5.86
01/25/13		1.9		149	20.8	0.031	20.16	0.01	6.18
02/15/13									
03/15/13									
03/29/13		0.7		104	14.8	0.0309	20.15	0.01	5.76
04/11/13		5.5		101	9.9	0.0365	32.5	0.02	5.98
04/26/13		10.3		76	8.5	0.0371	24.05	0.02	5.5
05/09/13		17.4		68	6.5	0.0423	33.15	0.02	5.93
06/05/13		19.5		72	7.1	0.032	21.3	0.02	6.42
06/27/13		20.1		75	7.7	0.028	20.4	0.02	6.41
07/11/13		20.5		77	7.6	0.027	19.5	0.01	6.39
08/08/13		21.3		81	8.2	0.029	18.7	0.01	6.15
08/30/13		22.8		79	7.8	0.031	20.4	0.01	5.99
09/13/13		18.9		74	7.5	0.025	18.4	0.01	5.87
10/01/13		16.9		89	8.9	0.0264	17.2	0.01	5.71
10/18/13		15.5		93	9.2	0.0062	40.3	0.03	5.75
10/31/13		16.9		59	5.7	0.026	17.2	0.01	5.71
11/06/13		9.7		91	10.3	0.034	21.9	0.02	5.83
11/22/13		5.9		82	10.2	0.035	23	0.02	5.52
12/05/13		3.4		94	12.3	0.014	8.8	0.01	4.77
01/10/14		0		98.7	13.3	0.03	18.23	0.02	6.08
02/13/14		0		92.5	9.5	0.03	35.41	0.01	5.89
03/11/14		0.1		95.4	10.1	0.033	26.32	0.01	5.22
04/11/14	8:58:00								
05/09/14	8:54:00	11.2		88	9.7				6.56
06/10/14	13:11:00	22.1		88	7.6	0.0254	16.25	0.01	5.77
07/10/14	13:16:00	24.7		90	7.5	0.0258	16.9	0.01	5.6
08/11/14	15:01	22.9	758.4	56	4.8	0.0269	17.55	0.01	5.79
09/09/14	13:10	21.2	766.3	68	6.1	0.027	17.55	0.01	6.11
10/10/14	15:09	16.8	754.2	95	9.2	0.0268	44.3	0.01	5.44
11/17/14	10:38	7	756.8	82	9.9	0.027	17.55	0.01	4.9
12/15/14	11:13	4.8	752.4	94	12.1	0.026	16.9	0.01	4.38
01/16/15	10:40	2.7	744	89	12.1	0.026	16.9	0.01	4.44
02/12/15	8:35								
03/13/15	10:26	2.18	762			0.026	17	0.01	5.64
04/15/15	10:28	3.2	755.8	86	11.4	0.029	18.85	0.01	5.14
05/20/15	13:53	16.1	743.1	84	8.2	0.02	13	0.01	5.69
06/17/15	12:50	19.8	754.5	76	6.9	0.023	14.95	0.01	4.84
07/17/15	14:41	25.3	756.3	70	5.8	0.024	15.6	0.01	5.79
08/14/15	13:44	25.2	758.4	78	6.4	0.024	15.6	0.02	5.7
09/17/15	16:06	23.6	755.4			0.024	5.6	0.01	5.9
10/19/15	9:34	11.3	760.3			0.025	16.25	0.01	6.45
11/26/15	11:08	3.4	779.8			0.027	17.55	0.01	6.06
12/17/15	13:57	4.8	760.4	80	10.2	0.03	19.5	0.01	6.17
01/26/16									
02/24/16	13:38	2.8	760.9	92	12.5	0.03	19.5	0.01	5.54
03/23/16	12:32	3.4	751.1	97	12.9	0.03	19.5	0.01	5.65
04/22/16	13:31	10.5	751.4	89	10	0.03	19.5	0.01	5.12
05/20/16	9:05	15.2	758.5	79	7.9	0.05	32.5	0.02	6.06
06/23/16	8:00	20.5	751.3	70	6.3	0.033	21.45	0.01	5.59
07/19/16	14:36	26.7	752.7	70	7.5	0.052	33.8	0.02	5.24
08/15/16	10:34	24.3	756.1	60	5	0.046	29.9	0.02	6.2
09/23/16	10:50	20.6	755.2	78	7	0.037	24.05	0.02	
10/28/16	12:23	10.9	762	93.3	10.31	0.027	17.55	0.01	5.76
11/23/16	9:40	7.1	750.9	84	10.1	0.027	17.55	0.01	6.06

12/21/16	11:43	1.1	752.8	92	12.9	0.028	18.2	0.01	6.05
01/26/17	14:20	1.6	737.5	96	13.5	0.028	18.2	0.01	5.84
02/21/17									
03/27/17	12:47	2.2	765.5	95	13	0.025	16.25	0.01	5.39
04/25/17	11:48	9	767.9	99	11.5	0.024	15.6	0.01	6.01
05/12/17	13:34	12.7	740.3	90	9.5	0.024	15.6	0.01	5.45
06/19/17	11:12	20.3	754.4	96	8.7	0.025	16.25	0.01	5.09
07/20/17	10:19	25.1	752.6	79	6.5	0.025	16.25	0.01	6.1
08/18/17	11:35	22.5	753.2	88	7.7	0.026	16.9	0.01	5.9
09/21/17	13:14	20.4	757.4	77	7	0.025	16.25	0.01	5.75
10/27/17	9:20	16	752.6	94	9.2	0.026	16.9	0.01	6.33
11/30/17	13:29	5.6	762	103	13	0.029	18.85	0.01	5.25
12/18/17									

