2015

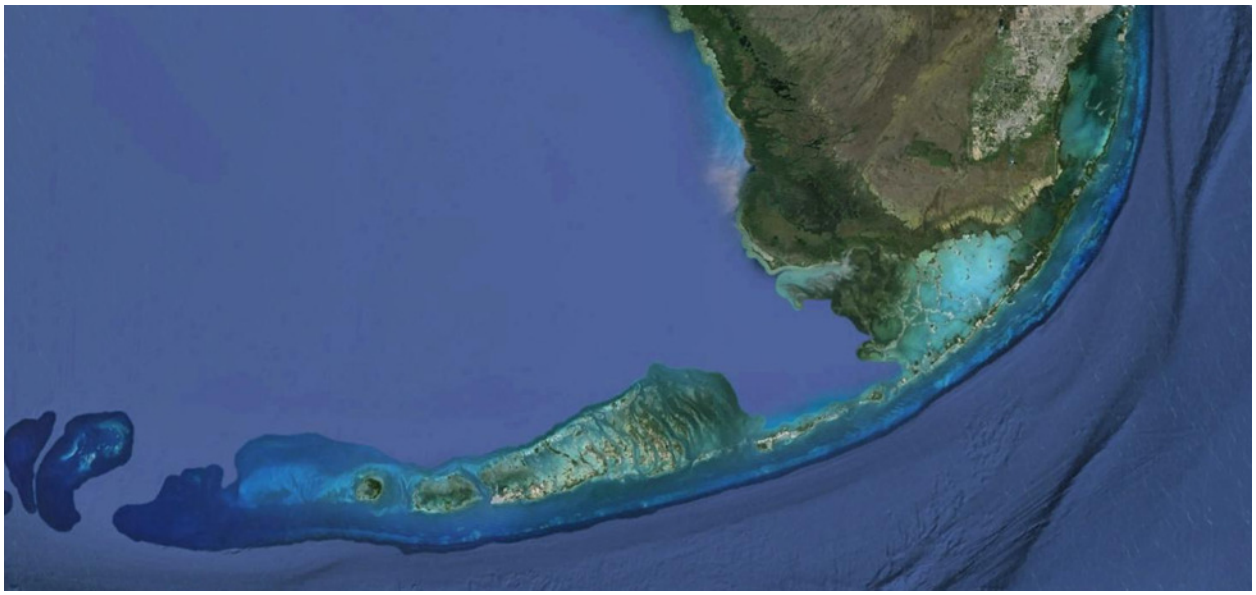
Water Quality Monitoring Project for Demonstration of Canal Remediation Methods Florida Keys- Report #1: Canal Characterization

Henry O. Briceño
Florida International University, bricenoh@fiu.edu

Alexandra Serna
Florida International University

WATER QUALITY MONITORING PROJECT FOR DEMONSTRATION OF CANAL REMEDIATION METHODS FLORIDA KEYS

Report #1: Canal Water Characterization



Henry O. Briceño & Alexandra Serna

Southeast Environmental Research Center

Florida International University

Miami, FL 33199

http://serc.fiu.edu/wqmnetwork/

This page is intentionally left blank

WATER QUALITY MONITORING PROJECT FOR DEMONSTRATION OF CANAL REMEDIATION METHODS, FLORIDA KEYS

Report #1: Canal Water Characterization

US EPA Agreement #X7 00D02412

This is contribution number 709T from the Southeast Environmental Research Center, Florida International University.

WATER QUALITY MONITORING PROJECT FOR DEMONSTRATION OF CANAL REMEDIATION METHODS, FLORIDA KEYS

Report #1: Canal Water Characterization

EXECUTIVE SUMMARY

This report serves as a summary of our efforts to date in the execution of the Water Quality Monitoring Project for Demonstration of Canal Remediation Methods, and a channel to deliver the datasets generated during field and laboratory measurements. The period of record for this report is Mar. 2014 – Dec. 2014 and includes data from two sampling events.

The objective of the project is to provide data needed to make unbiased, statistically rigorous statements about the status and temporal trends of water quality parameters in the remediated canals. The execution of the project includes two phases: 1) Characterization of canal waters before remediation; and 2) monitoring water quality changes after remediation. We have completed the phase of data collection for the Characterization stage with two measuring/sampling campaigns.

Characterization was accomplished using three data-gathering techniques, measuring vertical profiles (casts), continuous 24-hour recording (diel) of physical-chemical properties, and water sampling and analysis for nutrients. We deployed multi-sensor, water quality monitoring instruments (SeaBird CTD and YSI) to measure physicochemical parameter of at least two profiles throughout the water column at each canal, to generate depth profiles of each parameter. We also deployed pairs of YIS sondes to continuously measure physical-chemical variables of water quality during 24-hours. Finally, we collected and analyzed surface and bottom water samples.

WATER QUALITY MONITORING PROJECT FOR DEMONSTRATION OF CANAL REMEDIATION METHODS.

Introduction

The Environmental Protection Agency funded regional monitoring project, executed by Florida International University, has documentation elevated nutrient concentrations (DIN, TP and SiO2) in waters close to shore along the Keys, and corresponding responses from the system, such as higher phytoplankton biomass (CHLA), turbidity and light attenuation (Kd), as well as lower oxygenation (DO) and lower salinities of the water column. These changes, associated to human impact, have become more obvious in a new series of stations located very close to shore, near canal mouths and sampled since November 2011 (SHORE; Fig 1). These waters are part of the so called Halo Zone, a belt following the shoreline which extends up to 500 meters offshore, and whose water quality characteristics are closely related to those in canals and affected by quick movement of infiltrated runoff and wastewaters (septic tanks), tides and high water tables

Many canals do not meet the State's minimum water quality criteria and are a potential source of nutrients and other contaminants to near shore waters designated as Outstanding Florida Waters. Hence, the Monroe County Board of County Commissioners (MCBOCC) has approved the implementation of canal restoration demonstration projects whose results will be used to assess restoration costs.

The Monroe County, the Water Quality Protection Program Steering Committee and the Canal Subcommittee have selected ten (10) canals out of twenty (20) pre-selected sites, for demonstration of restoration technologies (See Summary in Table 1). The main objective of this demonstration is to obtain realistic data and costs for future restoration planning and grant application purposes (AMEC 2012). Those technologies under consideration target two fundamental problems, poor circulation (stagnation) and

accumulation of organic matter. Both, poor circulation and accumulation of organic debris, besides run-off and seepage from septic tanks, are major contributors to water quality degradation in the Florida Keys (Kruczynski, 1999), especially to the degradation of canal waters.

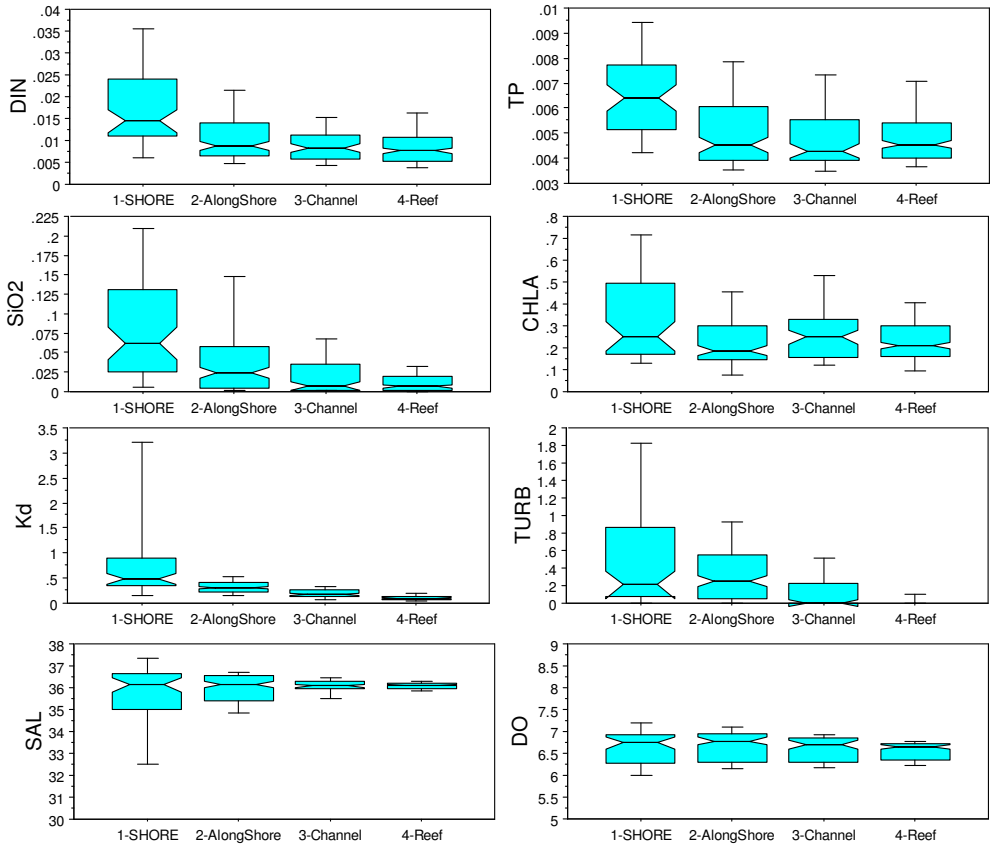


Figure 1. *Nutrient and response changes along transect from shore sites (~100 m) to reef-track*

TABLE 1. Selected Canal Demonstration Projects Monroe County (Modified after AMEC 2013)

Weed Barrier			Organic Removal	Weed Barrier & Organic Removal	Pumping	Culvert Installation		Backfilling
#137 Plantation Key Treasure Harbor	#148 Lower Matecumbe Key Mate-Lido Beach	#287 Big Pine Hollerich Subdivision	#290 Big Pine Between Ave I & J	#266 Big Pine. Dr Arm Subdivision	#278 Big Pine. Eden Pines Colony Subdivision	#277 Big Pine. Tropical Bay Subdivision	#459 Geiger. Boca Chica Ocean Shores Subdivision	#29 Key Largo Sexton Cove Estates Subdivision
							#472 Geiger. Geiger Mobile Homes Subdivision	
#132 Plantation Key	**#147 Matecumbe K**	**#293 Big Pine**			**#282 Big Pine**		**#458 Geiger**	**# 28 Key Largo**

Control canals highlighted in yellow

Proposed Remediation Technologies

The restoration technologies proposed for canal restoration demonstration are as follows:

- Reductions in weed wrack loading (using bubble curtains, weed gates or other methods)
- Enhanced circulation (using culverts, pumps, or other means) to reduce hydraulic residence times and eliminate areas of water column stagnation
- Removal of accumulated organic sediments, in areas where the sediments are contributing to the development of phytoplankton blooms, bottom-water hypoxia and excessive hydrogen sulfide production; and
- Backfilling to reduce canal depth, in areas where excessive depth is contributing to poor circulation, bottom-water hypoxia, and other canal management issues.

Selected Management goals

The Canal Subcommittee identified the following goals in their April 27, 2012 meeting, considered in the *Monroe County Canal Master Plan Phase 1, Summary Report* (AMEC Environments and Structure; June 2012). First, Restore and maintain water quality conditions in canal systems to levels that are consistent with the State's current water quality criteria for Class III waters; second, install cost-effective barriers to prevent or substantially reduce weed wrack inputs from near shore waters to avoid eutrophication and/or hypoxia; third, to reduce or prevent the incidence of anoxia, problematic sulfide levels and sediment toxicity in canals; fourth, protect aquatic and benthic canal habitats that currently support native flora and fauna; and fifth, create and maintain a constituency of informed, involved citizens who understand the environmental and economic issues involved in managing manmade canal systems

Monitoring Objectives

The general objective of water quality monitoring for the demonstration canals is to measure the status and trends of water quality parameters to evaluate progress toward achieving and maintaining water quality standards and protecting/restoring the living marine resources of the Sanctuary, and to objectively compare diverse restoration methodologies used in the demonstration. The major tasks for this project include: logistical planning, field measurements, water sampling, laboratory analysis, data management, data analysis, interpretation and reporting, and participation in science and management meetings related to remediation and water quality of the Florida Keys canals

Specific objectives are as follows:

- To provide data needed to make unbiased, statistically rigorous statements about the status and temporal trends of water quality parameters in the remediated canals
- To inform management actions and policy development processes for improved water quality in the Sanctuary.

Conceptual Guidelines to Canal Monitoring

Monitoring is defined as the continued observation of the selected canal waters to determine spatial and temporal variability in water quality. Monitoring involves systematic, long-term data collection and analysis to measure the status of water quality and to detect changes over time. Detecting and quantifying such changes at each specific canal, subjected to a specific remediation methodology (Table 1), can focus research on quantifying and qualifying those changes to evaluate the success of corrective ACTIONS (Table 2). As shown in Table 2, each ACTION (Reduce Weed Wrack, Culvert Installation, Removal of Organic Sediments and Backfilling) is expected to lead to the achievement of some desired GOALS established as landmarks by the Canal Subcommittee. Reaching or approaching these GOALS entail important CONSEQUENCES in the canal conditions responding to CHANGES occurring in the water column, and if such changes were to occur, we can detect and quantify them using our analytical toolkit and INDEXES or indicators of environmental conditions (Doren et al 2009).

Let us use the Reduction of Weed Wrack as example of ACTION in Table 2 to lay down the scientific rationale behind the proposed monitoring strategy. If in fact this ACTION leads towards the desired GOALS (Reduce Organic Matter Load) foreseen by the Canal Sub-Committee, it is because some changes with hypothesized CONSEQUENCES occurred in the canal system. That is, dissolved and particulate organic matter (DOM & POM) and nutrient concentrations must decline, while the decomposer bacteria community, which thrives on organic matter, changed in abundance and/or structure.

Table 2. Conceptual model guidelines

ACTION	GOAL	CONSEQUENCES	EXPECTED CHANGE	INDEX TOOLKIT
Reduce Weed Wrack Loading	Reduce Organic Matter Load	DOM, POM and Nutrients decline. Decomposer Bacteria change	P declines N declines BOD declines CHLa declines DO increases DOM changes Stratification Bacteria type	P N BOD, TOC CHLa; Phyto-PAN DO & %DO sat DOM; Parafac CTD cast profiles qPCR

ACTION	GOAL	CONSEQUENCES	EXPECTED CHANGE	INDEX TOOLKIT
Installation of culverts	Reduce flushing time. Increase water circulation	Mixing increases Stratification declines Nutrient load declines Benthic community changes	P declines N declines BOD declines CHLa declines DO increases DOM changes Stratification Bacteria type Turbidity declines Salinity changes	Kd P N BOD, TOC CHLa; Phyto-PAN DO & %DO sat DOM; Parafax CTD cast profiles qPCR

ACTION	GOAL	CONSEQUENCES	EXPECTED CHANGE	INDEX TOOLKIT
Organic Sediment Removal	Reduce benthic flux & hypoxia Reduce chemical stratification	DOM and POM reduction Oxygen demands (organic /chemical) decline Hydrogen sulfide declines	P declines N declines BOD declines CHLa declines DO increases DOM changes H2S generation Stratification Bacteria type Turbidity declines Salinity changes	Kd P N BOD, TOC CHLa; Phyto-PAN DO & %DO sat DOM; Parafax CTD cast profiles qPCR H2S pH

ACTION	GOAL	CONSEQUENCES	EXPECTED CHANGE	INDEX TOOLKIT
Backfilling	Reduce excessive depth to improve circulation and reduce hypoxia	Stratification declines Oxygenation improves Hydrogen sulfide reduced	Light penetration P declines N declines BOD declines CHLa declines DO increases DOM changes H2S generation Stratification Bacteria type Turbidity declines Salinity changes	Kd P N BOD, TOC CHLa; Phyto-PAN DO & %DO sat DOM; Parafax CTD cast profiles qPCR H2S pH Redox

These transformations would be manifested as a series of EXPECTED CHANGES in the water column as follows: phosphorous, nitrogen, carbon and silica species in water would decline limiting potential biota productivity. This, in turn, would lead to lower concentrations of phytoplankton biomass (CHLa) and lower rates of biological oxygen consumption or demand (BOD). These would immediately cascade into higher dissolved oxygen (DO) concentrations and higher DO % saturations in the water column, as well as changes in the previously stratified water column. New types and assemblages of bacteria adapted to this new set of conditions in the water column would result. Then, if those changes were to occur, we have a wide gamut of tools (INDEXES) to detect and quantify such changes, among them, nutrient concentrations (N, P, C and SiO2), biological oxygen demand (BOD), chlorophyll a (CHLa) concentration and sources determined with Pulse-Amplitude-Modulation (PAM) analyzer (differentiates pigments produced by phytoplankton components, such as diatoms, cyanobacteria and dinoflagellates).

Additionally, concentration of dissolved organic matter (DOM) and its types may be determined by Parallel Factor Analysis (Parafac) to separate DOM into terrestrial humic-like, microbial-derived humic-like, and protein-like components; and, if deemed appropriate, the source of fecal colliforms present in the water column may be discriminated with Quantitative Polymerase Chain Reaction (qPCR) assays for microbial source tracking of fecal contamination from bird, dog, or human sources. Finally a simple way to determine water column conditions and stratification is by using sondes to capture a series of CTD casts of continuous water quality profiles. Similar detailed analysis was performed for the rest of proposed ACTIONS as shown in Table 2, to finally consolidate the Conceptual Monitoring Design as presented in Figure 2.

Characterization of Water quality in the Demonstration Canals

The monitoring experiment has been conceptually conceived as a Before–and-After Control-Impact Design with multiple sites (BACI experiment; Green, 1979; Smith, 2002). This design (Table 2) entails the collection of data prior to the remediation activity (ACTION) in several sites within the canal to compare with data after remediation. The impact areas (remediated canals) are paired and compared to another canal (non-remediated canal), which is referred to as the control or reference canal. Selected canals for remediation and the proposed control canals are presented in Table 1. Physical-chemical properties of the water column were measured, and water samples were collected and analyzed following previous experience characterizing and monitoring canal WQ in Little Venice, Marathon (Briceño and Boyer 2009)

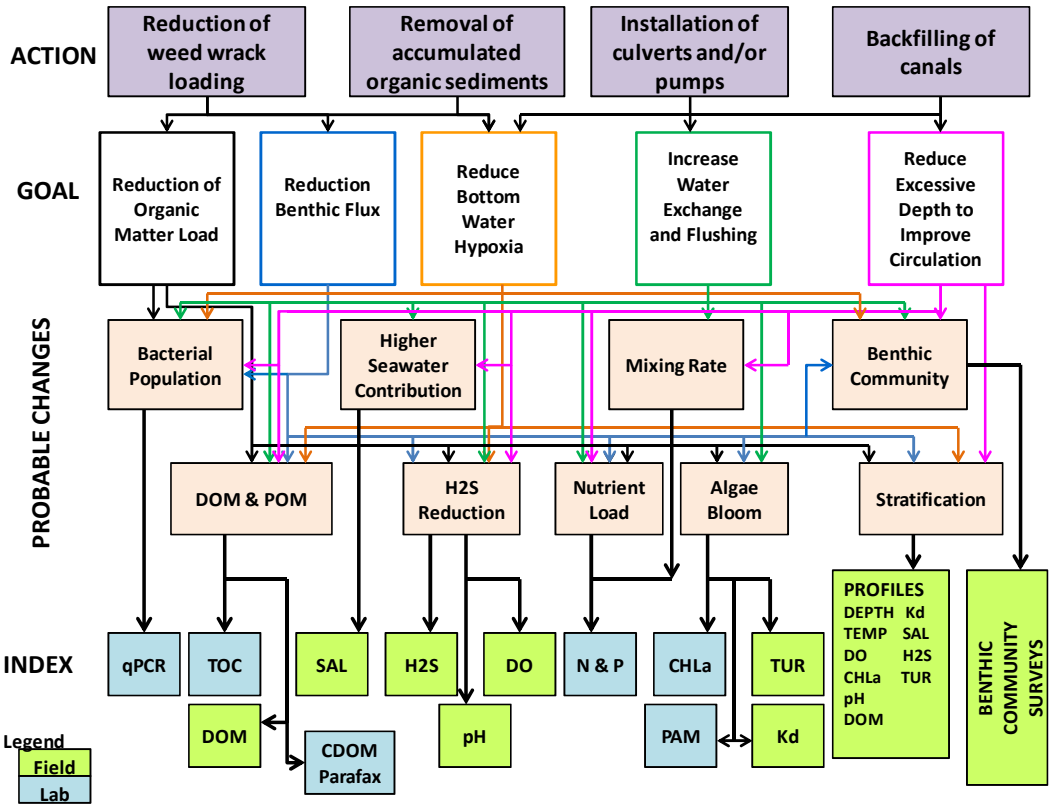


Figure 2. Conceptual Monitoring Design

Results of Characterization of Canal Waters

Characterization was accomplished using three data-gathering techniques from the toolkit, vertical profiles, continuous 24-hour recording (diel) of physical-chemical properties, and water sampling and analysis for nutrients. We deployed multi-sensor, water quality monitoring instruments (SeaBird CTD and YSI; Fig 3) to measure physicochemical parameter of at least two profiles throughout the water column, to generate depth profiles of each parameter.

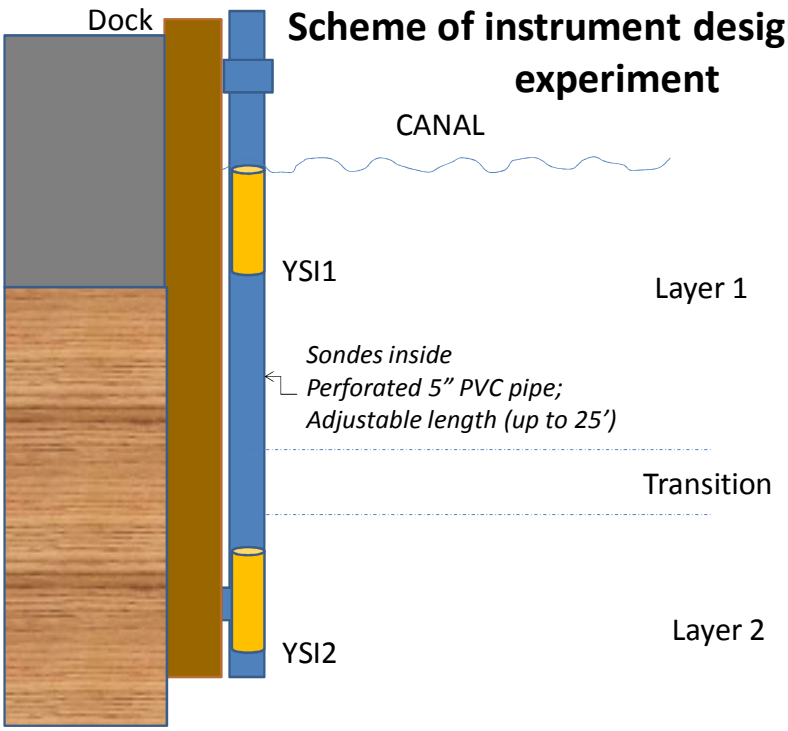
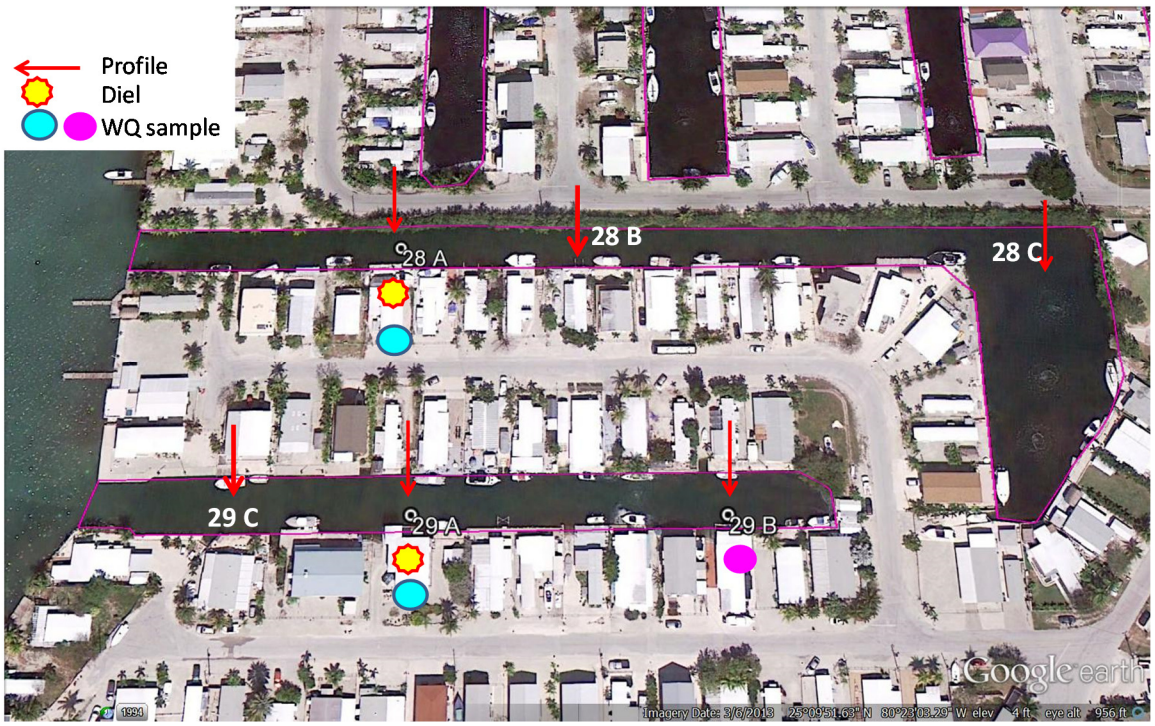
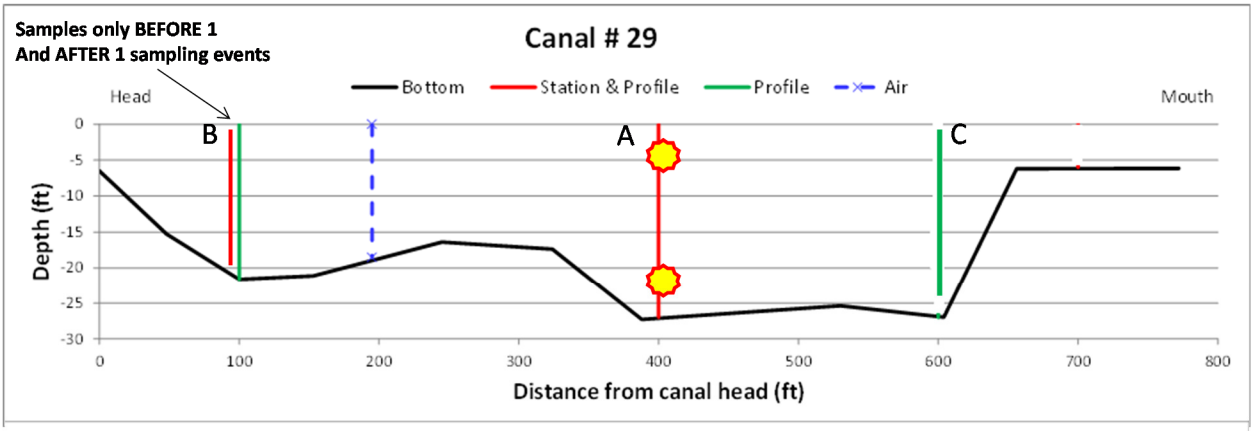


Figure 3: Placement of YSI sondes for capturing physical-chemical properties of water column in Florida Keys canals. YSI are inside PVC pipe clamped to wooden piling

Sites were selected at each canal after considerations of preliminary water quality (AMEC) and canal cross-sections (Figure 4 to 15). The measured physicochemical parameters included depth (m), salinity (PSU), specific conductivity, temperature (°C),

dissolved oxygen (DO in mg l^{-1}), %DO Saturation, PAR (µE m^{-2} s^{-1}), pH, turbidity and in situ chromophoric dissolved organic matter (CDOM) fluorescence. The light extinction coefficient (k_d in m^{-1}) was calculated as a log function from PAR measurements through the water column.





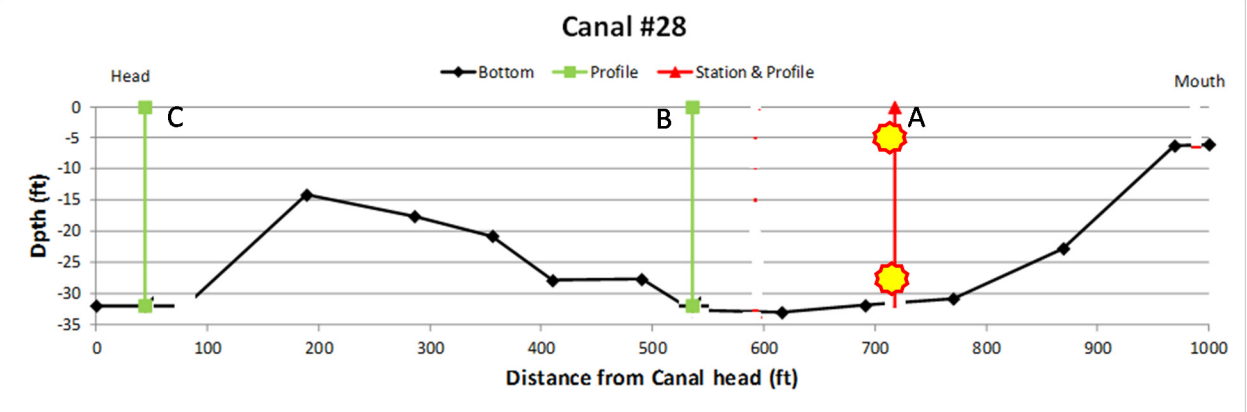
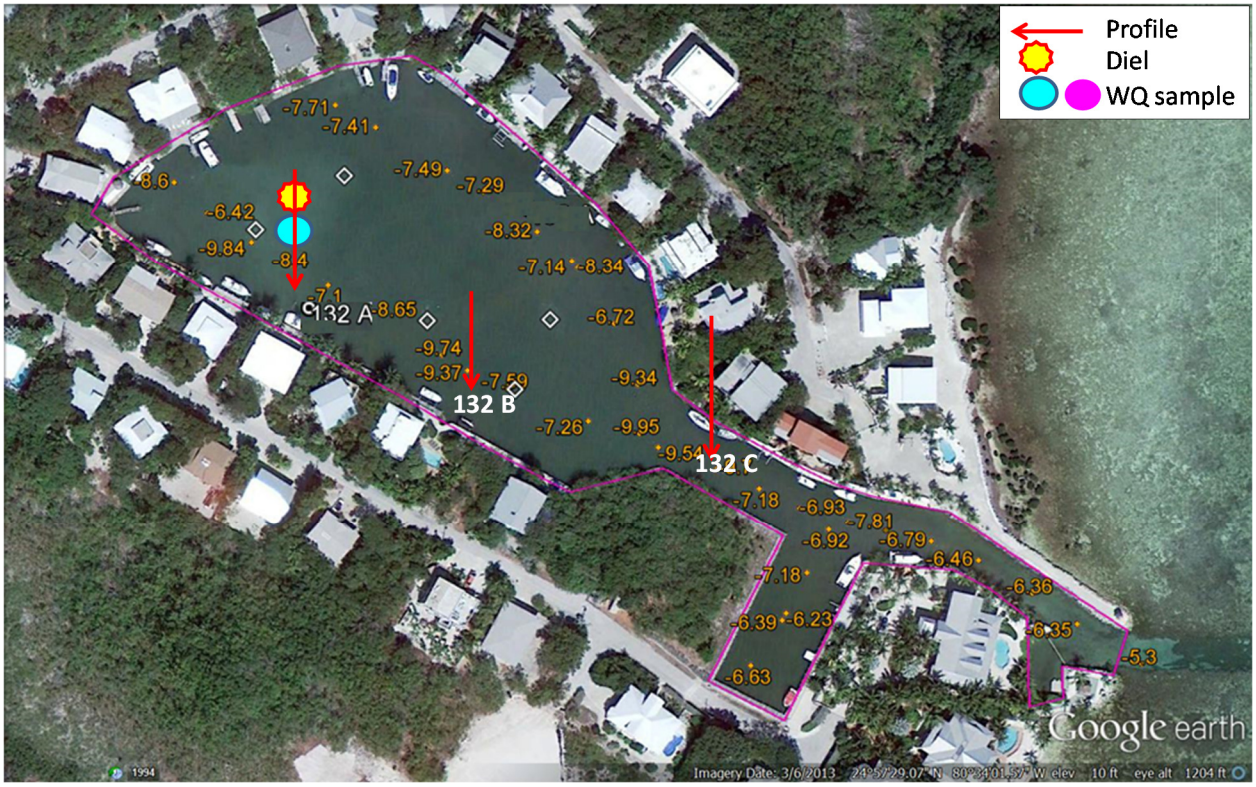


Figure 4: Canals #28 and #29 and their cross-sections, Sexton Cove, Key Largo. Location of verticals for profiles and diel, as well as sample location sites (red)



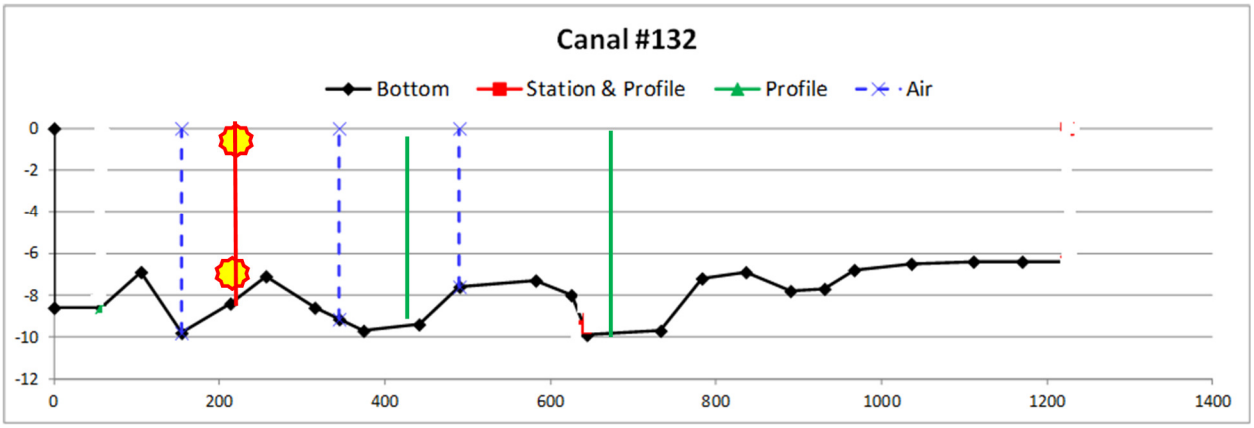
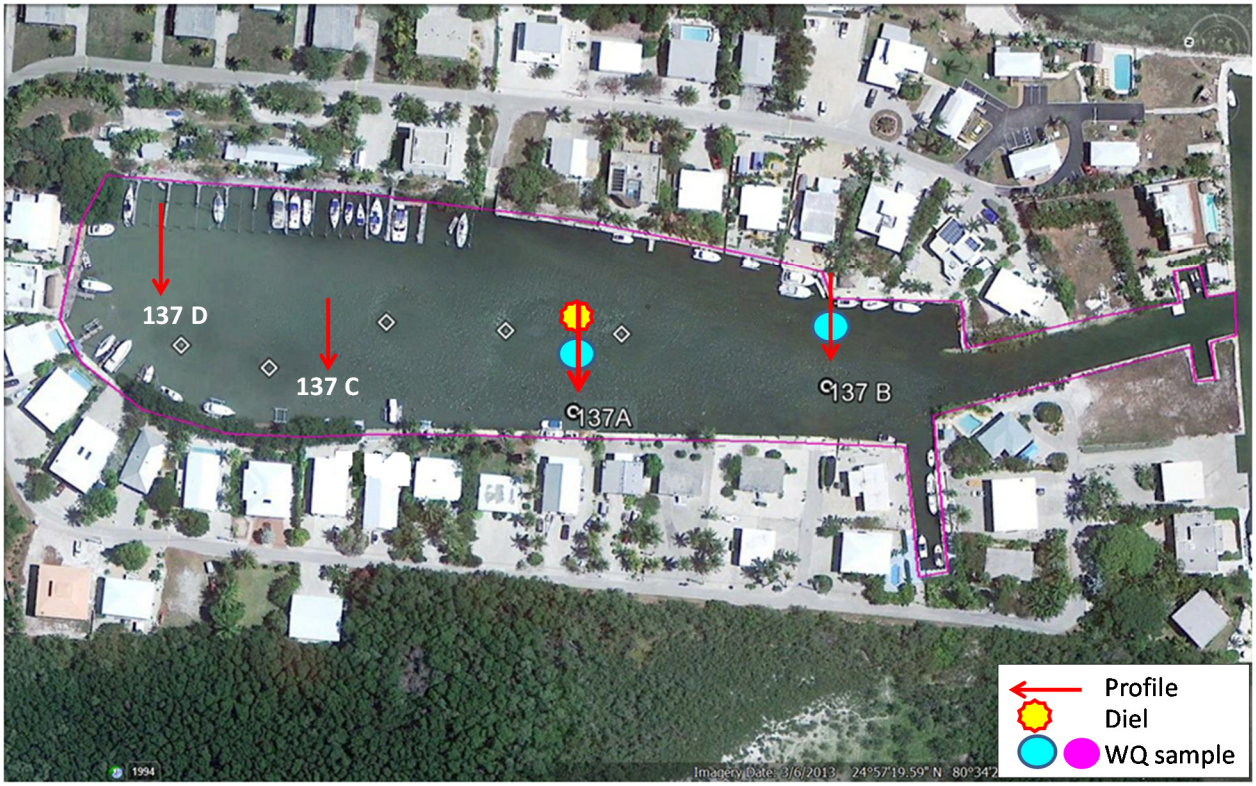


Figure 5: Control Canal #132 and its cross-section, located at Treasure Harbor, Plantation Key



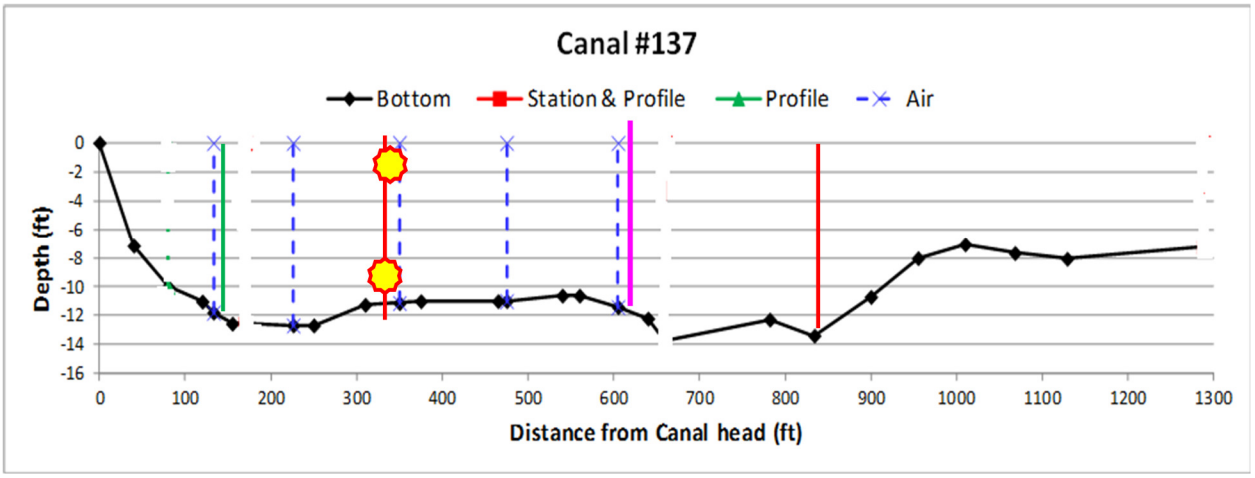


Figure 6: Canal #137 and its cross-section, located at Treasure Harbor, Plantation Key.

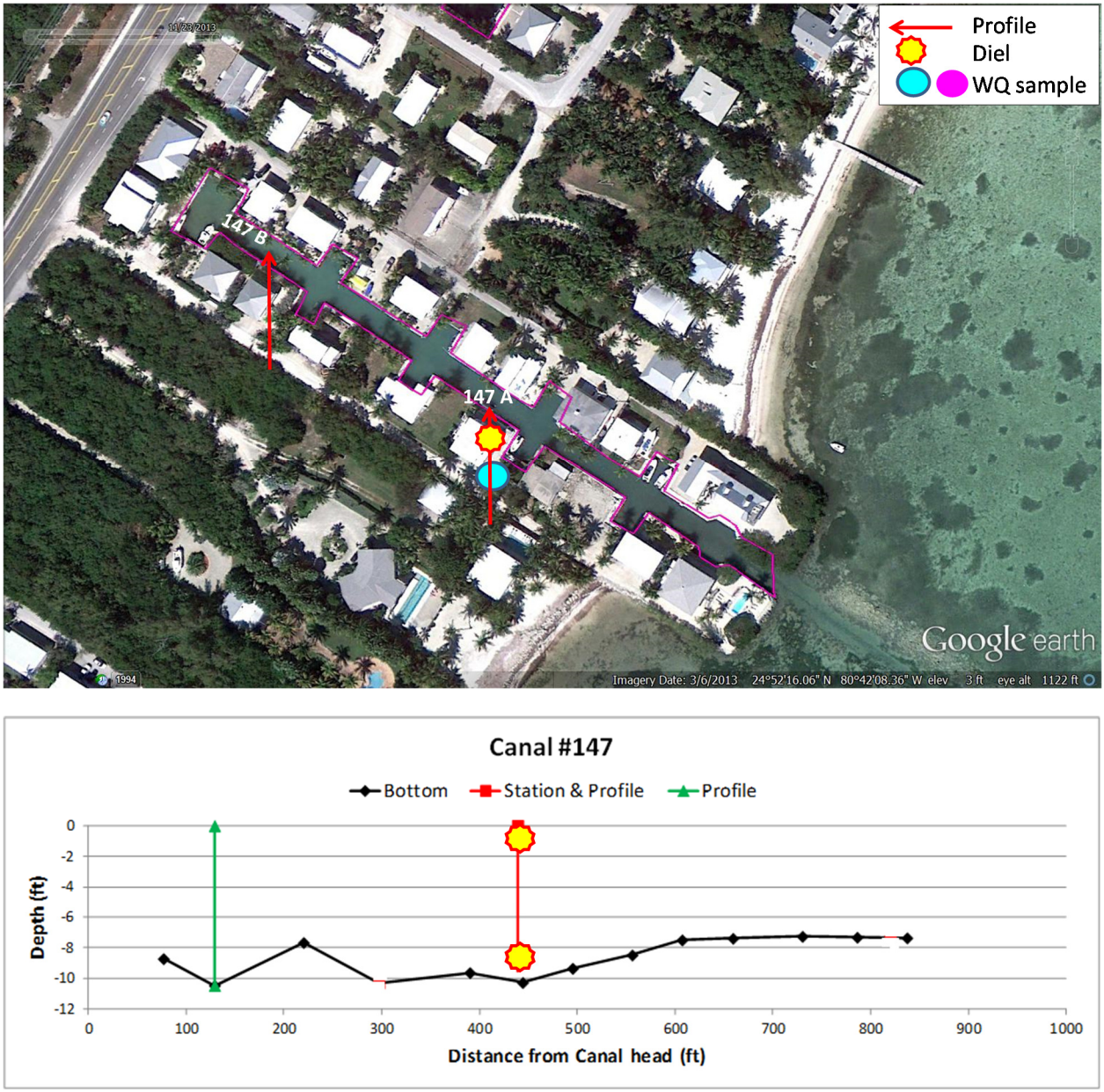


Figure 7: Canal #147 and its cross-section, located at Mate Lido Beach, Matecumbe Key.

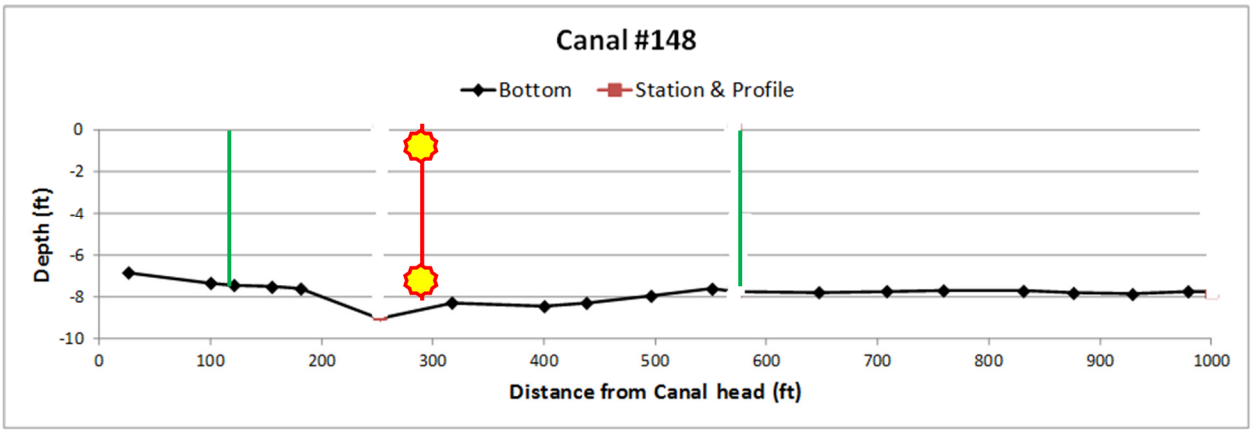
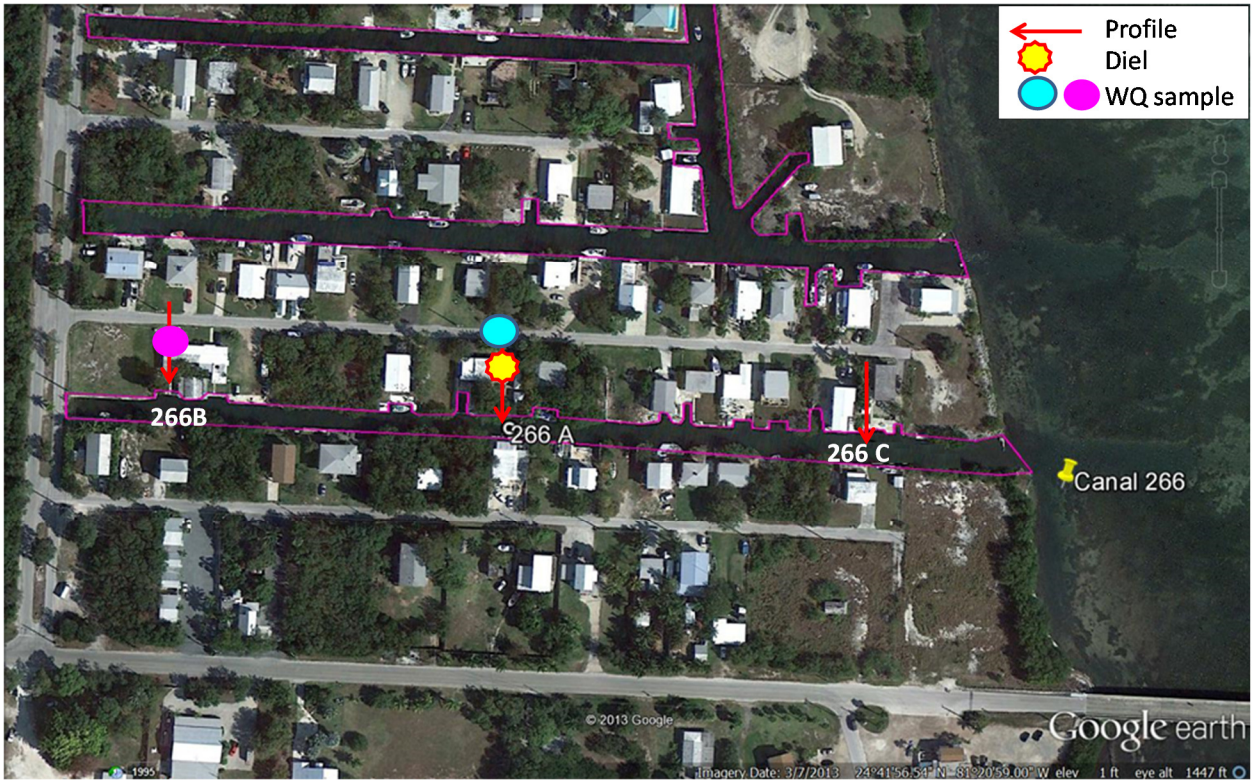


Figure 8: Control Canal #148 and its cross-section, located at Mate Lido Beach, Matecumbe Key.



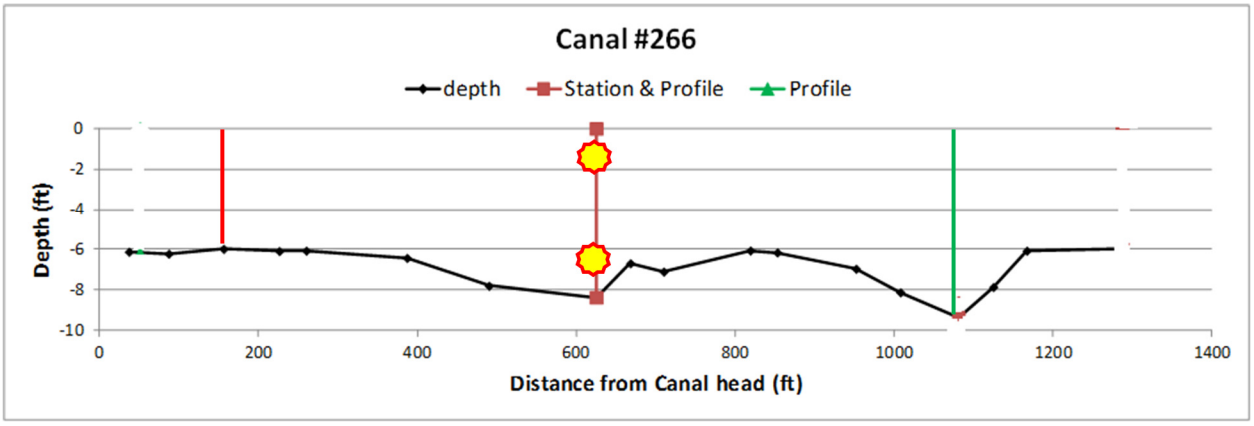


Figure 9: Canal #266 and its cross-section, located at Dr. Arm Subdivision, Big Pine Key.

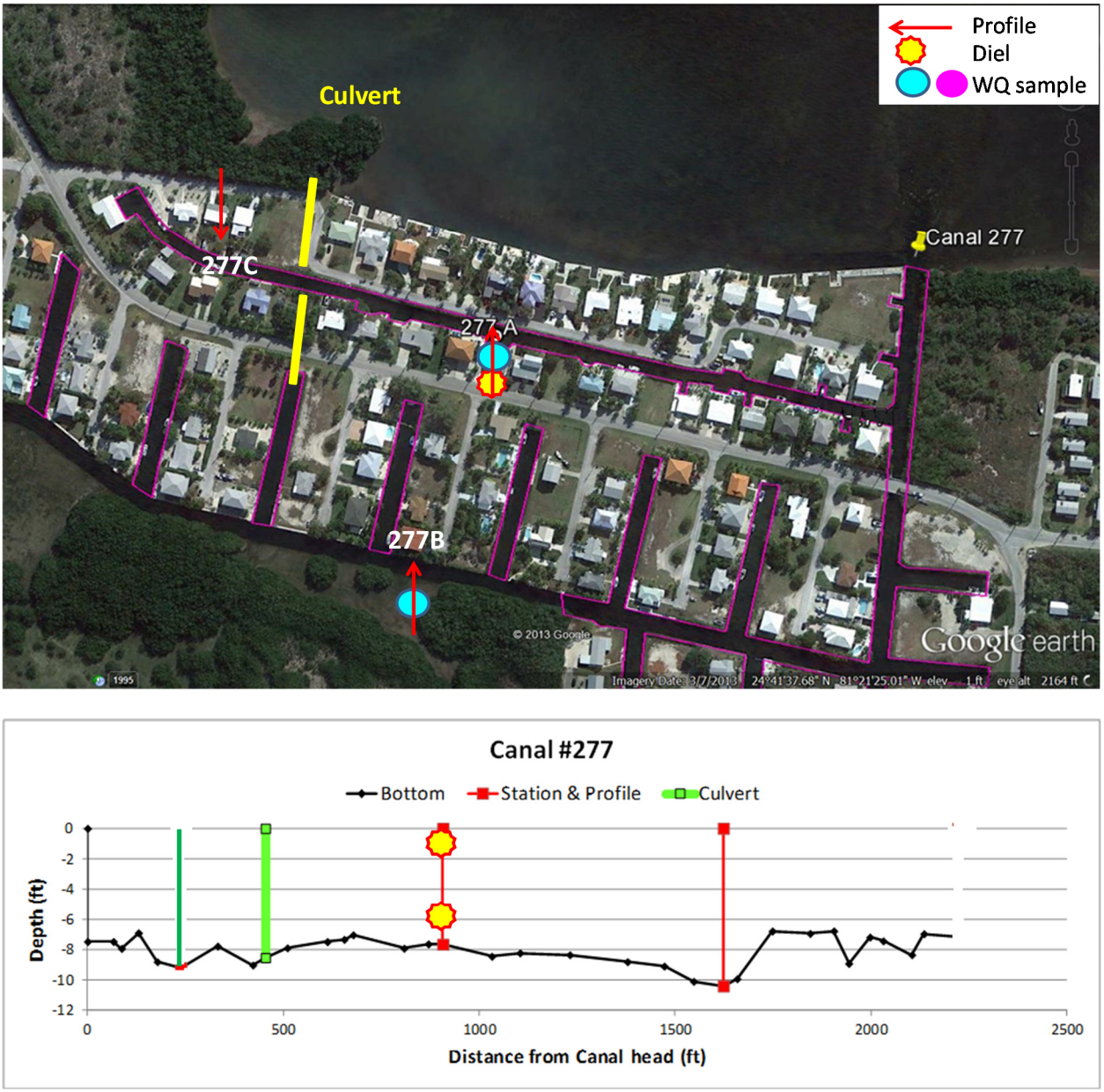


Figure 10: Canal #277 and its cross-section, located at Tropical Bay Subdivision, Big Pine Key.

