2. AUTOMATED DATA COLLECTION

2.1 Groundwater Quality

2.1.1 Instrumentation and Data Collection Methods

Automated groundwater monitoring stations were installed at 14 well clusters in a total of 42 wells (three wells per cluster) from February 2010 to August 2010. In each well, two probes manufactured by In-Situ, Inc. (an Aqua TROLL® 100 [AT100] and a Level TROLL® 500 [LT500]) were deployed primarily between June 2010 and September 2010 and were set to record water quality parameters and water levels, respectively, at 15-minute intervals. The probes were connected by cable to a telemetry unit and the data at each of these sites is transmitted remotely by cellular phone service to a central database once per day. The telemetry units are powered with 12-volt batteries that are recharged by solar panels.

The focus of this subsection is on the AT100 probe that measures groundwater quality parameters. The AT100 has a titanium body with a completely sealed, internal lithium battery, a real-time clock, a datalogger, and temperature and conductance sensors. At each well, an AT100 is placed in the middle of the screened well interval and measures actual conductance (microSiemens per centimeter [µS/cm]) and temperature (degrees Celsius [°C]). This probe also calculates salinity, TDS, and water density. Salinity values are calculated using actual conductance and temperature, and are reported in practical salinity units (per Practical Salinity Scale 1978 [PSS78]). TDS is based on actual conductance with a default conversion factor of 0.65, and results are reported in milligrams/liter (mg/L). Water density is calculated using salinity and temperature, and results are reported in grams per cubic centimeter (g/cm^3).

Per the QAPP, the ideal cleaning and calibration schedule for the groundwater probes is approximately every eight weeks, with the Biscayne Bay probes on a rotation of approximately every six weeks. The actual schedule varies depending on field conditions and logistics.

For the cleaning and calibration effort, probes are pulled from each well and the accuracy of the specific conductance and temperature readings are verified. For specific conductance, each AT100 is placed in a container with a known conductivity solution near the expected sample value and an initial read (IR) is performed. The reading on the probe and the value of the specific conductivity solution is recorded. Values within 5% of the standard solution are considered acceptable; if the probe's reading falls outside the 5% range, data from the previous calibration event up to the present reading are qualified as estimated ("E"). Following the IR, the probes are cleaned with analyte-free water and a non-abrasive cloth or sponge. Sensor heads are cleaned using a cotton swabs or soft pipe cleaners.

If a probe passes IR, an initial calibration (IC) and initial calibration verification (ICV) are conducted with a solution at the high end of the expected sample range. The AT100 and Aqua Troll® 200 (AT200) use a single-point calibration equation. If the specific conductance reading of the probe during IC and the value of the calibration solution are within 0.98 to 1.02 of each other (referred to as the cell constant), the reading is considered ideal, but a higher range between 0.90 and 1.10 is acceptable. Following cleaning and a successful IC, two continuing calibration verifications (CCVs) are done with standard conductivity solutions, with one typically above and another typically below the expected sample value range, to bracket the range of readings.

For temperature, each AT100 is verified using a National Institute of Standards and Technology (NIST) -certified thermometer. The temperature reading of the probe is considered acceptable if it is within a 0.5°C range of the NIST thermometer reading. If a probe temperature reading is outside the acceptable range, it will be replaced with another sensor.

During cleaning and calibration, operational parameters involving general system functionality are also addressed. The external battery voltage that powers the telemetry system (12:00 a.m. to 1:00 a.m. and 12:00 p.m. to 1:00 p.m. each day) is checked. The 12-volt batteries and solar panels are inspected, as well as fuses and wiring connections. In addition, internal voltage and memory availability of all probes are checked. Desiccants in the system are replaced, as needed, and overall cleanliness is maintained. Inoperable equipment is repaired or replaced. In the event that equipment is vandalized, it is replaced.

In addition to routine cleaning/calibration, all probes are sent for factory calibration approximately once every 18 months. If the cleaning and calibration event occurs when a probe needs to be sent for factory maintenance, the probe undergoes an IR and high and low CCVs first to determine if it reads within the acceptable 5% range. When a probe is sent back to the factory for recalibration, another probe that has been factory calibrated within the past 18 months is installed in its place. Since the replacement probe did not record data prior to the current calibration, it would undergo only the IC, ICV, and high and low CCVs.

For June 2011 through November 2011, the most problematic issue with the automated stations continued to be the inconsistent daily reporting by the telemetry units. In nearly all cases, the data were recorded and stored in the instrument but, due to intermittent connectivity to the network, the data were not always transmitted to the FPL database on a daily basis. In a few cases, data were lost due to lightning strikes or probe electronic resets. If the system does not reconnect after these connectivity failures, FPL has to download and manually patch in the data. Data are downloaded from probes, when needed typically during cleaning and calibration events. High-gain antennas are now installed at most sites, and FPL is currently testing a new telemetry system and software.

In addition, there are some probe issues that are causing oscillations in some of the specific conductance values. These issues are discussed in the following subsections.

2.1.2 Results and Discussion

All raw data are made available to the Agencies upon receipt by FPL and subsequently reviewed for accuracy. Depending upon the results, some of the data are qualified using the qualification codes, as outlined in the QAPP. The validation and qualification of the data is a substantial undertaking and will continue to be so in the future. For example, each groundwater well (one AT100 and one LT500) generates 576 data points each day. This results in 24,192 data points generated by the groundwater stations (42 wells) each day, or 241,920 points monthly. Approximately 8,878,464 data values are generated by the 42 groundwater stations each year. Both the surface and groundwater stations generate approximately 16.5 million data points per year.

Data validation and qualification is a multi-step process. The first step begins with the plotting of key water quality parameters (salinity, specific conductance, and temperature) over a set validation period as well as the entire period of record. This allows a quick review of the results and identification/flagging of data that are outside an expected range. Any evident aberrations in the resulting time series plots are then reviewed further based on specific station location, meteorological conditions, and previous results.

As a second step, the data are then compared to validation and calibration logs to ensure that the probes are recording data within the tolerances (5% for specific conductance and 0.5°C for temperature). Data within the accepted levels are deemed good and data outside that range are qualified. For specific conductance ICV, and CCVs, most probes have been verified successfully; however, some of the data have been qualified primarily due to IR outside acceptable levels. All but one probe has passed the temperature verification to date. The calibration and verification logs for the automated station probes are included in Appendix B.

In the final step, each data point for specific conductance, salinity, and temperature is compared to its previous 15-minute value to check for any unusual oscillations in the data that may not have been caught during the calibration and verification events. Salinity differences greater than or equal to (≥) 1 practical salinity unit (per PSS78) and temperature changes ≥1°C that occur within 15-minute intervals are flagged, and both data rows are highlighted. Data are then manually reviewed for validity. Flagged data are compared against meteorological data and other station data to help determine if they are real or spurious observations beyond normal parameters. There have been instances where a probe exhibits extreme 15-minute oscillations (e.g., up to 80,000 μS/cm fluctuations) for a period of time before resuming function within normal ranges. Other examples of spurious data include occurrences of specific conductance values dropping drastically and instantaneously and remaining at low levels for days to weeks, or oscillating for one or two time intervals before instantaneously returning to original levels.

Once the above steps are completed and all flagged data are reviewed, the data are qualified as appropriate. The qualifiers used in the data qualification effort are “E” indicating an estimated value, “?” indicating suspect or questionable data, “G” indicating a re-calculated value, and “C” indicating a calibration event. Data dependent upon another parameter, (i.e., temperature, specific conductance, salinity, density, and TDS are also qualified for the corresponding period where these parameters are interrelated.

The " E" (estimated) qualifier has been added to data that oscillate, but not more than 5% from what is believed to be the actual value, due to a system electrical/radio frequency issue. Data from the previous cleaning and calibration event up to present are also qualified as "E" when an IR ranges from 5% to 30%, or when verification or bracketing is not performed. For example, when In-Situ, Inc. deployed probes without performing verification (other than what was done at the factory), these data were qualified with an "E."

The "?" (questionable) qualifier has been applied to data that should not be included in any data analysis because they may not be an accurate depiction of actual field conditions. This includes but is not limited to, the following:

- Data from any probe with an IR greater than 30%; however, no data have yet to be qualified as questionable for this reason;
- Specific conductance values that erroneously oscillate between high and low readings at 15-minute intervals due to problems with the automated system; and
- Specific conductance, temperature, and water levels artificially altered when the probe is pulled for cleaning and calibration.

During a cleaning and calibration event, both "?" and "C" qualifiers are applied to all applicable parameters. The calibration event begins when a probe starts to be retrieved and ends when it has been reset back in place and the temperature reading has stabilized. When air and water temperatures differ greatly, it can take the probe temperature several hours to return to accurate readings of ambient water temperature and, thus, all values are affected.

After a review of the key parameters in their entirety by a second quality assurance/quality control (QA/QC) person, all qualified data from each station are validated on the EDMS and, subsequently, become available for download by the Agencies.

During the validation and qualification process of the June 2011 through November 2011 automated water quality data, FPL made several qualification refinements which also affected a very small percentage of the previously qualified data. Examples of these refinements include qualifying water level data that have exceeded the top-of-casing during extreme rain or tidal high water events, qualifying water quality readings slightly affected during sampling events, or qualifying data after redeploying probes following cleaning and calibration. Appendix C shows which data were qualified and the reason for the qualifications.

Only a small percentage of the water quality data have been qualified as questionable. The biggest reason for using the "?" qualifier is erroneous oscillating specific conductance values (greater than 5% over a 15-minute interval). An In-Situ, Inc. representative initially stated that these abnormal fluctuations could have been caused by air bubbles on the sensor or by blocked sensor heads. However, gently shaking and tapping the probes have not necessarily alleviated this issue in every instance. FPL subsequently re-grounded some of the sites in hopes of rectifying the problem; however, oscillations were not completely eliminated. In-Situ, Inc. was able to reproduce the oscillation in the lab using high-frequency radio waves. These radio waves in the lab caused the probe cables to resonate, which caused fluctuating specific conductance readings. In-Situ, Inc. subsequently installed ferrite beads on the probe cables to eliminate cable resonance, but data oscillations still occurred, on occasion. While the oscillations appear to be less frequent than at the project's onset, it is still believed that other factors are contributing to the oscillations; therefore, testing will continue in order to determine the underlying causes of these patterns. The latest test, implemented in January 2012, disconnected external power from the probes showing oscillations. To date, these probes have been disconnected from the 12-volt battery (but remain connected to the telemetry system) and have been powered by the internal 1.5-volt lithium battery, and data appear stable.

Figures 2.1-1 through 2.1-14 illustrate time series graphs of specific conductance, temperature, and salinity at each well. These graphs depict validated data and exclude suspect data that have been qualified as questionable or that were recorded during a calibration event. Appendix D provides time series graphs of these three parameters, with all reported data including questionable data. All time-series graphs are plotted for the entire time period to facilitate a review of the data collected from the semi-annual reporting period in context with the previous reporting periods.

Overall, the qualified groundwater specific conductance and salinity data indicated consistent readings throughout the entire monitoring period, including the reporting period from June 2011 through November 2011 included in this Semi-Annual Monitoring Report. The salinity results track the specific conductance results since salinity is calculated based on specific conductance and temperature. No observable seasonal changes occurred in any well location. Nearly all the specific conductance time series plots exhibit very little change over time.

Similar to what has been previously observed, the deep wells typically have higher specific conductance than the intermediate and shallow depth wells during this period. Wells closest to the CCS have higher specific conductance than the wells located further away. Outer well clusters TPGW-7, 8, and 9 have groundwater that would meet FDEP standards as fresh based on the specific conductance readings. Also, wells TPGW-4S, TPGW-5S, and TPGW-6S have specific conductance values indicative of fresh water per FDEP standards. All other wells are much saltier, and nearly all of these are influenced by marine water. Monitoring wells TPGW-1M, 1D, 2S, 2M, 2D, 3S, 3M, 3D, 12M, 12D, 13S, 13M, and 13D have the saltiest water, with specific conductivities consistently in excess of 60,000 µS/cm (Table 2.1-1).

The specific conductance levels in well cluster TPGW-13, which is in the CCS, range in value between 79,000 and 87,000 µS/cm. The shallowest zone has slightly higher values in comparison to the intermediate and deep zones. The well clusters in Biscayne Bay generally have specific conductance values at or slightly above 54,000 µS/cm which is representative of average seawater with a salinity of 35 parts per thousand (ppt) at 25.9°C. An exception is the higher specific conductance at TPGW-14D where the average concentration over the monitoring period is 74,000 µS/cm. The intermediate depth well at this location has a concentration between 61,000 and 67,000 µS/cm. Specific conductance values at a shallower SFWMD well (BBCW10GW1, located several miles north of the CCS in Biscayne Bay at a depth of 49 feet below bay bottom) has specific conductance values ranging from 53,000 µS/cm to 55,500 µS/cm

(SFWMD 2011). This SFWMD well includes data for portions of years 2006 and 2007 and since 2010.

Temperature patterns observed during the semi-annual monitoring period were consistent with previous findings. Values across the entire network typically changed very little in the intermediate and deep wells. Several of the intermediate depth wells exhibited a few tenths of a degree change, but the deep wells displayed almost no change in temperature. The groundwater temperatures in the shallow wells generally changed from a few tenths of a degree to 1.0°C throughout the monitoring period; this appears to be seasonally related (Table 2.1-1). Based on a review of the entire time series plots to date, shallow groundwater temperatures are lowest during the period from June to August and then began to increase in the following months with a peak in January or February. Two exceptions are the temperatures in the shallow zone at wells TPGW-1 and at TPGW-2 where the highest temperatures occurred in July/August 2011.

On a regional scale, groundwater temperatures are still coolest in the freshwater wells to the west and increase towards Biscayne Bay. For example, at well cluster TPGW-9, which is farthest west, the average groundwater temperature at TPGW-9D is just over 24°C. At TPGW-10D, in Biscayne Bay, the groundwater temperature is consistently around 25.7°C.

Temperatures in Biscayne Bay wells range from 25°C to 26.6°C, depending on location, with the highest temperature varying between the depth intervals. The groundwater temperatures at TPGW-11 are generally the lowest of the three Biscayne Bay stations, while the deep zone at TPGW-14 has a consistent temperature of about 26.4°C. For comparison, temperatures at SFWMD well BBCW10GW1 have ranged between 25.8°C and 26.7°C, with the temperature being about 26°C in 2010 (SFWMD 2011b).

The temperature at well cluster TPGW-13 is the highest, with a temperature approximately 29.5°C and the intermediate and deep zones being very similar to each other. The shallow zone groundwater exhibited only a few tenths of a degree change in temperature during the period from June 2011 through November 2011. The highest temperature measured in the shallow well (30.5°C) was recorded in January 2011.

Table 2.1-1 provides a statistical summary of the automated groundwater quality data (specific conductance and temperature) since the beginning of monitoring for the Uprate Project through November 30, 2011 as well as for the June 2011 through November 2011 monitoring period. Figures 2.1-15 and 2.1-16 spatially show the average specific conductance values and temperatures and their associated standard deviations, respectively, for each well since the beginning of monitoring through November 30, 2011.

2.2 SURFACE WATER QUALITY

2.2.1 Instrumentation and Data Collection Methods

Automated surface water quality stations were located throughout the Turkey Point landscape as determined jointly with the Agencies. All stations record water quality and stage data at 15-

minute intervals, with the exception of Biscayne Bay stations TPBBSW-1, TPBBSW-2, TPBBSW-4, and BBSW-5 that only record water quality parameters. While most sites that record surface water data have two probes (top and bottom), some have only one probe, depending on surface water depth and other logistical considerations. Stations that are in less than 3 feet of water have only one probe, an AT200, associated with them. Surface water quality stations that have two probes include an AT100 at approximately 1 foot above the bottom and an AT200 within 3 feet of minimum water levels at the surface. The AT200 is similar to the AT100, except the AT200 also measures water stage. Similar to the AT100, the AT200 has a titanium body with a completely sealed internal lithium battery, real-time clock, datalogger, and pressure, temperature, and conductance sensors. The AT200 is also programmed to auto-correct water levels for water density based on readings recorded by the probe. This feature is explained in greater detail in Section 2.3.1.

Similar to the groundwater sites, probe cables are attached to a telemetry system that uploads once a day for most sites. Table 2.2-1 summarizes the probes used at each surface water station and the parameters measured. Currently, 33 probes (AT100s and AT200s) are deployed throughout the monitoring area, generating up to 6.3 million data points each year.

Four of the automated surface water quality sites in Biscayne Bay (TPBBSW-1, TPBBSW-2, TPBBSW-4, and TPBBSW-5) are not connected to a telemetry system for logistical reasons. Per the Monitoring Plan, these probes are set up similar to the BNP salinity monitoring network stations (Biscayne National Park 2007) equipped with probes that record specific conductance just above the sediment surface. Rather than installing platforms or pilings to mount the probes, the stilling wells, and the telemetry units, probes are firmly attached to a cement paver/pad and are placed at pre-determined locations on the Bay bottom. Since these probes are designated to measure only water quality parameters, AT100s are deployed at each of these four locations. The probes are swapped out approximately every six weeks, taken back to the field office where they are cleaned and calibrated, and the data are manually uploaded into the online database.

All AT100 and AT200 probes are cleaned and calibrated using the same methodology as described for groundwater sites. Appendix B shows the water quality field verification/ calibration logs. Additional verification measurements are conducted for the water level measurements associated with the AT200, as explained in greater detail in Section 2.3.1.

2.2.2 Results

The automated surface water quality data are qualified and validated in the same manner as the automated groundwater data. Figures 2.2-1 to 2.2-22 show time-series graphs of specific conductance, temperature, and salinity at each surface water station. These graphs depict validated data and exclude suspect data that have been qualified as questionable (?), estimated (E), or qualified due to impacts during a calibration (C) event. Appendix C shows what data were qualified, while Appendix D shows time series graphs of the three parameters, but with all reported data including suspect data. All time-series graphs are plotted for the entire time period to facilitate a review of the data collected from a semi-annual reporting period in context with the previous reporting periods.

Contrary to the groundwater results, specific conductance values at a number of surface water stations varied substantially. These variations are often attributable to rainfall events and wet and dry periods. For example, specific conductance in Biscayne Bay ranged from 11,000 µS/cm to almost 67,000 µS/cm during this semi-annual monitoring period, with lower values during wetter months and the highest values during a prolonged drought; the highest and lowest values were both observed at TPBBSW-1. In June 2011, following a drier than normal dry season, all but one Biscayne Bay station exhibited specific conductance values in excess of 60,000 µS/cm (salinities in excess of 40 [PSS78 scale]). It is interesting to note that the specific conductance values at TPBBSW-14 were lowest during this time period (average: 47,000 µS/cm).

In the first Annual Monitoring Report, submitted in August 2011 (FPL 2011b), FPL reported that, at the three L-31E Canal stations (TPSWC-1, TPSWC-2, TPSWC-3), the specific conductance values during the wet season were reflective of freshwater (as defined by FDEP); however, with the severe lack of rain in the 2010/2011 dry season, the values rose above 1,275 µS/cm at TPSWC-2 and TPSWC-3. Based on the data collected since May 2011, the values continued to rise, and peaked at 6,194µS/cm in June 2011. The rise in specific conductance was first noticed at TPSWC-3 and then progressed to TPSWC-2 and eventually TPSWC-1. The peak specific conductance value at TPSWC-1 exceeded 3,000 µS/cm and occurred about one month after the peak in the other two stations. The specific conductance at all stations dropped markedly in late July 2011. Refer to Figures 2.2-8, and 2.2-9, and 2.2-10 for more details.

Stations TPSWC-4 and TPSWC-5 are tidally influenced. Specific conductance at TPSWC-4 varies dramatically due to tidal influences and discharges from S-20 as well as rainfall events; water quality at this station can shift from marine to fresh almost instantaneously (Figure 2.2-11). Station TPSWC-5 more closely tracks that of Biscayne Bay stations; however, the specific conductance at the bottom is less affected by rainfall events due in part to the depth of the Grand Canal (~20 feet). Last October and November 2010, specific conductance values at this deep location approached 70,000 µS/cm; however, values in October 2011 and November 2011 were closer to 60,000 µS/cm (Figure 2.2-12).

Based on the automated data from June 2011 through November 2011, specific conductance values in the CCS ranged from 55,000 µS/cm to 88,000 µS/cm (Figures 2.2-13 through 2.2-19). Following a high rainfall event on October 8, 2011 (6.33 inches measured at TPM-1), the specific conductance values dropped 10% to 20% at all stations. This is similar to what occurred the previous year in September and November following several heavy rain events (7.34 and 4.36 inches, respectively, at TPM-1). The data show that there was no clear pattern of higher or lower specific conductivities among the CCS stations. Variability in the results is often within the acceptable calibration limits of the instrument. Quarterly surface water sampling indicates the specific conductance values at all CCS stations are typically within 5% of each other. Two of the three CCS stations (TPSWCCS-4 and TPSWCCS-6) that have top and bottom probes exhibit similar specific conductance values with depth. The other station (TPSWCCS-5) shows lower values in the bottom station however there have been siltation problems in the stilling well and erratic readings. Most of the bottom probe data has been qualified as questionable and what little data that remains is qualified as estimated and actual values may be closer to what is observed in the top probe.

The specific conductance values in the ID (Figures 2.2-20 through 2.2-22) vary depending upon whether pumping to maintain a seaward gradient between the L-31E Canal and the CCS and/or the ID is occurring. During non-pumping periods, the water in the ID is slightly saline to brackish, but during periods of heavy pumping, the water gets saline in the pumped segments. In June 2011, the specific conductance values reached a peak at two ID stations, with values in excess of 55,000 µS/cm. The effect was most pronounced at the bottom of TPSWID-2 where specific conductivities remained the highest for the longest duration (over 6 months). Further review of the ID operations will be conducted in the next Annual Report.

Similar to specific conductance in surface water stations, the temperature at surface water stations varied based on meteorological conditions. Most of the variations were in response to changes in air temperature. At stations with a probe at the top and bottom of the water column, the top station exhibited more variability since it was influenced by air temperature more than the bottom station.

Water temperatures in Biscayne Bay and non-CCS canal stations from June 2011 to November 2011 typically ranged from 12°C to 34°C. The lowest value was less than 12°C and recorded at TPBBSW-3. The highest temperature was noted at TPSWC-5 and exceeded 34°C in the summer.

In the CCS, the water temperature was warmer than Biscayne Bay and other stations, with temperatures ranging from approximately 22°C to 44°C during the June 2011 through November 2011 time period (Figures 2.2-13 through 2.2-19). The highest temperatures were at the plant outfall into the CCS (TPSWCCS-1), and the lowest were at the CCS intake on the opposite side of the CCS. The data show a temperature difference of 4°C to 8°C between TPSWCCS-1 and TPSWCCS-6.

Water temperatures in the ID ranged between 23°C and 34°C during June 2011 through November 2011 (Figures 2-20 through 2-22). In comparison to temperatures in the CCS at TPSWCCS-1, temperatures at TPSWID-1 are 3°C to 10°C lower.

Table 2.2-2 provides a statistical summary of the automated surface water quality data (specific conductance and temperature) since the beginning of monitoring for the Uprate Project through November 30, 2011 as well as for the June 2011 through November 2011 monitoring period. Figures 2.2-23 and 2.2-24 spatially show the average specific conductance values and temperatures and their associated standard deviations, respectively, for each automated surface water station over the entire monitoring period (mid-2010 through November 2011).

2.3 WATER LEVELS

2.3.1 Instrumentation and Data Collection Methods

Water levels provide insight into groundwater hydrology and groundwater and surface water interactions and are collected at all groundwater and most surface water stations for the Uprate

Project monitoring effort. There are only four water quality stations in Biscayne Bay that do not have stage recorders. Per the Monitoring Plan, automated surface water quality monitoring stations co-located with groundwater monitoring well clusters in Biscayne Bay were to have surface water stage recorders. During the siting of the wells and surface water stations in Biscayne Bay, only one surface water quality station (TPBBSW-3) was co-located with a well cluster (TPGW-11); thus, one stage recorder was initially installed in Biscayne Bay. FPL later opted to install two additional stage recorders in Biscayne Bay (one each at the platforms associated with TPGW-10 and TPGW-14) to better assess groundwater and surface water interactions and tidal differences across the landscape.

Water pressures are measured at 15-minute intervals, and water levels are calculated from the pressure data. The results are typically transmitted on a regular basis by telemetry. LT500 and AT200 probes are used to record water pressure/levels. The LT500 only measures water pressure and temperature. This probe model is used in all automated groundwater well sites and is co-located with AT100 water quality units, but is placed near the surface to increase the accuracy of the pressure readings. At all automated surface water stations, the AT200 probe is used for water levels since the probe measures both water pressure and water quality parameters. Both types of data are needed for surface water stations, and probes can typically be placed within 3 feet of the surface. Both probe models that measure water pressure have been deployed using a vented cable. The vented cable contains a tube that applies atmospheric pressure to the back of the pressure gauge. The instrument is programmed to automatically subtract this value from the measured pressure, reflected in the formula:

$$P_{gauge} = P_{absolute} - P_{atmosphere}$$

Aside from being able to measure water quality parameters, the biggest difference between the AT200 probe and the LT500 probe is how specific gravity (SG) is handled. In the AT200 probe, an option exists to program a fixed density value or auto-adjust water levels based on actual measured density. In the LT500 probe, only a fixed density value can be entered based on the water type (freshwater, brackish water, or saltwater). All LT500 probes are individually set to the fixed density value that best characterizes the water in the well. The AT200 probes are programed to automatically adjust water levels based on the measured density.

Both probes are programmed to record water levels based on a depth to water level setting. Water levels are calculated in the instruments from the measured pressure based on the following formula:

$$W_L = R_L + (2.31 * (R_P - M_P)/SG)$$

where:
W_L – water level (measured in feet based on the North American Vertical Datum of 1988 (feet [ft] NAVD 88)
R_L – reference water level (ft NAVD 88)
R_P – reference pressure (pounds per square inch [psi])
M_P – measured pressure (psi)
SG – specific gravity (unitless)

The reference level (R_L) is a key component and is established in the field by using a water level indicator to measure the depth to water from the top of the well casing. Since the top of casing has been surveyed to an established datum (both NAVD 88 and National Geodetic Vertical Datum of 1929 [NGVD 29]), an elevation of the water is quickly determined by subtracting the depth to water from the top of casing. The resulting water level elevation is then entered into the probe as the reference level. The probe then automatically calculates the related pressure value, referred to as the reference pressure (R_P). Subsequent pressure measurements recorded by the probe are relative to the reference pressure and its associated elevation.

The SG in the above formula is the same as the density reading; thus, the values come directly from the instrument.

The AT200 probes are cleaned in the same manner as described for the AT100 probes in the previous sections. The LT500 probes are only wiped down with analyte-free water, with care not to damage the pressure transducer. The same care is used on the AT200 probes. While the pressure sensor cannot be calibrated, the resulting stage readings are verified. FPL has refined their approach over the course of the monitoring effort to ensure the accuracy of the data. Currently, water level measurements are taken with a water level indicator prior to the removal of the LT500/AT200 probes for cleaning. An instantaneous reading from the probe is taken and compared to the water level indicator. Readings differing less than 0.1 foot are considered acceptable. The probe is then removed for cleaning, placed back in the well, and a similar comparison is made with the water level indicator and pressure reading. If needed, the reference level is reset so the probe reading matches the water level reading to within 0.03 foot, which is the accuracy of the pressure sensor.

Similar to the AT100 probes, all LT500 and AT200 probes are factory calibrated every 12 to18 months.

2.3.2 Results and Discussion

2.3.2.1 Groundwater

As part of the validation process, water levels and pressure were plotted for the entire time period for each station. Sudden changes in water level were identified and checked against stage changes at other stations and rainfall measurements. Time series plots of water levels in similar media and areas such as the CCS or in Biscayne Bay surface water were overlain and compared to one another to help identify potential problems with water level results. In addition, plots in groundwater and a nearby or overlying surface water body were overlain for similar comparisons. Careful attention was paid to periods when cleaning and calibration events occurred and for any activity that could have altered the probe placement. Where stage data were available from a water level indicator or stage gauge readings, those values were compared to the reported water level measurements.

If water levels reported by the probe and field measured values were off by more than 0.1 foot, the data was flagged for closer inspection. Also, shifts in data immediately following a calibration event or activity which could have impacted the probe placement were flagged if they were greater than 0.1 foot. The flagged data were reviewed further and, in some instances, it was clear there was an issue with an incorrect reference level and the data were corrected. In some instances, the cause for a discrepancy greater than 0.1 foot could not be established and the data were qualified as estimated; in other cases, the results did not make sense, and the data were qualified as questionable. For difference of less than 0.1 foot, no correction or qualification of the data was applied.

It should be mentioned that the accuracy of the land-based station survey is better than 0.1 foot (typically within hundredths of a foot), but well locations in the Bay may have a lower level of accuracy since those stations could only be surveyed with GPS units. Thus, an understanding of the survey accuracy limits should be taken into account when interpreting the results to hundredths of a foot or, in the case of the Biscayne Bay wells, to several tenths of a foot. Figures 2.3-1 through 2.3-14 show time series graphs at all automated groundwater stations. These graphs are based on refined validated data and exclude data that are questionable or recorded during a calibration event. Stage data were typically not qualified if the density values were suspect since the differences in the instrument-calculated density had little effect on the pressure reading/stage results, given the shallow depth of probe placement. All time series graphs are based on actual measured levels, with the probes set to a representative density setting. The values do not reflect freshwater head equivalents.

The data collected and the patterns observed are consistent with those previously reported and include:

- Water levels change very quickly in response to rainfall events. This is most evident in stations not significantly influenced by tides (TPGW-1, TPGW-2, TPGW-4 through TPGW-9, and TPGW-13). Typically, wherever there is a spike in water levels on the time series graphs, there is a corresponding rainfall event. Refer to Figures 2.3-1, 2.3-2, and 2.3-4 through 2.3-9.
- At each well cluster, fluctuations in stage for all three depth intervals track closely, indicating a good hydrologic connection between intervals.
- Water levels at stations in or immediately adjacent to Biscayne Bay (TPGW-3, TPGW-10, TPGW-11, TPGW-12, and TPGW-14) exhibited tidal influence at all three depths (Figures 2.3-3, 2.3-10, 2.3-11, 2.3-12 and 2.3-14). The amplitude of the tidal changes decreases across the landscape from north to south, similar to the decrease in surface water tidal amplitude discussed below. Thus, TPGW-10 has a higher range of water levels than at TPGW-14.
- Stations furthest from the coast (TPGW-7, TPGW-8, and TPGW-9) exhibit few differences in water levels among the shallow, intermediate, and deep wells (Figures 2.3-7, 2.3-8 and 2.3-9). These wells are all fresh per FDEP standards.
- Wells located slightly closer to the coast, such as TPGW-4 and TPGW-5, have groundwater in shallow wells with the highest elevations, and the brackish groundwater elevations in intermediate and deep wells were lower (Figures 2.3-4 and 2.3-5).
- Closer to Biscayne Bay and the CCS, several well clusters had deep or intermediate zones with the highest elevation, such as TPGW-2. At this cluster, the deep and

intermediate interval water levels alternate between having higher water levels (Figure 2.3-2).

At TPGW-13, which is located in the CCS, it was previously reported that the shallow interval had the highest elevation, the intermediate interval just below, and the deep interval up to 0.4 foot lower (FPL 2011b). While this is still true in most cases, it appears that the more recent data have the shallow and intermediate zones with the same water level.

The most notable finding during the June 2011 through November 2011 monitoring period is that the water levels at all the inland stations, with the exception of TPGW-2 and TPGW-13 and tidally influenced TPGW-3 and TPGW-12, had the lowest water levels in early June 2011. This is also the time period when groundwater specific conductance values were highest. At TPGW-2 and TPGW-13, the lowest water levels occurred approximately one month sooner in April/May 2011.

2.3.2.2 Surface Water

Figures 2.3-15 through 2.3-39 show time series graphs at all surface water stations where data from automated stage recorders are available. These graphs are based on validated data and exclude data that are questionable or recorded during a calibration event when the log was running. All the time series graphs are based on actual levels and do not reflect freshwater head equivalents.

The findings from the June 2011 through November 2011 monitoring period are consistent with those previously reported (FPL 2011b). These include the following:

- Diurnal water level variations were observed at all tidally influenced stations, including those located in Biscayne Bay (north to south: TPBBSW-10, TPBBSW-3, and TPBBSW-14) as well as tidal canal stations (TPSWC-4 and TPSWC-5). The tidal range reduces across the landscape from north to south. At TPBBSW-10, tidal ranges during spring tides and neap tides can be over 2.0 feet and less than 0.5 foot, respectively.
- The effect of rainfall is masked in most tidal stations; however, its effect is evident at TPSWC-4 since this station is downstream of S-20 discharge. Rainfall effects are also evident on all onshore stations where water level increases up to 1 foot have been observed following rainfall events. This includes the CCS.
- Water levels in the CCS also vary spatially, depending upon whether the station is located on the discharge or intake side of the canal. Water levels on the plant discharge side have a lower range in variability (<1 foot at TPSWCCS-1) than stations on the intake side (up to 4 feet at TPSWCCS-6).
- Water levels on the discharge side of the CCS are higher than those on the CCS plant intake side. The difference in stage between the discharge and intake side increased during the 2011 dry season and then decreased during the subsequent wet season.
- Water levels in the CCS appear to exhibit little response to tidal influences in Biscayne Bay surface water.

2.4 METEOROLOGICAL DATA

One of the key parameters of interest is the amount of precipitation in the CCS and surrounding areas. Rainfall timing, duration, and amounts provide some insight into the area's hydrology. Meteorological data such as barometric pressure, wind speed, and light levels (i.e., photosynthetically active radiation [PAR]) are useful in determining water losses and gains in the CCS and in establishing a water budget.

A meteorological station (TPM-1) was set up in the middle of the CCS, co-located with TPGW-13 and TPSWCCS-2. Four additional rainfall gauges were set up in the vicinity of the plant to determine the spatial and temporal variability in rainfall on and offshore Turkey Point Plant. Locations of the rainfall and the meteorological stations are shown on Figure 2.4-1.

2.4.1 Instrumentation and Data Collection Methods

Meteorological station TPM-1 consists of a weather transmitter (WXT520, Vaisala Inc., Helsinki, Finland) and a quantum sensor (190SA, Li-Cor Inc., Lincoln, Nebraska) attached to a datalogger (CR1000, Campbell Scientific Ltd., Logan, Utah) and telemetry system; the range of parameters measured is listed in Table 2.4-1. Technical specifications on the instrumentation are provided in Appendix I of the QAPP (FPL 2010).

The four rainfall-only stations (TPRF-2, TPRF-4, TPRF-11, and TPRF-12) consist of tipping bucket rainfall gauges (TB-3, Hydrological Services Inc., Liverpool, NSW, Australia) connected to waterproof pendant dataloggers (#UA-004-64, Onset Computer Corporation, Bourne, Massachusetts). Data are manually downloaded from these stations at approximately bi-monthly intervals. Rainfall data from the gauges are event-based. The tipping buckets fill at 0.10 inch and the time of each tip of the bucket is recorded.

Additional rainfall data for this report were also provided by a previously existing FPL meteorological station located south of the CCS by the Sea Dade Canal (LU-South), and from a previously existing rainfall station in the northern portion of the CCS (LU-NEast). The FPL meteorological station (LU-South) is similarly instrumented with a weather station (Climatronics Corp., Bohemia, New York), while the rainfall collector (LU-NEast) is a tipping bucket gauge.

Monitoring at TPM-1 was initiated on July 26, 2010, while the rainfall gauges were installed on November 12, 2010. At TPM-1, data are set to record at 15-minute intervals, although a reconfiguration of the initial setup by the manufacturer resulted in 30-minute data recording until March 7, 2011; although no data were lost, the data logger was then reset to record at 15-minute intervals after March 7, 2011. Data collected at this station are uploaded via telemetry to the FPL database on a daily basis.

There have been some previous issues with TPRF-12 not recording data, but the unit has since been rewired and is now functional. Additionally, several of the other stations have run out of memory and not recorded a full time period of data. These issues have since been resolved, but there are gaps in data from the rainfall gages.

2.4.2 Results

Rainfall and temperature, relative humidity and barometric pressure, wind speed and wind direction, and PAR for TPM-1 are shown on Figures 2.4-2 through 2.4-5, respectively.

From June 2011 to November 2011, a total of 41.14 inches of rain was recorded at TPM-1 (Table 2.4-2). The greatest monthly rainfall amounts were observed in October 2011 (13.3 inches), followed by July 2011 (10.6 inches) and August 2011 (9.2 inches) (Figure 2.4-6 and Table 2.4-3). In June 2011, only 1.6 inches of rain were recorded at TPM-1 and this followed 6.1 inches of rainfall from February 2011 to May 2011 (FPL 2011b), indicating extremely dry conditions during that time period. Table 2.4-3 also shows monthly rainfall totals from data from the other rainfall stations. The monthly rainfall totals in Biscayne Bay are consistently less than those on land. Several substantial rainfall events were recorded between June 2011 and November 2011. The most notable event was on October 8, 2011, when 6.33 inches of rain were recorded at TPM-1. Table 2.4-4 shows the dates of rainfall events where more than 1.0 inch of rainfall was recorded at any station.

Air temperatures in the middle of the CCS at TPM-1 ranged from 25°C to 32°C during most of the period (June 2011 through September 2011 average: 27°C), with temperatures dropping in October 2011 (average: 26.2°C). The prevailing wind directions from June 2011 through November 2011 were from the east and southeast and there was a predominately onshore wind direction (Figure 2.4-7). Forty-four percent of the time, the winds were between 7 to 11 meters per second (Figure 2.4-8).

Light levels did not appear to be significantly affected by cold front events; however, there was a noticeable trend of declining light levels with approach towards the end of the year.

2.5 CCS FLOW METER DATA

2.5.1 Instrumentation and Data Collection Methods

As previously discussed in the August 2011 Annual Report (FPL 2011b), automated Acoustic Doppler Flow Meters (ADFMs) were initially installed at three constrained-flow locations in the CCS and are referred to as the outflow, southerly, and inflow stations. The outflow station (TPFM-1) was set up to measure outflow of water from the plant entering the CCS; due to the canal setup, the station was located approximately 0.4 mile downstream of the plant, but prior to the flow spreading out into the CCS (Figure 1.1-4). The southerly station (TPFM-2) is located on the southern end of the CCS at a choke point where all water passes as it transitions from southerly to northerly flow (Figure 1.1-4). The inflow station was originally located about 0.4 mile from the intake back into the plant. The purpose of the flow meters was to help assess losses and gains in CCS water volume and flows as part of the water budget.

Each of the stations was equipped with a side-looking ADFM (Argonaut-SL 500, Sontek/YSI, Yellow Springs, Ohio) that emits three acoustic beams in a characteristic pattern (i.e., two horizontal beams separated by 50 degrees and one vertical beam). Each station is powered using a solar-charged lead acid battery. All data are stored in a datalogger (CR800, Campbell Scientific, Logan, Utah) and remotely transferred to a permanent database daily via telemetry. The data loggers are programmed to record indexed velocity and flow every 15 minutes.

Platforms to support these ADFMs were constructed in the summer of 2010. The meters were subsequently installed by YSI following industry standard protocol (mount the sensor plumb ±2 degrees, no obstructions above or in front of the sensor, etc.). Stream gauging and indexing efforts were conducted with the final installation indexing efforts completed in November 2010. Results of the indexing effort were provided in the August 2011 Annual Report (FPL 2011b).

Significant turbulence at TPFM-3 yielded poor data quality, and subsequent equipment failure resulted in removal of the flow meter in December 2010. This flow meter has not been reinstalled due primarily to issues with data quality, limitations in alternative inflow locations, and concerns of short-circuiting in the CCS. The issue of short-circuiting has been discussed with the agencies and it limits the usefulness of the flow meters as originally envisioned. FPL is currently collecting data to help confirm short-circuiting of water from the discharge canals into the Grand Canal and return canals under the berms in the CCS. Results from this effort have been provided to the Agencies on March 21, 2012.

2.5.2 Results

During the monitoring period from June 2011 through November 2011, equipment malfunctions limited the collection of flow meter data at the outflow station and southerly station. TPFM-1 was not operating in June 2011, and FPL replaced that flow meter with the one that had been previously pulled and fixed from TPFM-3. This flow meter recorded data for approximately one week (late June/early July 2011) before malfunctioning. At TPFM-2, data were collected from June 2011 through August 4, 2011, but the mounting bracket broke. All flow meters were sent to YSI for diagnostics and/or repair.

Figure 2.5-1 shows the velocity and flow meter data that were collected for this period along with the previously reported results.