Minamkeak Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		20.97		91.8		0.027	18	0.01	5.93
06/29/10	14:43	20.56		88.3		0.026	17	0.01	5.91
07/16/10	12:23	24.51		98.8		0.026	17	0.01	5.92
07/26/10	10:20	22.89		96.7		0.026	17	0.01	5.74
08/11/10	11:23	23.57		102.3		0.026	17	0.01	6.29
05/12/11	13:44	10.72		100.1	11.11	0.026	17	0.01	5.27
05/30/11	11:15	18.06		99.4	9.29	0.028	17	0.01	5.52
06/15/11	12:16	14.8		92.9	9.4	0.029	19	0.01	5.21
06/27/11	11:30	17.87		82	7.79	0.027	18	0.01	5.22
07/11/11	12:36	22.72		90.1	7.77	0.027	18	0.01	5.22
07/25/11	11:19	23.36		82.1	7	0.027	18	0.01	5.7
08/08/11	15:18	21.49		95.1	8.4	0.027	17	0.01	6.41
09/07/11	11:51	21.29		90.3	7.93	0.03	19	0.01	6.3
09/23/11	10:20	18.66		86.5	8.06	0.027	18	0.01	5.7
11/01/11		8.48		99.7	11.66	0.026	17	0.01	5.55
11/16/11		10.67		99	11	0.026	17	0.01	5.59
11/28/11		8.12				0.025	16	0.01	5.46
12/14/11		4.9		103.1	13.2	0.025	17	0.01	5.31
01/05/12		0.8				0.026	17	0.01	5.28
01/18/12		1.05		96.1	13.65	0.026	17	0.01	5.51
01/31/12		1.49		99.3	13.91	0.026	17	0.01	5.47
02/14/12		2.5		98.5	13.46	0.0246			6.22
03/09/12		3.12		99.1	13.28	0.0227			5.77
03/21/12		8.91				0.025	16	0.01	6.41
04/03/12		6.44		100.2	12.32	0.025	16	0.01	5.83
04/24/12		14.3		97	9.99	0.025	16	0.01	6.06
05/08/12		13.38		102.4	10.7	0.025	16	0.01	5.85
05/28/12		18.57		95.4	8.93	0.025	17	0.01	5.97
06/13/12		21.2		98.5	8.75	0.026	17	0.01	6.11
06/26/12		20.38		91.9	8.28	0.026	17	0.01	6.4
07/09/12		23.75		96	8.12	0.025	16	0.01	6.06
07/24/12		22.76		92	7.92	0.026	17	0.01	6.3
08/10/12		26.21		90.1	7.28	0.026	17	0.01	6.09
08/24/12		24.6		85	7.2	0.0264	17	0.01	6.22
09/07/12		20.8		85	7.7	0.0252	16	0.01	6.23
09/21/12		18.2		92	8.6	0.0252	16	0.01	6.18
10/05/12		17.6		90	8.5	0.0257	17	0.01	6.16

10/19/12		12.7		87	9.2	0.0256	17	0.01	6.25
11/05/12		11.1		89	9.8	0.0262	17	0.01	6.25
11/20/12		7.5		91	10.8	0.0264	16.9	0.01	6.12
11/30/12		2.4		89	12.1	0.0266	17.55	0.01	6.36
12/20/12		2.4		99	13.6	0.0267	17.55	0.01	5.29
01/25/13		1.6		136	16.2	0.0279	18.2	0.01	6.62
02/15/13									
03/15/13		0.6		62	8.7	0.0197	24.05	0.02	5.37
03/29/13		0.5		103	14.9	0.0278	18.2	0.01	6.12
04/11/13		7		74	9.1	0.028	18.2	0.01	6.05
04/26/13		10.1		82	9.3	0.0267	17.88	0.01	6.18
05/09/13		17.9		80	7.6	0.0273	18.2	0.01	6.03
06/06/13		20.3		95.6	9.6	0.026	18.3	0.01	6.06
06/28/13		19.3		90.3	8.84	0.026	17.6	0.01	6.3
07/12/13		20.1		89.9	8.7	0.022	16.9	0.01	6.23
08/09/13		21.1		87.7	8.8	0.025	17.5	0.01	6.14
08/30/13		22.5		87.6	8.9	0.024	19.4	0.01	5.99
09/13/13		18.7		80.5	8.1	0.019	20.1	0.01	5.74
10/01/13		15.8		73	7.2	0.0134	8.8	0.01	5.67
10/18/13		14.3		65	6.6	0.033	21.3	0.02	5.39
10/31/13		15.8		73	7.2	0.013	8.8	0.01	5.67
11/06/13		6.2		79	9.7	0.035	22.5	0.01	5.56
11/22/13		4.9		93	11.9	0.058	38	0.03	5.76
12/05/13		3.5		84	12.5	0.014	9.2	0.01	5.22
01/01/14		0		101.2	15.7	0.026	17.22	0.01	6.51
02/13/14		0		93.3	9.5	0.028	25.68	0.01	6.03
03/11/14		0.7		92.1	9.5	0.032	20.96	0.01	5.38
04/11/14	10:06:00								
05/09/14	9:51:00	12.3		102	10.8				6.76
06/10/14	11:58:00	21.6		89	7.8	0.0237	15.6	0.01	5.03
07/10/14	12:19:00	23.9		91	7.6	0.0246	16.25	0.01	5.43
08/11/14	13:47	22.8	757.7	91	7.7	0.0244	15.6	0.01	5.62
09/09/14	11:51	20.5	766.1	78	7.1	0.025	16.25	0.01	5.98
10/10/14	13:13	15.7	754.7	81	8.1	0.0205	13.65	0.01	5.69
11/17/14	11:29	7	755.5	84	10.1	0.025	16.25	0.01	5.84
12/15/14	12:16	4.6	751.8	80	10.5	0.024	15.6	0.01	5.14
01/16/15	11:38	1.1	742.9	101	14.3	0.026	16.25	0.01	
02/12/15	9:50	1.21	744			0.024	16	0.01	5.79
03/13/15	11:30	0.18	761.2			0.026	17	0.01	5.88
04/15/15	11:43	2.2	754.9	80	11	0.025	16.25	0.01	4.58
05/20/15	12:48	15	743.1	90	9	0.022	14.3	0.01	5.8
06/17/15	11:24	18.4	753.4	91	8.5	0.022	14.3	0.01	4.92
07/17/15	14:16	23.2	756.2	78	6.7	0.02	14.3	0.01	5.11
08/14/15	12:39	22.8	758.1	83	7.1	0.023	14.95	0.01	5.19
09/17/15	15:06	22.7	755.3			0.023	14.95	0.01	5.44
10/19/15	10:36	10.1	760.1			0.023	14.95	0.01	6.3
11/26/15	12:06	5.9	778.6	93	11.6	0.024	15.2	0.01	6.12
12/17/15	14:53	4.3	758.6	101	13.1	0.024	15.6	0.01	6.31
01/26/16	15:08	0.8	754.2	101	14.4	0.025	16.25	0.01	6.08
02/24/16	12:27	3.1	762.1			0.027	17.55	0.01	5.75
03/23/16	13:32	3.3	750.5	100	13.3	0.029	18.2	0.01	5.65
04/22/16	12:22	10.1	751.2	103	11.6	0.027	17.55	0.01	5.72
05/20/16	10:13	15.1	758	88	8.9	0.039	25.35	0.02	5.48
06/23/16	9:15	21.1	751.2	73	6.5	0.032	20.8	0.01	5.89
07/19/16	13:09	26.6	752.4	77	6.2	0.035	22.75	0.01	5.91
08/15/16	11:36	24.6	755.6	75	6.2	0.048	31.2	0.02	6.2
09/23/16	11:50	19.9	754.9	85	7	0.036	23.4	0.02	