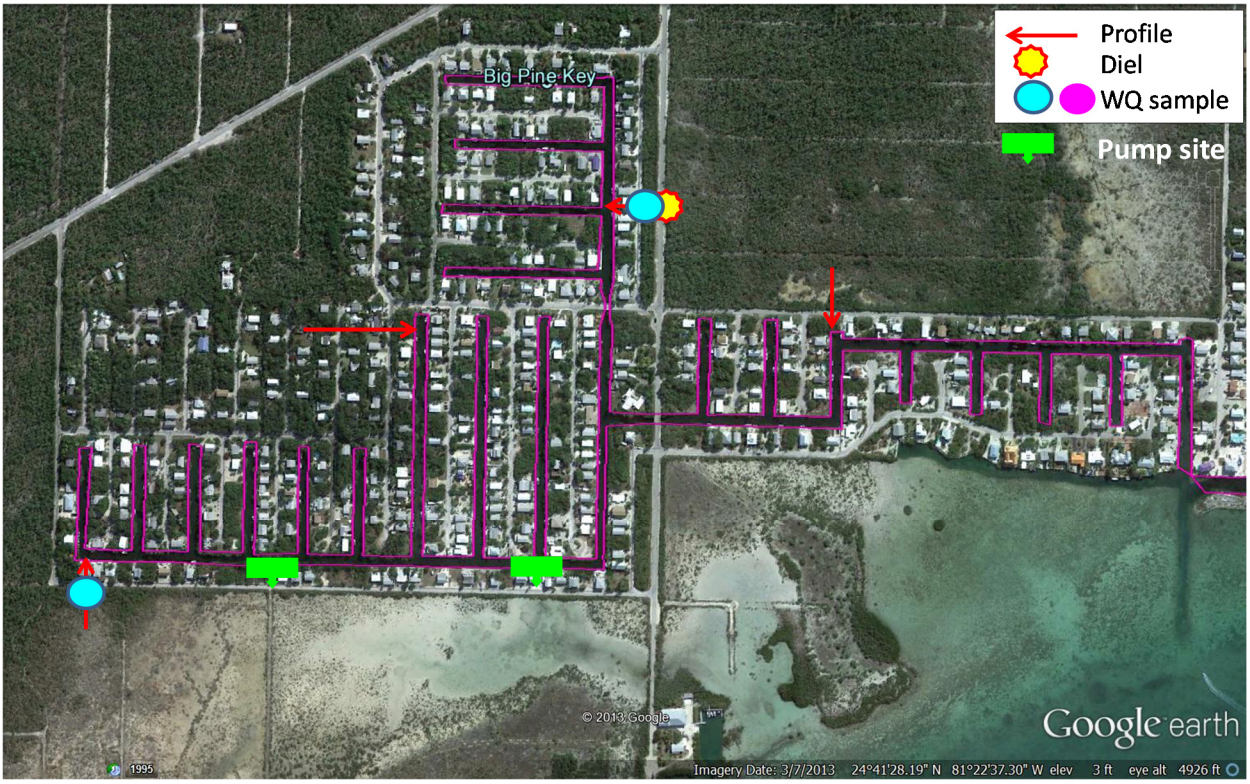
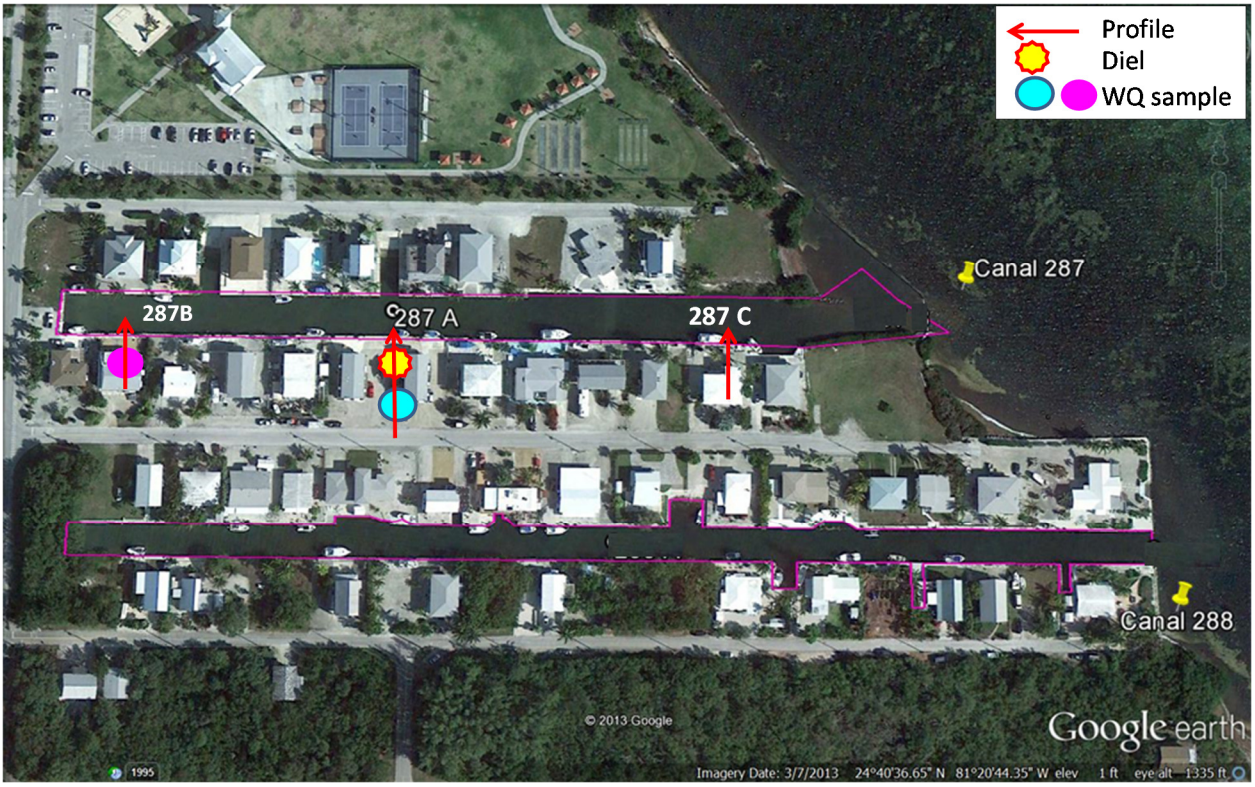


Figure 11: Canal #278 located at Eden Pines Colony, Big Pine Key.



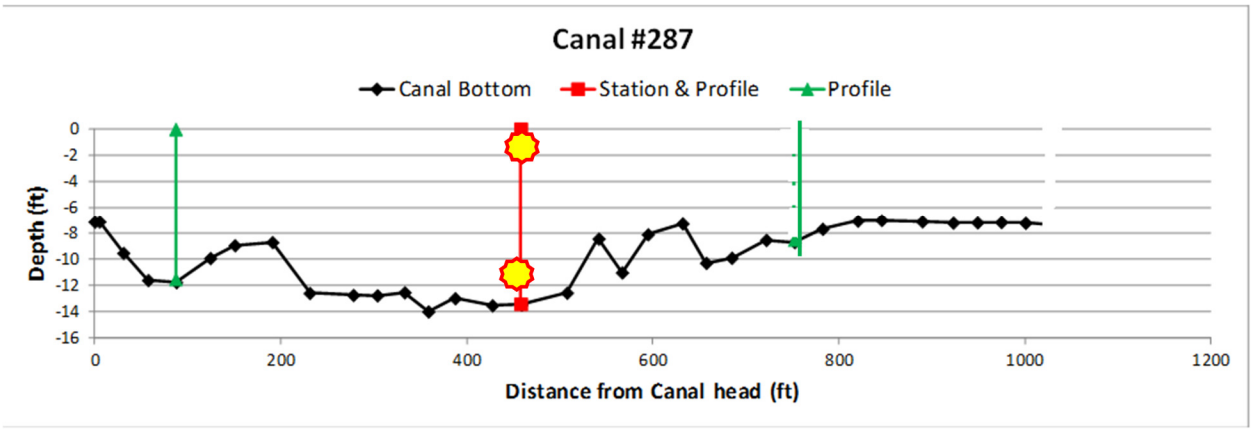
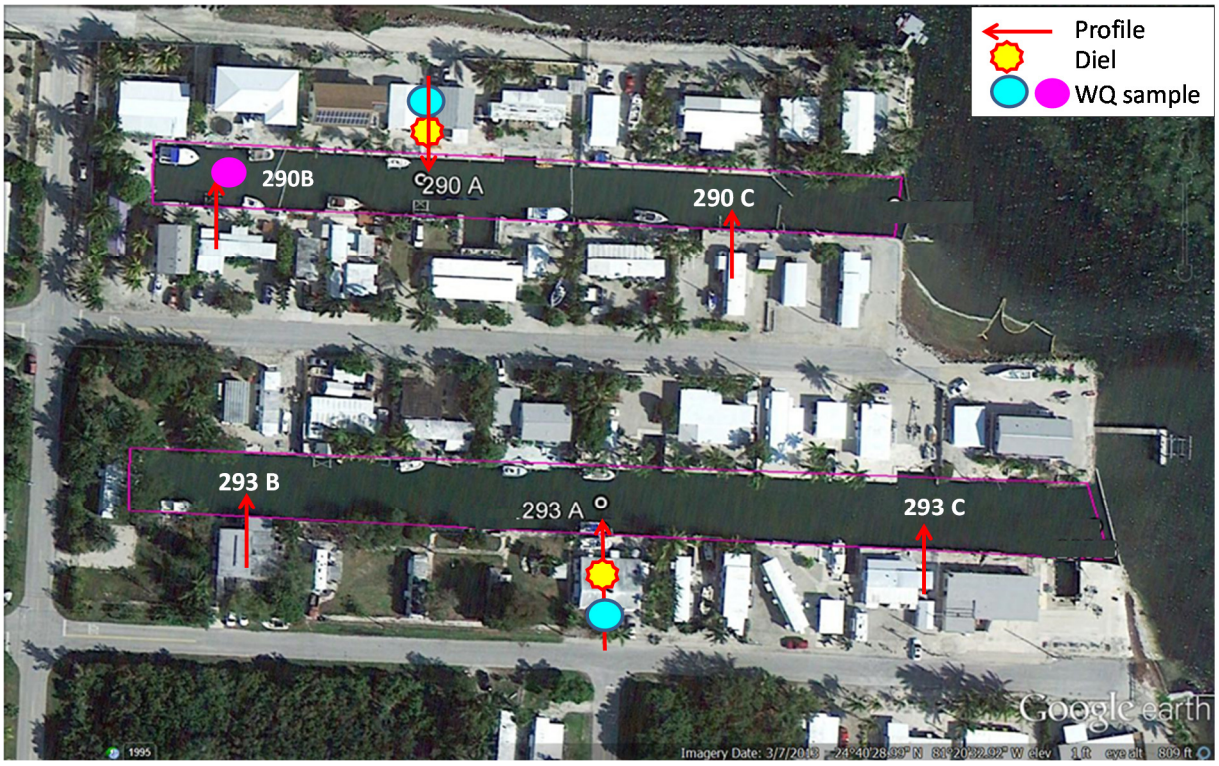


Figure 12: Canal #287 and its cross-section, located at Hollerich Subdivision, Big Pine Key.



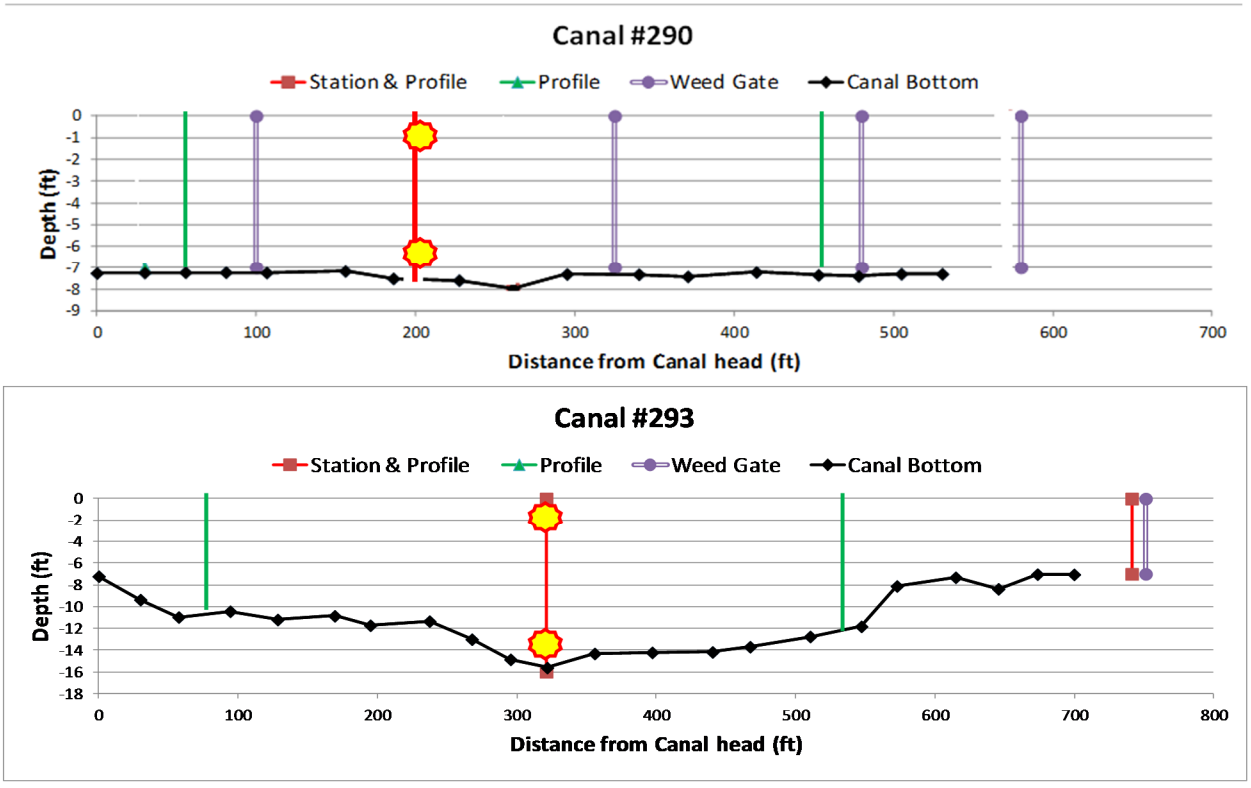


Figure 13: Canal #290 (Control) and #293 (Remediation) and their cross-sections, located at Big Pine Key.

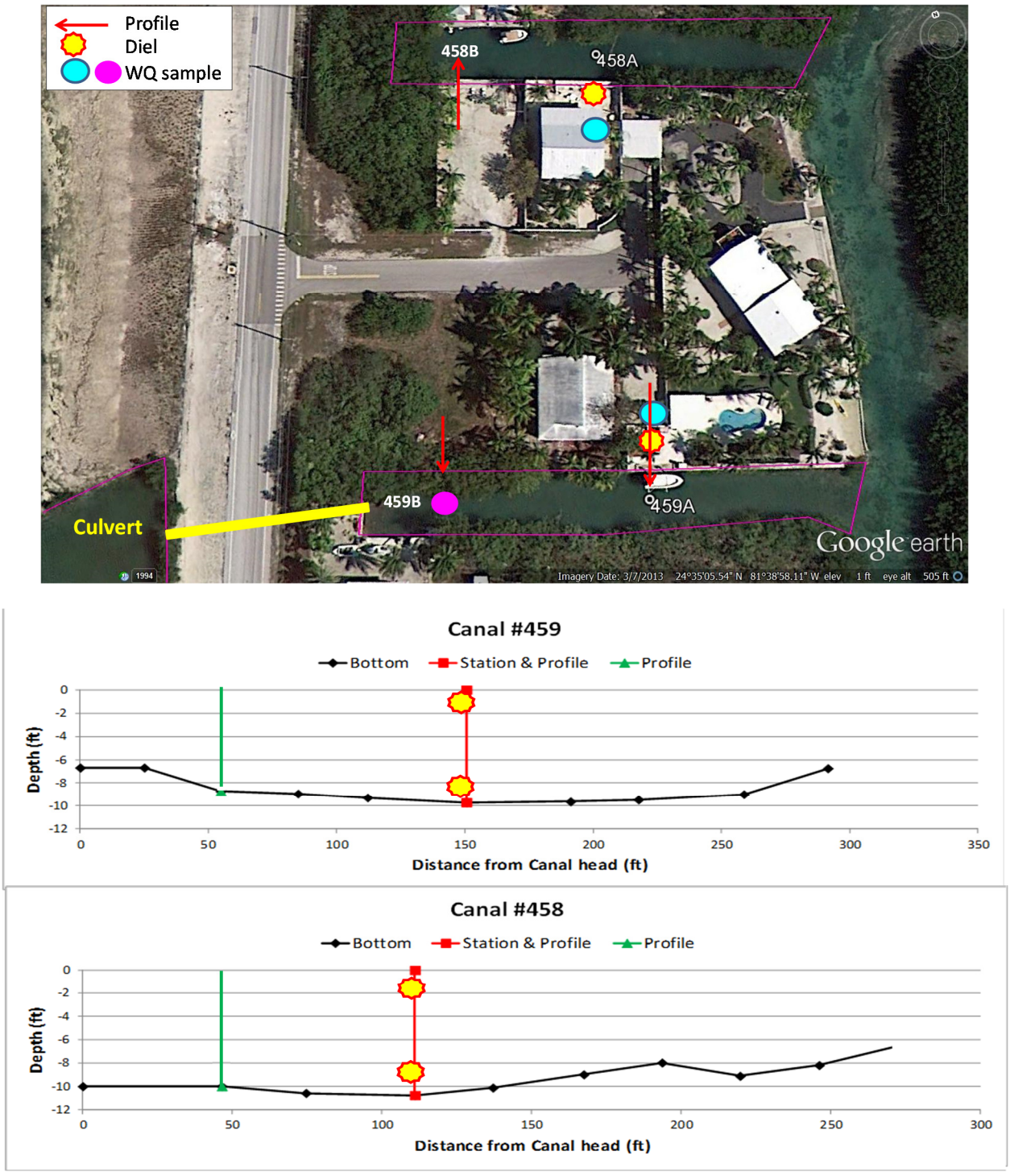


Figure 14: Canal #458 (Control) and #459 (Remediation) and their cross-sections, located at Boca Chica Ocean Shores Subdivision, Geiger Key.

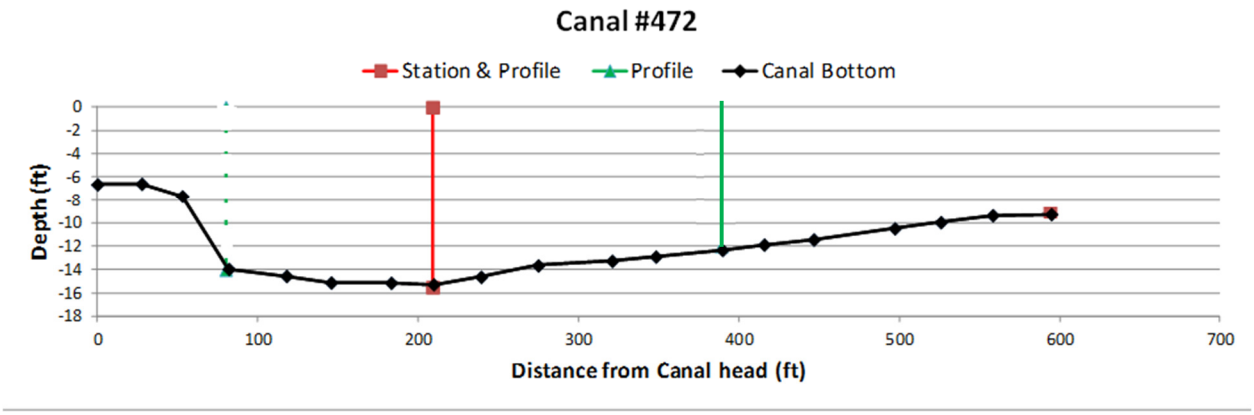


Figure 15: Canal #472 (Remediation) and its cross-section, located at Geiger Mobile Homes Subdivision, Geiger Key.

Diel experiments

Survey No 1

Diel experiments included the deployment of a couple of YSI sondes at each canal as shown in Figure 3. Sondes were placed inside a perforated PVC pipe; one was positioned close to surface (about 1 ft deep) and the second one at about 1 ft above the canal bottom. Results are shown in figures 16 to XX and Appendix 1. Key Largo stations, located on the bay side of the island are little or no affected by tidal cycles, and perhaps some variability may be only as a consequence of underground tidal pumping, and if so, the signal would be lagged.

Canal #28. Surface

Observation of time series suggest as follows:

Water Depth does not display tidal cycles, hence variability may be due to winds and/or underground tidal pumping with a range of only 0.4 ft

Water Temperature begins to drop after sunset and rises again in the morning. Range of variation is about 1 ^{o}C

Salinity and Specific Conductance display their higher values during "high water" level, contributing additional evidence in favor of tidal pumping

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated, without exceeding the regulation levels (all values above 42% DO Sat)

pH remains very stable on the low-alkaline side with values around 7.67

Turbidity is low, and drops slightly (aprox. 1 NTU) from mid-night to mid-morning. Waters are rather clear at about 0.8 NTU

Table 3: Basic statistics of diel data for surface waters of site 28A

	C28A-Bottom Temp C	C28A-Bottom SpCond mS/cm	C28A-Bottom Sal ppt	C28A-Bottom Depth meters	C28A-Bottom pH	C28A-Bottom Turbid NTU	C28A-Bottom ODOsat %	C28A-Bottom ODO mg/L
Average	23.90	50.90	33.43	6.18	7.82	0.79	81.74	5.69
Median	23.87	50.94	33.45	6.196	7.82	0.80	81.4	5.65
Stand. Dev	0.192	0.067	0.047	0.030	0.057	0.332	11.235	0.775
%DO Sat Exceedances	0%							

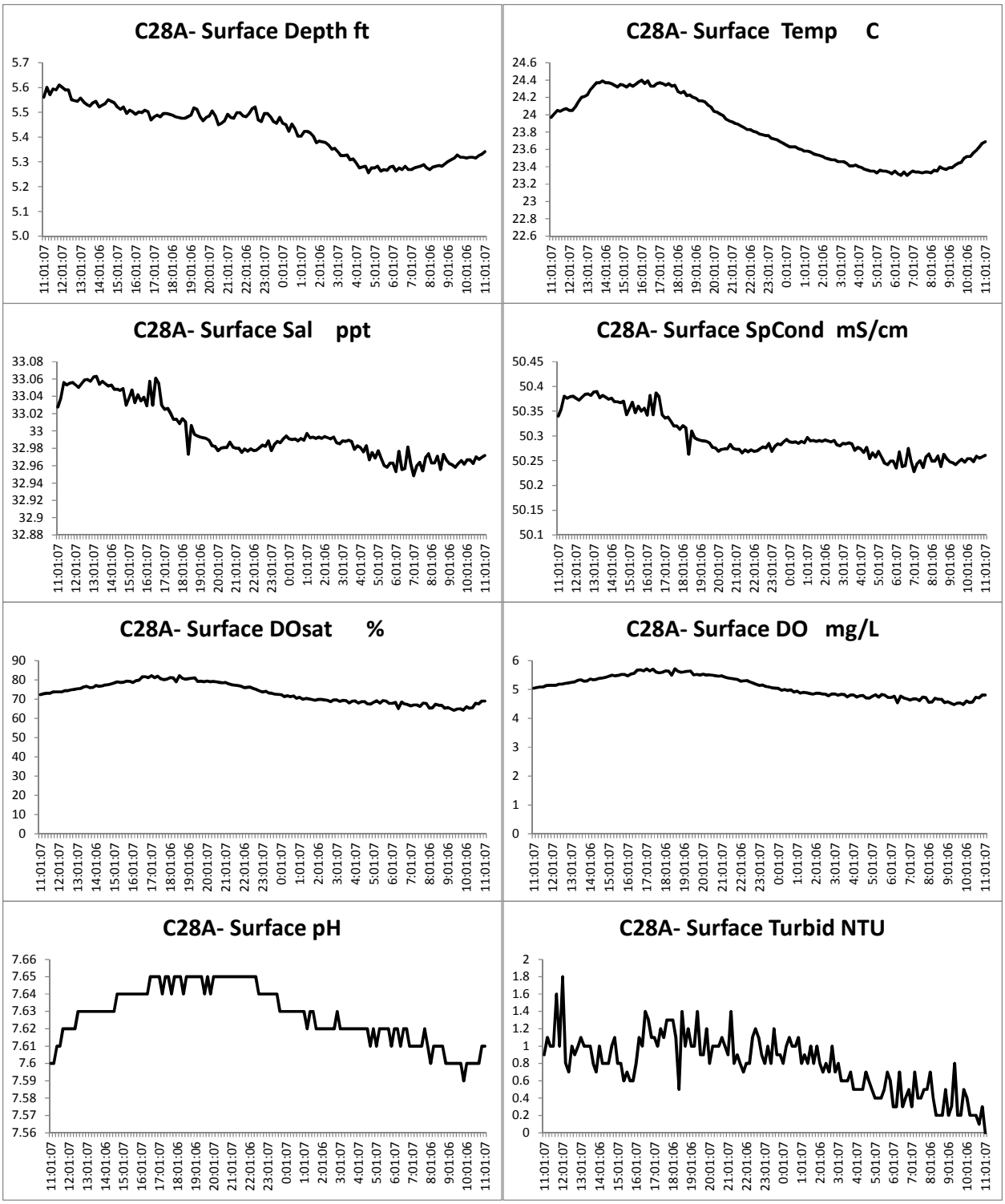


Figure 16: Time-series of physical-chemical data for surface water at site A in canal #28 during a 24-hour cycle (Diel cycle)

Canal #28. Bottom

Observation of time series suggest as follows:

Water Depth does not display a tidal cycle, and the small variability (range=0.3 ft) may be due to winds and/or underground tidal pumping

Water Temperature begins to drop after sunset and rises again in the morning. Range of variation is about 1 ^{o}C

Salinity and Specific Conductance display their higher values during high water level, contributing more evidence in favor of tidal pumping

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated, without any exceedance of the regulation (all values above 42% DO Sat).

pH remains on the low-alkaline side, with a mild drop from evening hours to mid-morning. In general it displays stable values around 7.67

Turbidity drops slightly from mid-night to mid-morning. Waters are rather clear

	C28A-Bottom Temp C	C28A-Bottom SpCond mS/cm	C28A-Bottom Sal ppt	C28A-Bottom Depth meters	C28A-Bottom pH	C28A-Bottom Turbid NTU	C28A-Bottom ODOsat %	C28A-Bottom ODO mg/L
Average	23.90	50.90	33.43	6.18	7.82	1.83	81.74	5.69
Median	23.87	50.94	33.45	6.196	7.82	1.90	81.4	5.65
Stand. Dev	0.192	0.067	0.047	0.030	0.057	1.142	11.235	0.775
%DO Sat Exceedances	0%							

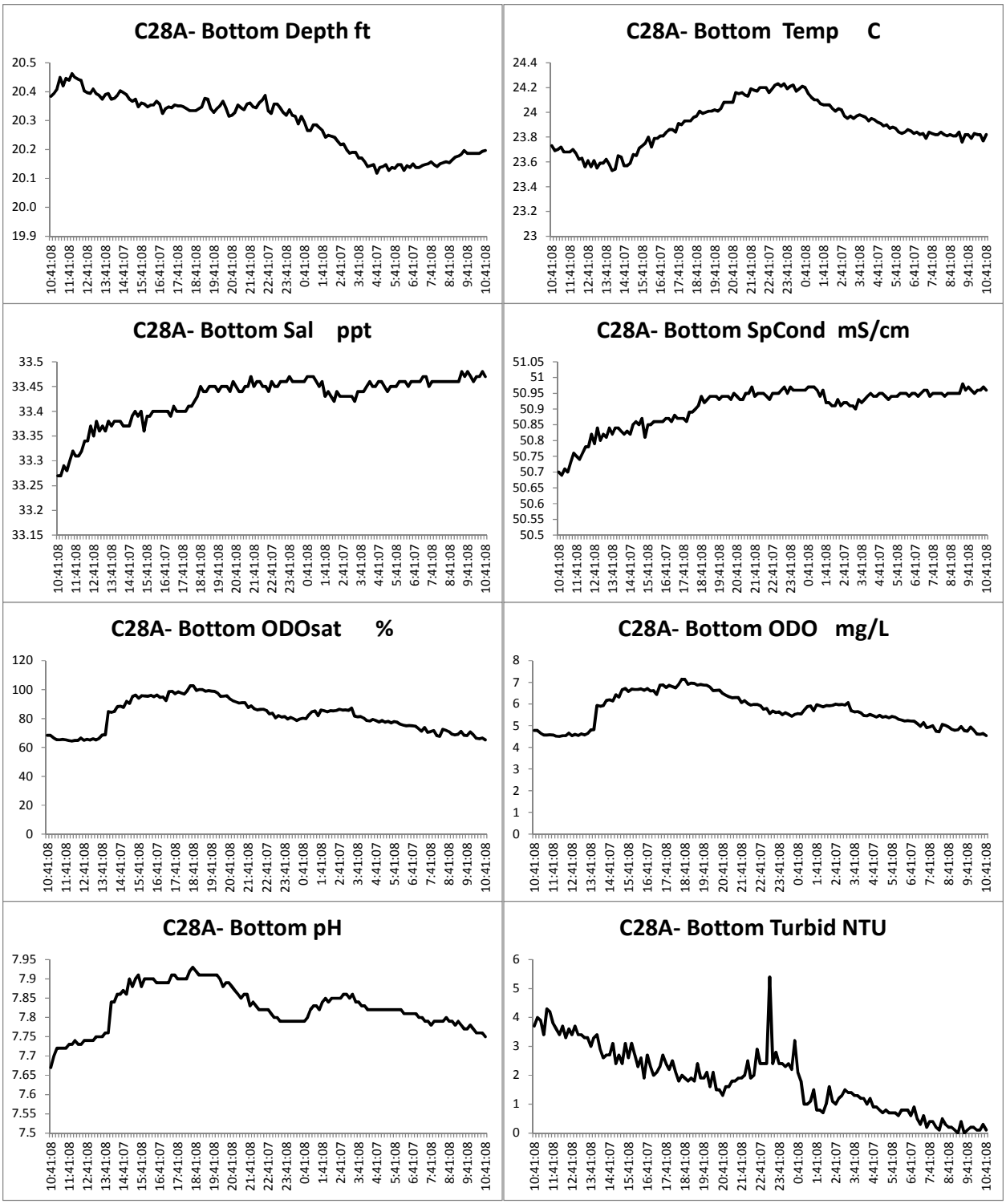


Figure 17: Time-series of physical-chemical data for bottom water at site A in canal #28 during a 24-hour cycle (Diel cycle)

Canal #29. Surface

Water Depth displays what seems to be a 4-5 hour lagged tidal cycles with amplitude of only 0.2 ft. This variability may also be due to winds.

Water Temperature began to drop after sunset and rose again the next morning. Range of variation is about 1.5 ^{O}C

Salinity and Specific Conductance show an increasing tendency but the change is of only 0.06 PSU.

Dissolved Oxygen and Oxygen saturation show declines beginning at sunset, extending to morning hours the next day, following both, daylight and temperature trends. The water column remained well oxygenated, without exceeding the regulation levels (all values above 42% DO Sat).

pH displays an increase of about 0.2 pH units in the early afternoon to remains very stable on the low-alkaline side with values around 7.67 the rest of the diel cycle.

Turbidity dropped from 2.5 NTU to practically zero NTU.

	C29A- Surface Temp C	C29A- Surface SpCond mS/cm	C29A- Surface Sal ppt	C29A- Surface Depth meters	C29A- Surface pH	C29A- Surface Turbid NTU	C29A- Surface DOsat %	C29A- Surface DO mg/L
Average	23.20	50.33	33.01	1.47	7.84	0.81	77.01	5.44
Median	23.13	50.32	33.01	1.473	7.86	0.70	76.3	5.42
Stand. Dev	0.337	0.060	0.043	0.014	0.058	0.568	8.284	0.582
%DO Sat Exceedances	0%							

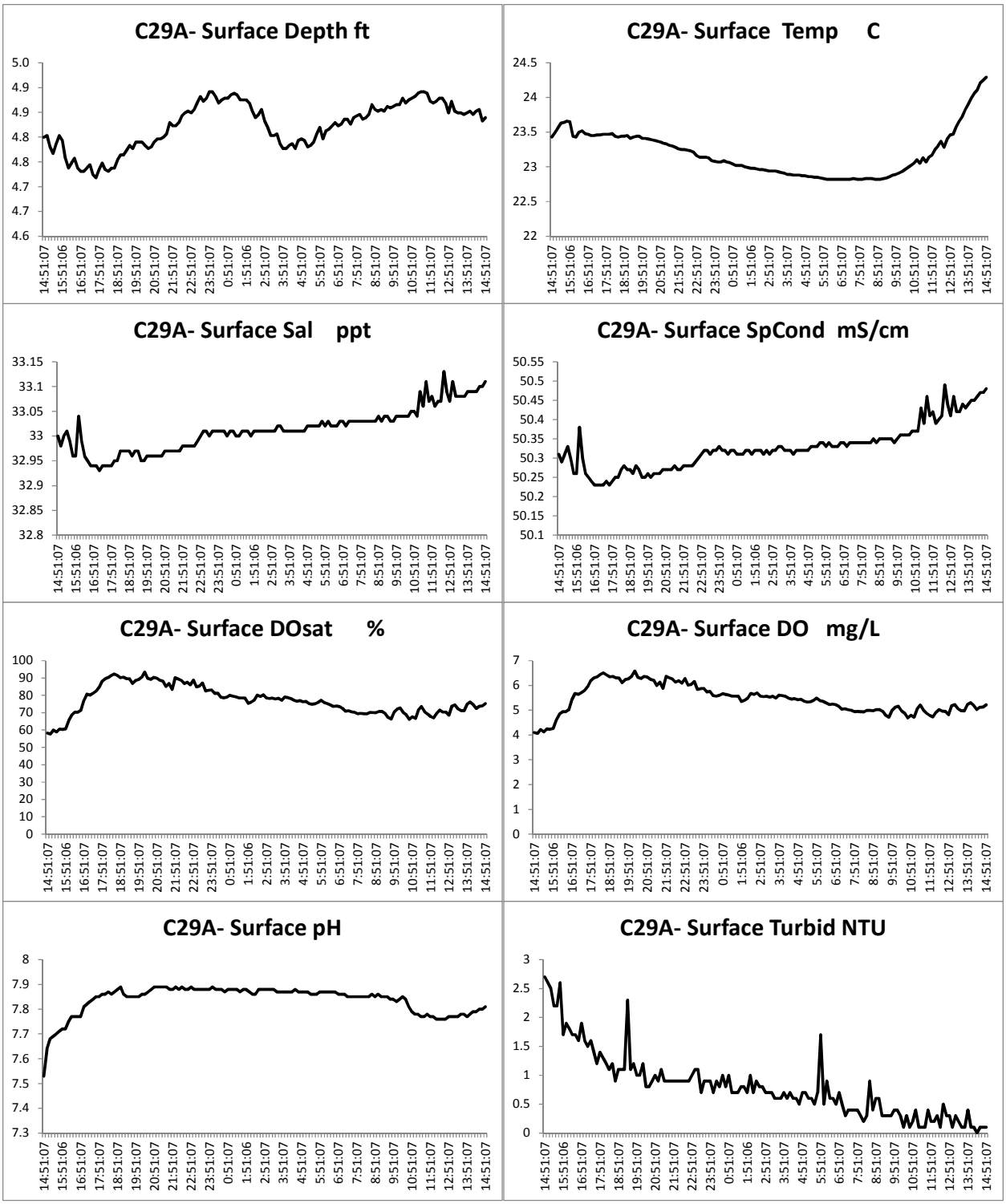


Figure 18: Time-series of physical-chemical data for surface water at site A in canal #29 during a 24-hour cycle (Diel cycle)

Canal #29. Bottom

Water Depth also displays what seems to be a 4-5 hour lagged tidal cycles with amplitude of only 0.2 ft. This variability may also be due to winds.

Water Temperature shows continuous increase. Range of variation is about 1.5 ^{O}C

Salinity and Specific Conductance are practically constants. Given the sensitivity of the sensors it is possible to define an increasing tendency although the change is of only 0.06 PSU, similar to the one observed in surface waters.

Dissolved Oxygen and Oxygen saturation show declines beginning at sunset, extending to mid night and then mostly constancy the rest of the diel cycle, when the water column remained at low DO concentrations exceeding the regulation levels (values below 42% DO Sat) most of the time after 8PM. %DO Saturation exceedances reached 43%

pH remains rather constant on the low-alkaline side with values around 7.65 the rest of the diel cycle.

Turbidity dropped from 2.5 NTU to practically zero NTU.

	C29A- Bottom Temp C	C29A- Bottom SpCond mS/cm	C29A- Bottom Sal ppt	C29A- Bottom Depth meters	C29A- Bottom pH	C29A- Surface Turbid NTU	C29A- Bottom DOsat %	C29A- Bottom DO mg/L
Average	23.09	50.65	33.25	4.79	7.77	0.81	44.25	3.13
Median	23.09	50.63	33.24	4.792	7.77	0.70	42.6	3.01
Stand. Dev	0.034	0.043	0.032	0.016	0.029	0.568	4.764	0.338
%DO Sat Exceedances	**43%**							

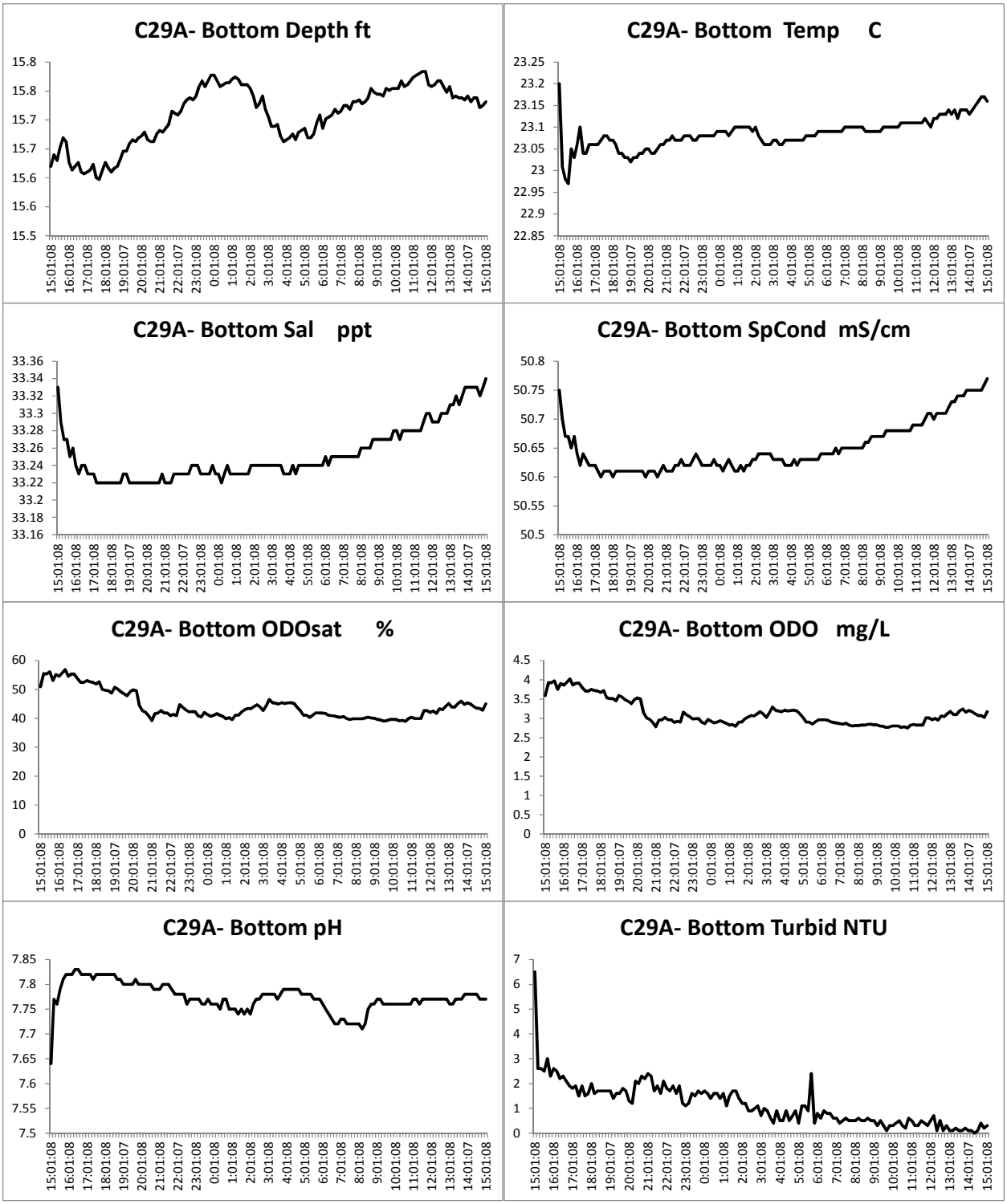


Figure 19: Time-series of physical-chemical data for bottom water at site A in canal #29 during a 24-hour cycle (Diel cycle)

Canal #132. Surface

Water Depth displays a very regular tidal cycle with a 2.6 ft tidal range.

Water Temperature shows a decline in late afternoon extending to the following morning, followed by an increase to evening hours. Temperature range is a little over 1ºC range

Salinity and Specific Conductance remained practically constants from Wednesday 4/2/14 to Thursday 4/3/14 when a sudden drop of about 1 PSU occurred at about 5 PM.

Dissolved Oxygen and Oxygen saturation daily cycles usually display an increase starting during daytime and extending to into the night, but here the cycle seems to be interrupted by the same lower salinity event occurring at 5 PM on 4/3/14. There were 41% of %DO saturation exceedances.

pH follows very closely the DO and %DO Saturation patterns.

Turbidity is relatively high especially during low tides

	C132A - Surface Temp C	C132A - Surface SpCond mS/cm	C132A - Surface Sal ppt	C132A - Surface Depth meters	C132A - Surface pH	C132A - Surface Turbid+ NTU	C132A - Surface DOsat %	C132A - Surface DO mg/L
Average	23.72	55.80	37.07	1.62	7.41	5.49	44.37	3.03
Median	23.72	55.87	37.12	1.616	7.4	4.8	43.8	3.01
Stand. Dev	0.387	0.166	0.128	0.247	0.027	2.886	5.592	0.366
%DO Sat Exceedances	41%							

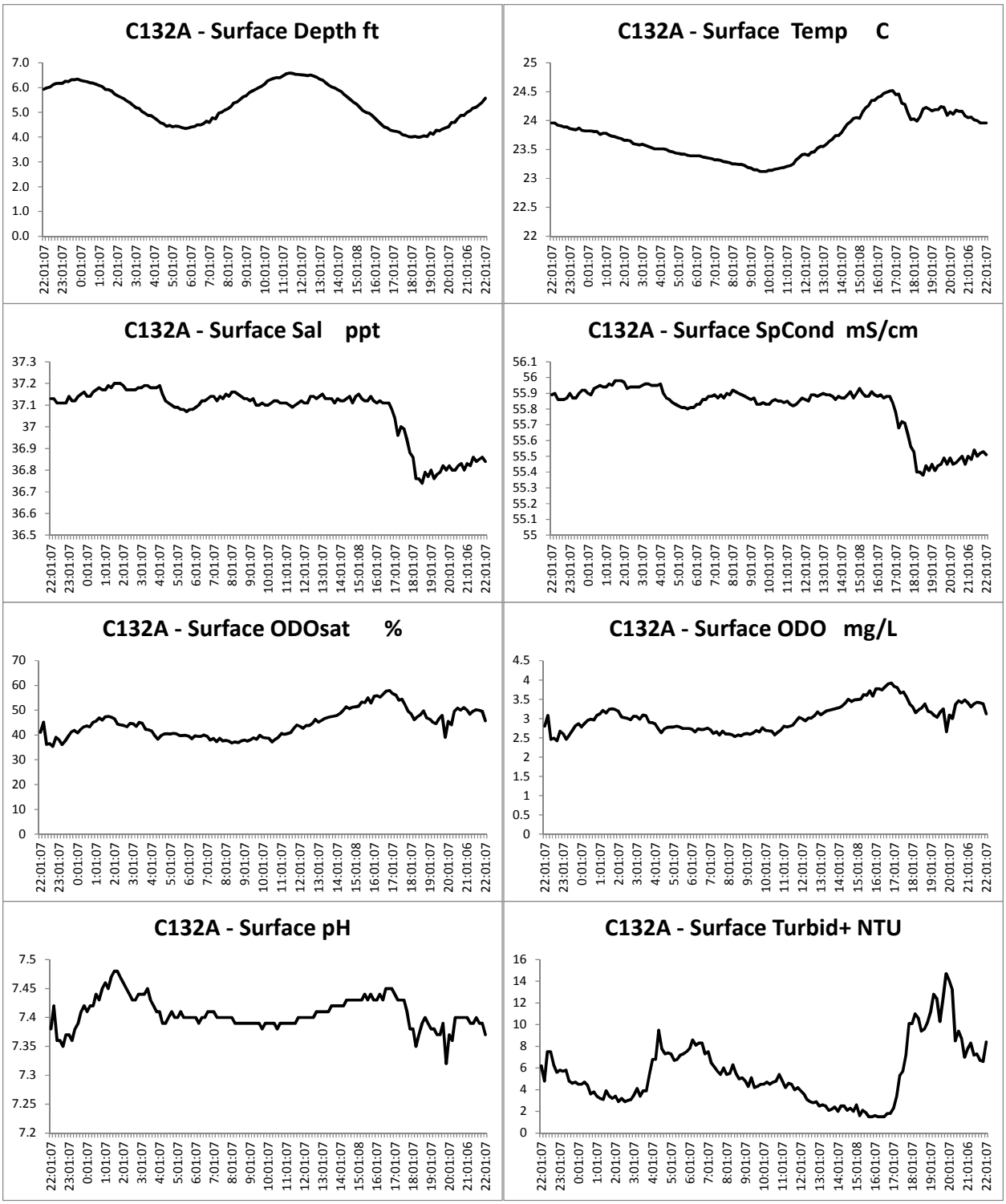


Figure 20: Time-series of physical-chemical data for surface water at site A in canal #132 during a 24-hour cycle (Diel cycle)

Canal #132. Bottom

Water Depth displays a very regular tidal cycle with less than 2.5 ft tidal range.

Water Temperature shows a decline from early evening extending to the following morning, when a sudden drop of temperature occurs, marking the beginning of a higly variable increasing trend extending back to the evening hours. Overal T range is 2 ^{O}C

Salinity and Specific Conductance remained practically constants from the evening hours (7 PM) to 10 AM when a sudden increase disrupts the system and high variability begins, extending to evening hours.

Dissolved Oxygen and Oxygen saturation display periods of relatively higher values bound by sudden declines. It begins with a short one from 8 PM to 10 PM. The second one displays a slight but continuous decline with low variability which extends from midnight to 9 AM. Finally, another one, showing higher variability follows, extending from about 10 AM to 6 PM. There were 56%DO saturation exceedances.

pH remains slightly above 7, and follows very closely the DO and %DO Saturation patterns (r^2=0.81).

Turbidity is relatively high especially during night hours and has a highly significant negative correlation with DO and and %DO Sat (r^2=0.65).

	C132A - Bottom Temp C	C132A - Bottom SpCond mS/cm	C132A - Bottom Sal ppt	C132A - Bottom Depth meters	C132A - Bottom pH	C132A - Bottom Turbid NTU	C132A - Bottom DOsat %	C132A - Bottom DO mg/L
Average	24.35	55.75	37.02	2.96	7.46	6.32	37.67	2.55
Median	24.49	55.76	37.03	2.977	7.47	4.6	39.7	2.68
Stand. Dev	0.521	0.200	0.149	0.245	0.118	5.221	14.437	0.986
%DO Sat Exceedances	56%							

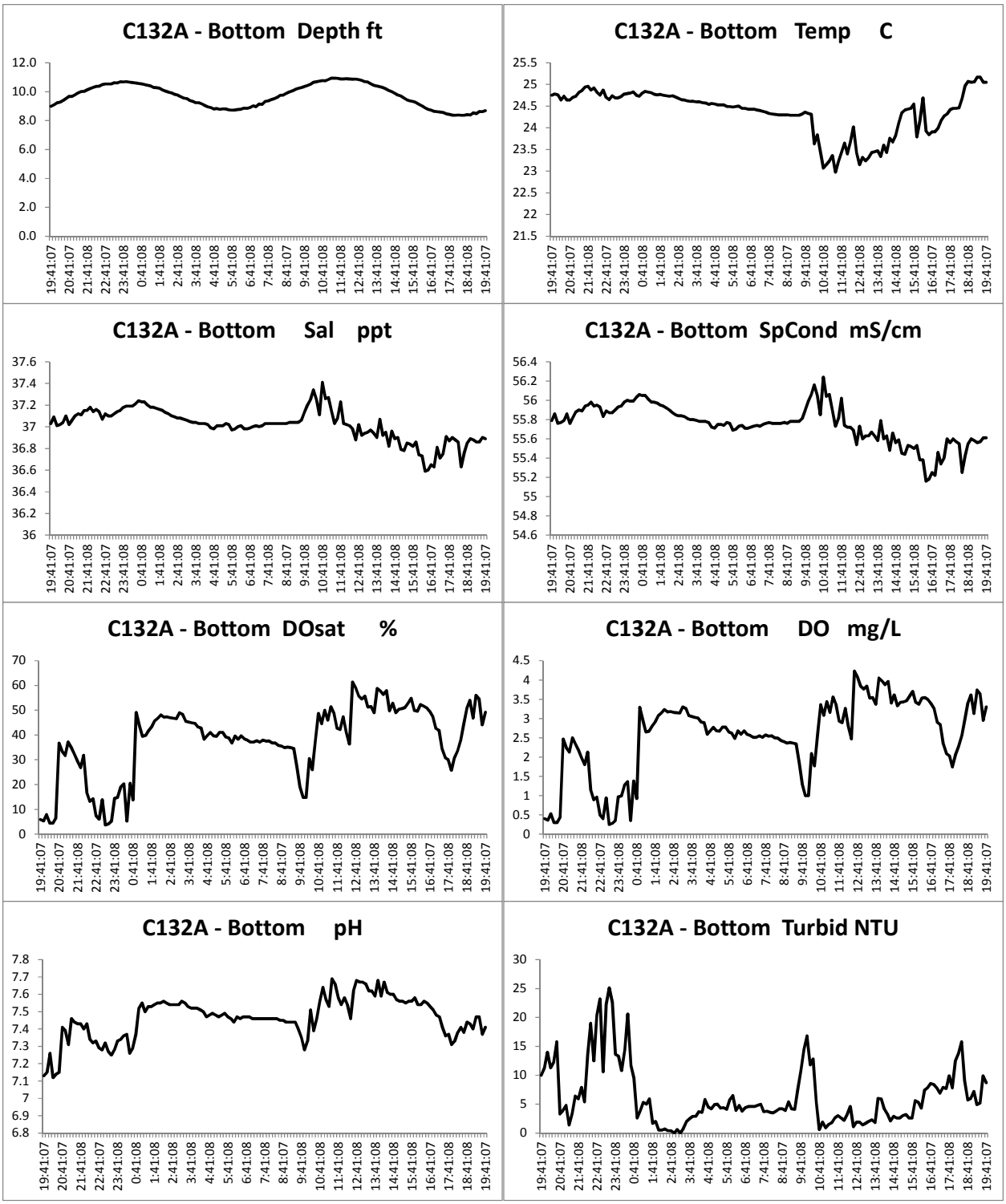


Figure 21: Time-series of physical-chemical data for bottom water at site A in canal #132 during a 24-hour cycle (Diel cycle)

Canal #137. Surface

Water Depth displays a very regular tidal cycle with a 3 ft tidal range.

Water Temperature shows a decline during night hours extending to the following morning, when an increasing trend starts and continues to evening hours. Evenings are characterized by relatively higher variability. Temperature range is a little over 2^{O}C range

Salinity and Specific Conductance display highly variable values in the afternoon and extending to midnight. Values remain very constant until midmorning (10 AM) when slightly higher variability initiates, followed by a very slight concentration increase extending into afternoon hours

Dissolved Oxygen and Oxygen saturation daily display low and rather constant values only interrupted by an isolated and higher concentration event from 7 PM to midnight. %DO Sat exceedances reach 83%

pH follows very closely the DO and %DO Saturation patterns with a highly significant linear correlation coefficients of r^2=0.92.

Turbidity is low with a relatively higher variability along a slightly increasing trend from mid-afternoon to early morning (5 AM), followed by a less noisy decline the rest of the day.

	C137A- Surface Temp C	C137A- Surface SpCond mS/cm	C137A- Surface Sal ppt	C137A- Surface Depth meters	C137A- Surface pH	C137A- Surface Turbid NTU	C137A- Surface ODOsat %	C137A- Surface ODO mg/L
Average	23.84	56.43	37.53	1.61	7.39	2.08	40.77	2.77
Median	23.74	56.42	37.53	1.63	7.35	2.1	35.5	2.43
Stand. Dev	0.437	0.072	0.054	0.274	0.138	0.992	17.003	1.139
%DO Sat Exceedances	83%							

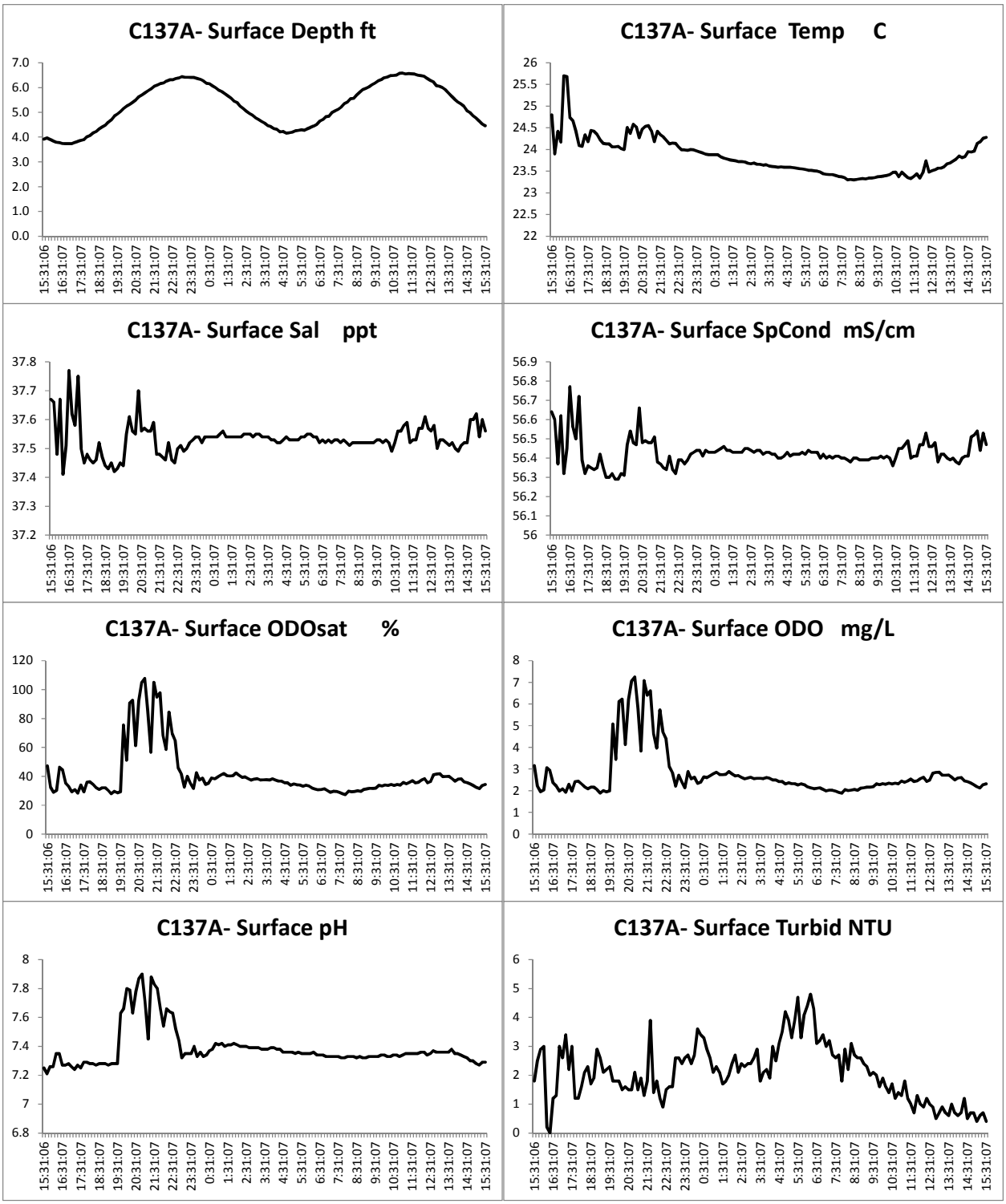


Figure 22: Time-series of physical-chemical data for surface water at site A in canal #137 during a 24-hour cycle (Diel cycle)

Canal #137. Bottom

Water Depth displays a very regular tidal cycle with a 2.8 ft tidal range.

Water Temperature shows a decline during night hours extending to the following morning, when an increasing trend starts and continues to evening hours. Afternoon and evenings hours are characterized by relatively higher variability. Temperature range is a little over 1.5^{o}C range

Salinity and Specific Conductance display highly variable values in the afternoon and extending into the evening. Values remain very constant until early morning (10 AM) when a sudden increase initiates slightly higher variability extending back to evening hours

Dissolved Oxygen and Oxygen saturation decline from mid afternoon to midnight, when a sudden increase occurs. Values remain high and slightly declining until early morning (8 AM) when an increasing trend with high variability begins. %DO Sat exceedances reach 100%

pH follows very closely the DO and %DO Saturation patterns with highly significant linear correlation coefficients of r^2=0.92.