Appendix E includes outage records for the period from June 2011 through November 2011 for Units 1, 3, and 4 (Unit 2 was not contributing to flows during this time period).

TABLES

Table 2.1-1. Statistical Summary of Automated Groundwater Water Quality Data (Specific Conductance and Temperature)

Well ID	Specific Conductance					Temperature				
	Maximum	Minimum	Average	Median	Standard Deviation	Maximum	Minimum	Average	Median	Standard Deviation
TPGW-1S	64171 (64171)	47861 (52682)	56779 (57044)	56698 (54640)	3296 (3904)	25.7 (25.7)	25.4 (25.5)	25.6 (25.6)	25.6 (25.6)	0.1 (0.1)
TPGW-1M	74443 (72106)	68659 (68929)	70819 (70450)	70486 (70435)	1096 (346)	26.0 (26.0)	25.9 (25.9)	26.0 (26.0)	26.0 (26.0)	0.0 (0.0)
TPGW-1D	72580 (72580)	69525 (69920)	71119 (71497)	70931 (71358)	549 (490)	26.2 (26.1)	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	0.0 (0.0)
TPGW-2S	77088 (77088)	68360 (72881)	73165 (74272)	73162 (73668)	1701 (1279)	27.5 (27.5)	25.6 (26.4)	26.5 (26.7)	26.5 (26.5)	0.4 (0.4)
TPGW-2M	77386 (77386)	73143 (74519)	75204 (75551)	75177 (75264)	760 (588)	27.4 (27.4)	26.9 (27.1)	27.1 (27.3)	27.0 (27.3)	0.2 (0.1)
TPGW-2D	77116 (77116)	72128 (74159)	75413 (75580)	75399 (75670)	459 (563)	27.6 (27.4)	27.3 (27.3)	27.4 (27.4)	27.4 (27.4)	0.1 (0.0)
TPGW-3S	64212 (64212)	62142 (62142)	63450 (63592)	63633 (63671)	441 (343)	26.2 (26.2)	25.6 (25.6)	25.9 (25.8)	25.9 (25.7)	0.2 (0.2)
TPGW-3M	70236 (69164)	66779 (67467)	68865 (68609)	68795 (68622)	420 (222)	26.0 (25.9)	25.9 (25.9)	25.9 (25.9)	25.9 (25.9)	0.0 (0.0)
TPGW-3D	70014 (70014)	66628 (68095)	68826 (69352)	68908 (69572)	782 (475)	25.8 (25.8)	25.7 (25.8)	25.8 (25.8)	25.8 (25.8)	0.0 (0.0)
TPGW-4S	3867 (3867)	1204 (1438)	2248 (2257)	2162 (2148)	423 (485)	25.3 (25.0)	24.2 (24.2)	24.7 (24.5)	24.8 (24.4)	0.3 (0.2)
TPGW-4M	38777 (38082)	35988 (37084)	37448 (37532)	37549 (37510)	368 (201)	24.6 (24.6)	24.4 (24.4)	24.5 (24.5)	24.5 (24.5)	0.1 (0.0)
TPGW-4D	43986 (43396)	41327 (41327)	42713 (42463)	42645 (42497)	429 (246)	24.5 (24.4)	24.3 (24.3)	24.4 (24.4)	24.4 (24.4)	0.0 (0.0)
TPGW-5S	1947 (1947)	752 (752)	1315 (1240)	1289 (12520)	206 (186)	23.8 (23.6)	23.3 (23.3)	23.5 (23.4)	23.5 (23.4)	0.2 (0.1)

Table 2.1-1. Statistical Summary of Automated Groundwater Water Quality Data (Specific Conductance and Temperature)

Well ID	Specific Conductance					Temperature				
	Maximum	Minimum	Average	Median	Standard Deviation	Maximum	Minimum	Average	Median	Standard Deviation
TPGW-5M	31729 (31485)	29580 (30413)	30745 (31057)	30822 (31102)	474 (318)	23.6 (23.6)	23.5 (23.5)	23.5 (23.5)	23.5 (23.5)	0.0 (0.0)
TPGW-5D	33960 (33960)	31234 (31795)	33154 (33313)	33243 (33561)	615 (567)	23.7 (23.7)	23.7 (23.7)	23.7 (23.7)	23.7 (23.7)	0.0 (0.0)
TPGW-6S	1258 (1247)	553 (553)	1162 (1128)	1158 (1126)	46 (37)	23.7 (23.6)	23.0 (23.2)	23.4 (23.3)	23.4 (23.4)	0.2 (0.1)
TPGW-6M	23108 (22493)	21669 (21669)	22590 (22326)	22475 (22399)	291 (200)	23.7 (23.6)	23.5 (23.5)	23.6 (23.6)	23.6 (23.6)	0.0 (0.0)
TPGW-6D	24217 (23889)	22537 (22537)	23624 (23403)	23607 (23379)	245 (135)	23.6 (23.6)	23.5 (23.5)	23.5 (23.5)	23.5 (23.5)	0.0 (0.0)
TPGW-7S	906 (603)	421 (530)	568 (566)	565 (562)	39 (15)	24 (23.9)	23.6 (23.6)	23.8 (23.7)	23.8 (23.7)	0.1 (0.1)
TPGW-7M	728 (728)	567 (567)	620 (642)	606 (647)	36 (46)	24.2 (24.2)	23.7 (23.7)	23.8 (23.8)	23.8 (23.8)	0.1 (0.1)
TPGW-7D	679 (600)	418 (547)	592 (583)	596 (582)	19 (6)	23.9 (23.9)	23.9 (23.9)	23.9 (23.9)	23.9 (23.9)	0.0 (0.0)
TPGW-8S	3681 (2848)	2067 (2067)	2919 (2555)	2896 (2608)	369 (183)	24.1 (24.0)	23.3 (23.3)	23.7 (23.6)	23.7 (23.6)	0.3 (0.2)
TPGW-8M	655 (645)	631 (634)	645 (640)	645 (640)	5 (2)	23.8 (23.7)	23.6 (23.6)	23.7 (23.6)	23.7 (23.6)	0.1 (0.0)
TPGW-8D	721 (712)	237 (237)	682 (676)	684 (677)	20 (29)	23.8 (23.8)	23.5 (23.5)	23.7 (23.7)	23.7 (23.7)	0.0 (0.0)
TPGW-9S	659 (657)	444 (516)	598 (581)	600 (557)	40 (44)	25.3 (25.3)	24.2 (24.2)	24.6 (24.6)	24.5 (24.5)	0.3 (0.3)
TPGW-9M	752 (665)	605 (617)	656 (641)	655 (646)	18 (11)	24.2 (24.1)	23.6 (23.7)	23.9 (23.9)	24.0 (23.9)	0.2 (0.1)

Table 2.1-1. Statistical Summary of Automated Groundwater Water Quality Data (Specific Conductance and Temperature)

Well ID	Specific Conductance					Temperature				
	Maximum	Minimum	Average	Median	Standard Deviation	Maximum	Minimum	Average	Median	Standard Deviation
TPGW-9D	655 (648)	627 (627)	639 (632)	639 (630)	8 (4)	24.1 (24.1)	24.0 (24.0)	24.1 (24.0)	24 (24.0)	0.0 (0.0)
TPGW-10S	52602 (52589)	50000 (50525)	51255 (51877)	51211 (52012)	813 (521)	26.6 (26.6)	25.5 (25.5)	26.0 (26.0)	26.1 (26.0)	0.3 (0.4)
TPGW-10M	55812 (55117)	53789 (53999)	54729 (54609)	54780 (54756)	454 (286)	25.9 (25.9)	25.8 (25.8)	25.8 (25.8)	25.8 (25.8)	0.0 (0.0)
TPGW-10D	56394 (55727)	54162 (54162)	55184 (54946)	55005 (54921)	523 (430)	25.7 (25.7)	25.7 (25.7)	25.7 (25.7)	25.7 (25.7)	0.0 (0.0)
TPGW-11S	56001 (56001)	53393 (53406)	54620 (54303)	54750 (53791)	751 (757)	25.5 (25.4)	25.0 (25.0)	25.2 (25.2)	25.2 (25.1)	0.2 (0.1)
TPGW-11M	57774 (56240)	54895 (54895)	56232 (55919)	56016 (55852)	665 (195)	25.4 (25.4)	25.3 (25.3)	25.3 (25.3)	25.3 (25.3)	0.0 (0.0)
TPGW-11D	59311 (59311)	55275 (55994)	57953 (58022)	57864 (57874)	599 (566)	25.3 (25.3)	25.3 (25.3)	25.3 (25.3)	25.3 (25.3)	0.0 (0.0)
TPGW-12S	45533 (45533)	38736 (39415)	41074 (42136)	40839 (41891)	884 (842)	26.3 (26.3)	25.8 (25.8)	26.0 (25.9)	26.0 (25.9)	0.1 (0.1)
TPGW-12M	65338 (64458)	58312 (58312)	63623 (62548)	64030 (62846)	1228 (1453)	26.2 (26.1)	26.0 (26.0)	26.1 (26.1)	26.1 (26.1)	0.0 (0.0)
TPGW-12D	65013 (65013)	62948 (63220)	64020 (64060)	64137 (64225)	401 (405)	26.2 (26.1)	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	0.0 (0.0)
TPGW-13S	86909 (83868)	82147 (82147)	84302 (82959)	84069 (82955)	1197 (262)	30.5 (30.0)	29.3 (29.8)	29.9 (29.8)	29.8 (29.8)	0.4 (0.0)
TPGW-13M	83273 (82377)	79217 (79217)	80959 (80437)	80692 (80589)	1044 (607)	29.6 (29.6)	29.4 (29.5)	29.5 (29.5)	29.5 (29.5)	0.1 (0.0)
TPGW-13D	85430 (85430)	80256 (80256)	82598 (82152)	82495 (82447)	897 (1022)	29.5 (29.5)	29.4 (29.4)	29.4 (29.4)	29.4 (29.4)	0.0 (0.0)

Table 2.1-1. Statistical Summary of Automated Groundwater Water Quality Data (Specific Conductance and Temperature)

Well ID	Specific Conductance					Temperature				
	Maximum	Minimum	Average	Median	Standard Deviation	Maximum	Minimum	Average	Median	Standard Deviation
TPGW-14S	59860 (59695)	56922 (56922)	58396 (58009)	58623 (57573)	780 (803)	26.3 (26.3)	25.5 (25.5)	26.0 (25.9)	26.0 (25.9)	0.3 (0.3)
TPGW-14M	67002 (66060)	61767 (61767)	63631 (63732)	63516 (63633)	1031 (1205)	26.2 (26.2)	26.1 (26.1)	26.2 (26.1)	26.2 (26.1)	0.0 (0.0)
TPGW-14D	75797 (75797)	72427 (72427)	73987 (73959)	73858 (73749)	719 (1010)	26.4 (26.4)	26.3 (26.3)	26.4 (26.4)	26.4 (26.4)	0.0 (0.0)

Notes:
First value reflects data collected since beginning of monitoring in June/September 2010 through November 2011.
Second value in parenthesis reflects data collected for this semi-annual period from June 2011 through November 2011.

Table 2.2-2. Statistical Summary of Automated Surface Water Water Quality Data (Specific Conductance and Temperature)

Well ID	Specific Conductance					Temperature				
	Maximum	Minimum	Average	Median	Standard Deviation	Maximum	Minimum	Average	Median	Standard Deviation
TPSWC-1T	3574 (3574)	315 (315)	853 (1111)	650 (1192)	471 (598)	33.7 (33.7)	14.5 (22.4)	26.3 (28.6)	27.2 (29.4)	4.0 (2.6)
TPSWC-1B	3158 (3158)	387 (589)	1035 (1469)	820 (1379)	602 (690)	30.6 (30.6)	14.7 (22.9)	25.2 (27.7)	26.3 (28.7)	4.0 (2.2)
TPSWC-2T	6194 (6194)	256 (256)	1366 (1808)	763 (683)	1427 (2103)	34.8 (34.8)	14.1 (21.9)	26.1 (28.2)	26.8 (29.0)	4.1 (2.8)
TPSWC-2B	9507 (9507)	267 (267)	1644 (2315)	786 (698)	1902 (2590)	31.8 (31.8)	14.0 (21.8)	25.3 (27.5)	26.4 (28.6)	4.2 (2.7)
TPSWC-3T	5864 (5864)	265 (265)	1501 (1578)	1003 (742)	1356 (1732)	33.6 (33.6)	15.1 (22.4)	26.5 (28.8)	27.5 (29.7)	4.0 (2.6)
TPSWC-3B	22776 (22370)	265 (265)	3900 (4670)	1343 (1626)	5924 (6280)	32.2 (32.2)	15.0 (22.2)	26.2 (28.5)	27.4 (29.5)	4.2 (2.5)
TPSWC-4T	63343 (63343)	378 (462)	29259 (32501)	31686 (35427)	20670 (22807)	34.4 (34.4)	18.2 (22.8)	27.3 (28.7)	27.7 (29.0)	2.9 (2.2)
TPSWC-4B	62424 (62424)	388 (474)	34615 (38123)	40024 (45168)	21224 (22753)	34.5 (34.5)	17.4 (23.0)	27.5 (28.7)	28.0 (29.1)	2.9 (2.2)
TPSWC-5T	61200 (61200)	27741 (35033)	50320 (52775)	49985 (54928)	6904 (6947)	34.5 (34.5)	13.8 (22.5)	26.7 (29.3)	27.6 (30.3)	4.2 (2.8)
TPSWC-5B	71282 (63559)	46974 (52158)	58379 (59617)	58524 (60119)	4318 (1895)	34.9 (33.3)	16.4 (26.2)	28.1 (30.5)	28.6 (30.8)	3.6 (1.6)
TPSWID-1T	45621 (45621)	2101 (2576)	11662 (14261)	6755 (7865)	10506 (12483)	36.3 (36.3)	16.8 (23.2)	27.2 (29.3)	27.5 (29.8)	3.7 (2.9)
TPSWID-1B	48037 (48037)	2109 (2981)	15469 (18334)	13282 (13703)	12331 (13724)	33.9 (33.9)	16.8 (23.1)	27.1 (28.9)	27.5 (29.6)	3.4 (3.0)
TPSWID-2T	55392 (55392)	1441 (1457)	9464 (12038)	3969 (3980)	11934 (15086)	33.6 (33.6)	18.8 (23.5)	27.1 (29.0)	27.3 (29.6)	3.1 (2.5)
TPSWID-2B	67557	2146	37050	34762	23911	32.5	23.5	29.5	29.9	2.1

Table 2.2-2. Statistical Summary of Automated Surface Water Water Quality Data (Specific Conductance and Temperature)

Well ID	Specific Conductance					Temperature				
	Maximum	Minimum	Average	Median	Standard Deviation	Maximum	Minimum	Average	Median	Standard Deviation
	(62140)	(1177)	(8089)	(3750)	(13487)	(34.4)	(18.3)	(27.3)	(27.6)	(3.2)
TPSWID-3T	62140 (62140)	1177 (1627)	8089 (12888)	3750 (4575)	13487 (17632)	34.4 (34.4)	18.3 (23.6)	27.3 (29.3)	27.6 (30.1)	3.2 (2.5)
TPSWID-3B	66206 (66206)	1211 (1691)	12762 (17829)	4181 (5110)	20129 (23533)	33.8 (33.8)	18.1 (23.6)	26.7 (28.7)	27.1 (29.2)	3.0 (2.4)
TPSWCCS-1B	87836 (87491)	54595 (54641)	74380 (78813)	76881 (80516)	8152 (7265)	43.8 (43.8)	18.0 (26.9)	34.7 (37.5)	34.6 (38.7)	4.5 (3.8)
TPSWCCS-2B	87632 (85526)	64216 (73761)	81351 (81938)	82176 (83295)	3766 (3163)	38.2 (38.2)	14.5 (26.2)	30.2 (33.6)	30.2 (34.3)	4.2 (2.6)
TPSWCCS-3B	88238 (88238)	53565 (65771)	75126 (79688)	75525 (80797)	7193 (5189)	39.8 (39.8)	14.8 (23.5)	29.6 (32.6)	29.5 (33.2)	4.4 (3.3)
TPSWCCS-4T	89263 (89263)	55754 (67452)	78278 (81106)	80321 (82101)	6512 (5149)	37.8 (37.8)	12.4 (21.8)	28.4 (30.9)	28.5 (31.7)	4.3 (3.3)
TPSWCCS-4B	90004 (90004)	50528 (67874)	77792 (81428)	79992 (82026)	7274 (5249)	37.9 (37.9)	12.3 (21.8)	28.4 (31.0)	28.5 (31.8)	4.3 (3.3)
TPSWCCS-5T	87508 (87508)	54602 (70431)	76484 (79428)	78484 (80137)	6518 (4975)	37.0 (37.0)	12.8 (22.3)	27.8 (30.2)	28.0 (30.8)	4.1 (3.2)
TPSWCCS-5B	82208 (N/A)	80766 (N/A)	81273 (N/A)	81300 (N/A)	190 (N/A)	33.8 (33.8)	18.9 (24.5)	27.7 (29.6)	27.6 (30.0)	2.9 (2.4)
TPSWCCS-6T	86666 (86666)	59558 (70645)	77233 (80359)	78715 (81394)	5932 (4016)	35.7 (35.7)	12.5 (22.8)	27.8 (30.4)	28.0 (31.4)	4.1 (3.1)
TPSWCCS-6B	86600 (86600)	59570 (69240)	76747 (79270)	78445 (79983)	6418 (4972)	35.7 (35.7)	12.4 (22.8)	27.1 (29.4)	27.5 (29.7)	3.8 (3.1)
TPSWCCS-7B	85289 (73640)	53511 (63171)	70737 (69445)	71775 (70558)	5750 (3103)	42.6 (42.6)	15.7 (24.9)	32 (34.9)	31.8 (35.7)	4.4 (3.6)
TPBBSW-1B	66884 (66884)	10464 (11223)	51548 (55643)	53228 (55963)	8814 (6637)	33.4 (33.4)	18.7 (23.5)	27.9 (29.6)	28.0 (30.1)	2.8 (2.1)

Table 2.2-2. Statistical Summary of Automated Surface Water Water Quality Data (Specific Conductance and Temperature)

Well ID	Specific Conductance					Temperature				
	Maximum	Minimum	Average	Median	Standard Deviation	Maximum	Minimum	Average	Median	Standard Deviation
TPBBSW-2B	64725 (64725)	25666 (26673)	49501 (52047)	52698 (54292)	9866 (9498)	35.0 (35.0)	15.5 (20.8)	27.2 (29.0)	27.6 (29.6)	3.6 (2.9)
TPBBSW-3B	63371 (63371)	28789 (28789)	50087 (51587)	51488 (54180)	7651 (8321)	34.8 (34.8)	9.5 (20.3)	25.7 (28.5)	26.4 (29.4)	4.5 (3.1)
TPBBSW-4B	61649 (61649)	36028 (36028)	51374 (53110)	53551 (55706)	6529 (6725)	33.7 (33.7)	18.1 (21.9)	27.2 (28.7)	27.6 (29.7)	3.3 (2.9)
TPBBSW-5B	64177 (64177)	32263 (36516)	49832 (52344)	51700 (54711)	7995 (7792)	34.5 (34.5)	18.6 (21.5)	27.4 (28.8)	27.8 (29.7)	3.3 (2.9)
TPBBSW-10B	64623 (64623)	18922 (18922)	50268 (47610)	52773 (51016)	10011 (11317)	35.2 (35.2)	16.6 (20.4)	27.5 (28.6)	27.8 (29.4)	3.2 (3.0)
TPBBSW-14B	48028 (48028)	35635 (35635)	43420 (43737)	44011 (45026)	3302 (3733)	33.9 (33.9)	19.352 (21.563)	27.6 (28.6)	28.0 (29.6)	3.1 (3.0)

Notes:
First value reflects data collected since beginning of monitoring in June/September 2010 through November 2011.
Second value in parenthesis reflects data collected for this semi-annual period from June 2011 through November 2011.

Table 2.4-1. Parameters Collected at 15-Minute Intervals Reported by the Meteorological Station at TPM-1

Parameter	Units	Accuracy	Resolution
Rainfall – amount	Inches	Better than 5%, weather dependent	0.001
Relative humidity	%	± 3	0.1
Temperature	Celcius	± 0.3	± 0.1
Barometric pressure	mmHg	0.5	0.5
Wind speed- average	mph	1 ft/sec	0.3 ft/sec
Wind speed- gusts and lull	mph	1 ft/sec	0.3 ft/sec
Wind direction	degrees	± 3	1
Light level	µmols m^{-2} s^{-1}	5-10 µA/100 µmols m^{-2} s^{-1}	NA
Hail	Hits	1	1

Key:
ft/sec – Feet per second.
mmHg - Millimeters of mercury.
mph – Miles per hour.
NA – Not applicable.
µmols m^{-2} s^{-1} - Micromoles per meter square per second.

Table 2.4-2. Rainfall Record at Meteorological Station, TPM-1

Month	Date	Year	Rain (in)
6	1	2011	0.008
6	2	2011	0.141
6	3	2011	0.007
6	5	2011	0.001
6	6	2011	0.019
6	16	2011	0.055
6	17	2011	0.055
6	18	2011	0.085
6	19	2011	0.003
6	20	2011	0.164
6	21	2011	0.082
6	22	2011	0.012
6	23	2011	0.001
6	24	2011	0.006
6	25	2011	0.102
6	26	2011	0.055
6	27	2011	0.100
6	28	2011	0.028
6	29	2011	0.605
6	30	2011	0.050
7	1	2011	0.064
7	2	2011	0.530
7	3	2011	0.048
7	4	2011	0.004
7	5	2011	0.330
7	6	2011	1.520
7	7	2011	3.874
7	8	2011	0.001
7	9	2011	0.008
7	10	2011	0.001
7	11	2011	0.394
7	12	2011	0.003
7	13	2011	0.380
7	15	2011	0.002
7	16	2011	0.002

Month	Date	Year	Rain (in)
7	17	2011	0.248
7	18	2011	1.343
7	19	2011	0.905
7	20	2011	0.140
7	21	2011	0.308
7	22	2011	0.047
7	23	2011	0.003
7	24	2011	0.103
7	25	2011	0.015
7	26	2011	0.001
7	27	2011	0.038
7	28	2011	0.146
7	29	2011	0.183
8	1	2011	0.003
8	2	2011	0.026
8	3	2011	0.255
8	5	2011	0.001
8	6	2011	1.472
8	7	2011	0.627
8	8	2011	0.968
8	9	2011	0.009
8	10	2011	0.028
8	11	2011	0.058
8	12	2011	0.070
8	13	2011	0.080
8	14	2011	0.599
8	15	2011	0.550
8	16	2011	0.116
8	17	2011	0.001
8	18	2011	0.033
8	19	2011	0.452
8	20	2011	0.098
8	21	2011	0.010
8	22	2011	0.170
8	23	2011	0.004

Table 2.4-2. Rainfall Record at Meteorological Station, TPM-1

Month	Date	Year	Rain (in)
8	24	2011	0.007
8	25	2011	0.301
8	26	2011	0.301
8	27	2011	0.224
8	29	2011	0.684
8	30	2011	2.080
9	1	2011	0.017
9	2	2011	1.758
9	3	2011	0.003
9	8	2011	0.206
9	9	2011	0.022
9	10	2011	0.001
9	12	2011	0.359
9	13	2011	0.339
9	14	2011	0.006
9	16	2011	0.003
9	18	2011	0.057
9	19	2011	0.199
9	20	2011	0.004
9	21	2011	0.127
9	22	2011	1.472
9	23	2011	0.684
9	25	2011	1.182
9	26	2011	0.148
9	27	2011	0.196
9	29	2011	0.006
9	30	2011	0.144
10	6	2011	0.008
10	7	2011	0.460
10	8	2011	6.333
10	9	2011	0.073

Month	Date	Year	Rain (in)
10	10	2011	0.016
10	11	2011	0.010
10	12	2011	0.010
10	13	2011	0.019
10	15	2011	1.053
10	16	2011	1.633
10	17	2011	0.382
10	18	2011	0.350
10	19	2011	1.330
10	22	2011	0.002
10	23	2011	0.003
10	28	2011	0.619
10	29	2011	0.139
10	30	2011	0.007
11	1	2011	0.021
11	2	2011	0.010
11	4	2011	0.004
11	5	2011	0.117
11	6	2011	0.032
11	7	2011	0.004
11	8	2011	0.002
11	9	2011	0.006
11	13	2011	0.003
11	15	2011	0.001
11	17	2011	0.014
11	18	2011	0.052
11	19	2011	0.013
11	20	2011	0.037
11	24	2011	0.005
11	29	2011	0.001
Total			**41.15**

Table 2.4-3. Total Rain Days and Rainfall Amounts Recorded Monthly at Each Station

	TPM-1		TPRF-2		TPRF-11		TPRF-4		LU-South		LU-NEast	
Month	# of Rain Days	Amount (in)	# of Rain Days	Amount (in)	# of Rain Days	Amount (in)	# of Rain Days	Amount (in)	# of Rain Days	Amount (in)	# of Rain Days	Amount (in)
Jun-11	20	1.58	12	2.75	9	1.93	NA	NA	6	0.42	10	1.61
Jul-11	29	10.64	15	10.69	15	6.99	NA	NA	11	8.47	11	5.79
Aug-11	29	9.24	NA	NA	20	5.44	NA	NA	20	6.32	23	7.96
Sep-11	21	6.93	NA	NA	15	4.44	19	4.77	5	4.95	7	1.89
Oct-11	19	13.25	NA	NA	14	7.07	6	6.44	8	14.5	9	3.60
Nov-11	18	0.32	NA	NA	NA	NA	NA	NA	5	0.61	3	0.27

Note: LU-South and LU-NEast Data Subject to Final QA/QC

Key:

LU = Land Use

NA = Not Available

TPM1 = Turkey Point Meteorological Station

TPRF = Turkey Point Rainfall Gauge

Table 2.4-4. Dates of Daily Rainfall > 1" in a 24-Hour Period for All Stations

Date	TPM-1	TPRF-2 [1]	TPRF-11	TPRF-4 [2]	LU-South [3]	LU-NEast [3]
6/29/11	0.605	1.96	0.47	NA	0.00	0.00
7/6/11	1.52	2.5	0.89	NA	2.27	0.35
7/7/11	3.874	3.39	3.89	NA	2.95	2.83
7/18/11	1.343	2.51	0.2	NA	1.26	0.31
8/6/11	1.472	0.39	0.28	NA	0.23	1.37
8/8/11	0.968	1.55	0.4	NA	0.63	1.27
8/15/11	0.55	0.01	0.41	NA	1.30	0.05
8/30/11	2.08	NA	1.48	NA	1.01	0.21
9/2/11	1.758	NA	0.35	NA	1.27	0.16
9/22/11	1.472	NA	0.17	0.79	0.00	0.00
9/25/11	1.182	NA	1.05	1.04	0.00	0.00
10/8/11	6.333	NA	2.44	3.86	8.05	1.37
10/15/11	1.053	NA	0.45	1.2	1.25	0.38
10/16/11	1.633	NA	1.06	1.23	1.27	0.53
10/19/11	1.33	NA	0.92	NA	0.90	0.24

Notes:
[1] Only a few days of data were recorded in August, September and October 2011.
[2] No data were found in June, July and August 2011.
[3] LU-South and LU-NEast Data Subject to Final QA/QC.

Key:

LU = Land Use

NA = Not Available

TPM1 = Turkey Point Meteorological Station

TPRF = Turkey Point Rainfall Gauge

FIGURES

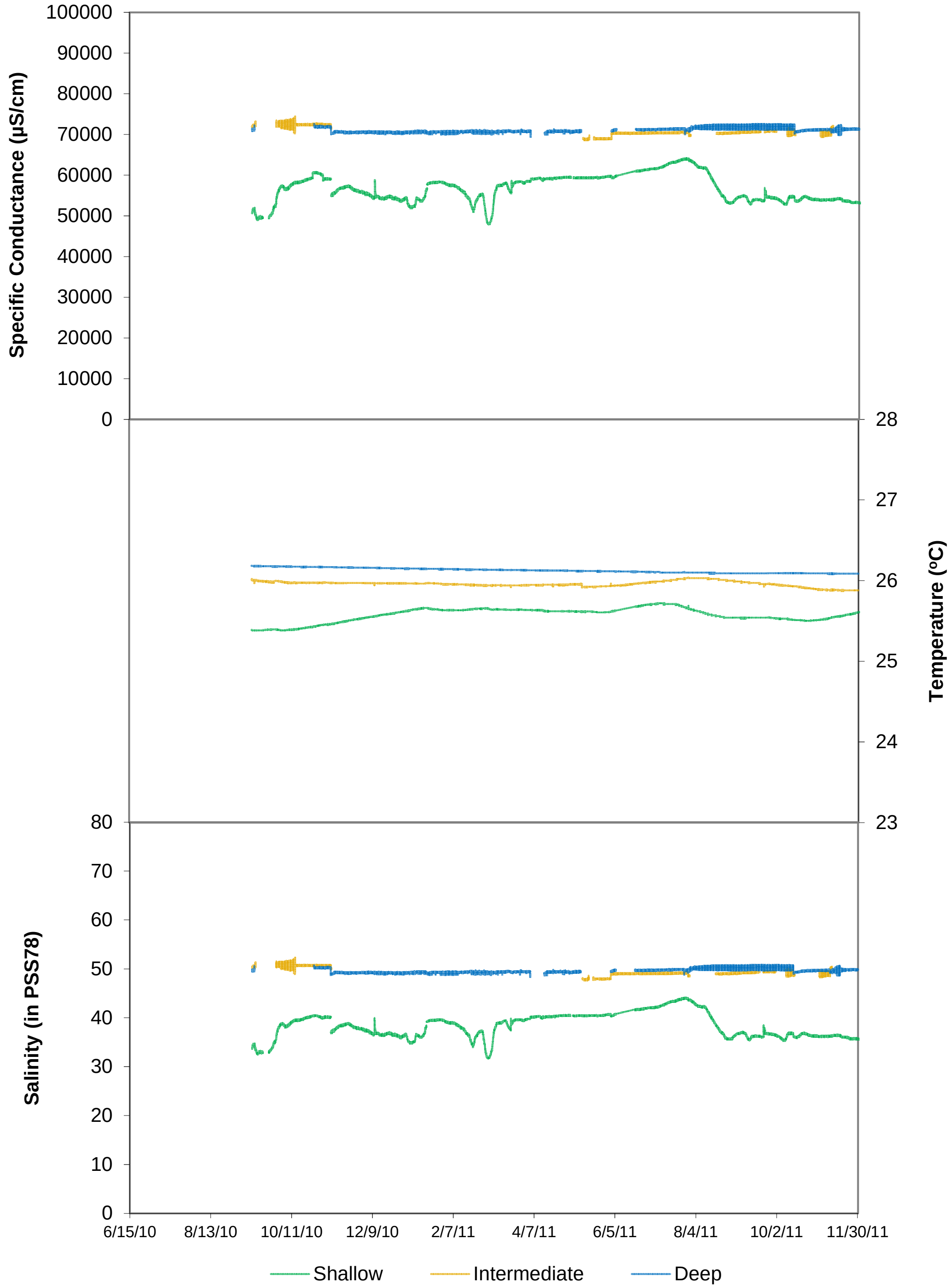


Figure 2.1-1. TPGW-1 Specific Conductance, Temperature and Salinity.

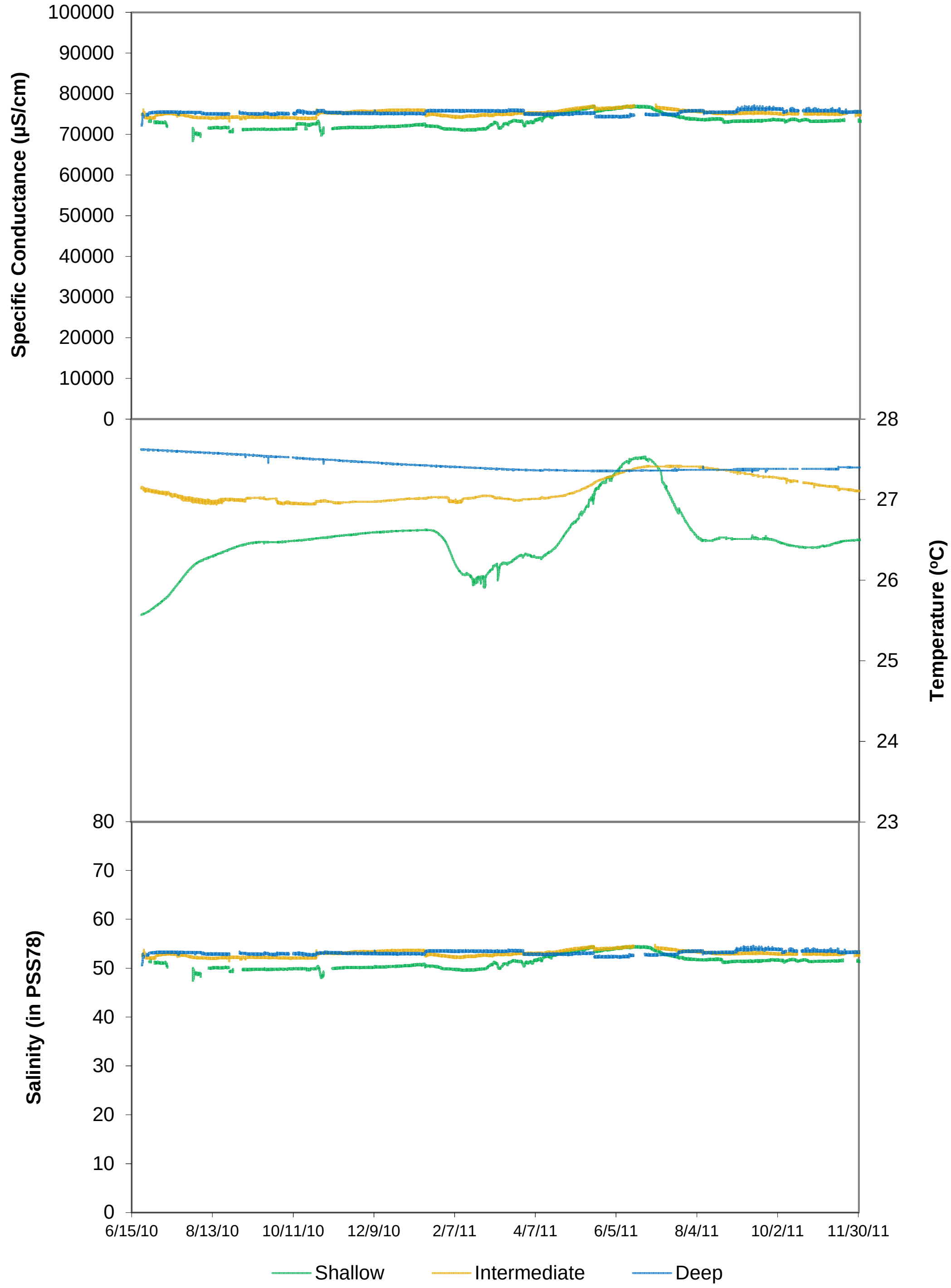


Figure 2.1-2. TPGW-2 Specific Conductance, Temperature and Salinity.

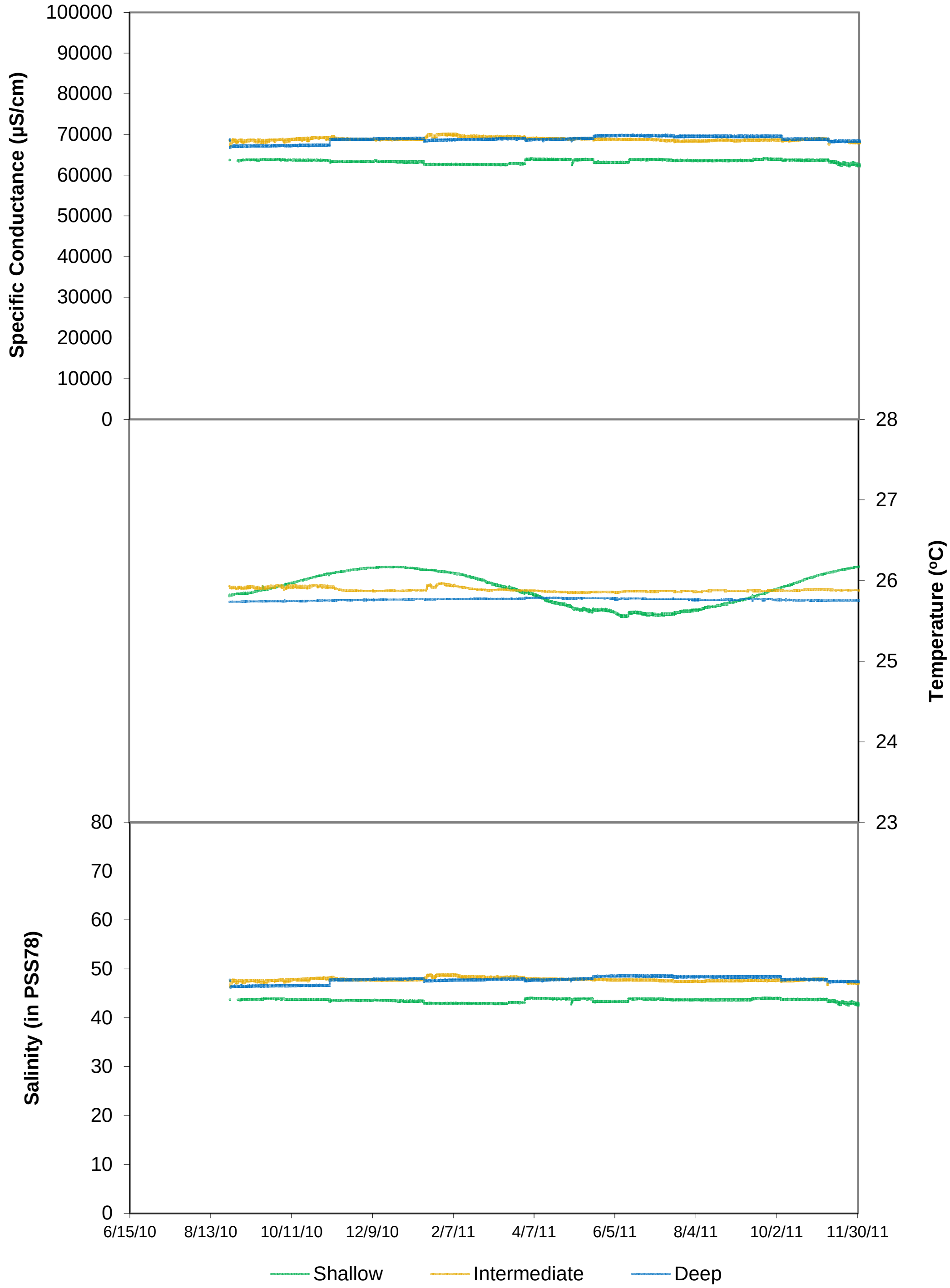


Figure 2.1-3. TPGW-3 Specific Conductance, Temperature and Salinity.