10/28/16	11:30	8.7	762.5	100	11.61	0.024	15.6	0.01	5.31
11/23/16	10:30	6.7	750.5	108	13.3	0.023	14.95	0.01	6.26
12/21/16	12:30	0.02	752	102	14.5	0.024	15.6	0.01	6.2
01/26/17	13:20	1.3	737.6	101	14.3	0.024	15.6	0.01	5.99
02/21/17	12:27	1.6	761.1	100	14	0.025	15.6	0.01	5.04
03/27/17	11:48	2.2	765	103	14	0.023	14.95	0.01	5.56
04/25/17	10:25	10.3	768.7	98	10.9	0.036	23.4	0.02	5.48
05/12/17	12:40	12.2	753.9	102	10.6	0.023	14.95	0.01	5.15
06/19/17	12:12	20.3	754.2	100	9	0.023	14.95	0.01	5.06
07/20/17	11:22	25	752.1	82	6.8	0.024	15.6	0.01	5.2
08/18/17	12:28	21.6	755.8	85	7.5	0.024	15.61	0.01	5.06
09/21/17	14:10	21.4	756.6	83	7.2	0.024	15.6	0.01	5.18
10/27/17	10:28	16.5	752.6	84	8.2	0.024	15.6	0.01	4.96
11/30/17	14:30	4	761.2	98	12.7	0.025	16.25	0.01	5.05
12/18/17	11:57	1.6	758	92	12.8	0.025	16.25	0.01	5.49

Wallace Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10									
06/29/10									
07/16/10									
07/26/10									
08/11/10									
05/12/11									
05/30/11									
06/15/11									
06/27/11									
07/11/11									
07/25/11									
08/08/11									
09/07/11									
09/23/11									
11/01/11		7.62		93.7	11.19	0.048	31	0.02	5.73
11/16/11		10.36		98.2	10.99	0.044	29	0.02	5.54
11/28/11		7.15				0.042	28	0.02	5.65
12/14/11		3.96		99.4	13.02	0.042	27	0.02	5.67
01/05/12		0.25				0.043	23	0.02	5.39
01/18/12		2.68		93.8	12.73	0.045	29	0.02	5.41
01/31/12		3.3		92.4	12.33	0.045	29	0.02	5.49
02/14/12		4.07		91.1	11.89	0.048			5.8
03/09/12									
03/21/12		21.15				0.05	32	0.02	6.31
04/03/12		8.27		99.1	11.65	0.052	34	0.02	7.01
04/24/12		13.45		97.5	10.18	0.052	33	0.02	5.97
05/08/12		17.2		100.8	9.75	0.053	34	0.02	5.66
05/28/12		21.78		103.7	9.11	0.053	35	0.02	5.98
06/13/12		22.35		101	8.84	0.054	35	0.02	5.96
06/26/12		20.05		91	8.24	0.054	35	0.02	6.08
07/09/12		25.93		104.9	8.51	0.054	35	0.02	5.9
07/24/12		22.03		92.9	8.12	0.056	36	0.02	6.05
08/10/12		26.7		94.6	7.57	0.057	37	0.03	6
08/24/12		26.5		82	6.7	0.0577	37.7	0.03	6.45
09/07/12		19.1		82	7.5	0.0562	36.4	0.03	6.26