Turbidity is highly variable but without a defined pattern

	C137A- Bottom Temp C	C137A- Bottom SpCond mS/cm	C137A- Bottom Sal ppt	C137A- Bottom Depth meters	C137A- Bottom pH	C137A- Bottom Turbid NTU	C137A- Bottom DOsat %	C137A- Bottom DO mg/L
Average	24.43	56.17	37.33	3.70	7.38	4.23	26.37	1.78
Median	24.58	56.15	37.31	3.718093148	7.37	4.1	27.4	1.87
Stand. Dev	0.456	0.145	0.115	0.272	0.099	2.309	9.407	0.641
%DO Sat Exceedances	100%							

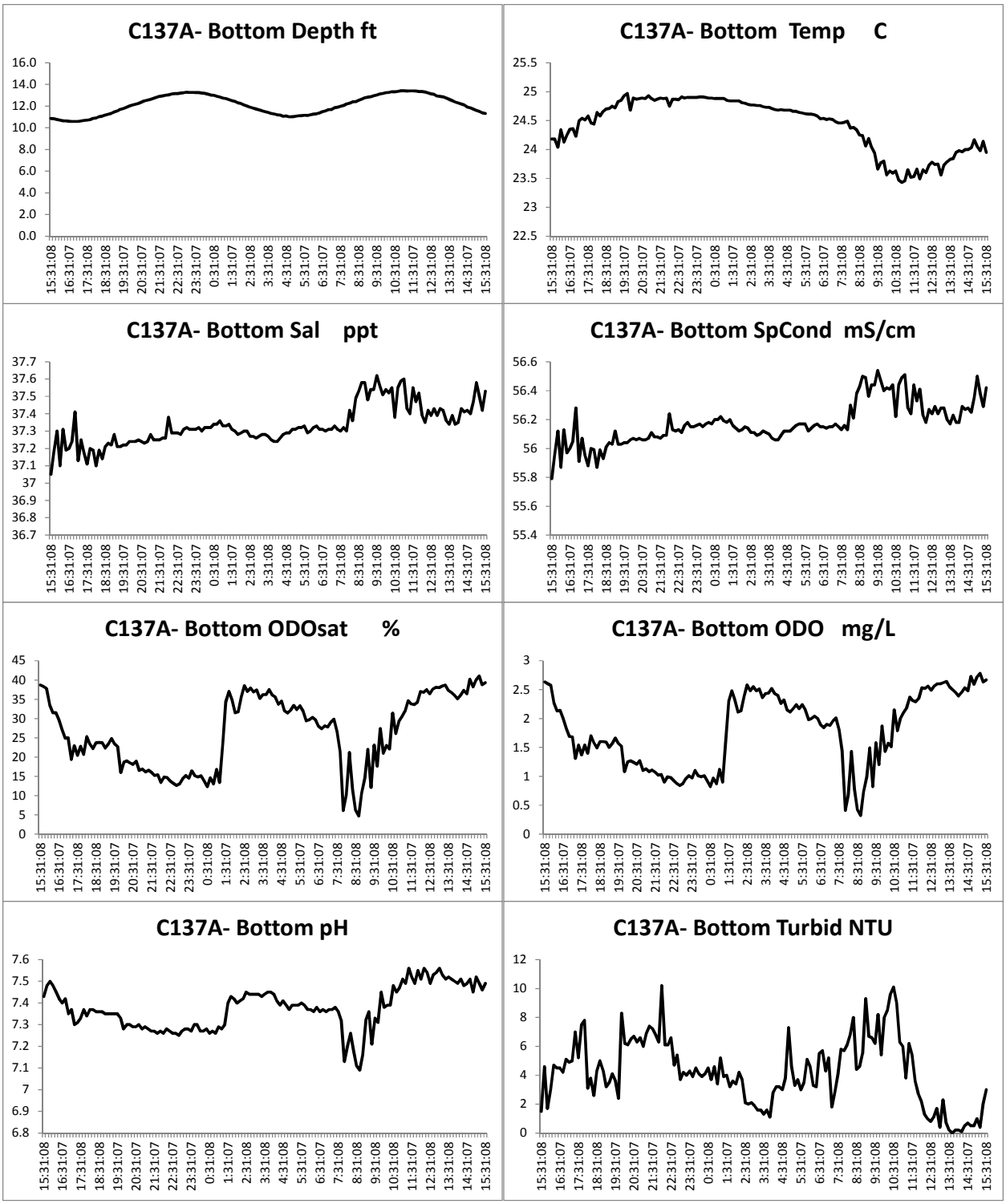


Figure 23: Time-series of physical-chemical data for bottom water at site A in canal #137 during a 24-hour cycle (Diel cycle)

Canal #147. Surface.

Water Depth displays a very regular tidal cycle with a 1.4 ft tidal range.

Water Temperature shows an increase from mid-morning to evening, followed by a decline extending to early morning hours. It follows daylight cycle.

Salinity and Specific Conductance show a low slightly declining tendency from early evening to early morning, followed by a sharp increase. Declining values resume soon after

Dissolved Oxygen and Oxygen saturation display increasing tendency during daylight and declining trend the rest of the time. %DO Saturation exceedances reach 38%

pH remains slightly above 7, and follows very closely the DO and %DO Saturation patterns (r2=0.95)

Turbidity is very low without definite pattern

	C147A- Surface Temp C	C147A- Surface SpCond mS/cm	C147A- Surface Sal ppt	C147A- Surface Depth meters	C147A- Surface pH	C147A- Surface Turbid NTU	C147A- Surface ODOsat %	C147A- Surface ODO mg/L
Average	26.04	55.69	36.93	1.40	7.64	0.59	55.56	3.65
Median	25.98	55.68	36.93	1.401	7.62	0.40	52.7	3.47
Stand. Dev	0.337	0.108	0.075	0.124	0.106	0.410	26.240	1.706
%DO Sat Exceedances	38%							

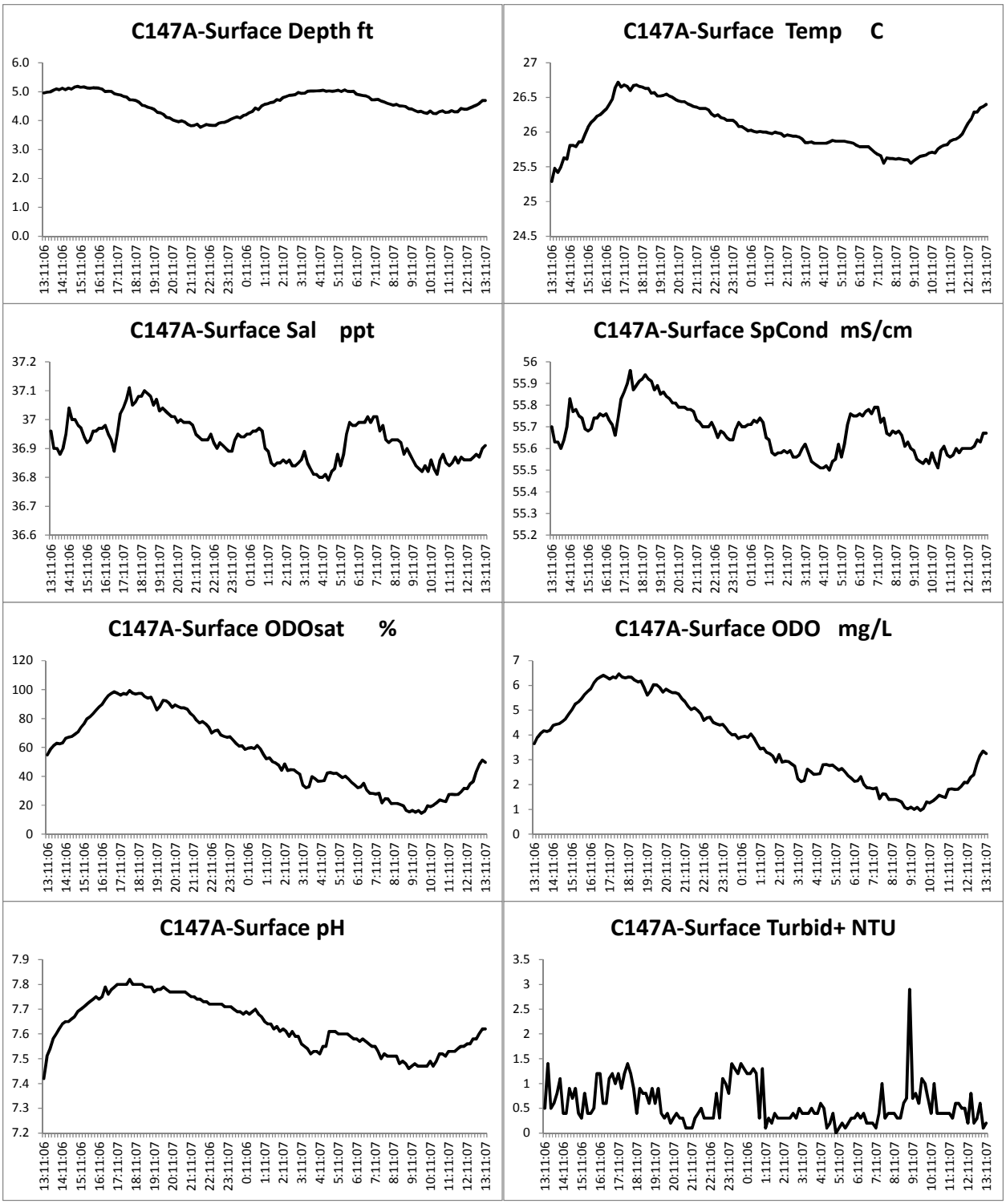


Figure 24: Time-series of physical-chemical data for surface water at site A in canal #147 during a 24-hour cycle (Diel cycle)

Canal #147. Bottom

Water Depth displays a very regular tidal cycle with a 1.4 ft tidal range.

Water Temperature shows a decline during night hours extending to the following morning, when an increasing trend starts and continues to evening hours.

Salinity and Specific Conductance display highly variable values in the afternoon and extending to midnight. Values remain about constant the rest of the time

Dissolved Oxygen and Oxygen saturation follow a similar pattern as that of temperature %DO Sat exceedances reach 46%

pH follows very closely the DO and %DO Saturation patterns with a highly significant linear correlation coefficients of r^2=0.96.

Turbidity is low with a relatively higher variability along a slightly increasing trend from mid-afternoon to early morning (5 AM), followed by a less noisy decline the rest of the day.

	C147A-Bottom Temp C	C147A-Bottom SpCond mS/cm	C147A-Bottom Sal ppt	C147A-Bottom Depth meters	C147A-Bottom pH	C147A-Bottom Turbid+ NTU	C147A-Bottom ODOsat %	C147A-Bottom ODO mg/L
Average	27.04	55.94	37.09	2.21	7.72	1.80	45.03	2.91
Median	26.96	55.94	37.09	2.211	7.73	1.4	47.4	3.06
Stand. Dev	0.265	0.072	0.056	0.124	0.106	1.630	26.448	1.701
%DO Sat Exceedances	46%							

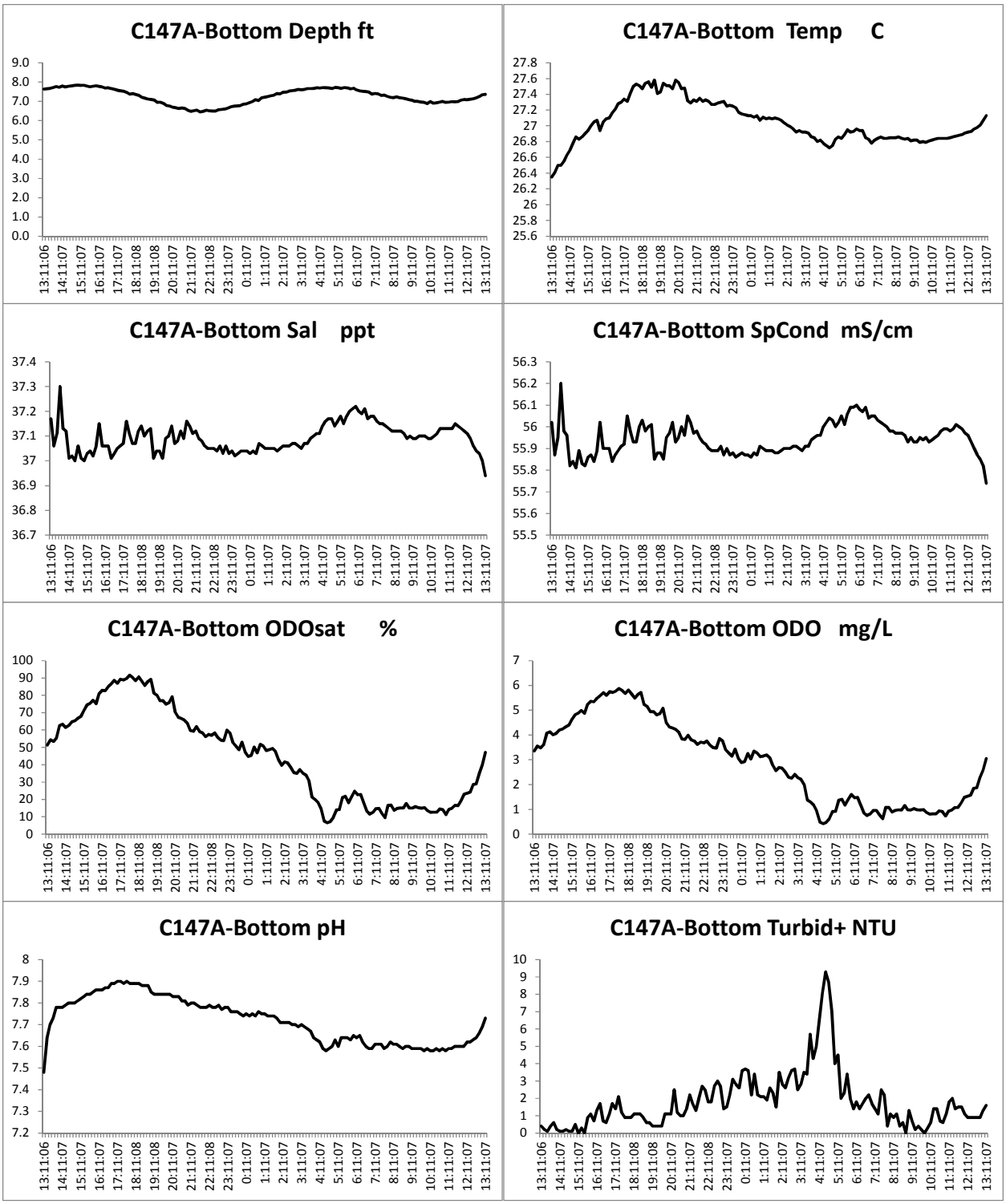


Figure 25: Time-series of physical-chemical data for bottom water at site A in canal #147 during a 24-hour cycle (Diel cycle)

Canal #148. Surface

Water Depth displays a very regular tidal cycle with a 2 ft tidal range.

Water Temperature shows a decline from late afternoon to early morning followed by an increase extending back to afternoon hours.

Salinity and Specific Conductance is coarsely related to tidal cycle, but display steeper declines and increases during afternoon and evening hours. There is a slight decline from midnight to very early morning, followed by a mild increase up to early afternoon

Dissolved Oxygen and Oxygen saturation experience a singificant drop from afternoon to midnight, followed by slight increase until noon time, when another steeper increase follow %DO Sat exceedances reach 46%

pH follows very closely the DO and %DO Saturation patterns with a highly significant linear correlation coefficients of r^2=0.98.

Turbidity is low with only a period of higher values starting at night, peaking at midnight and returning to low values by 4 AM

	C148A-Surface Temp C	C148A-Surface SpCond mS/cm	C148A-Surface Sal ppt	C148A-Surface Depth meters	C148A-Surface pH	C148A-Surface Turbid+ NTU	C148A-Surface ODOsat %	C148A-Surface ODO mg/L
Average	24.17	54.62	36.17	1.47	7.77	2.80	72.09	4.89
Median	23.97	54.6	36.15	1.474	7.69	1.70	47.2	3.24
Stand. Dev	0.650	0.309	0.230	0.183	0.166	3.022	48.459	3.235
%DO Sat Exceedances	46%							

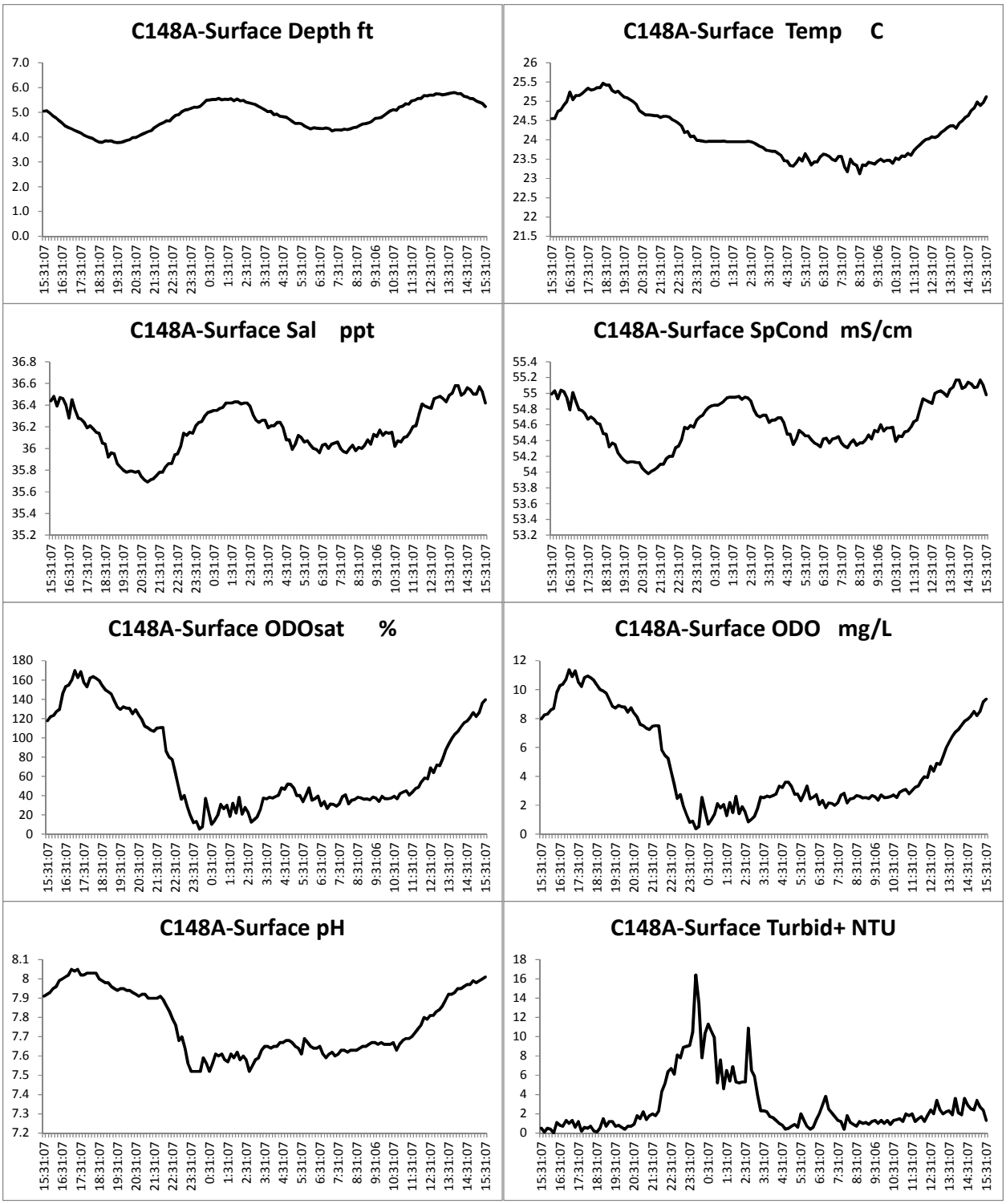


Figure 26: Time-series of physical-chemical data for surface water at site A in canal #148 during a 24-hour cycle (Diel cycle)

Canal #148. Bottom

Water Depth displays a very regular tidal cycle with a 2 ft tidal range.

Water Temperature shows an increase during afternoon and evening hours. Stays unchanged until mid-morning when a sudden drop occurs followed by an increasing trend

Salinity and Specific Conductance is coarsely related to tidal cycle, but display steeper declines and increases during afternoon and evening hours. There is a slight decline from midnight to very early morning, followed by a mild increase up to early afternoon

Dissolved Oxygen and Oxygen saturation experience a significant drop from afternoon to midnight, followed by slight increase until midnight. Follows a decline to mid morning hours to finally increase again the afternoon. %DO Sat exceedances reach 24%

pH follows very closely the DO and %DO Saturation patterns with a highly significant linear correlation coefficients of r^2=0.98.

Turbidity is low with only a period of higher values starting at mid-afternoon peaking at late night and dropping sharply at midnight, to remain low the rest of the time

	C148A-Bottom Temp C	C148A-Bottom SpCond mS/cm	C148A-Bottom Sal ppt	C148A-Bottom Depth meters	C148A-Bottom pH	C148A-Bottom Turbid+ NTU	C148A-Bottom ODOsat %	C148A-Bottom ODO mg/L
Average	24.93	55.44	36.77	2.36	7.91	3.09	68.54	4.61
Median	25.06	55.42	36.77	2.356	7.91	2.20	68.4	4.57
Stand. Dev	0.333	0.193	0.144	0.182	0.130	2.909	26.580	1.803
%DO Sat Exceedances	24%							

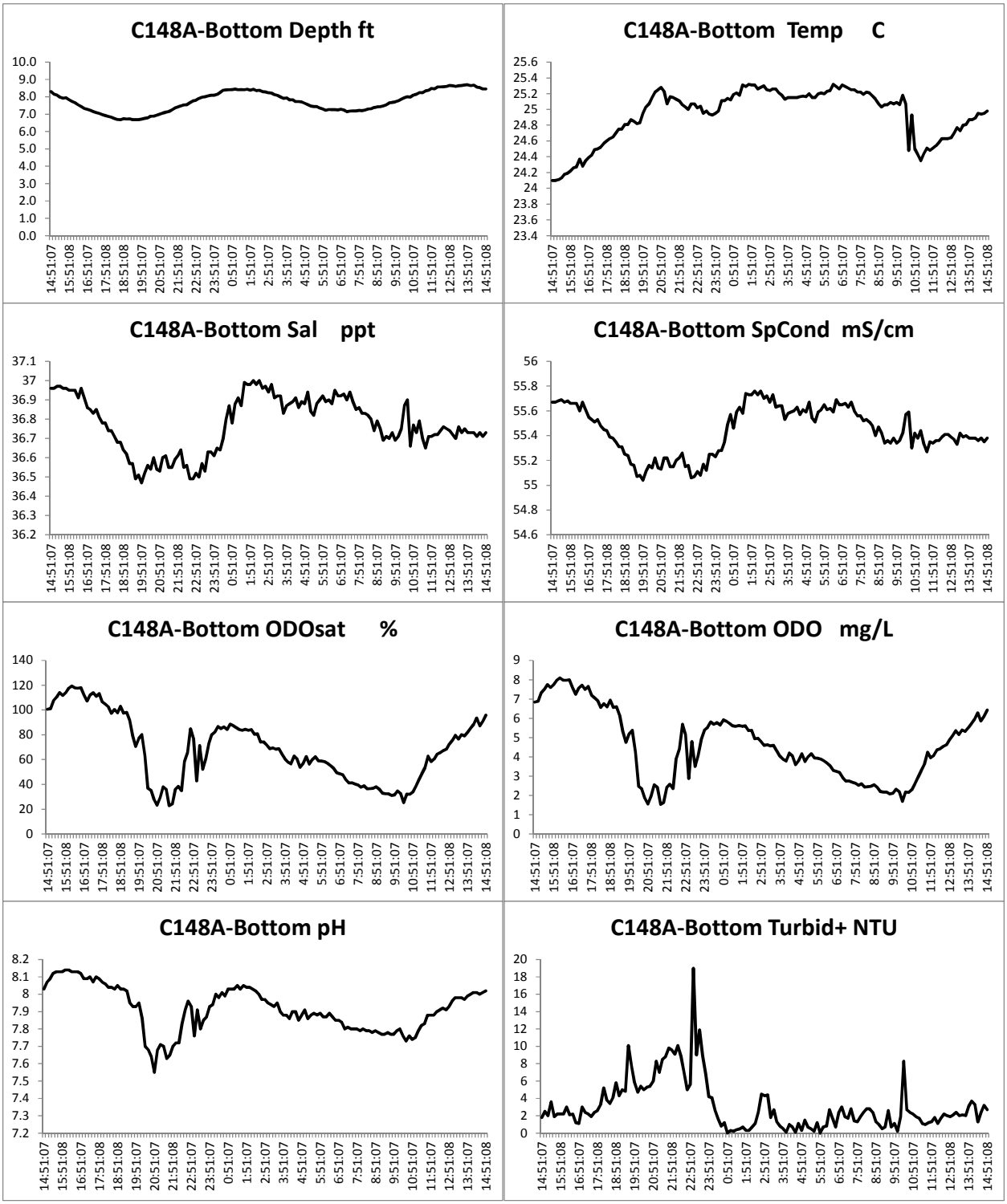


Figure 27: Time-series of physical-chemical data for bottom water at site A in canal #148 during a 24-hour cycle (Diel cycle)

Canal #266. Surface

Water Depth displays an irregular tidal cycle with a relatively large hump peaking at 10 AM. Totaling 1 ft tidal range.

Water Temperature declines from the evening to noon time next day, when values increase.

Salinity and Specific Conductance stays without major changes from evening to early morning hours, when a hump, similar to that of temperature occur.

Dissolved Oxygen and Oxygen saturation remain constant and close to zero with just a few relatively larger values, all smaller than 1 mg/l, during the afternoon. %DO Sat exceedances reach 100%

pH follows very closely the salinity pattern with a highly significant linear correlation coefficients of r^2=0.70.

Turbidity is low with only a period of higher values starting at noon peaking at 2 PM and dropping sharply

	C266A- Surface Temp C	C266A- Surface SpCond mS/cm	C266A- Surface Sal ppt	C266A- Surface Depth meters	C266A- Surface pH	C266A- Surface Turbid+ NTU	C266A- Surface ODOsat %	C266A- Surface ODO mg/L
Average	31.61	56.68	37.49	0.32	7.40	10.04	1.60	0.10
Median	31.2	56.65	37.46	0.306	7.37	6.80	1	0.06
Stand. Dev	1.031	0.197	0.147	0.121	0.060	9.791	1.579	0.091
%DO Sat Exceedances	100%							

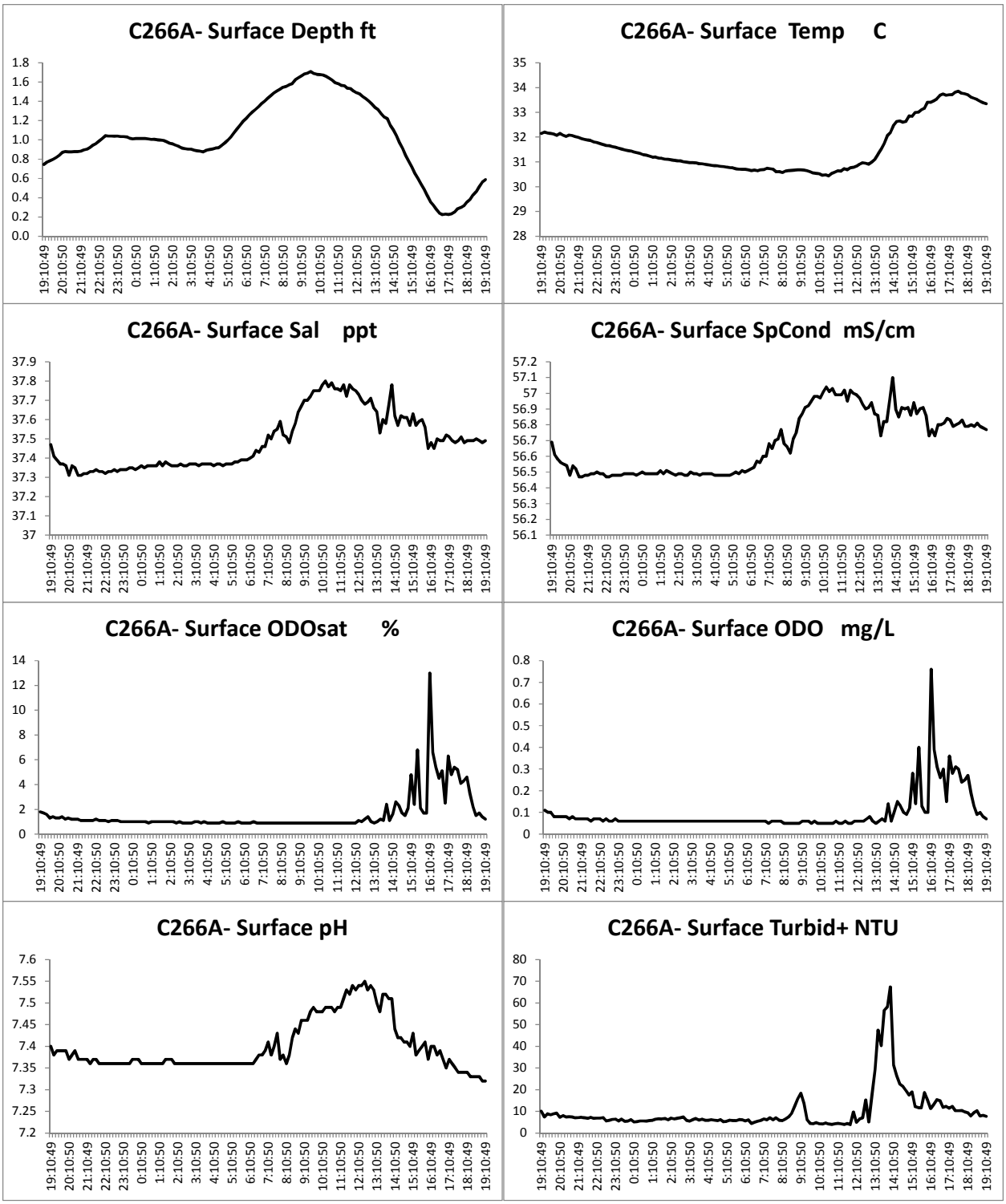


Figure 28: Time-series of physical-chemical data for surface water at site A in canal #266 during a 24-hour cycle (Diel cycle)

Canal #266. Bottom

Water Depth displays a flat constant depth of about 3.5 ft

Water Temperature remains constant with mild variation during the morning and a sharp drop temperature about 5 PM.

Salinity and Specific Conductance stays without major changes from evening to early afternoon hours, when an increase of 1 ^{O}C occur.

Dissolved Oxygen and Oxygen saturation remain constant and close to zero with just a few relatively larger values, all smaller than 2 mg/l, during the afternoon. %DO Sat exceedances reach 100%

pH remains constant at about 7.2 and only experiences some slightly higher readings in the afternoon, when salinity is also higher.

Turbidity is low and declines from evening to mid-morning hours. Then, began an increase with higher variability from noon time into early evening.

	C266A-Bottom Temp C	C266A-Bottom SpCond mS/cm	C266A-Bottom Sal ppt	C266A-Bottom Depth meters	C266A-Bottom pH	C266A-Bottom Turbid+ NTU	C266A-Bottom ODOsat %	C266A-Bottom ODO mg/L
Average	30.10	57.92	38.47	1.14	7.24	81.59	1.29	0.08
Median	30.09	57.94	38.49	1.125	7.23	73.90	1.3	0.08
Stand. Dev	0.139	0.309	0.236	0.064	0.141	24.720	0.199	0.013
%DO Sat Exceedances	100%							

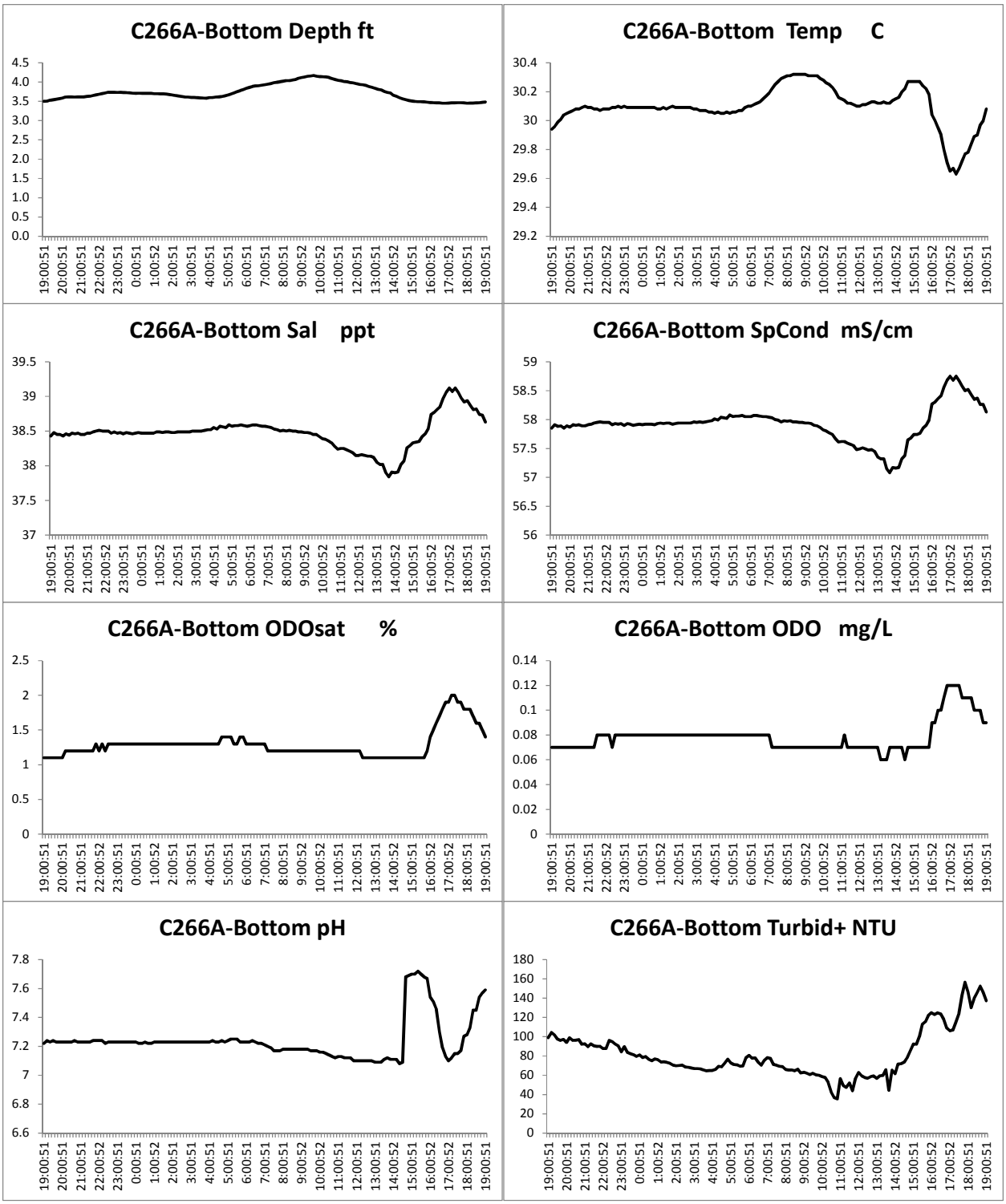


Figure 29: Time-series of physical-chemical data for bottom water at site A in canal #266 during a 24-hour cycle (Diel cycle)

Canal #277. Surface

Water Depth displays a very regular tidal cycle with a 0.7 ft tidal range.

Water Temperature stays about constant except for a slight decrease from morning hours till early afternoon

Salinity and Specific Conductance remain constant until early afternoon when an increasing tendency occurs and peaking at around noon. Total range is just 1.5 ^{O}C

Dissolved Oxygen and Oxygen saturation declines from mid afternoon, and amid significant variability, to mid-morning, when values increase rapidly peaking at about 10 AM. %DO Sat exceedances reach 99%

pH follows very closely the DO and %DO Saturation patterns with a highly significant inear correlation coefficients of r^2=0.91.

Turbidity is low with only a period of increasing values starting at midnight and peaking at early morning hours.

	C277A- Surface Temp C	C277A- Surface SpCond mS/cm	C277A- Surface Sal ppt	C277A- Surface Depth meters	C277A- Surface pH	C277A- Surface Turbid+ NTU	C277A- Surface ODOsat %	C277A- Surface ODO mg/L
Average	29.58	51.33	33.59	0.47	7.34	1.42	23.88	1.51
Median	29.52	50.89	33.26	0.466	7.36	1.20	26.7	1.69
Stand. Dev	0.258	0.822	0.605	0.058	0.050	0.771	9.956	0.632
%DO Sat Exceedances	99%							

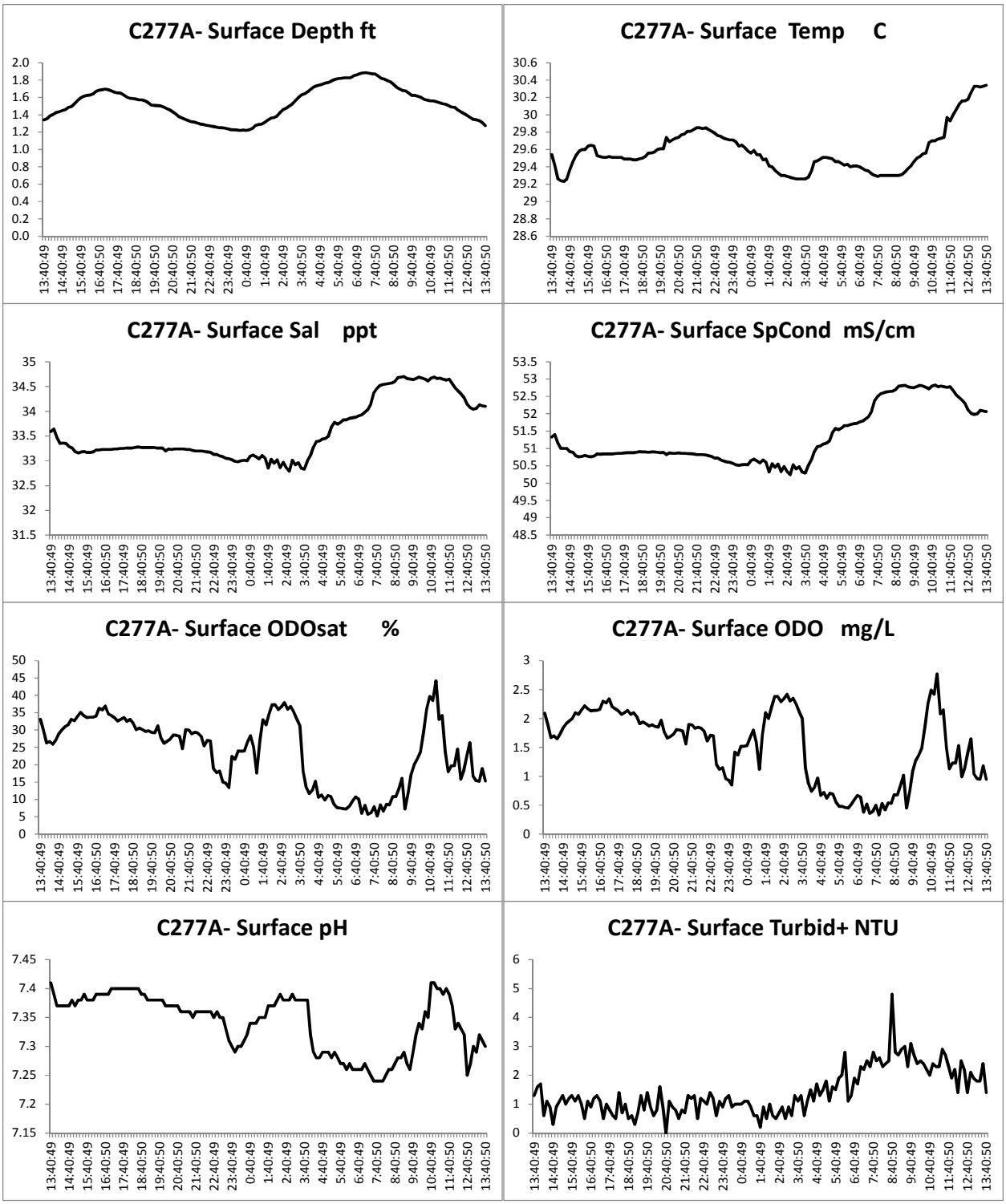


Figure 30: Time-series of physical-chemical data for surface water at site A in canal #277during a 24-hour cycle (Diel cycle)

Canal #277. Bottom

Water Depth displays a very regular tidal cycle with a 0.8 ft tidal range.

Water Temperature increased constantly

Salinity and Specific Conductance decrease slightly from noon to very early morning, when a sudden increase began at about 2 AM

Dissolved Oxygen and Oxygen saturation declines from mid afternoon, continuously until midnight. %DO Sat exceedances reach 99%

pH follows very closely the DO and %DO Saturation patterns with a highly significant linear correlation coefficients of r^2=0.92.

Turbidity is low and declines from early afternoon to 2 AM, when a sudden increase in turbidity occurs with a strong peak at 4 AM and continuously increasing to early morning.

	C277A- Surface Temp C	C277A- Surface SpCond mS/cm	C277A- Surface Sal ppt	C277A- Surface Depth meters	C277A- Surface pH	C277A- Surface Turbid+ NTU	C277A- Surface ODOsat %	C277A- Surface ODO mg/L
Average	29.58	51.33	33.59	0.47	7.34	1.42	23.88	1.51
Median	29.52	50.89	33.26	0.466	7.36	1.20	26.7	1.69
Stand. Dev	0.258	0.822	0.605	0.058	0.050	0.771	9.956	0.632
%DO Sat Exceedances	99%							

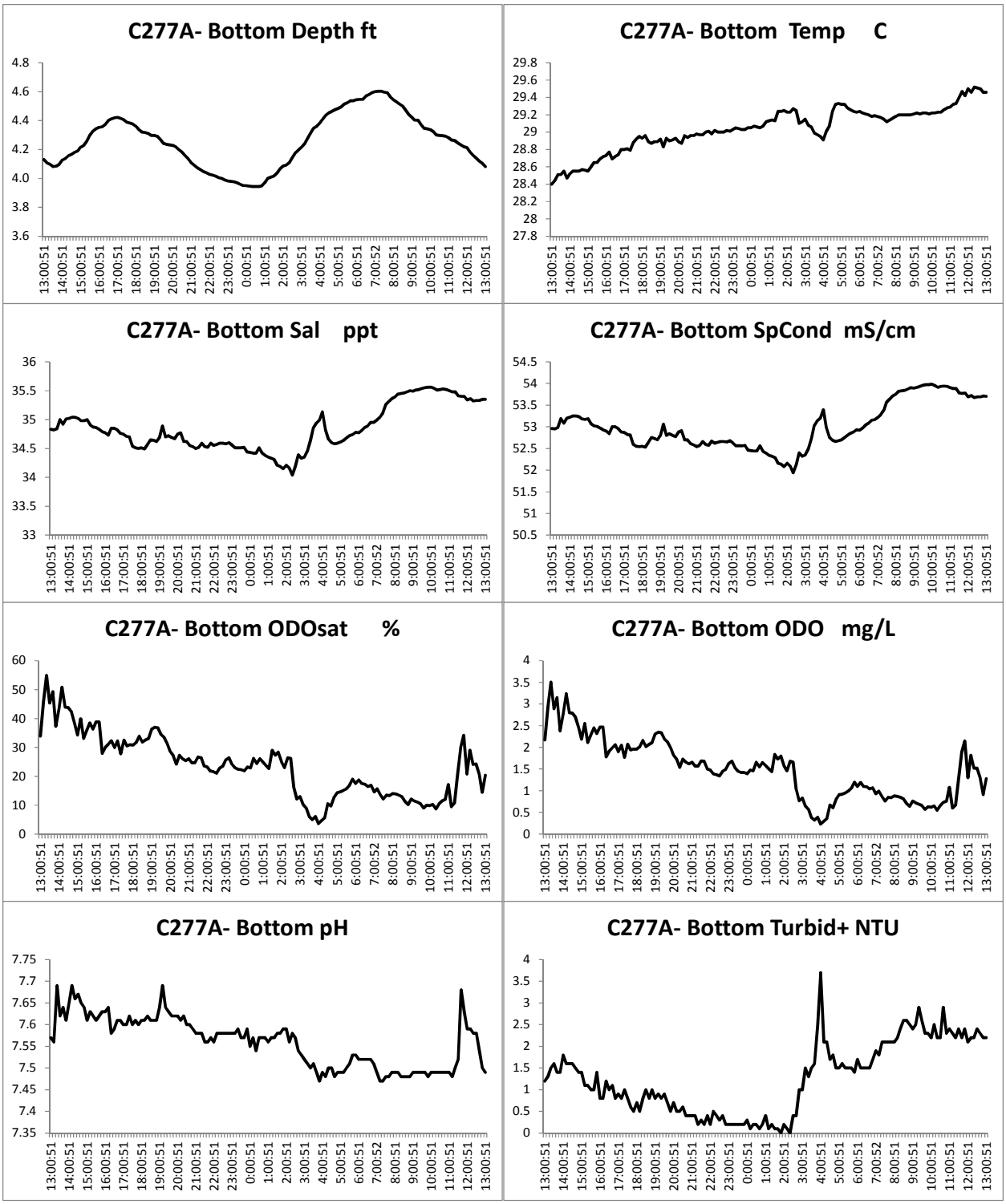


Figure 31: Time-series of physical-chemical data for bottom water at site A in canal #277during a 24-hour cycle (Diel cycle)

Canal #278. Surface

Water Depth displays a very regular tidal cycle with a 1.8 ft tidal range.

Water Temperature decreased from afternoon to very early morning hours, then increases until afternoon hours

Salinity and Specific Conductance follows tides coarsely. Decrease slightly from afternoon to midnight, when a sudden increase began at midnight

Dissolved Oxygen and Oxygen saturation declines from mid afternoon, continuously until mid-morning and then slightly increase. %DO Sat exceedances reach 48%

pH roughly follows DO and %DO Saturation patterns with a highly significant linear correlation coefficients of r^2=0.82.

Turbidity is low and declines from early afternoon to 2 AM, when a sudden increase in turbidity occurs with a strong peak at 4 AM and continuously increasing to early morning.

	C278A- Bottom Temp C	C278A- Bottom SpCond mS/cm	C278A- Bottom Sal ppt	C278A- Bottom Depth meters	C278A- Bottom pH	C278A- Bottom Turbid+ NTU	C278A- Bottom ODOsat %	C278A- Bottom ODO mg/L
Average	31.65	52.24	34.19	1.60	7.61	0.41	41.51	2.53
Median	31.62	52.2	34.16	1.608	7.61	0.40	42	2.57
Stand. Dev	0.219	0.161	0.112	0.083	0.018	0.204	4.904	0.303
%DO Sat Exceedances	48%							

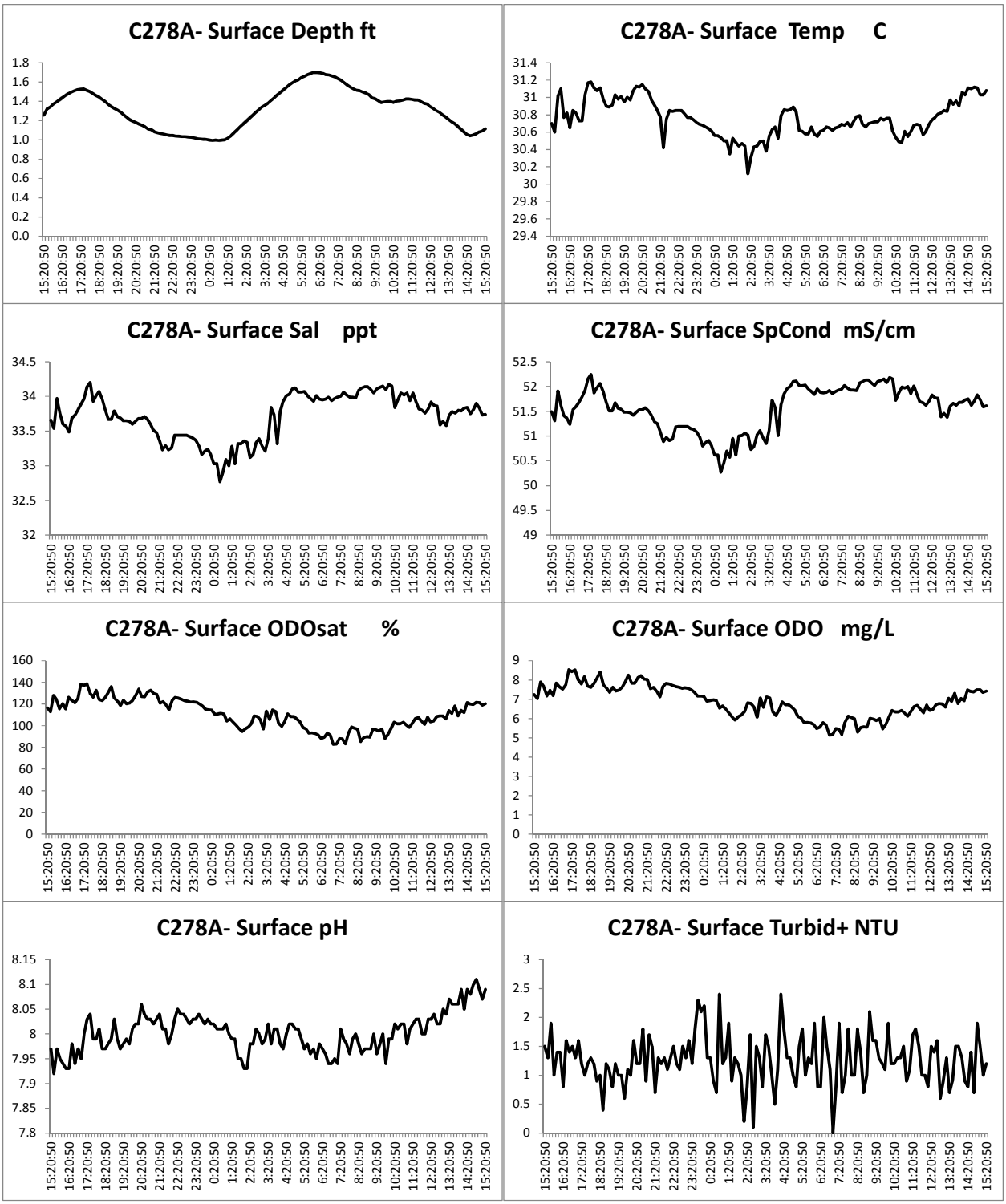


Figure 32: Time-series of physical-chemical data for surface water at site A in canal #278 during a 24-hour cycle (Diel cycle)

Canal #278. Bottom

Water Depth displays a very regular tidal cycle with a 0.8 ft tidal range.

Water Temperature increased constantly

Salinity and Specific Conductance remain constant and beging to decline in early morning when the variability increases.

Dissolved Oxygen and Oxygen saturation declines from mid afternoon, continuously until midmorning, when there is a slight increase. %DO Sat exceedances reach 99%

pH continuous decline

Turbidity is low and irregular

	C278A- Bottom Temp C	C278A- Bottom SpCond mS/cm	C278A- Bottom Sal ppt	C278A- Bottom Depth meters	C278A- Bottom pH	C278A- Bottom Turbid+ NTU	C278A- Bottom ODOsat %	C278A- Bottom ODO mg/L
Average	31.65	52.24	34.19	1.60	7.61	0.41	41.51	2.53
Median	31.62	52.2	34.16	1.608	7.61	0.40	42	2.57
Stand. Dev	0.219	0.161	0.112	0.083	0.018	0.204	4.904	0.303
%DO Sat Exceedances	48%							

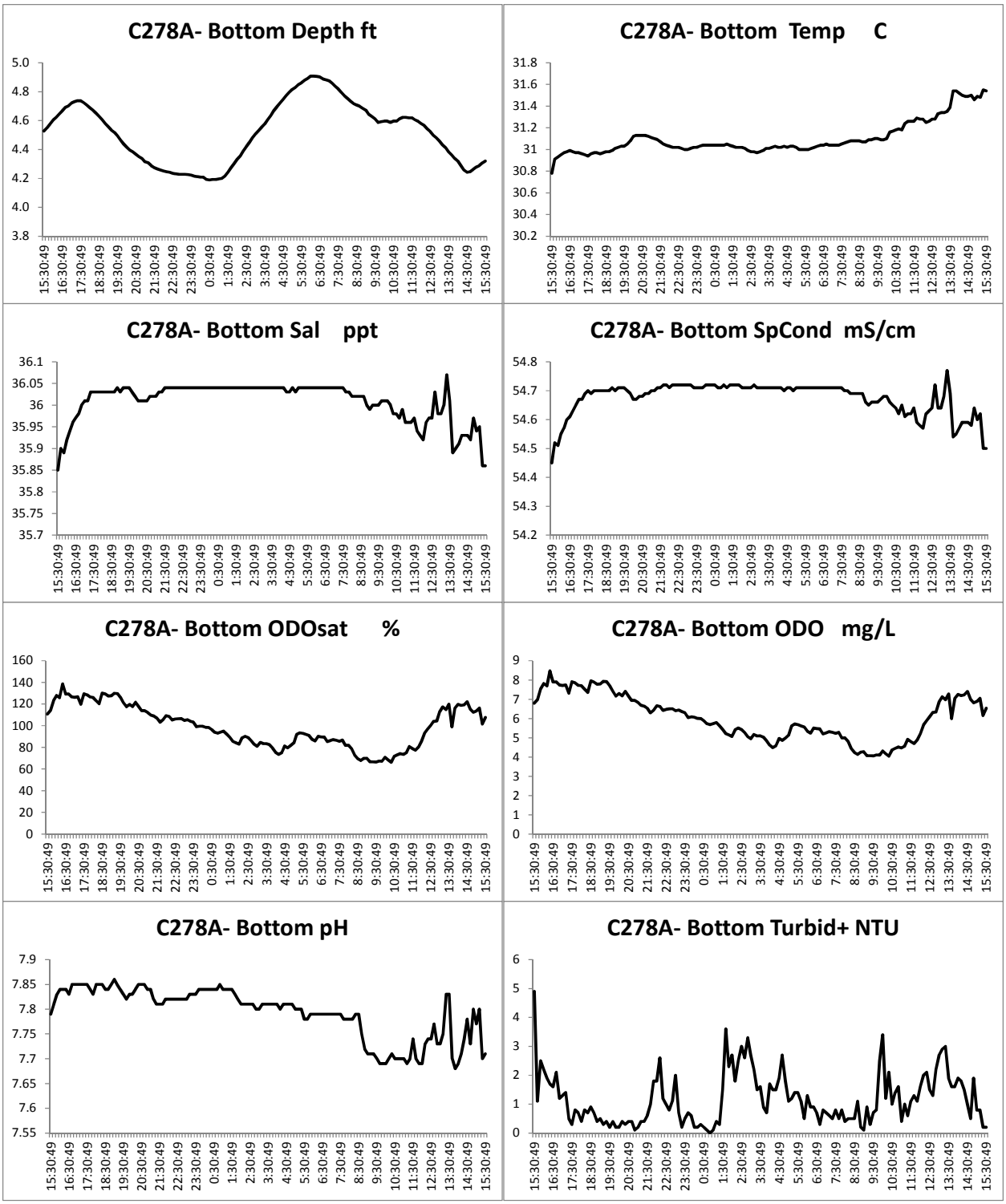


Figure 33: Time-series of physical-chemical data for bottom water at site A in canal #278during a 24-hour cycle (Diel cycle)

Canal #282. Surface

Water Depth displays an asymmetric tidal cycle with a strong decline from 9Am to 3 PM. 0.8 ft tidal range.