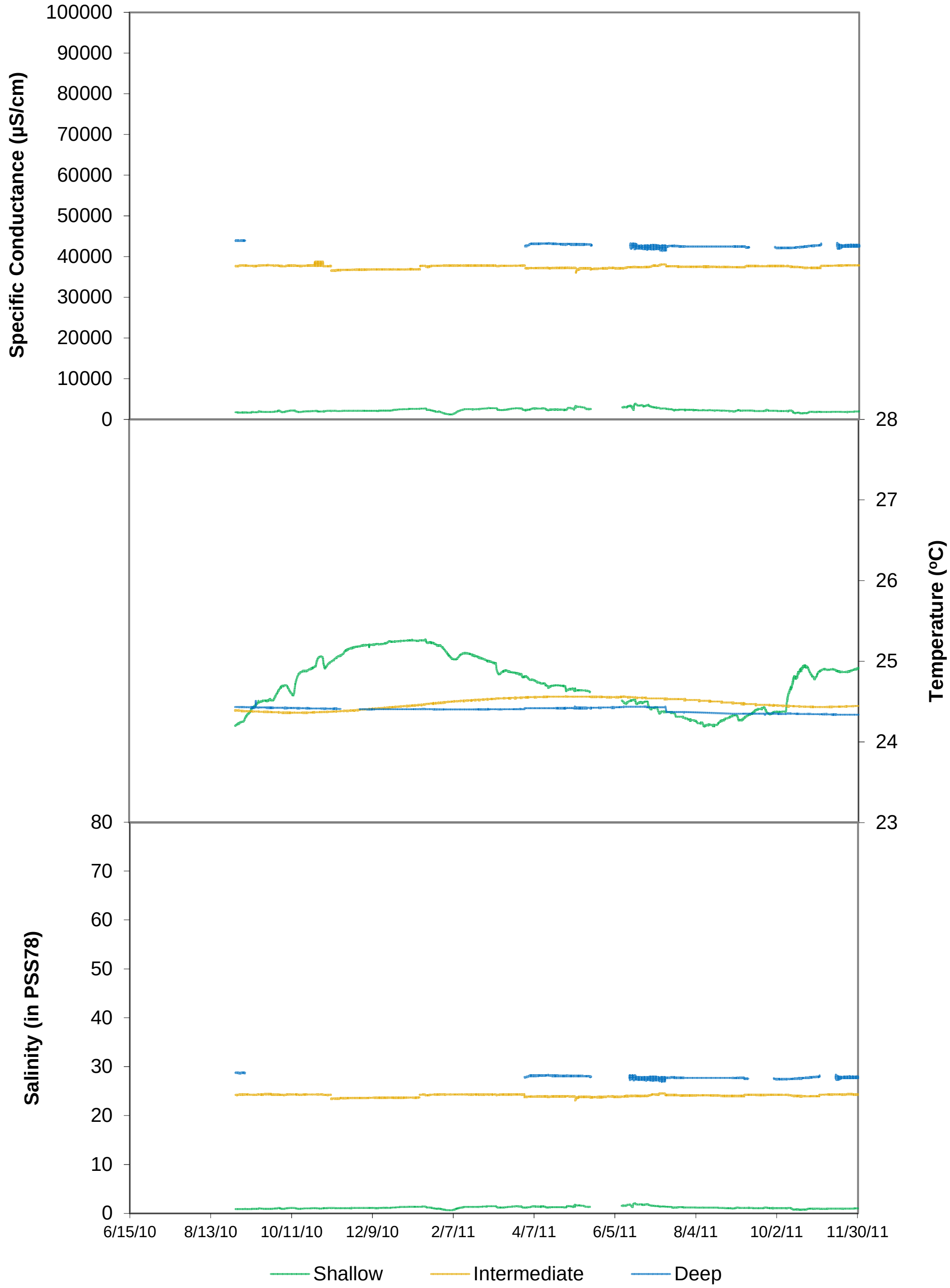


Figure 2.1-4. TPGW-4 Specific Conductance, Temperature and Salinity.

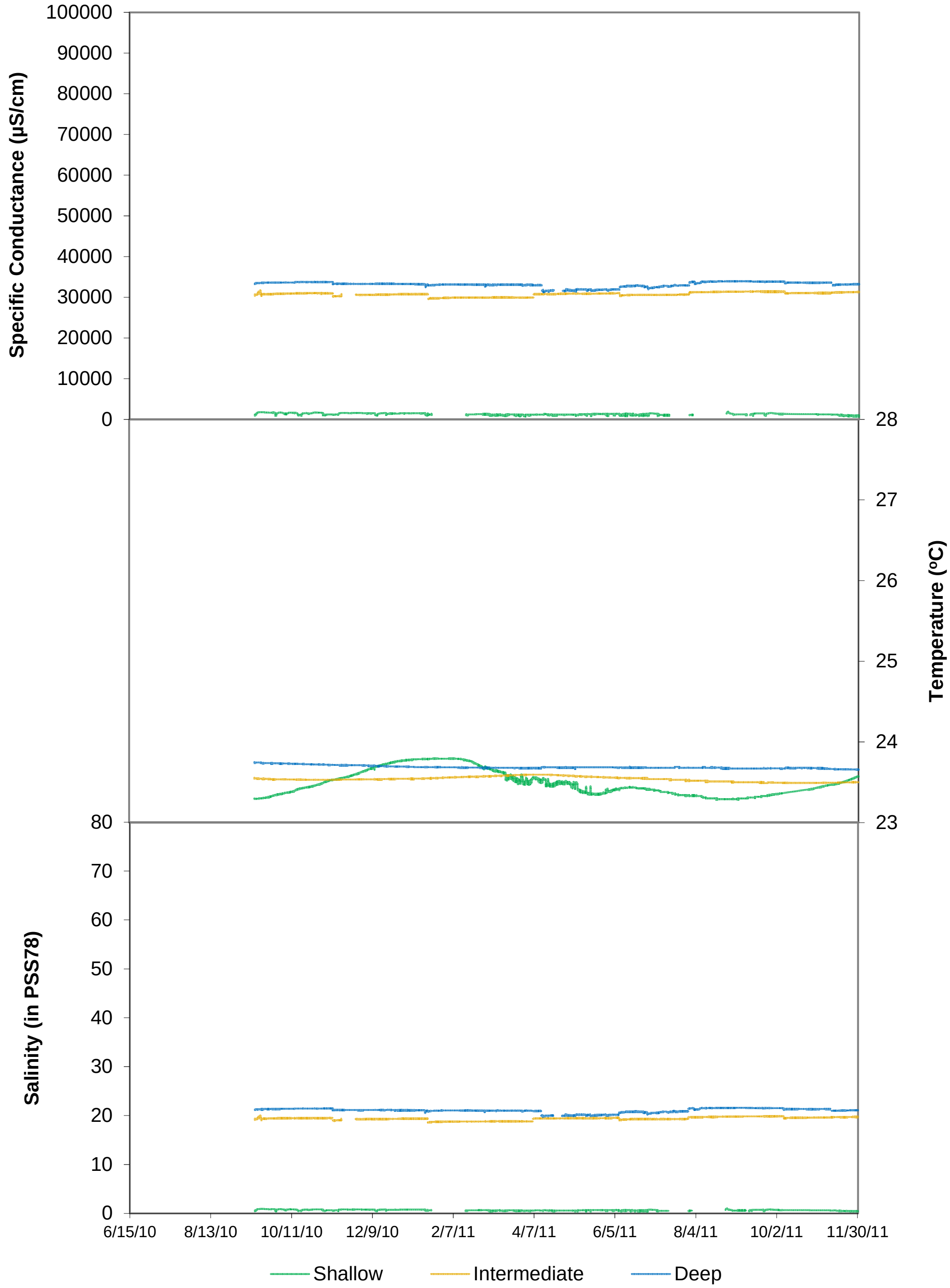


Figure 2.1-5. TPGW-5 Specific Conductance, Temperature and Salinity.

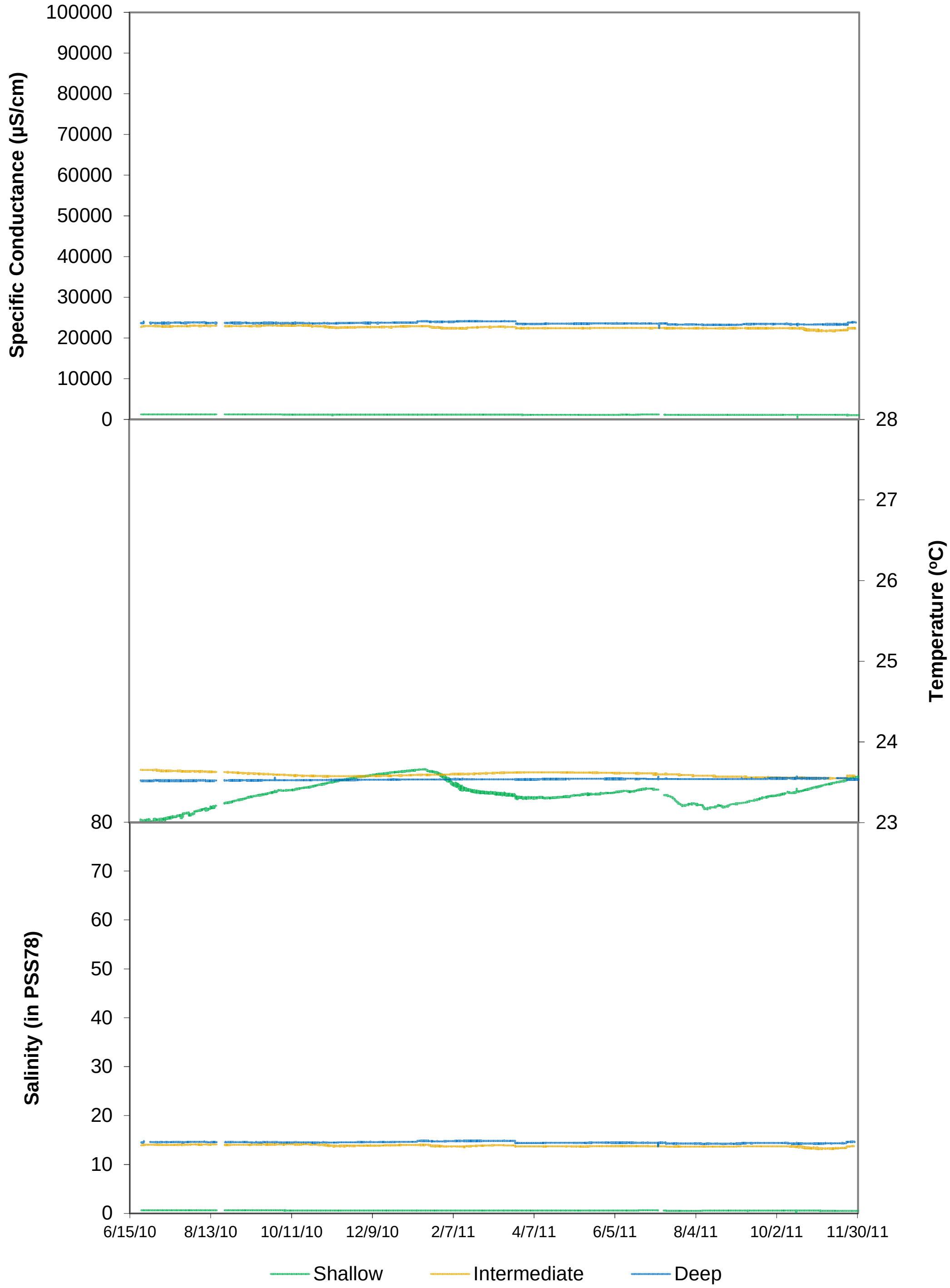


Figure 2.1-6. TPGW-6 Specific Conductance, Temperature and Salinity.

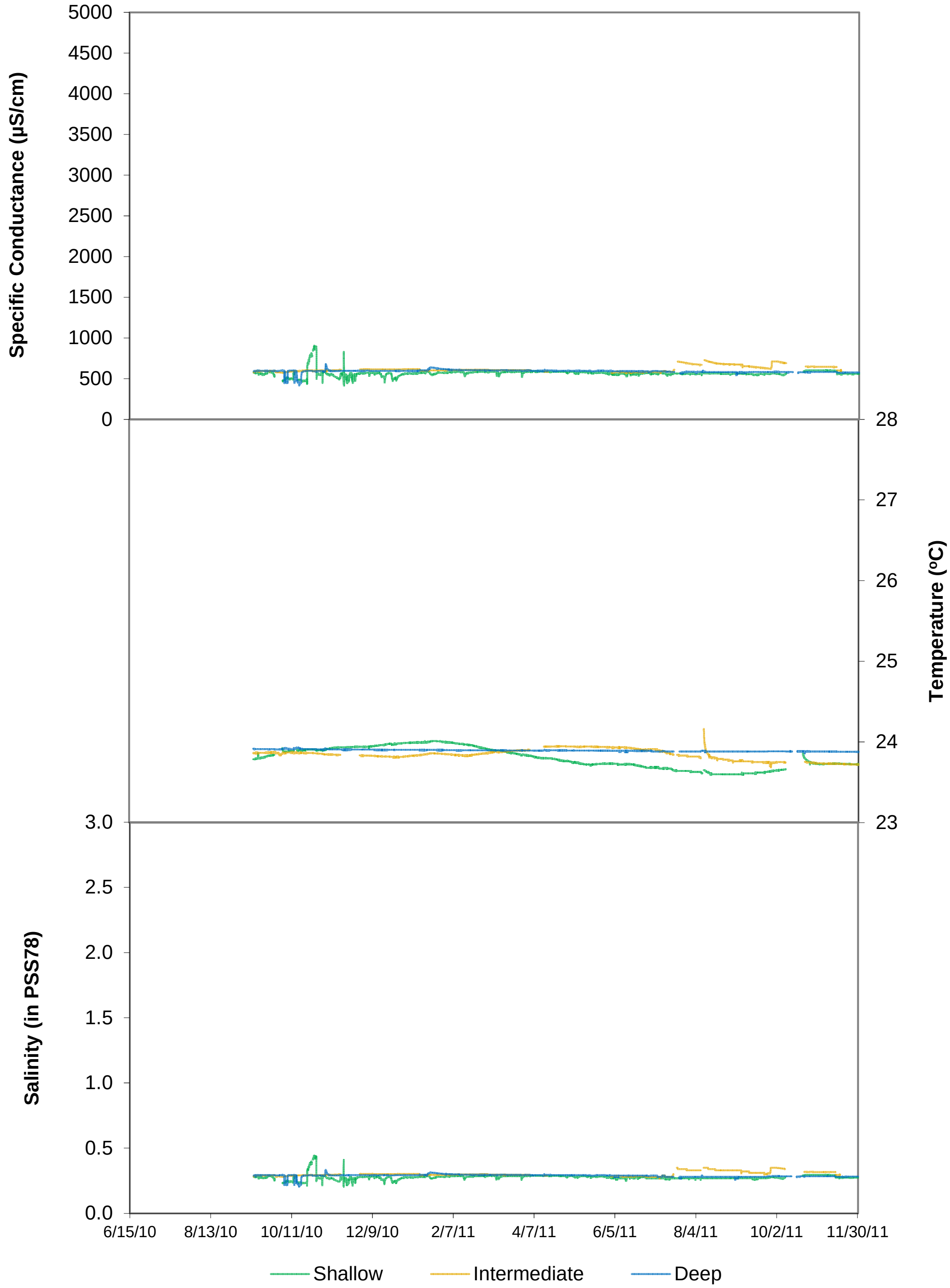


Figure 2.1-7. TPGW-7 Specific Conductance, Temperature and Salinity.

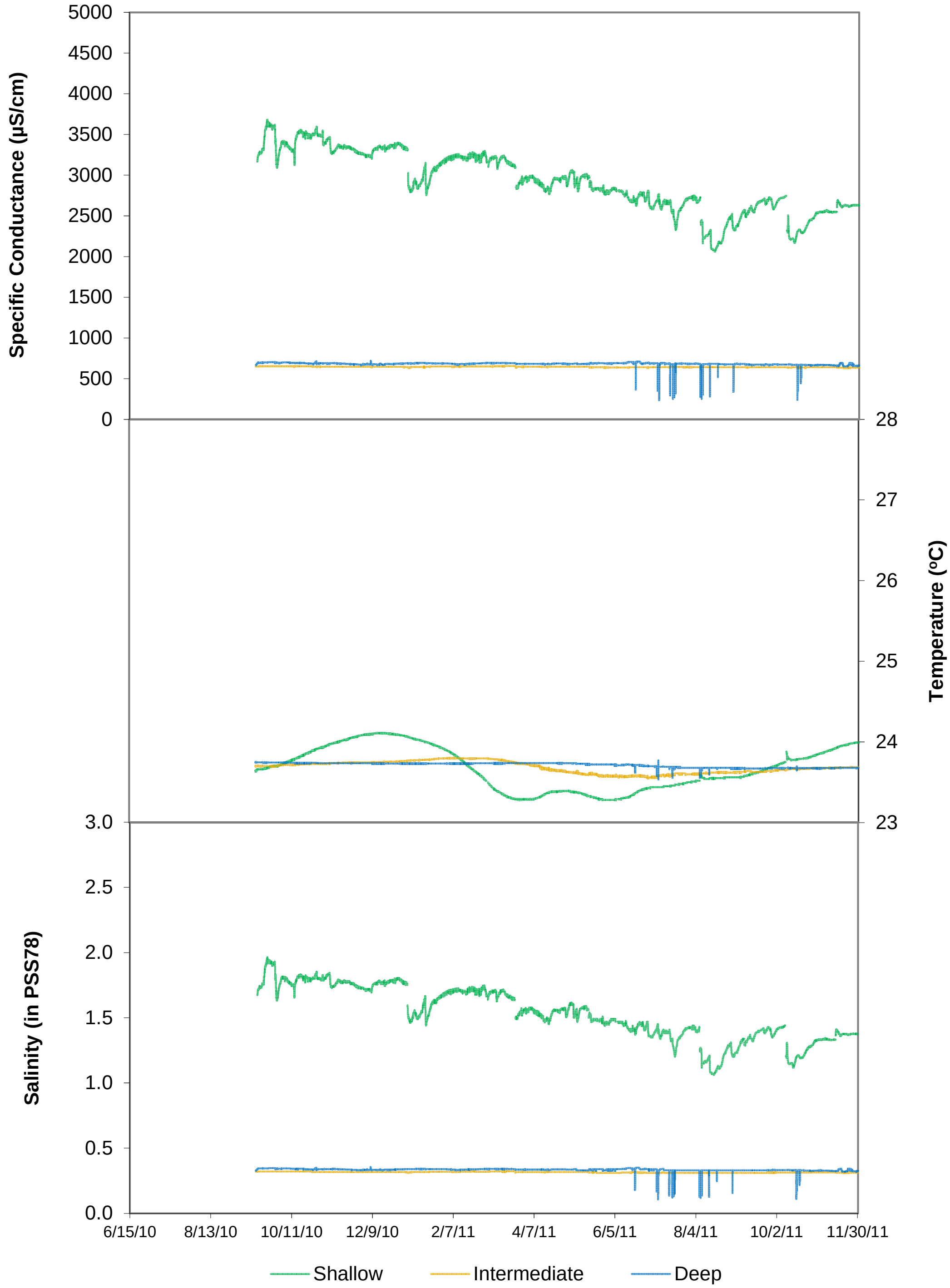


Figure 2.1-8. TPGW-8 Specific Conductance, Temperature and Salinity.

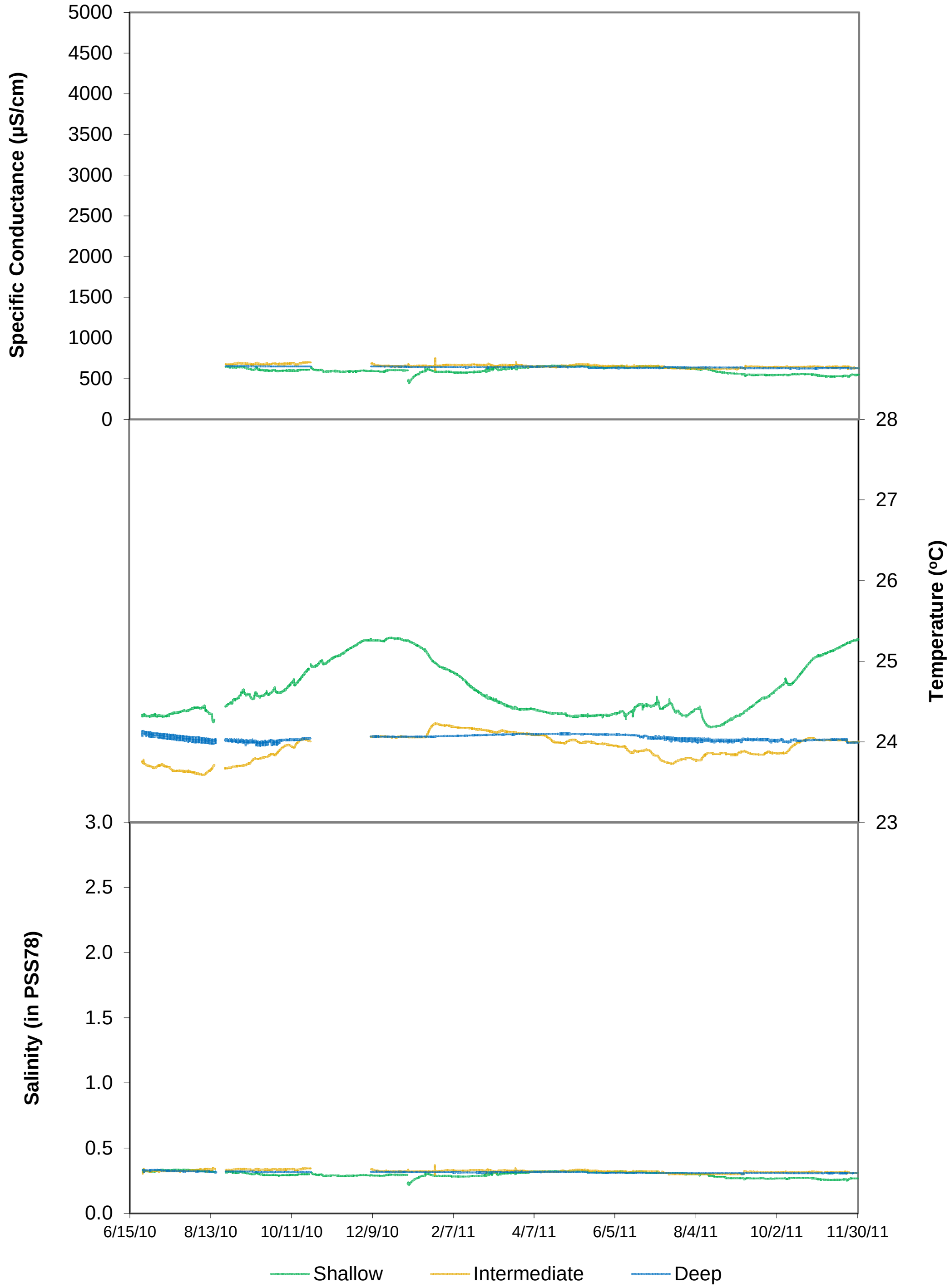


Figure 2.1-9. TPGW-9 Specific Conductance, Temperature and Salinity.

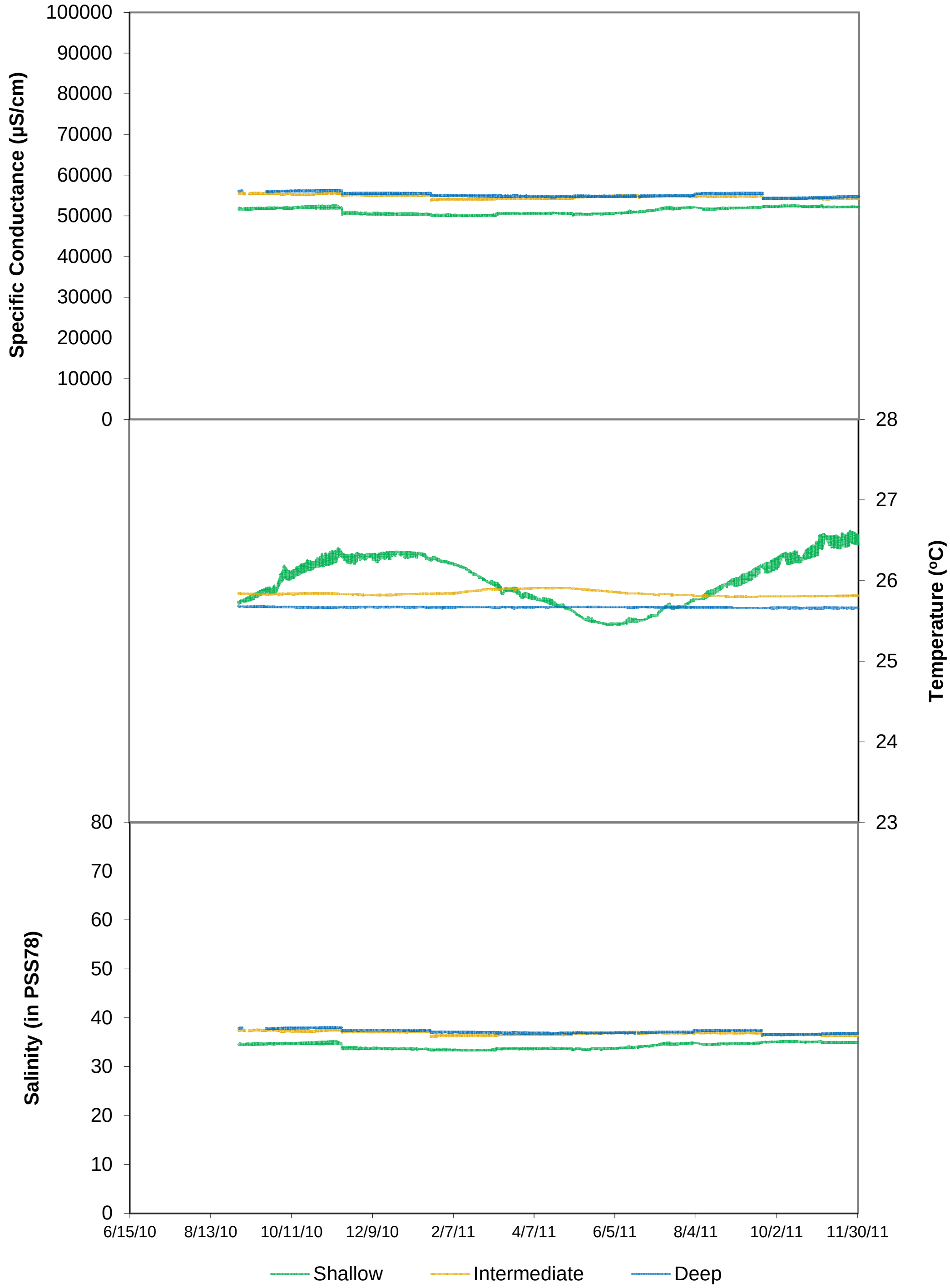


Figure 2.1-10. TPGW-10 Specific Conductance, Temperature and Salinity.

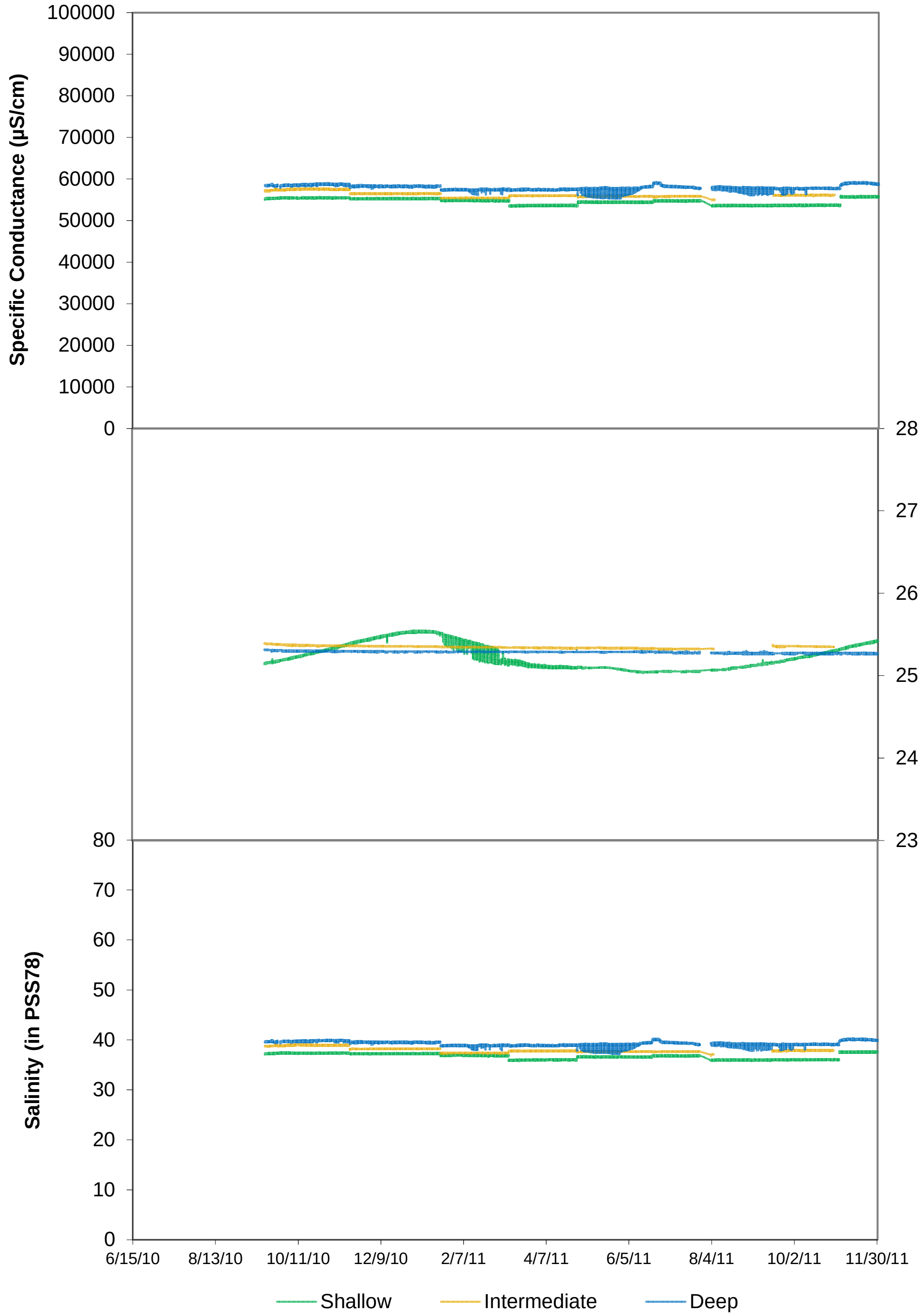


Figure 2.1-11. TPGW-11 Specific Conductance, Temperature and Salinity.

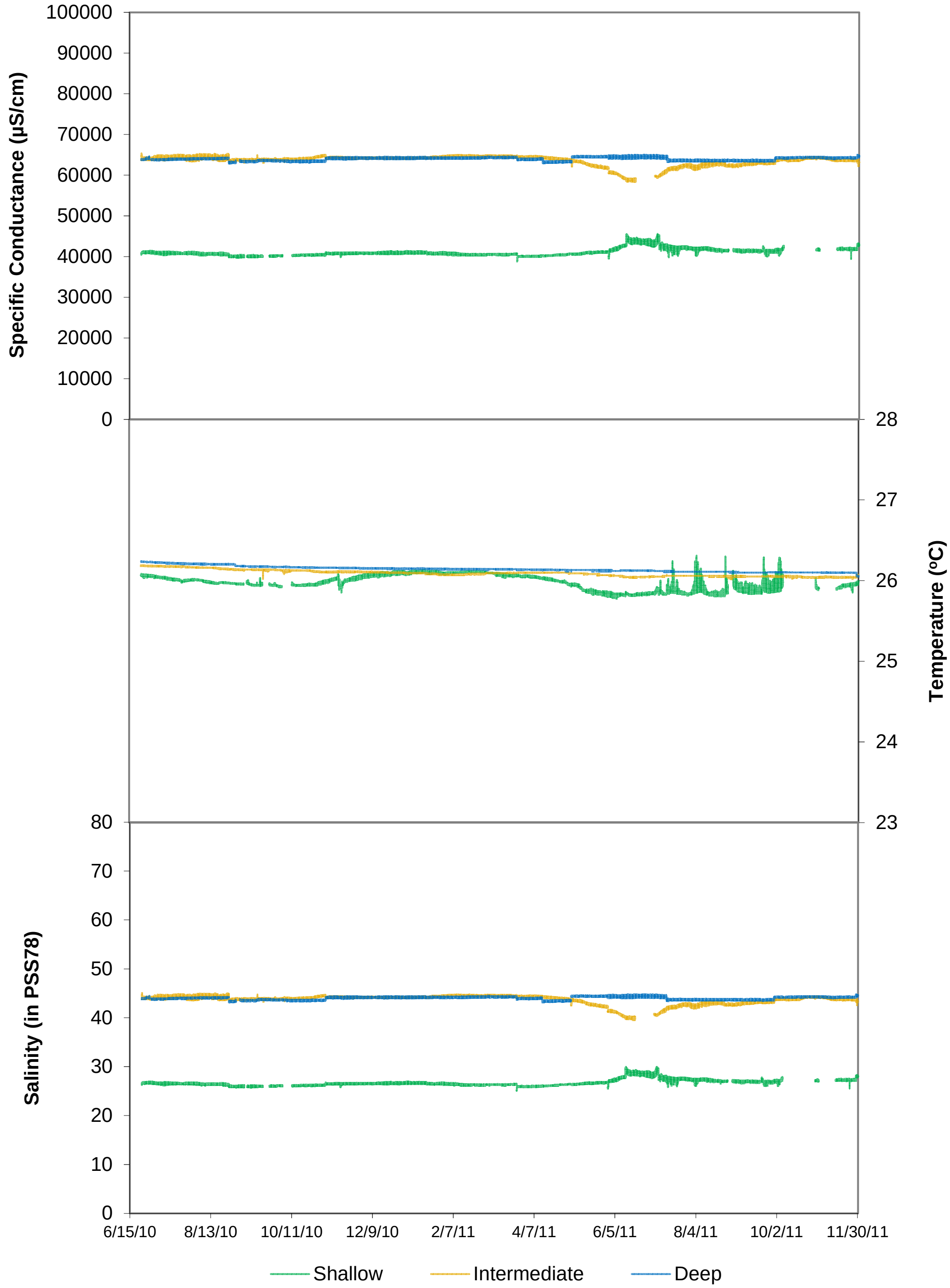


Figure 2.1-12. TPGW-12 Specific Conductance, Temperature and Salinity.

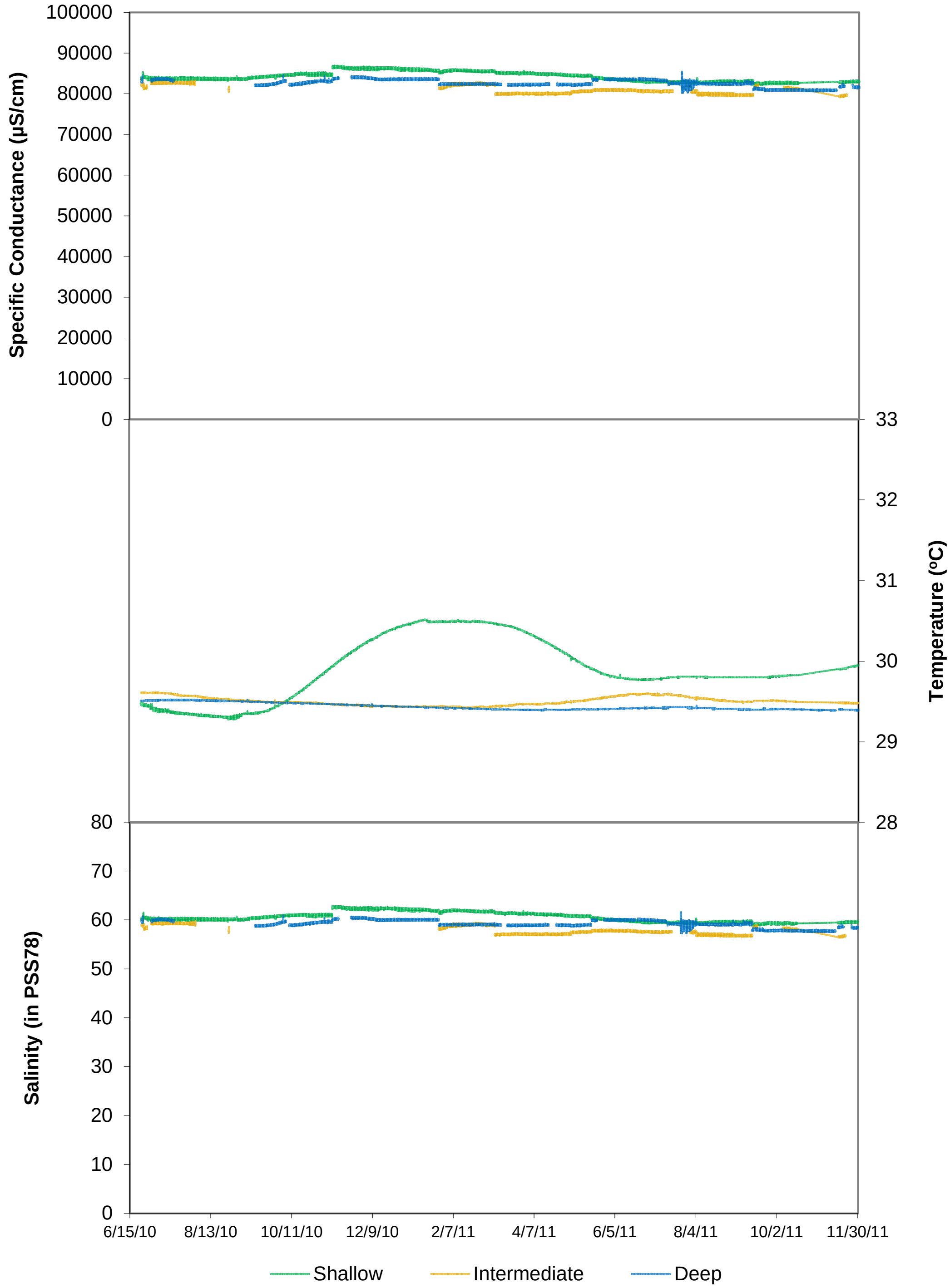


Figure 2.1-13. TPGW-13 Specific Conductance, Temperature and Salinity.