09/21/12		18.6		98	9.2	0.0528	34.45	0.02	6.16
10/05/12		18		96	9	0.053	34	0.03	6.18
10/19/12		14.2		90	9.2	0.054	35	0.02	6.23
11/05/12		11.5		91	9.9	0.0548	35.75	0.02	6.21
11/20/12		6.8		93	11.3	0.0545	36.1	0.02	6.12
11/30/12		1.1		96	13.4	0.0546	35.75	0.02	6.51
12/20/12		1.8		101	14	0.0517	33.15	0.02	5.95
01/25/13									
02/15/13									
03/15/13									
03/29/13		0.6		105	15	0.0526	34.45	0.02	5.89
04/11/13		7		77	9.3	0.0327	20.8	0.01	5.52
04/26/13		9.3		71	8.4	0.0479	31.2	0.02	5.81
05/09/13		10.7		54	5.9	0.0394	23.4	0.01	5.3
06/06/13		18.5		86.3	8.42	0.042	34	0.01	5.57
06/28/13									
07/12/13		20.89		78.5	7.98	0.048	26.98	0.01	5.77
08/09/13		21.87		74.4	7.54	0.032	19.54	0.01	5.89
08/30/13		21.9		89.5	9.01	0.042	34.52	0.01	5.55
09/13/13		18.4		77.8	7.65	0.029	25.6	0.01	5.69
10/01/13		13.5		73	7.3	0.031	17.4	0.01	5.33
10/18/13		14.4		77	7.9	0.033	16.4	0.02	5.21
10/31/13		15.1		73	7.3	0.027	17.4	0.01	5.33
11/06/13		8.2		61	7.2	0.019	12.2	0.01	5.44
11/22/13		4.4		74	9.5	0.015	9.9	0.01	4.65
12/05/13		4.6		102	11.8	0.014	7.8	0.01	4.44
01/10/14		0		99.4	9.8	0.042	26.32	0.02	6.47
02/13/14		0		94.8	9.8	0.045	25.23	0.01	5.76
03/11/14		0		84.2	9.12	0.058	30.44	0	5.27
04/11/14	11:50:00								
05/09/14	11:07:00	12.6		105	11				6.94
06/10/14	10:14:00	21		90	8	0.0458	29.9	0.02	5.93
07/10/14	10:30:00	22.3		70	6.1	0.0491	31.85	0.02	6.11
08/11/14	12:18	22.3	759.6	74	6.4	0.0512	32.5	0.02	6.19
09/09/14	10:21	18.7	768.2	74	6.9	0.0518	33.8	0.02	6.18
10/10/14	11:46	14.9	756.5	87	8.8	0.0504	33.8	0.02	5.94
11/17/14	12:54	5.8	756.4	89	11.1	0.035	22.75	0.02	5.17
12/15/14	14:31	4.6	754.4	100	12.9	0.037	26	0.02	4.75
01/16/15	13:42	2.7	743.3	100	13.6	0.042	28.3	0.02	5.34
02/12/15	12:35	1.57	746			0.045	29	0.02	5.39
03/13/15	12:58	2.17	762.4			0.049	32	0.02	5.57
04/15/15	13:10	3	756	86	11.5	0.054	34.45	0.02	5.07
05/20/15	11:15	15.9	746.6	94	9.3	0.051	39.65	0.02	6.42
06/17/15	9:45	19.5	754.1	92	8.5	0.05	32.5	0.02	6.03
07/17/15	11:36	24.5	758.4	71	5.9	0.053	34.45	0.02	6.23
08/14/15	10:27	22.7	750	84	7.2	0.052	33.8	0.02	6
09/17/15	13:13	23	758			0.054	35.1	0.02	6.17
10/19/15	12:05	10	761.8	87	9.8	0.057	37.7	0.03	6.45
11/26/15	13:53	5.7	779.2	93	11.7	0.053	35.1	0.02	6.23
12/18/15	9:35	4.7	744.5	106	13.6	0.052	33.8	0.02	6.2
01/26/16	11:27	1.2	760.3	89	12.6	0.053	35.1	0.02	5.95
02/24/16	10:45	4	765.6	84	11	0.05	32.5	0.02	5.43
03/23/16	10:36	3.1	752.8	100	13.4	0.052	35.75	0.02	5.87
04/22/16	10:49	11.3	753.4	105	11.5	0.051	33.15	0.02	5.98
05/20/16	11:48	16.6	759.4	94	9.1	0.06	39	0.03	5.59
06/23/16	13:45	23.9	752.6	90	7.6	0.057	37.05	0.03	6.21
07/19/16	10:37	24.4	753.9	80	6.7	0.063	40.95	0.03	6.21

08/15/16	8:48	24	757	58	4.9	0.073	47.45	0.03	6.25
09/23/16	14:35	19.1	754.4	67	6.1	0.082	53.3	0.03	
10/28/16	9:03	9.6	766.1	97.4	11.07	0.053	34.45	0.02	5.82
11/23/16	11:34	6.7	752.4	113	13.3	0.051	33.15	0.02	6.13
12/21/16	13:40	1.8	753.6	99	13.8	0.053	34.45	0.02	6
01/26/17	12:10	3	740.4	86	11.6	0.044	29.25	0.02	5.02
02/21/17	13:48	2.7	762	74	10	0.047	31.85	0.02	4.93
03/27/17	10:03	2.8	767.5	94	12.7	0.048	29.9	0.02	5.49
04/25/17	9:32	10.8	768.7	97	10.7	0.047	30.55	0.02	6.01
05/12/17	11:27	13.4	756.2	96	10.1	0.047	30.55	0.02	5.74
06/19/17	13:35	21.3	755.9	88	7.8	0.048	31.2	0.02	5.67
07/20/17	13:00	27.6	753.2	87	6.9	0.05	32.5	0.02	5.53
08/18/17	14:11	23.7	757.4	79	6.7	0.051	33.15	0.02	5.74
09/21/17	11:25	20.2	758	59	5.3	0.052	33.8	0.02	6.03
10/27/17	11:44	14.6	754.7	72	7.4	0.053	33.8	0.02	5.68
11/30/17	15:35	4.6	763.3	95	12.3	0.048	31.2	0.02	5.16
12/18/17	10:26	1	760.7	95	13.5	0.053	34.45	0.02	5.31

WambackMill Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10		16.15		97.1		0.046	30	0.02	6.04
06/29/10	10:33	17.31		100.9		0.044	28	0.02	4.93
07/16/10	13:46	19.33		99.6		0.046	30	0.02	4.6
07/26/10	11:41	19.14		101.4		0.044	28	0.02	4.97
08/11/10	10:02	19.01		103.5		0.039	26	0.02	6.34
05/12/11	15:39	10.17		102.1	11.49	0.036	24	0.02	4.43
05/30/11	13:50	16.25		101.8	9.99	0.036	24	0.02	4.84
06/15/11									
06/27/11									
07/11/11									
07/25/11	14:45	20.15		91.6	8.3	0.043	28	0.02	5.05
08/08/11	13:10	18.83		97.1	8.04	0.043	28	0.02	5.73
09/07/11	14:54	16.89		111	10.75	0.048	31	0.02	5.69
09/22/11	15:02			87	8.92	0.047	31	0.02	5.84
11/01/11		5.68		97.1	12.19	0.035	23	0.02	4.79
11/16/11		9.25		96.7	11.11	0.035	23	0.02	4.66
11/28/11		5.87				0.034	22	0.01	4.89
12/14/11		2.52		99.7	13.6	0.033	22	0.01	5.25
01/05/12		0.11				0.039	25	0.02	4.83
01/18/12		1.16		94.6	13.4	0.042	27	0.02	4.94
01/31/12		0.11		98.4	14.3	0.039	25	0.02	4.77
02/14/12		0.04		97.1	14.22	0.0376			5.14
03/09/12		3.31		100.4	13.39	0.0354			4.94
03/21/12		9.19				0.039	26	0.02	5.6
04/03/12		5.59		97.2	12.22	0.037	24	0.02	5.45
04/24/12		11.21		97.9	10.73	0.038	25	0.02	5.68
05/08/12		14.17		101.1	10.37	0.038	25	0.02	5.5
05/28/12		16.76		100.5	9.77	0.037	24	0.02	5.56
06/13/12		16.74		101.4	9.83	0.049	27	0.02	5.88
06/26/12		17.52		93.5	8.94	0.041	27	0.02	5.79
07/09/12		20.48		103.2	9.04	0.04	26	0.02	5.28
07/24/12		18.9		99.8	9.28	0.044	28	0.02	5.86
08/10/12		20.45		101.2	9.13	0.043	28	0.02	5.65