Water Temperature declines constantly from afternoon to morning next day when begins to climb back

Salinity and Specific Conductance continuously increases

Dissolved Oxygen and Oxygen saturation declines from early evening to noon next day, when begin to increase again , continuously until midmorning, when there is a slight increase. There are not %DO Sat exceedances

pH continuous decline

Turbidity is low and irregular

	C278A- Bottom Temp	C278A- Bottom SpCond	C278A- Bottom Sal	C278A- Bottom Depth	C278A- Bottom pH	C278A- Bottom Turbid+	C278A- Bottom ODOsat	C278A- Bottom ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	31.10	54.67	36.01	1.38	7.79	1.18	98.89	6.03
Median	31.04	54.7	36.03	1.389	7.81	1	98.3	5.99
Stand. Dev	0.158	0.056	0.045	0.066	0.052	0.881	19.283	1.176
%DO Sat Exceedances	0%							

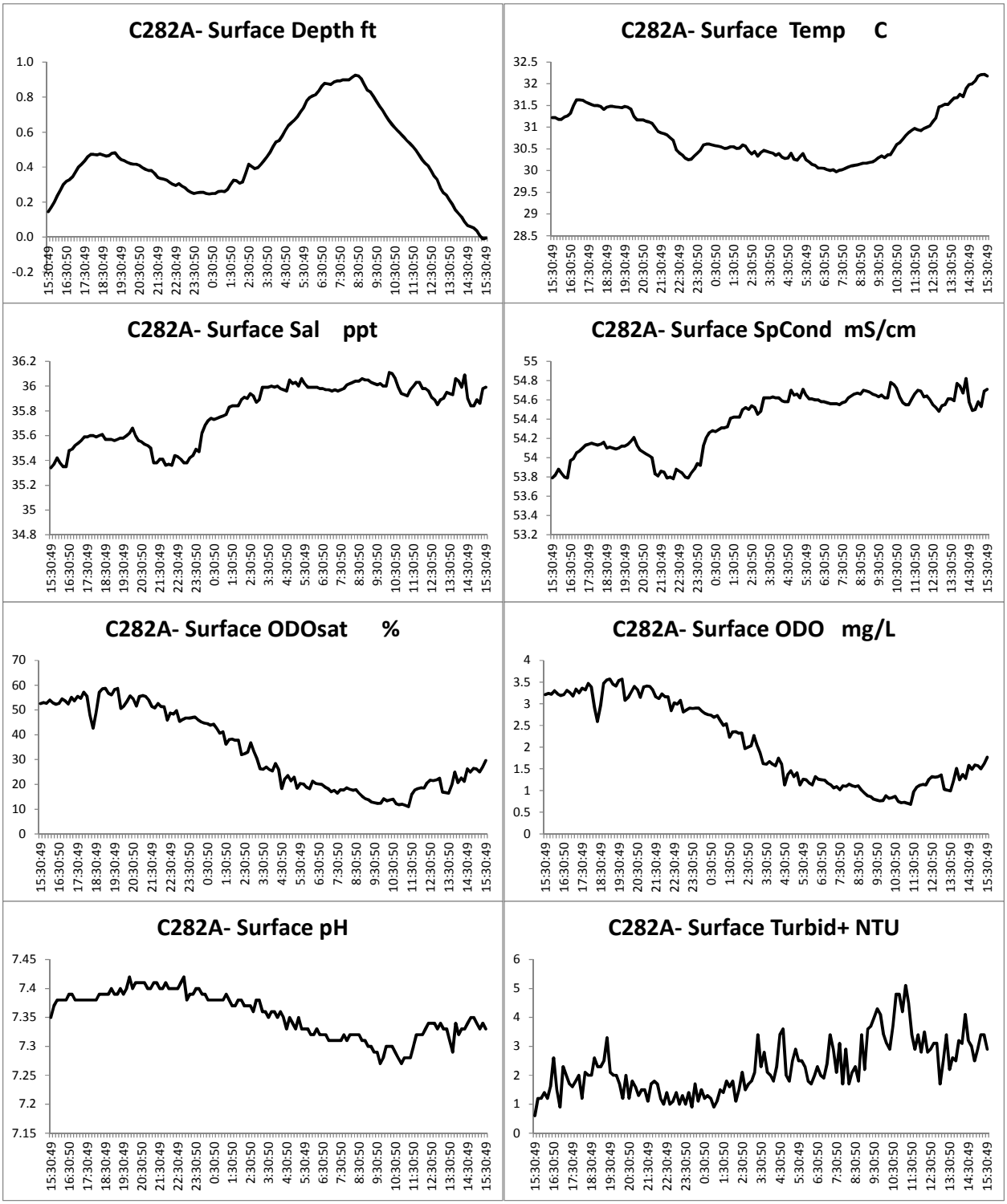


Figure 34: Time-series of physical-chemical data for surface water at site A in canal #282 during a 24-hour cycle (Diel cycle)

Canal #282. Bottom

Water Depth displays rather flat depth curve just 0.5 ft depth range.

Water Temperature increases from afternoon hours to early morning, where values decline rapidly to early morning, when an increasing tendency resumes.

Salinity and Specific Conductance continuously increases from late afternoon hours to mid-morning next day when values decline until afternoon hours

Dissolved Oxygen and Oxygen saturation describe an opposite tendency as that of salinity. %DO Sat exceedances reach 90%

pH is highly correlated with DO and %DO Sat (r2=.98)

Turbidity shows high turbidity from mid-afternoon to late night hours, when it becomes very small and constant around 3 NTU

	C282A- Bottom Temp	C282A- Bottom SpCond	C282A- Bottom Sal	C282A- Bottom Depth	C282A- Bottom pH	C282A- Bottom Turbid+	C282A- Bottom ODOsat	C282A- Bottom ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	30.31	55.07	36.33	1.26	7.56	7.57	22.89	1.41
Median	30.33	55.04	36.3	1.249	7.54	5.3	19.9	1.23
Stand. Dev	0.190	0.204	0.154	0.074	0.068	5.441	14.102	0.870
%DO Sat Exceedances	90%							

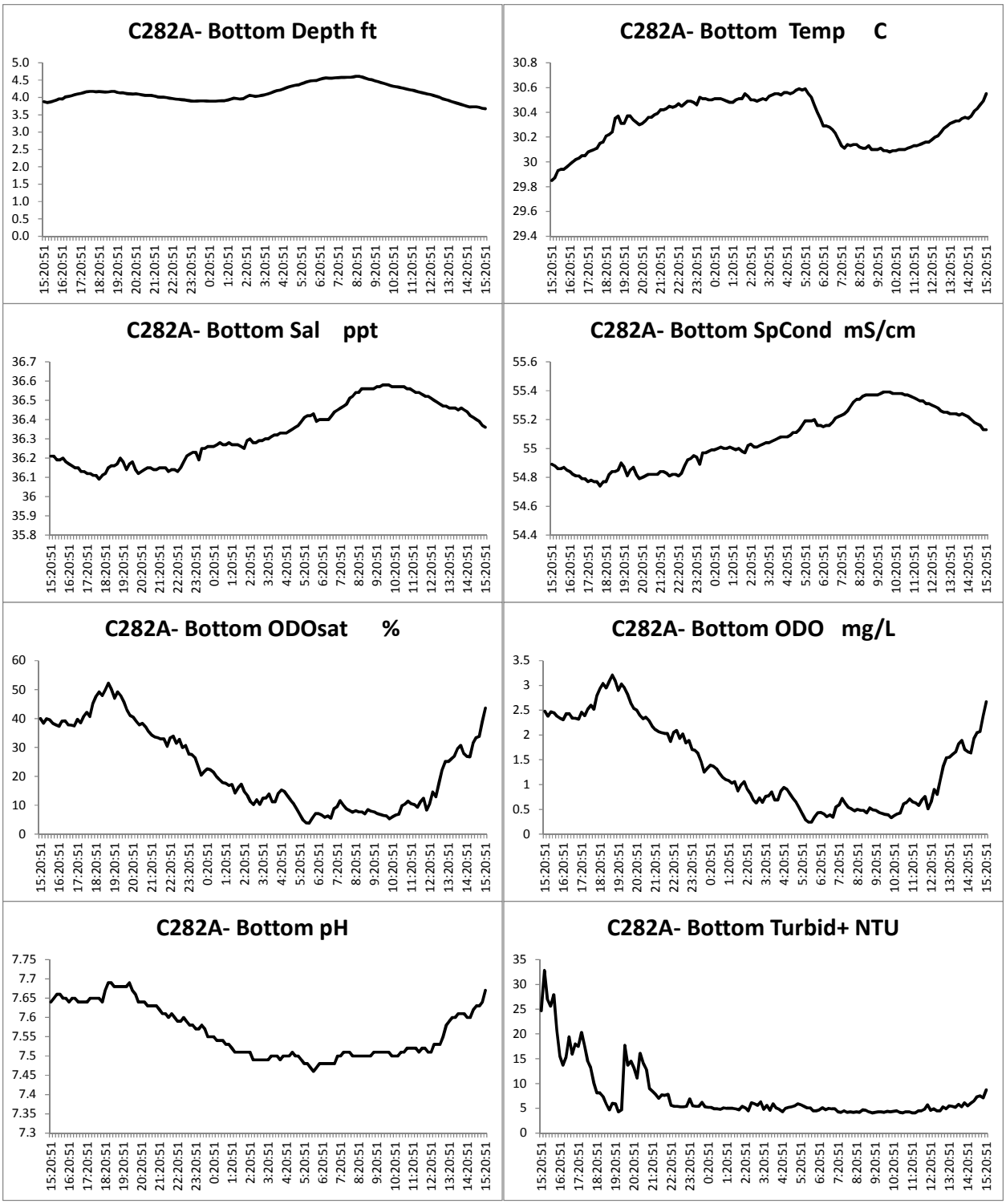


Figure 35: Time-series of physical-chemical data for bottom water at site A in canal #282 during a 24-hour cycle (Diel cycle)

Canal #287. Surface

Water Depth displays an asymmetrical tidal curve with maximum at 7 AM. 0.8ft tidal range.

Water Temperature declines from mid afternoon to early morning next day when an increasing tendency resumes.

Salinity and Specific Conductance declines especially at low tide, with higher variability

Dissolved Oxygen and Oxygen saturation follow very closely the temperature pattern. %DO Sat exceedances reach 18%

pH. Follows very closely the pattern of DO and %DO Sat (r2=0.87)

Turbidity is generally low and with noisy signal

	C287A- Surface Temp	C287A- Surface SpCond	C287A- Surface Sal	C287A- Surface Depth	C287A- Surface pH	C287A- Surface Turbid+	C287A- Surface ODOsat	C287A- Surface ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	29.61	53.02	34.84	0.42	7.45	0.37	48.58	3.05
Median	29.88	53.31	35.03	0.425	7.45	0.3	49.2	3.1
Stand. Dev	0.501	0.645	0.461	0.014	0.045	0.232	9.603	0.599
%DO Sat Exceedances	18%							

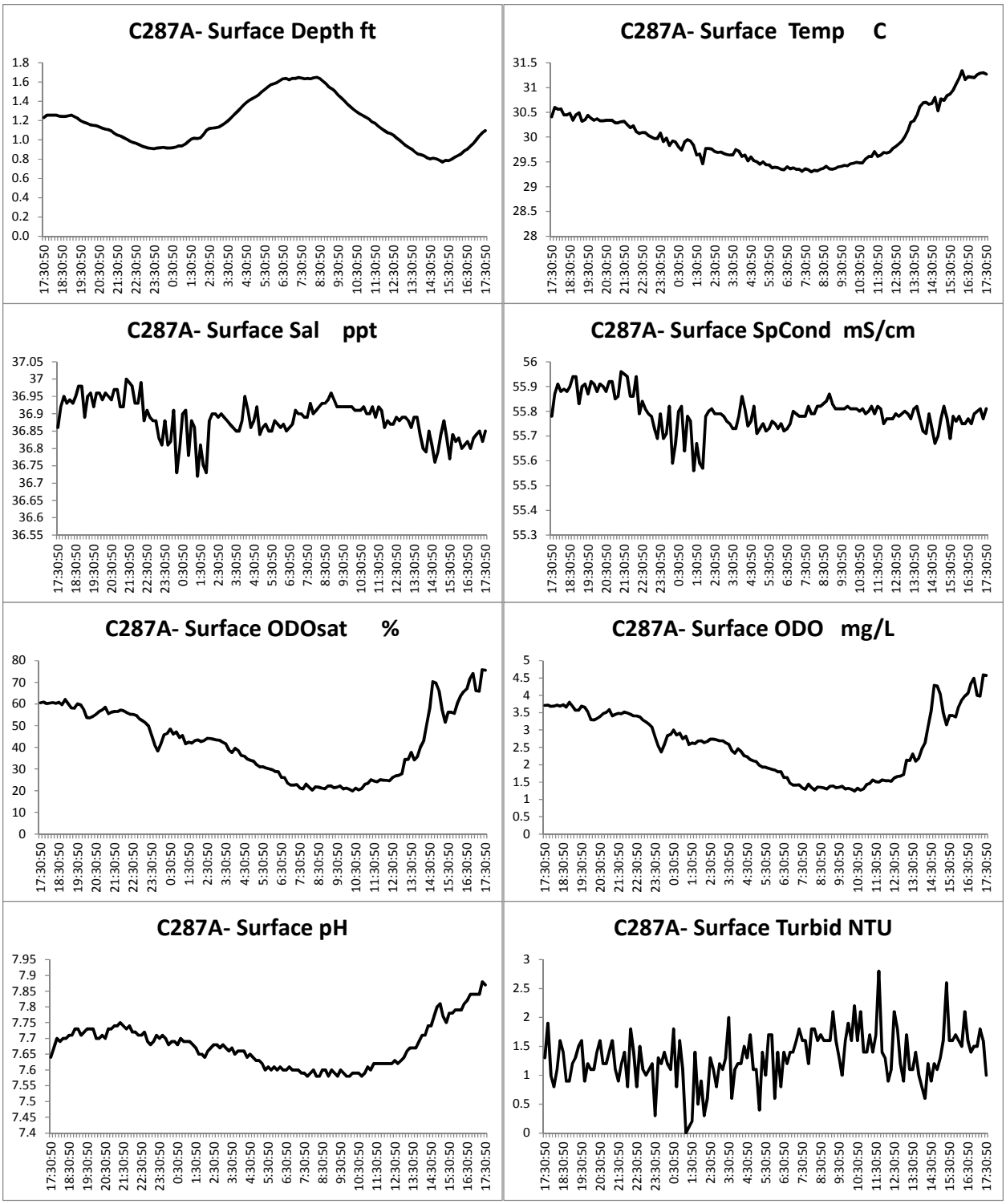


Figure 36: Time-series of physical-chemical data for surface water at site A in canal #287 during a 24-hour cycle (Diel cycle)

Canal #287. Bottom

Water Depth displays an asymmetrical tidal curve with 0.8ft tidal range.

Water Temperature remain constant from early evening to noon time next day when an increasing tendency resumes.

Salinity and Specific Conductance declines in evening-night time an then remains constant the rest of the time

Dissolved Oxygen and Oxygen saturation show a period where values remain totally flat at zero from late night to noon next day,At both sides of this period, values are higher and with relatively large variability. %DO Sat exceedances reach 100%

pH signal is noisy and displays a declining tendency from mid afternoon to mid morning, when a slightly decreasing tendency sets in.

Turbidity shows similar tendency as that of pH

	C287A- Bottom Temp	C287A- Bottom SpCond	C287A- Bottom Sal	C287A- Bottom Depth	C287A- Bottom pH	C287A- Bottom Turbid+	C287A- Bottom ODOsat	C287A- Bottom ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	29.54	53.87	35.47	2.25	7.30	10.40	4.84	0.30
Median	29.57	53.88	35.48	2.253	7.29	8.1	2	0.13
Stand. Dev	0.144	0.087	0.064	0.117	0.032	6.931	3.994	0.252
%DO Sat Exceedances	100%							

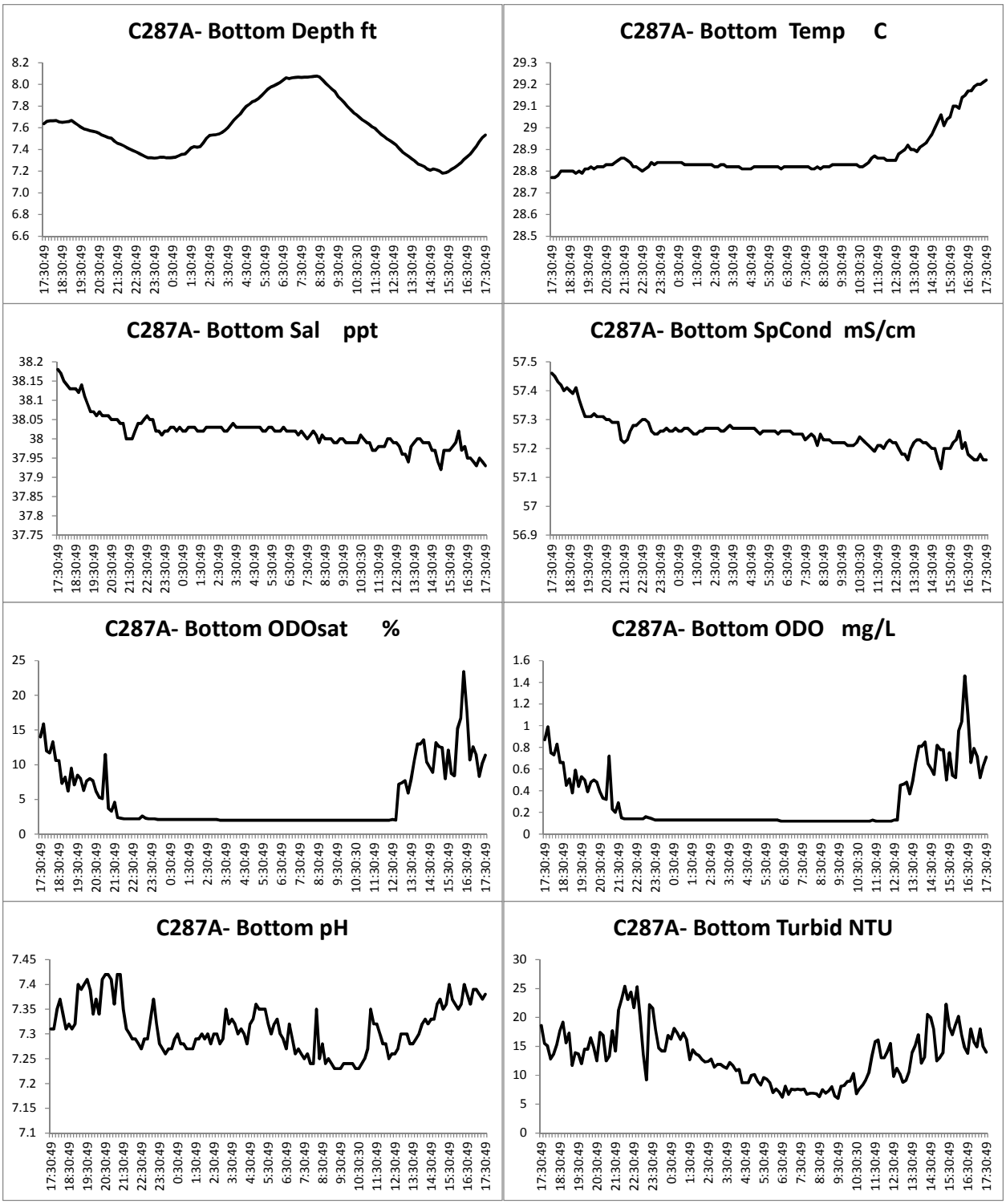


Figure 37: Time-series of physical-chemical data for bottom water at site A in canal #287 during a 24-hour cycle (Diel cycle)

Canal #290. Surface

Water Depth displays an asymetrical tidal curve with 1.2 ft tidal range.

Water Temperature remain constant from evening to morning hours, when it increases until mid-afternoon

Salinity and Specific Conductance show a slight declining trend from evening hours to early morning and then remains about constant to slightly increasing

Dissolved Oxygen and Oxygen saturation display low to zero values from evening to mid-morning next day, when a steep increase begins peaking at mid afternoon. Total %DO exceedances reach 97%

pH displays a constant tendency from evening to morning hours, when a slightly increasing tendency sets in.

Turbidity shows low and very noisy signal with a poorly defined increasing tendency from midnight and peaking at mid-morning

	C290A- Surface Temp	C290A- Surface SpCond	C290A- Surface Sal	C290A- Surface Depth	C290A- Surface pH	C290A- Surface Turbid	C290A- Surface ODOsat	C290A- Surface ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	30.95	55.68	36.77	0.45	7.65	1.34	14.04	0.84
Median	30.64	55.68	36.76	0.434	7.62	1.2	9.7	0.6
Stand. Dev	1.024	0.146	0.092	0.097	0.093	0.578	12.942	0.763
%DO Sat Exceedances	97%							

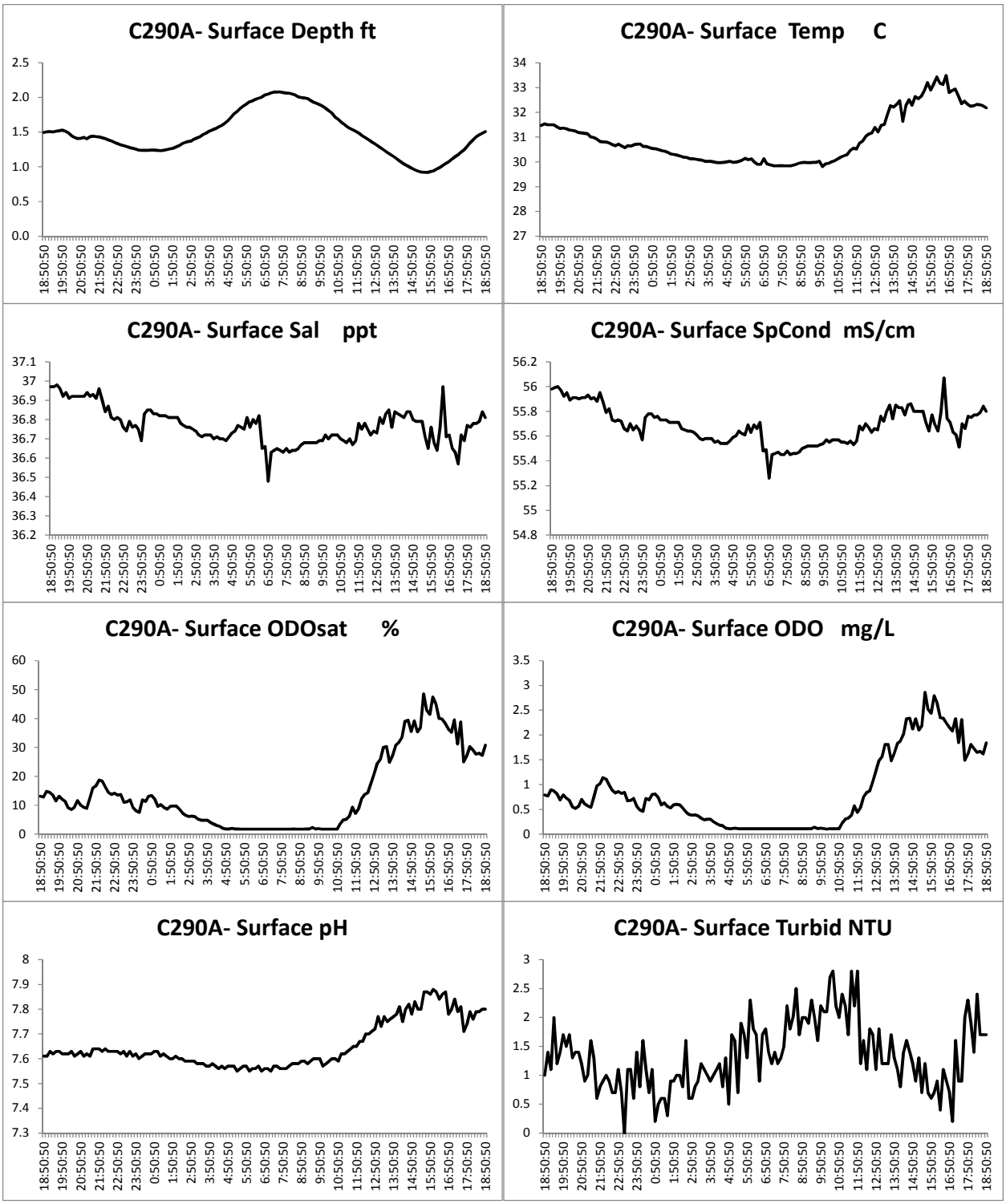


Figure 38: Time-series of physical-chemical data for surface water at site A in canal #290 during a 24-hour cycle (Diel cycle)

Canal #290. Bottom

Water Depth displays an rather flatl tidal curve with 0.8ft tidal range.

Water Temperature remain constant from evening to early morning hours, when it declines until mid-morning to resume increases again until evening hours

Salinity and Specific Conductance show a little increase from night hours to early morning when values suddenly drop and stay low the rest of the day.

Dissolved Oxygen and Oxygen saturation show a period where values remain totally flat at zero from late night to noon next day, Values at night hours are very low, and values increase drastically at noon and remain relatively high (2.5 mg/l) until evening hours. %DO Sat exceedances reach 94%

pH displays a declining tendency from evening to early morning, when a slightly increasing tendency sets in.

Turbidity shows low values from afternoon to very early morning hours, when a slight and highly variable tendency ensues

	C290A- Bottom Temp	C290A- Bottom SpCond	C290A- Bottom Sal	C290A- Bottom Depth	C290A- Bottom pH	C290A- Bottom Turbid	C290A- Bottom ODOsat	C290A- Bottom ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	30.56	56.36	37.28	1.40	7.30	3.71	10.53	0.64
Median	30.7	56.39	37.3	1.383	7.29	3.6	2.4	0.15
Stand. Dev	0.290	0.087	0.061	0.098	0.060	1.347	14.252	0.867
%DO Sat Exceedances	94%							

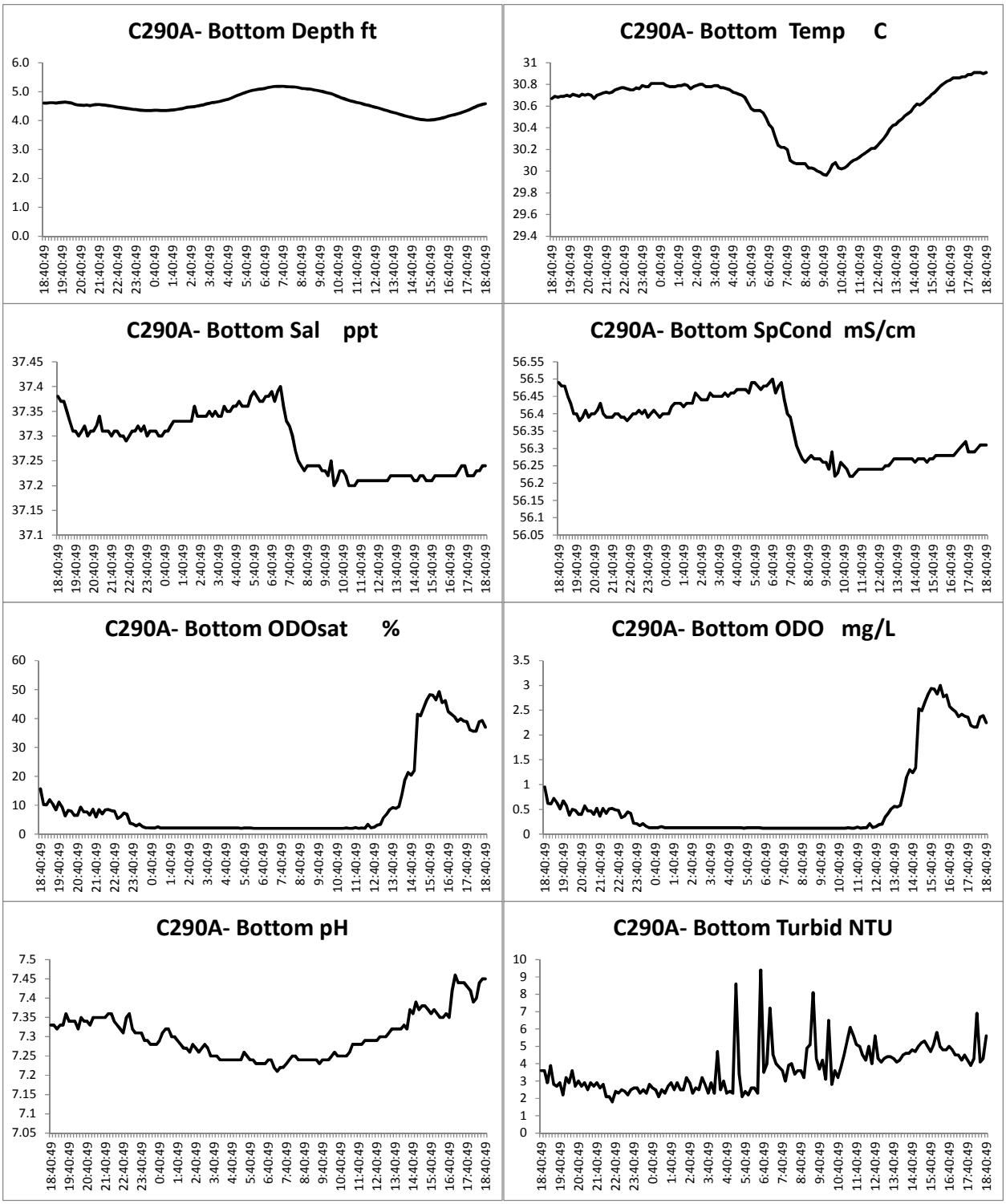


Figure 39: Time-series of physical-chemical data for bottom water at site A in canal #290 during a 24-hour cycle (Diel cycle)

Canal #293. Surface

Water Depth displays an asymetric tidal curve with 1.5 ft tidal range.

Water Temperature remain constant from evening to early morning hours, when it increases until mid-afternoon hours

Salinity and Specific Conductance coarsely relate to salinity, declining from evening to mid-night, increasing to early morning and declining again until late afternoon

Dissolved Oxygen and Oxygen saturation remains practically at zero except for afternoon hours %DO Sat exceedances reach 100%

pH stays close to 7.2 units and displays a slightly increasing tendency

Turbidity declines from afternoon hours to 2 AM, when it remains about constant the rest of the time

	C293A- Surface Temp	C293A- Surface SpCond	C293A- Surface Sal	C293A- Surface Depth	C293A- Surface pH	C293A- Surface Turbid	C293A- Surface ODOsat	C293A- Surface ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	30.83	56.12	37.10	0.58	7.23	3.12	2.67	0.16
Median	30.65	56.13	37.08	0.569	7.22	3.1	0.9	0.06
Stand. Dev	0.777	0.207	0.162	0.099	0.037	0.727	4.594	0.271
%DO Sat Exceedances	100%							

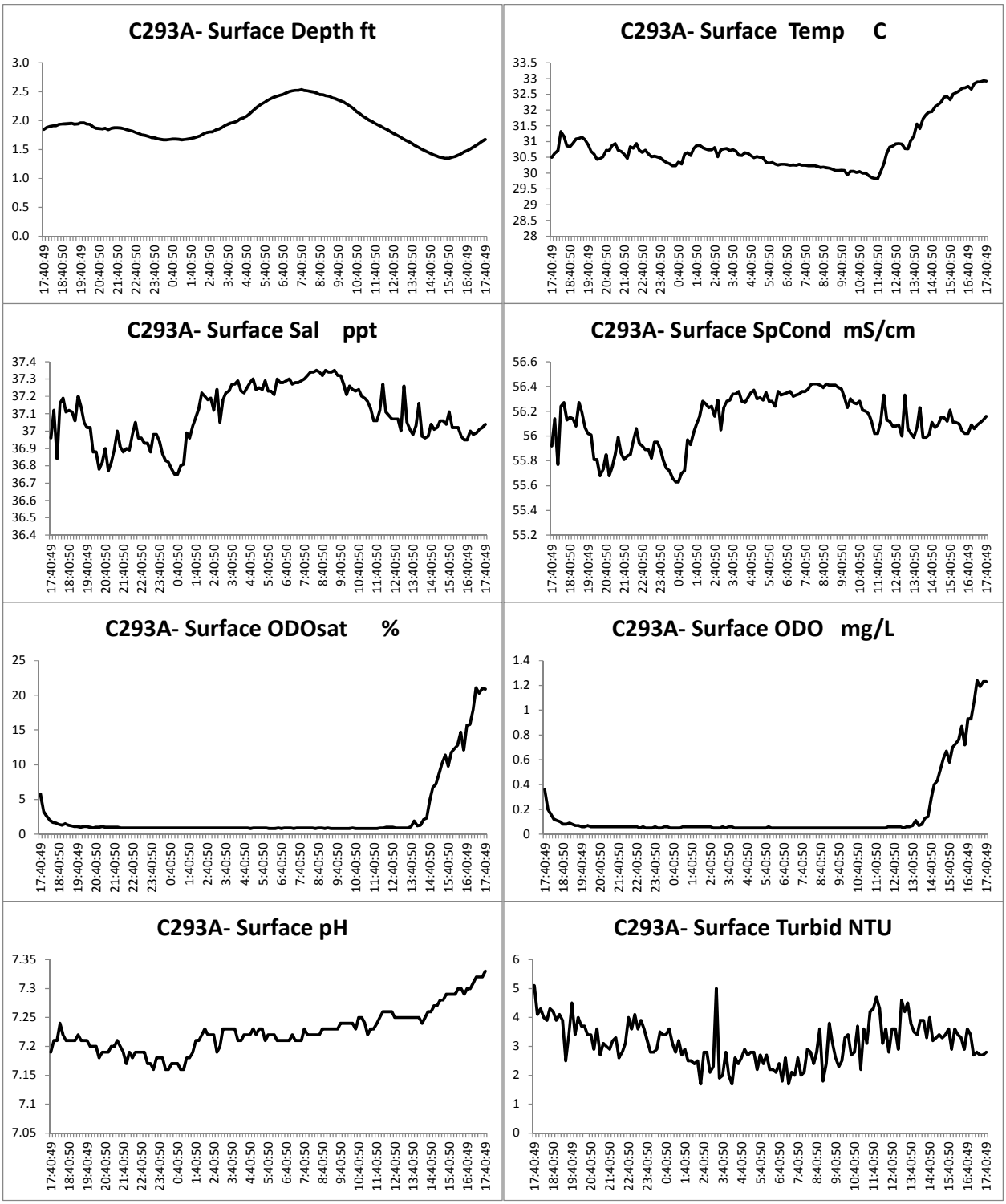


Figure 40: Time-series of physical-chemical data for surface water at site A in canal #293 during a 24-hour cycle (Diel cycle)

Canal #293. Bottom

Water Depth displays a flat depth curve with just 0.8 ft range.

Water Temperature is noisy and without definite pattern

Salinity and Specific Conductance are noisy and without well defined tendency

Dissolved Oxygen and Oxygen saturation remains practically at zero. %DO Sat exceedances reach 100%

pH shows slightly higher values from morning to evening hours

Turbidity displays a pattern similar to that of pH

	C293A- Surface Temp	C293A- Surface SpCond	C293A- Surface Sal	C293A- Surface Depth	C293A- Surface pH	C293A- Surface Turbid	C293A- Surface ODOsat	C293A- Surface ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	30.83	56.12	37.10	0.58	7.23	3.12	2.67	0.16
Median	30.65	56.13	37.08	0.569	7.22	3.1	0.9	0.06
Stand. Dev	0.777	0.207	0.162	0.099	0.037	0.727	4.594	0.271
%DO Sat Exceedances	100%							

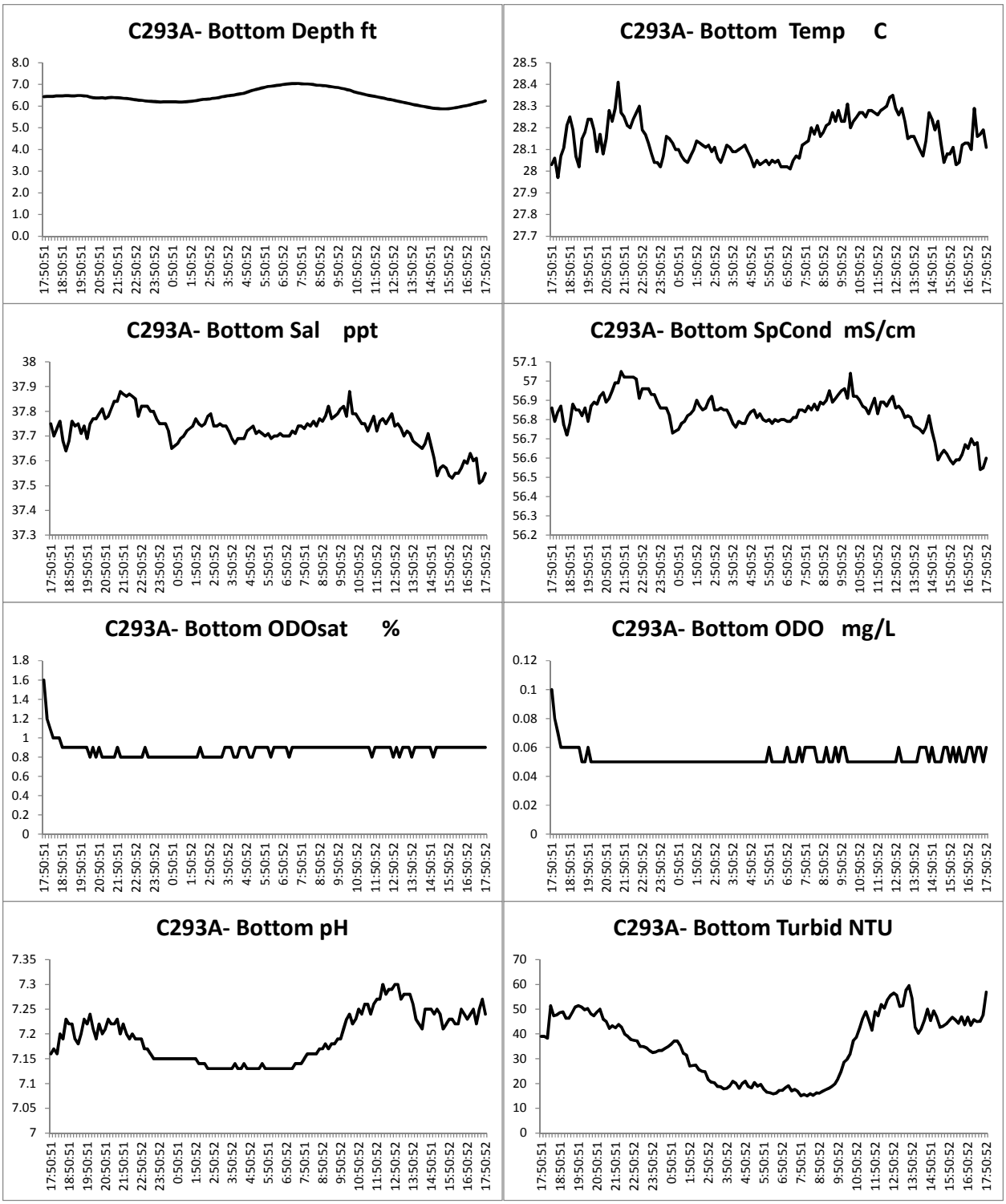


Figure 41: Time-series of physical-chemical data for bottom water at site A in canal #293 during a 24-hour cycle (Diel cycle)

Canal #459. Surface

Water Depth displays a well-defined tidal cycle of 0.4 ft range.

Water Temperature increases during the afternoon hours and declines to early morning when it slightly increases again.

Salinity and Specific Conductance decrease during afternoon and evening hours. Increase continuously to early morning, when a significant drop occurs at about 6 AM

Dissolved Oxygen and Oxygen saturation describe a similar pattern as that of temperature. There were no %DO Sat exceedances.

pH is highly correlated with DO and %DO Sat (r2=.86)

Turbidity shows low values especially noisy from evening to afternoon hours next day

	C459A- Surface Temp	C459A- Surface SpCond	C459A- Surface Sal	C459A- Surface Depth	C459A- Surface pH	C459A- Surface Turbid	C459A- Surface ODOsat	C459A- Surface ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	25.96	58.44	39.00	1.29	7.95	1.28	90.37	5.88
Median	25.73	58.45	39.02	1.282	7.95	1.2	87.6	5.73
Stand. Dev	0.623	0.109	0.089	0.082	0.039	0.458	16.299	1.002
%DO Sat Exceedances	0%							

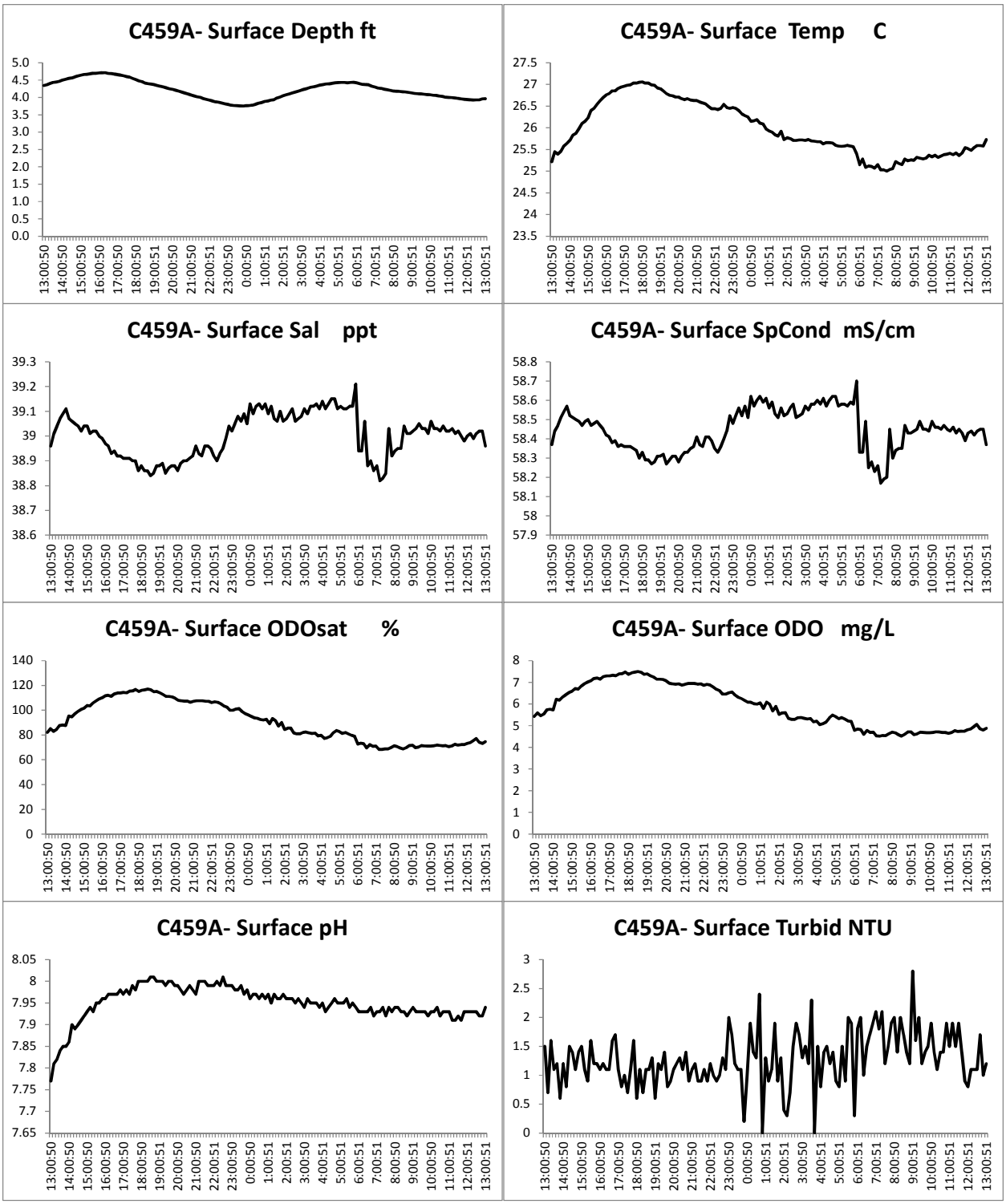


Figure 42: Time-series of physical-chemical data for surface water at site A in canal #459 during a 24-hour cycle (Diel cycle)

Canal #459. Bottom

Water Depth displays a well-defined tidal cycle of 0.8 ft range.

Water Temperature increases during the afternoon hours and declines the rest of the time.

Salinity and Specific Conductance declines from noon to evening, when an increase in salinity begins and extends to midnight. Finally, remains constant until noon next day

Dissolved Oxygen and Oxygen saturation describe a similar pattern as that of temperature. There were no %DO Sat exceedances.

pH is highly correlated with DO and %DO Sat (r2=.86)

Turbidity shows low values especially noisy from evening to afternoon hours next day

	C459A- Bottom Temp	C459A- Bottom SpCond	C459A- Bottom Sal	C459A- Bottom Depth	C459A- Bottom pH	C459A- Bottom Turbid	C459A- Bottom ODOsat	C459A- Bottom ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	26.36	57.43	38.23	1.95	8.06	2.30	86.04	5.59
Median	26.22	57.46	38.27	1.942	8.06	2.3	82.2	5.36
Stand. Dev	0.581	0.119	0.100	0.057	0.031	0.678	13.223	0.807
%DO Sat Exceedances	0%							

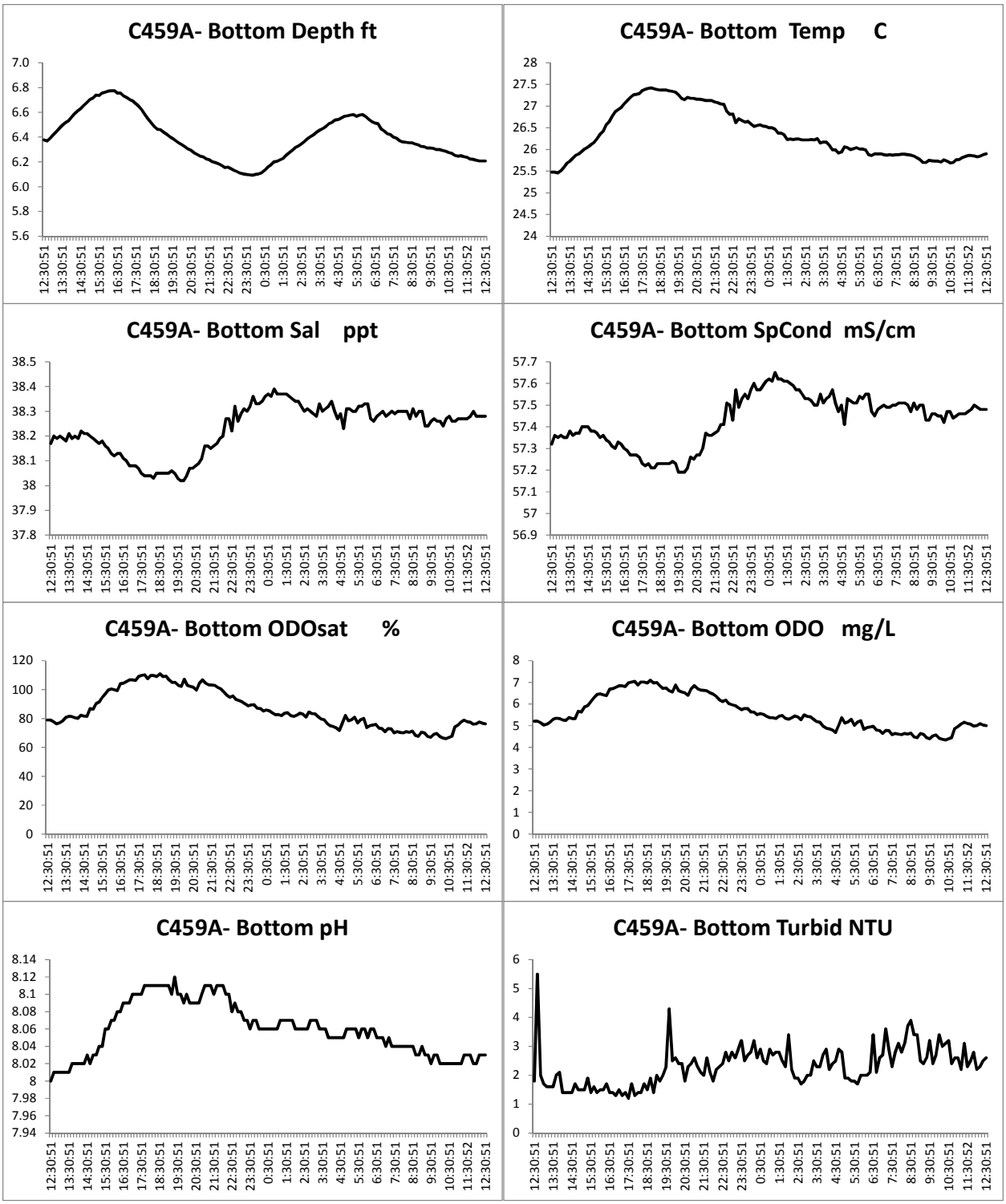


Figure 42: Time-series of physical-chemical data for bottom water at site A in canal #459 during a 24-hour cycle (Diel cycle)

Canal #472. Surface

NOTE: The sonde emerged from the water during low tide.

Water Depth only the highest portions of the tidal curve are shown

Water Temperature seems to display increasing values during daylight hours

Salinity and Specific Conductance. Seems to hold constant

Dissolved Oxygen and Oxygen saturation display a continuous decline. From values which were inside the water, total %DO exceedances reach 91%

pH is about constant to slightly declining and seems to decline strongly during morning hours

Turbidity not well defined pattern

	C472A- Surface Temp	C472A- Surface SpCond	C472A- Surface Sal	C472A- Surface Depth	C472A- Surface pH	C472A- Surface Turbid	C472A- Surface ODOsat	C472A- Surface ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	26.77	58.14	38.75	1.12	7.93	0.93	80.67	5.19
Median	26.61	58.17	38.76	1.146	7.93	0.9	79.8	5.11
Stand. Dev	0.464	0.092	0.078	0.087	0.030	0.318	5.416	0.319
%DO Sat Exceedances	0%							

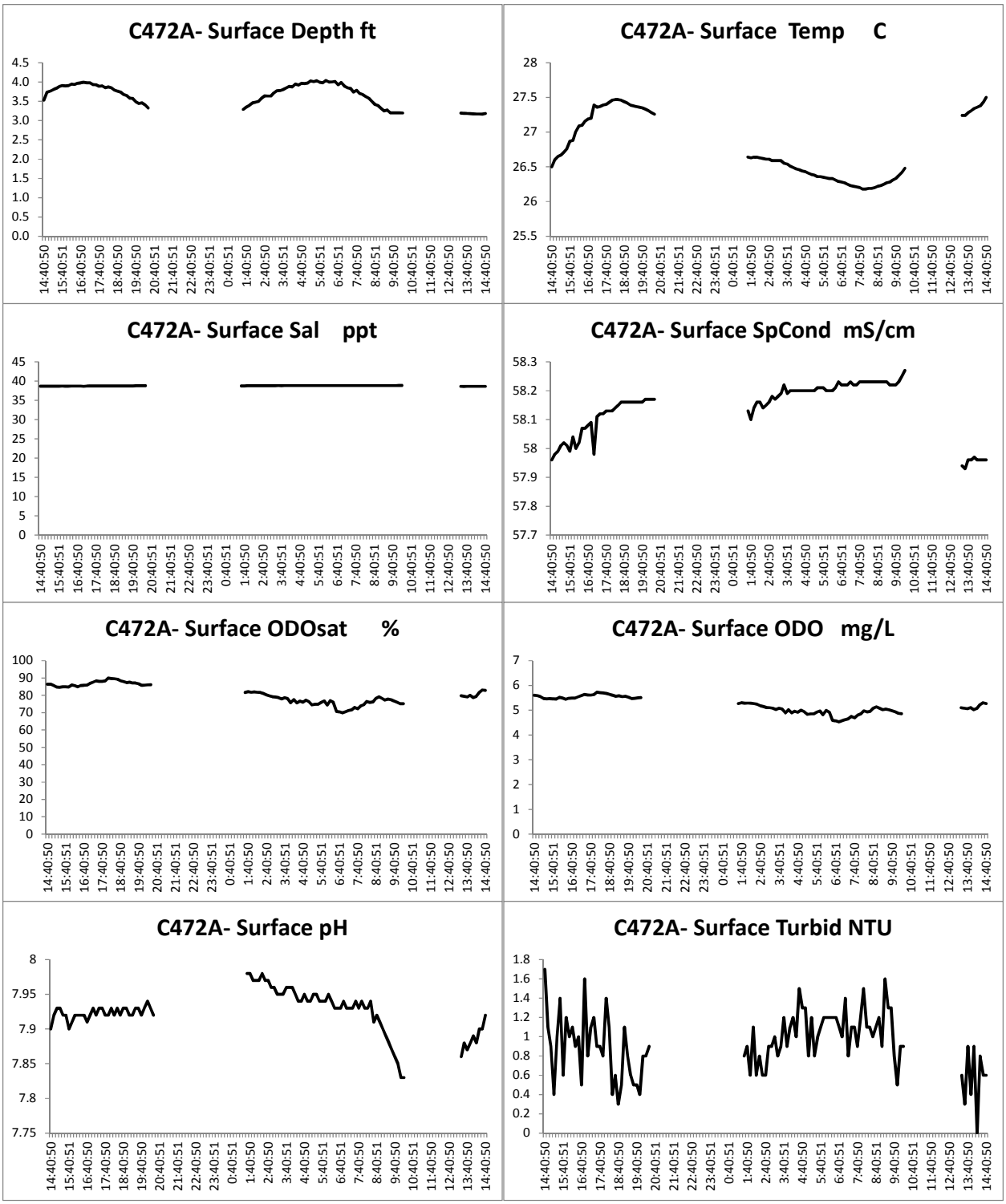


Figure 43: Time-series of physical-chemical data for surface water at site A in canal #472 during a 24-hour cycle (Diel cycle)

Canal #472. Bottom

Water Depth displays a well-defined tidal cycle of 0.8 ft range.