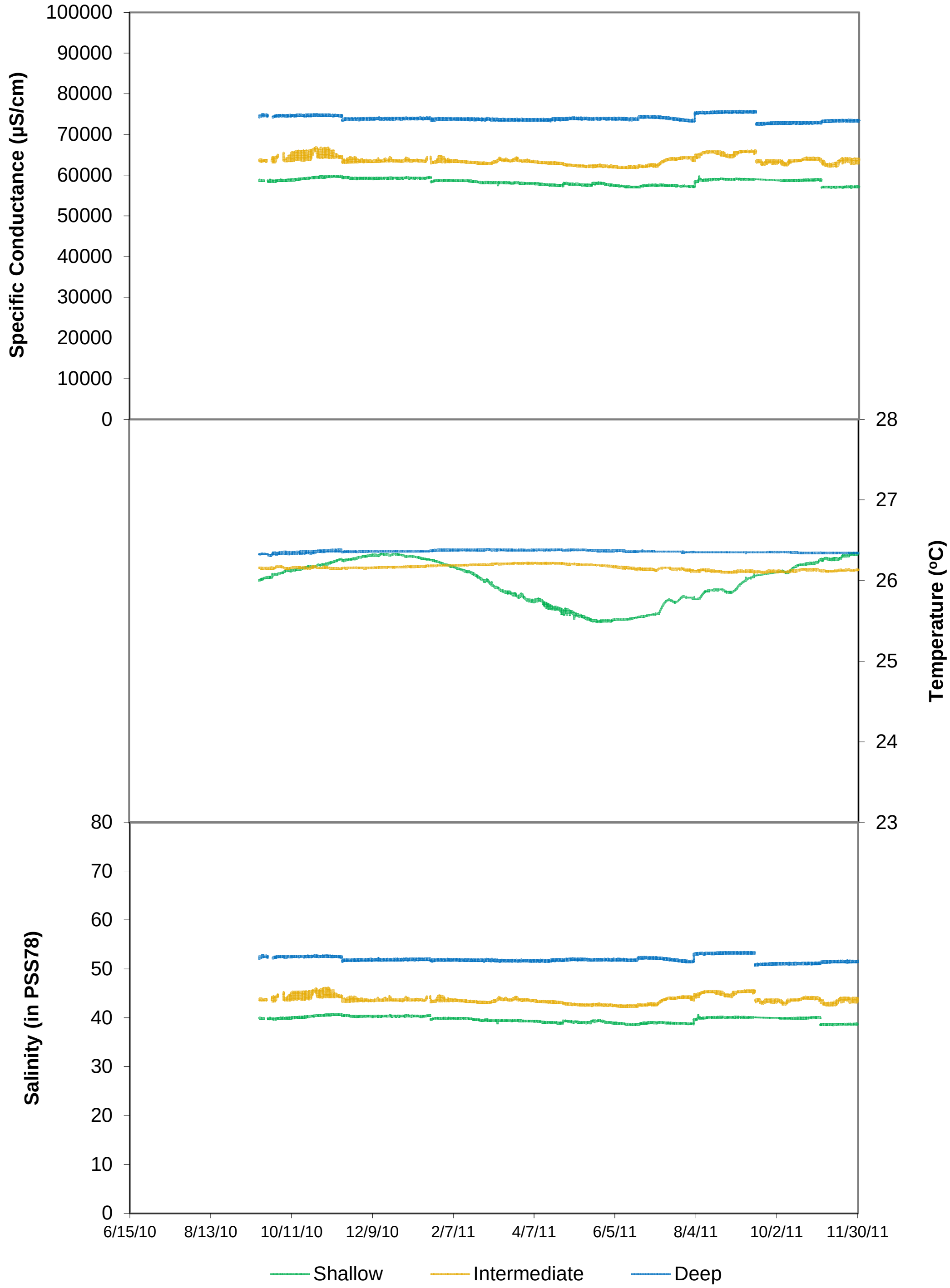
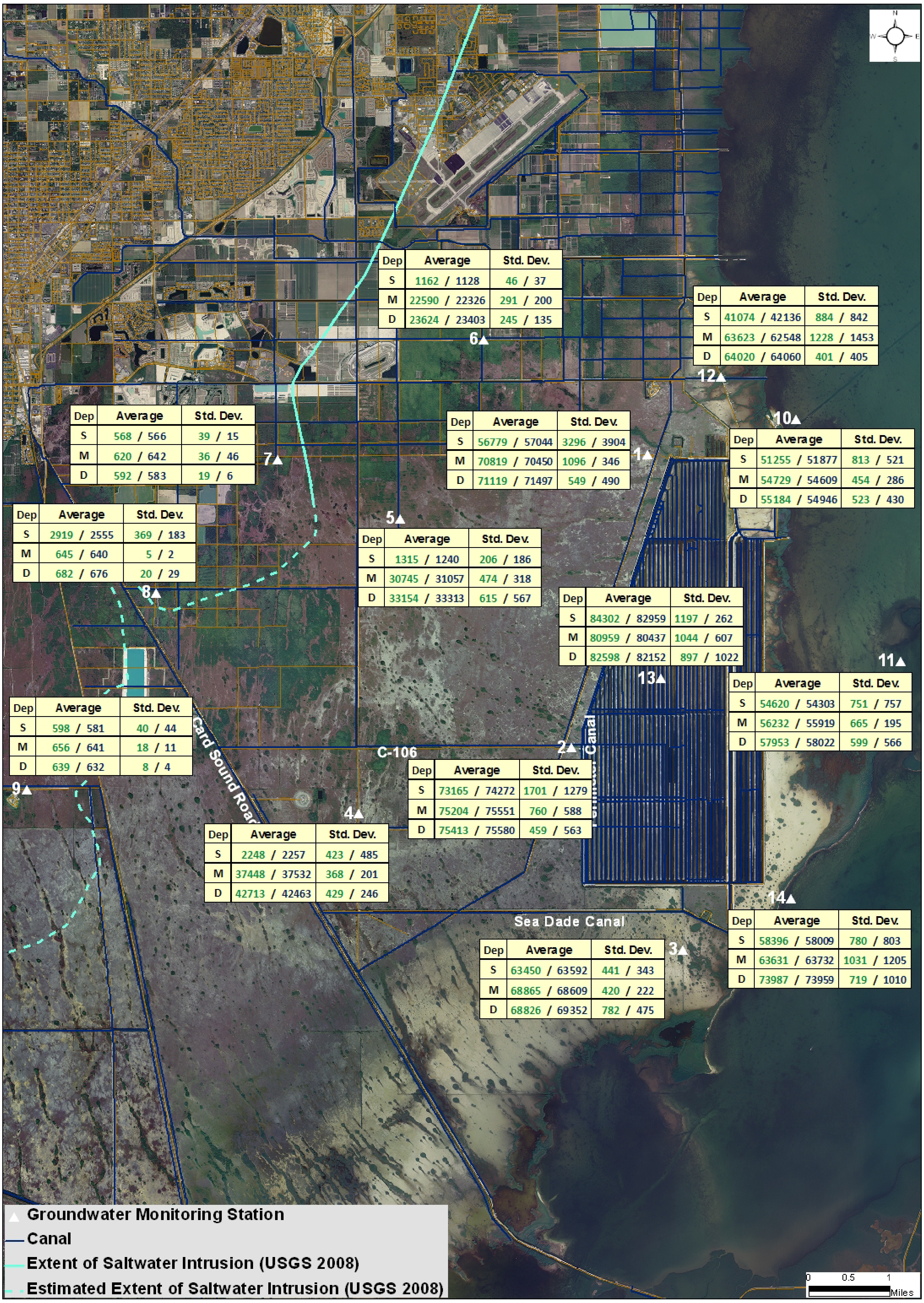


Figure 2.1-14. TPGW-14 Specific Conductance, Temperature and Salinity.

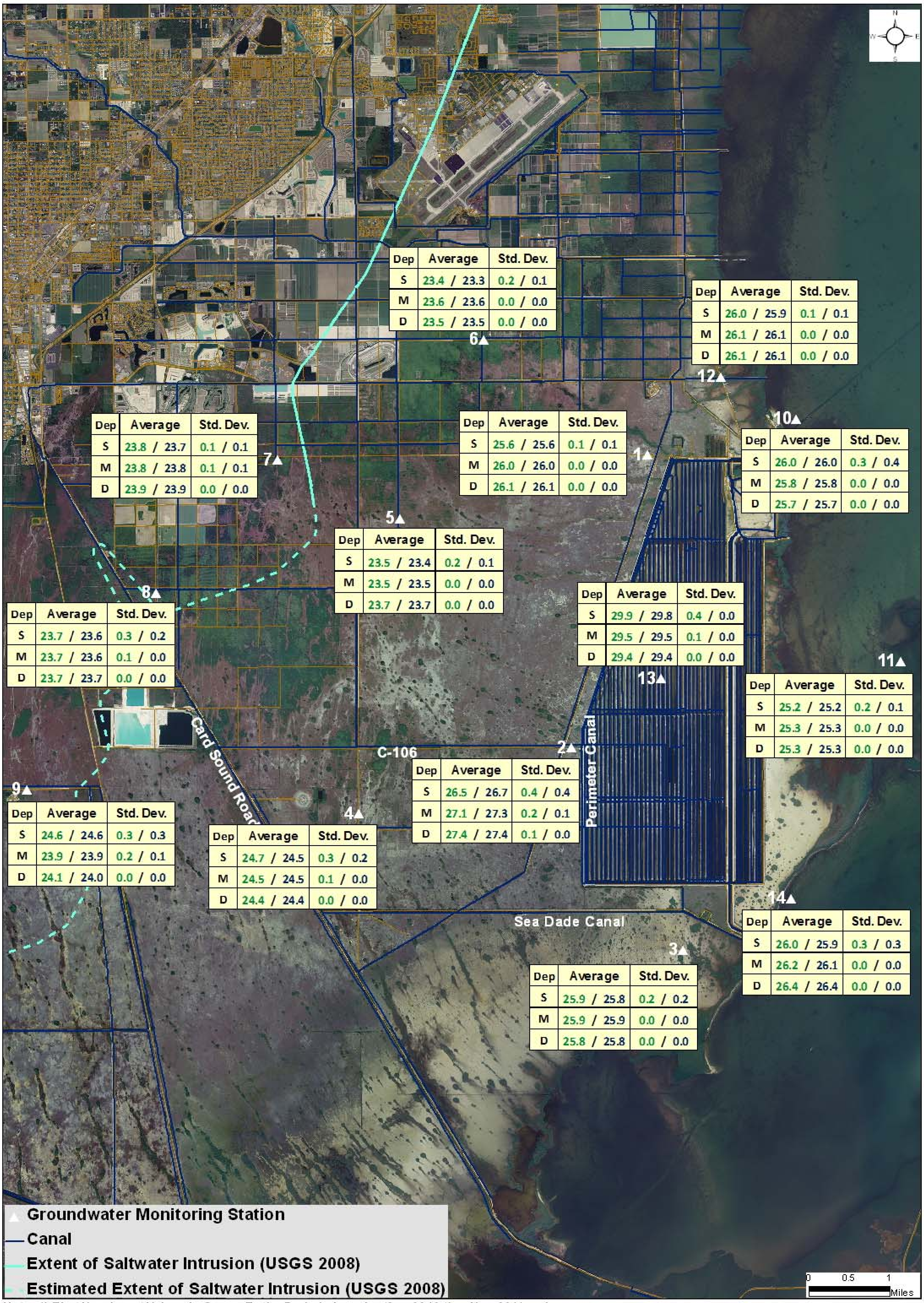


Note: 1) First Numbers / Values in Green: Entire Period since Jun/Sep 2010 thru Nov 2011 and
2) Second Numbers / Values in Blue: Semi Annual Reporting Period Jun 2011- Nov 2011

3-2012

Average and Standard Deviation of Specific Conductance Values (µS/cm) for Groundwater Stations

Figure 2.1-15. Average and Standard Deviation of Specific Conductance Values for Groundwater Stations.



Note: 1) First Numbers / Values in Green: Entire Period since Jun/Sep 2010 thru Nov 2011 and
2) Second Numbers / Values in Blue: Semi Annual Reporting Period Jun 2011- Nov 2011

3-2012

Figure 2.1-16. Average and Standard Deviation of Temperature (Celcius) for Groundwater Stations.

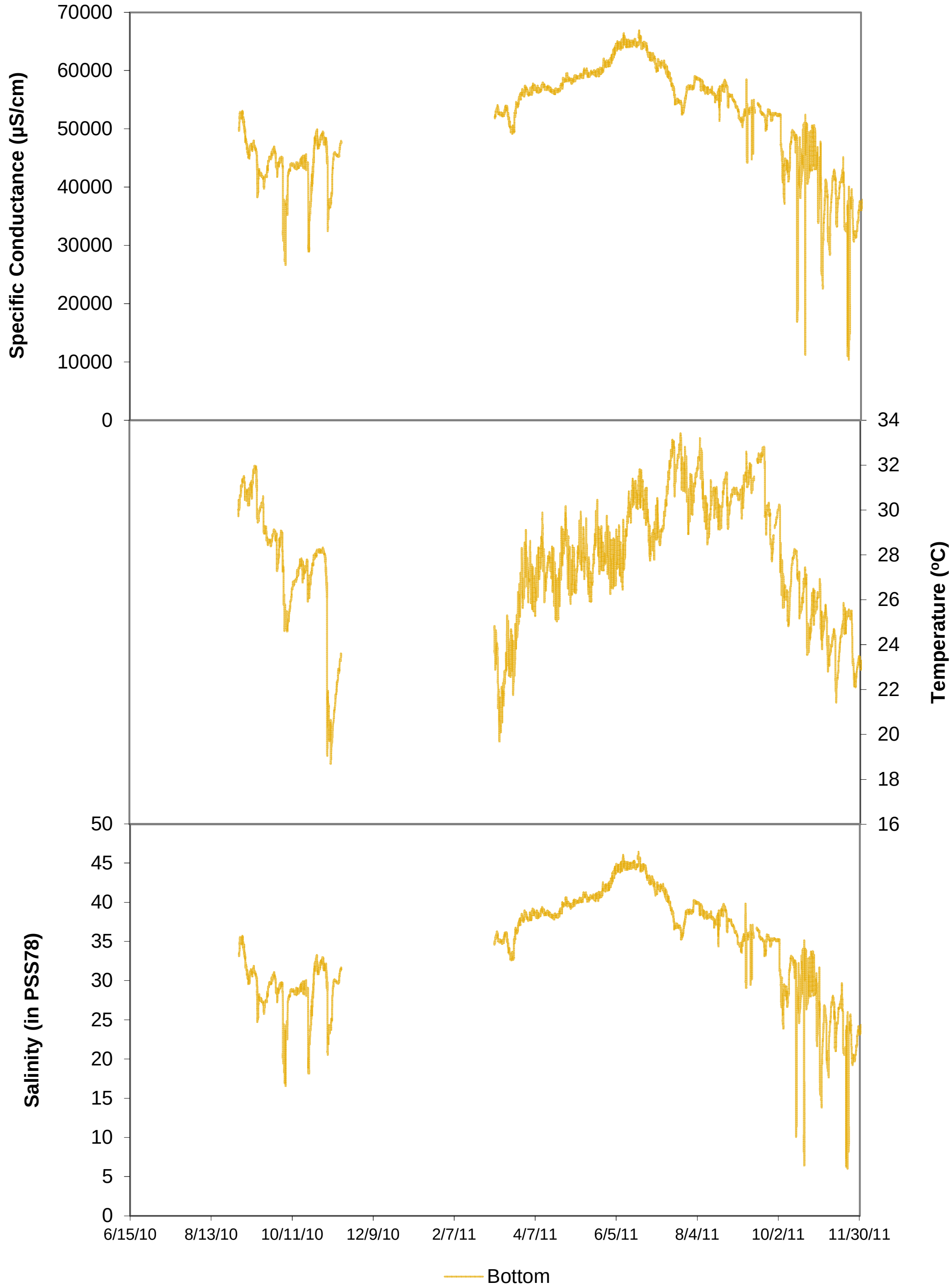


Figure 2.2-1. TPBBSW-1 Specific Conductance, Temperature and Salinity.

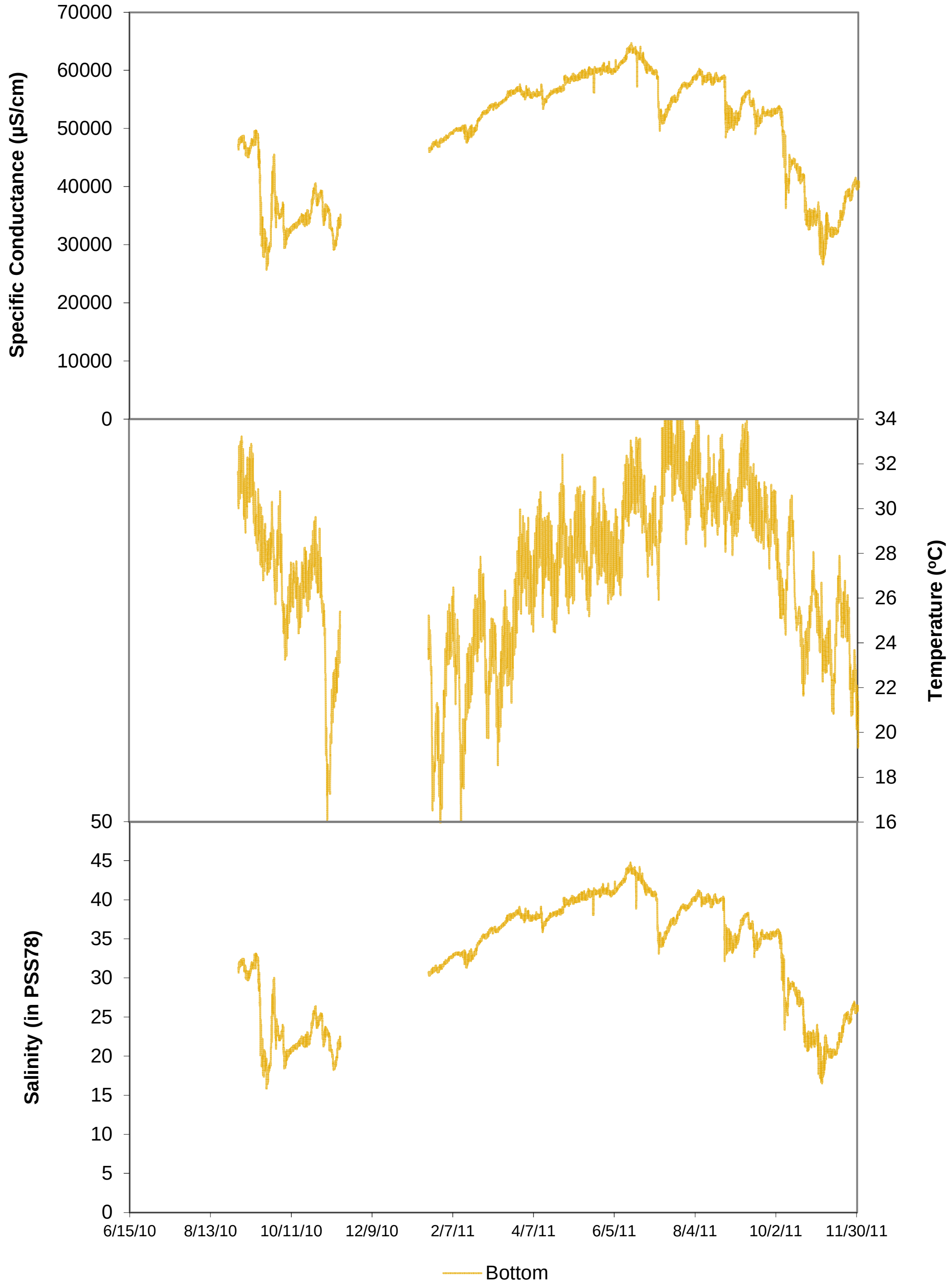


Figure 2.2-2. TPBBSW-2 Specific Conductance, Temperature and Salinity.

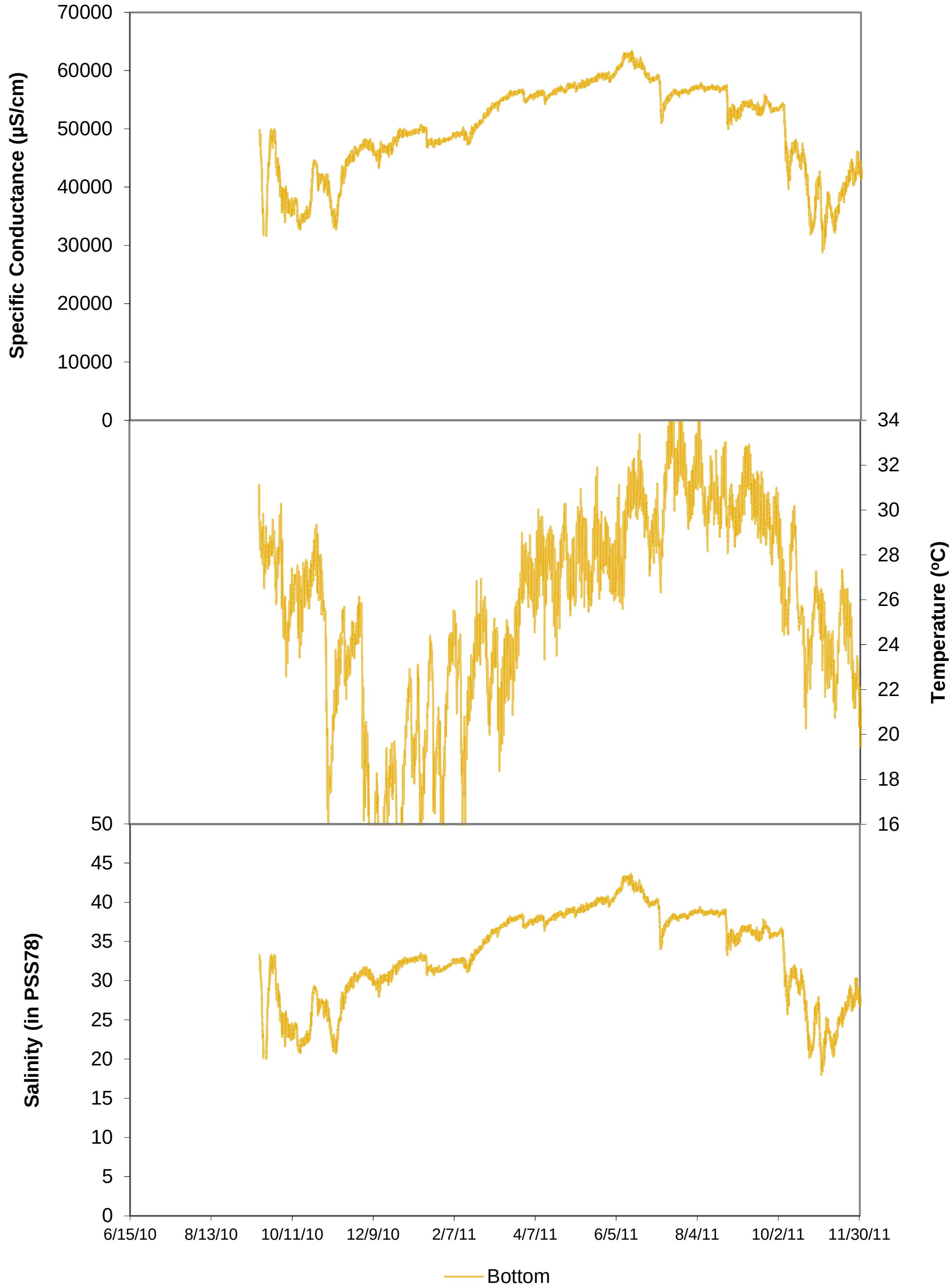


Figure 2.2-3. TPBBSW-3 Specific Conductance, Temperature and Salinity.

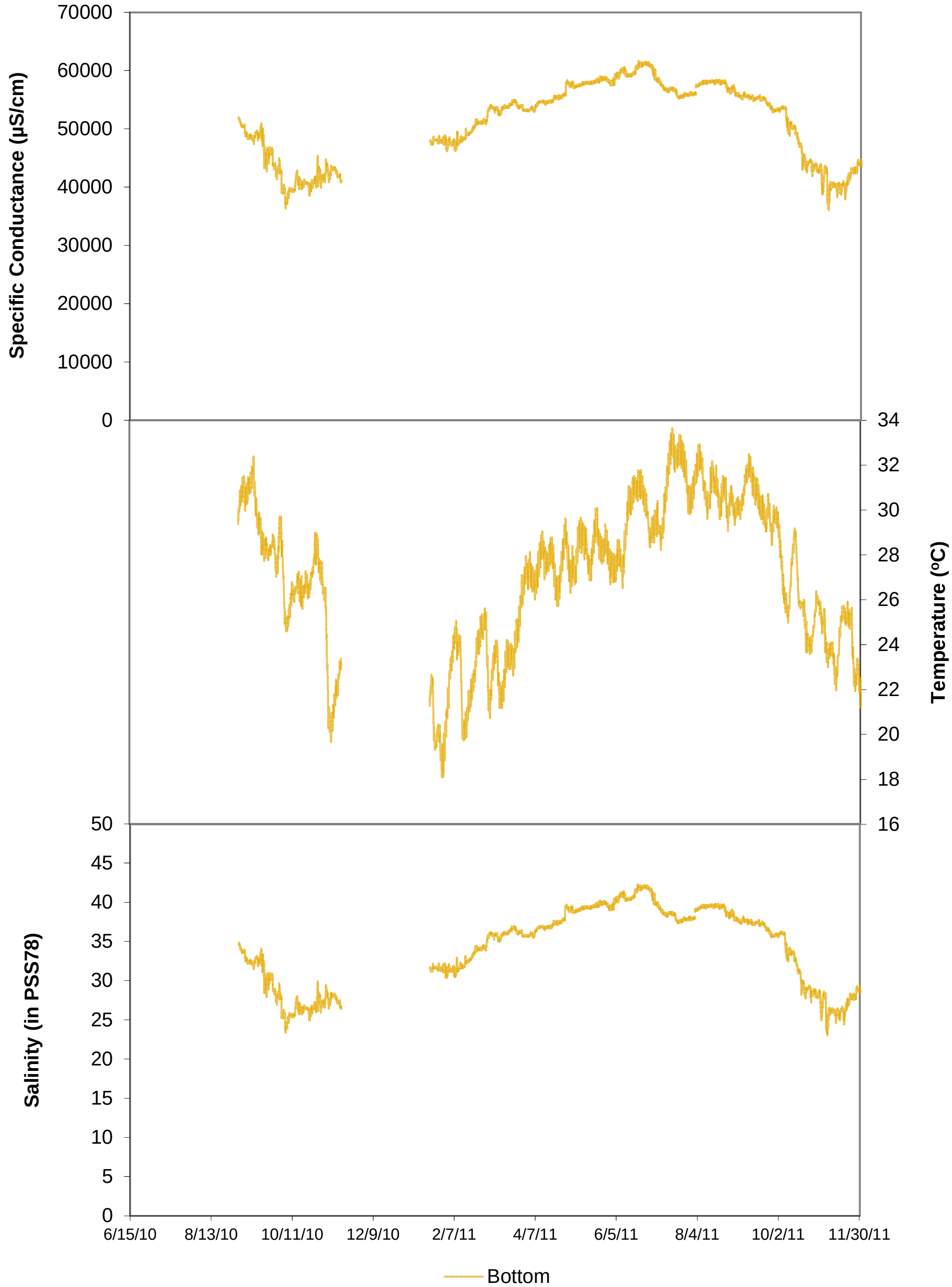


Figure 2.2-4. TPBBSW-4 Specific Conductance, Temperature and Salinity.

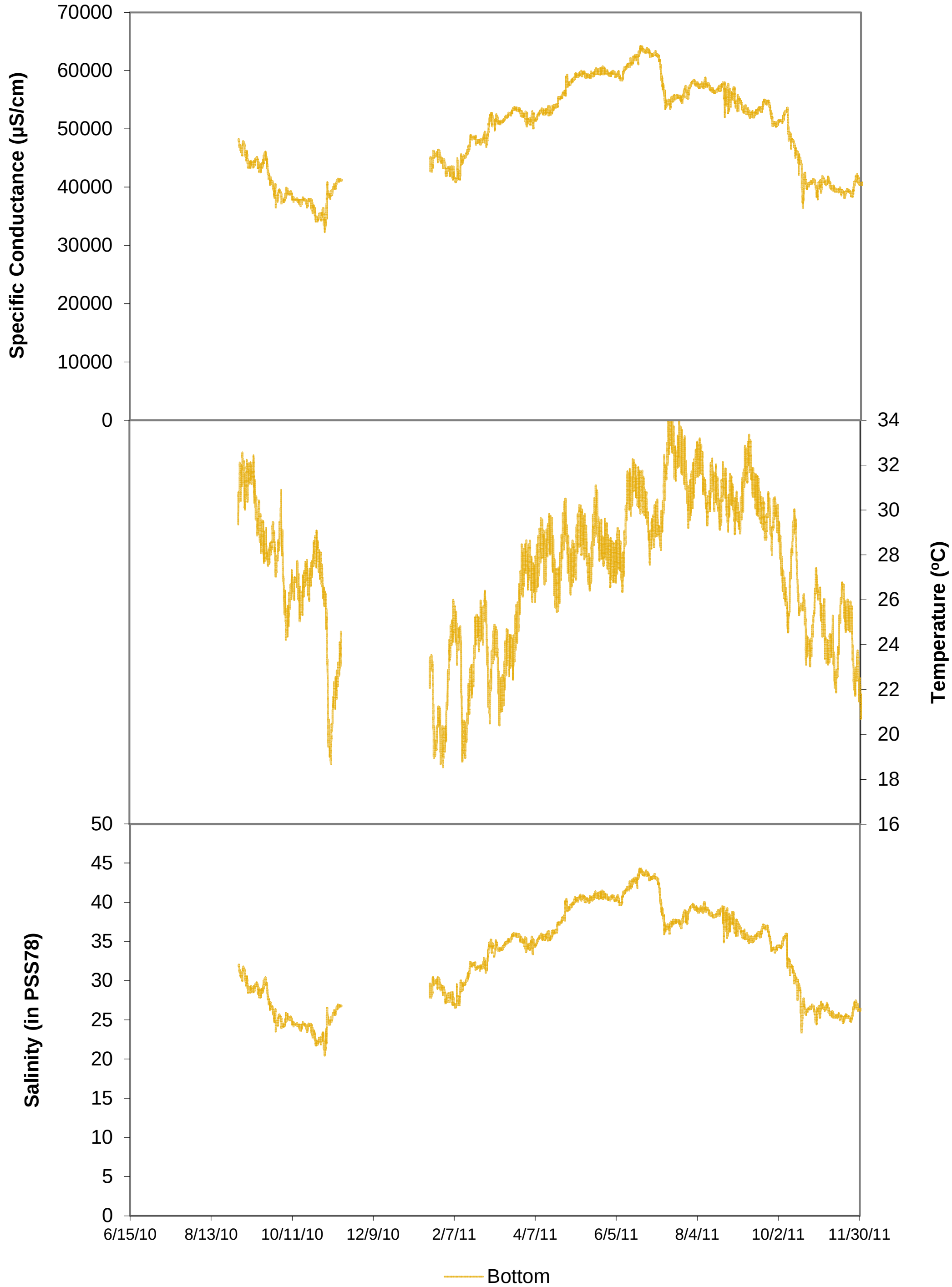


Figure 2.2-5. TPBBSW-5 Specific Conductance, Temperature and Salinity.

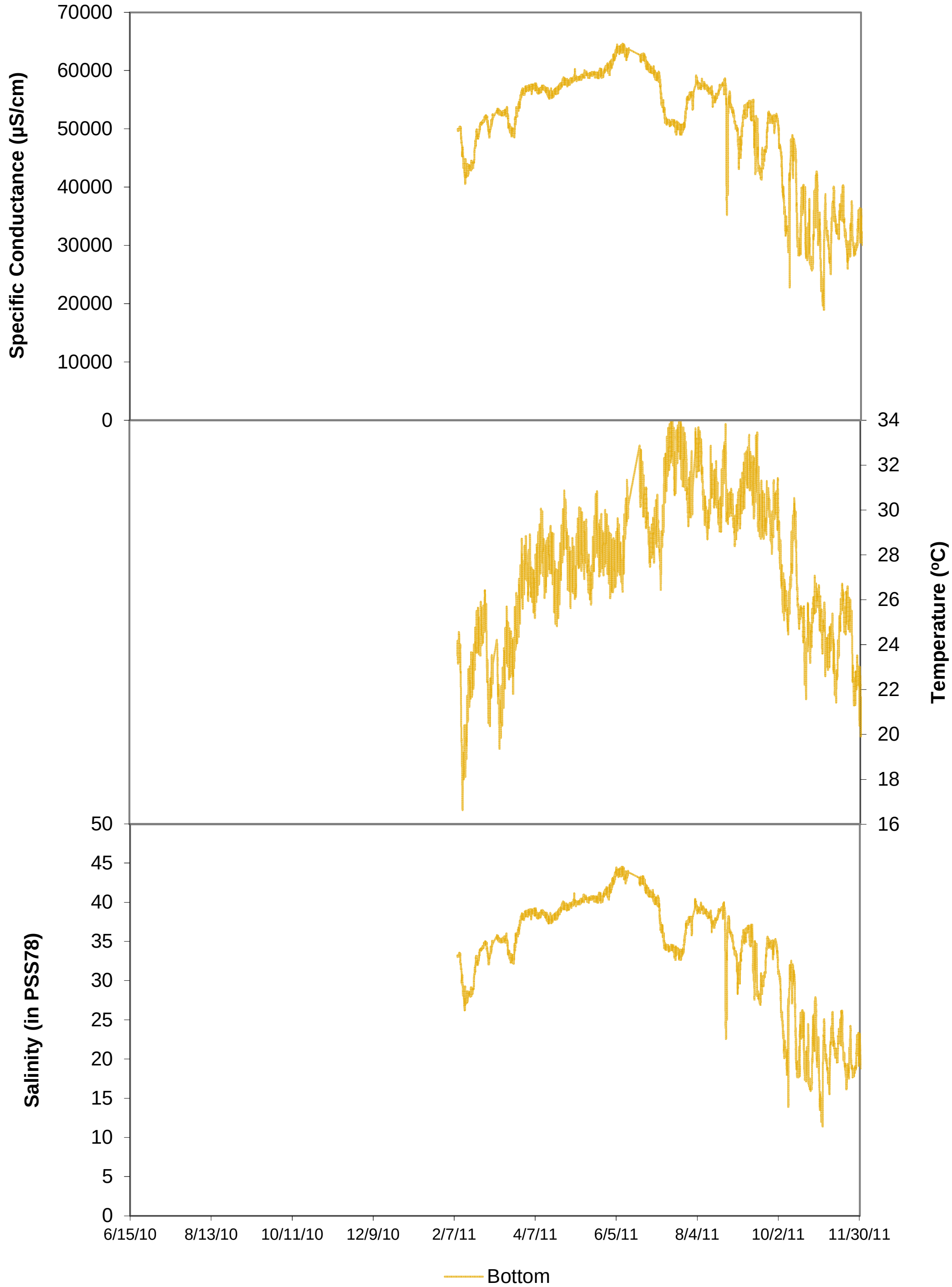


Figure 2.2-6. TPBBSW-10 Specific Conductance, Temperature and Salinity.

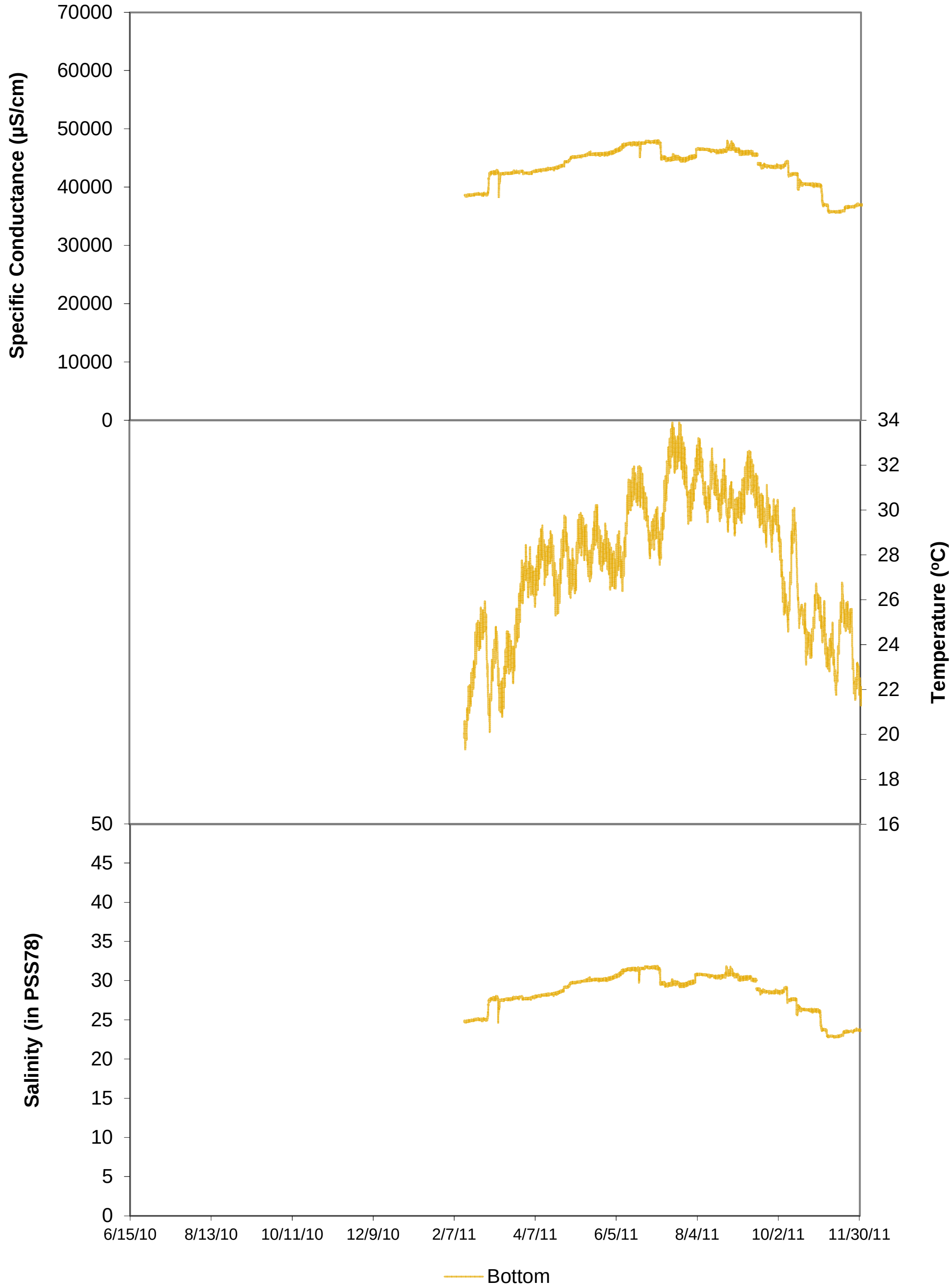


Figure 2.2-7. TPBBSW-14 Specific Conductance, Temperature and Salinity.

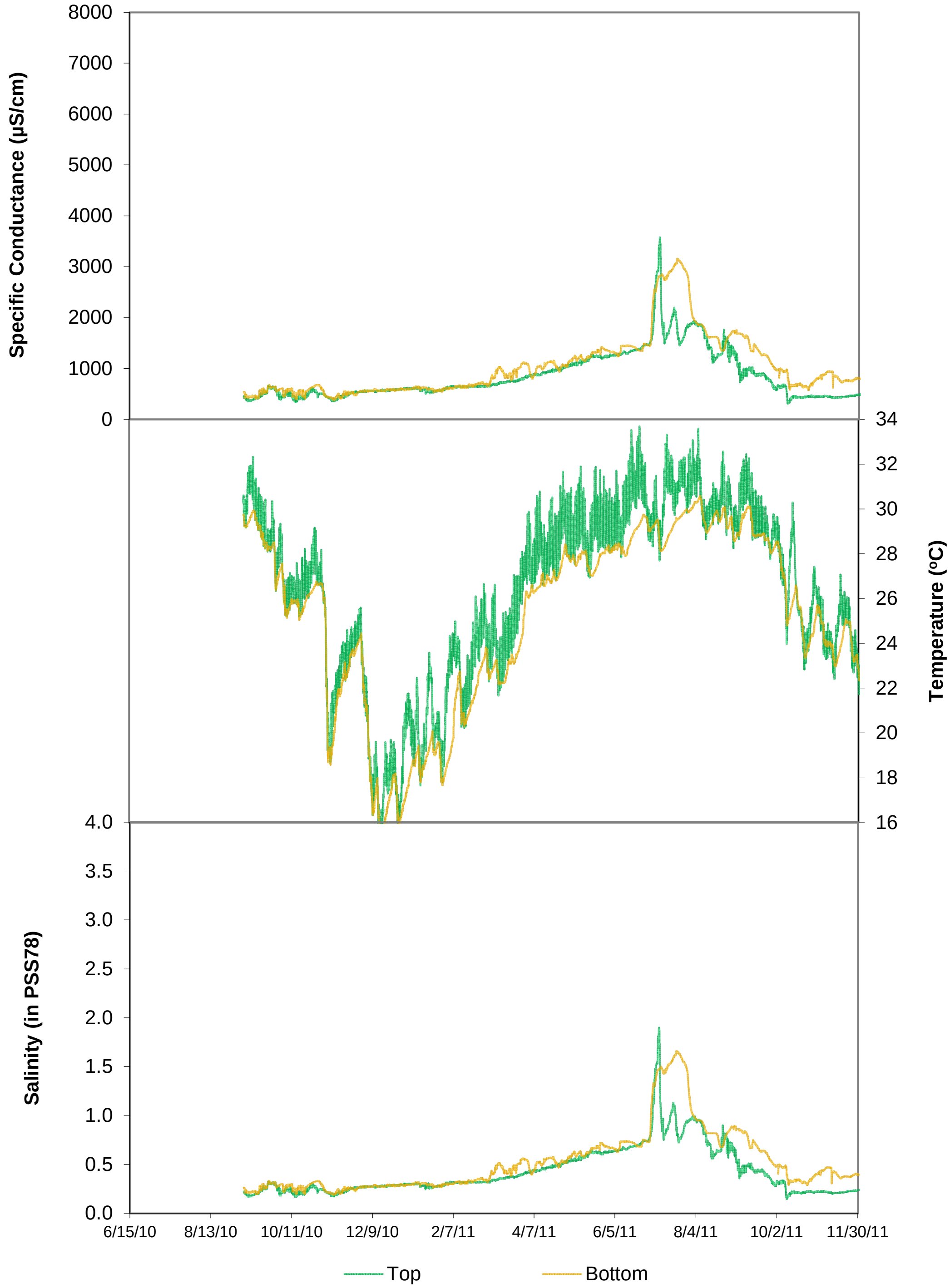


Figure 2.2-8. TPSWC-1 Specific Conductance, Temperature and Salinity.