08/24/12		20.3		91	8.3	0.0449	29.25	0.02	6.05
09/07/12		16.7		103	10	0.0556	36.4	0.03	5.26
09/21/12		15.4		110	11	0.0414	26.65	0.02	4.95
10/05/12		14.7		104	10.6	0.0401	26	0.02	5.26
10/19/12		10.1		103	11.6	0.041	27	0.02	5.5
11/05/12		8.8		95	11	0.0495	32.5	0.02	4.96
11/20/12		2.7		107	14.6	0.0457	29.9	0.02	5.12
11/30/12		0.2		95	13.08	0.0441	28.6	0.02	5.49
12/20/12		2		106	14.7	0.0545	35.1	0.02	4.67
01/25/13									
02/15/13		0		89	12.7	0.0649	36.75	0.03	6.27
03/15/13		0.7		97	13.9	0.0276	33.8	0.02	5.27
03/29/13		0		101	14.8	0.058	37.7	0.03	4.59
04/11/13		6.4		75	9.3	0.0436	28.6	0.02	5.83
04/26/13		8.4		81	9.2	0.0453	29.25	0.02	5.44
05/09/13		14.5		82	8.4	0.045	28.6	0.02	5.66
06/06/13		18.4		98.7	9.8	0.044	27.4	0.02	5.83
06/28/13		20.7		98.2	9.7	0.045	29.1	0.02	5.81
07/12/13		20.4		97.7	9.81	0.033	22.3	0.02	5.78
08/09/13		20.9		95.8	9.66	0.042	28.98	0.02	5.78
08/30/13		21.8		88.7	8.97	0.029	21.32	0.02	5.64
09/13/13		17.7		94.8	9.55	0.022	18.5	0.02	5.49
10/01/13		13.7		92	9.2	0.015	17	0.01	5.23
10/18/13		14.2		94	7.8	0.021	20.9	0.02	4.93
10/31/13		15.3		92	9.2	0.026	17	0.01	5.56
11/06/13		8.1		86	10.1	0.018	11.4	0.01	5.52
11/22/13		2.5		112	15.3	0.015	9.5	0.01	5.02
12/05/13		3.8		87	14.6	0.031	18.5	0.01	4.51
01/10/14		0		99.8	10.5	0.041	30.24	0.01	6.34
02/13/14		0		92.1	9.8	0.05	37.52	0.01	6.14
03/11/14		0.3		98.3	9.82	0.022	28.59	0.01	5.2
04/11/14	12:49:00								
05/09/14	12:20:00	11.2		108	11.7				5.97
06/10/14	9:01:00	16.4		106	10.4	0.0331	21.45	0.01	5.27
07/10/14	9:29:00	18		100	9.5	0.0397	26	0.02	5.88
08/11/14	10:56	17.3	764.1	96	9.2	0.0422	27.3	0.02	6.93
09/09/14	9:17	12.9	772.6	88	9.3	0.0417	27.3	0.02	6.95
10/10/14	10:25	11.7	761.1	100	10.9	0.0433	29.95	0.02	5.19
11/17/14	13:58	3.7	759.7	97	12.8	0.031	20.15	0.01	4.46
12/15/14	14:35	4.3	759.4	79	10.7	0.035	22.75	0.02	4.06
01/16/15	14:46	0.1	747.8	103	15	0.041	26.65	0.02	4.69
02/12/15	13:13	0.07	750.3			0.039	25	0.02	5.16
03/13/15	13:50	0.06	767			0.054	35	0.02	5.35
04/15/15	14:18	1.1	760.2	87	12.4	0.03	19.5	0.01	4.25
05/20/15	10:05	12.6	751.7	98	10.4	0.024	15.6	0.01	8.03
06/17/15	8:31	14.7	757.5	103	10.4	0.029	18.85	0.01	5.45
07/17/15	9:57	16.9	762.7	99	9.4	0.38	24.7	0.02	6.02
08/14/15	8:59	18	764.1	106	10.1	0.035	22.75	0.02	5.64
09/17/15	12:03	17.5	762.7			0.043	27.95	0.02	5.45
10/19/15	13:13	7	766.1	101	12.2	0.042	27.3	0.02	5.44
11/26/15	14:52	2.5	783.2	101	13.8	0.044	28.6	0.02	4.84
12/18/15	10:33	5.1	747.9	106	14.2	0.039	25.35	0.02	5.07
01/26/16	9:57	0	766.1	96	13.9	0.039	25.35	0.02	4.96
02/24/16	9:17	0.6	771.5	101	14.5	0.037	24.05	0.02	4.45
03/23/16	9:36	1.6	757	104	14.5	0.037	24.05	0.02	5.39
04/22/16	9:43	8.4	757.7	112	13.1	0.037	24.05	0.02	5.49
05/20/16	13:08	13.9	763.5	101	10.5	0.038	24.7	0.02	5.24