Water Temperature increases continuously

Salinity and Specific Conductance show higher variability from mid-morning to sunset hours

Dissolved Oxygen and Oxygen saturation display a continuous decline. Total %DO exceedances reach 91%

pH is about constant to slightly declining **Turbidity** shows low values from afternoon to late night hours followed by increasing tendency peaking at midnight. Another relatively high set of values occur from mid-morning to mid-afternoon

	C472A- Bottom Temp	C472A- Bottom SpCond	C472A- Bottom Sal	C472A- Bottom Depth	C472A- Bottom pH	C472A- Bottom Turbid	C472A- Bottom ODOsat	C472A- Bottom ODO
	C	mS/cm	ppt	meters		NTU	%	mg/L
Average	26.11	58.41	38.97	4.06	7.83	5.25	32.04	2.08
Median	26.1	58.4	38.97	4.064	7.82	3.9	30.5	1.98
Stand. Dev	0.090	0.075	0.055	0.064	0.025	3.178	7.030	0.459
%DO Sat Exceedances	91%							

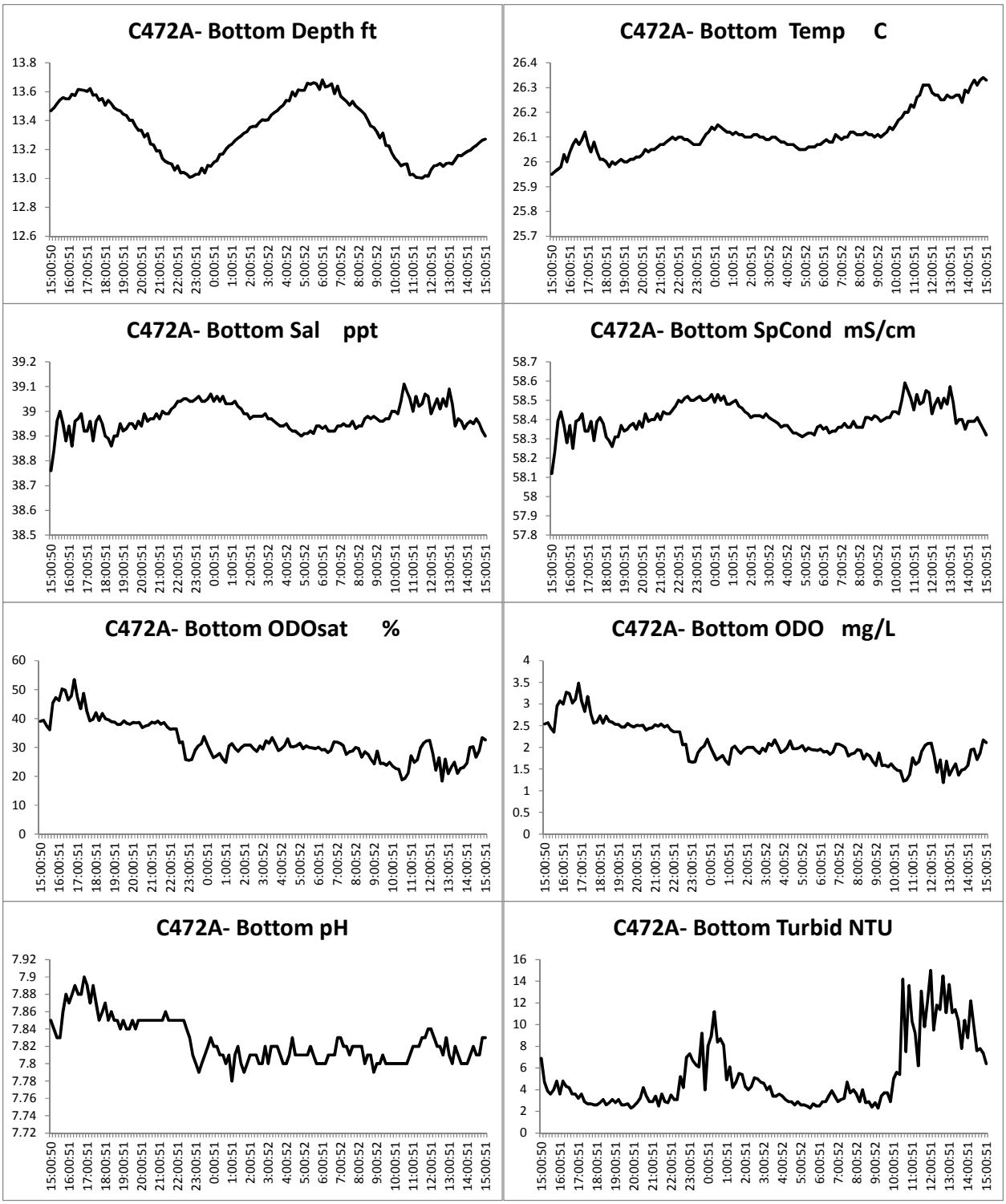


Figure 44: Time-series of physical-chemical data for bottom water at site A in canal #472 during a 24-hour cycle (Diel cycle)

Diel experiments

Survey No 2

Canal #132. Surface

	C132A- Surface Temp C	C132A- Surface SpCond mS/cm	C132A- Surface Sal ppt	C132A- Surface Depth meters	C132A- Surface pH	C132A- Surface Turbid NTU	C132A- Surface ODOsat %	C132A- Surface ODO mg/L
Average	30.32	52.93	34.74	0.28	7.47	8.96	69.33	4.30
Median	30.34	52.94	34.77	0.28	7.45	10.30	63.40	3.93
Stand. Dev	0.46	0.16	0.13	0.01	0.06	3.75	15.06	0.91
%DO Sat Exceedances	0%							

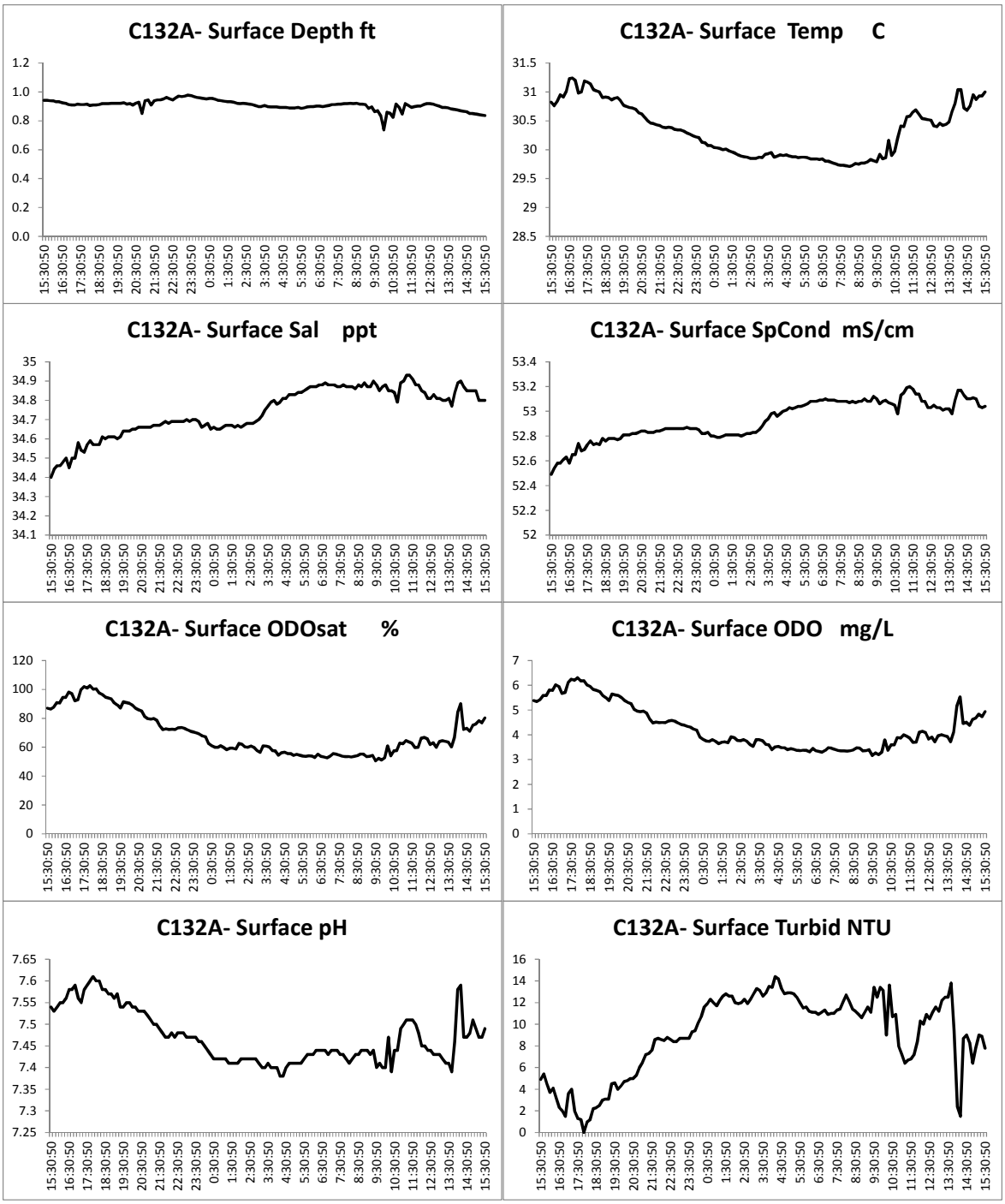


Figure 45: Time-series of physical-chemical data for surface water at site A in canal #132 during a 24-hour cycle (Diel cycle). Survey FKC02

Canal #132. Bottom

Water Depth displays a well-defined tidal cycle of 1.7 ft range.

Water Temperature increases during the afternoon hours and declines to early morning when it increases again

Salinity and Specific Conductance displays an increasing tendency from afternoon to early morning when values stabilize the rest of the days.

Dissolved Oxygen and Oxygen saturation are practically constant. There are no %DO Sat exceedances

pH display rather constant values only interrupted by a higher values event from 3 PM to 6 PM

Turbidity shows high and rather constant values interrupted by a decline event from 3 PM to 6 PM

	C132A-Bottom Temp C	C132A-Bottom SpCond mS/cm	C132A-Bottom Sal ppt	C132A-Bottom Depth meters	C132A-Bottom pH	C132A-Bottom Turbid NTU	C132A-Bottom ODOsat %	C132A-Bottom ODO mg/L
Average	29.73	52.95	34.77	1.82	7.41	12.13	51.97	3.26
Median	29.76	53.00	34.81	1.83	7.40	12.90	51.20	3.21
Stand. Dev	0.17	0.13	0.09	0.15	0.04	2.69	4.34	0.27
%DO Sat Exceedances	0%							

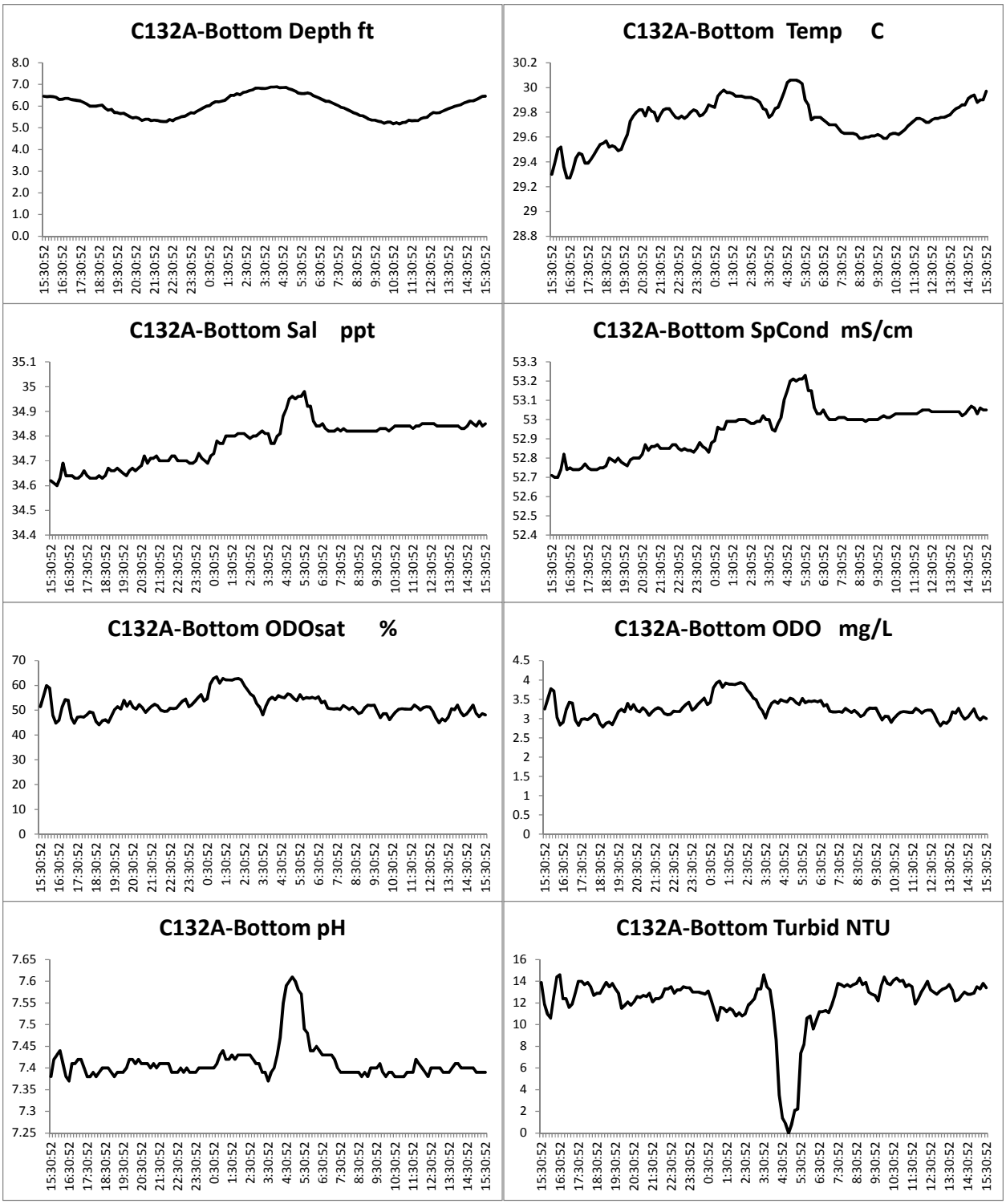


Figure 46: Time-series of physical-chemical data for bottom water at site A in canal #132 during a 24-hour cycle (Diel cycle). Survey FKC02

	C137A-Bottom Temp C	C137A-Bottom SpCond mS/cm	C137A-Bottom Sal ppt	C137A-Bottom Depth meters	C137A-Bottom pH	C137A-Bottom Turbid NTU	C137A-Bottom ODOsat %	C137A-Bottom ODO mg/L
Average	28.76	52.77	34.68	1.94	7.36	2.76	54.63	3.48
Median	28.79	52.76	34.67	1.93	7.36	2.30	55.70	3.55
Stand. Dev	0.23	0.04	0.03	0.18	0.03	1.98	5.32	0.33
%DO Sat Exceedances	5%							

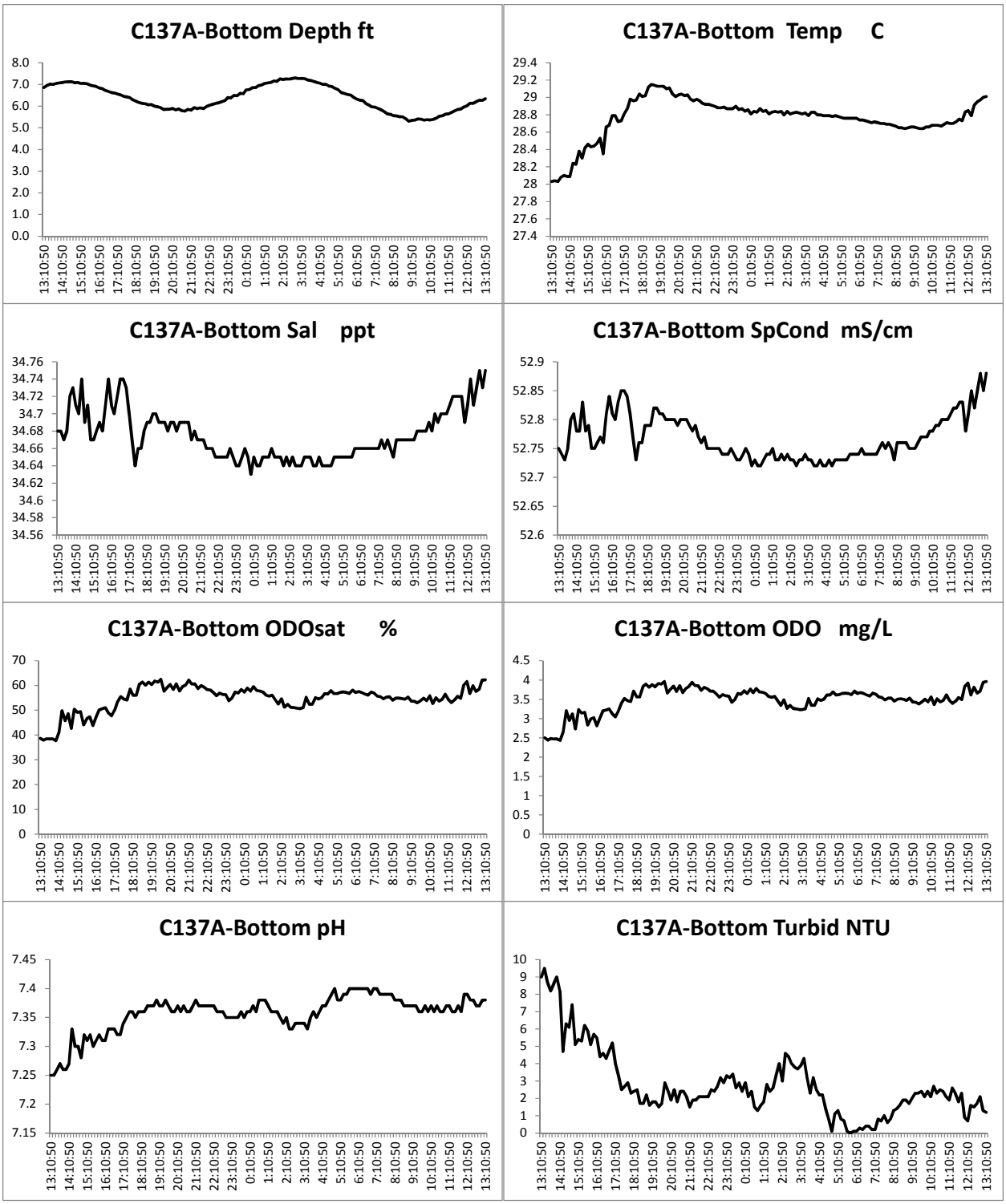


Figure 47: Time-series of physical-chemical data for bottom water at site A in canal #137 during a 24-hour cycle (Diel cycle). Survey FKC02

	C137A- Surface Temp C	C137A- Surface SpCond mS/cm	C137A- Surface Sal ppt	C137A- Surface Depth meters	C137A- Surface pH	C137A- Surface Turbid+ NTU	C137A- Surface ODOsat %	C137A- Surface ODO mg/L
Average	29.07	52.50	34.46	0.32	7.44	0.75	63.09	4.00
Median	29.02	52.50	34.46	0.33	7.42	0.60	61.70	3.92
Stand. Dev	0.27	0.09	0.07	0.03	0.06	0.60	7.28	0.45
%DO Sat Exceedances	0%							

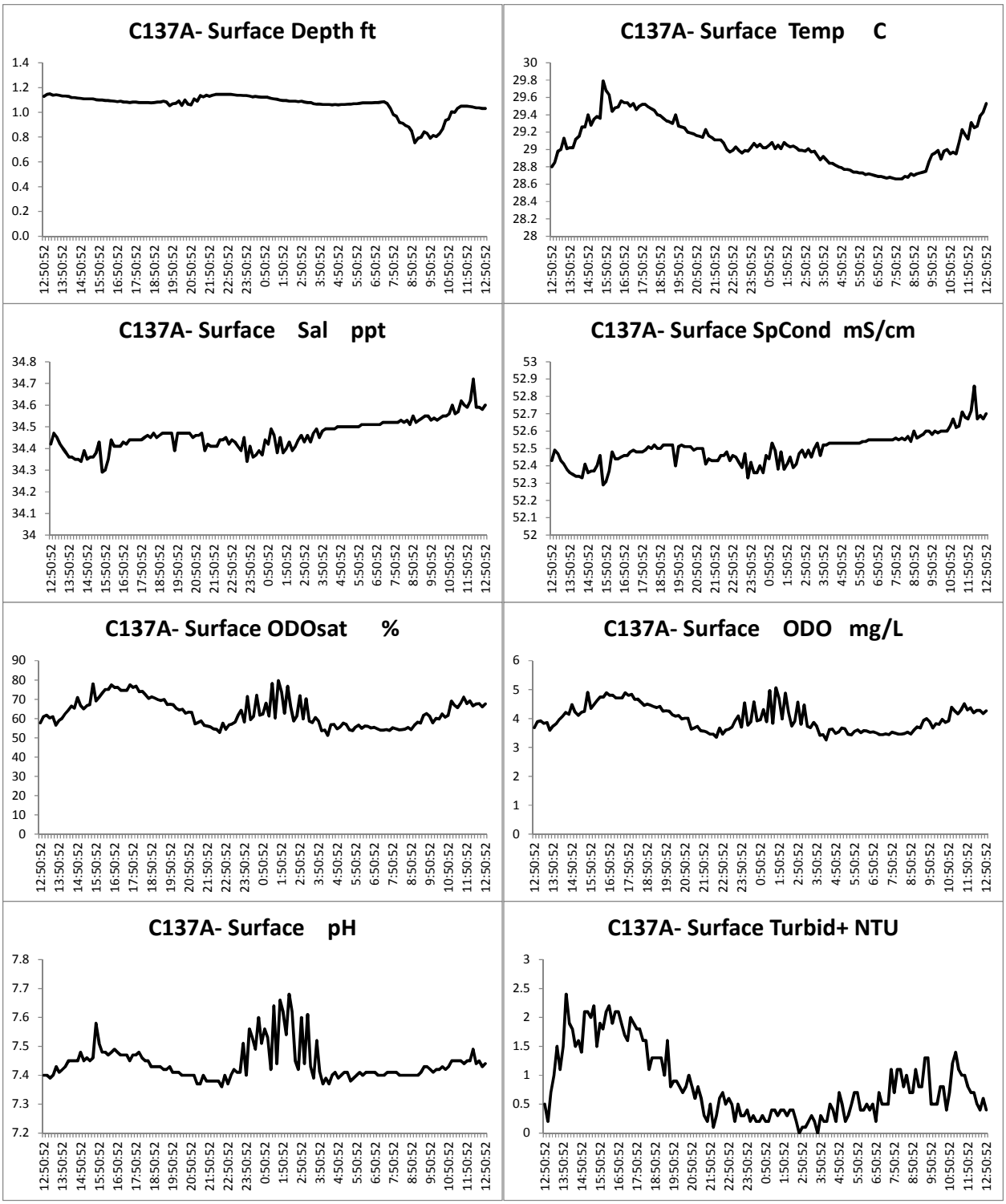


Figure 48: Time-series of physical-chemical data for surface water at site A in canal #137 during a 24-hour cycle (Diel cycle). Survey FKC02

	C147A- Bottom Temp C	C147A- Bottom SpCond mS/cm	C147A- Bottom Sal ppt	C147A- Bottom Depth meters	C147A- Bottom pH	C147A- Bottom Turbid+ NTU	C147A- Bottom ODOsat %	C147A- Bottom ODO mg/L
Average	25.94	56.47	37.52	1.91	7.13	46.77	0.59	0.04
Median	25.93	56.66	37.66	1.93	7.12	46.20	0.60	0.04
Stand. Dev	0.03	0.36	0.27	0.15	0.04	8.37	0.09	0.00
%DO Sat Exceedances	100%							

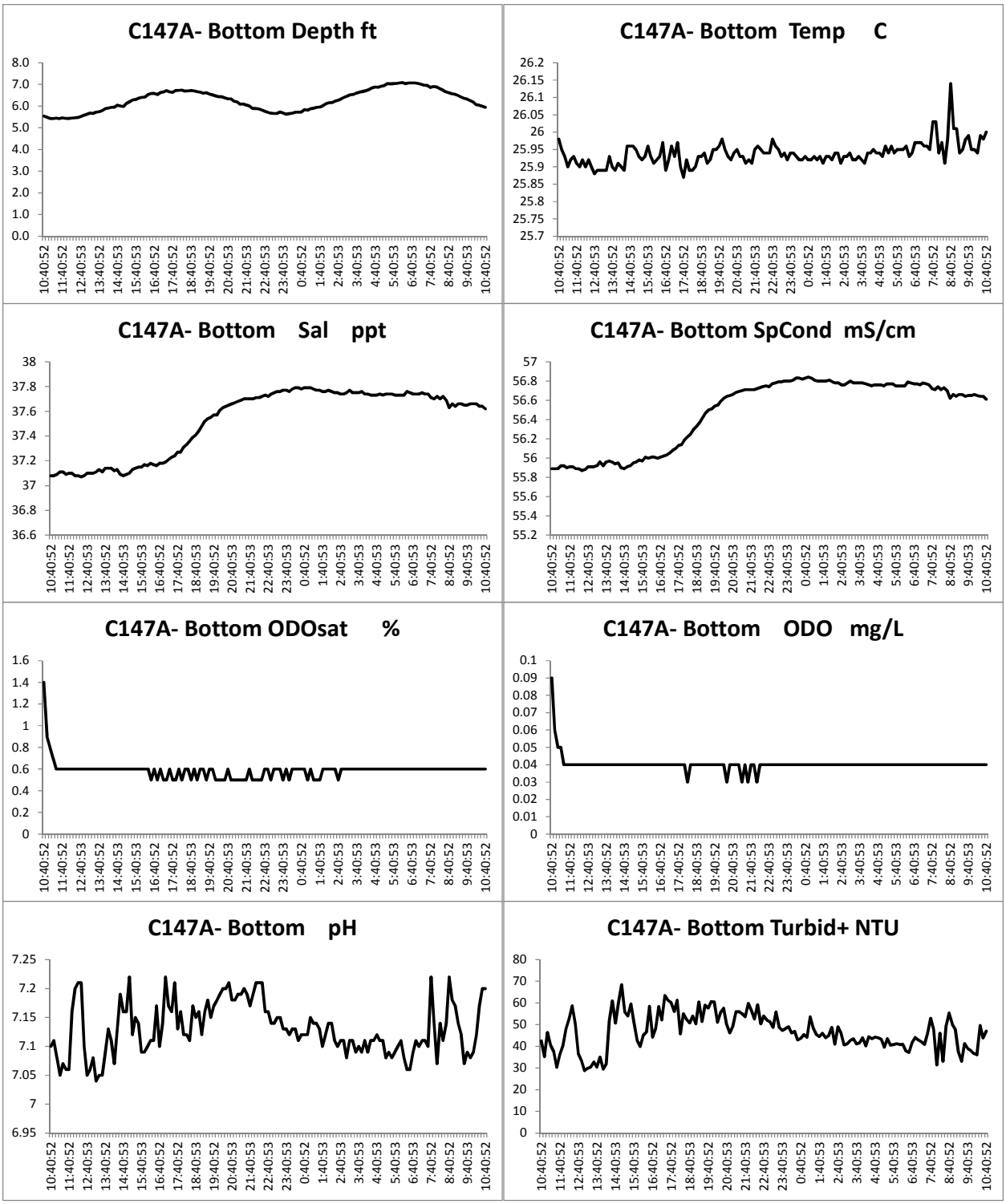


Figure 49: Time-series of physical-chemical data for bottom water at site A in canal #147 during a 24-hour cycle (Diel cycle). Survey FKC02

	C147A- Surface Temp C	C147A- Surface SpCond mS/cm	C147A- Surface Sal ppt	C147A- Surface Depth meters	C147A- Surface pH	C147A- Surface Turbid+ NTU	C147A- Surface ODOsat %	C147A- Surface ODO mg/L
Average	30.51	52.63	34.51	0.31	7.82	0.43	76.64	4.75
Median	30.60	52.64	34.52	0.31	7.79	0.30	67.70	4.24
Stand. Dev	0.43	0.15	0.11	0.01	0.11	0.36	30.14	1.84
%DO Sat Exceedances	0%							

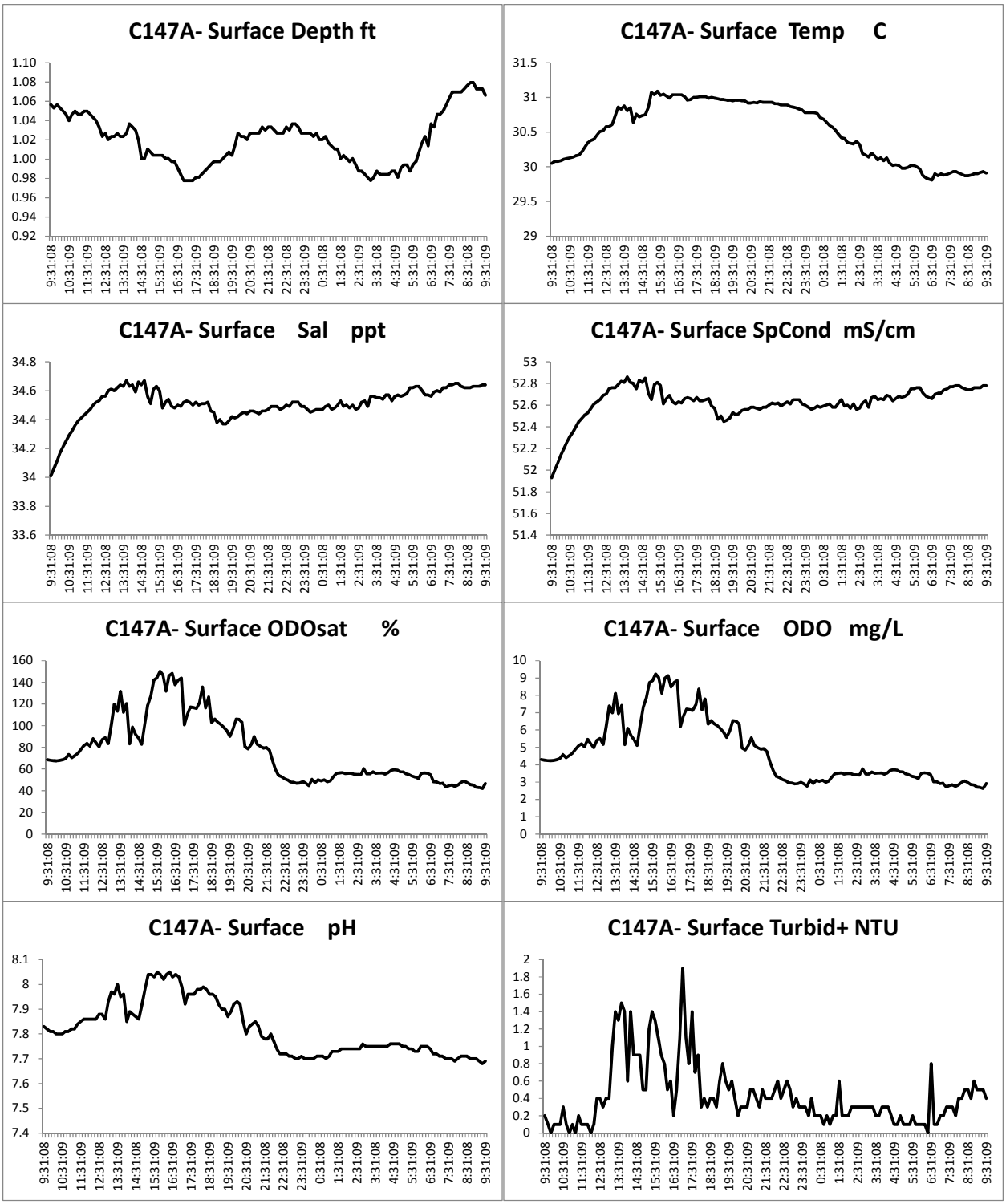


Figure 50: Time-series of physical-chemical data for surface water at site A in canal #147 during a 24-hour cycle (Diel cycle). Survey FKC02

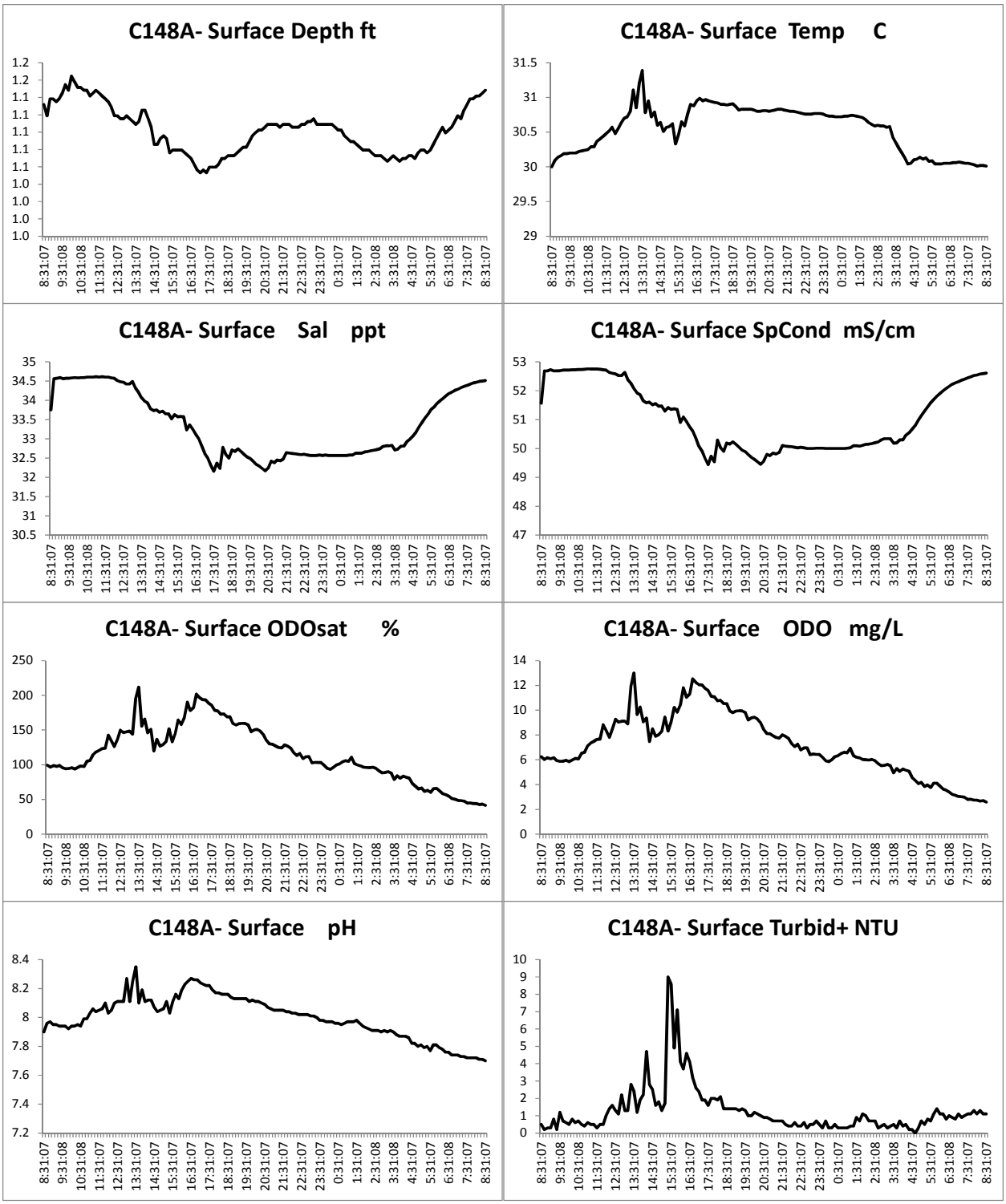


Figure 51: Time-series of physical-chemical data for surface water at site A in canal #148 during a 24-hour cycle (Diel cycle). Survey FKC02

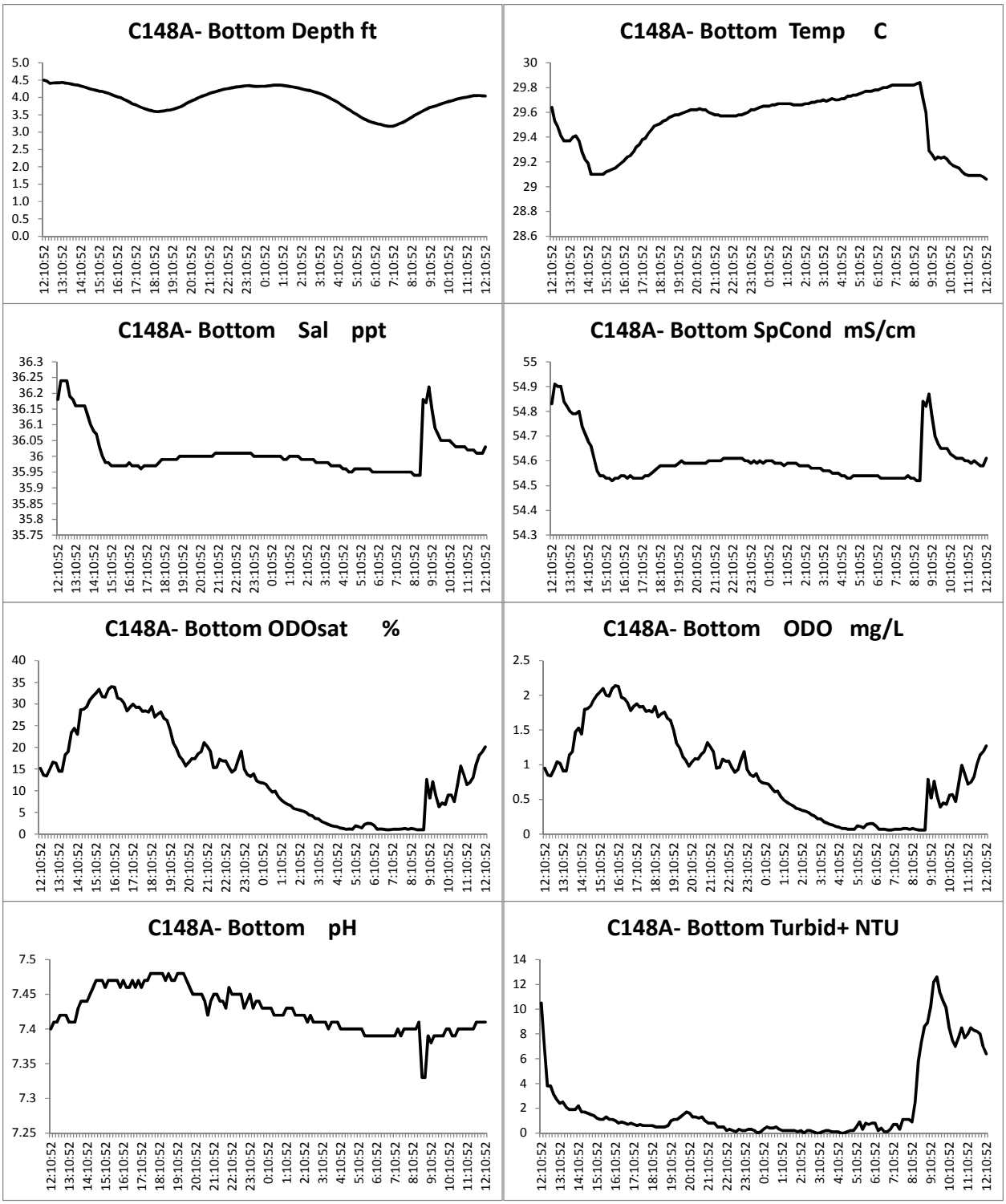


Figure 52: Time-series of physical-chemical data for bottom water at site A in canal #148 during a 24-hour cycle (Diel cycle). Survey FKC02

	C266A- Bottom Temp C	C266A- Bottom SpCond mS/cm	C266A- Bottom Sal ppt	C266A- Bottom Depth meters	C266A- Bottom pH	C266A- Bottom Turbid+ NTU	C266A- Bottom ODOsat %	C266A- Bottom ODO mg/L
Average	29.51	54.60	36.01	1.20	7.43	2.12	14.04	0.88
Median	29.58	54.59	36.00	1.22	7.42	0.80	13.70	0.86
Stand. Dev	0.24	0.08	0.07	0.11	0.03	3.08	10.28	0.65
%DO Sat Exceedances	100%							

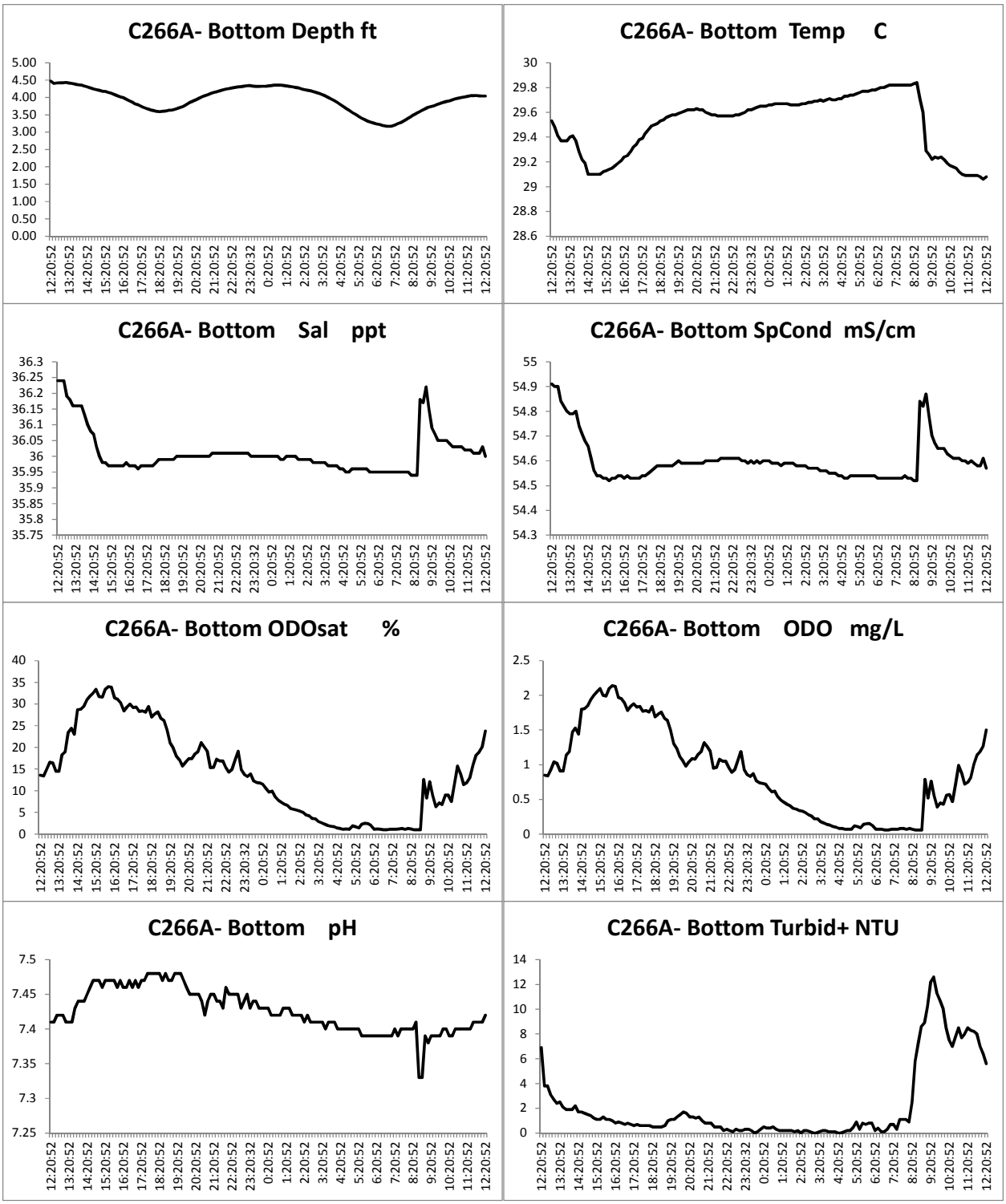


Figure 53: Time-series of physical-chemical data for bottom water at site A in canal #266 during a 24-hour cycle (Diel cycle). Survey FKC02

	C266A- Surface Temp C	C266A- Surface Salinity mS/cm	C266A- Surface ppt	C266A- Surface Depth meters	C266A- Surface pH	C266A- Surface Turbidity+ NTU	C266A- Surface ODO% %	C266A- Surface ODO mg/L
Average	30.06	34.99	53.25	0.34	7.53	0.43	46.40	2.91
Median	30.06	34.92	53.15	0.34	7.53	0.40	45.30	2.84
Stand. Dev	0.26	0.29	0.40	0.01	0.04	0.20	8.22	0.52
%DO Sat Exceedances	32%							

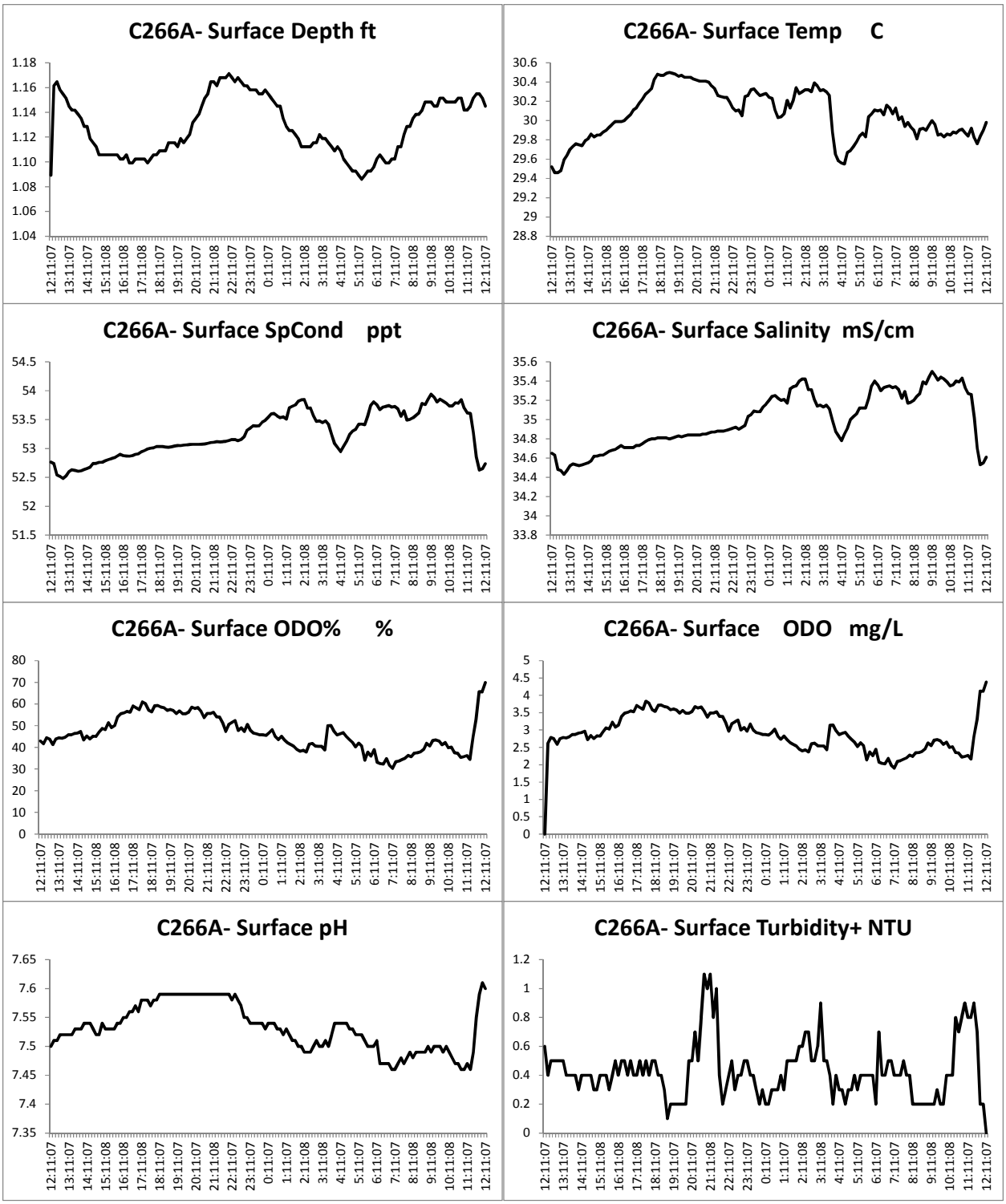


Figure 54: Time-series of physical-chemical data for surface water at site A in canal #266 during a 24-hour cycle (Diel cycle). Survey FKC02

	C277A- Bottom Temp C	C277A- Bottom SpCond mS/cm	C277A- Bottom Sal ppt	C277A- Bottom Depth meters	C277A- Bottom pH	C277A- Bottom Turbid+ NTU	C277A- Bottom ODOsat %	C277A- Bottom ODO mg/L
Average	29.40	54.53	35.96	1.00	7.48	0.84	33.16	2.08
Median	29.33	54.54	35.98	1.02	7.49	0.70	33.20	2.07
Stand. Dev	0.20	0.24	0.17	0.09	0.04	0.56	10.82	0.68
%DO Sat Exceedances	78%							

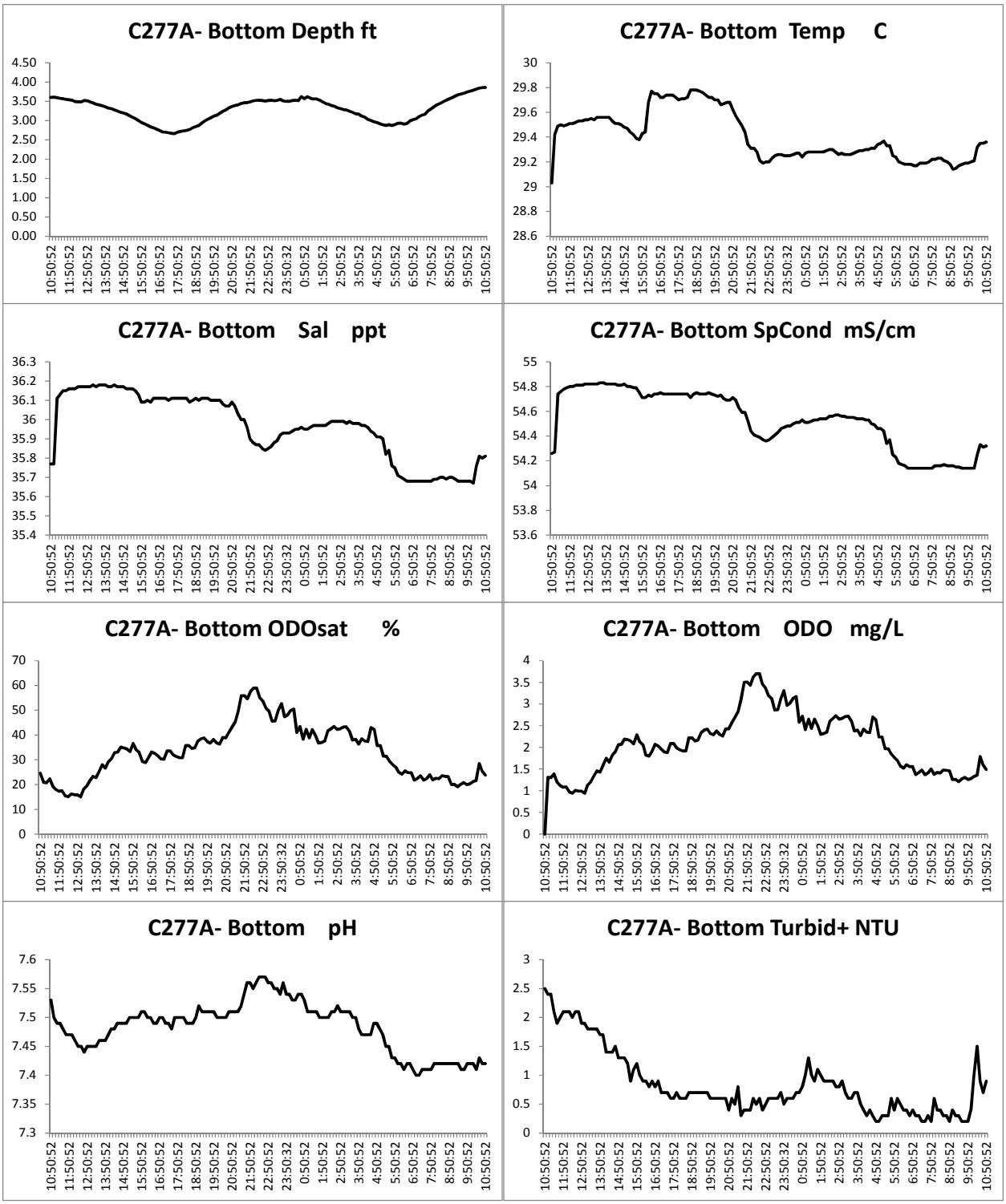


Figure 55: Time-series of physical-chemical data for bottom water at site A in canal #277 during a 24-hour cycle (Diel cycle). Survey FKC02

	C277A- Surface Temp C	C277A- Surface SpCond mS/cm	C277A- Surface Sal ppt	C277A- Surface Depth meters	C277A- Surface pH	C277A- Surface Turbid+ NTU	C277A- Surface ODOsat %	C277A- Surface ODO mg/L
Average	29.46	53.80	35.42	0.48	7.49	0.36	35.73	2.24
Median	29.40	53.94	35.51	0.48	7.49	0.30	35.50	2.22
Stand. Dev	0.54	0.41	0.29	0.01	0.03	0.18	5.08	0.32
%DO Sat Exceedances	83%							

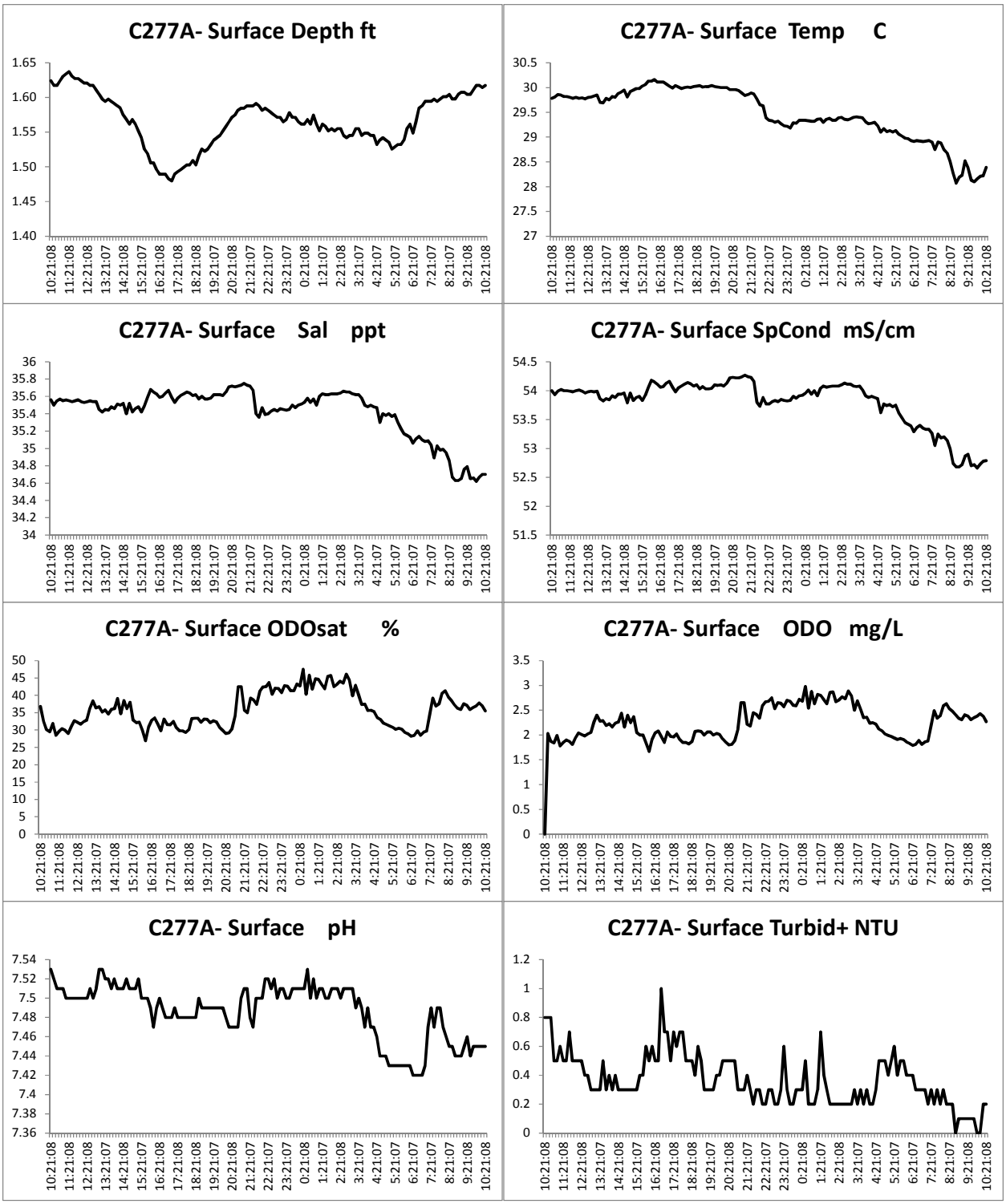


Figure 56: Time-series of physical-chemical data for surface water at site A in canal #277 during a 24-hour cycle (Diel cycle). Survey FKC02

	C278A- Bottom Temp C	C278A- Bottom SpCond mS/cm	C278A- Bottom Sal ppt	C278A- Bottom Depth meters	C278A- Bottom pH	C278A- Bottom Turbid+ NTU	C278A- Bottom ODOsat %	C278A- Bottom ODO mg/L
Average	31.65	52.24	34.19	1.60	7.61	0.41	41.51	2.53
Median	31.62	52.20	34.16	1.61	7.61	0.40	42.00	2.57
Stand. Dev	0.22	0.16	0.11	0.08	0.02	0.20	4.90	0.30
%DO Sat Exceedances	48%							