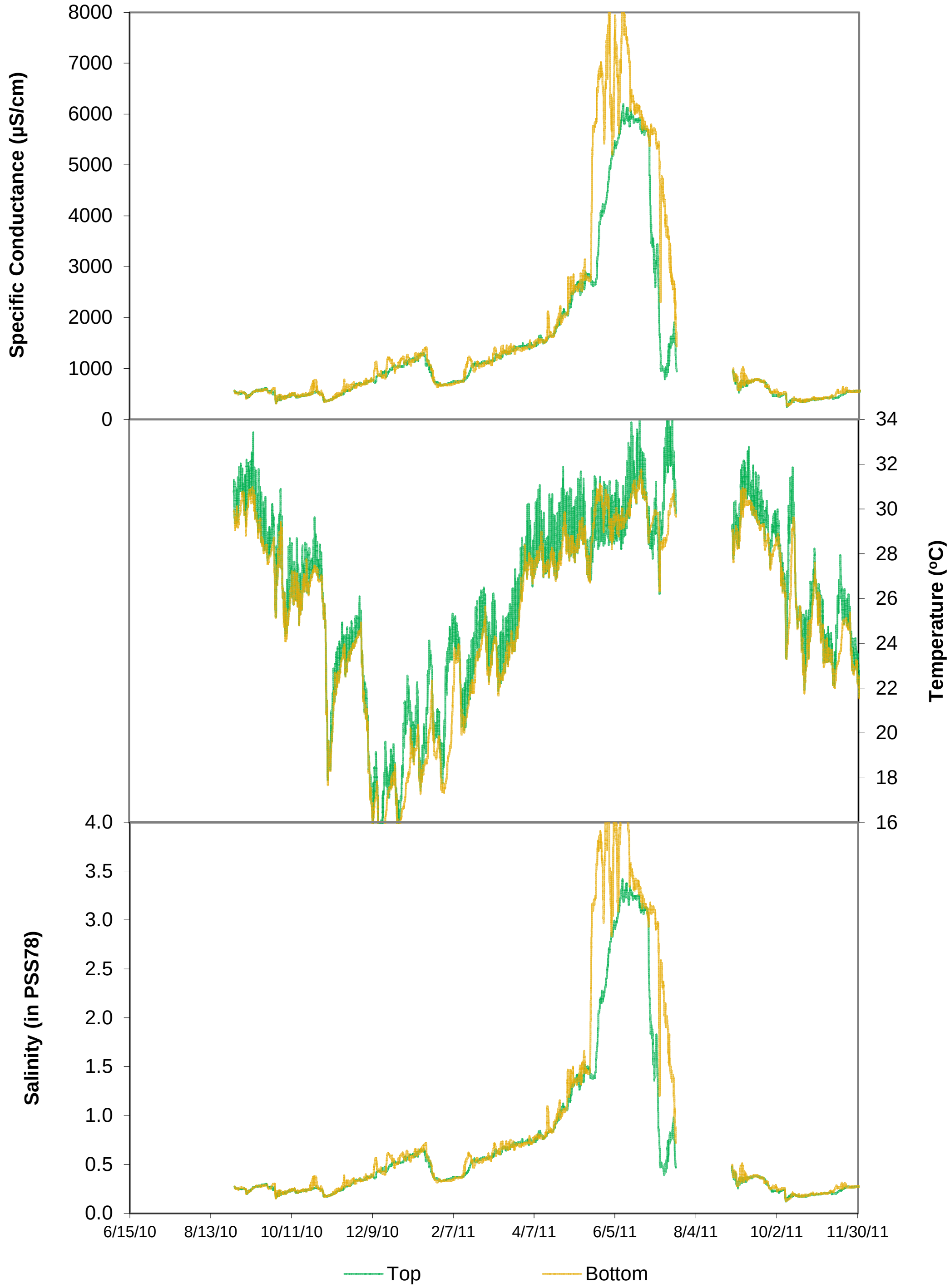


Figure 2.2-9. TPSWC-2 Specific Conductance, Temperature and Salinity.

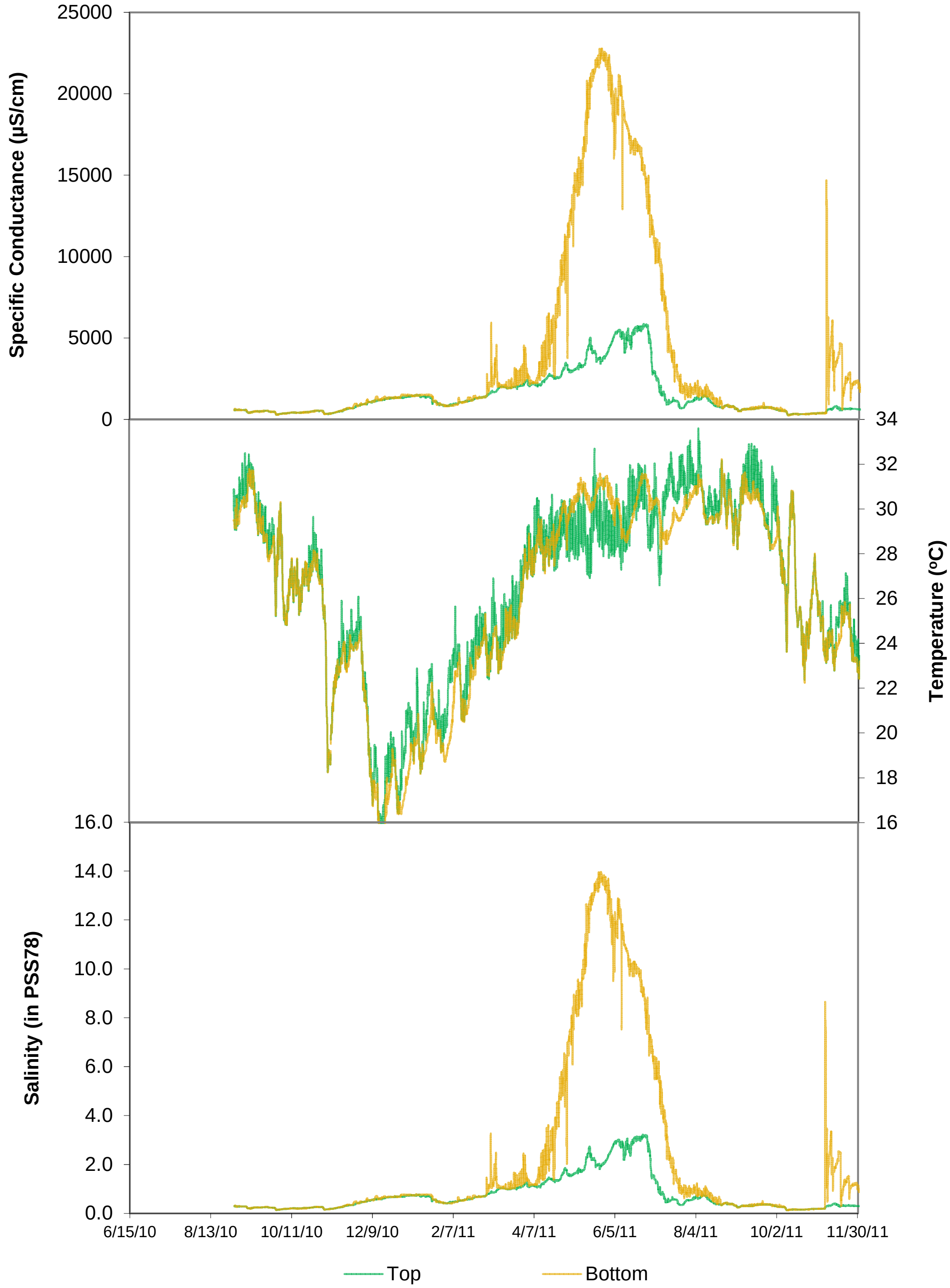


Figure 2.2-10. TPSWC-3 Specific Conductance, Temperature and Salinity.

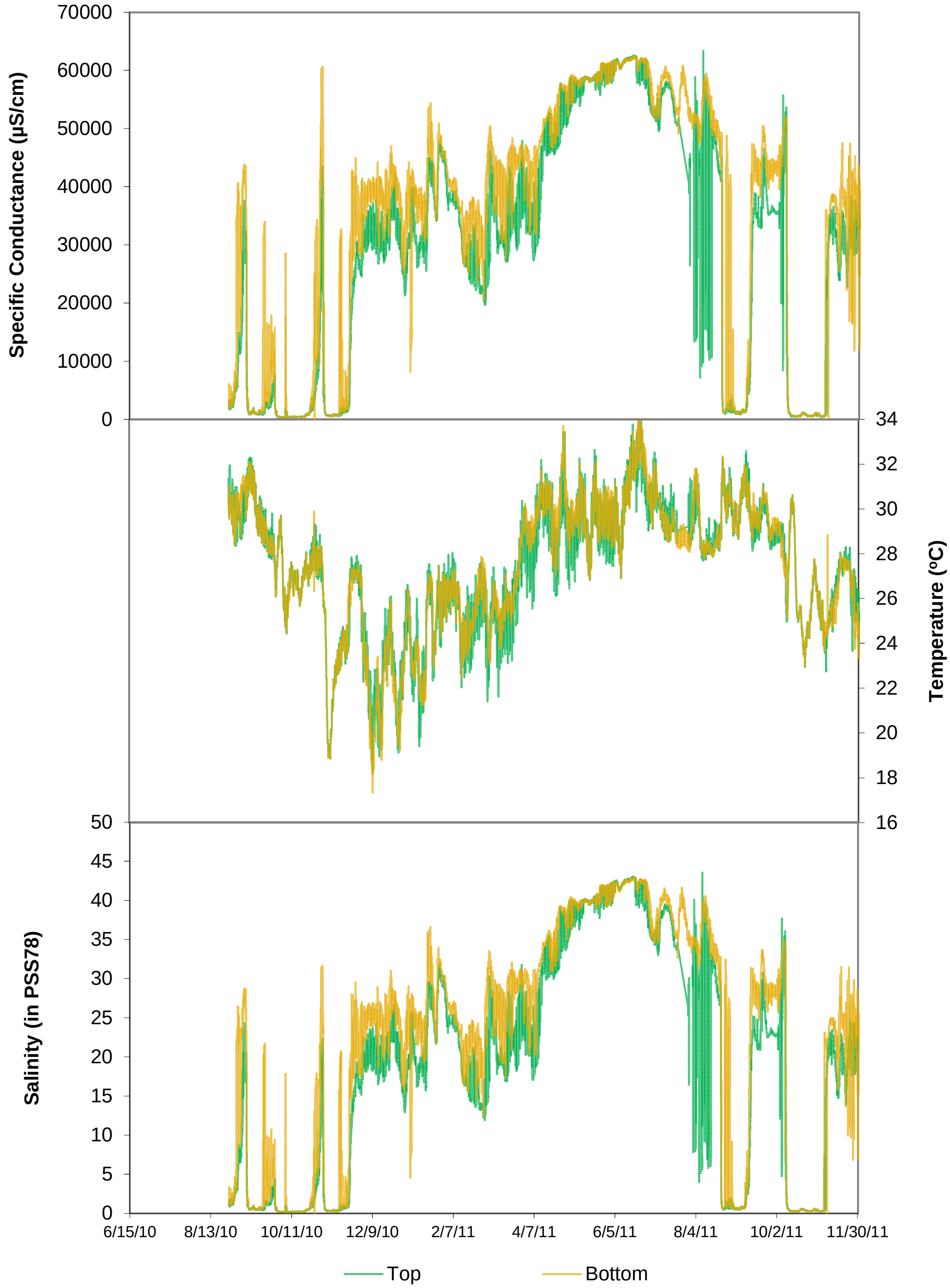


Figure 2.2-11. TPSWC-4 Specific Conductance, Temperature and Salinity.

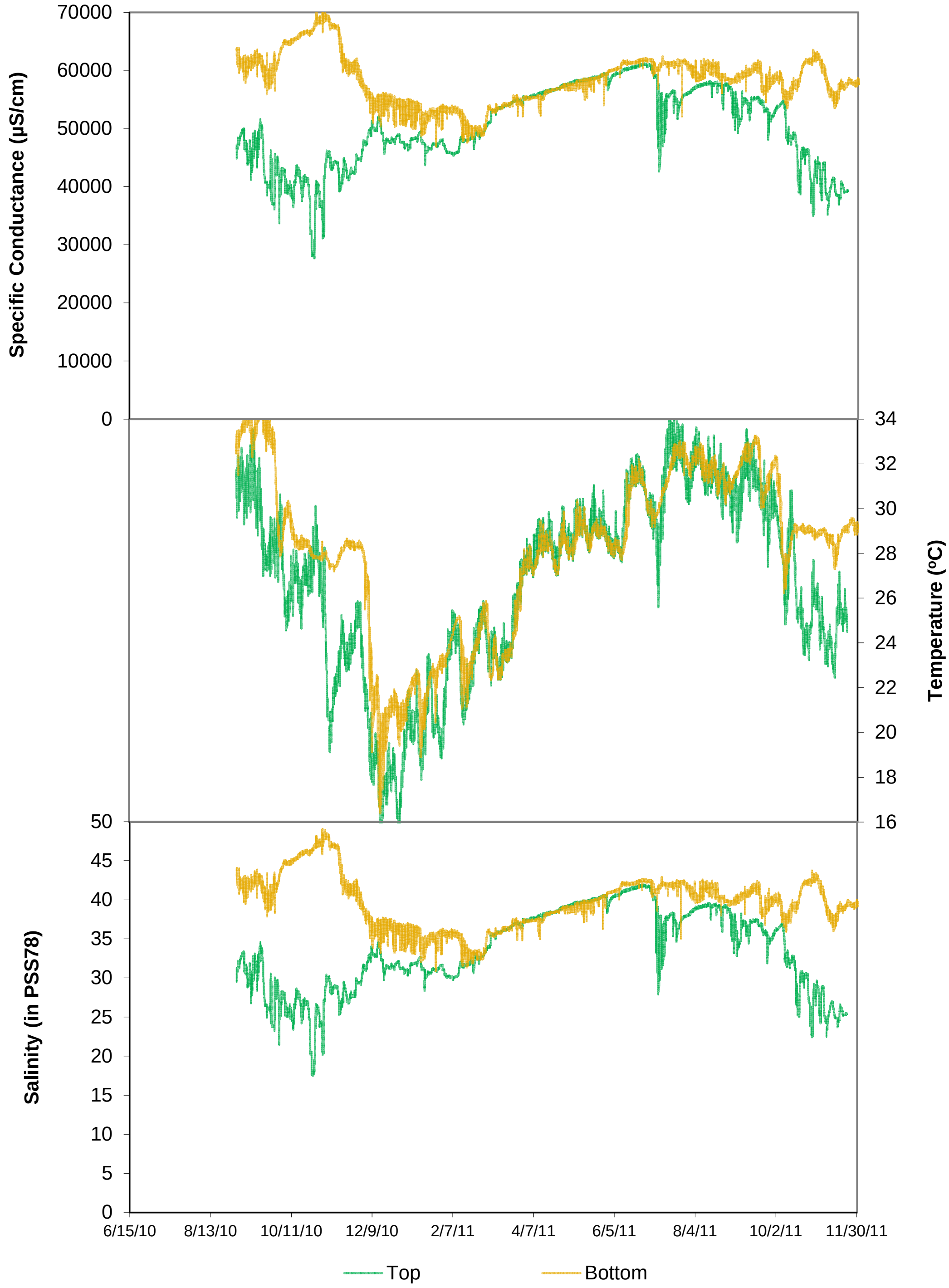


Figure 2.2-12. TPSWC-5 Specific Conductance, Temperature and Salinity.

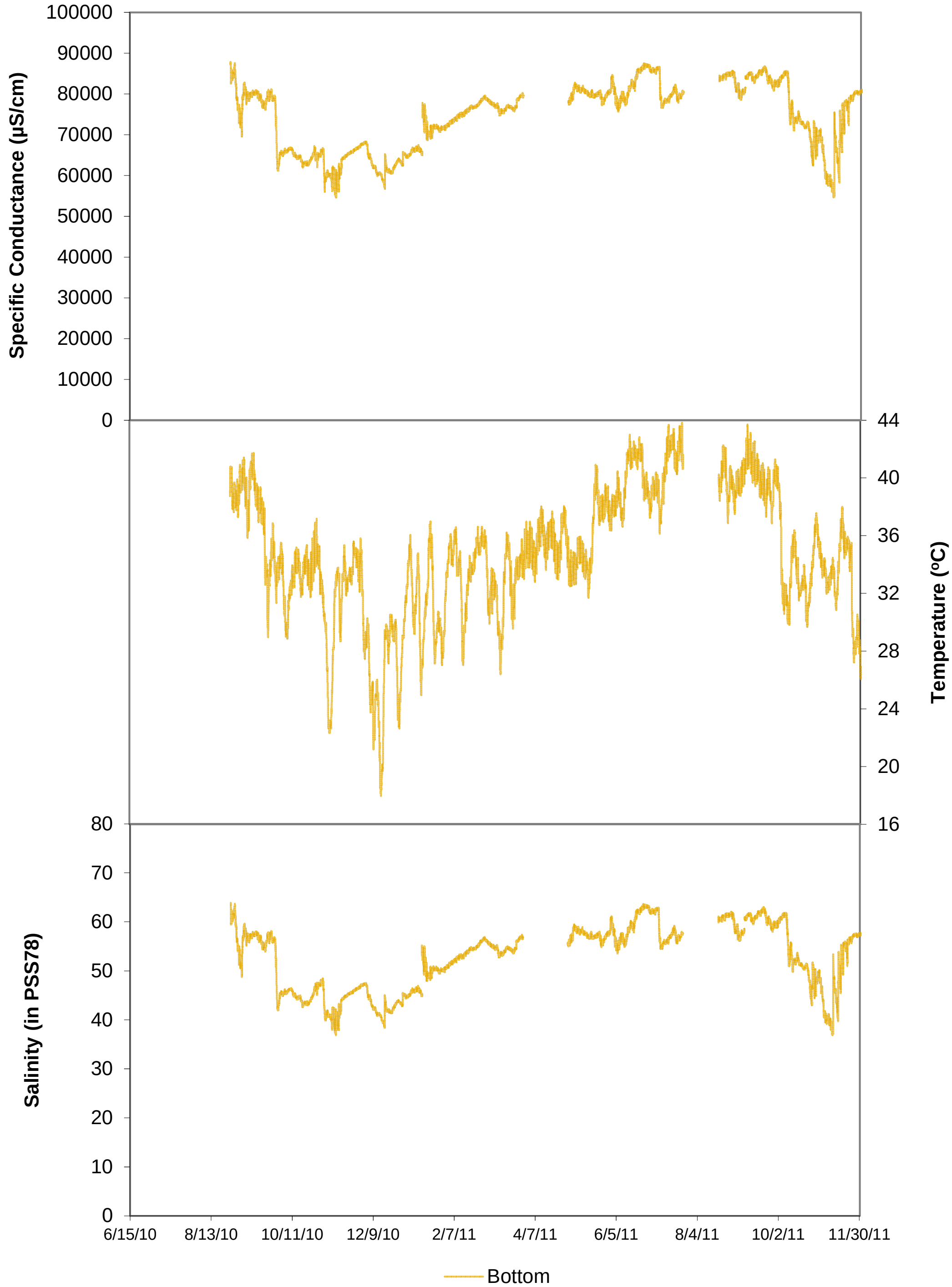


Figure 2.2-13. TPSWCCS-1 Specific Conductance, Temperature and Salinity.

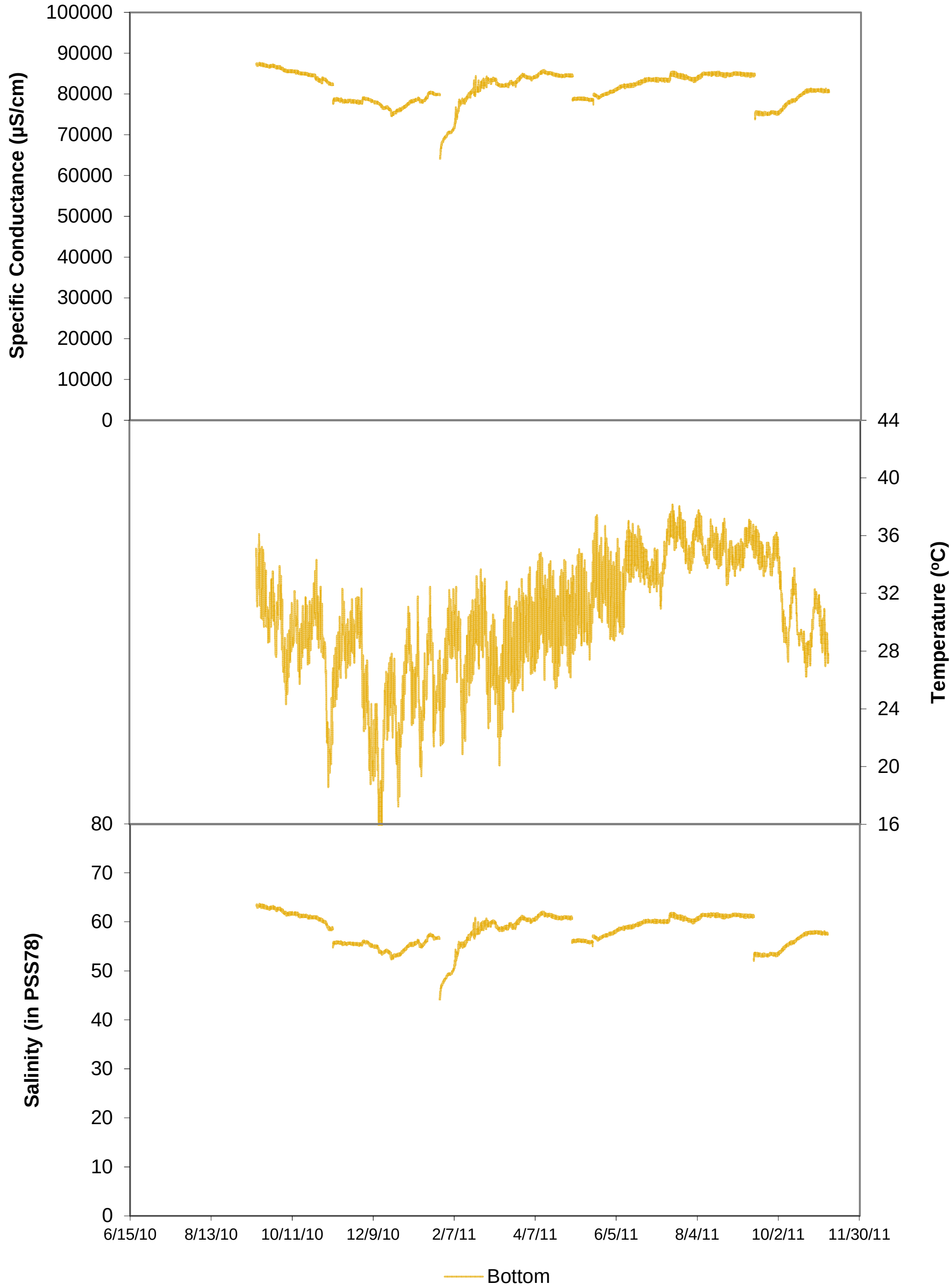


Figure 2.2-14. TPSWCCS-2 Specific Conductance, Temperature and Salinity.

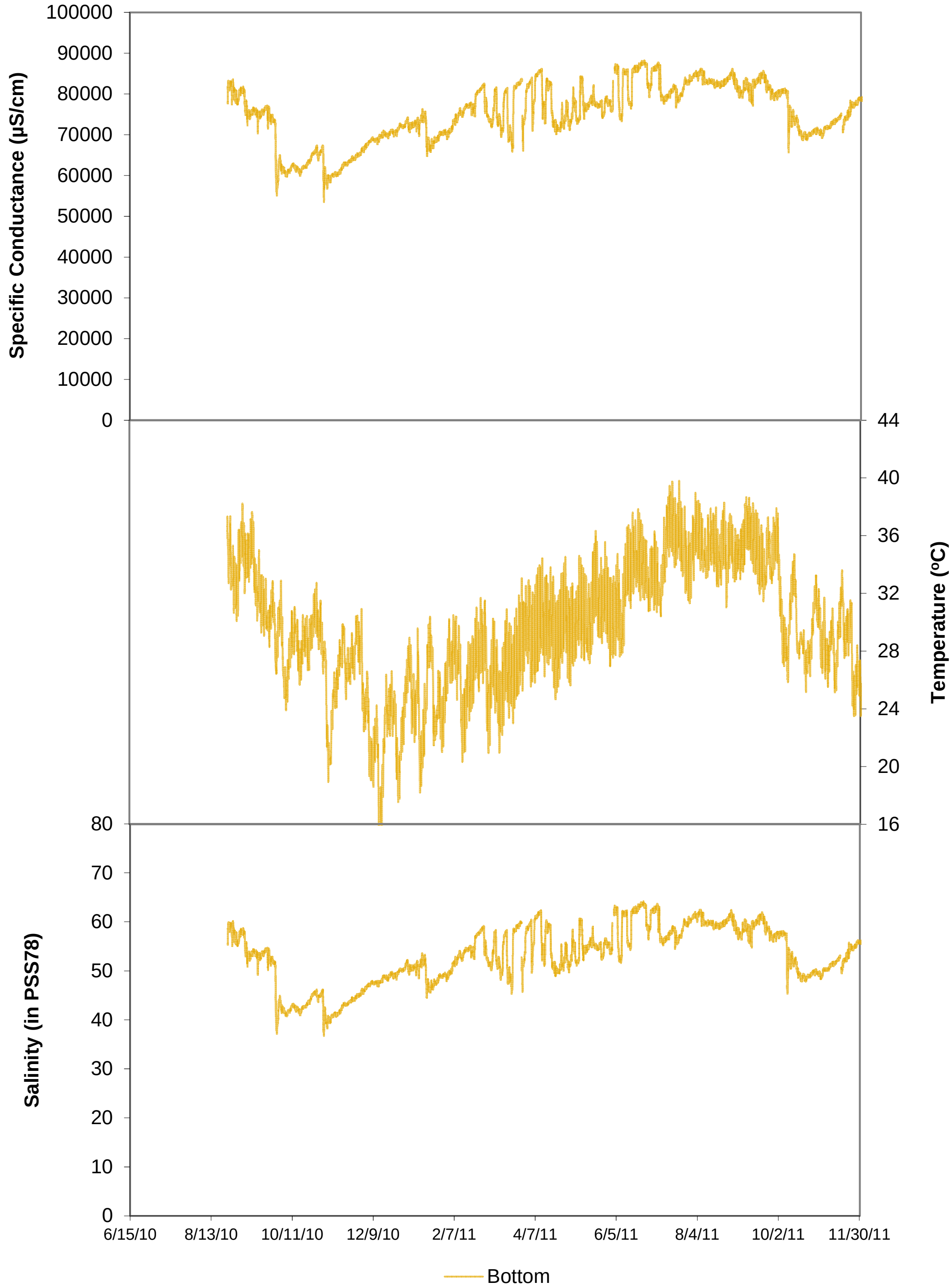


Figure 2.2-15. TPSWCCS-3 Specific Conductance, Temperature and Salinity.

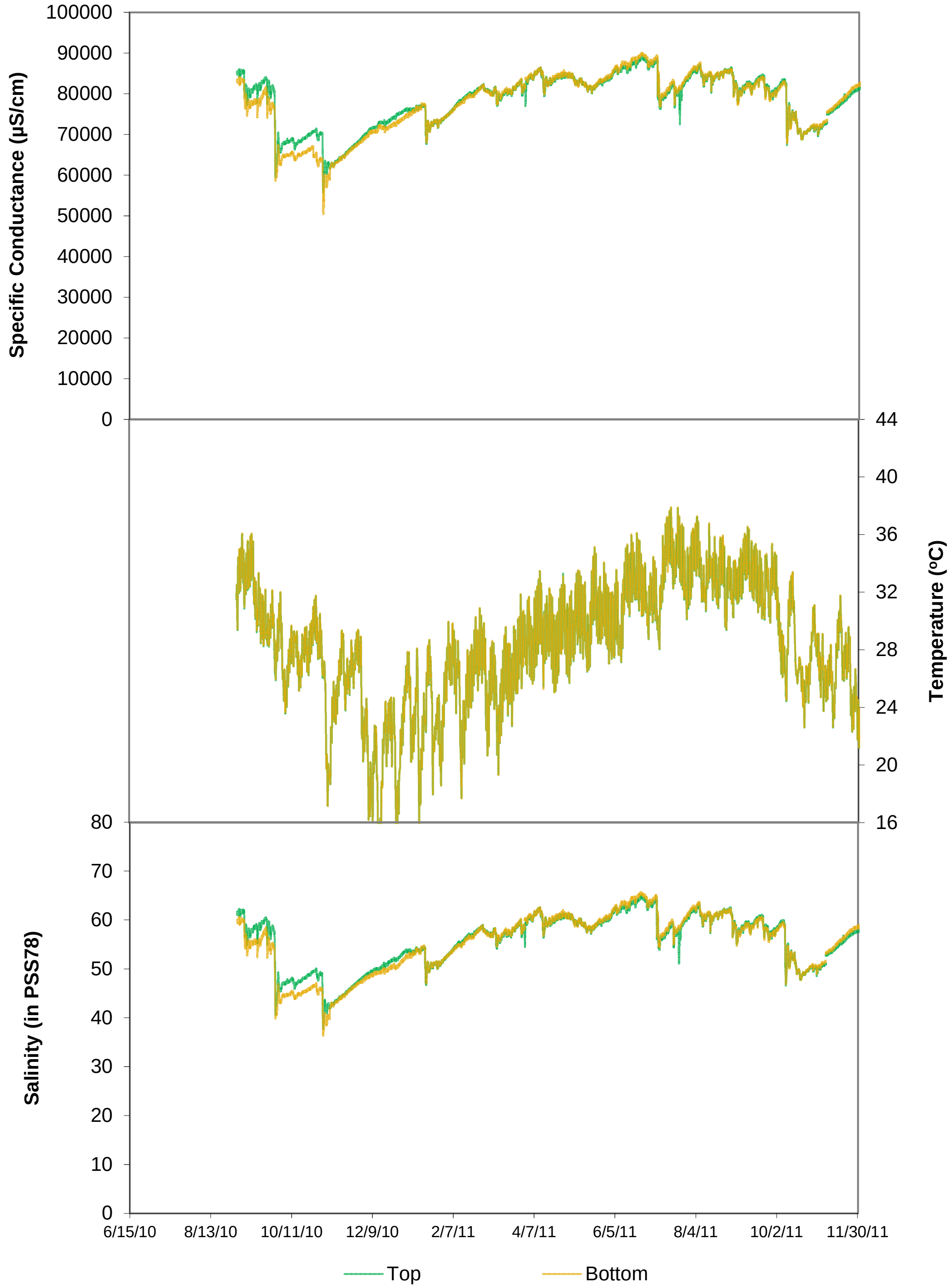


Figure 2.2-16. TPSWCCS-4 Specific Conductance, Temperature and Salinity.

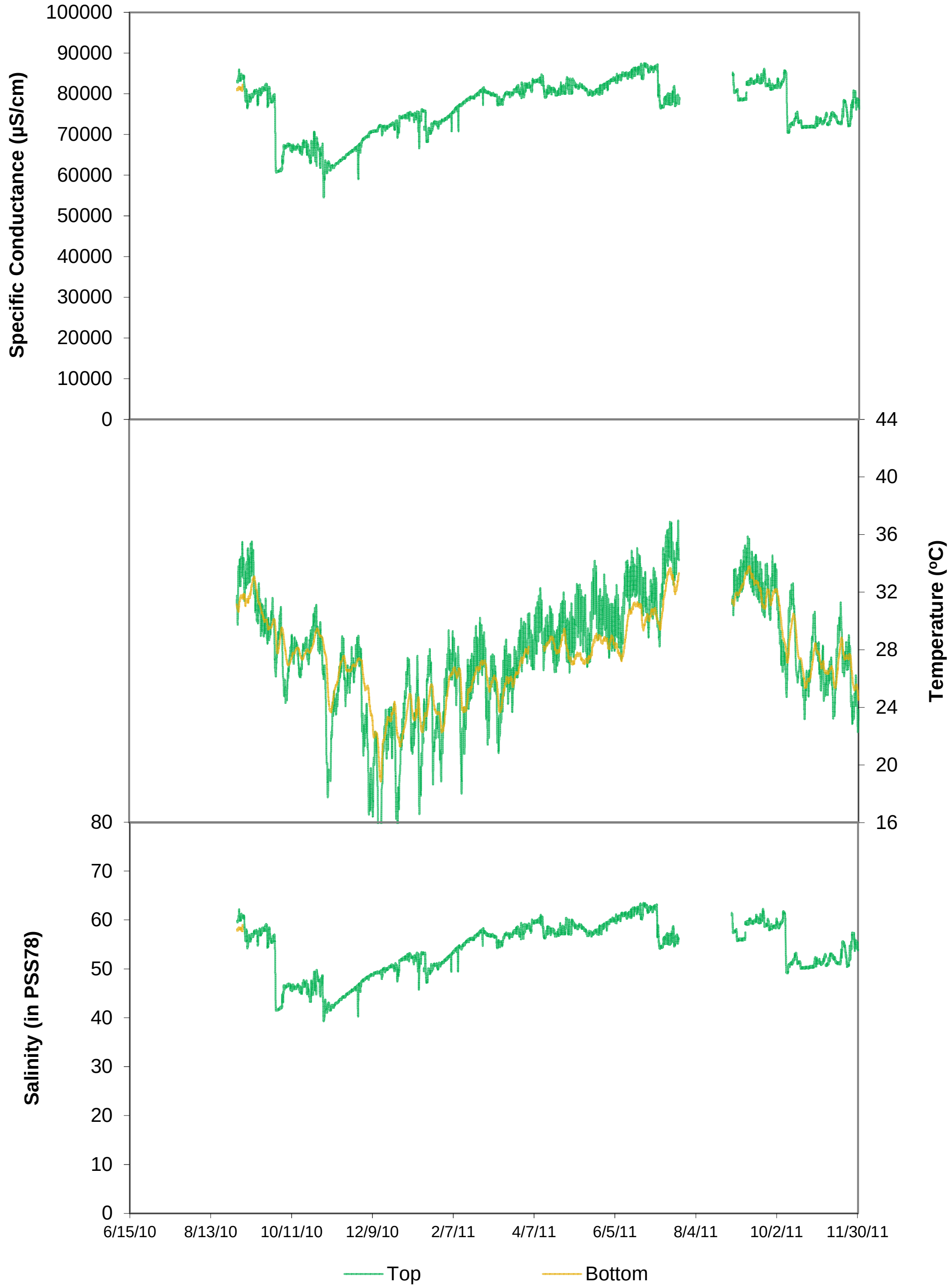


Figure 2.2-17. TPSWCCS-5 Specific Conductance, Temperature and Salinity.

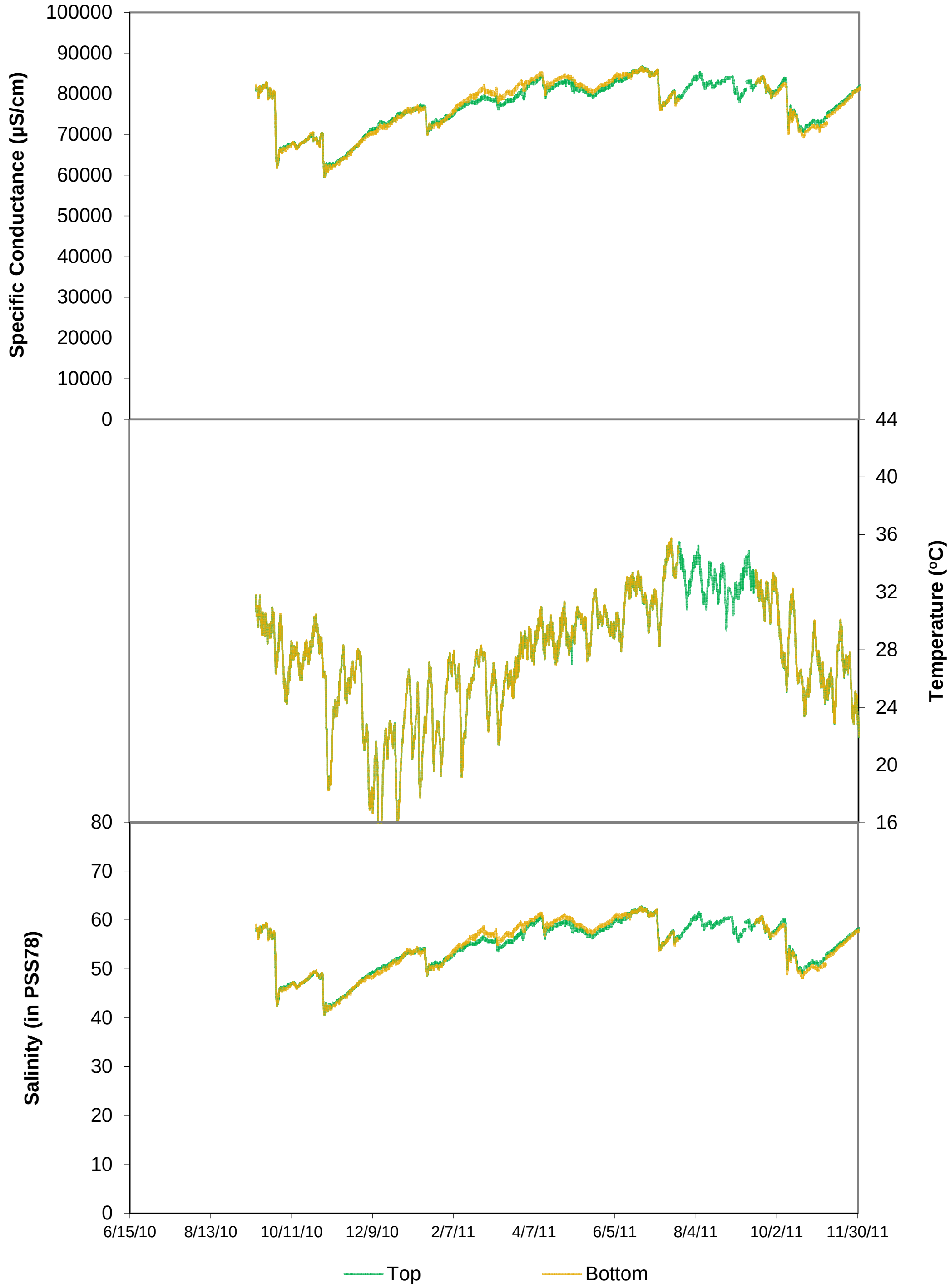


Figure 2.2-18. TPSWCCS-6 Specific Conductance, Temperature and Salinity.

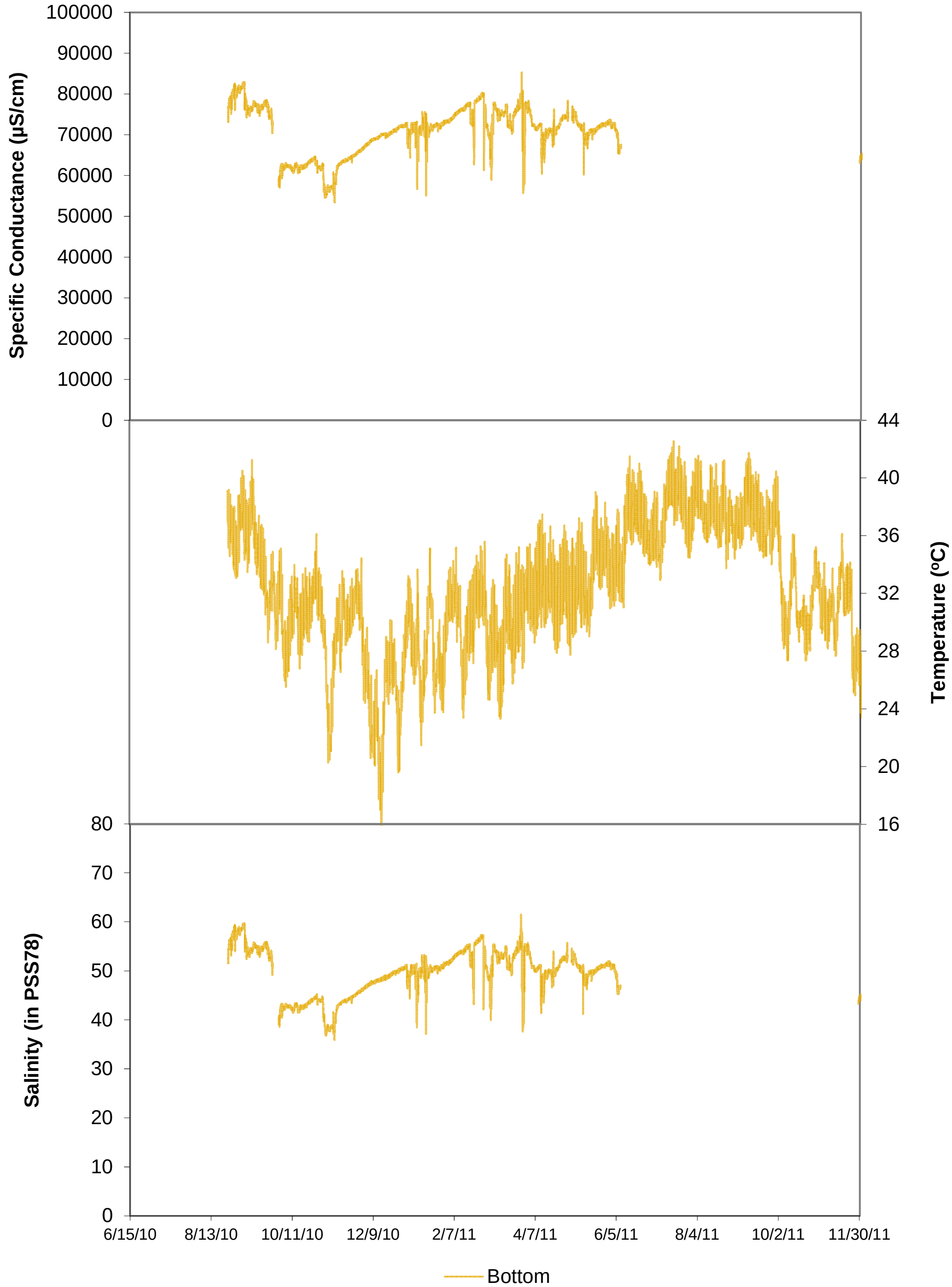


Figure 2.2-19. TPSWCCS-7 Specific Conductance, Temperature and Salinity.