06/23/16	11:25	17.8	757.2	90	8.8	0.042	27.3	0.02	5.96
07/19/16	9:14	19.9	758.2	91	8.3	0.047	30.55	0.02	6.03
08/15/16	7:37	20.3	760	91	8.2	0.06	39	0.03	7.15
09/23/16	13:14	15.4	760.3	94	9.4	0.068	44.2	0.03	
10/28/16	8:04	7.4	770.8	114.9	13.79	0.041	26.65	0.02	4.73
11/23/16	12:32	5.6	757	117	14.7	0.04	26	0.02	4.93
12/21/16	14:04	0	758.2	103	15.1	0.039	25.35	0.02	5.03
01/26/17	10:43	0.6	746.1	95	13.8	0.033	21.45	0.01	4.08
02/21/17	15:04	0	766.4	98	14.3	0.037	24.05	0.02	4.44
03/27/17	9:00	0.6	772.4	103	14.8	0.034	22.1	0.01	4.08
04/25/17	8:30	7.3	772.9	101	12.2	0.033	21.45	0.01	4.66
05/12/17	10:32	10.2	760.8	102	11.4	0.033	21.45	0.01	3.96
06/19/17	14:39	17.2	760.5	102	9.9	0.033	21.45	0.01	4.58
07/20/17	14:22	22.2	757	123	10.7	0.038	24.7	0.02	4.8
08/18/17	15:05	17.9	761.4	100	9.5	0.04	26	0.02	4.76
09/21/17	10:16	18	762.3	93	8.8	0.039	25.35	0.02	5.4
10/27/17	12:55	13.7	759.3	105	10.9	0.04	26	0.02	4.39
11/30/17	16:18	2.7	767.8	102	13.8	0.05	32.5	0.02	3.95
12/18/17	9:32	-0.1	765.7	113	16.5	0.046	29.9	0.02	3.85

Weagle Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10									
06/29/10									
07/16/10									
07/26/10									
08/11/10									
05/12/11									
05/30/11									
06/15/11									
06/27/11									
07/11/11									
07/25/11									
08/08/11									
09/07/11									
09/23/11									
11/01/11		7.95		103	12.2	0.031	20	0.01	5.64
11/16/11		9.94		97.5	10.99	0.029	29	0.01	5.61
11/28/11		6.88				0.028	18	0.01	5.63
12/14/11		4.54		102.7	13.24	0.027	18	0.01	5.6
01/05/12		0.39				0.029	19	0.01	5.64
01/18/12		1.29		87.9	12.42	0.027	18	0.01	5.59
01/31/12		1.32		99.1	13.93	0.031	20	0.01	5.59
02/14/12		1.71		91.5	12.76	0.0269			6.09
03/09/12		1.97		96.6	13.35	0.0278			5.66
03/21/12		7.81				0.031	20	0.01	6.32
04/03/12		6.61		100.4	12.27	0.03	19	0.01	5.83
04/24/12		13.84		95.7	9.89	0.029	19	0.01	6.07
05/08/12		13.54		96.1	10.01	0.031	20	0.01	5.94
05/28/12		18.63		94.7	8.83	0.031	20	0.01	5.95
06/13/12		18.34		82.7	7.77	0.032	21	0.01	5.96
06/26/12		17.69		75	7.01	0.111	75	0.05	6.12
07/09/12		19.75		74.4	6.72	0.191	124	0.09	5.87

07/24/12		19.57		79.9	7.3	0.15	98	0.07	6.06
08/10/12		20.64		64.4	5.76	0.148	116	0.08	6.01
08/24/12		20.4		77	6.9	0.1145	75	0.05	6.26
09/07/12		18.1		56	5.2	0.1241	81	0.06	6.27
09/21/12		15.8		60	6.6	0.2247	145	0.01	5.95
10/05/12		17.5		87	8.3	0.0362	23	0.02	6.06
10/19/12		12.3		90	9.7	0.0358	23	0.02	6.2
11/05/12		11.3		92	10	0.0394	25.35	0.02	5.76
11/20/12		7		100	12.1	0.0353	22.75	0.02	5.97
11/30/12		2.1		101	13.8	0.0359	23	0.02	6.37
12/20/12		1.9		102	14.2	0.0371	24.05	0.02	5.97
01/25/13		1.6		105	14.6	0.0419	27.3	0.02	6.53
02/15/13		1.5		109	15.5	0.0449	28.6	0.02	6.16
03/15/13		0.7		107	13.8	0.044	24.7	0.01	5.59
03/29/13		0.5		111	16	0.0367	23.4	0.02	6
04/11/13		6.1		83	10.8	0.0331	21.45	0.01	6.15
04/26/13		10.4		82	9.3	0.0404	26	0.02	6.15
05/09/13		17.6		81	7.8	0.0346	17.55	0.01	6.13
06/06/13		18.2		80.3	7.93	0.029	20.5	0.01	6.15
06/28/13		20.1		79.2	8.1	0.032	19.6	0.01	6.12
07/12/13		20.8		81.6	8.2	0.029	33	0.01	6.09
08/09/13		21.7		78.8	7.7	0.035	29	0.01	5.98
08/30/13		22		81.9	8.3	0.033	34	0.01	5.88
09/13/13		19.7		88.8	8.5	0.029	28.8	0.01	5.74
10/01/13		17		71	6.9	0.026	17.4	0.01	5.6
10/18/13		15.2		93	10.8	0.033	21.6	0.02	5.85
10/31/13		17		71	6.9	0.027	17.4	0.01	5.6
11/06/13		9		90	10.4	0.035	22.4	0.01	5.94
11/22/13		4.7		104	13.4	0.029	20.5	0.01	5.28
12/05/13		3.6		95	13.8	0.014	9.3	0.01	5.22
01/10/14		0		99.7	14.5	0.041	26.35	0.02	5.43
02/13/14		0		98.7	9.8	0.04	27.41	0.01	6.15
03/11/14		0.8		99.7	13.3	0.038	21.16	0.01	5.51
04/11/14	10:38:00								
05/09/14	10:16:00	11.3		104	11.3				6.78
06/10/14	11:10:00	20.5		84	7.5	0.0352	22.75	0.02	5.9
07/10/14	11:27:00	22.9		95	8.1	0.0304	19.5	0.01	5.66
08/11/14	13:23	18.4	759.4	61	5.7	0.1389	90.35	0.07	5.22
09/09/14	11:16	14	767.7	64	6.6	0.1964	127.4	0.09	5.68
10/10/14	12:48	15.6	755.8	101	10.1	0.0311	21.15	0.01	5.24
11/17/14	11:57	6.2	756.7	102	12.6	0.026	16.9	0.01	5.3
12/15/14	12:35	4.5	753.3	87	11.4	0.027	18.2	0.01	4.88
01/16/15	11:59	2.5	744	103	13.9	0.226	146.9	0.11	5.64
02/12/15	11:02	1.78	745.5			0.005	3	0	5.85
03/13/15	11:50	1.66	762.4			0.034	23	0.02	5.81
04/15/15	12:07	3.2	755.8	81	11	0.041	26.65	0.02	4.7
05/20/15	12:24	15.6	745.2	88	8.7	0.026	16.9	0.01	5.98
06/17/15	10:52	19.4	754	99	9.1	0.025	16.25	0.01	5.47
07/17/15	12:51	24.7	757.9	96	7.9	0.026	16.9	0.01	5.57
08/14/15	12:16	23.5	759.3	83	7	0.028	18.2	0.01	5.06
09/17/15	14:42	21.6	756.5			0.041	26.65	0.02	5.38
10/19/15	10:58	9.8	761.6			0.032	20.8	0.01	6.35
11/26/15	12:30	5.9	779.6	103	12.9	0.034	22.1	0.01	6.18
12/17/15	15:13	4.1	760.2	104	13.6	0.043	27.95	0.02	6.3
01/26/16	12:08	1.5	758.8	90	12.7	0.042	27.3	0.02	6.17
02/24/16	12:05	3.1	764.2	98	13.2	0.034	22.1	0.01	5.55
03/23/16	11:46	3.2	752.1	97	12.9	0.037	24.05	0.02	5.83