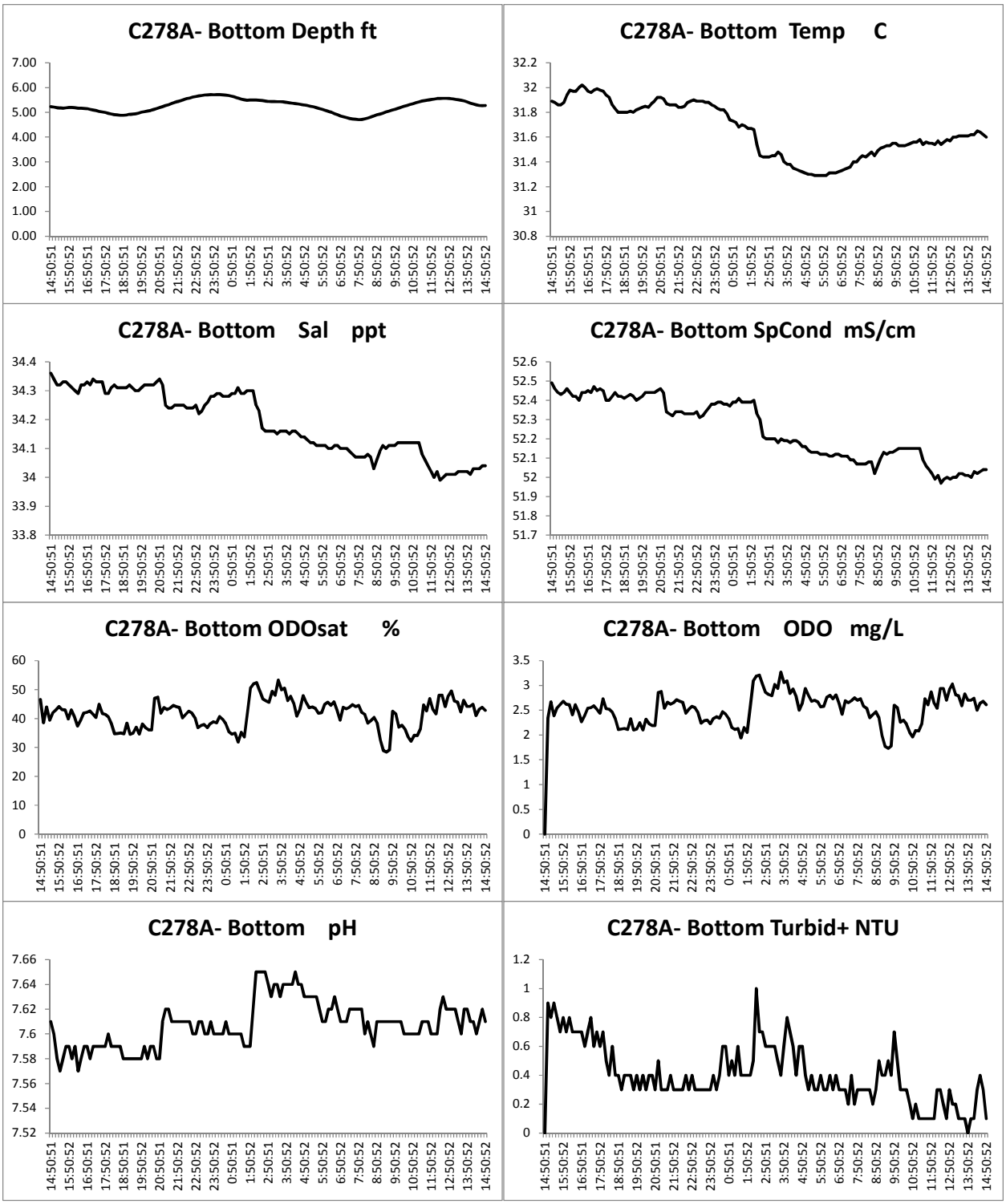


Figure 57: Time-series of physical-chemical data for bottom water at site A in canal #278 during a 24-hour cycle (Diel cycle). Survey FKC02

	C278A- Surface Temp C	C278A- Surface Salinity mS/cm	C278A- Surface ppt	C278A- Surface Depth meters	C278A- Surface pH	C278A- Surface Turbidity NTU	C278A- Surface DO% %	C278A- Surface DO mg/L
Average	30.85	32.48	49.88	0.33	7.65	0.30	62.72	3.84
Median	30.77	32.46	49.85	0.33	7.66	0.30	63.90	3.92
Stand. Dev	0.50	0.09	0.14	0.01	0.02	0.13	6.90	0.43
%DO Sat Exceedances	0%							

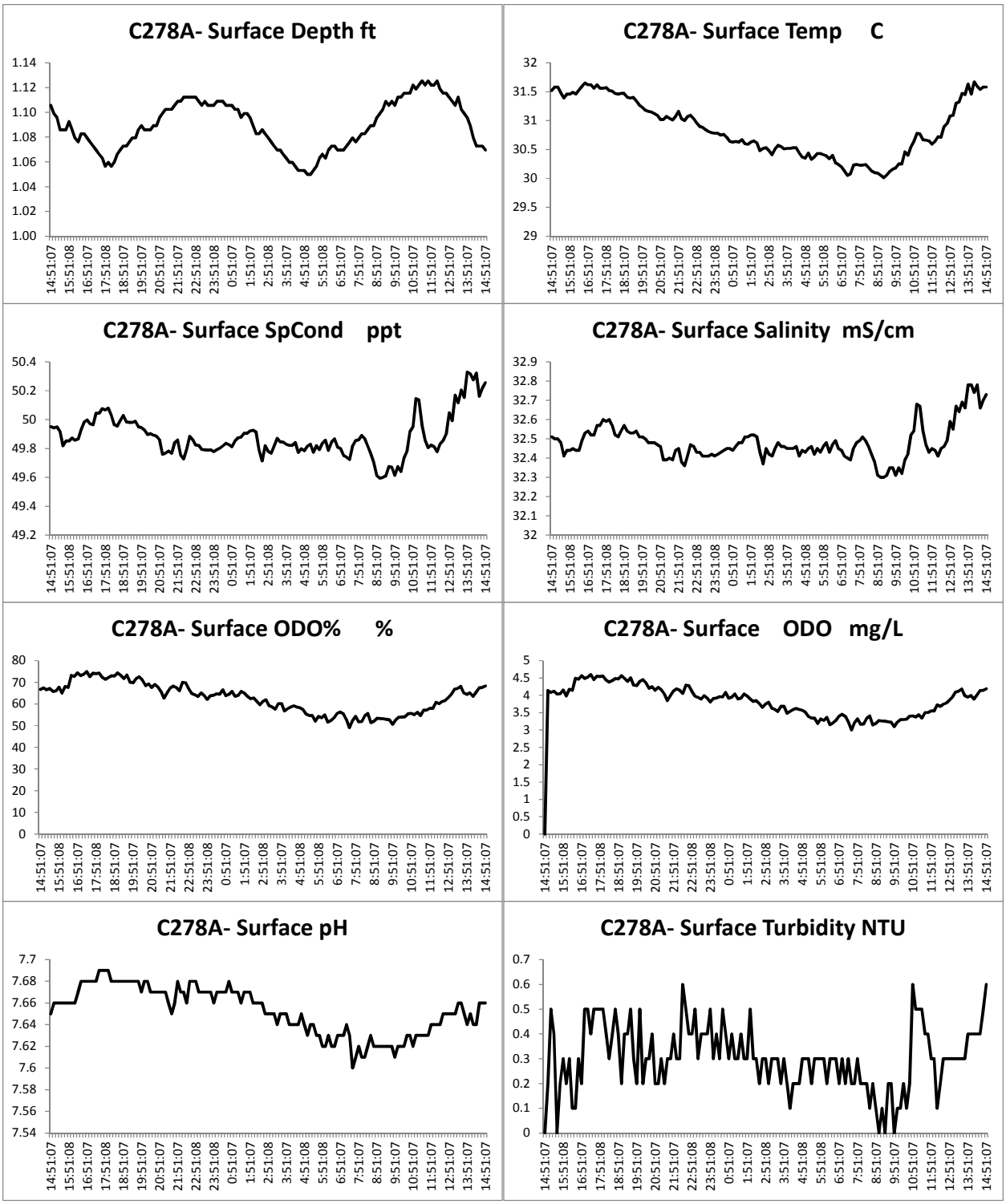


Figure 58: Time-series of physical-chemical data for surface water at site A in canal #278 during a 24-hour cycle (Diel cycle). Survey FKC02

	C282A- Bottom Temp C	C282A- Bottom SpCond mS/cm	C282A- Bottom Depth meters	C282A- Bottom pH	C282A- Bottom NTU	C282A- Bottom ODO% %
Average	30.26	52.27	0.80	7.49	0.93	45.48
Median	30.27	52.28	0.82	7.49	0.80	45.00
Stand. Dev	0.21	0.29	0.10	0.05	1.73	10.36
%DO Sat Exceedances	36%					

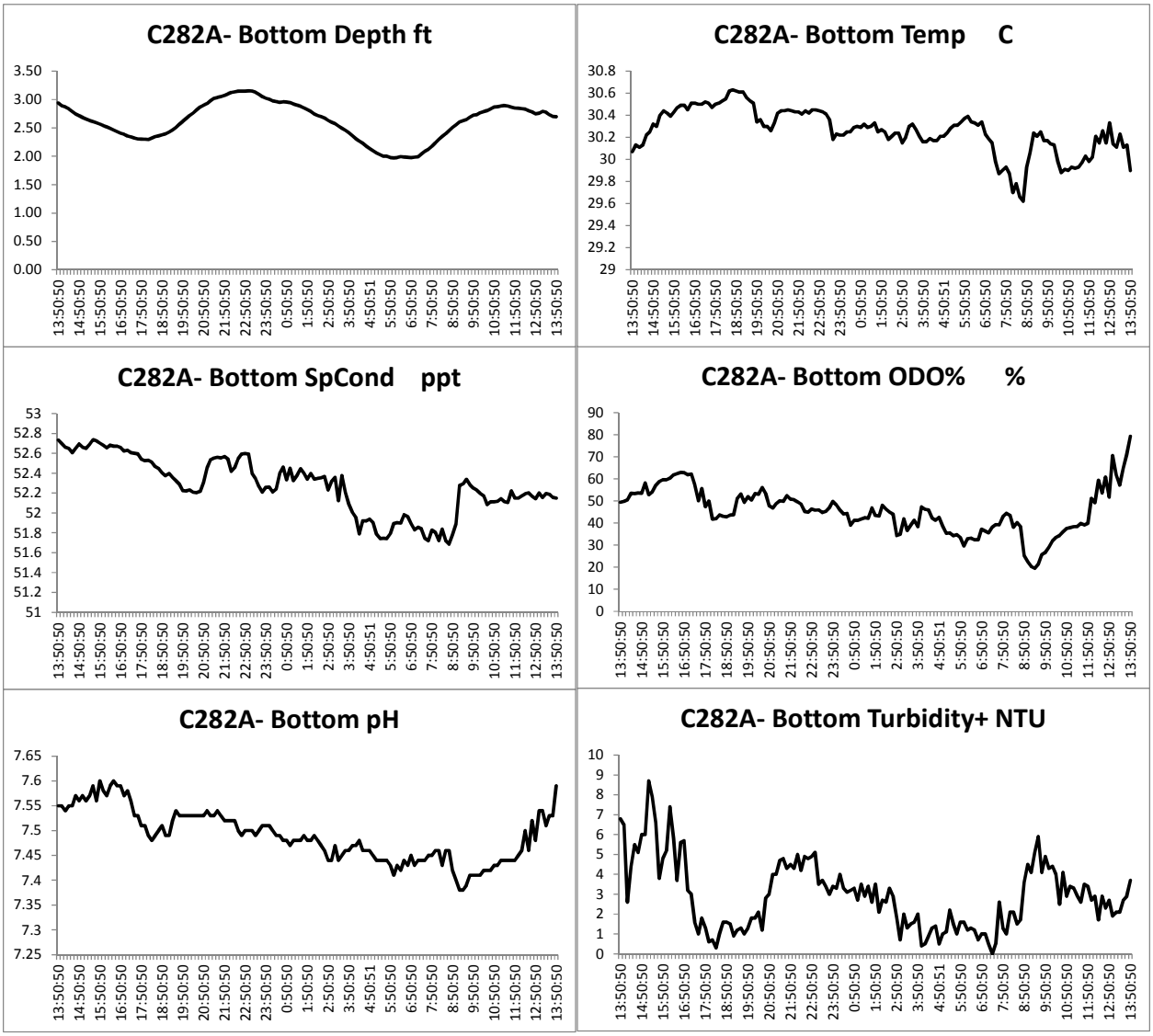


Figure 59: Time-series of physical-chemical data for bottom water at site A in canal #282 during a 24-hour cycle (Diel cycle). Survey FKC02

	C282A- Surface Temp C	C282A- Surface SpCond mS/cm	C282A- Surface Depth meters	C282A- Surface pH	C282A- Surface NTU	C282A- Surface ODO% %
Average	30.13	51.87	0.39	7.44	0.26	52.94
Median	30.12	51.88	0.39	7.43	0.20	51.10
Stand. Dev	0.55	0.54	0.01	0.05	0.17	8.68
%DO Sat Exceedances	6%					

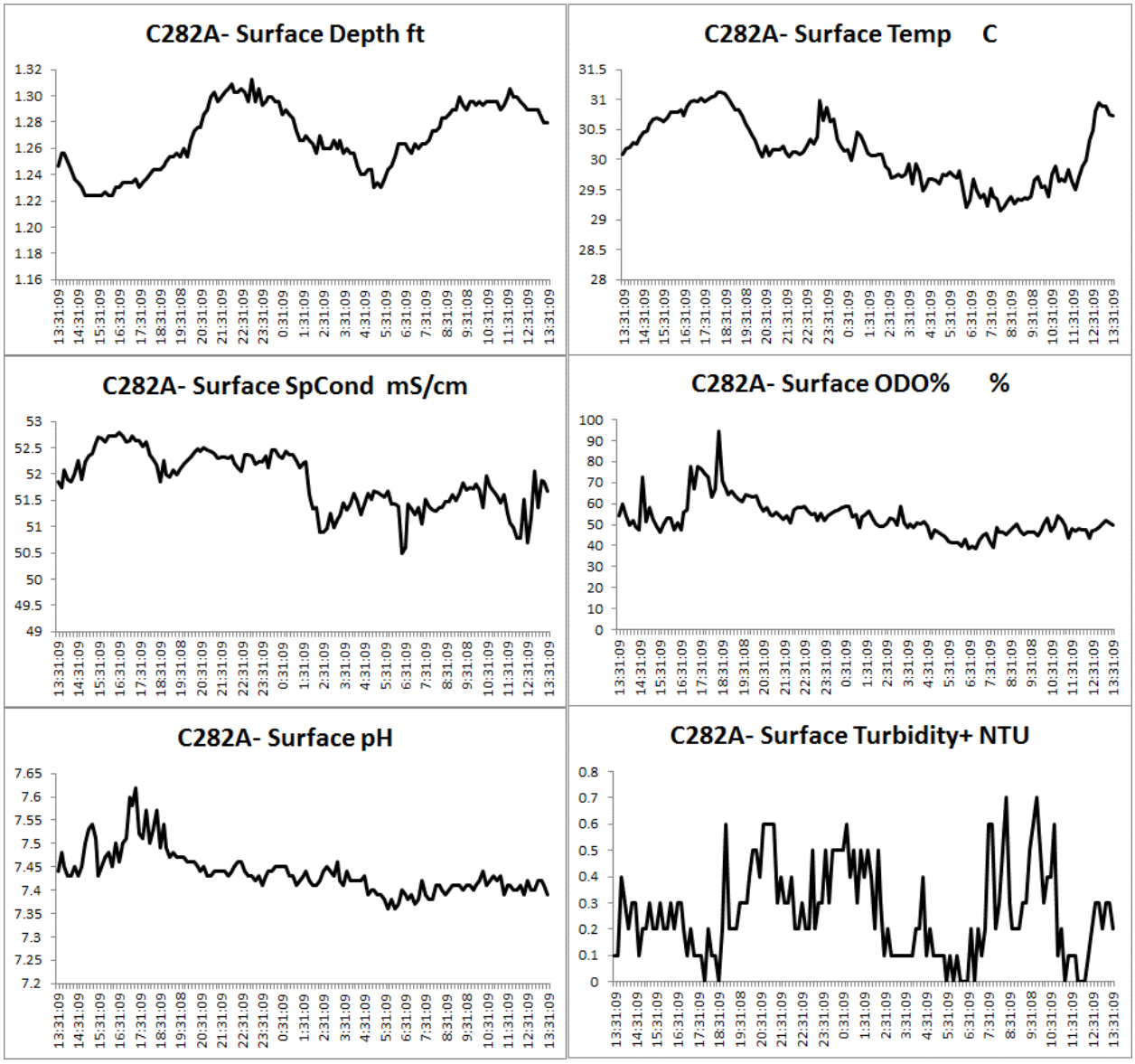


Figure 69: Time-series of physical-chemical data for surface water at site A in canal #282 during a 24-hour cycle (Diel cycle). Survey FKC02

	C287A- Bottom Temp C	C287A- Bottom SpCond mS/cm	C287A- Bottom Sal ppt	C287A- Bottom Depth meters	C287A- Bottom pH	C287A- Bottom Turbid+ NTU	C287A- Bottom ODOsat %	C287A- Bottom ODO mg/L
Average	29.54	53.87	35.47	2.25	7.30	10.40	4.84	0.30
Median	29.57	53.88	35.48	2.25	7.29	8.10	2.00	0.13
Stand. Dev	0.14	0.09	0.06	0.12	0.03	6.93	3.99	0.25
%DO Sat Exceedances	100%							

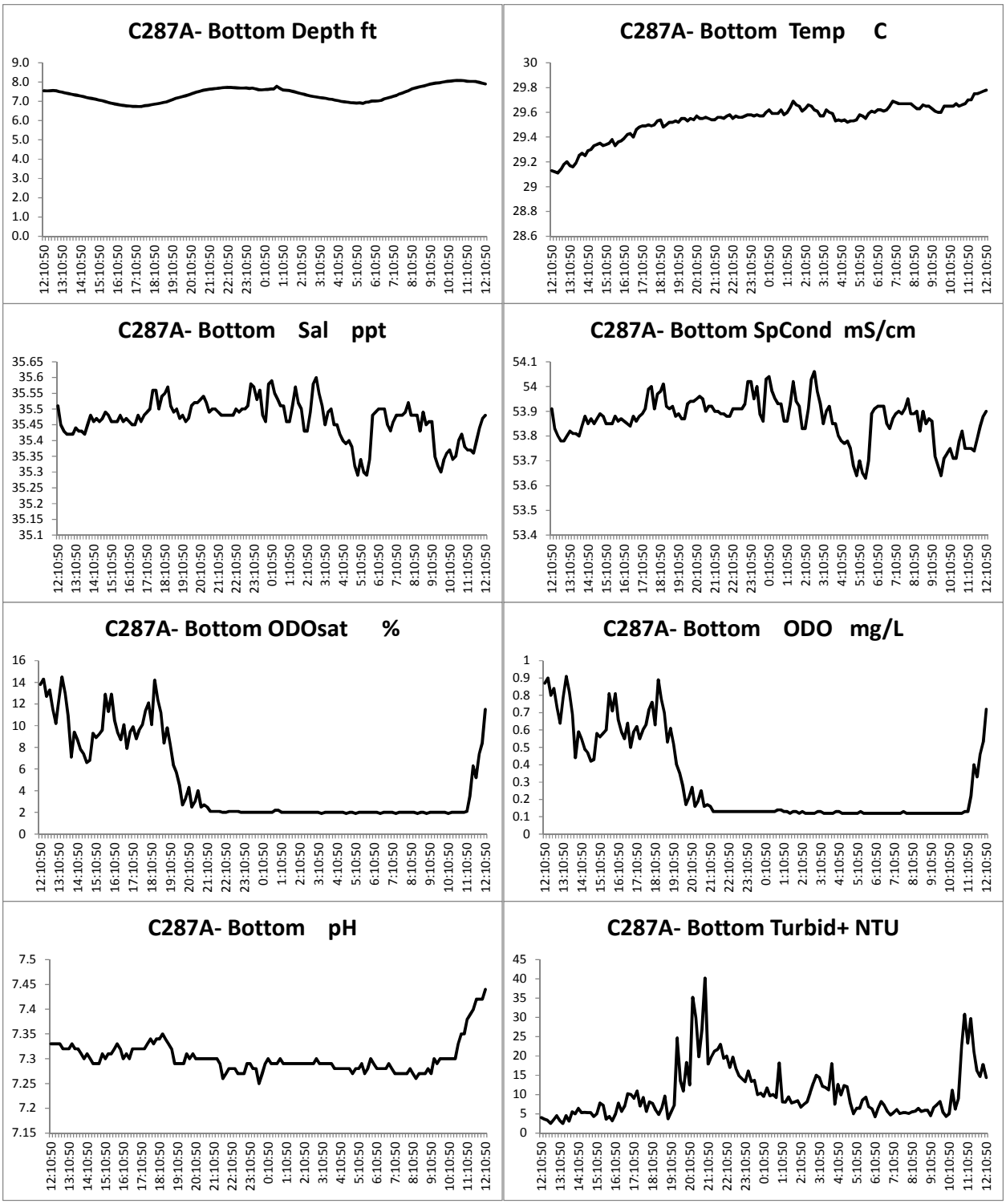


Figure 61: Time-series of physical-chemical data for bottom water at site A in canal #287 during a 24-hour cycle (Diel cycle). Survey FKC02

	C287A- Surface Temp C	C287A- Surface SpCond mS/cm	C287A- Surface Sal ppt	C287A- Surface Depth meters	C287A- Surface pH	C287A- Surface Turbid+ NTU	C287A- Surface ODOsat %	C287A- Surface ODO mg/L
Average	29.61	53.02	34.84	0.42	7.45	0.37	48.58	3.05
Median	29.88	53.31	35.03	0.43	7.45	0.30	49.20	3.10
Stand. Dev	0.50	0.64	0.46	0.01	0.05	0.23	9.60	0.60
%DO Sat Exceedances	18%							

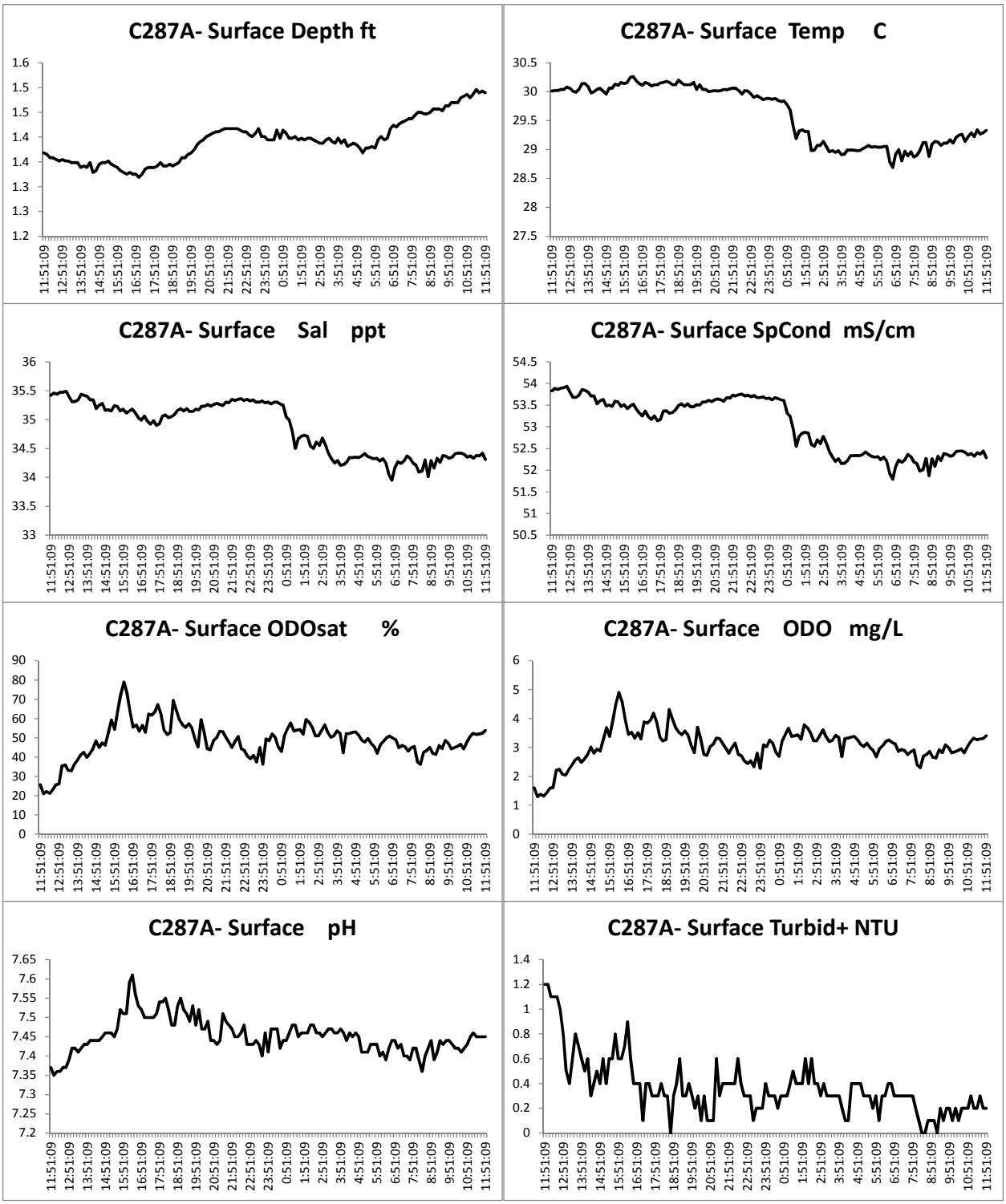


Figure 62: Time-series of physical-chemical data for surface water at site A in canal #287 during a 24-hour cycle (Diel cycle). Survey FKC02

	C29A- Bottom Temp C	C29A- Bottom SpCond mS/cm	C29A- Bottom Sal ppt	C29A- Bottom Depth meters	C29A- Bottom pH	C29A- Bottom Turbid+ NTU	C29A- Bottom ODOsat %	C29A- Bottom ODO mg/L
Average	29.92	57.86	38.44	6.07	7.60	0.87	23.88	1.46
Median	29.92	57.85	38.43	6.07	7.60	0.50	23.10	1.41
Stand. Dev	0.01	0.11	0.08	0.01	0.02	0.88	3.83	0.23
%DO Sat Exceedances	100%							

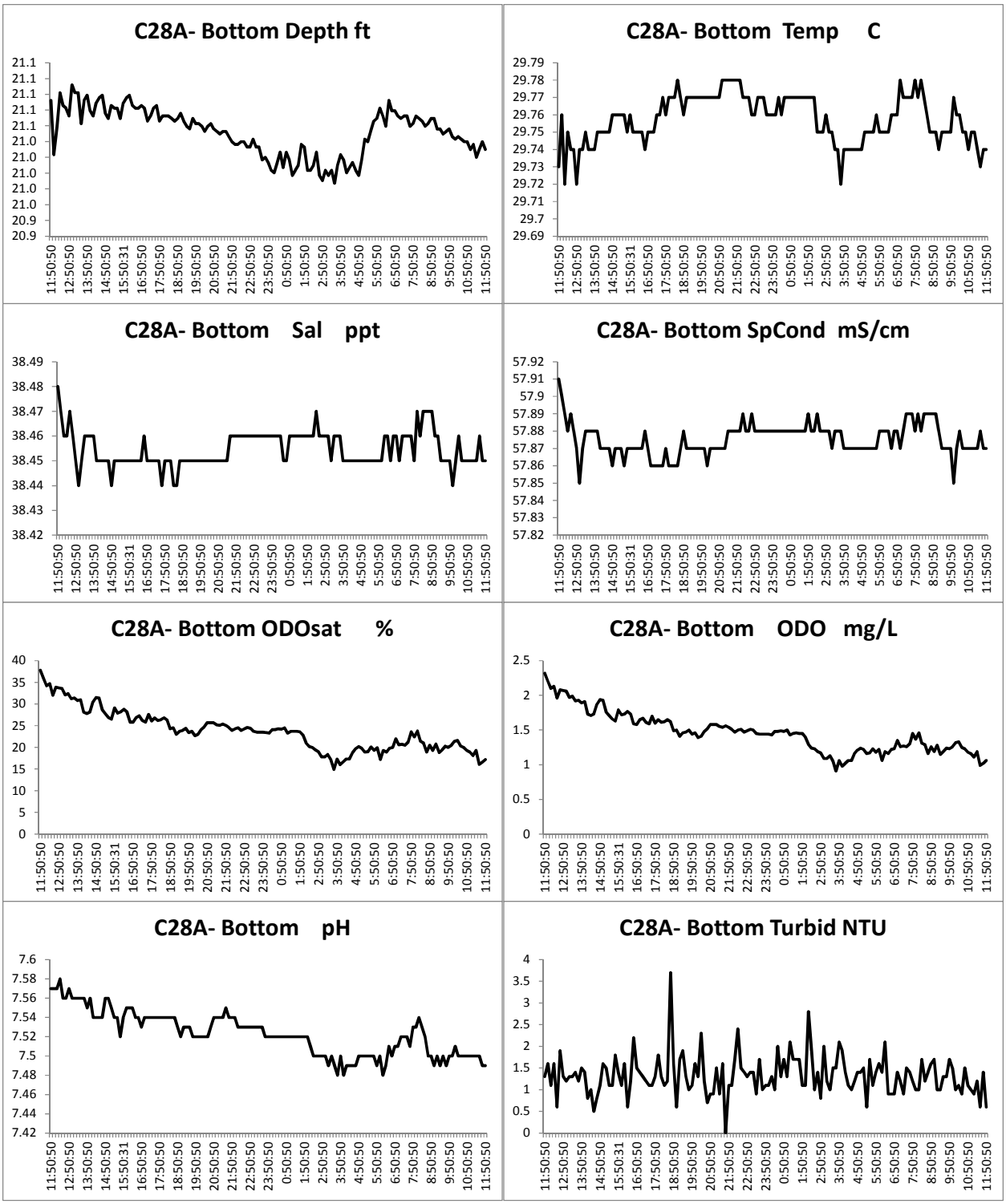


Figure 63: Time-series of physical-chemical data for bottom water at site A in canal #28 during a 24-hour cycle (Diel cycle). Survey FKC02

	C28A- Surface Temp C	C28A- Surface SpCond mS/cm	C28A- Surface Sal ppt	C28A- Surface Depth meters	C28A- Surface pH	C28A- Surface Turbid+ NTU	C28A- Surface ODOsat %	C28A- Surface ODO mg/L
Average	30.05	56.73	37.59	0.56	7.42	0.36	45.85	2.82
Median	30.10	56.73	37.58	0.56	7.42	0.30	43.90	2.70
Stand. Dev	0.18	0.20	0.16	0.01	0.05	0.22	8.21	0.50
%DO Sat Exceedances	39%							

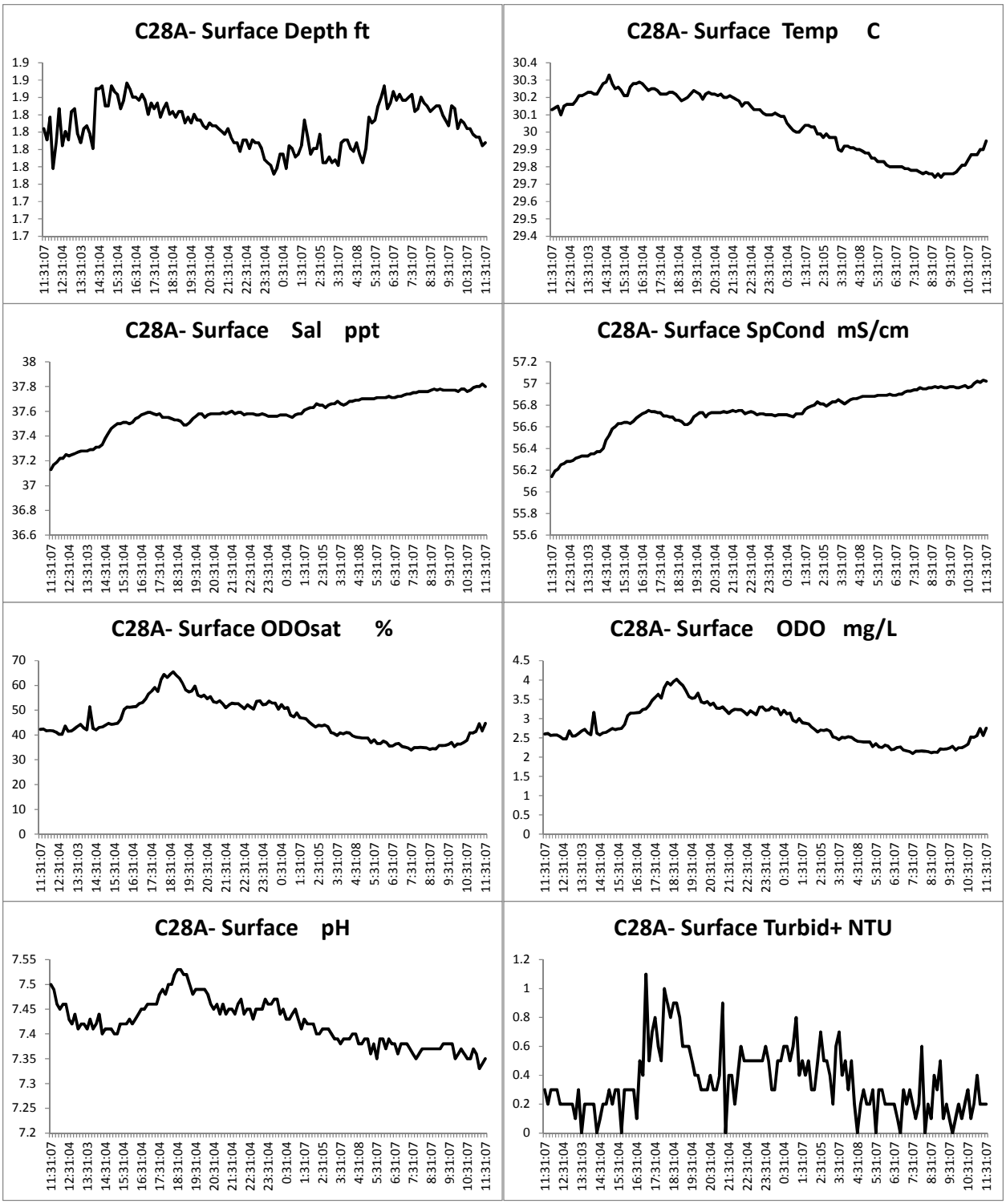


Figure 64: Time-series of physical-chemical data for surface water at site A in canal #28 during a 24-hour cycle (Diel cycle). Survey FKC02

	C290A- Bottom Temp C	C290A- Bottom SpCond mS/cm	C290A- Bottom Sal ppt	C290A- Bottom Depth meters	C290A- Bottom pH	C290A- Bottom Turbid+ NTU	C290A- Bottom ODOsat %	C290A- Bottom ODO mg/L
Average	30.33	53.77	35.37	0.93	7.44	4.34	39.52	2.44
Median	30.35	53.77	35.37	0.94	7.44	3.10	38.50	2.38
Stand. Dev	0.40	0.06	0.05	0.10	0.08	3.37	13.60	0.83
%DO Sat Exceedances	56%							

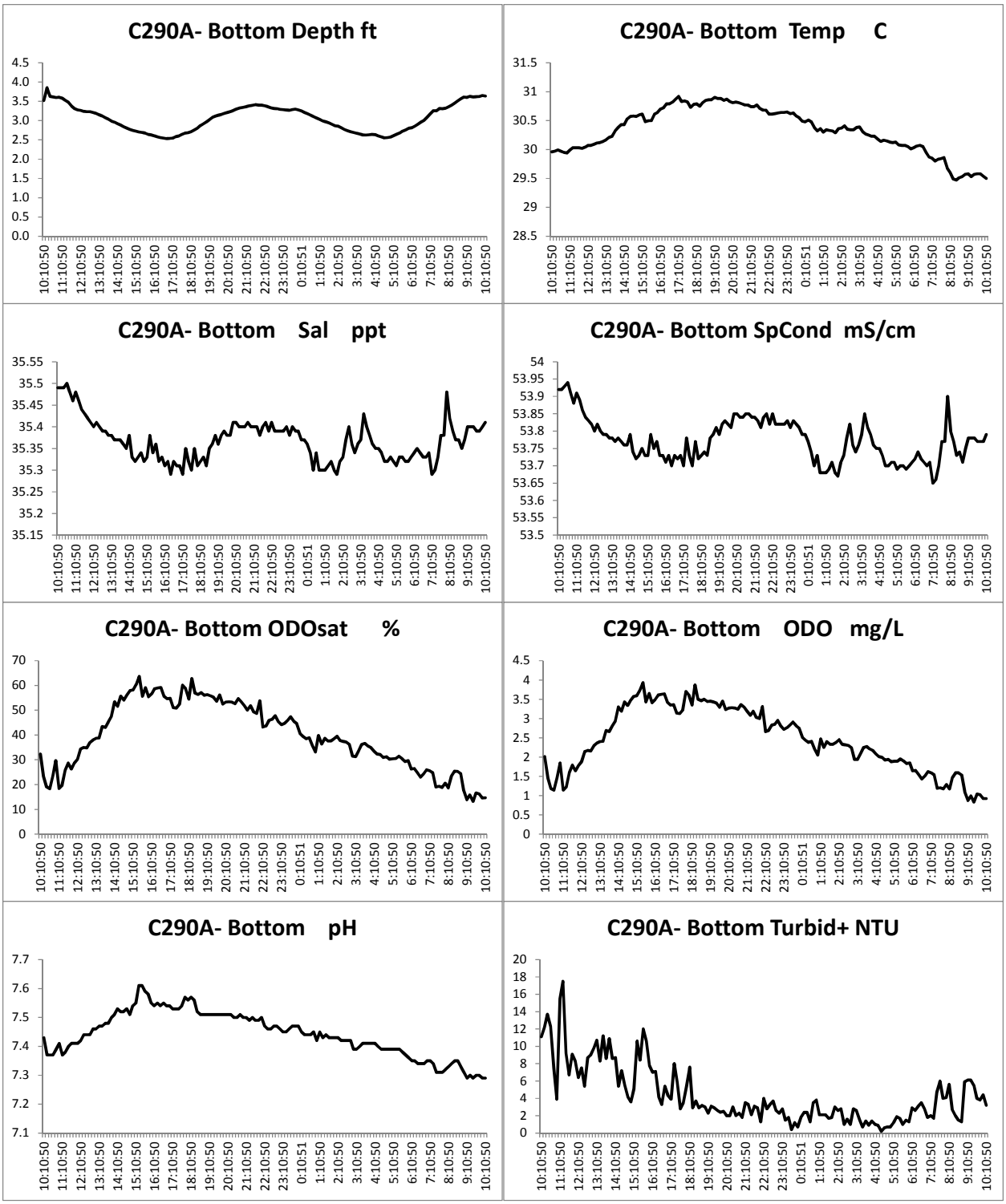


Figure 65: Time-series of physical-chemical data for bottom water at site A in canal #290 during a 24-hour cycle (Diel cycle). Survey FKC02

	C290A- Surface Temp C	C290A- Surface SpCond mS/cm	C290A- Surface Sal ppt	C290A- Surface Depth meters	C290A- Surface pH	C290A- Surface Turbid+ NTU	C290A- Surface ODOsat %	C290A- Surface ODO mg/L
Average	30.46	54.17	35.66	0.34	7.42	1.57	38.59	2.37
Median	30.38	54.10	35.61	0.35	7.43	1.20	38.50	2.38
Stand. Dev	0.47	0.20	0.14	0.01	0.07	1.43	13.80	0.83
%DO Sat Exceedances	63%							

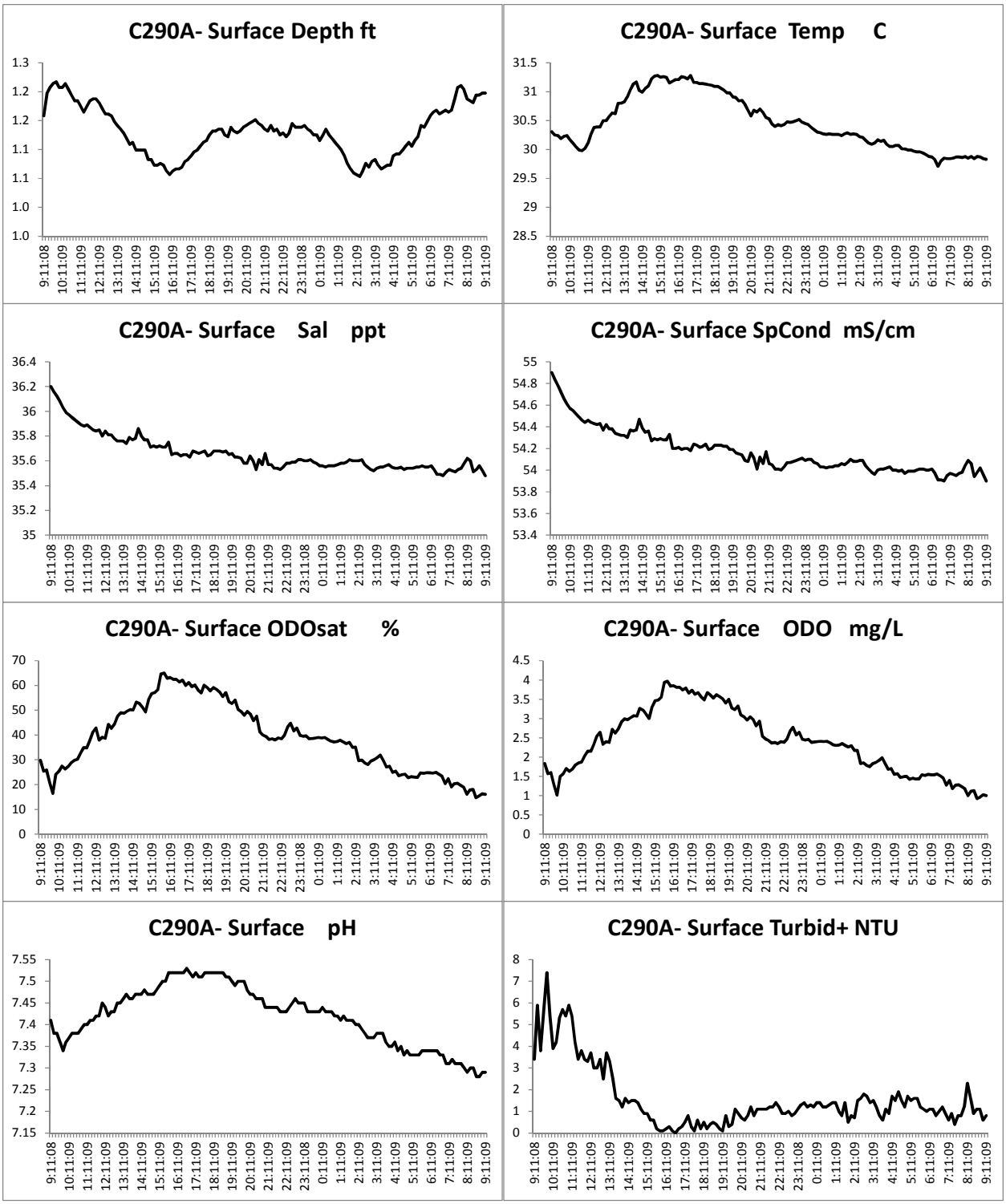


Figure 66: Time-series of physical-chemical data for surface water at site A in canal #290 during a 24-hour cycle (Diel cycle). Survey FKC02

	C293A- Bottom Temp C	C293A- Bottom SpCond mS/cm	C293A- Bottom Sal ppt	C293A- Bottom Depth meters	C293A- Bottom pH	C293A- Bottom Turbid NTU	C293A- Bottom ODOsat %	C293A- Bottom ODO mg/L
Average	30.36	55.46	36.62	2.37	7.21	24.97	1.06	0.07
Median	30.39	55.60	36.72	2.38	7.22	20.80	1.00	0.06
Stand. Dev	0.09	0.43	0.31	0.10	0.03	10.08	0.53	0.03
%DO Sat Exceedances	100%							

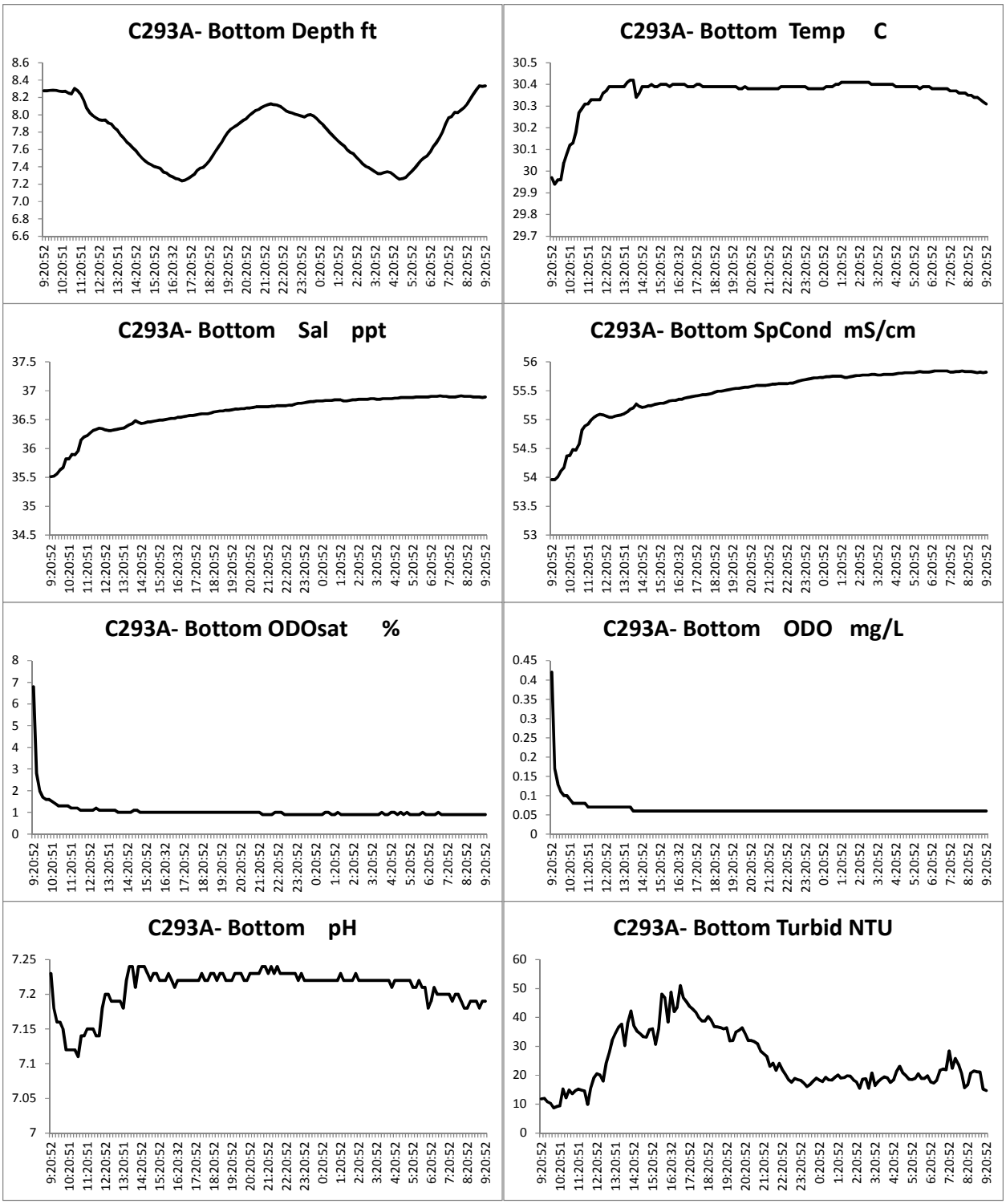


Figure 67: Time-series of physical-chemical data for bottom water at site A in canal #293 during a 24-hour cycle (Diel cycle). Survey FKC02

	C293A- Surface Temp C	C293A- Surface SpCond mS/cm	C293A- Surface Sal ppt	C293A- Surface Depth meters	C293A- Surface pH	C293A- Surface Turbid+ NTU	C293A- Surface ODOsat %	C293A- Surface ODO mg/L
Average	30.30	54.09	35.60	0.52	7.49	0.46	46.47	2.87
Median	30.23	54.08	35.60	0.53	7.49	0.40	46.50	2.87
Stand. Dev	0.30	0.09	0.07	0.03	0.05	0.34	12.35	0.75
%DO Sat Exceedances	38%							

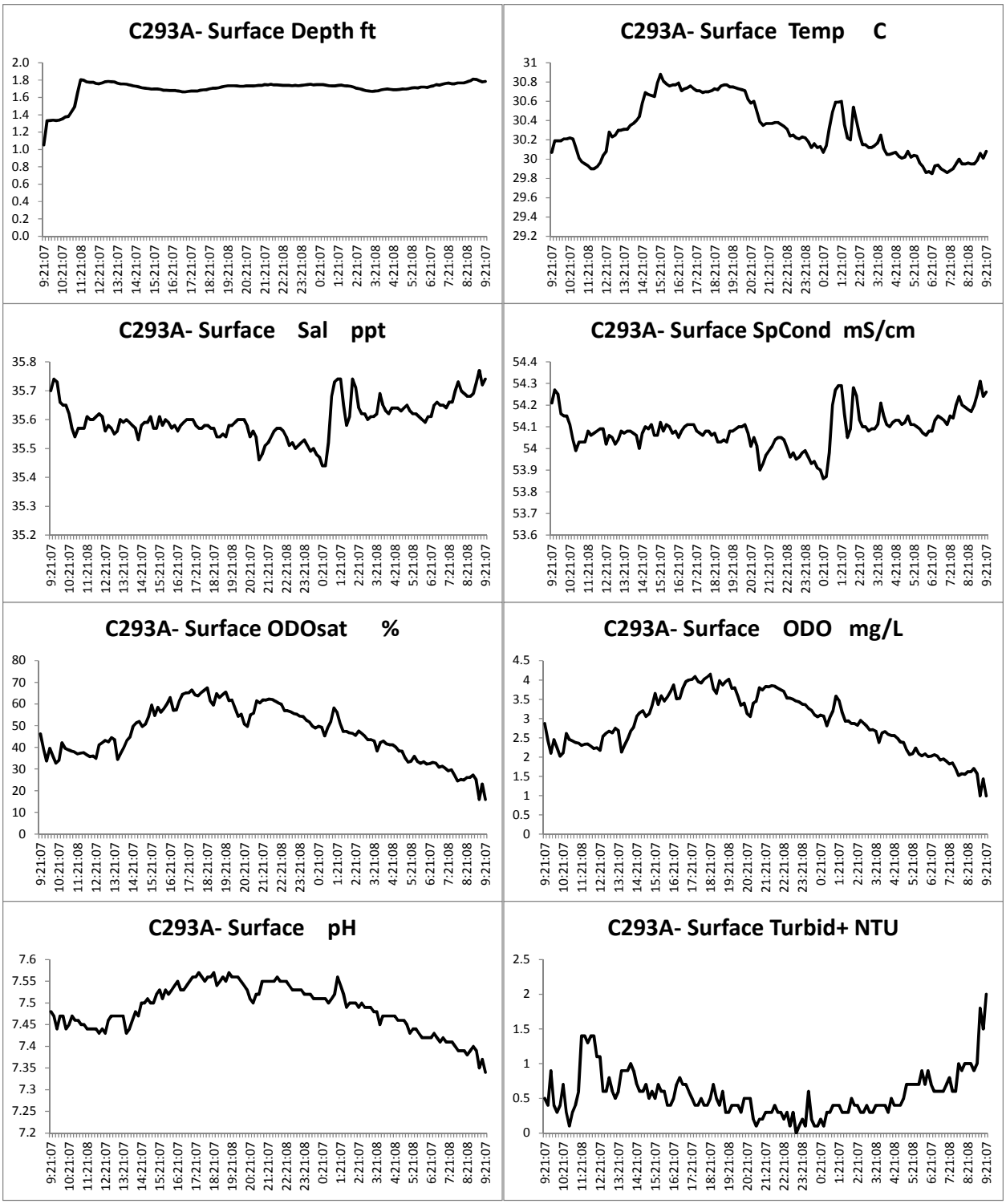


Figure 68: Time-series of physical-chemical data for surface water at site A in canal #293 during a 24-hour cycle (Diel cycle). Survey FKC02

	C29A- Bottom Temp C	C29A- Bottom SpCond mS/cm	C29A- Bottom Sal ppt	C29A- Bottom Depth meters	C29A- Bottom pH	C29A- Bottom Turbid+ NTU	C29A- Bottom ODOsat %	C29A- Bottom ODO mg/L
Average	29.92	57.86	38.44	6.07	7.60	0.87	23.88	1.46
Median	29.92	57.85	38.43	6.07	7.60	0.50	23.10	1.41
Stand. Dev	0.01	0.11	0.08	0.01	0.02	0.88	3.83	0.23
%DO Sat Exceedances	100%							

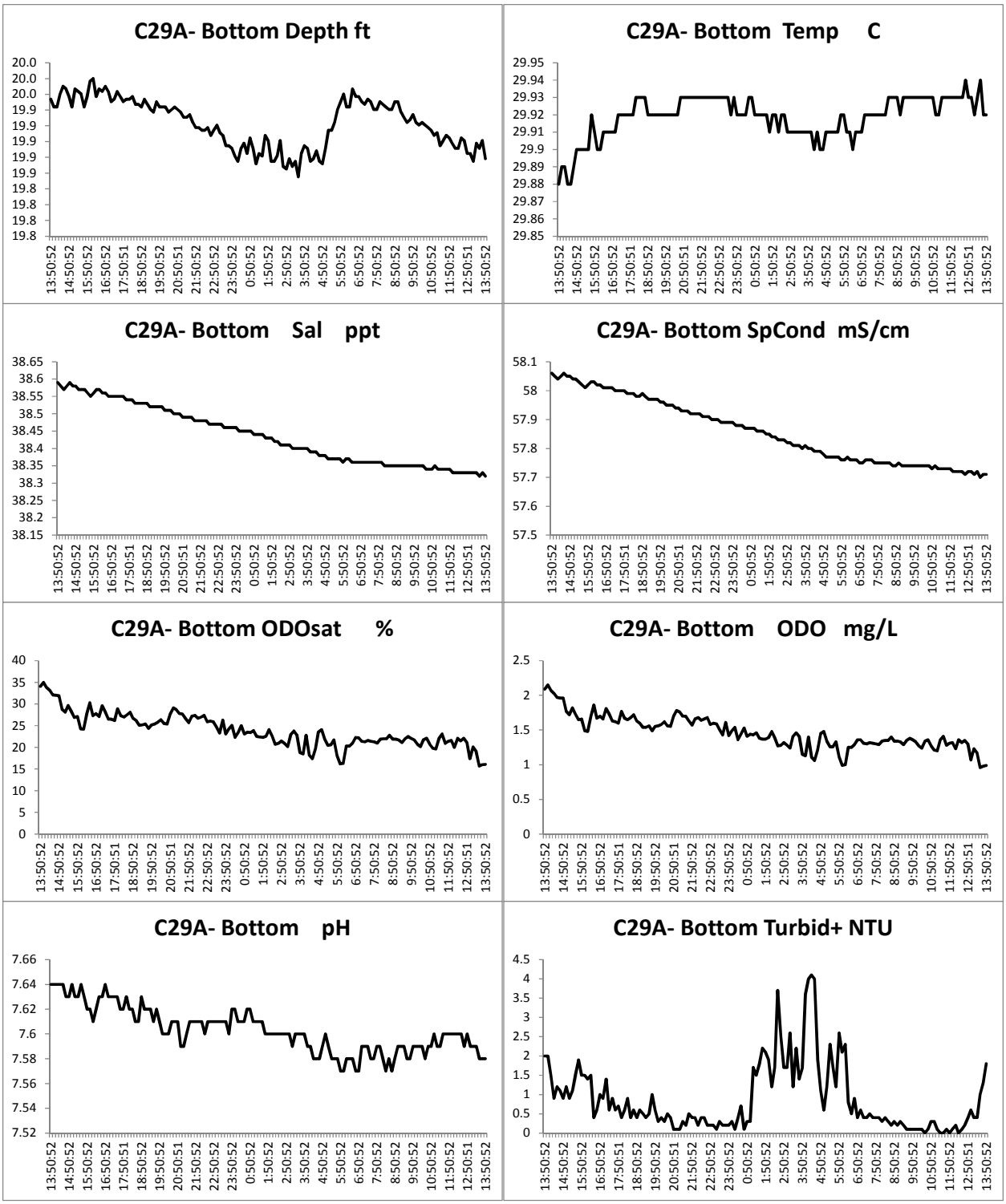


Figure 69: Time-series of physical-chemical data for bottom water at site A in canal #29 during a 24-hour cycle (Diel cycle). Survey FKC02