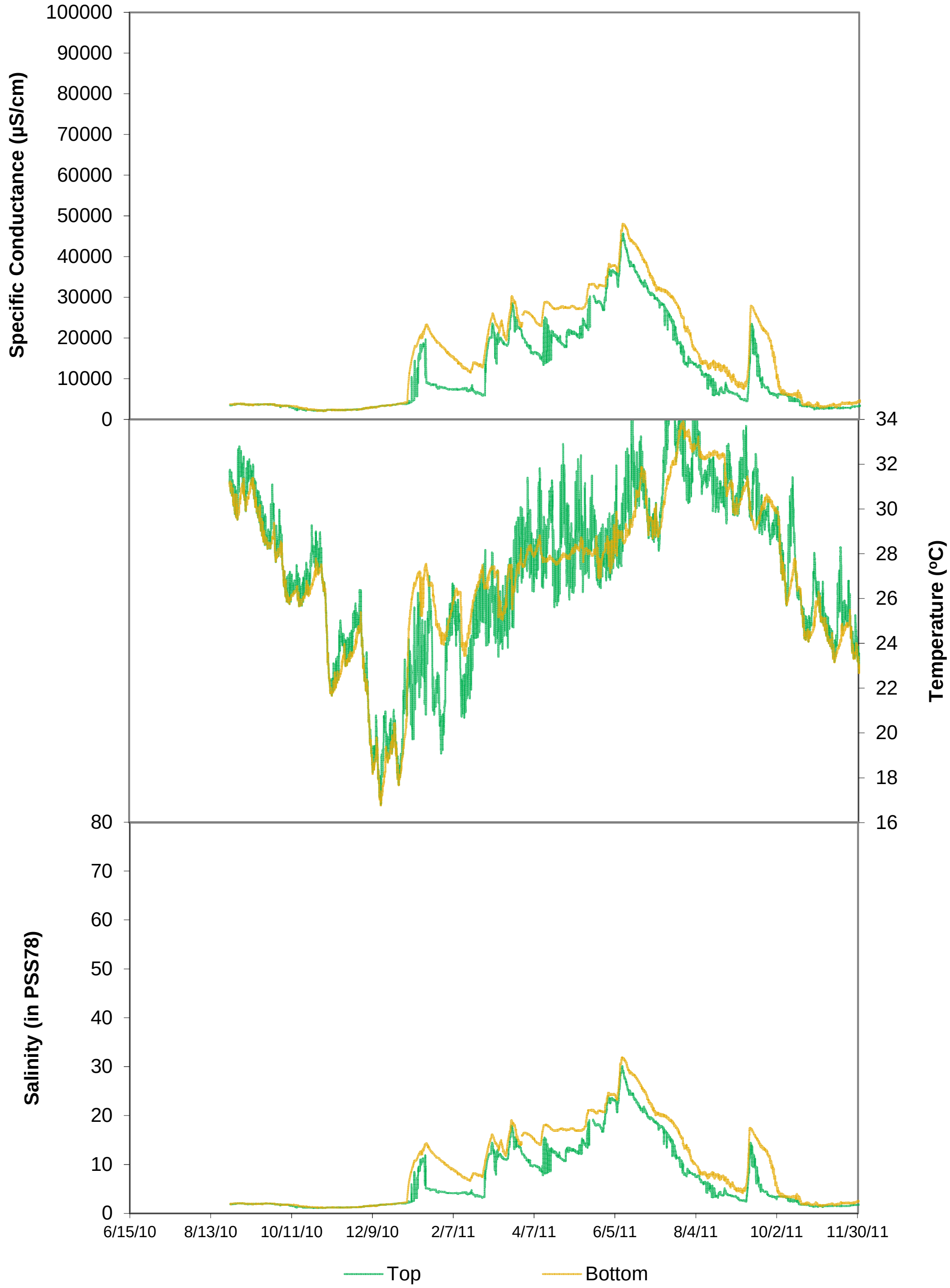


Figure 2.2-20. TPSWID-1 Specific Conductance, Temperature and Salinity.

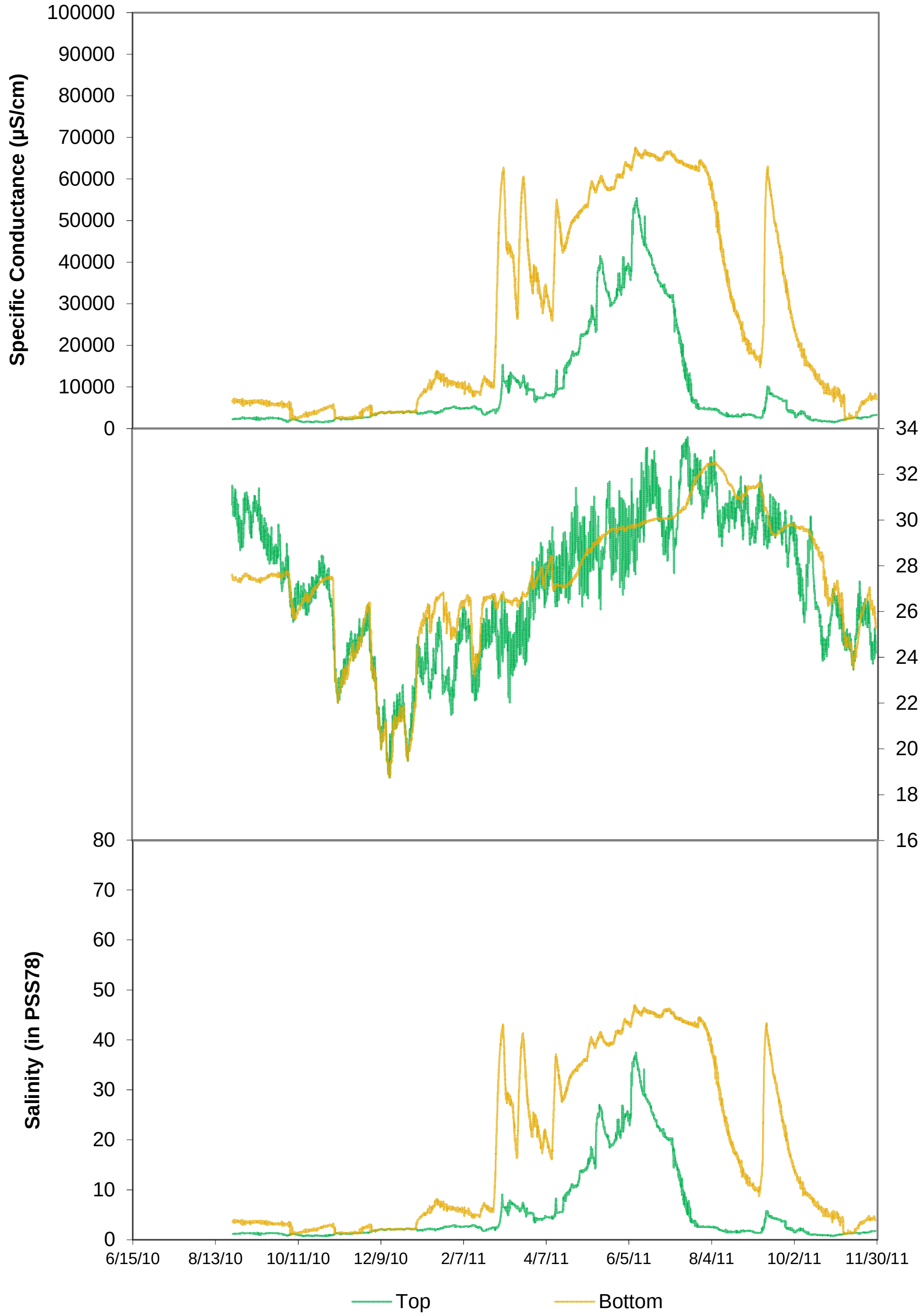


Figure 2.2-21. TPSWID-2 Specific Conductance, Temperature and Salinity.

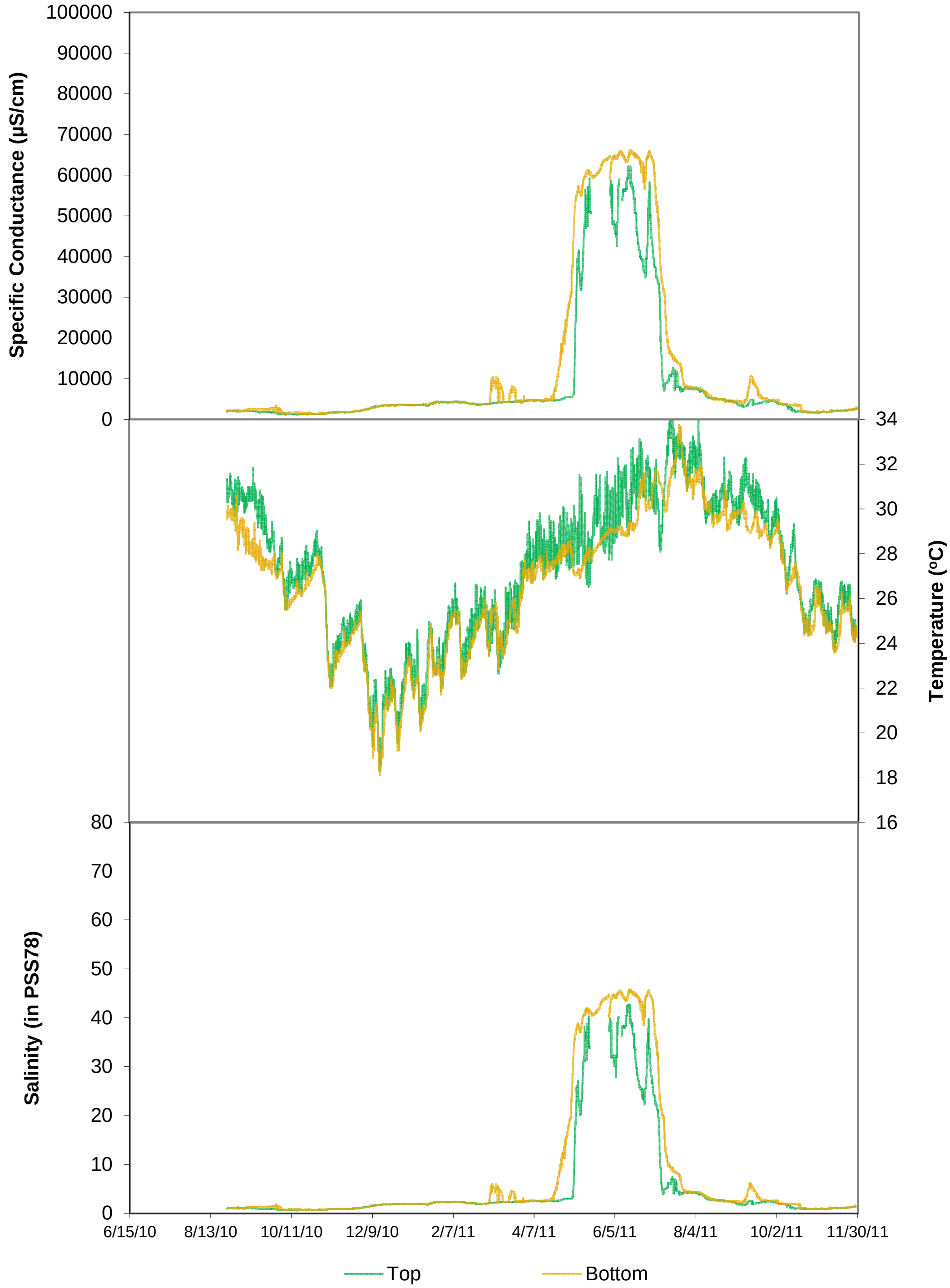


Figure 2.2-22. TPSWID-3 Specific Conductance, Temperature and Salinity.

Note: 1) First Numbers / Values in Green: Entire Period since Jun/Sep 2010 thru Nov 2011 and
2) Second Numbers / Values in Blue: Semi Annual Reporting Period Jun 2011- Nov 2011

3-2012

Average and Standard Deviation of Specific Conductance Values (µS/cm) for Surface Water Stations

Figure 2.2-23. Average and Standard Deviation of Specific Conductance Values for Surface Water Stations.

Note: 1) First Numbers / Values in Green: Entire Period since Jun/Sep 2010 thru Nov 2011 and
2) Second Numbers / Values in Blue: Semi Annual Reporting Period Jun 2011- Nov 2011

3-2012

Average and Standard Deviation of Temperature Values (Celsius) for Surface Water Stations

Figure 2.2-24. Average and Standard Deviation of Temperature for Surface Water Stations.

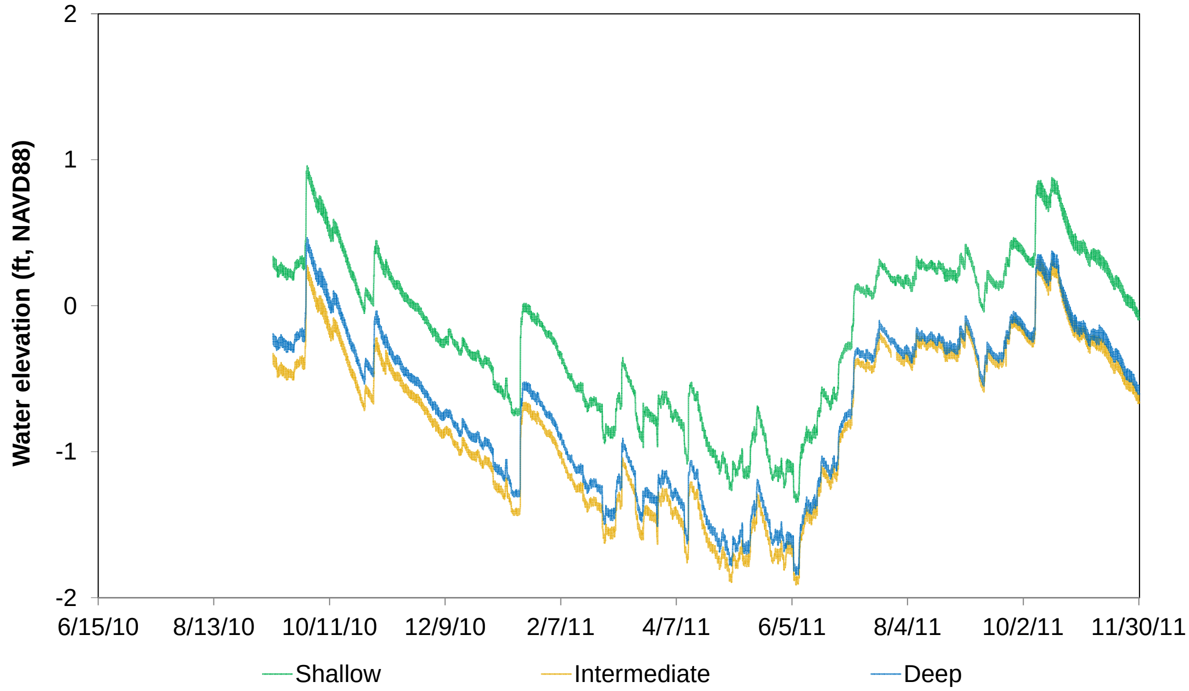


Figure 2.3-1. TPGW-1 Water Elevations.

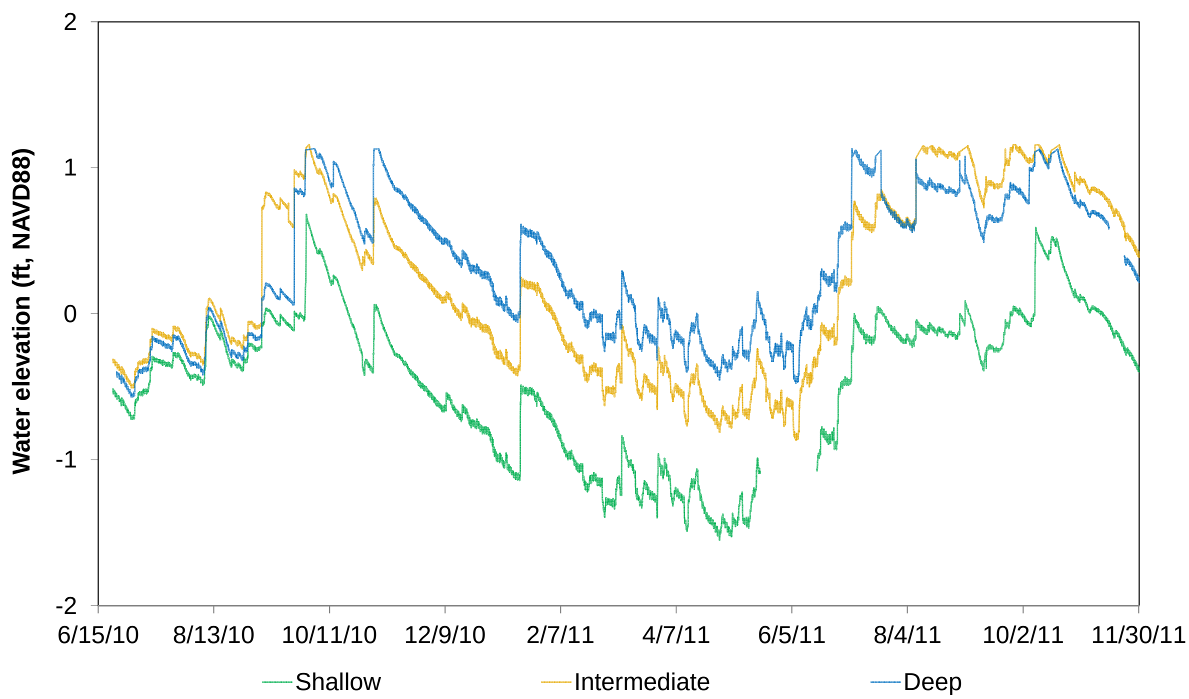


Figure 2.3-2. TPGW-2 Water Elevations.

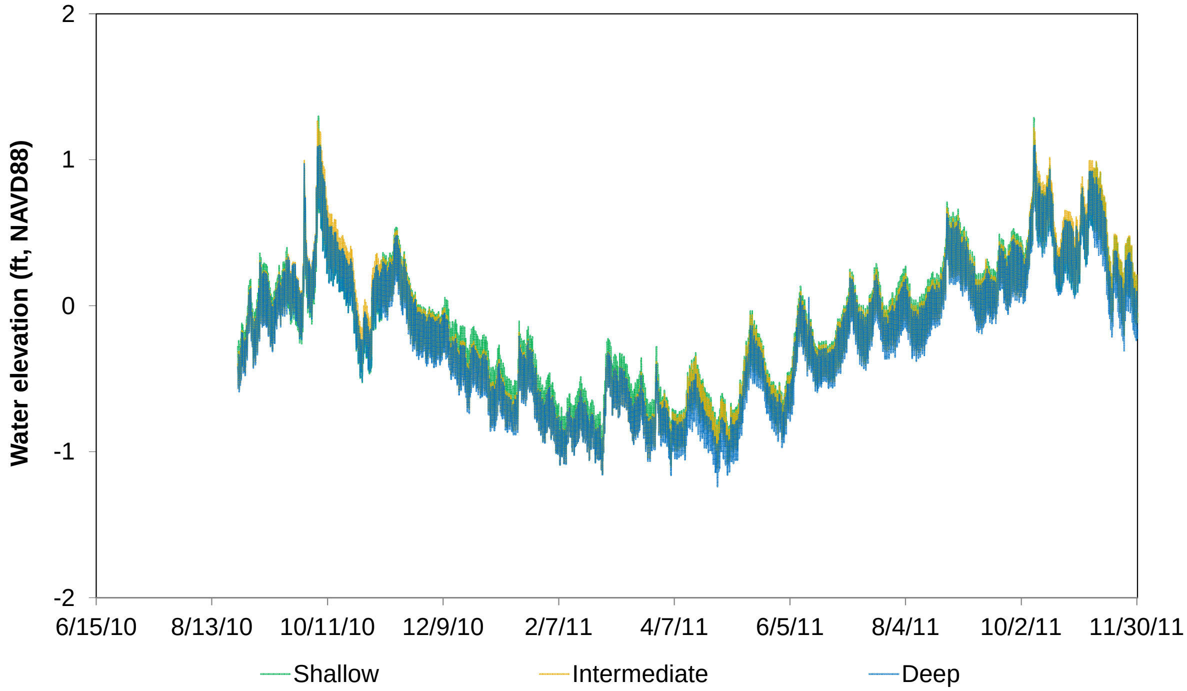


Figure 2.3-3. TPGW-3 Water Elevations.

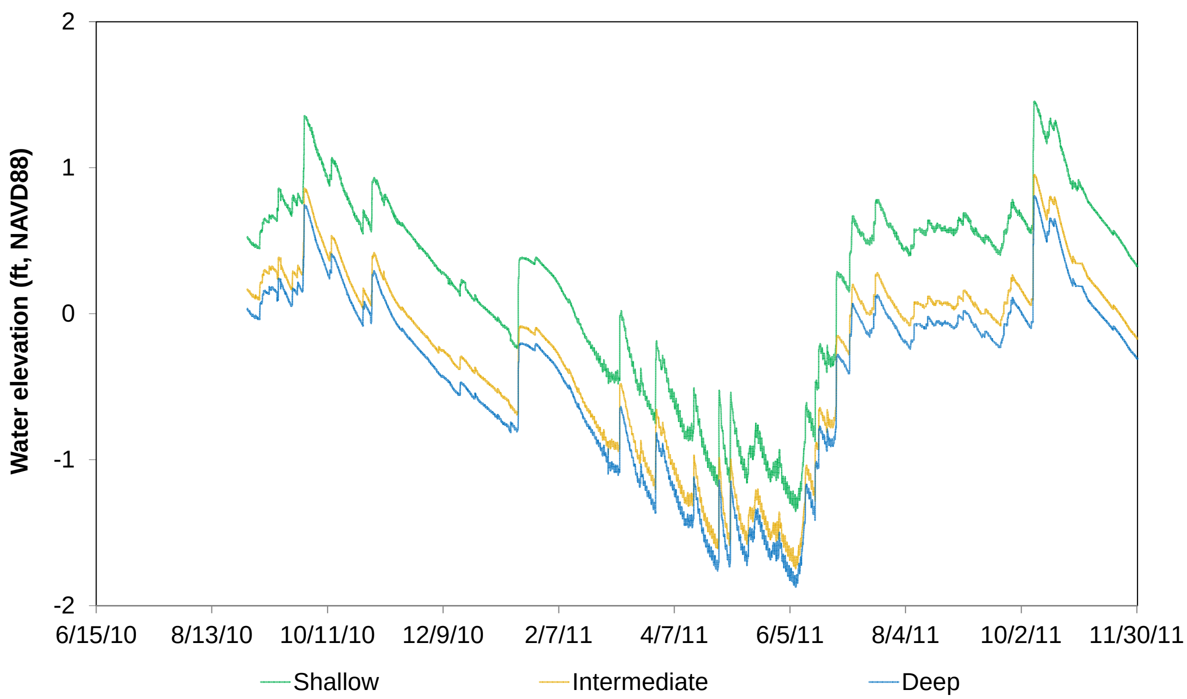


Figure 2.3-4. TPGW-4 Water Elevations.

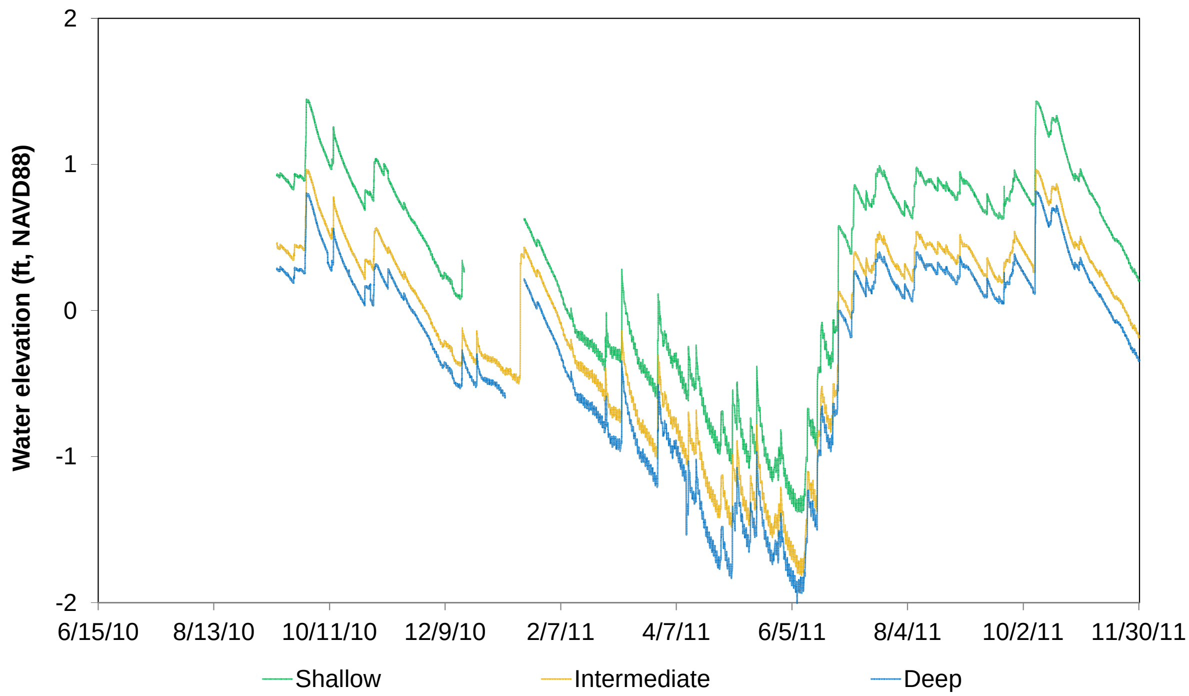


Figure 2.3-5. TPGW-5 Water Elevations.

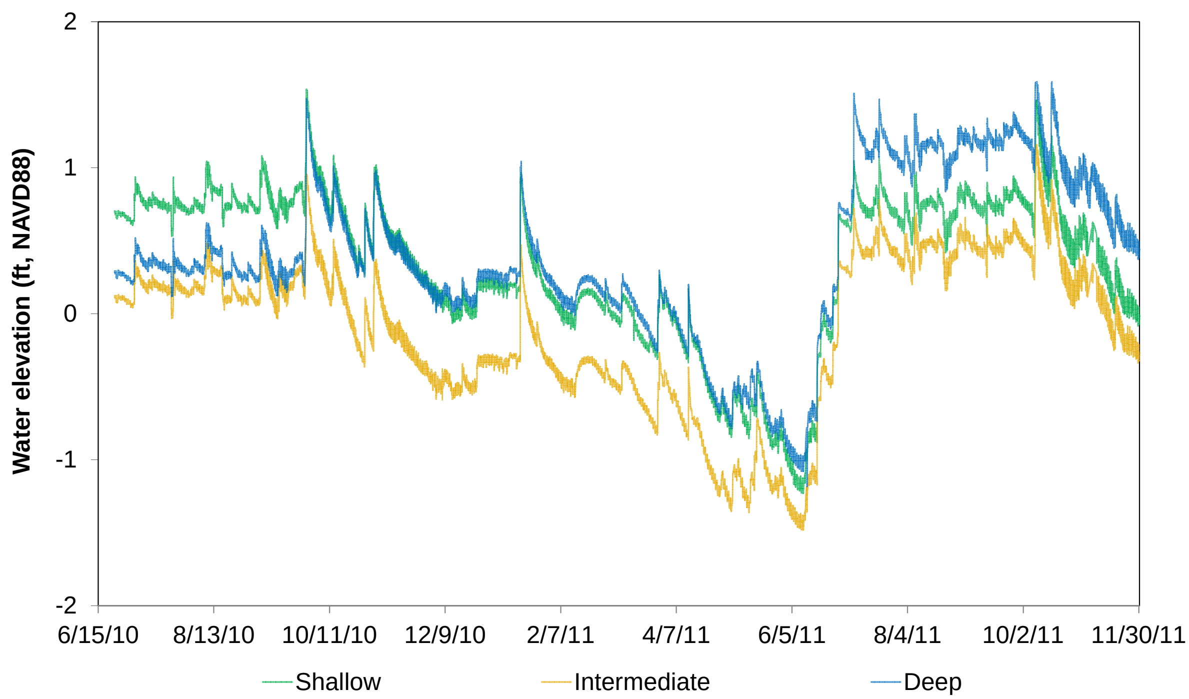


Figure 2.3-6. TPGW-6 Water Elevations.

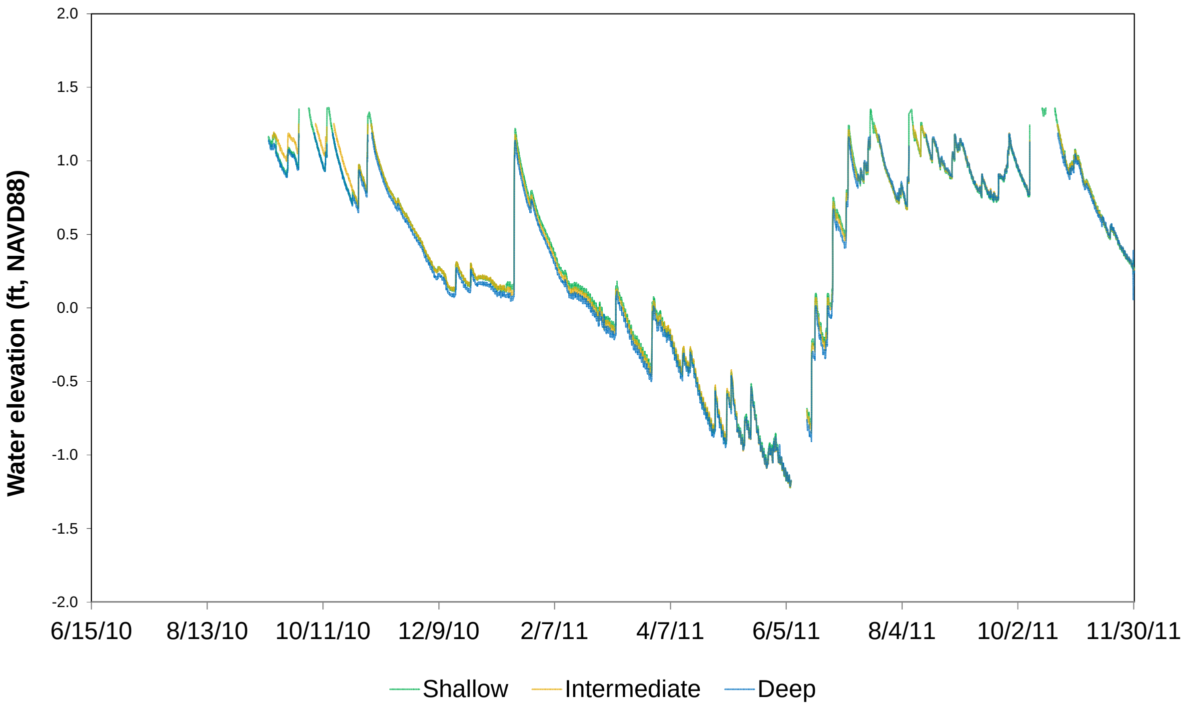


Figure 2.3-7. TPGW-7 Water Elevations.

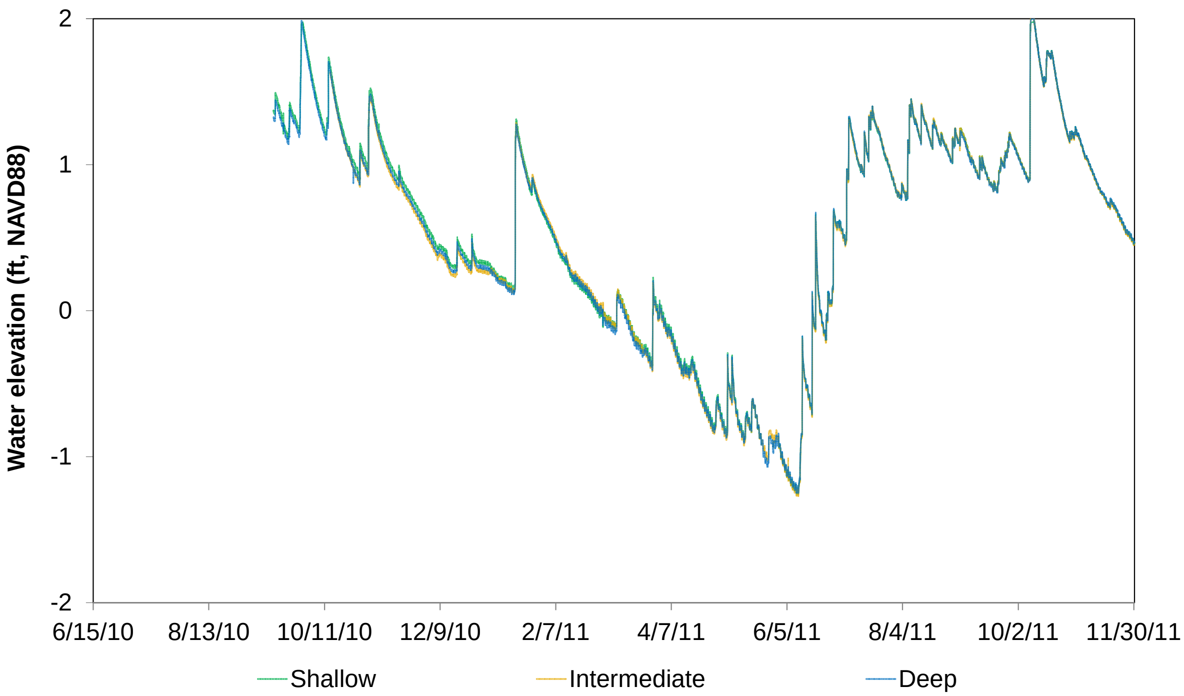


Figure 2.3-8. TPGW-8 Water Elevations.

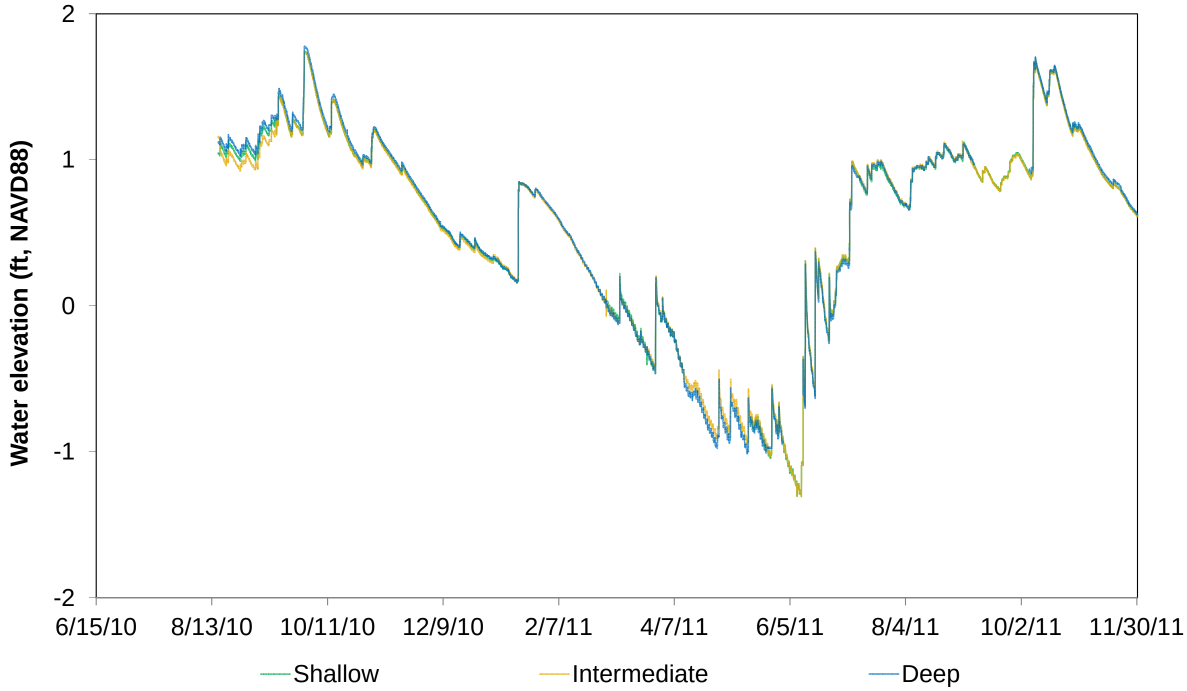


Figure 2.3-9. TPGW-9 Water Elevations.

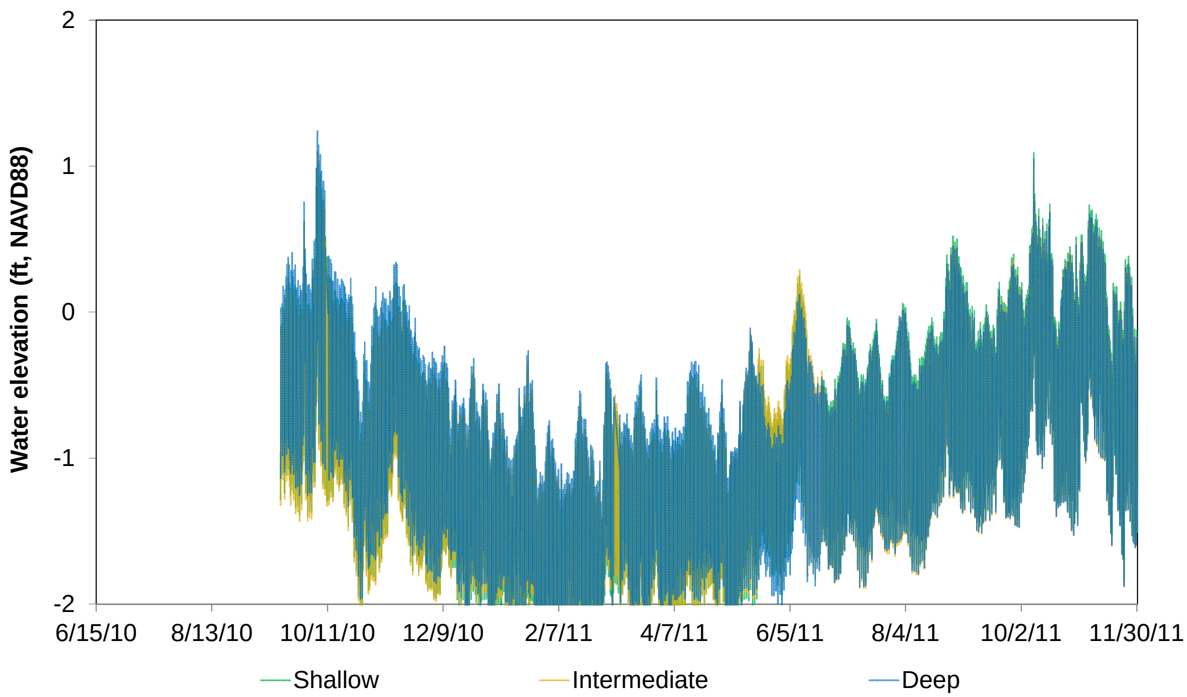


Figure 2.3-10. TPGW-10 Water Elevations.