04/22/16	11:53	11.4	752.7	92	10.2	0.035	22.75	0.02	5.69
05/20/16	10:43	15.4	759.5	78	7.8	0.045	29.25	0.02	5.7
06/23/16	9:45	20.7	752.5	66	5.9	0.041	26.65	0.02	5.78
07/19/16	12:40	24.2	753.8	56	4.7	0.056	36.4	0.02	5.91
08/15/16	9:29	23.8	756.2	87	7.3	0.052	33.8	0.02	5.58
09/23/16	9:00	13	757.5	80	8.2	0.081	52.65	0.04	
10/28/16	10:59	9.4	764.3	72	8.21	0.136	88.4	0.06	6.39
11/23/16	10:49	7.2	752	103	12.4	0.043	27.95	0.02	5.9
12/21/16	12:49	2.4	753.4	87	11.9	0.062	40.3	0.03	6.1
01/26/17	12:58	1.7	739.2	98	13.6	0.037	24.05	0.02	5.73
02/21/17	12:49	1.8	762.2	98	13.5	0.036	23.4	0.02	5.45
03/27/17	10:52	2.1	766.7	96	13.3	0.034	22.1	0.01	5.41
04/25/17	10:25	10.3	768.7	98	10.9	0.036	23.4	0.02	5.48
05/12/17	12:18	13.4	755.5	93	9.7	0.037	24.05	0.02	5.58
06/19/17	12:33	20.2	755.5	81	7.4	0.038	24.7	0.02	5.49
07/20/17	11:48	25.2	753.5	79	6.5	0.031	20.15	0.01	5.65
08/18/17	12:48	21.4	757.2	72	6.3	0.048	30.55	0.02	4.96
09/21/17	9:37	18.4	757.8	46	4.3	0.07	45.5	0.03	5.72
10/27/17	10:55	13.2	754.5	57	6	0.073	47.45	0.03	5.09
11/30/17	14:58	4.5	762.8	106	13.6	0.038	24.7	0.02	4.9
12/18/17	11:27	0.6	759.7	100	14.3	0.038	24.7	0.02	5.08

Wildcat Data

DATE	TIME	TEMPERATURE (oC)	PRESSURE (mmHg)	DO%	DO (mg/L)	CONDUCTIVITY (mS/cm)	TDS (mg/L)	SALINITY (ppt)	pH
06/14/10									
06/29/10									
07/16/10									
07/26/10									
08/11/10									
05/12/11									
05/30/11									
06/15/11									
06/27/11									
07/11/11									
07/25/11									
08/08/11									
09/07/11									
09/23/11									
11/01/11		4.76		91.2	11.7	0.038	25	0.02	4.72
11/16/11		9.63		92.6	10.54	0.038	22	0.01	4.73
11/28/11		5.76				0.038	25	0.02	4.95
12/14/11		3.26		96.6	12.92	0.032	21	0.01	5.02
01/05/12		0.47				0.037	24	0.02	4.97
01/18/12		2.18				0.043	29	0.02	4.98
01/31/12		0.27		92.3	13.27	0.044	29	0.02	4.88
02/14/12		0.06		90.5	13.2	0.0446			4.04
03/09/12		3.32		93.6	12.54	0.0522			4.98
03/21/12		6.42				0.046	30	0.02	5.67
04/03/12		4.74		93.2	11.98	0.042	28	0.02	5.23
04/24/12		14.02		93.1	9.59	0.052	33	0.02	5.29
05/08/12		10.56		92.1	10.26	0.046	30	0.02	5.38
05/28/12		15.48		91	9.08	0.049	32	0.02	5.51
06/13/12		16.53		95.8	9.35	0.049	32	0.02	5.92