	C29A- Surface Temp C	C29A- Surface SpCond mS/cm	C29A- Surface Sal ppt	C29A- Surface Depth meters	C29A- Surface pH	C29A- Surface Turbid+ NTU	C29A- Surface ODOsat %	C29A- Surface ODO mg/L
Average	30.01	57.30	38.01	0.54	7.64	1.19	55.66	3.41
Median	30.07	57.32	38.03	0.54	7.64	1.20	56.00	3.43
Stand. Dev	0.23	0.08	0.07	0.01	0.02	0.40	5.97	0.36
%DO Sat Exceedances	0%							

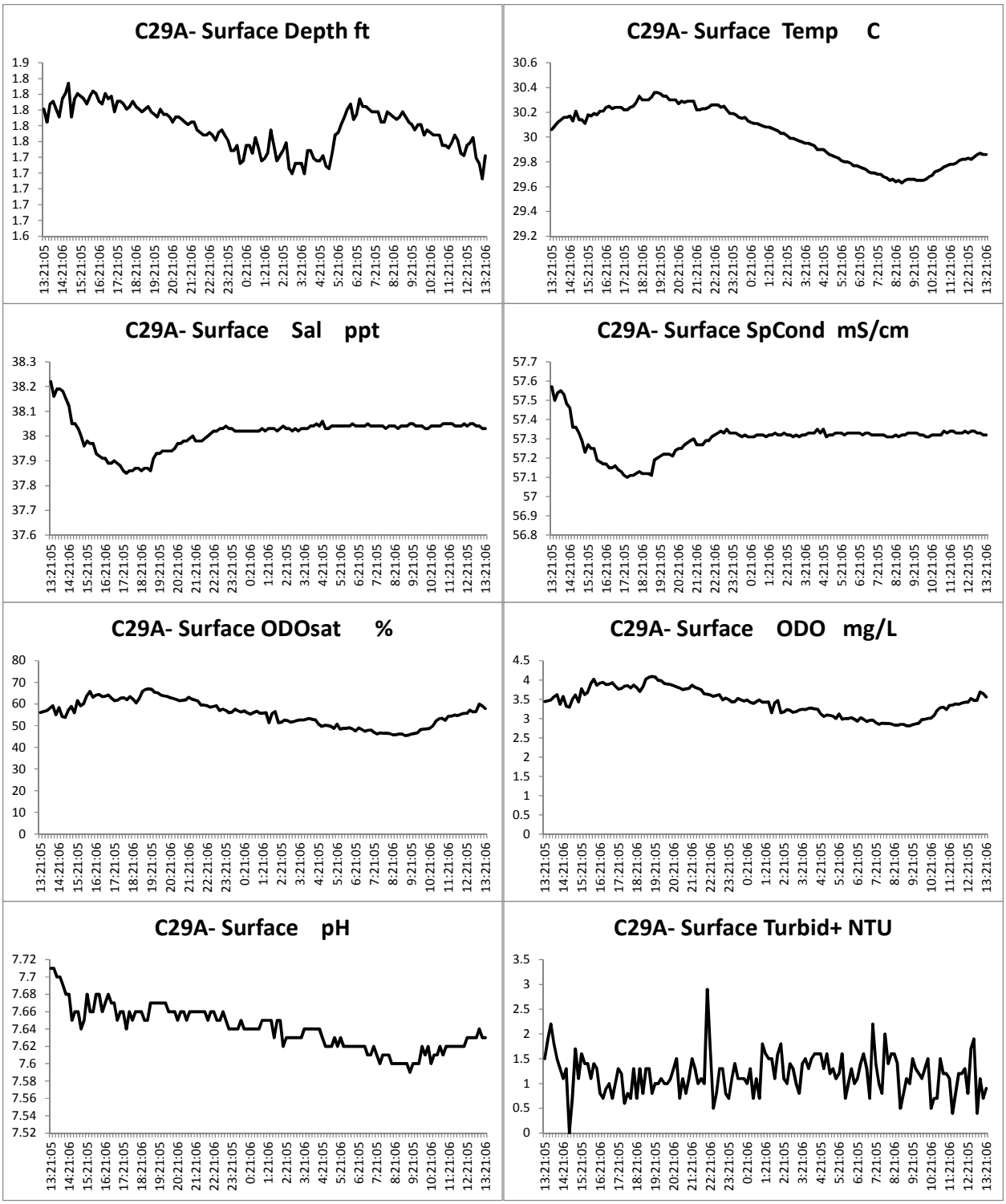


Figure 70: Time-series of physical-chemical data for surface water at site A in canal #29 during a 24-hour cycle (Diel cycle). Survey FKC02

	C458A- Bottom Temp C	C458A- Bottom SpCond mS/cm	C458A- Bottom Sal ppt	C458A- Bottom Depth meters	C458A- Bottom pH	C458A- Bottom Turbid NTU	C458A- Bottom ODOsat %	C458A- Bottom ODO mg/L
Average	30.36	53.69	35.30	2.03	7.68	2.28	24.66	1.53
Median	30.48	53.91	35.47	2.03	7.68	2.10	23.70	1.47
Stand. Dev	0.24	0.40	0.29	0.08	0.03	1.51	4.66	0.28
%DO Sat Exceedances	100%							

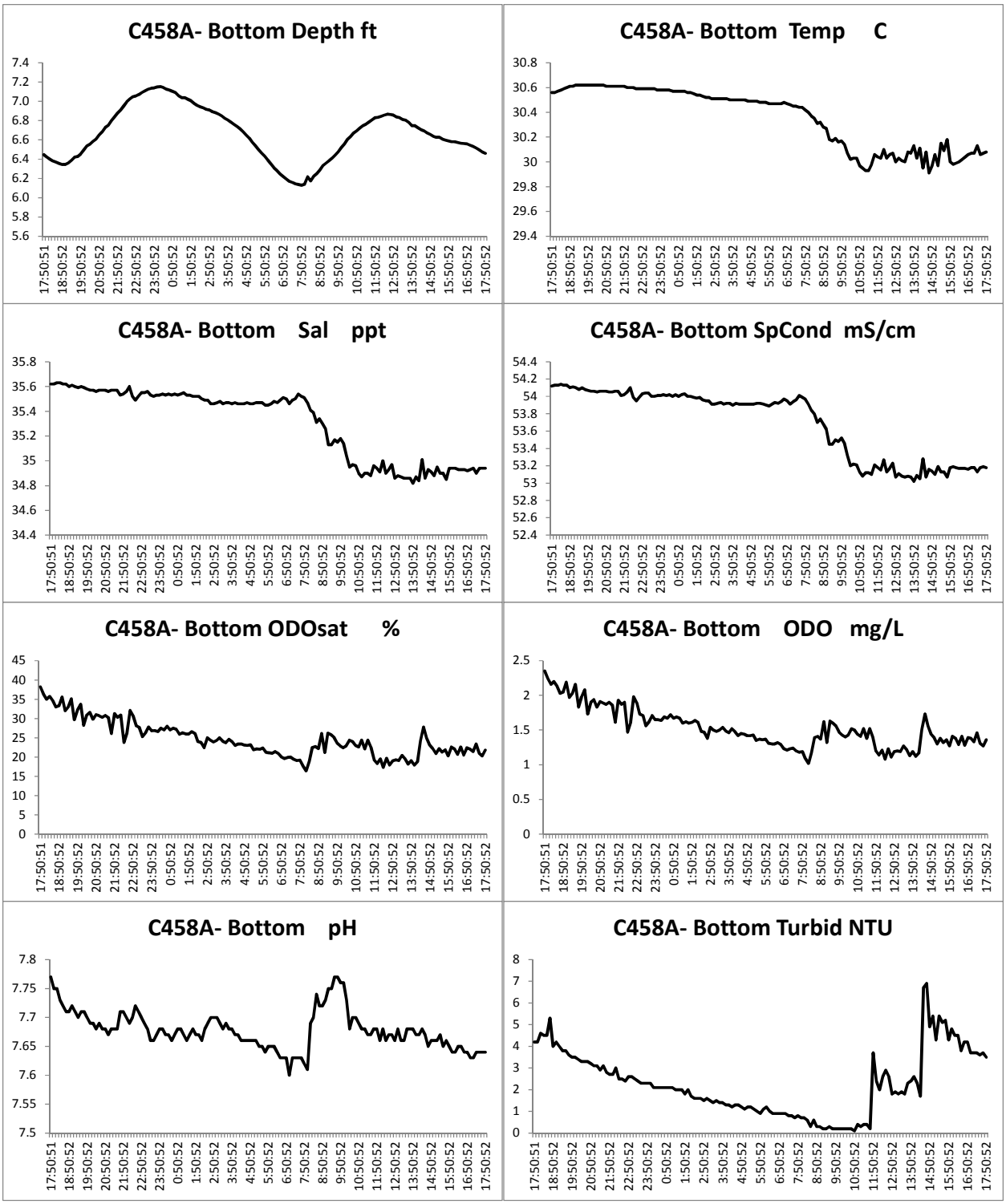


Figure 71: Time-series of physical-chemical data for surface water at site A in canal #458 during a 24-hour cycle (Diel cycle). Survey FKC02

	C458A- Surface Temp C	C458A- Surface Salinity mS/cm	C458A- Surface ppt	C458A- Surface Depth meters	C458A- Surface pH	C458A- Surface Turbidity+ NTU	C458A- Surface ODO% %	C458A- Surface ODO mg/L
Average	29.72	33.02	50.56	0.36	7.81	0.30	85.08	5.19
Median	29.68	33.19	50.78	0.36	7.82	0.30	88.10	5.38
Stand. Dev	0.36	0.46	0.62	0.01	0.05	0.19	16.27	0.99
%DO Sat Exceedances	0%							

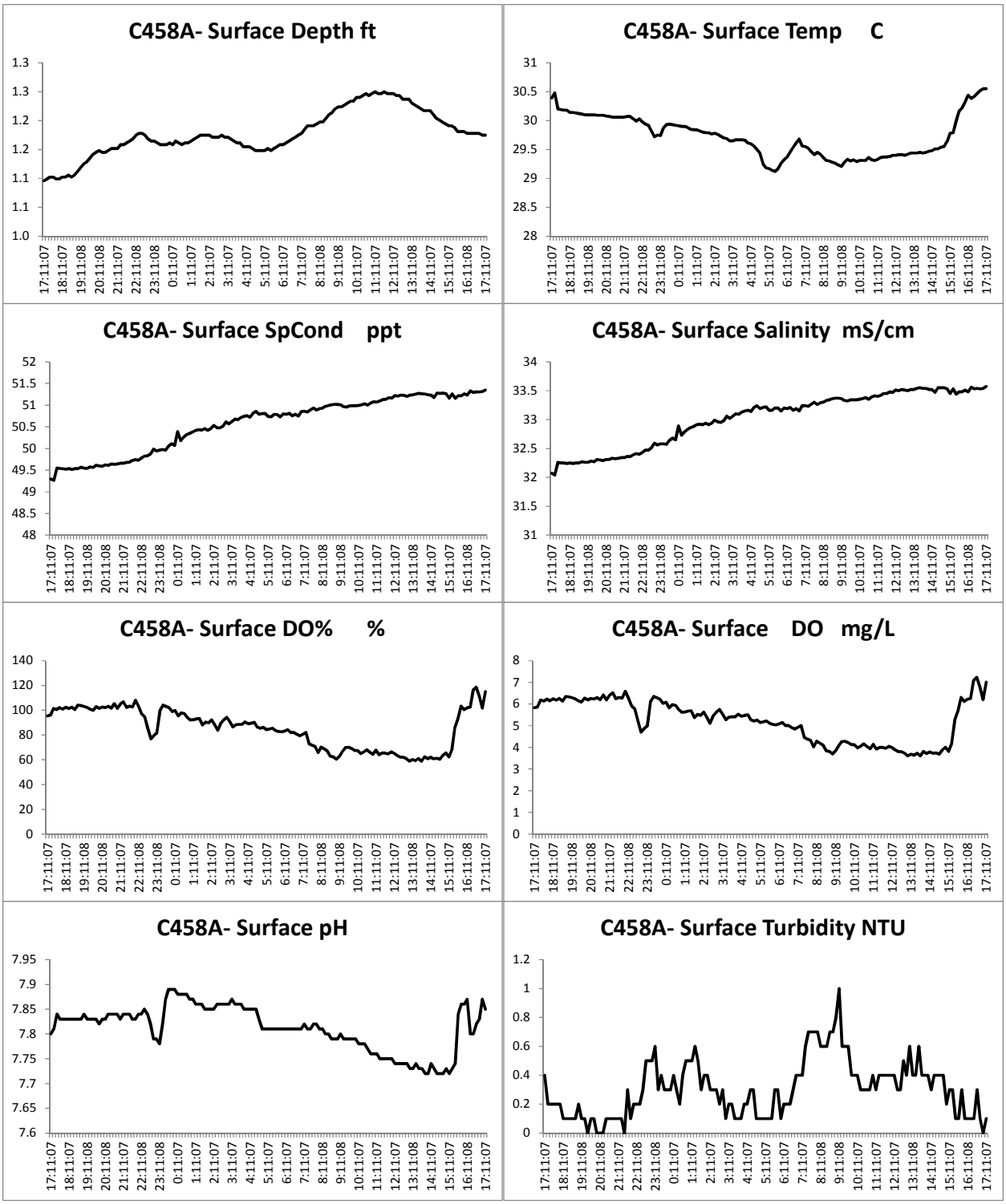


Figure 72: Time-series of physical-chemical data for surface water at site A in canal #458 during a 24-hour cycle (Diel cycle). Survey FKC02

	C459A- Bottom Temp C	C459A- Bottom SpCond mS/cm	C459A- Bottom Sal ppt	C459A- Bottom Depth meters	C459A- Bottom pH	C459A- Bottom Turbid+ NTU	C459A- Bottom DOsat %	C459A- Bottom DO mg/L
Average	29.62	50.55	33.01	1.52	7.81	1.88	55.41	3.51
Median	29.75	50.55	33.03	1.52	7.81	1.70	60.40	3.87
Stand. Dev	0.37	0.29	0.21	0.08	0.07	0.96	33.60	2.12
%DO Sat Exceedances	26%							

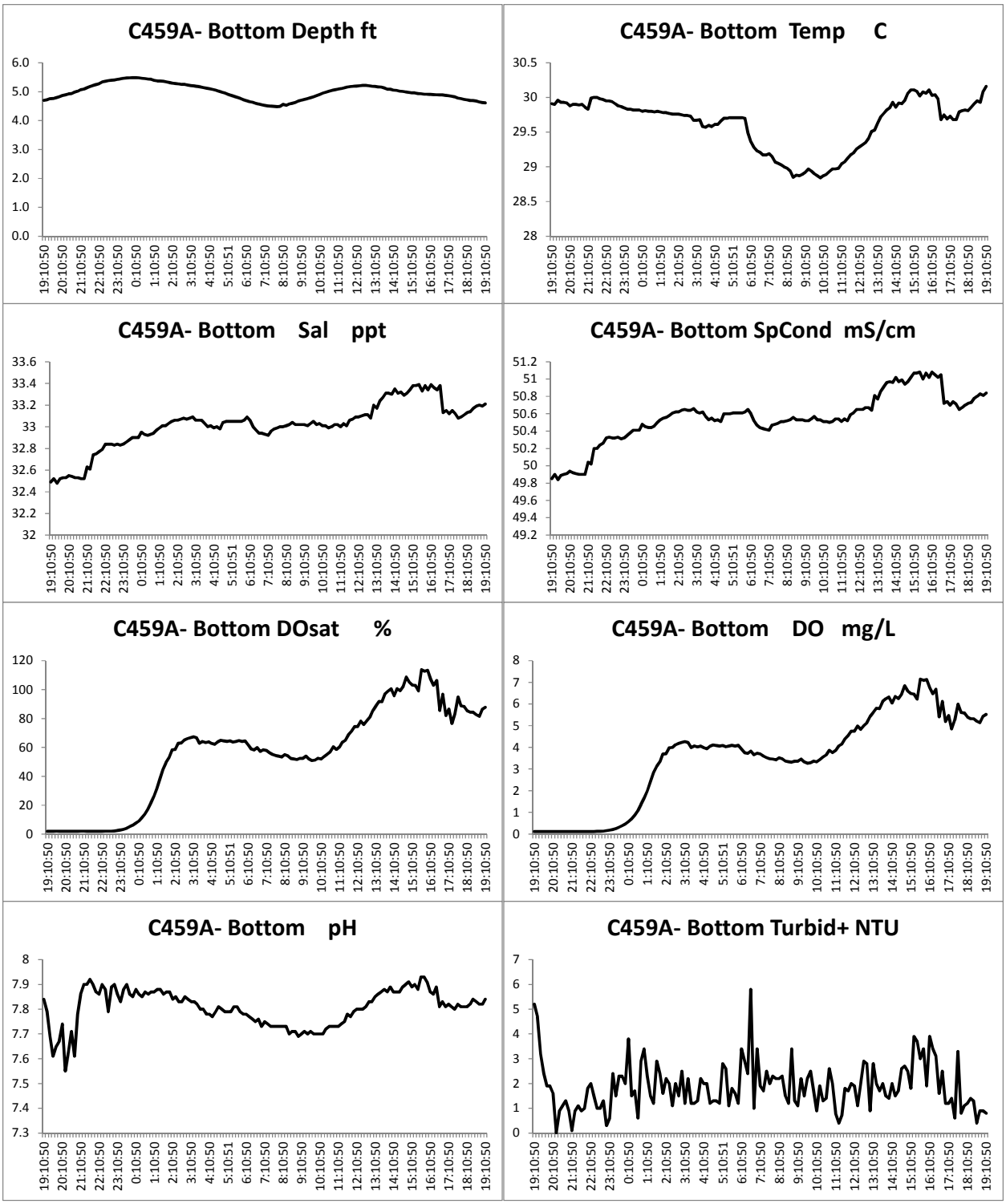


Figure 73: Time-series of physical-chemical data for bottom water at site A in canal #459 during a 24-hour cycle (Diel cycle). Survey FKC02

	C459A- Surface Temp C	C459A- Surface SpCond mS/cm	C459A- Surface Sal ppt	C459A- Surface Depth meters	C459A- Surface pH	C459A- Surface Turbid+ NTU	C459A- Surface ODOsat %	C459A- Surface ODO mg/L
Average	29.81	50.91	33.27	0.35	7.81	0.58	93.45	5.89
Median	29.71	50.96	33.32	0.35	7.81	0.50	91.50	5.79
Stand. Dev	0.48	0.29	0.21	0.01	0.07	0.44	20.55	1.26
%DO Sat Exceedances	0%							

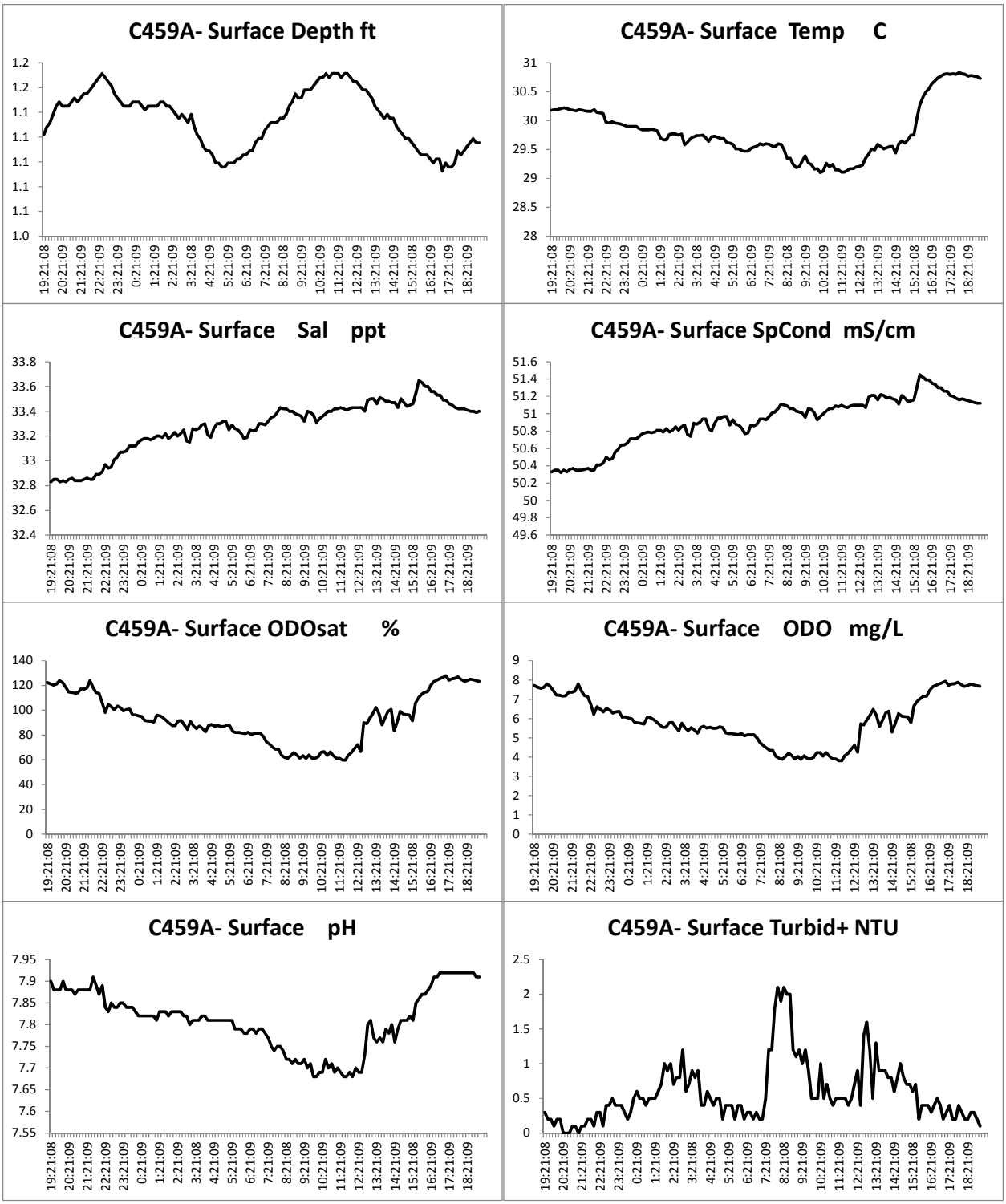


Figure 74: Time-series of physical-chemical data for surface water at site A in canal #459 during a 24-hour cycle (Diel cycle). Survey FKC02

	C472A- Bottom Temp C	C472A- Bottom SpCond mS/cm	C472A- Bottom Sal ppt	C472A- Bottom Depth meters	C472A- Bottom pH	C472A- Bottom Turbid+ NTU	C472A- Bottom ODOsat %	C472A- Bottom ODO mg/L
Average	27.86	57.31	38.09	3.38	6.64	27.28	3.37	0.21
Median	27.86	57.29	38.08	3.40	6.64	26.40	3.40	0.21
Stand. Dev	0.03	0.08	0.06	0.17	0.02	4.93	0.12	0.01
%DO Sat Exceedances	100%							

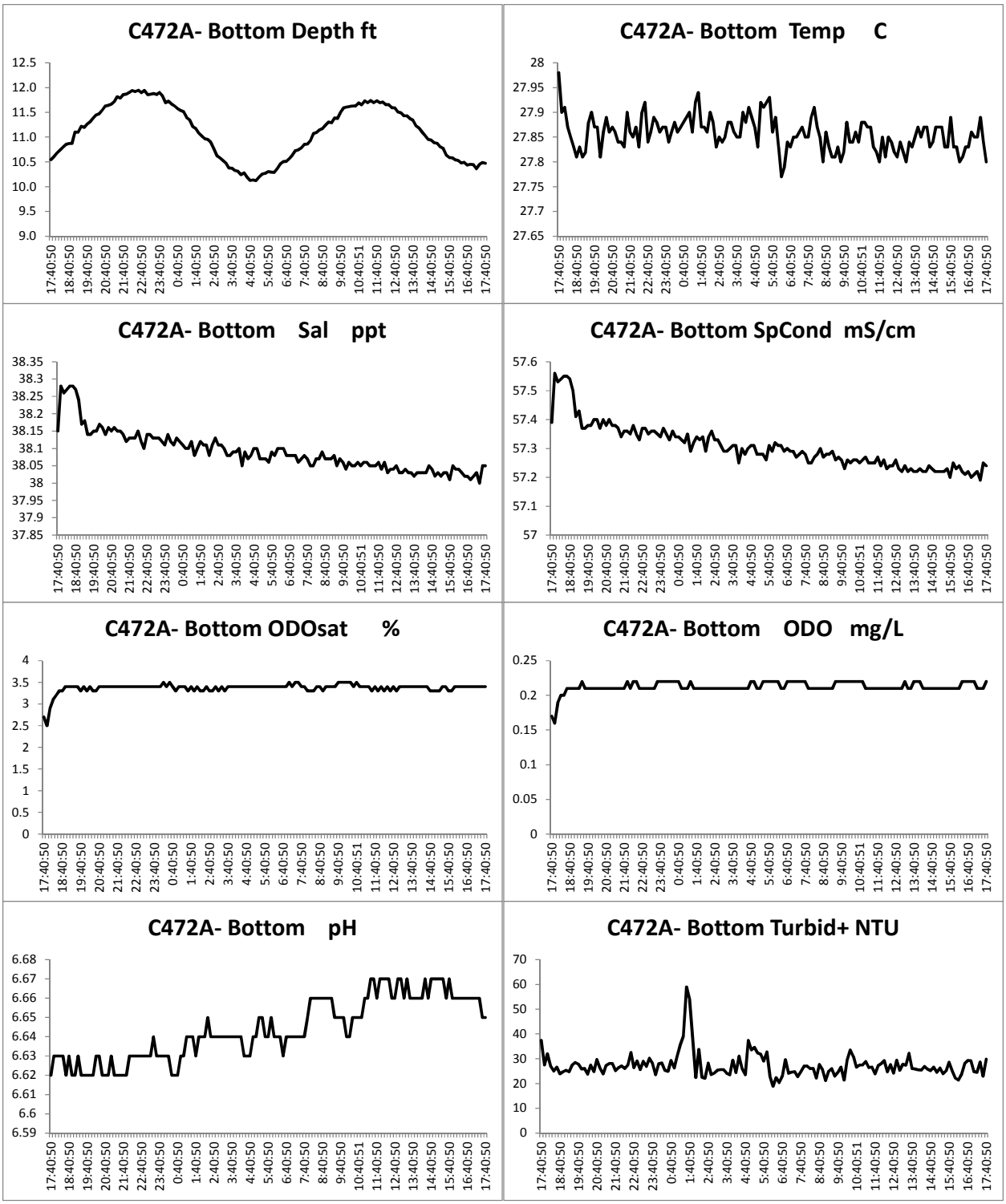


Figure 75: Time-series of physical-chemical data for bottom water at site A in canal #472 during a 24-hour cycle (Diel cycle). Survey FKC02

	C472A- Surface Temp C	C472A- Surface SpCond mS/cm	C472A- Surface Sal ppt	C472A- Surface Depth meters	C472A- Surface pH	C472A- Surface Turbid NTU	C472A- Surface DOsat %	C472A- Surface DO mg/L
Average	29.97	50.70	33.11	0.36	7.80	0.37	88.27	5.56
Median	30.02	50.64	33.07	0.36	7.79	0.40	87.50	5.53
Stand. Dev	0.29	0.25	0.19	0.01	0.04	0.23	15.10	0.94
%DO Sat Exceedances	0%							

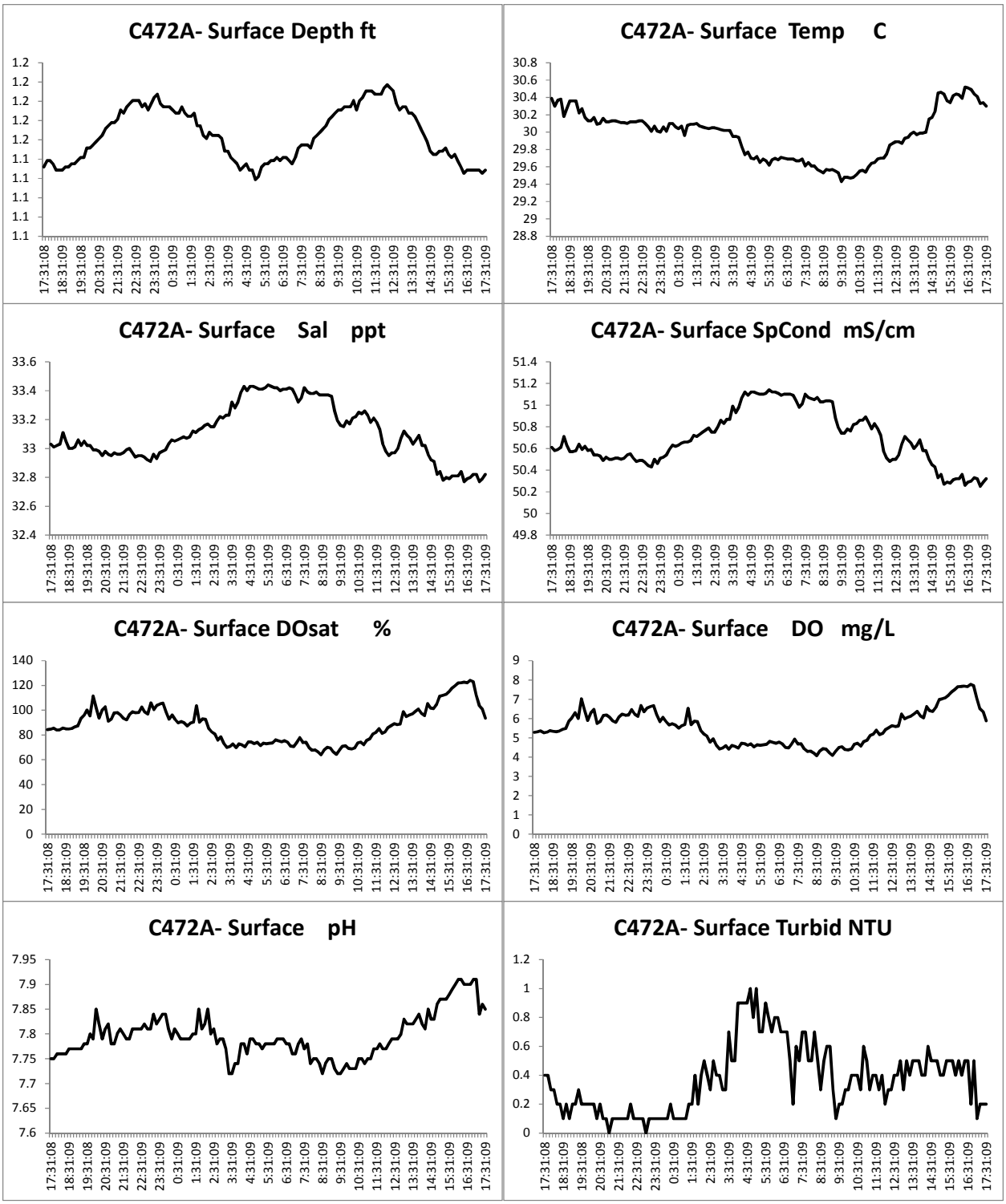


Figure 76: Time-series of physical-chemical data for surface water at site A in canal #472 during a 24-hour cycle (Diel cycle). Survey FKC02

CTD Casts

Survey No 1

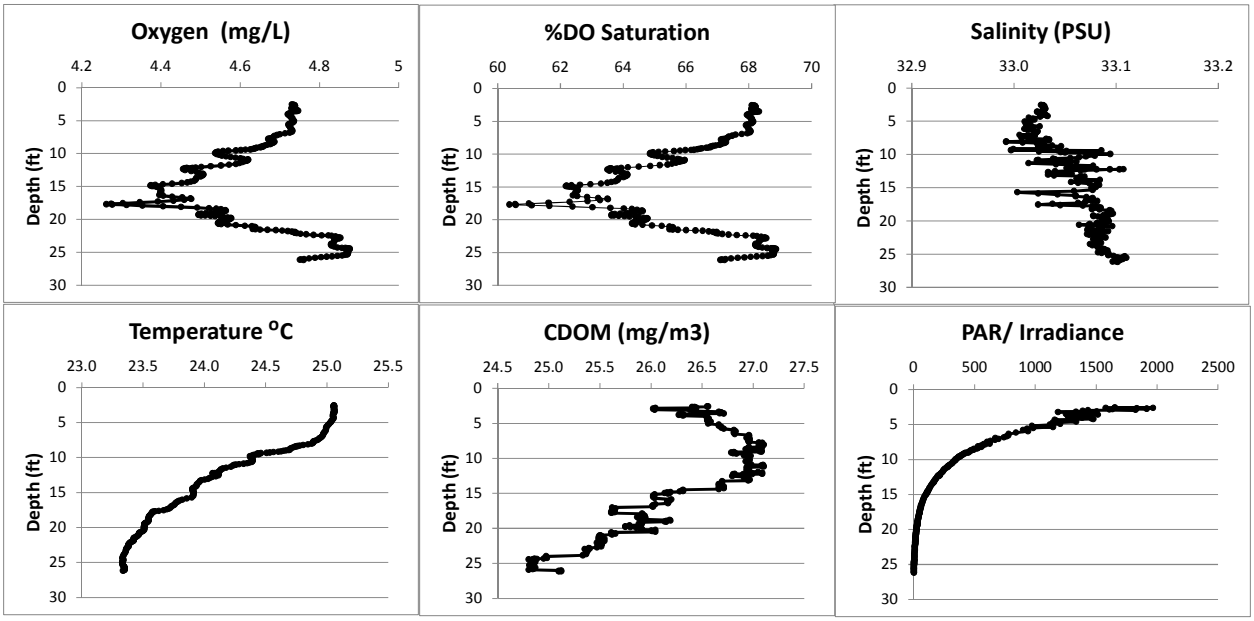


Figure 77. Profile of physicochemical properties of station No. 28A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values between 70 and 80% and within the regulation levels.

Salinity remains very stable with values around 33.

Water Temperature drops along the profile with a range of variation of about 2 °C.

Colored Dissolved Organic Matter slightly decreases downward.

Photosynthetically Active Radiation decreases with increasing water depth from values around 2000 to practically zero and has a vertical attenuation coefficient of 0.86.

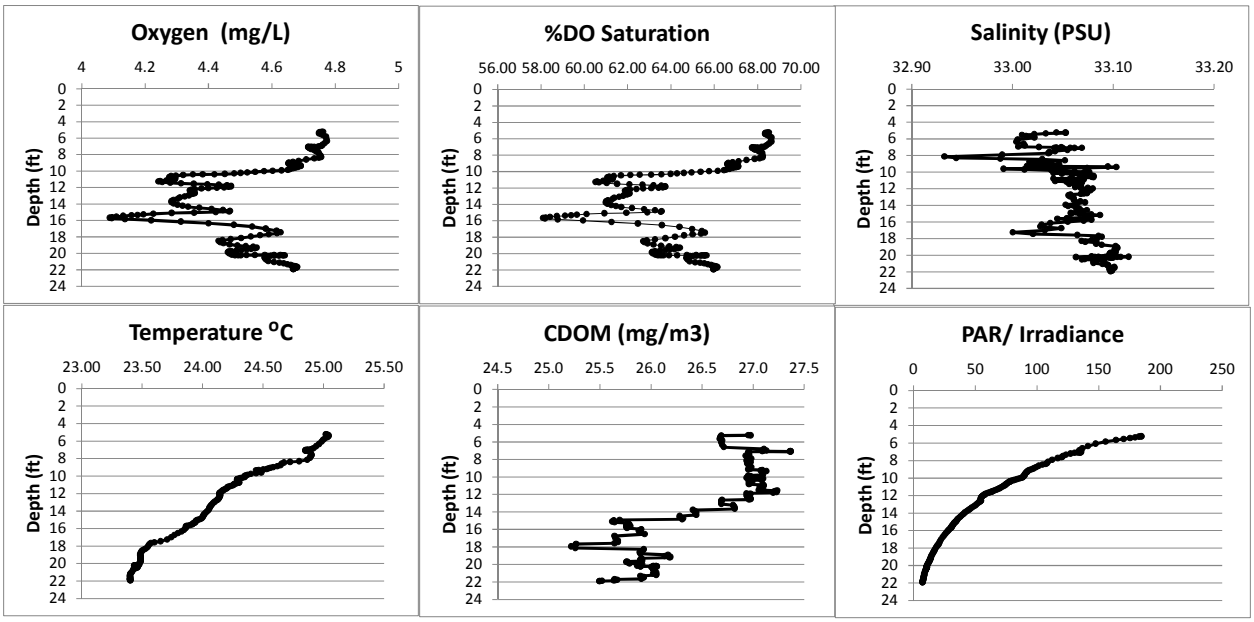


Figure 78. Profile of physicochemical properties of station No. 28B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values between 58 and 70% and within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 33. Given the sensitivity of the sensors it is possible to define an increasing trend with water depth although the change is of 0.2 PSU.

Water Temperature drops along the profile with a range of variation of about 2 °C.

Colored Dissolved Organic Matter slightly decreases downward.

Photosynthetically Active Radiation/Irradiance decreases with increasing water depth and has a vertical attenuation coefficient of 0.63.

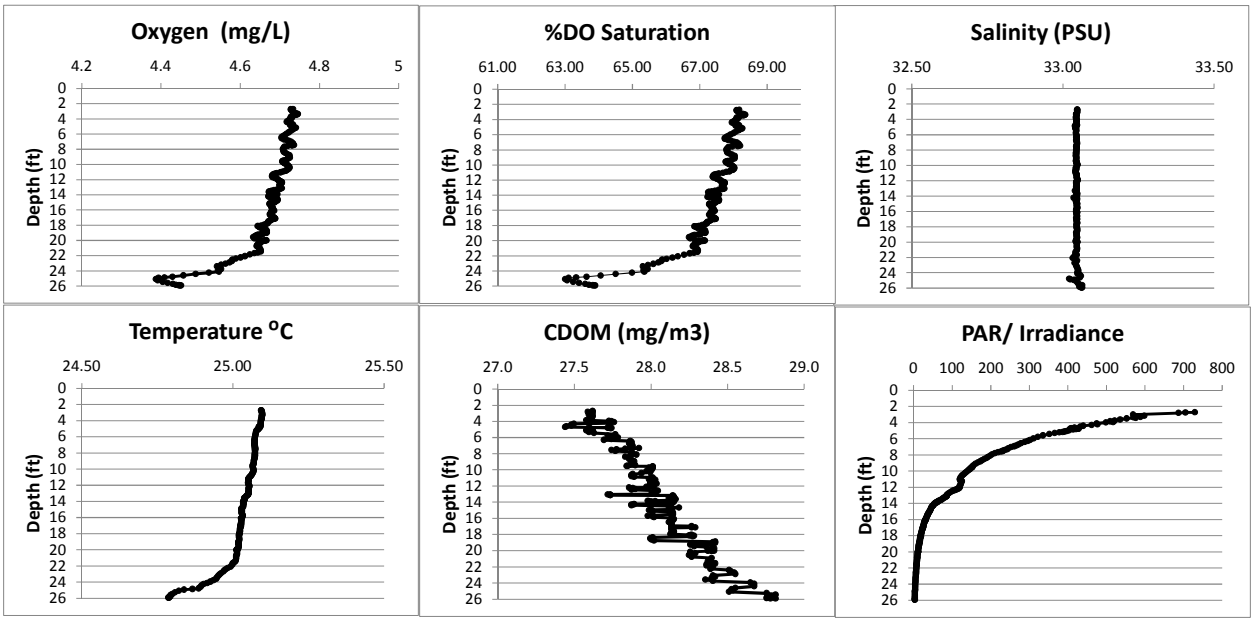


Figure 79. Profile of physicochemical properties of station No. 28C

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values between 60 and 70% and within the regulation levels

Salinity remains very stable with values around 33.

Water Temperature remains also very stable with values around 25 ^{o}C.

Colored Dissolved Organic Matter slightly increased downward.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.77.

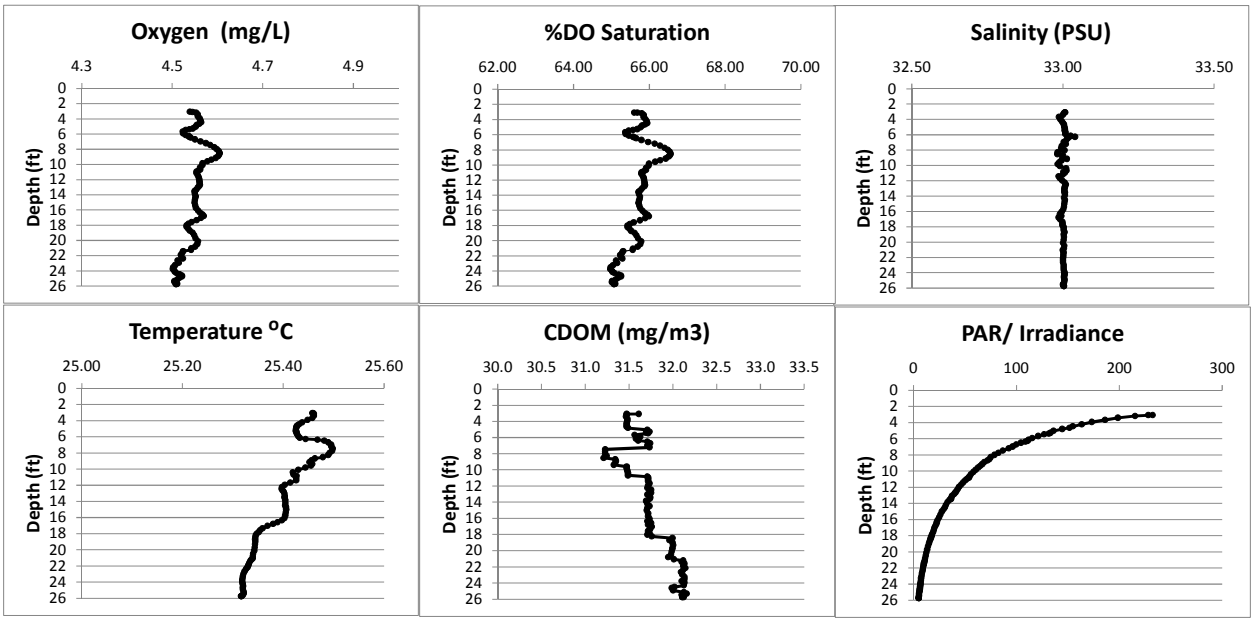


Figure 80. Profile of physicochemical properties of station No. 29A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values around 66% and within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 33.

Water Temperature remains also very stable with values around 25.4 ^{O}C.

Colored Dissolved Organic Matter remains rather constant between 31-31 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.52.

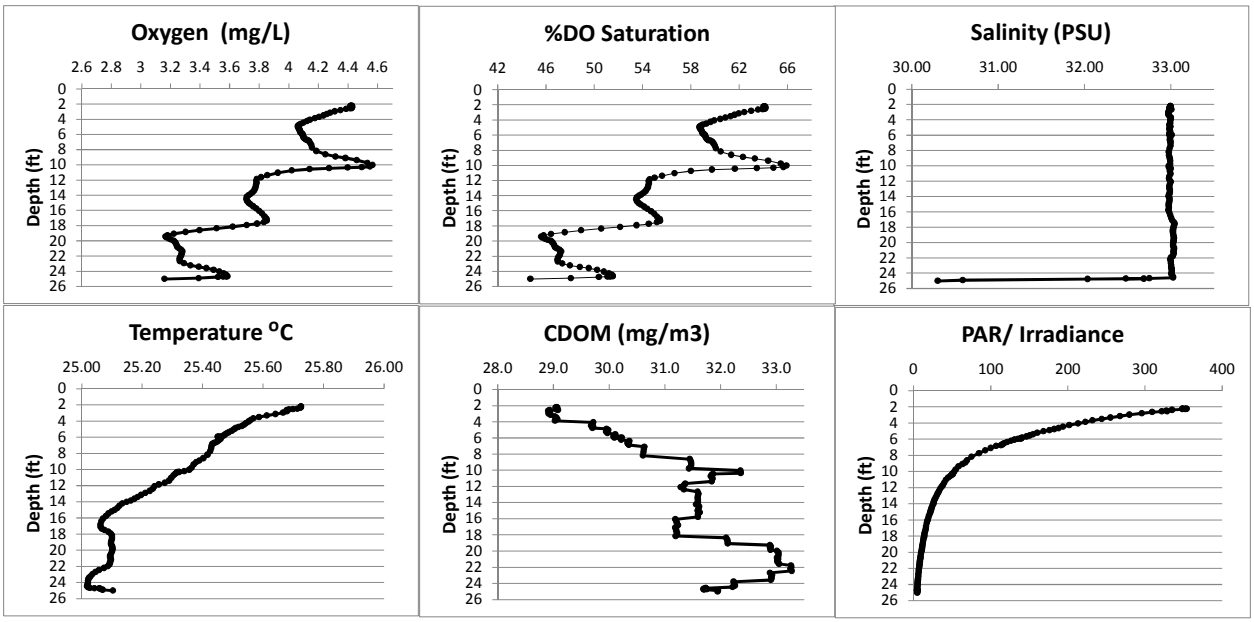


Figure 81. Profile of physicochemical properties of station No. 29B

Dissolved Oxygen and Oxygen saturation show a steady decline although water remains well oxygenated with all values above 42% DO Saturation, according to the regulation levels.

Salinity remains very stable with values around 33 and captures a decrease at 24.5 ft.

Water Temperature drops along the profile with a range of variation of about 1 ^{O}C.

Colored Dissolved Organic Matter slightly increased downward from 29 to 33 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.61.

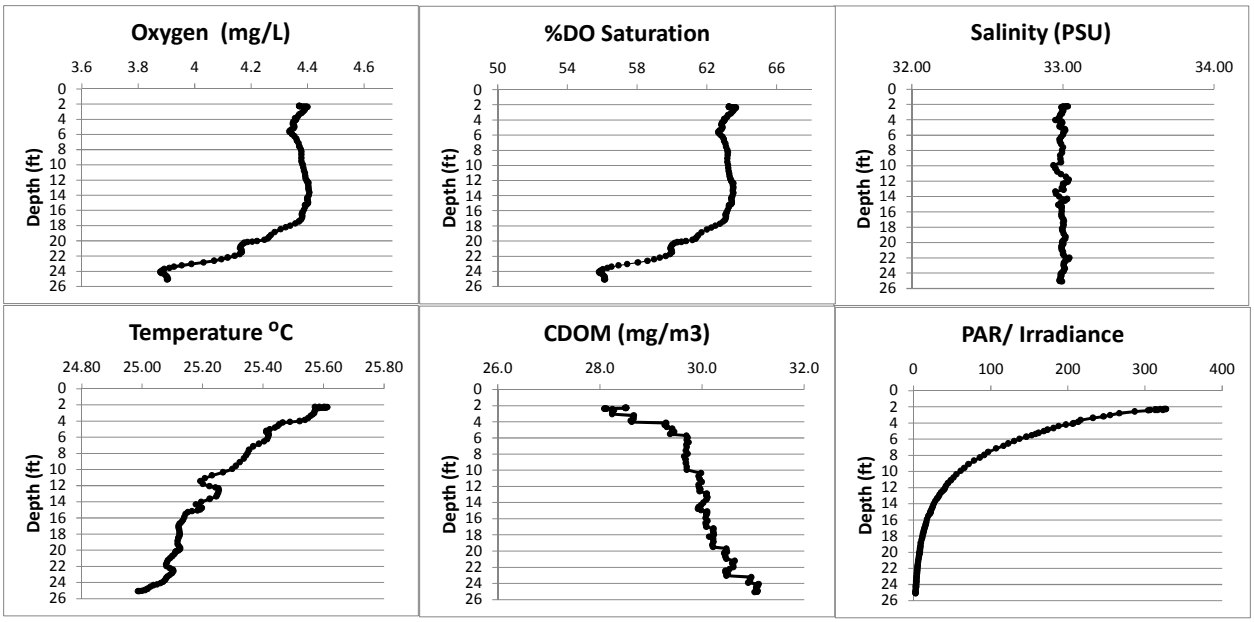


Figure 82. Profile of physicochemical properties of station No. 29C

Dissolved Oxygen and Oxygen saturation do not change significantly and readings are between 55 and 63%, without exceeding the regulation levels (above 42% DO Saturation).

Salinity remains very stable with values around 33.

Water Temperature remains very stable with values around 25. Given the sensitivity of the sensors it is possible to define a decreasing trend with water depth although the change is of about 1 ^{o}C.

Colored Dissolved Organic Matter slightly increased downward.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.68.

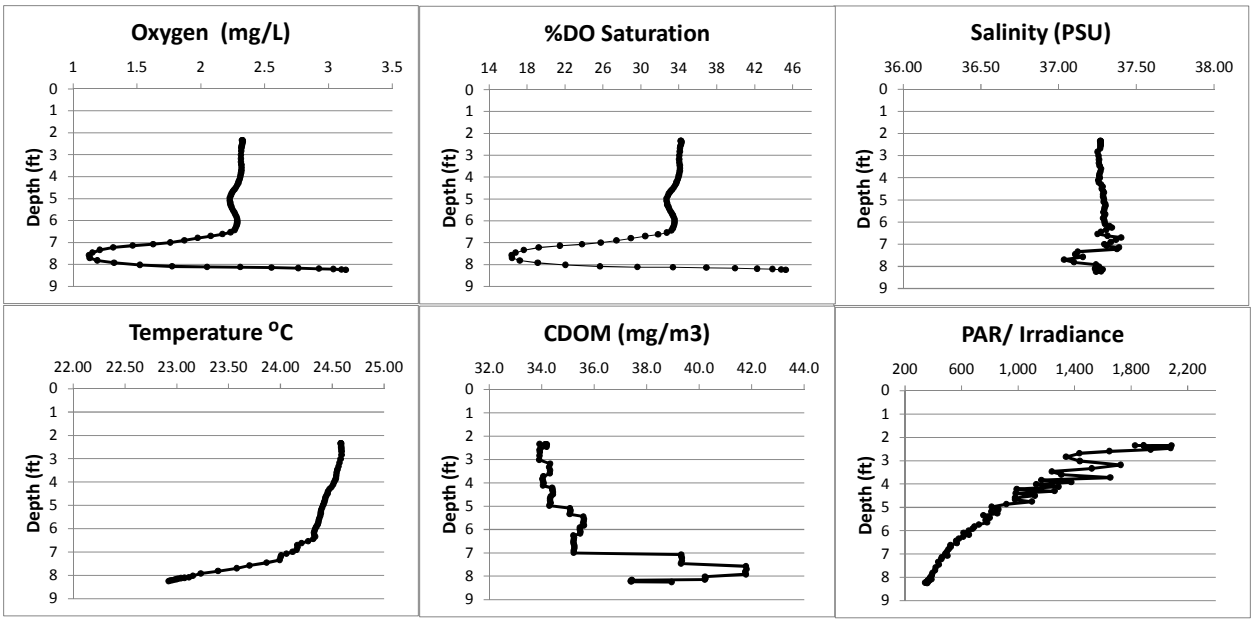


Figure 83. Profile of physicochemical properties of station No. 132A

Dissolved Oxygen and Oxygen saturation are in general low throughout the water column with most values exceeding the regulation levels (values below 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature drops along the profile with a range of variation of about 2 ^{o}C.

Colored Dissolved Organic Matter slightly increased downward from 34 to 42 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth from values around 2000 to practically zero and has a vertical attenuation coefficient of 0.95.

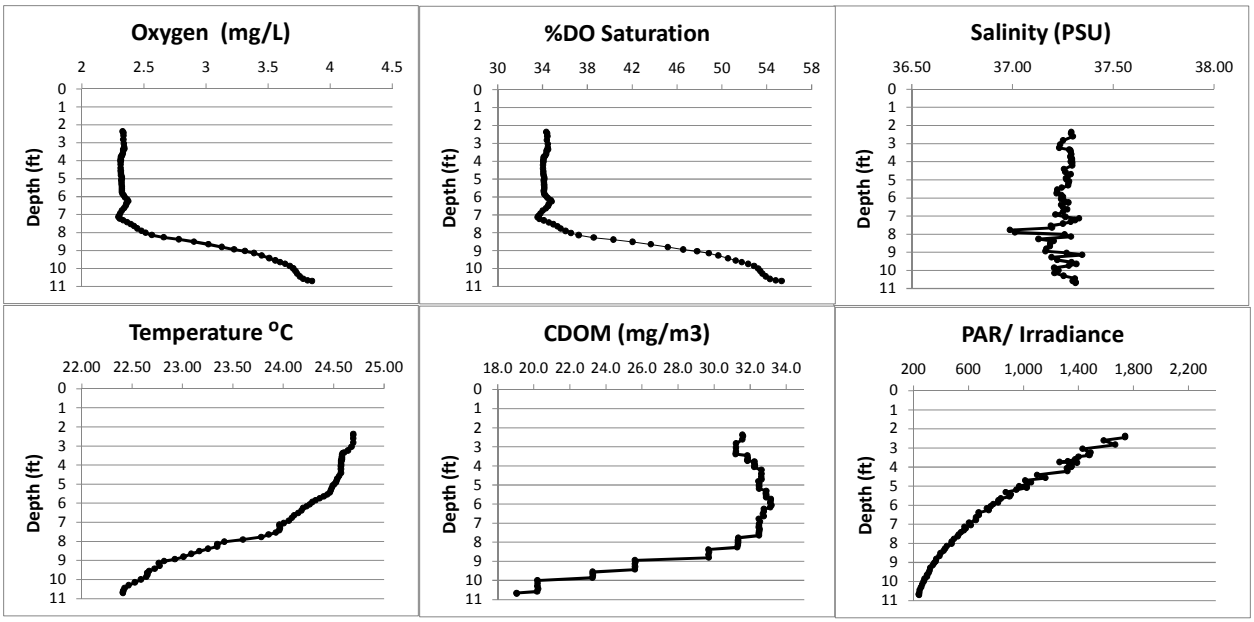


Figure 84. Profile of physicochemical properties of station No. 132B

Dissolved Oxygen and Oxygen saturation were in general low throughout the water column with some values exceeding the regulation levels (values below 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature drops along the profile with a range of variation of about 2 ^{o}C.

Colored Dissolved Organic Matter decreases downward from around 33 to 18 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth from values around 1800 to 200 and has a vertical attenuation coefficient of 0.82.

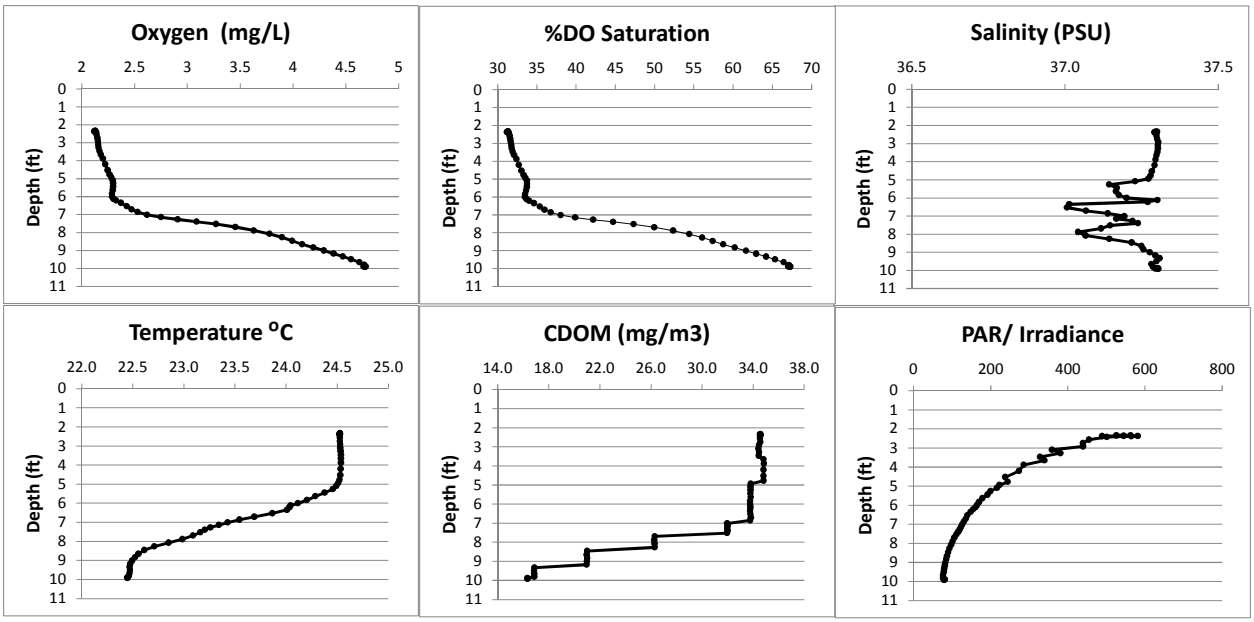


Figure 85. Profile of physicochemical properties of station No. 132C

Dissolved Oxygen and Oxygen saturation are in general low and values range between 31 and 67% DO Saturation with approximately 30% exceeding the regulation levels (values below 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature drops along the profile with a range of variation of about 2 °C.