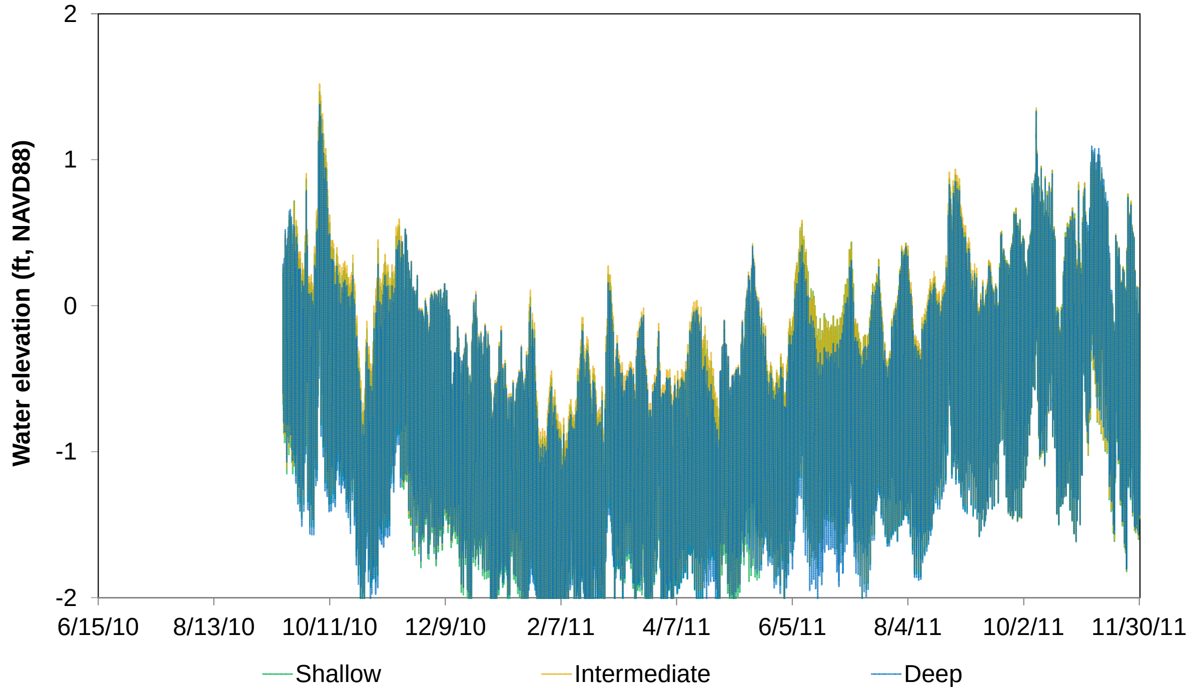


Figure 2.3-11. TPGW-11 Water Elevations.

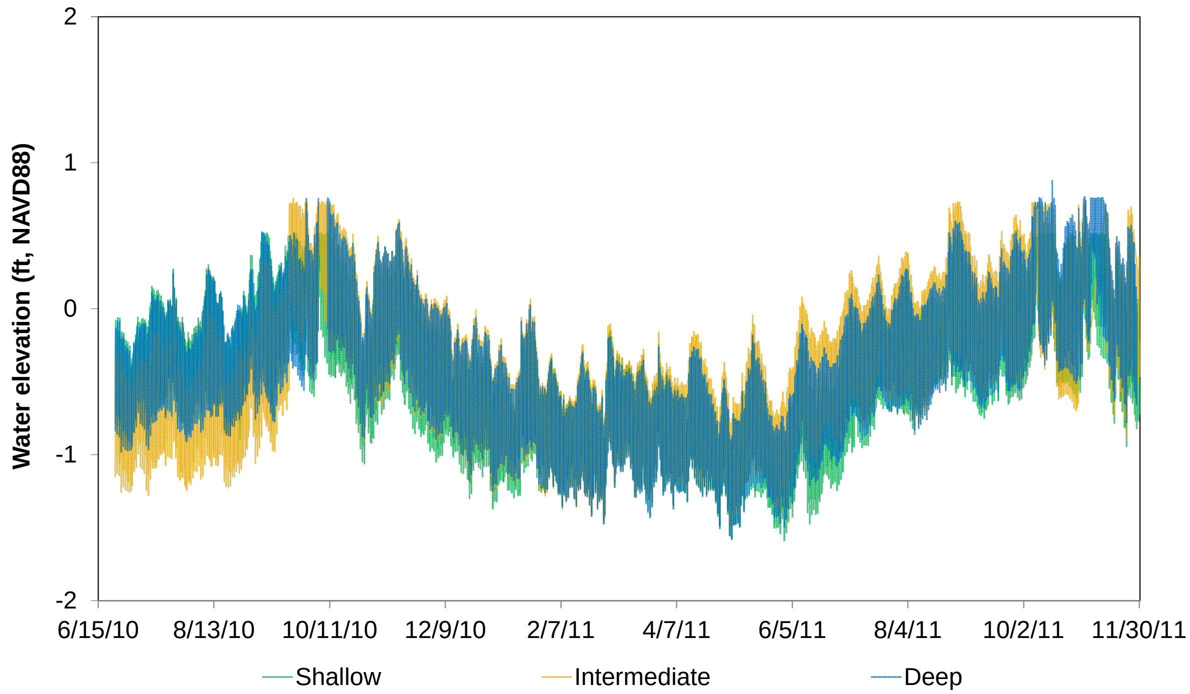


Figure 2.3-12. TPGW-12 Water Elevations.

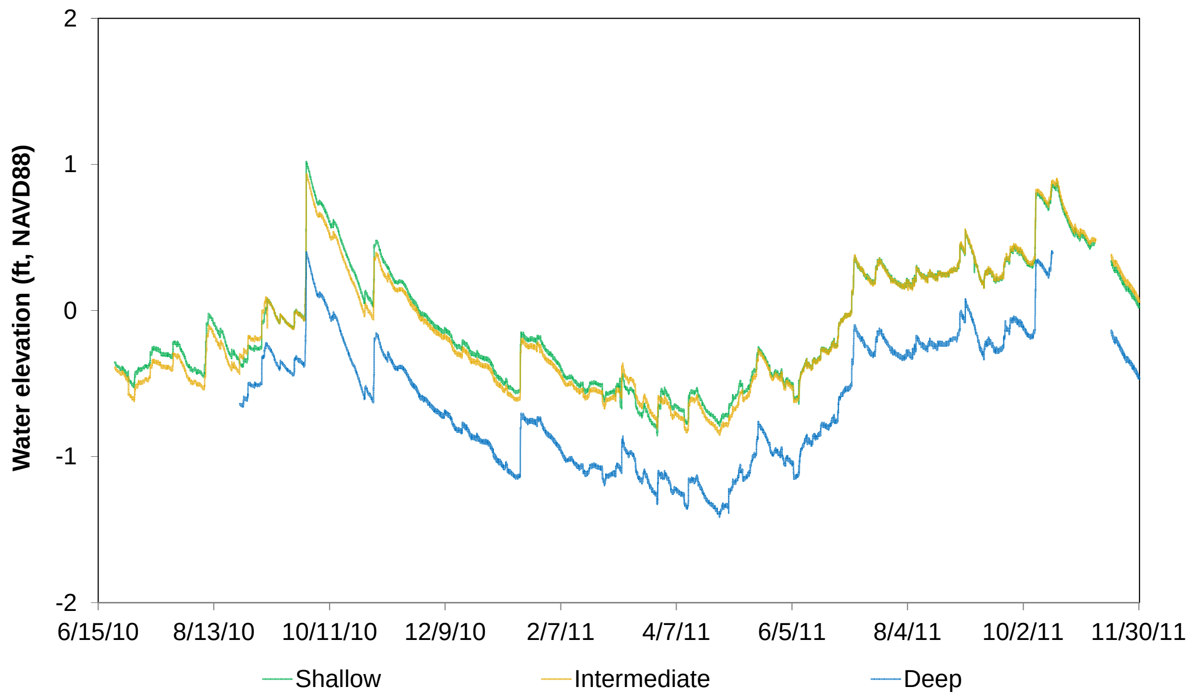


Figure 2.3-13. TPGW-13 Water Elevations.

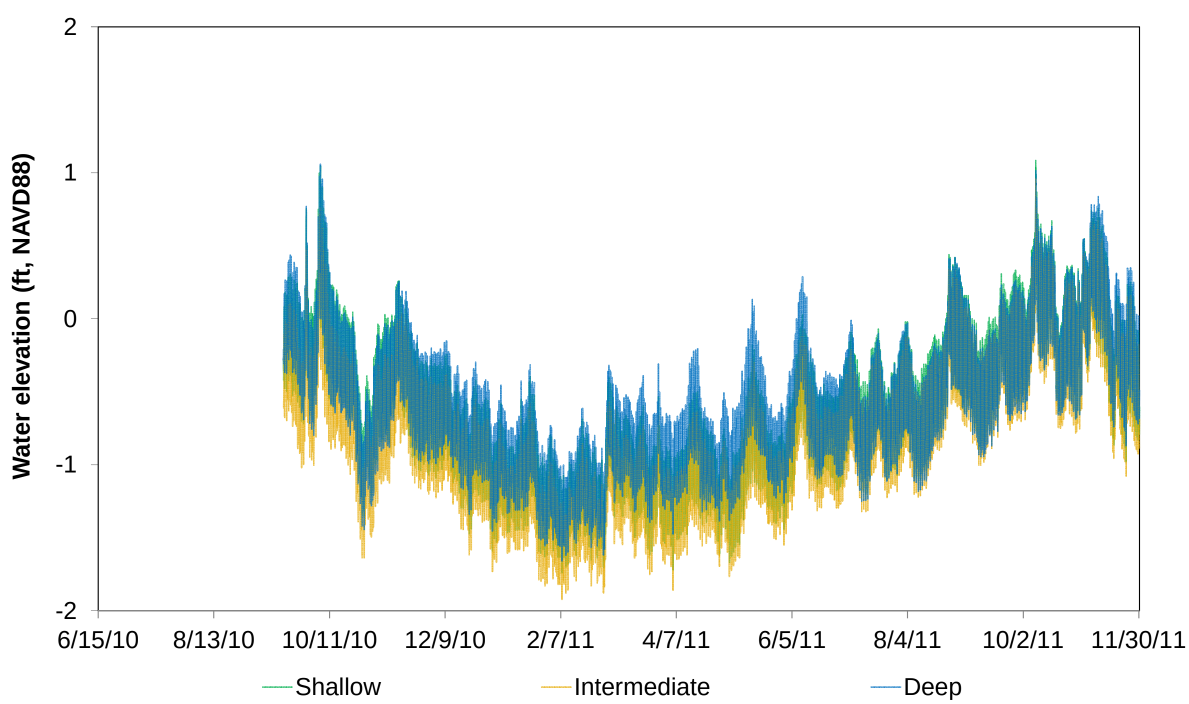


Figure 2.3-14. TPGW-14 Water Elevations.

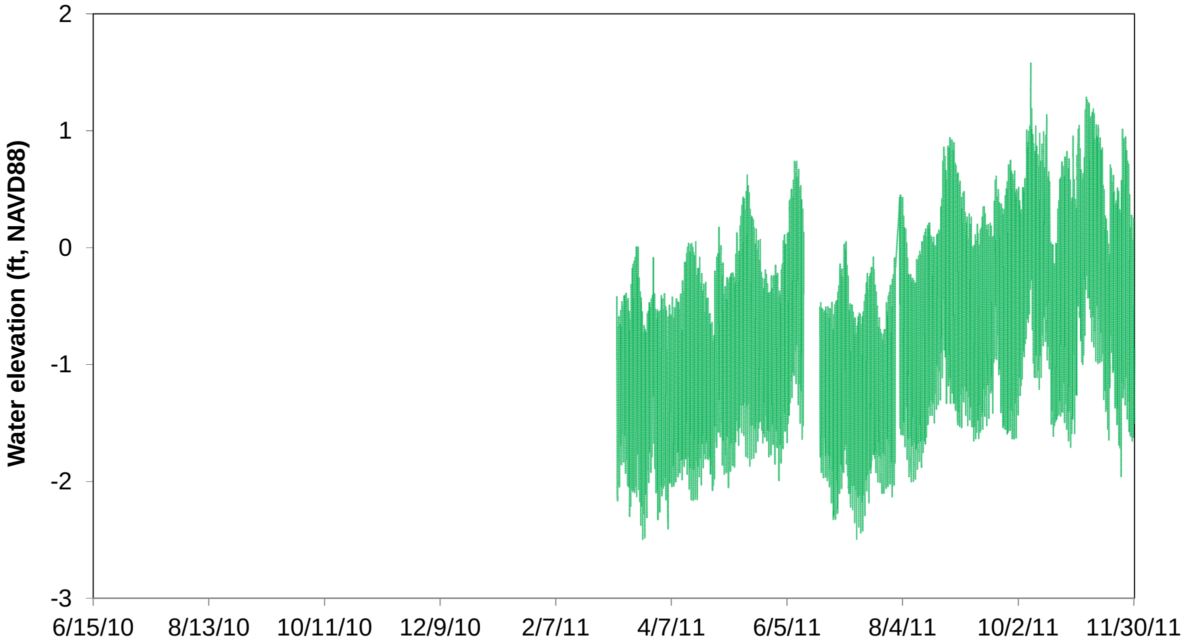


Figure 2.3-15. TPBBSW-10 Water Elevations.

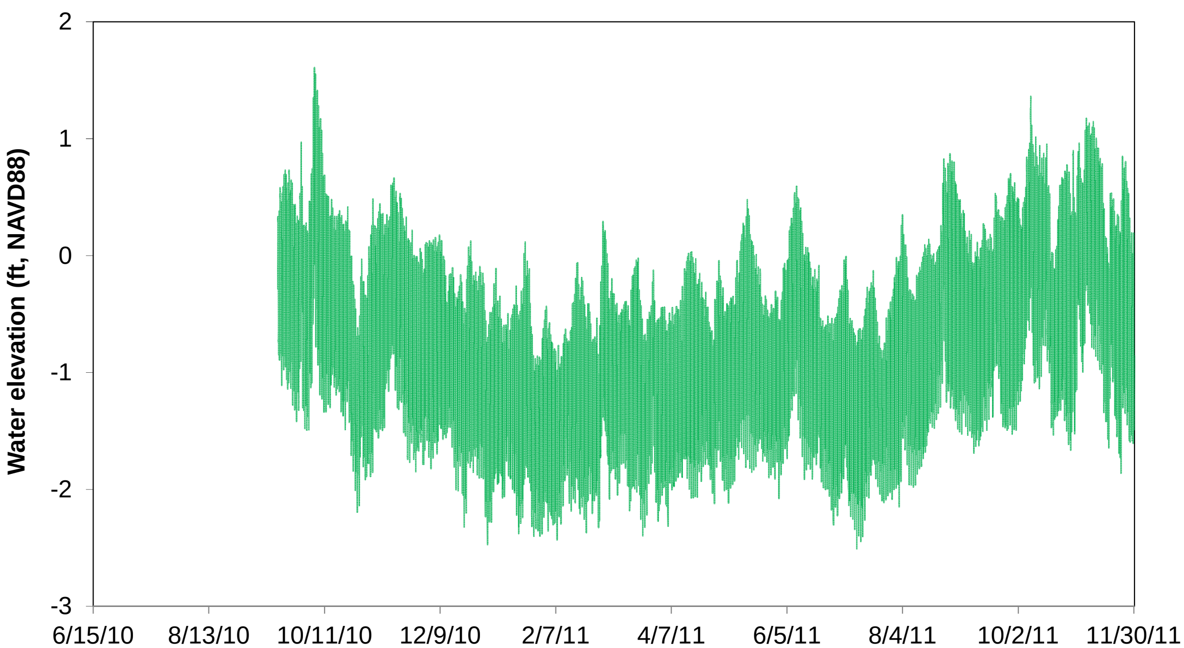


Figure 2.3-16. TPBBSW-3 Water Elevations.

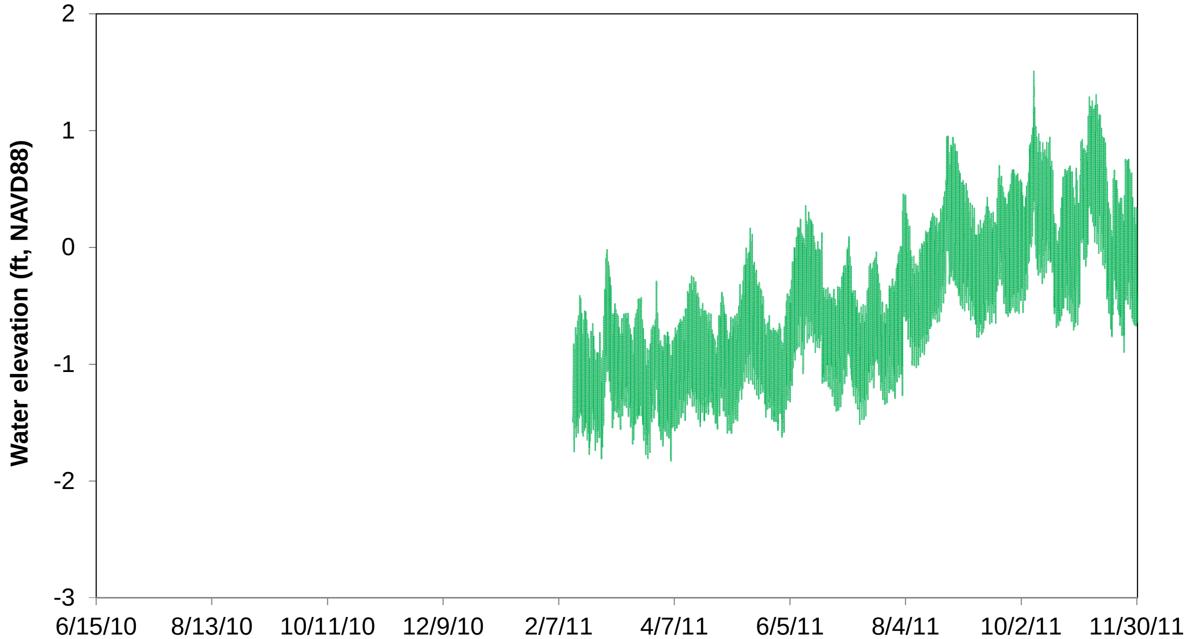


Figure 2.3-17. TPBBSW-14 Water Elevations.

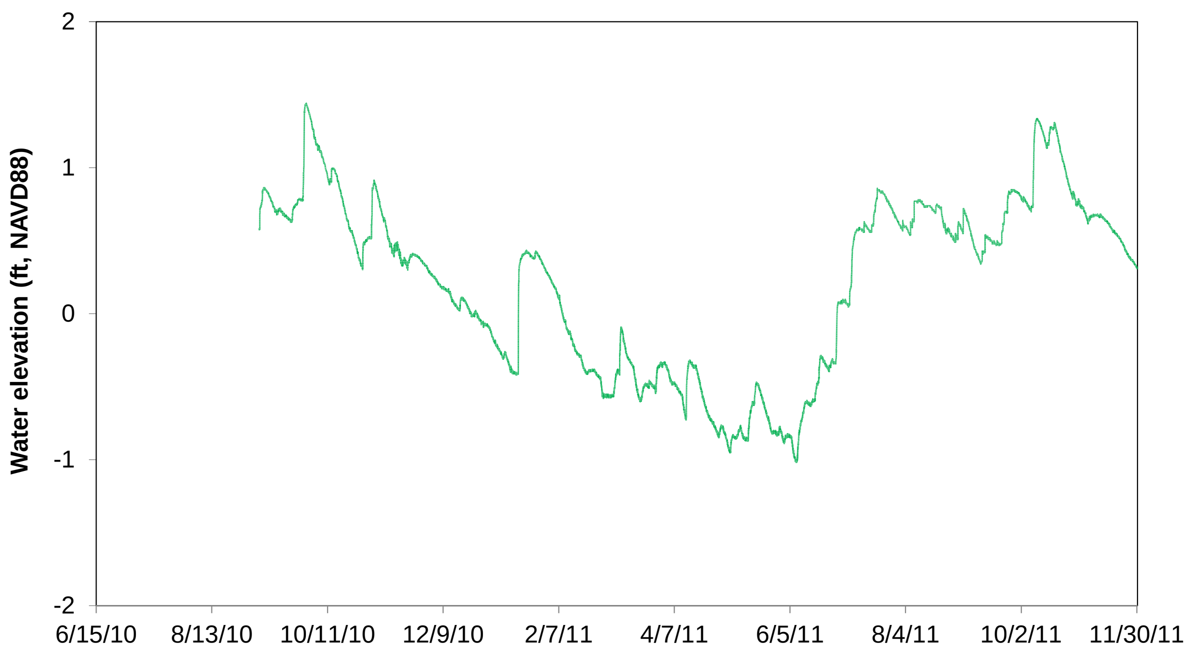


Figure 2.3-18. TPSWC-1 Water Elevations.

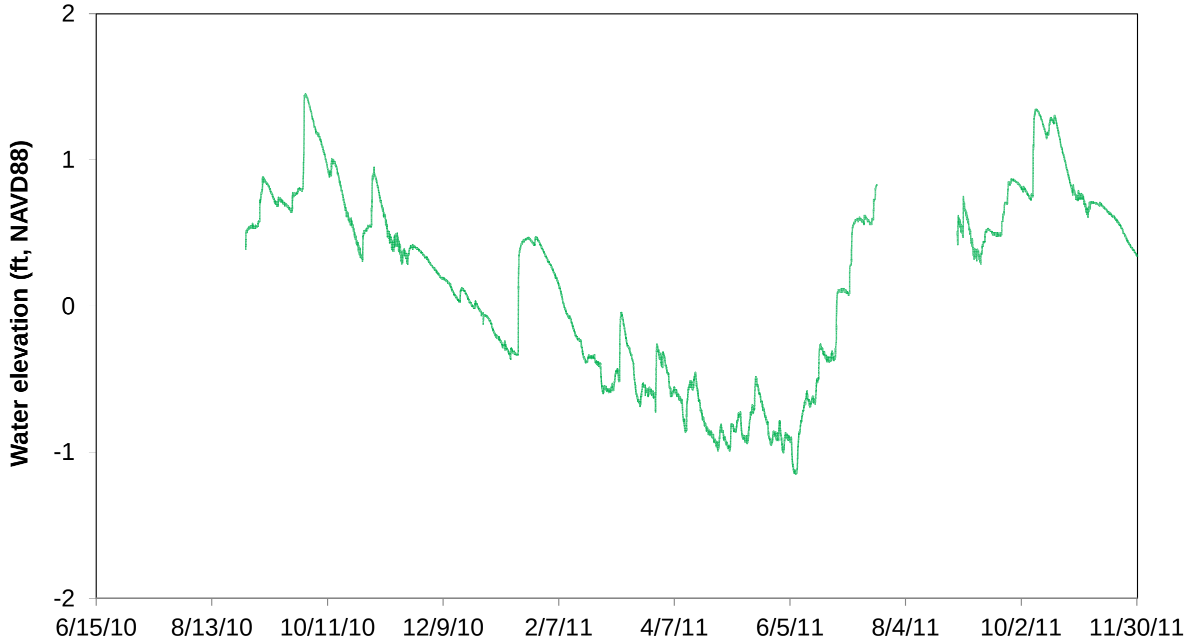


Figure 2.3-19. TPSWC-2 Water Elevations.

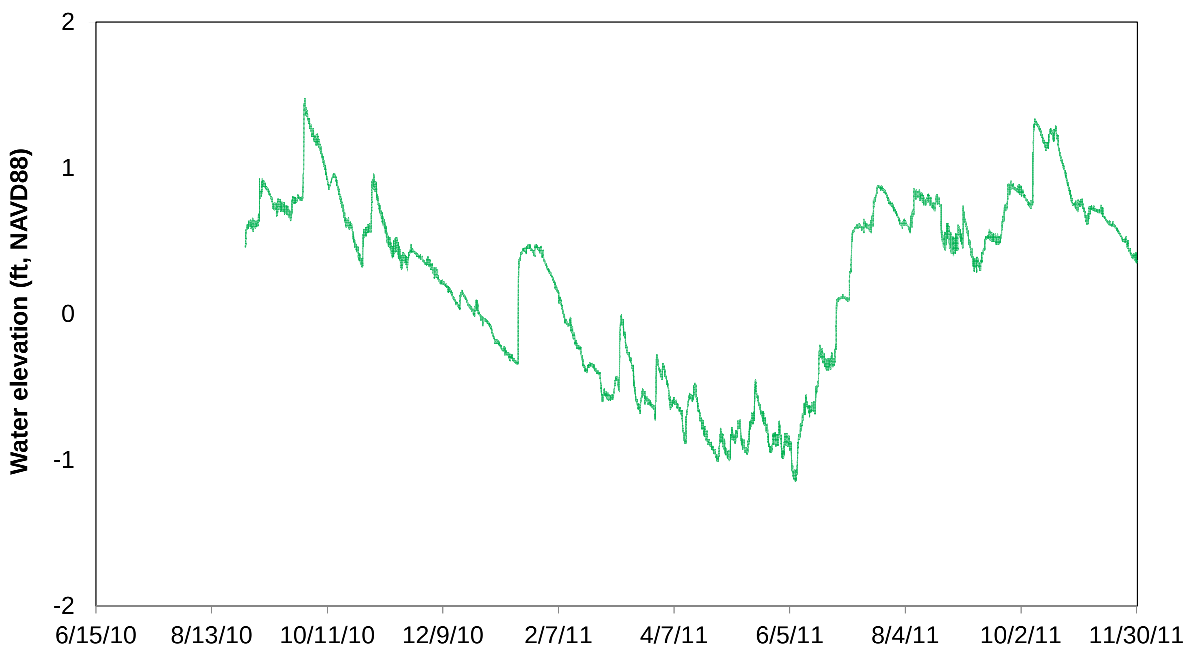


Figure 2.3-20. TPSWC-3 Water Elevations.

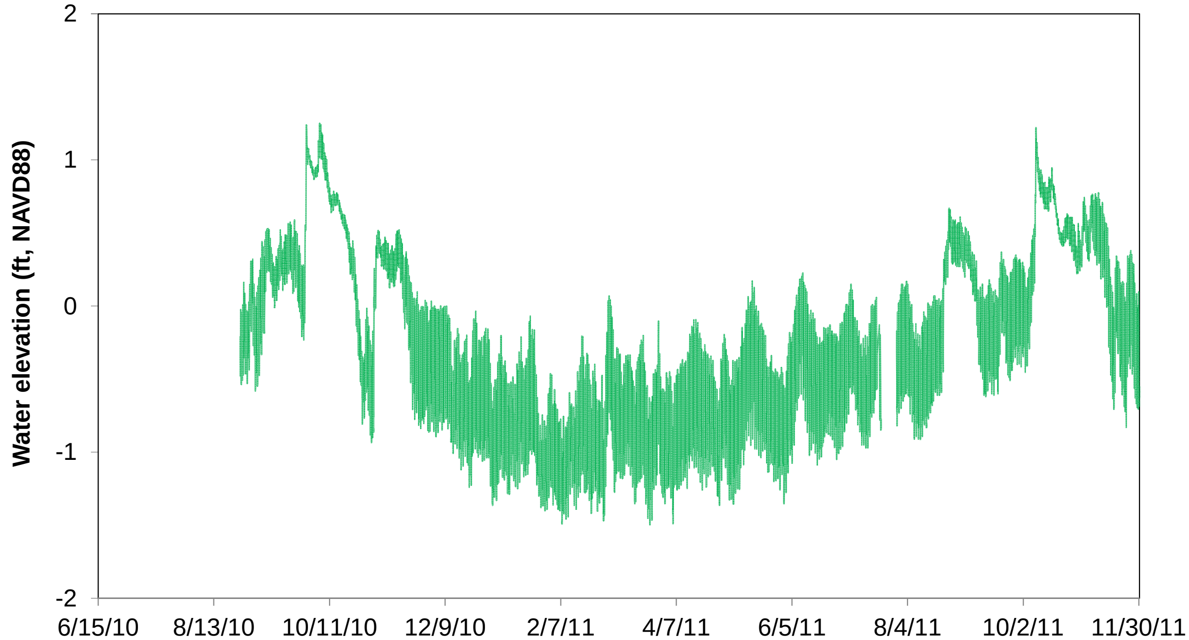


Figure 2.3-21. TPSWC-4 Water Elevations.

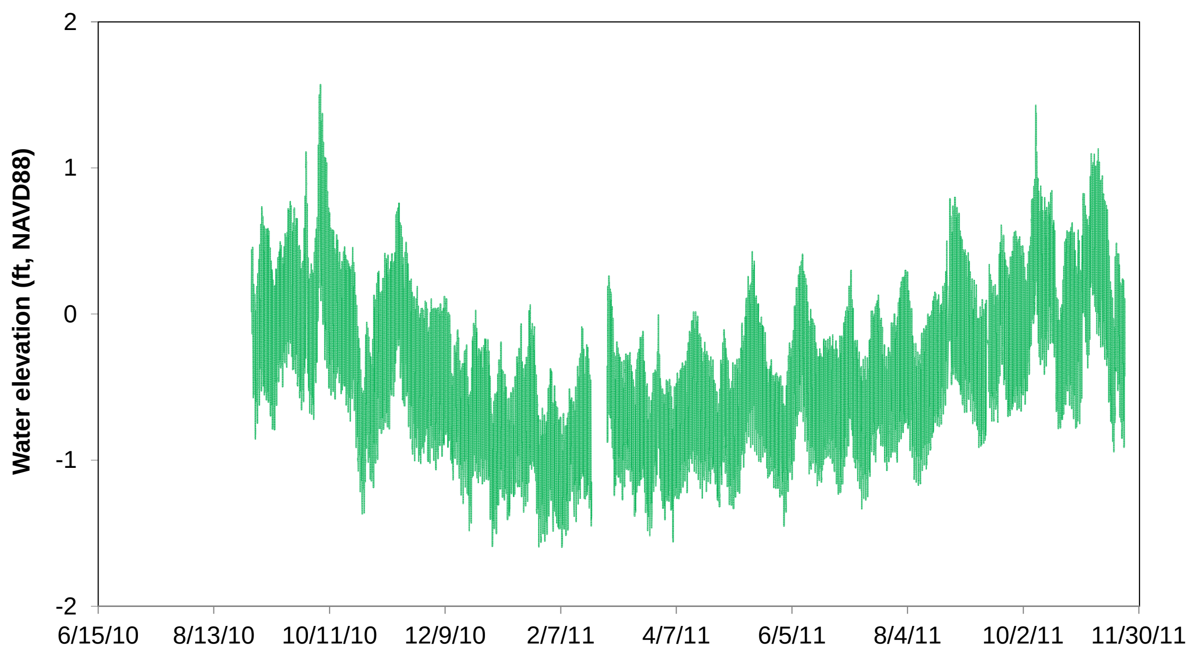


Figure 2.3-22. TPSWC-5 Water Elevations.

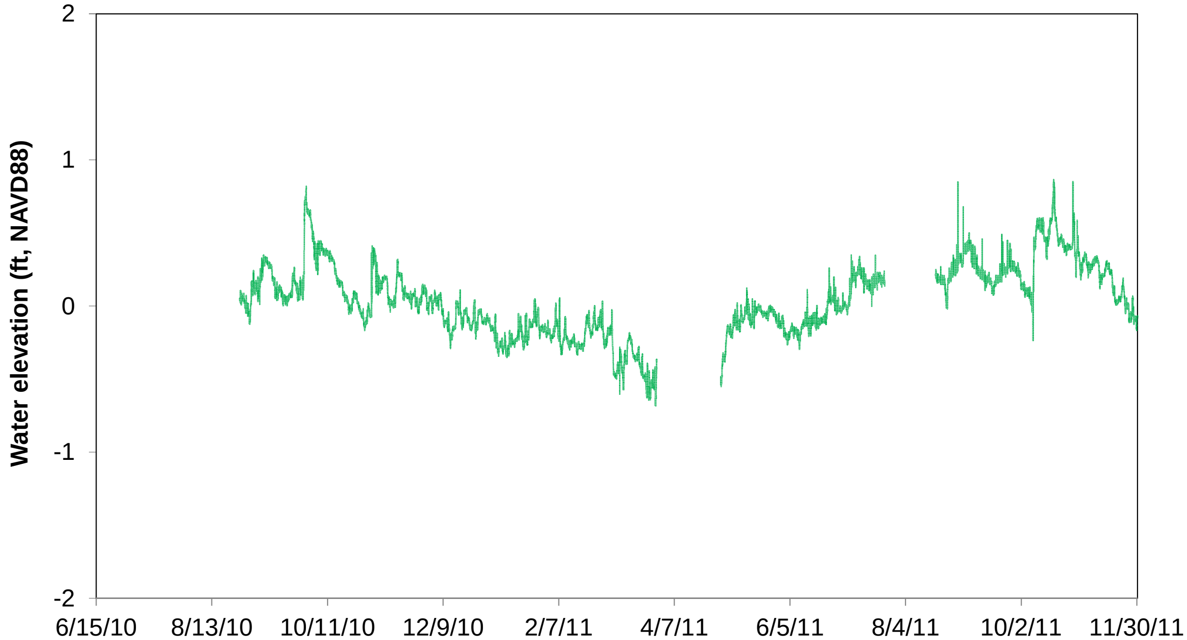


Figure 2.3-23. TPSWCCS-1 Water Elevations.

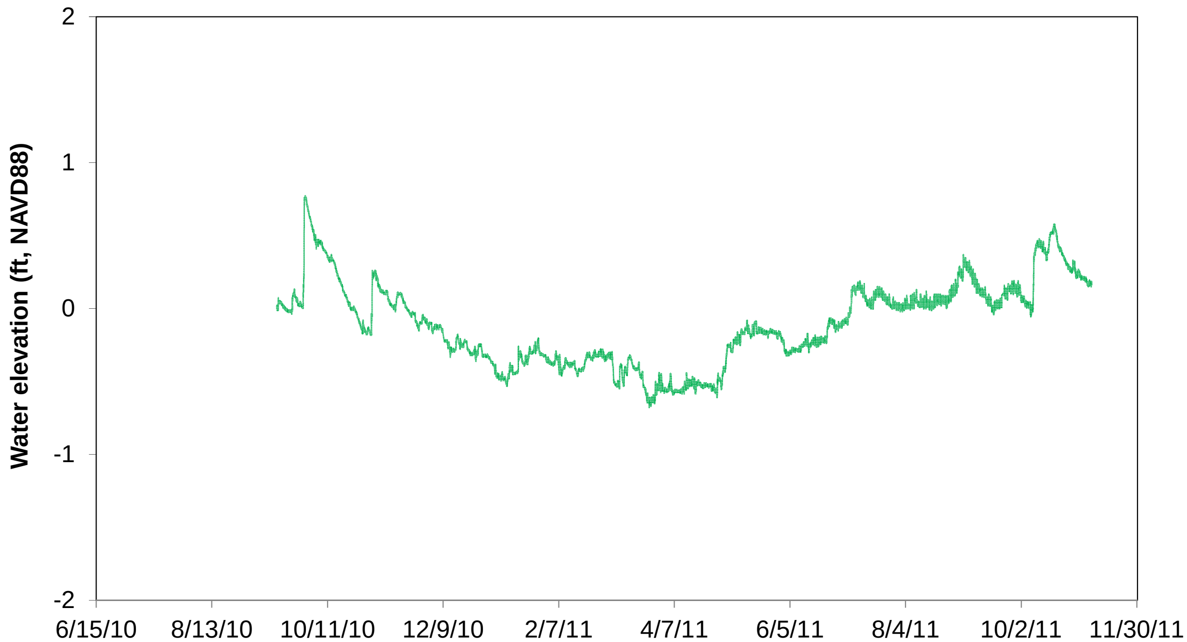


Figure 2.3-24. TPSWCCS-2 Water Elevations.

Figure 2.3-25. TPSWCCS-3 Water Elevations.

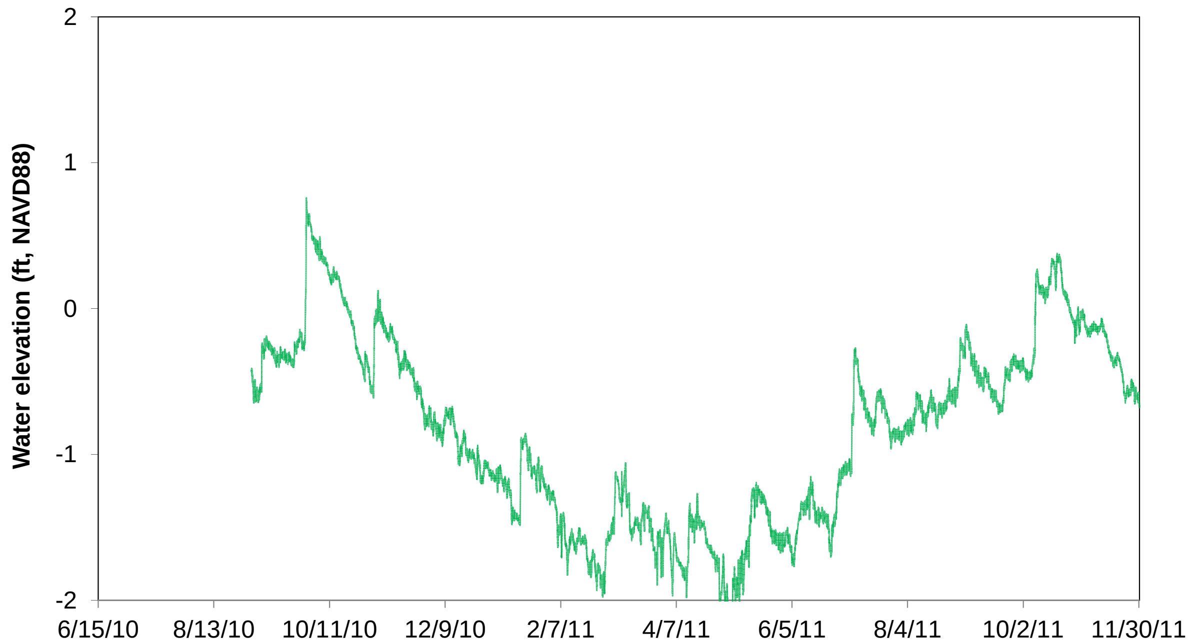


Figure 2.3-26. TPSWCCS-4 Water Elevations.

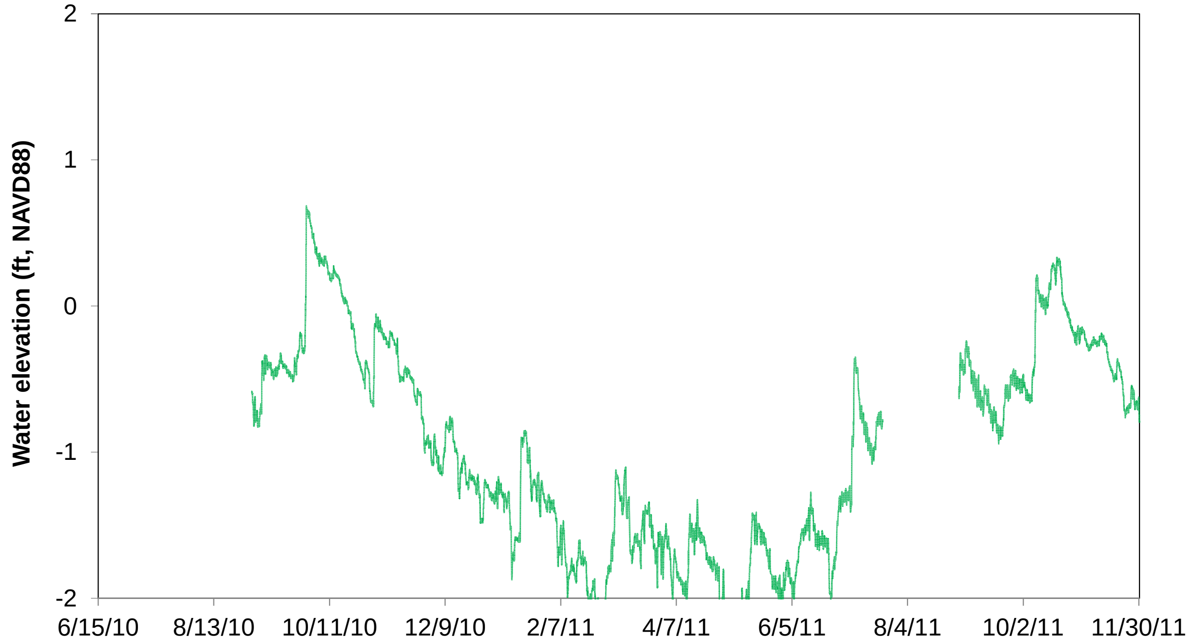


Figure 2.3-27. TPSWCCS-5 Water Elevations.