06/26/12		17.37		86.3	8.27	0.057	37	0.03	6.2
07/09/12		19.67		84.5	7.72	0.048	31	0.02	5.97
07/24/12		20.23		89.7	8.13	0.062	40	0.03	6.5
08/10/12		19.69		89.6	8.19	0.053	35	0.02	7.92
08/24/12		19.4		78	7.2	0.0542	35.1	0.02	5.88
09/07/12		18.3		91	8.15	0.0594	33.85	0.03	5.88
09/21/12		16		88	8.16	0.0706	46.15	0.03	5.14
10/05/12		15.8		94	9.3	0.0535	34	0.02	5.06
10/19/12		8.9		91	10.5	0.057	37	0.03	5.11
11/05/12		9.3		86	9.8	0.0587	38.35	0.03	4.51
11/20/12		4.7		97	12.5	0.0552	35.75	0.03	4.84
11/30/12		0.6		97	13.9	0.055	35.75	0.02	5.41
12/20/12		1.2		89	12.5	0.0491	31.85	0.02	4.73
01/25/13		1.1		93	13.1	0.056	36.4	0.03	5.96
02/15/13		0		101	14.6	0.0566	37.06	0.03	6.41
03/15/13		0.6		102	14.4	0.0646	42.25	0.03	4.92
03/29/13		0		104	15.1	0.0485	31.2	0.02	4.98
04/11/13		5.1		84	10.8	0.0493	31.83	0.02	6.45
04/26/13		9.8		81	9.2	0.0508	33.15	0.02	5.31
05/09/13		16.1		76	7.5	0.0515	33.15	0.02	5.43
06/06/13		17.3		75	7.4	0.049	32.5	0.01	5.99
06/28/13		18.2		77	7.7	0.051	33.7	0.02	6.12
07/12/13		19.2		76	7.4	0.05	32	0.02	6.12
08/09/13		20.1		77	7.8	0.052	34	0.02	6.09
08/30/13		22.1		75	7.1	0.051	29	0.02	5.78
09/13/13		18.3		81	8.1	0.044	25	0.02	5.56
10/01/13		14		89	8.7	0.0287	18.7	0.01	5.38
10/18/13		13.8		84	8.7	0.034	22	0.02	4.93
10/31/13		14		59	6.1	0.029	18.6	0.01	5.38
11/06/13		6.4		109	13.4	0.0207	13.4	0.01	4.95
11/22/13		3.6		96	12.7	0.04	25.9	0.02	4.63
12/05/13		3.4		94	12.5	0.014	8.9	0.01	4.62
01/10/14		0		96.1	12.1	0.044	35.8	0.01	5.88
02/13/14		0		94.5	9.6	0.052	36.07	0.01	6.23
03/11/14		0.3		99.6	13.2	0.052	38.51	0.01	5.12
04/11/14	8:42:00								
05/09/14	8:42:00	11		105	11.4				5.85
06/10/14	13:24:00	20.1		99	9	0.0404	26	0.02	4.87
07/10/14	13:02:00	22.4		89	7.8	0.0449	29.25	0.02	5.07
08/12/14	15:20	20.6	758.1	102	9.2	0.0459	29.9	0.02	4.91
09/10/14	13:29	15	765.8	85	8.6	0.0499	32.5	0.02	5.3
10/10/14	15:22	13.5	753.9	92	9.6	0.0443	28.6	0.02	3.97
11/17/14	10:26	4.2	756.7	92	12	0.042	27.3	0.02	3.88
12/15/14	10:57	4.7	752.3	84	10.8	0.029	18.85	0.01	3.7
01/16/15	10:25	0.4	743.7	95	13.7	0.044	28.6	0.02	4.14
02/12/15	8:10								
03/13/15	10:05	0	762			0.083	54	0.04	5.67
04/15/15	10:10	0.4	755.8	117	16.5	0.041	26.65	0.02	4.21
05/20/15	14:13	15.4	742.9	91	9.1	0.027	17.55	0.01	4.83
06/17/15	13:05	19.1	754.3	93	8.6	0.04	24.05	0.02	4.37
07/17/15	14:55	22.1	756.2	94	8.2	0.049	31.85	0.02	4.91
08/14/15	14:00	22.1	758.2	82	7.2	0.044	28.6	0.02	4.51
09/17/15	16:27	20	755			0.049	31.85	0.02	4.69
10/19/15	8:51	7.4	759.7			0.05	32.5	0.02	5.76
11/26/15	10:56	3.4	779.6	89	11.9	0.047	30.55	0.02	5.33
12/17/15	13:00	3.4	761.5	92	12.3	0.046	29.9	0.02	5.47
01/26/16	13:53	0.1	755.7	95	13.9	0.044	28.6	0.02	4.9

02/24/16	13:57	2.1	760.3	105	14.4	0.042	27.3	0.02	4.82
03/23/16	12:19	2.5	750.8	97	13.4	0.048	31.2	0.02	4.81
04/22/16	14:04	13.9	751.2	92	9.5	0.044	28.6	0.02	5.12
05/20/16	8:51	13.6	758.2	88	9.2	0.054	35.1	0.02	5.5
06/23/16	7:50	16.5	751.3	77	7.5	0.055	35.75	0.02	4.24
07/19/16	15:00	24.2	752.4	89	7.5	0.052	33.8	0.02	5.24
08/15/16	10:14	20.3	755.7	57	5.1	0.074	48.1	0.03	5.76
09/23/16	10:30	14.6	755.9	89	9.1	0.067	43.55	0.03	
10/28/16	12:37	8.2	761.6	101	11.91	0.069	44.85	0.03	4.69
11/23/16	9:30	5.9	750.6	88	10.9	0.05	34.45	0.02	4.89
12/21/16	11:28	1.2	752.8	91	13	0.053	34.45	0.02	4.96
01/26/17	15:00	1.2	737	92	13.1	0.039	25.35	0.02	4.74
02/21/17	11:08	0	762.6	97	14	0.046	29.9	0.02	3.43
03/27/17	13:03	2.4	765	97	13.2	0.044	28.6	0.02	4.78
04/25/17	12:06	10.6	767.5	100	11.1	0.04	26	0.02	4.8
05/12/17	13:48	13.3	754.2	98	10.2	0.041	26.65	0.02	4.54
06/19/17	10:58	19.4	754.2	82	7.5	0.044	27.95	0.02	4.23
07/20/17	9:56	21.1	752.8	81	7.2	0.041	26.65	0.02	5.3
08/18/17	11:20	16.7	755.9	85	8.3	0.057	37.05	0.03	4.54
09/21/17	12:58	19	757.3	76	7.1	0.048	31.2	0.02	5.63
10/27/17	8:38	14.2	751.9	73	7.5	0.055	35.75	0.02	4.88
11/30/17	13:10	2.8	761.9	91	12.3	0.056	36.4	0.03	4.21
12/18/17	12:56	0.1	758.2	99	14.1	0.053	33.8	0.02	4.66