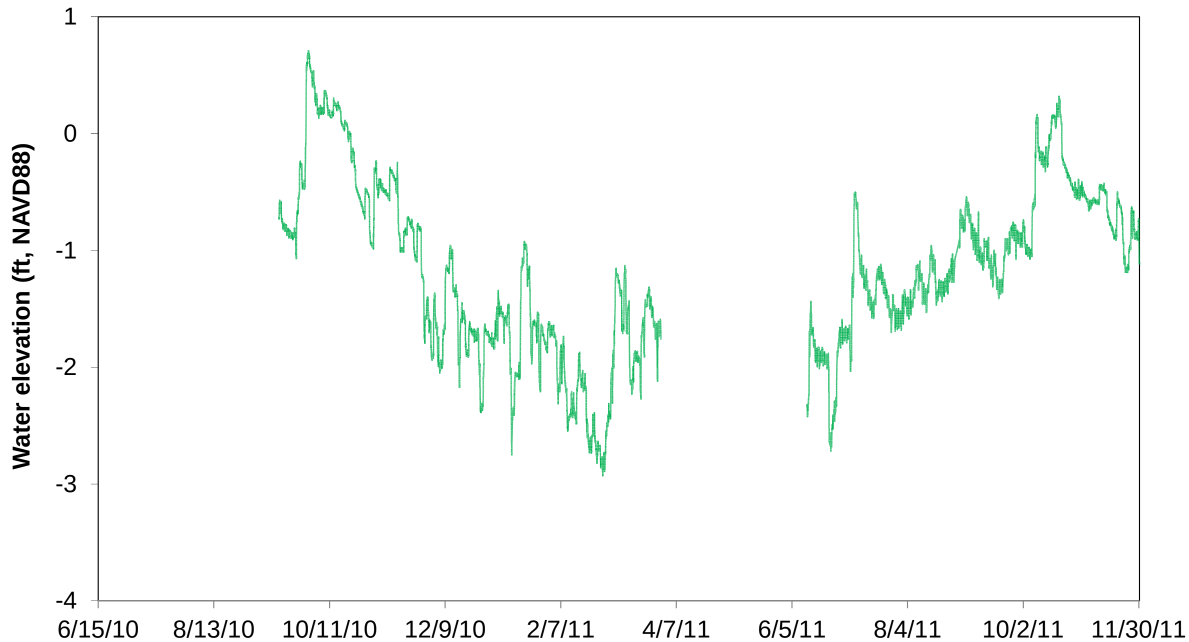


Figure 2.3-28. TPSWCCS-6 Water Elevations.

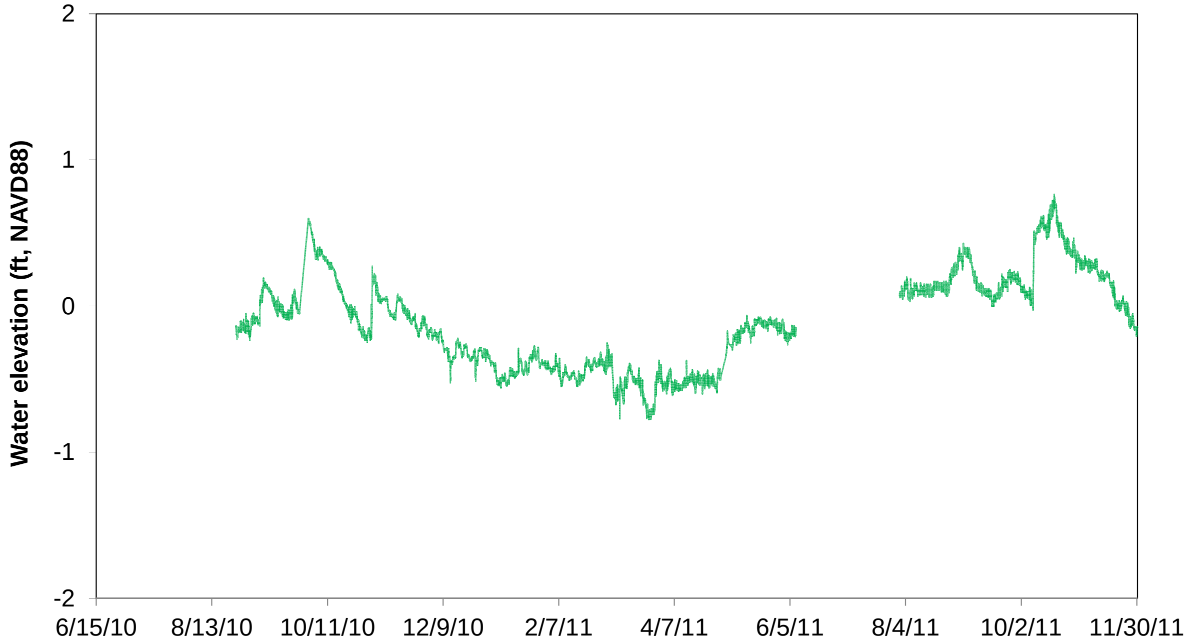


Figure 2.3-29. TPSWCCS-7 Water Elevations.

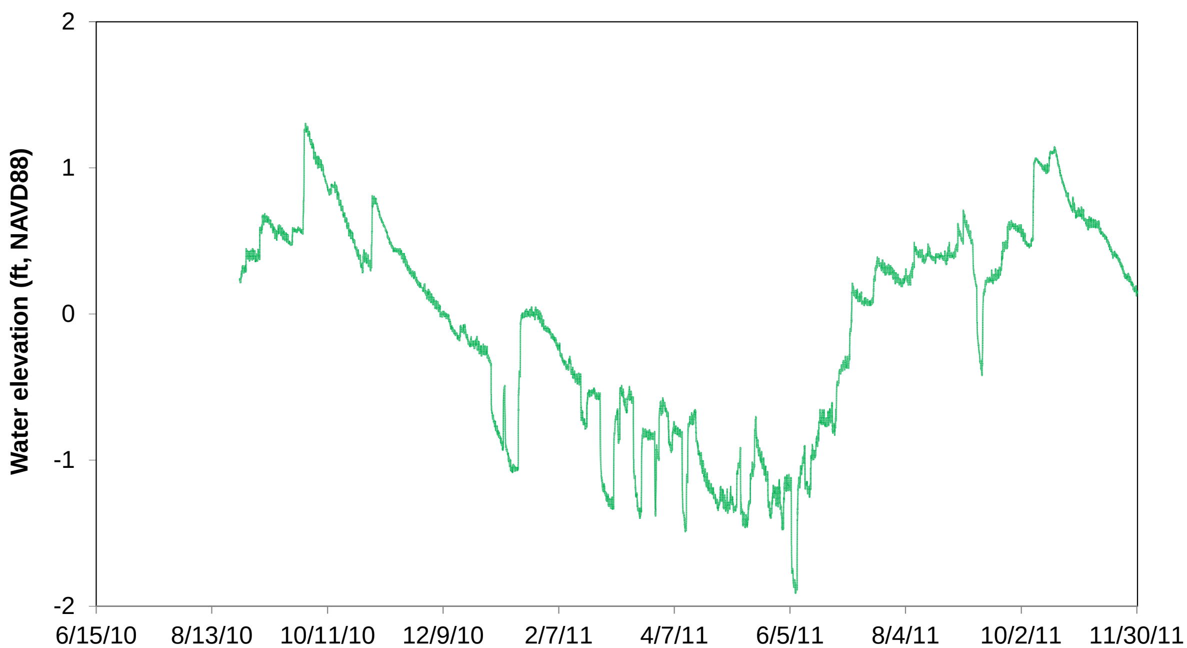


Figure 2.3-30. TPSWID-1 Water Elevations.

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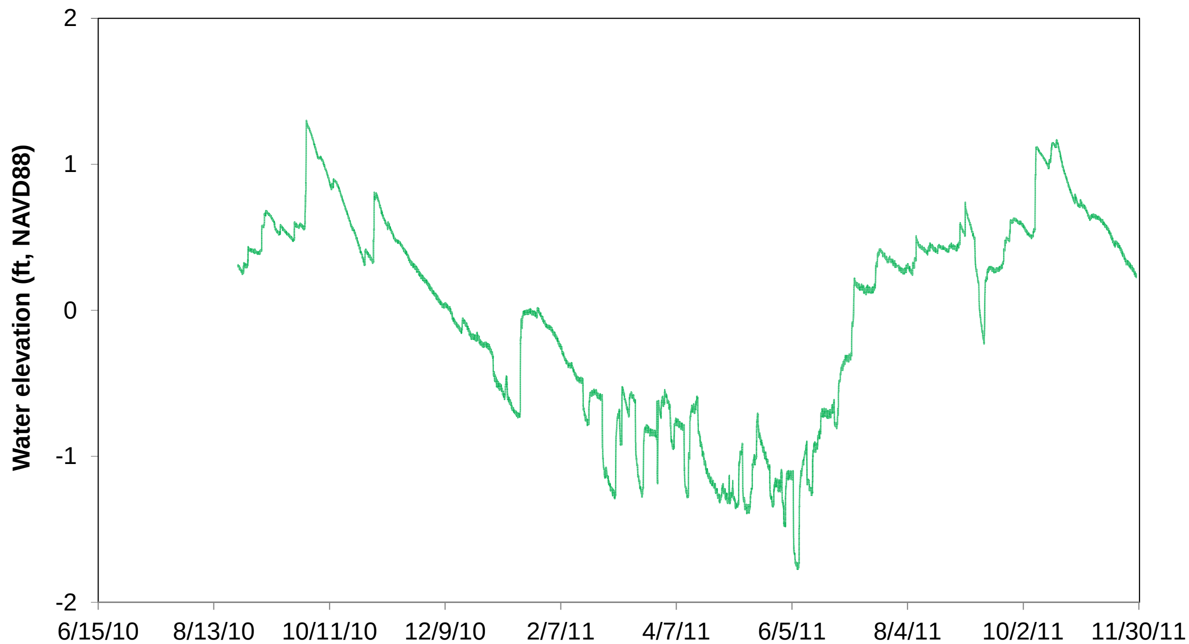


Figure 2.3-31. TPSWID-2 Water Elevations.

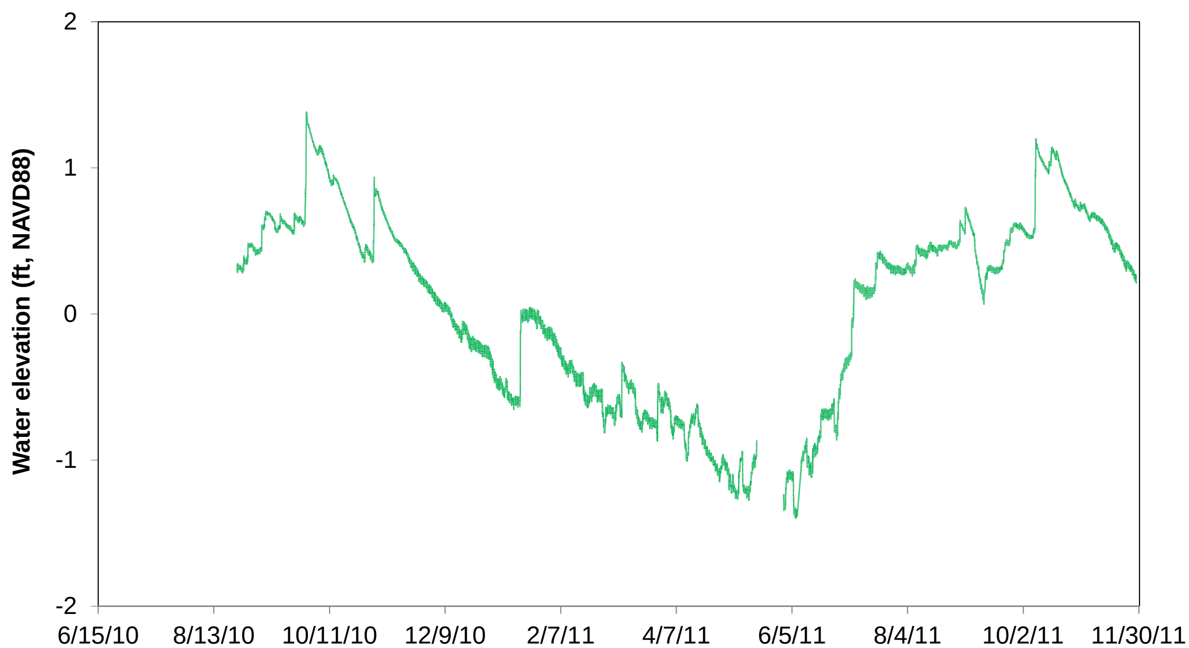


Figure 2.3-32. TPSWID-3 Water Elevations.

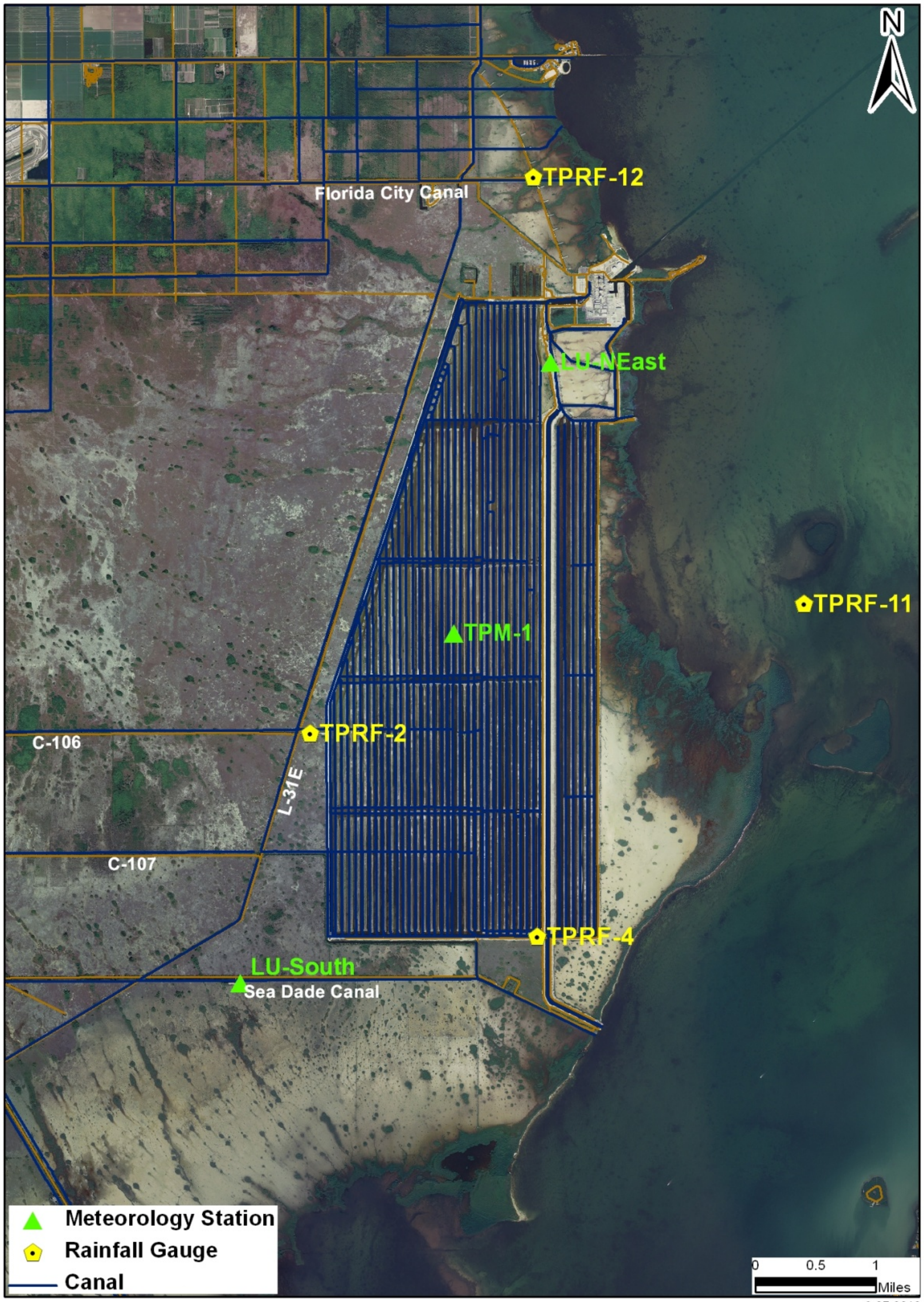


Figure 2.4-1. Locations of Meteorological Stations and Rainfall Gauges.

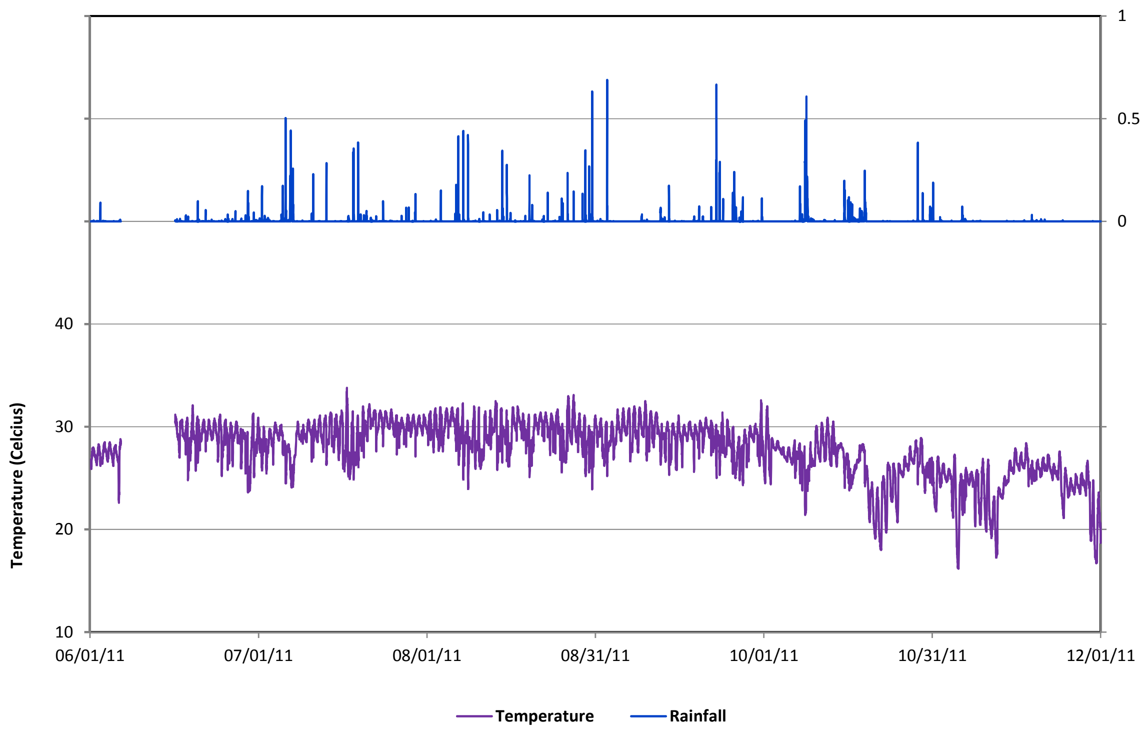


Figure 2.4-2. Time Series of Temperature and Rainfall at TPM-1.

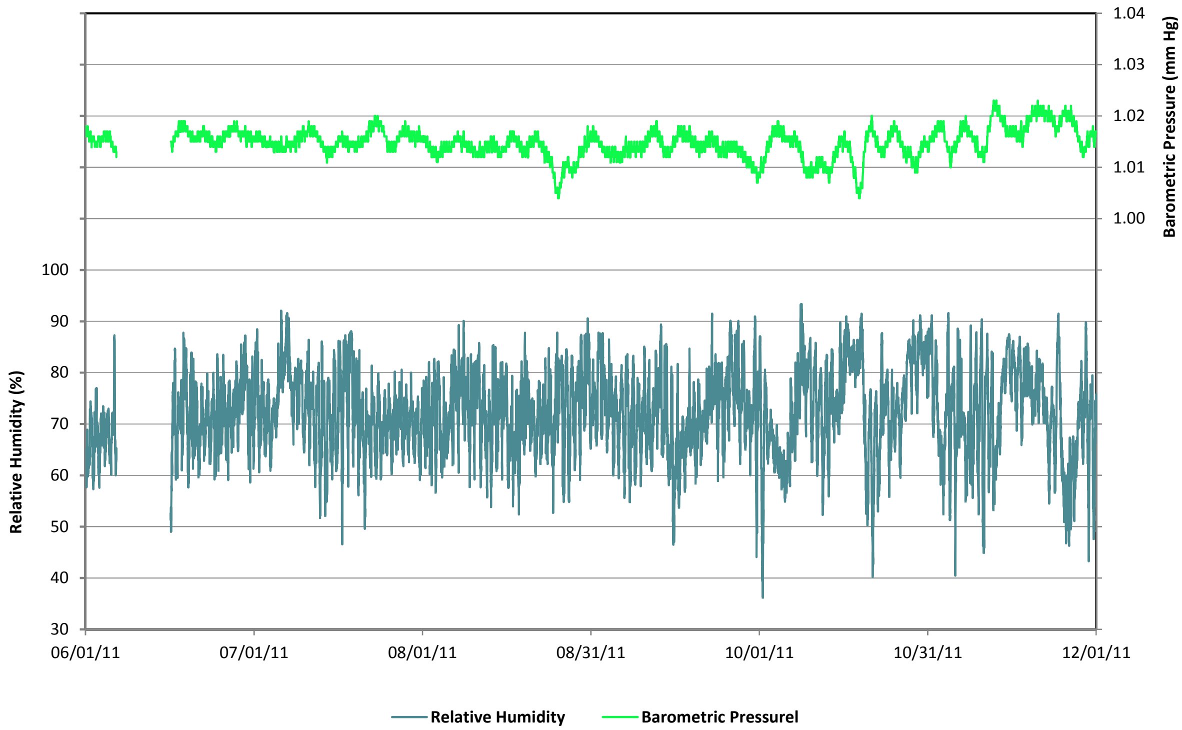


Figure 2.4-3. Time Series of Relative Humidity and Barometric Pressure at TPM-1.

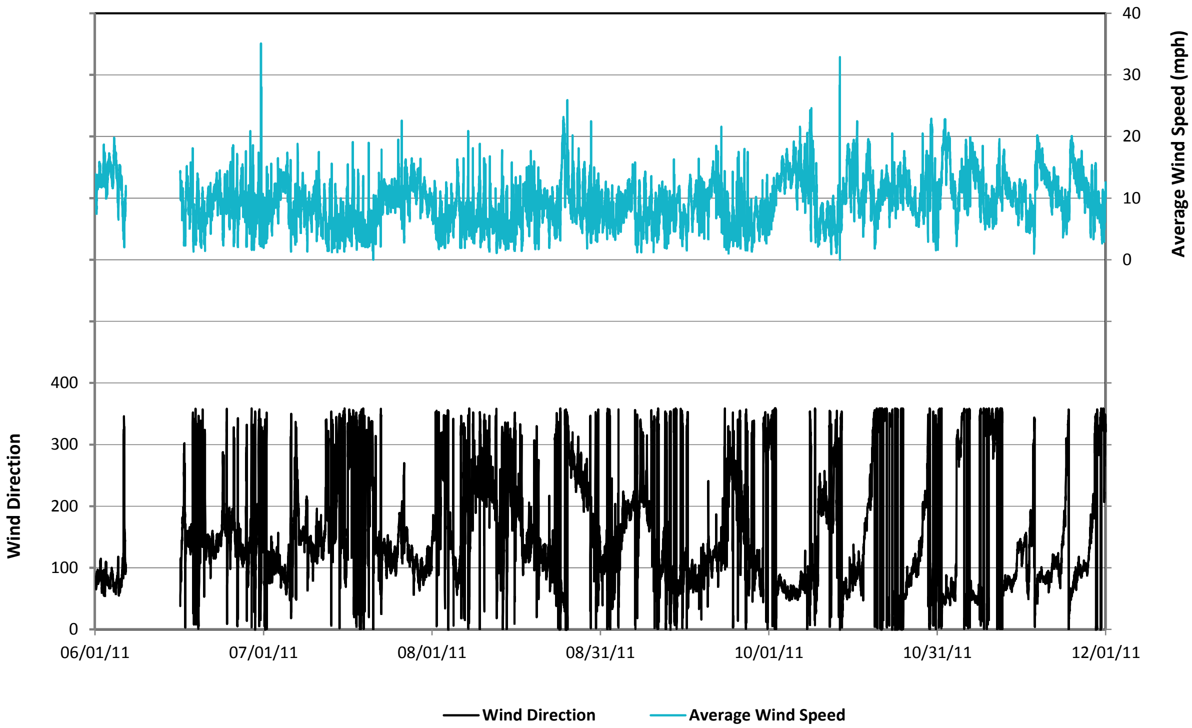


Figure 2.4-4. Time Series of Wind Direction and Average Wind Speed for TPM-1.

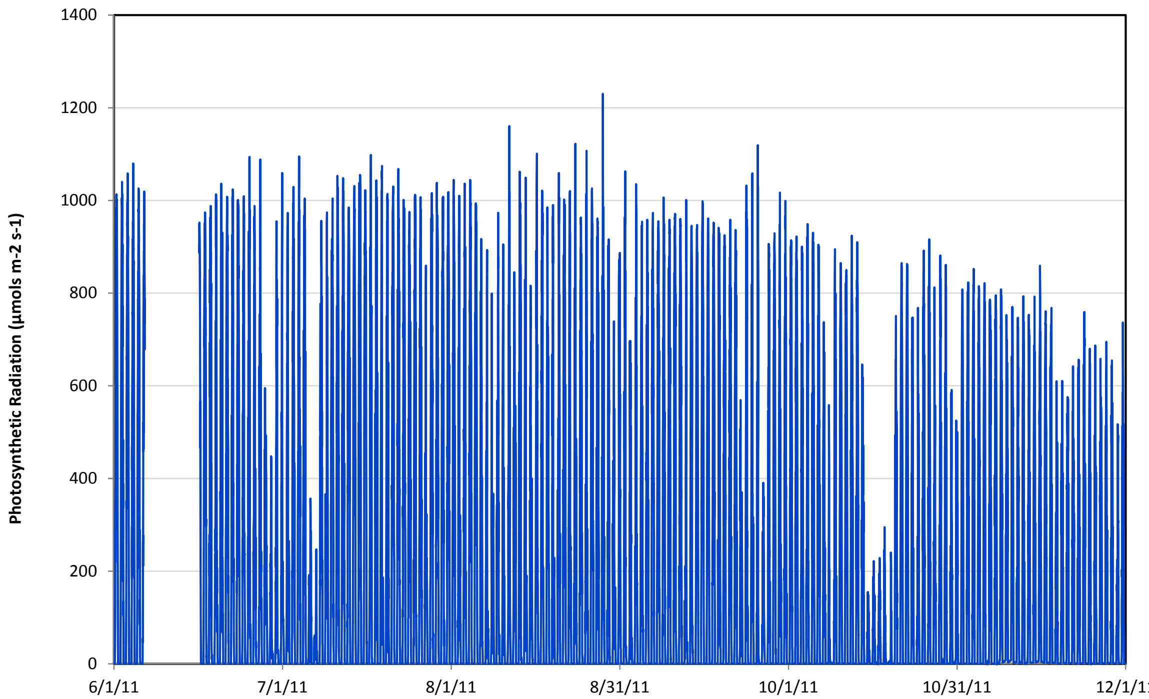


Figure 2.4-5. Time Series of Photosynthetically Active Radiation (PAR) for TPM-1.

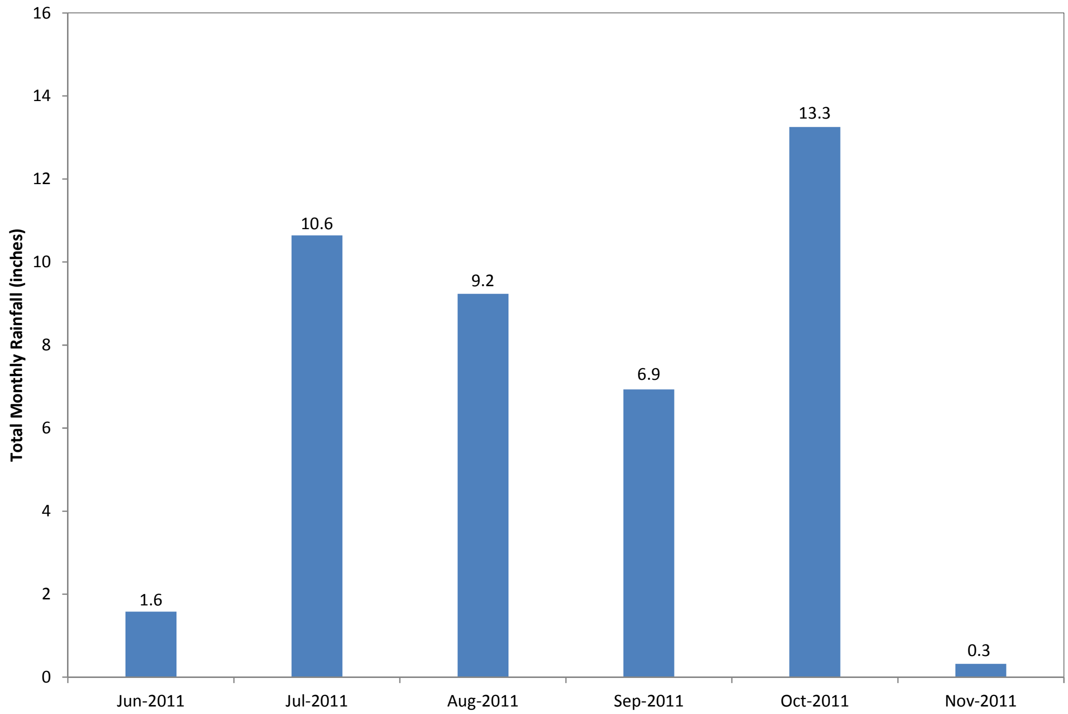


Figure 2.4-6. Monthly Rainfall at TPM-1.

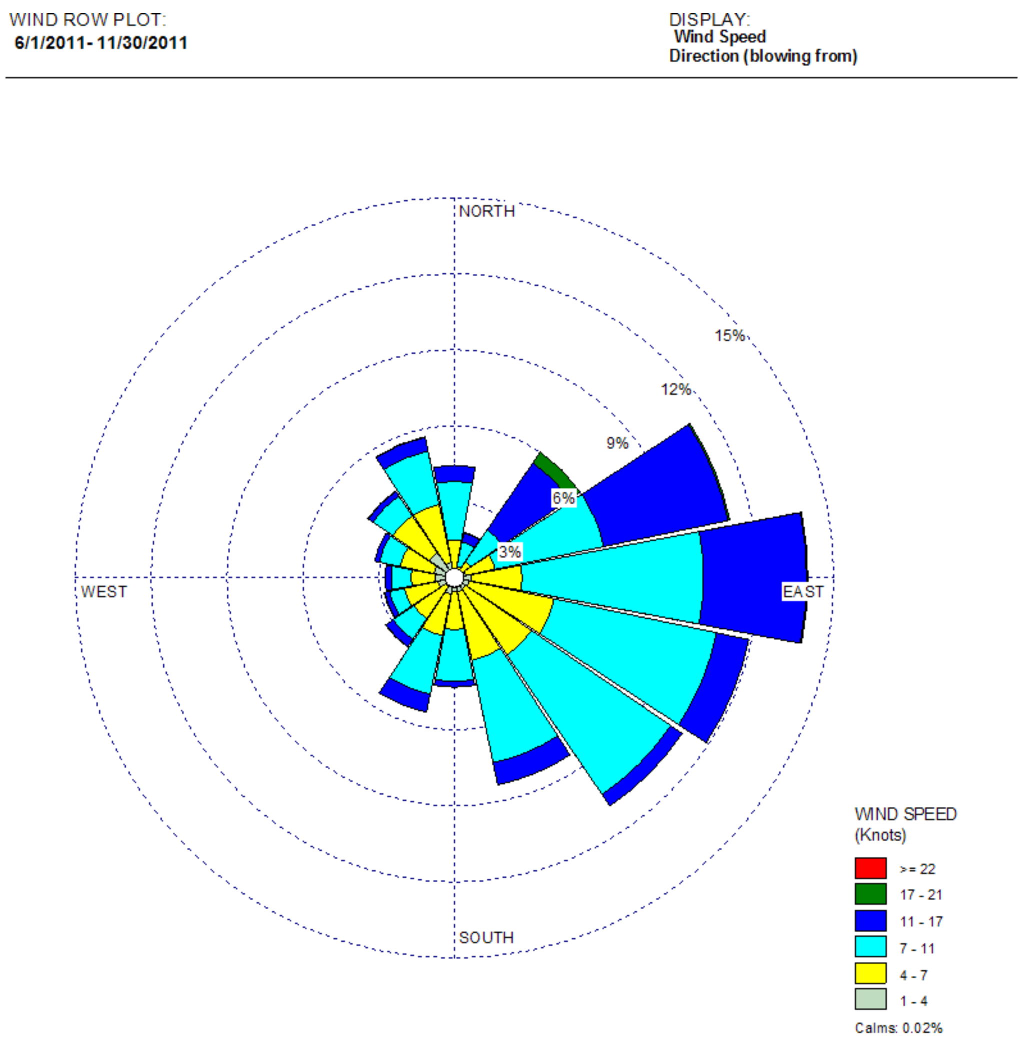


Figure 2.4-7. Wind Row Plot Indicating Wind Speed and Direction.

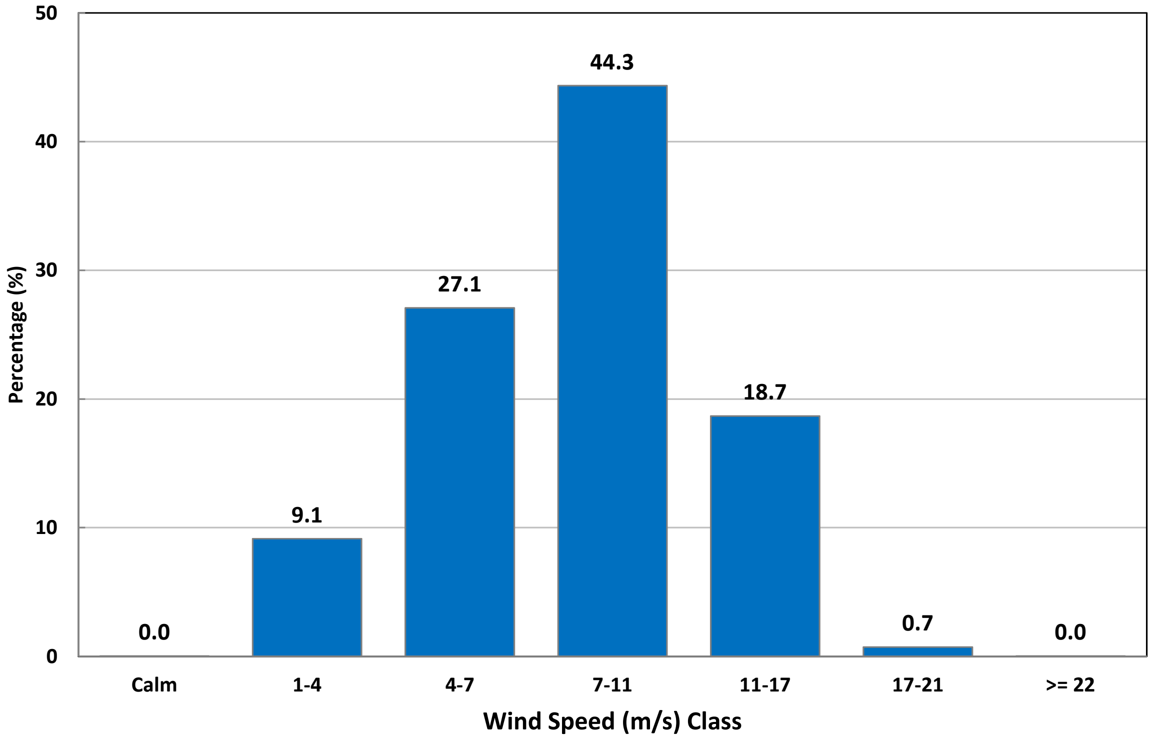
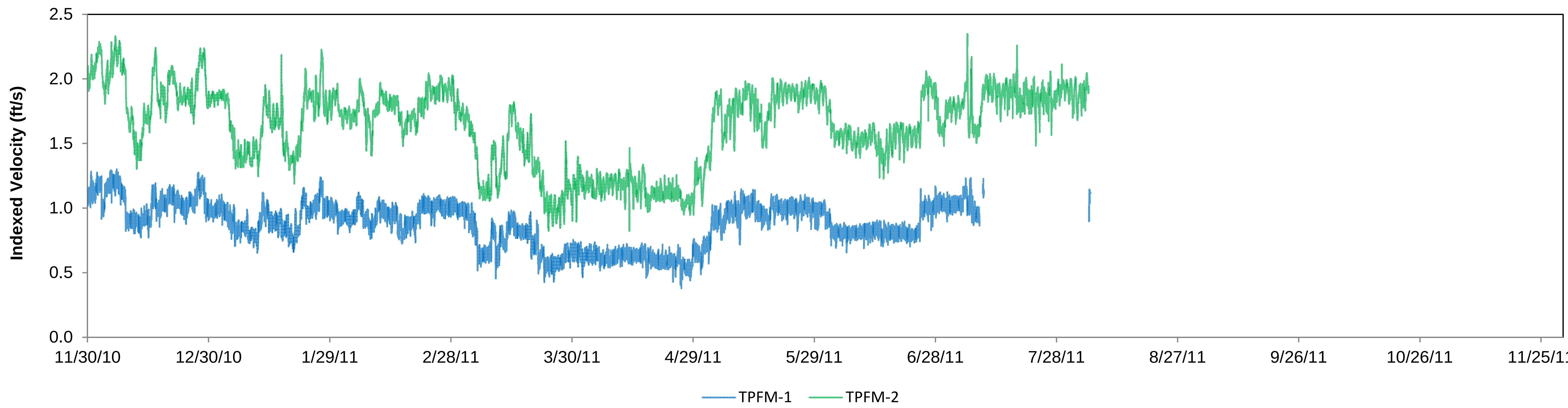


Figure 2.4-8. Wind Speed (Class) Frequency Distribution.



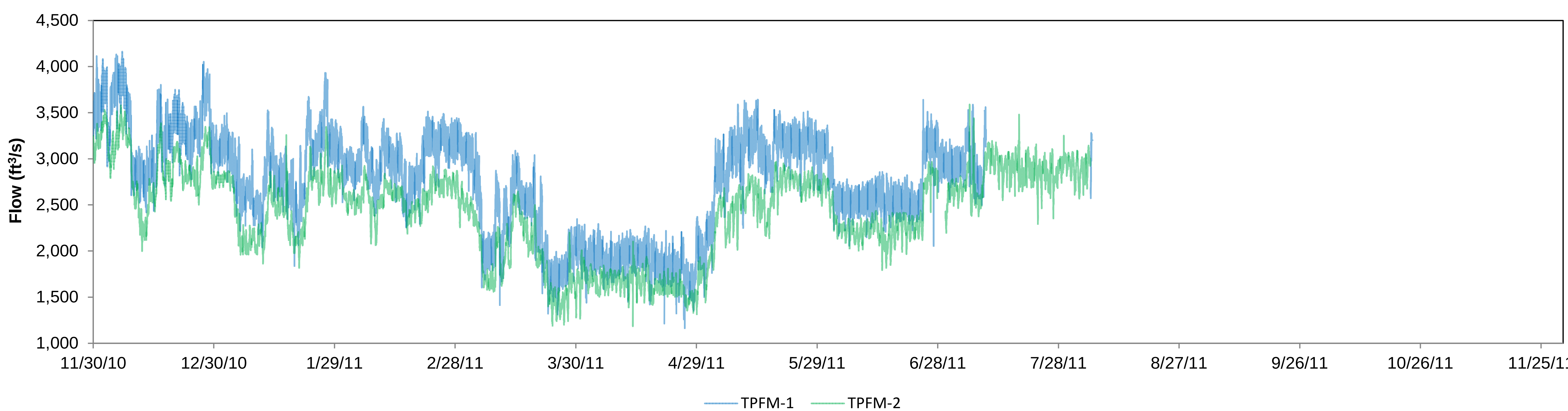


Figure 2.5-1. Indexed Velocity and Flow Rates for Flow Meter Stations TPFM-1 (Outflow from Plant into CCS) and TPFM-2 (South End of CCS).