Colored Dissolved Organic Matter decreases downward from around 33 to 18 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.87.

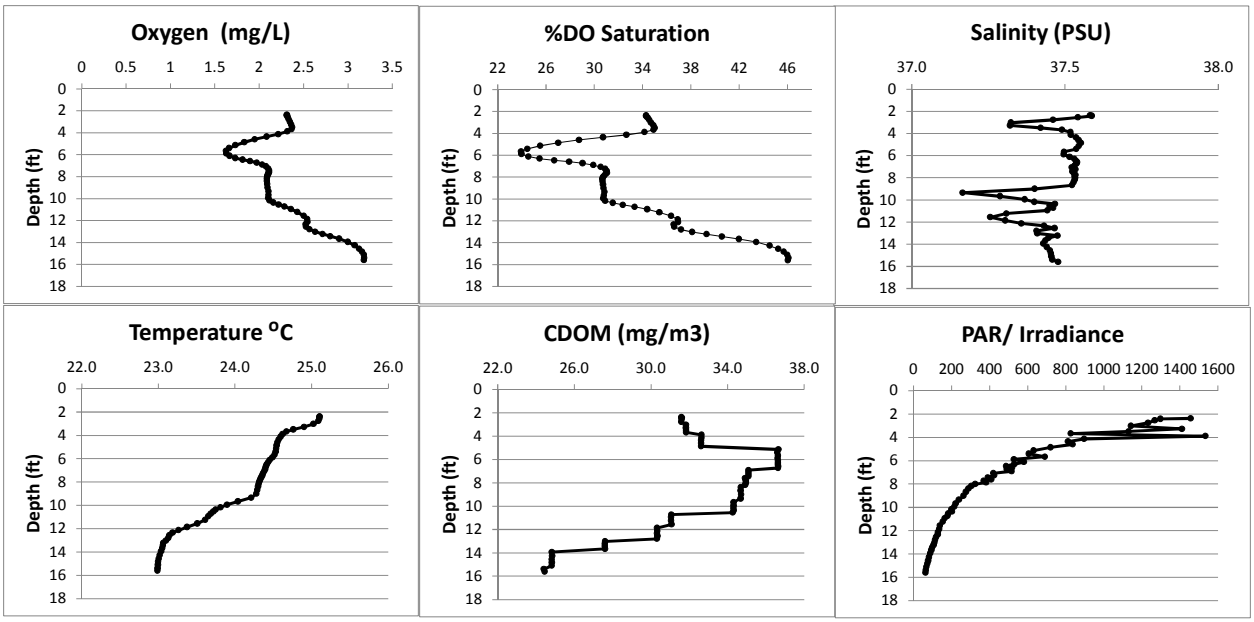


Figure 86. Profile of physicochemical properties of station No. 137A

Dissolved Oxygen and Oxygen saturation are generally low with a slight increasing trend downward and values between 23 and 47%, close to values exceeding the regulation levels (below 42% DO Saturation).

Salinity remains very stable with values between 37 and 38.

Water Temperature drops along the profile with a range of variation of about 2 °C.

Colored Dissolved Organic Matter decreases downward up to 24 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth with some variations at the surface and a vertical attenuation coefficient of 0.78.

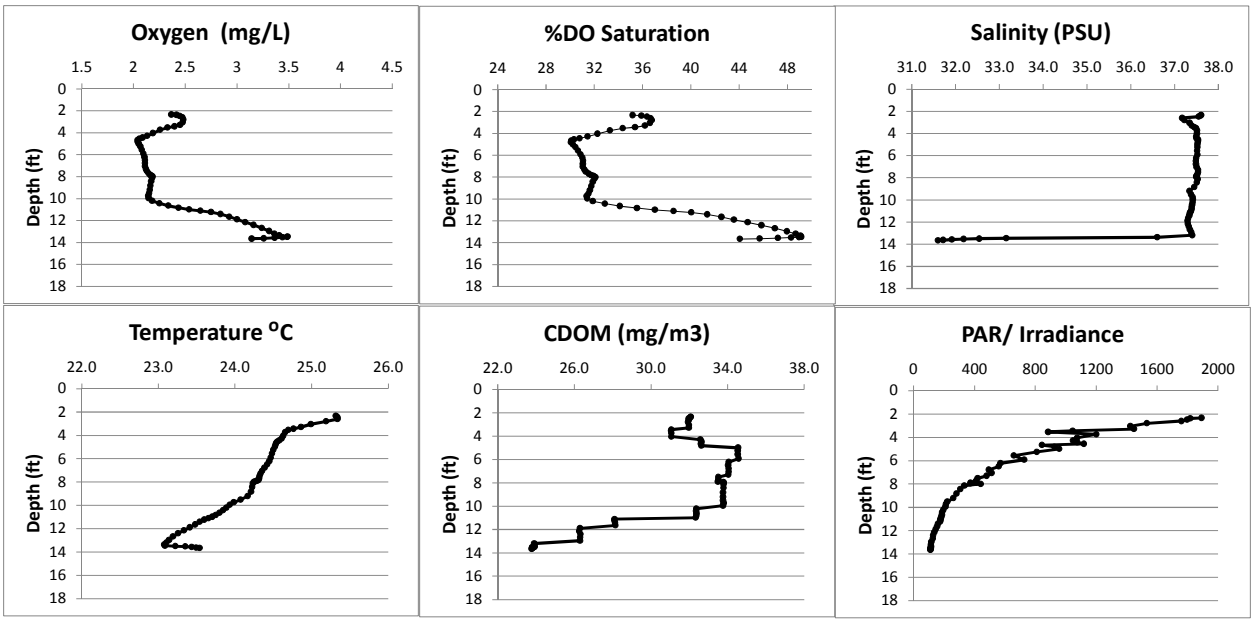


Figure 87. Profile of physicochemical properties of station No. 137B

Dissolved Oxygen and Oxygen saturation are generally low with a slight increasing trend downward and values between 30 and 49%, close to values exceeding the regulation levels (below 42% DO Saturation).

Salinity remains very stable with values around 37 and captures a decrease at 13 ft.

Water Temperature drops along the profile with a range of variation of about 2 ^{o}C.

Colored Dissolved Organic Matter decreases downward from around 31-32 to 23 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.82.

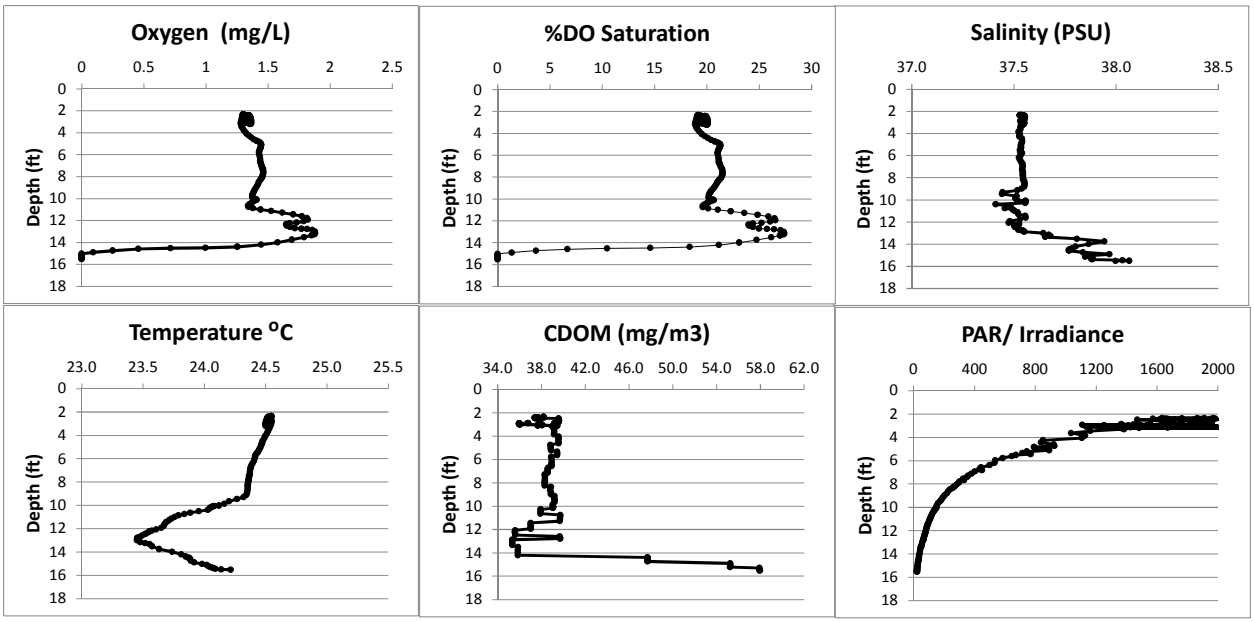


Figure 88. Profile of physicochemical properties of station No. 137C

Dissolved Oxygen and Oxygen saturation are generally low with some oscillations after 10 ft water depth. All values exceed the regulation levels (below 42% DO Saturation).

Salinity remains very stable with values around 37.5 and captures a decrease at 10 ft. Given the sensitivity of the sensors it is possible to define an increasing trend thereafter although the change is of 0.5 PSU.

Water Temperature drops along the profile with a range of variation of about 1 ^{o}C.

Colored Dissolved Organic Matter remains very stable with values around 38 mg m^{-3} and an increase is observed after 13 ft water depth.

Photosynthetically Active Radiation exponentially decreases with water depth with some variations at the surface and a vertical attenuation coefficient of 1.08.

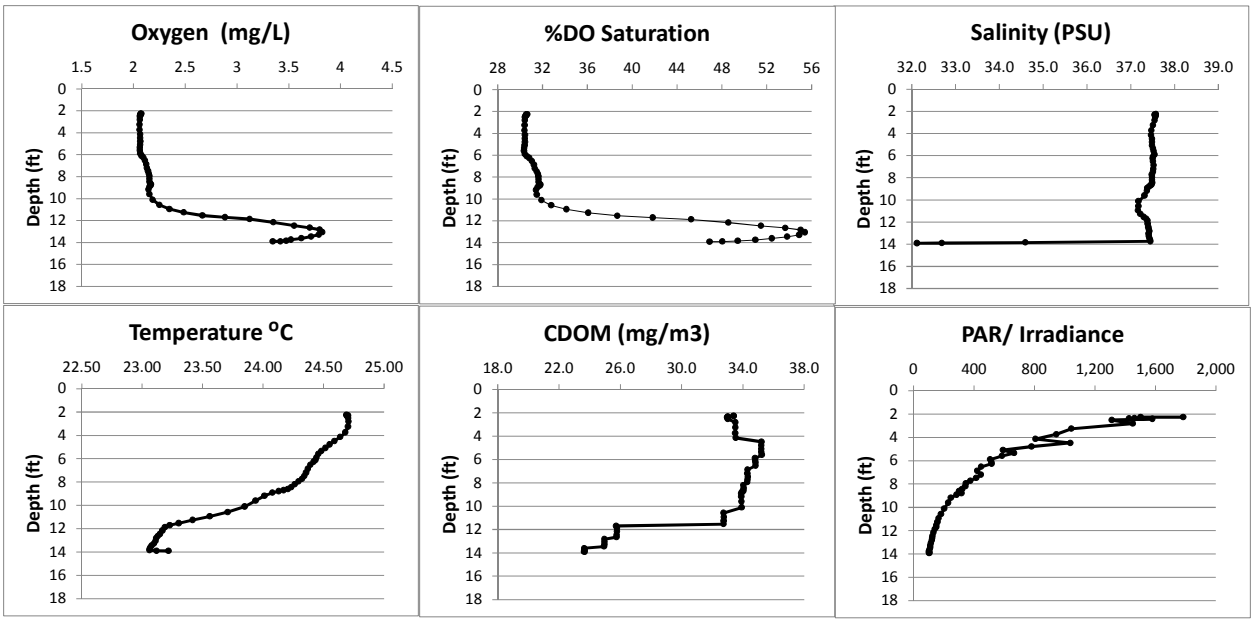


Figure 89. Profile of physicochemical properties of station No. 137D

Dissolved Oxygen and Oxygen saturation are in general low throughout the water column with some values exceeding the regulation levels (values below 42% DO Saturation).

Salinity remains very stable with values around 37 and captures a decrease at 14 ft.

Water Temperature drops along the profile with a range of variation of about 2 ^{o}C.

Colored Dissolved Organic Matter slightly decreases downward from around 9.3 ft 34 to 23 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth from values around 1800 to practically zero and has a vertical attenuation coefficient of 0.77.

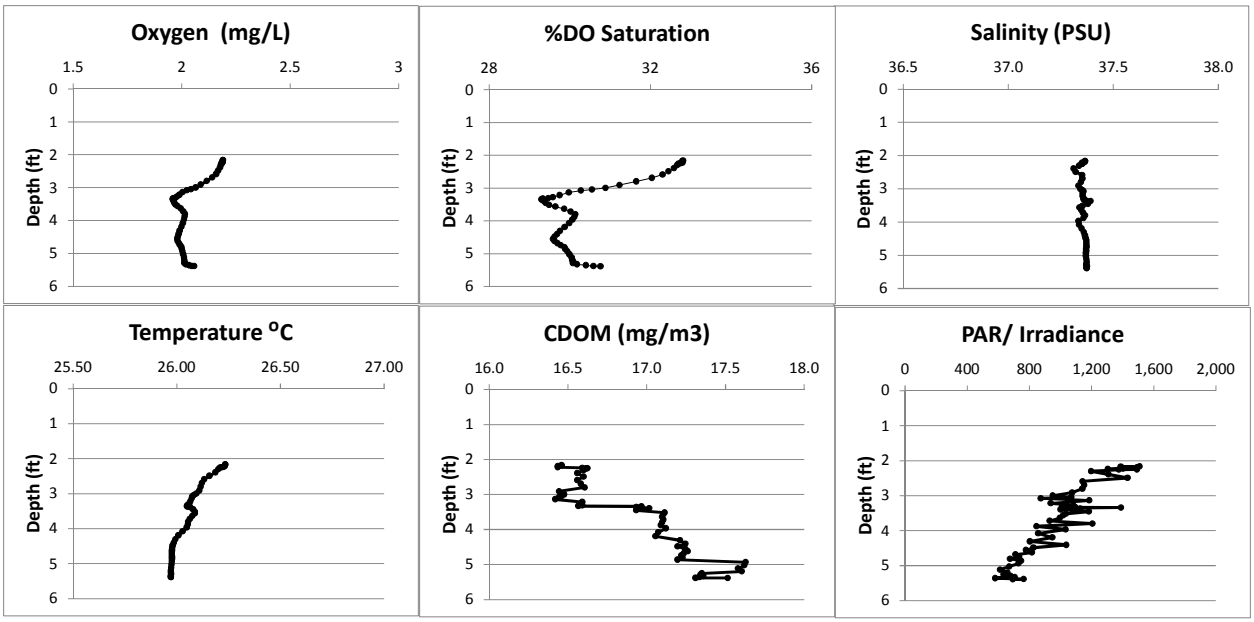


Figure 90. Profile of physicochemical properties of station No. 147A

Dissolved Oxygen and Oxygen saturation are in general low throughout the water column with all values exceeding the regulation levels (values below 42% DO Saturation).

Salinity remains very stable with values between 37 and 38.

Water Temperature remains very stable with values around 26 ^{O}C.

Colored Dissolved Organic Matter remains very stable with values around 17 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth from values around 1500 to 500 and has a vertical attenuation coefficient of 0.76.

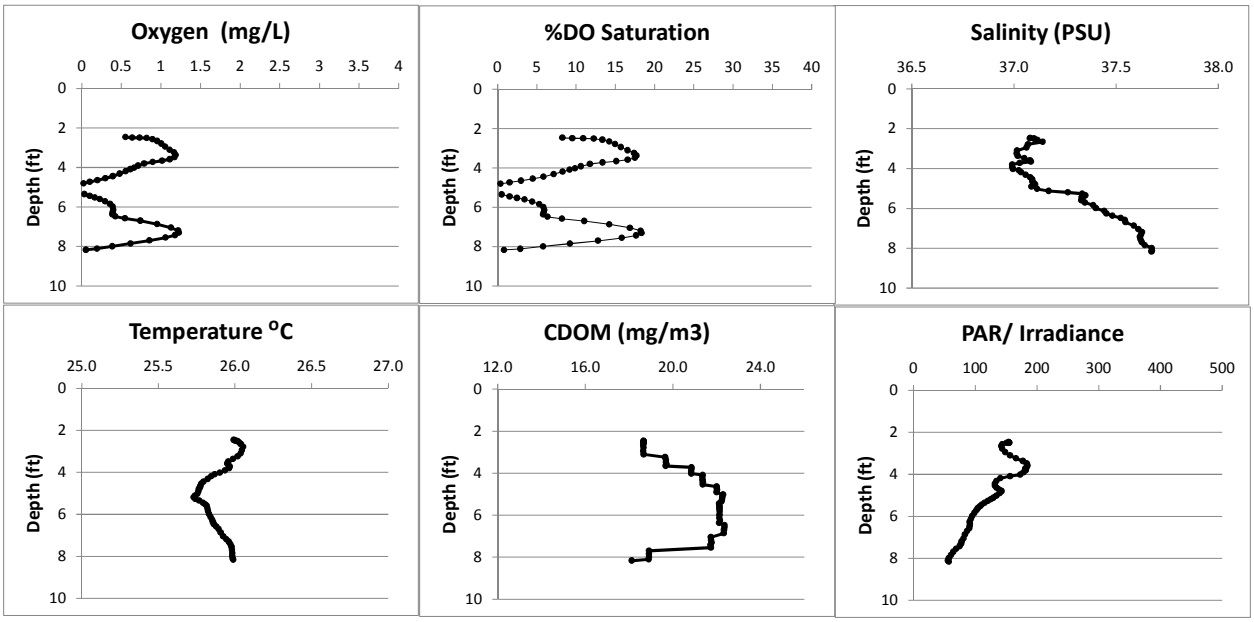


Figure 91. Profile of physicochemical properties of station No. 147B

Dissolved Oxygen and Oxygen saturation are low and do not change significantly. All values exceed the regulation levels (values below 42% DO Saturation).

Salinity remains very stable with values between 37 and 38.

Water Temperature remains very stable with values around 26 ^{O}C.

Colored Dissolved Organic Matter remains very stable with values around 20 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.61.

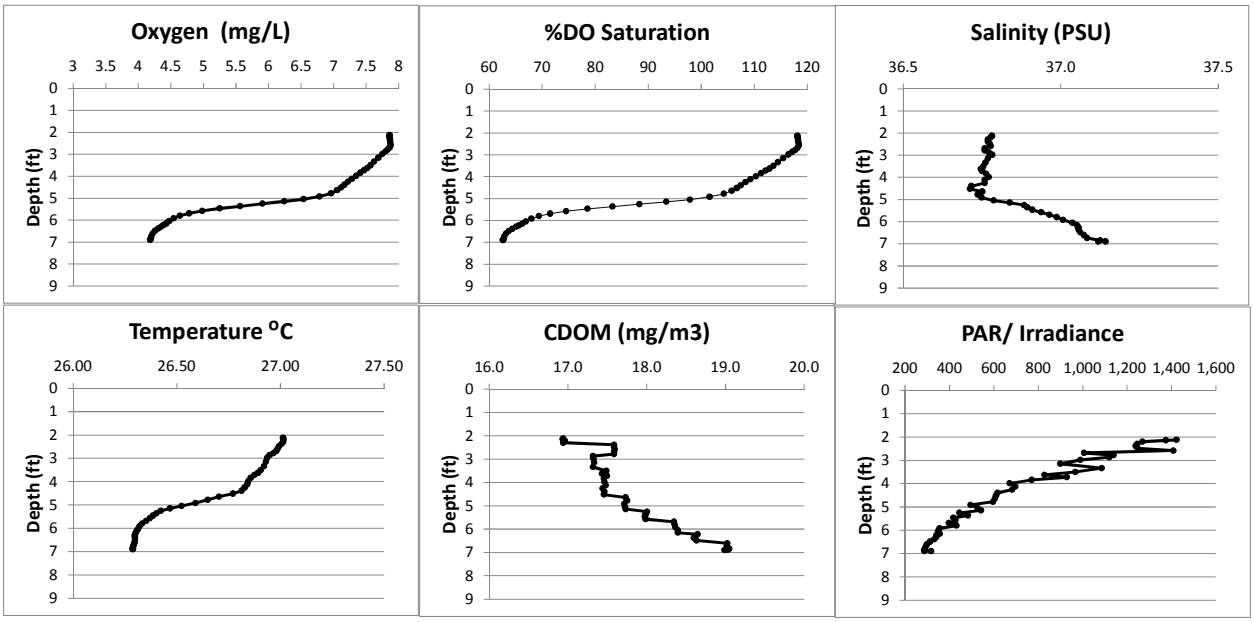


Figure 92. Profile of physicochemical properties of station No. 148A

Dissolved Oxygen and Oxygen saturation vary by water depth and water remains well oxygenated, without exceeding the regulation levels (above 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature remains stable with values between 26 and 27 ^{o}C.

Colored Dissolved Organic Matter slightly increased downward.

Photosynthetically Active Radiation decreases exponentially with water depth and has a vertical attenuation coefficient of 1.11.

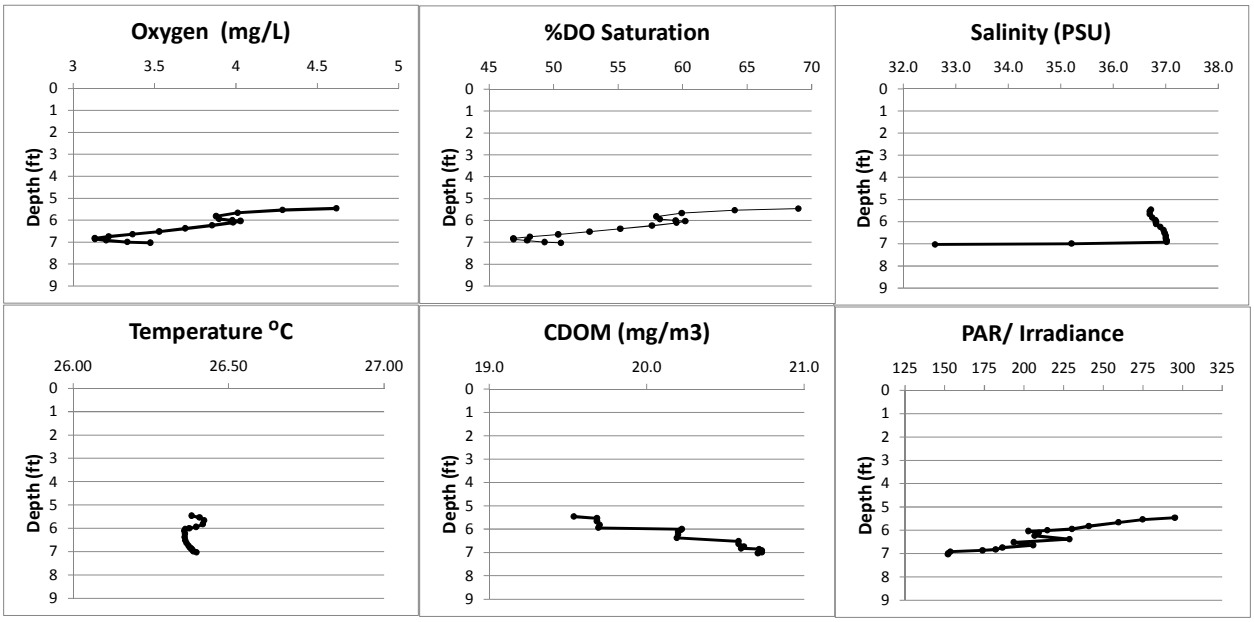


Figure 93. Profile of physicochemical properties of station No. 148B

Dissolved Oxygen and Oxygen saturation vary by water depth and water remains well oxygenated, without exceeding the regulation levels (above 42% DO Saturation).

Salinity remains stable with values around 37 and captures a decrease at 7 ft.

Water Temperature remains stable with values between 26 and 27 ^{o}C.

Colored Dissolved Organic Matter remains stable.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.16.

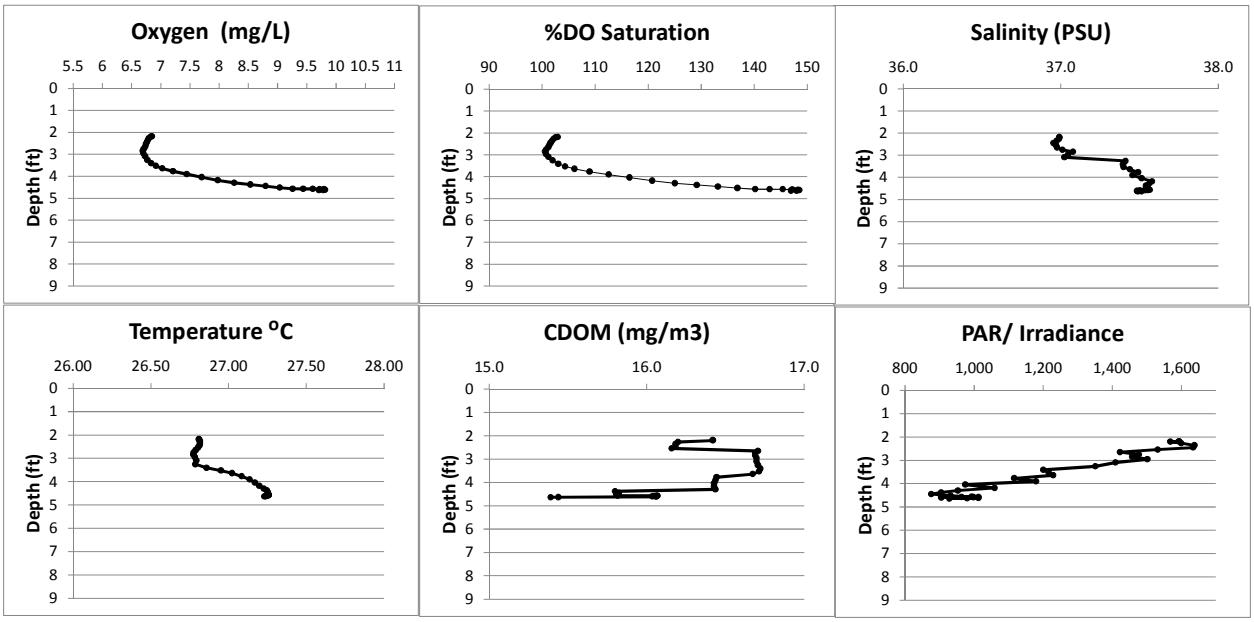


Figure 94. Profile of physicochemical properties of station No. 148C

Dissolved Oxygen and Oxygen saturation vary by water depth and water remains well oxygenated, without exceeding the regulation levels (above 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature remains stable with values around 27 ^{o}C.

Colored Dissolved Organic Matter remains stable.

Photosynthetically Active Radiation decreases with water depth from values around 1600 to 900 and has a vertical attenuation coefficient of 0.77.

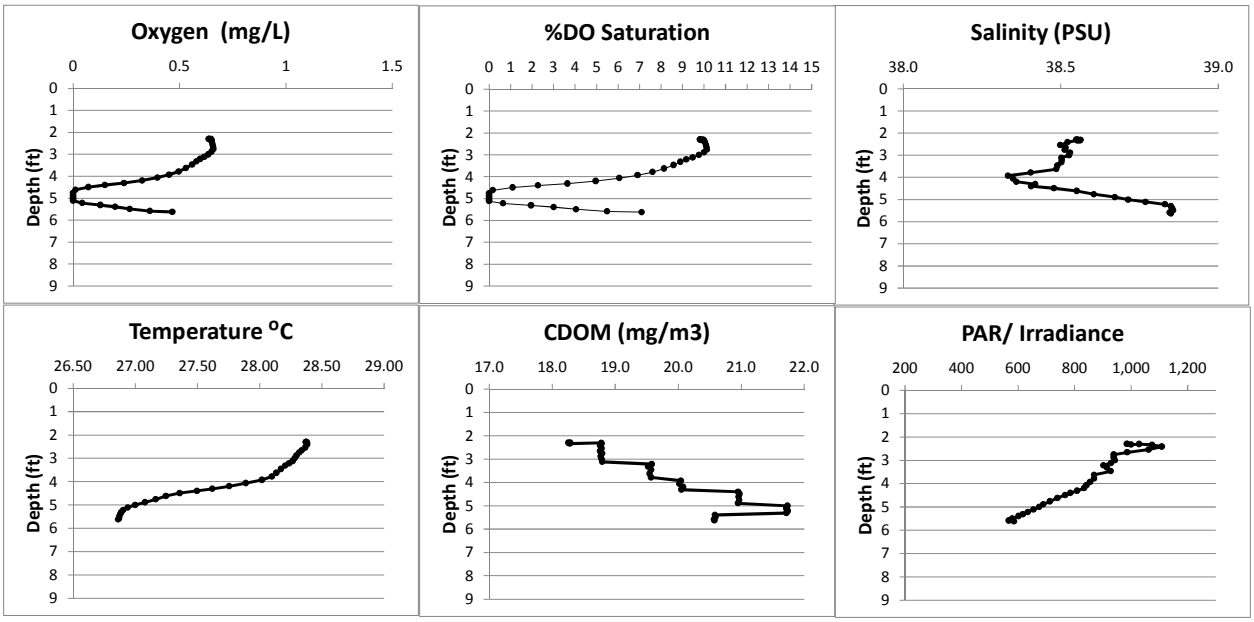


Figure 95. Profile of physicochemical properties of station No. 266A

Dissolved Oxygen and Oxygen saturation are generally low with a decreasing tendency downward until a water depth of 5 ft, when values slightly increase. All values exceed the regulation levels (below 42% DO Saturation).

Salinity remains stable with values around 38.5.

Water Temperature drops along the profile with a range of variation of about 2 °C.

Colored Dissolved Organic Matter increases along the profile.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.56.

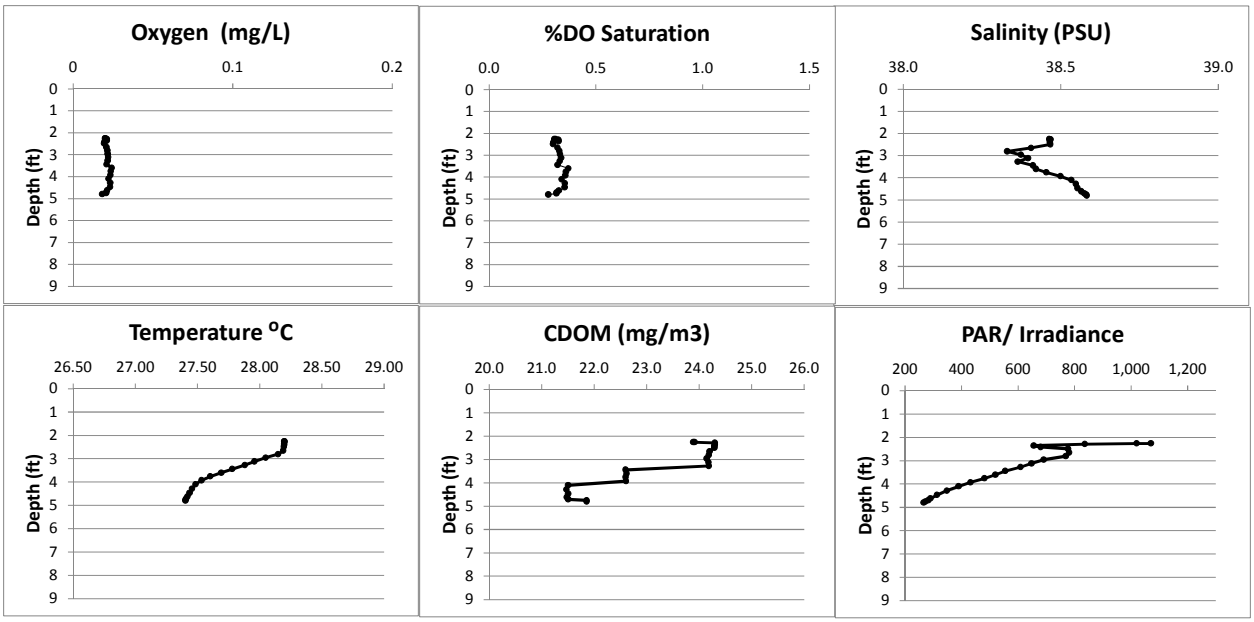


Figure 96. Profile of physicochemical properties of station No. 266B

Dissolved Oxygen and Oxygen saturation are very low, practically zero, and the water column remain a concentration exceeding the regulation levels (below 42% DO Saturation).

Salinity remains stable with values around 38.5.

Water Temperature drops along the profile with a range of variation of about 1 °C.

Colored Dissolved Organic Matter remains stable.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.53.

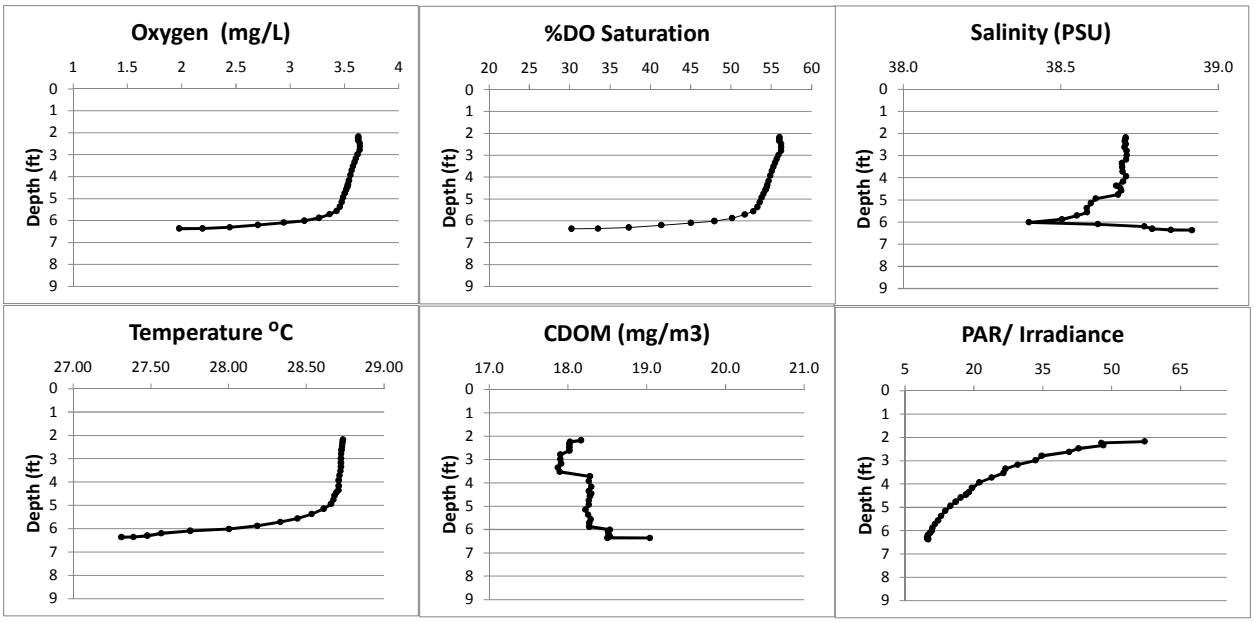


Figure 97. Profile of physicochemical properties of station No. 266C

Dissolved Oxygen and Oxygen saturation are generally low with a decreasing tendency downward and values between 30 and 56%, close to values exceeding the regulation levels (below 42% DO Saturation).

Salinity remains stable with values between 38 and 39.

Water Temperature drops along the profile with a range of variation of about 1.4 ^{O}C.

Colored Dissolved Organic Matter remains very stable.

Photosynthetically Active Radiation decreases exponentially with water depth and has a vertical attenuation coefficient of 1.28.

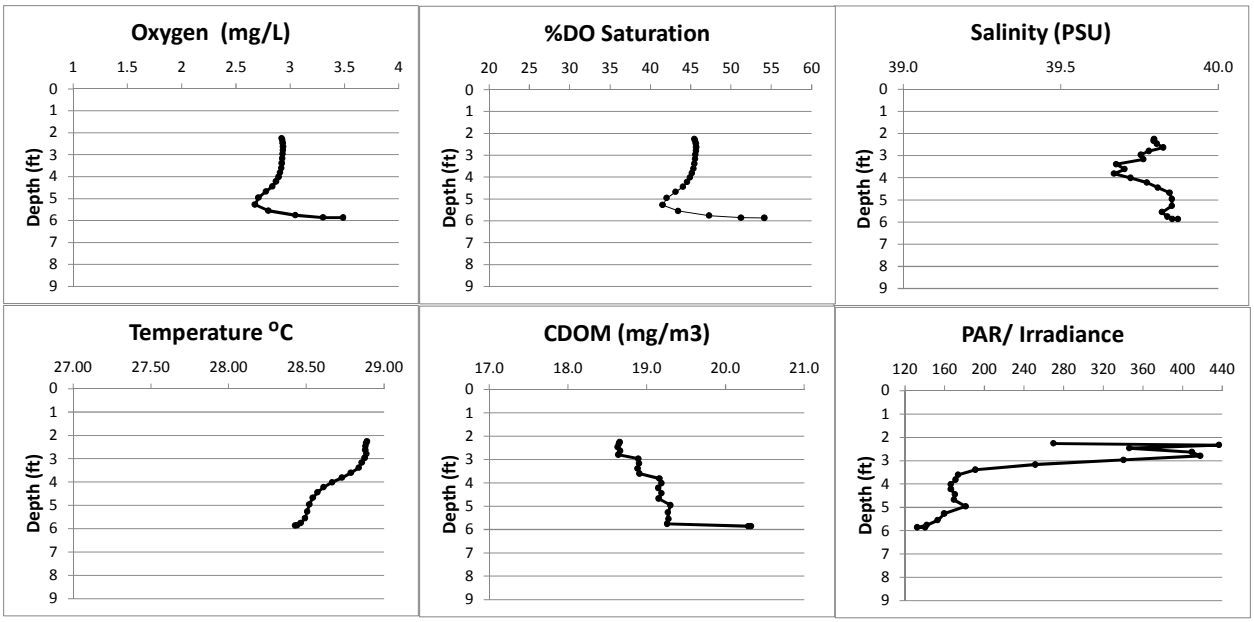


Figure 98. Profile of physicochemical properties of station No. 277A

Dissolved Oxygen and Oxygen saturation do not change significantly and values are between 41 and 54%, very close to values exceeding the regulation levels (below 42% DO Saturation).

Salinity y remains very stable around 39.5.

Water Temperature remains stable with values between 28 and 29 ^{O}C.

Colored Dissolved Organic Matter slightly increases with water depth from 18.6 to 20.3 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth with some oscillations and has a vertical attenuation coefficient of 0.91.

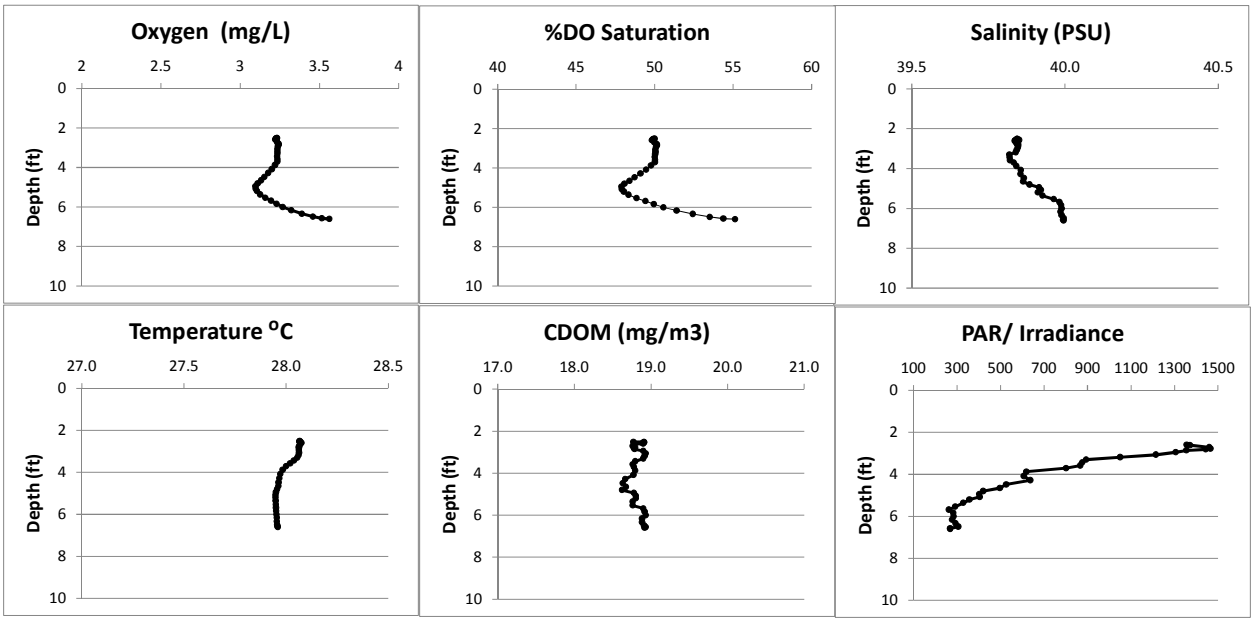


Figure 99. Profile of physicochemical properties of station No. 277B

Dissolved Oxygen and Oxygen saturation do not change significantly and values are around 50%, without exceeding the regulation levels (below 42% DO Saturation).

Salinity remains very stable around 40.

Water Temperature remains stable with values around 28 ^{O}C.

Colored Dissolved Organic Matter remains very stable around 19 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.22.

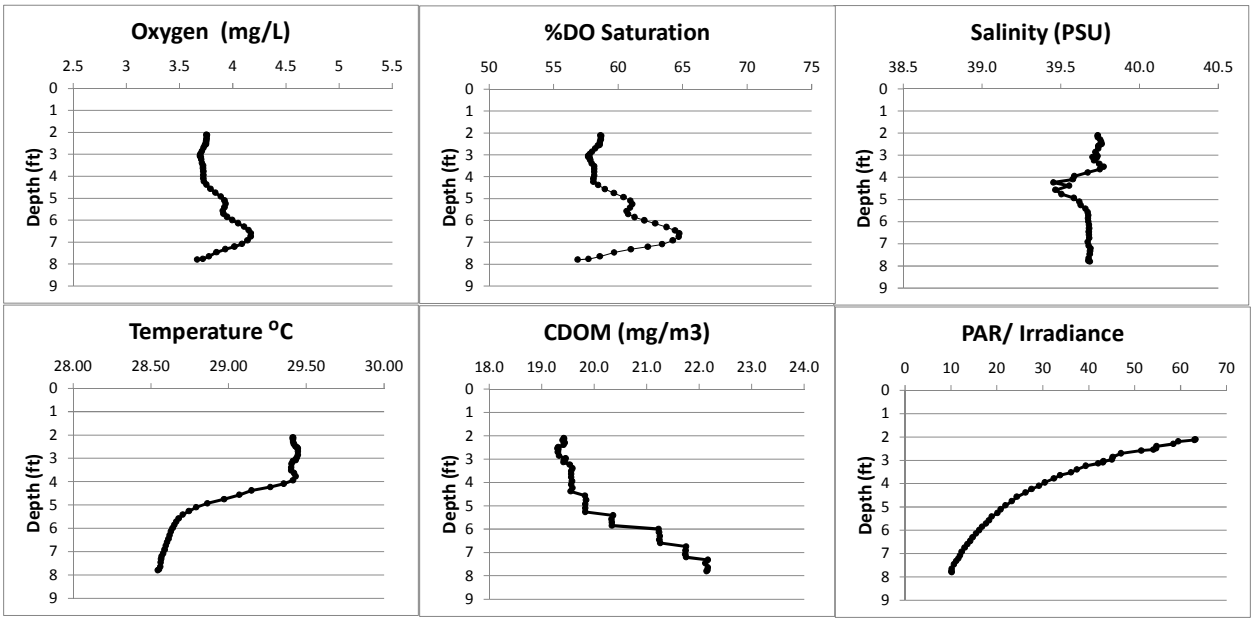


Figure 100. Profile of physicochemical properties of station No. 277C

Dissolved Oxygen and Oxygen saturation slightly vary by water depth and water remains well oxygenated, without exceeding the regulation levels (above 42% DO Saturation).

Salinity remains stable with values between 39 and 40.

Water Temperature drops along the profile with a range of variation of about 1 °C.

Colored Dissolved Organic Matter increases along the profile from 19 to 22 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 1.06.

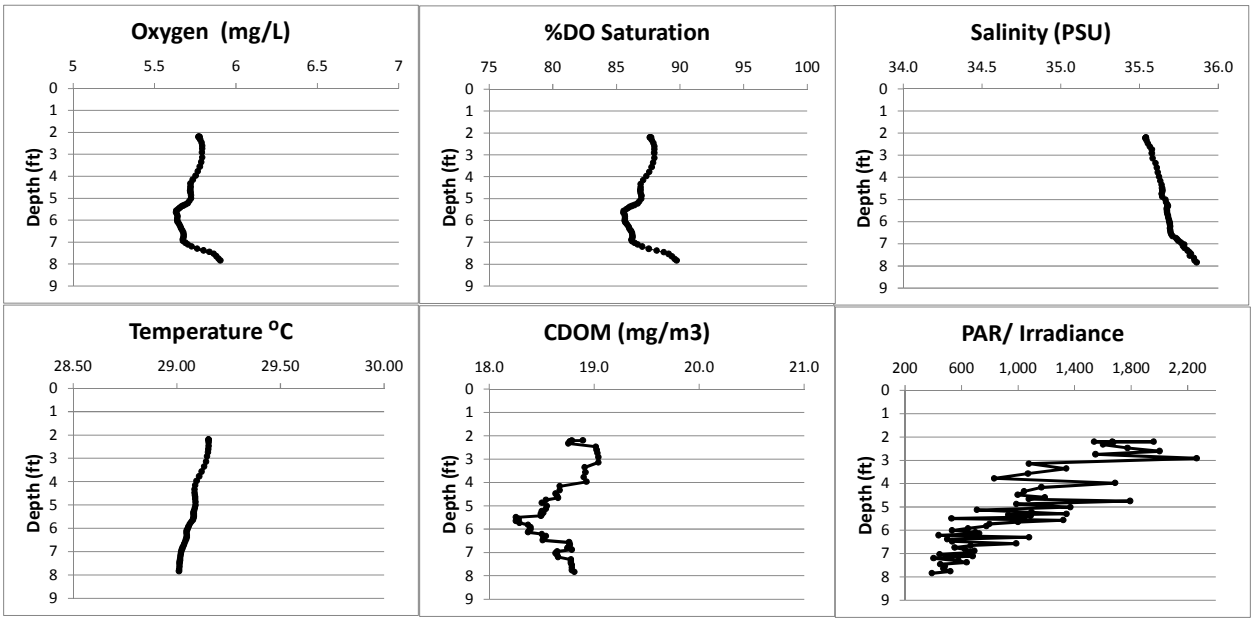


Figure 101. Profile of physicochemical properties of station No. 278A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values between 85 and 89% and within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 36.

Water Temperature remains very stable with values around 29 °C.

Colored Dissolved Organic Matter remains stable throughout the profile.

Photosynthetically Active Radiation decreases with water depth with some oscillations and has a vertical attenuation coefficient of 0.79.

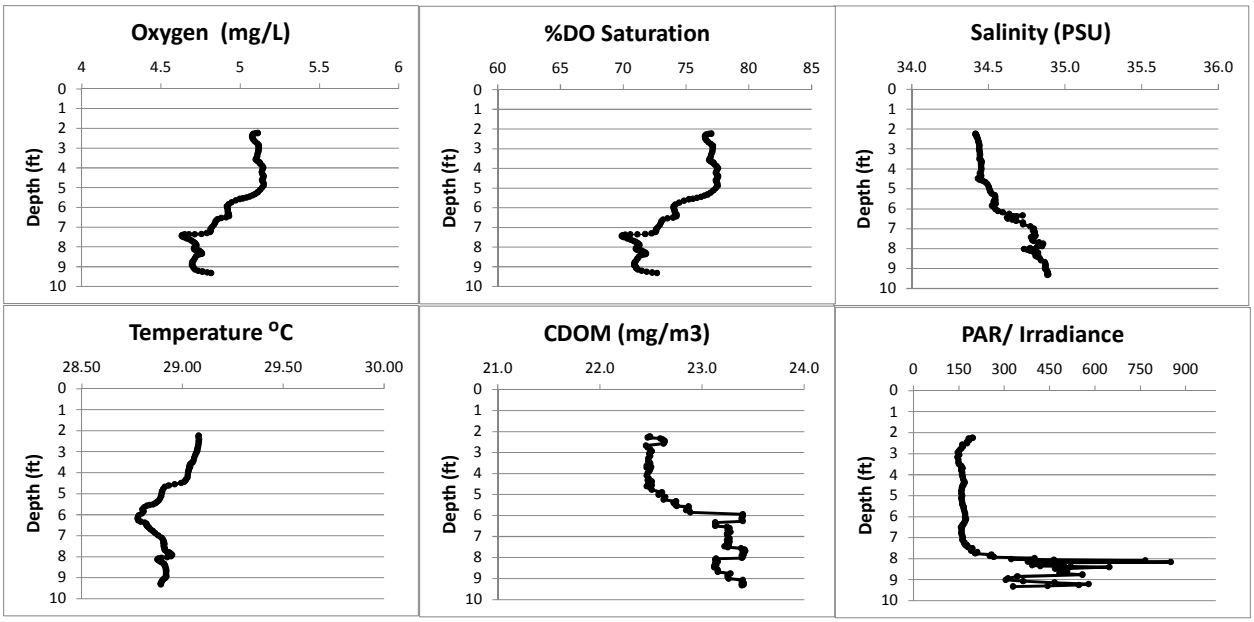


Figure 102. Profile of physicochemical properties of station No. 278B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values between 70 and 77% and within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 35.

Water Temperature remains very stable with values around 29 °C.

Colored Dissolved Organic Matter remains stable throughout the profile.

Photosynthetically Active Radiation varies with water depth without any trend.

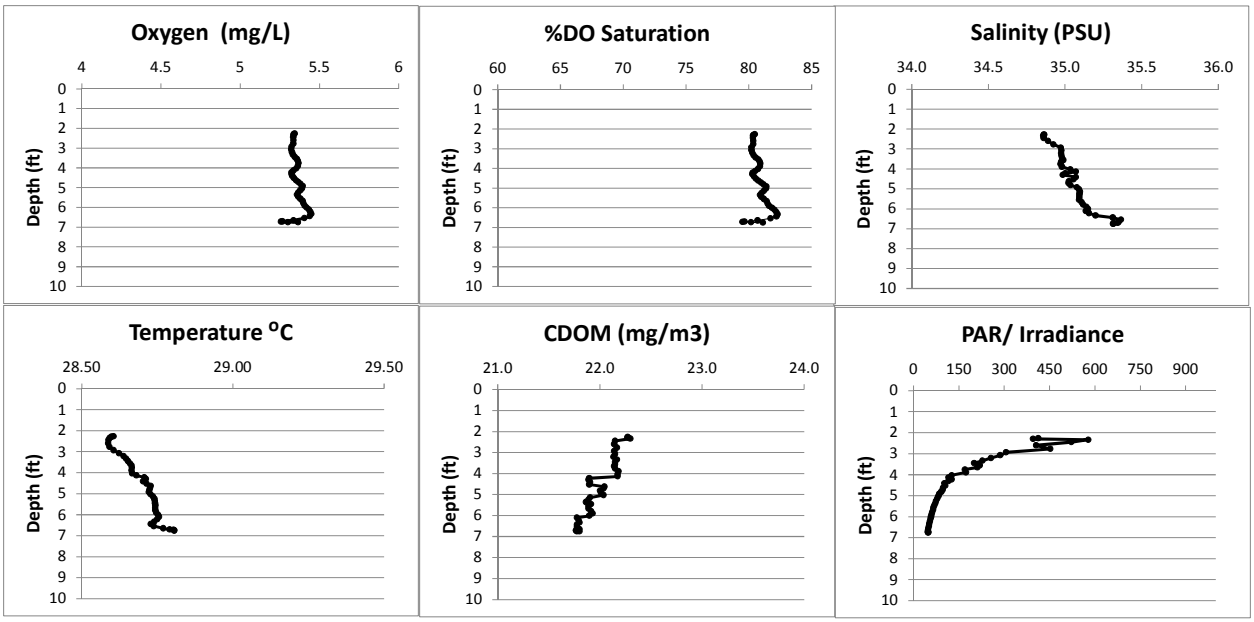


Figure 103. Profile of physicochemical properties of station No. 278C

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values above 80% and within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 35.

Water Temperature remains very stable with values around 29 ^{O}C.

Colored Dissolved Organic Matter remains stable along the profile.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 1.73.

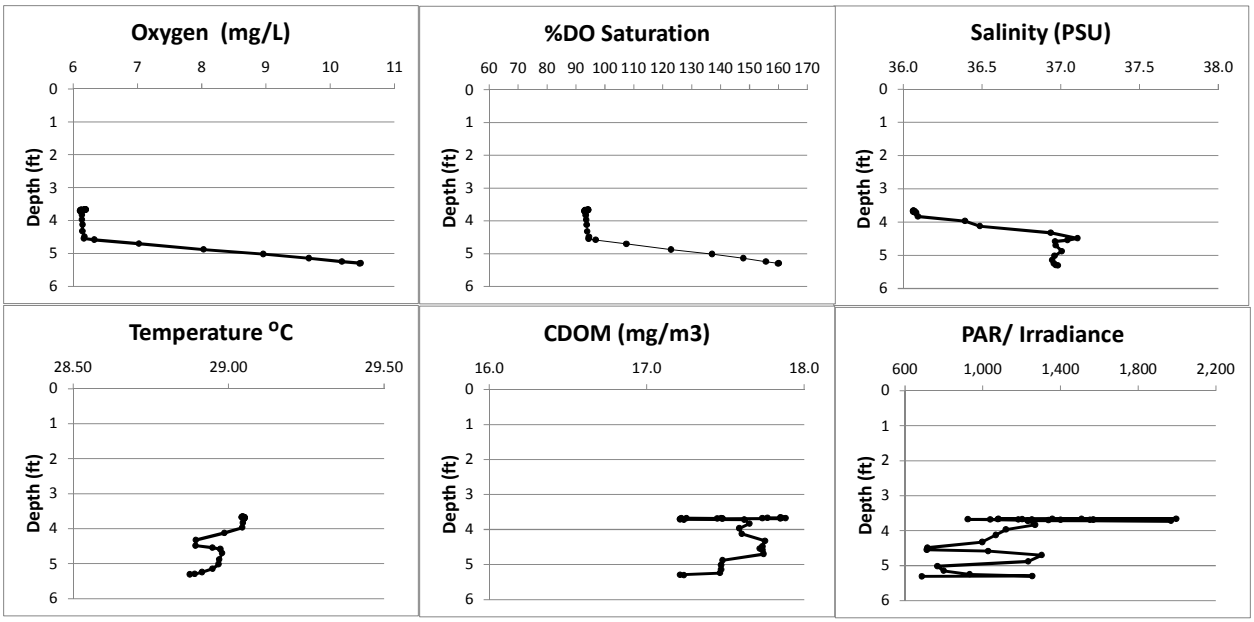


Figure 104. Profile of physicochemical properties of station No. 278D

Dissolved Oxygen and Oxygen saturation show an increasing tendency and water remains well oxygenated with values above 93% and within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values between 36 and 37.

Water Temperature remains very stable with values around 29 ^{O}C.

Colored Dissolved Organic Matter remains stable along the profile.

Photosynthetically Active Radiation varies with water depth and has a vertical attenuation coefficient of 0.87.

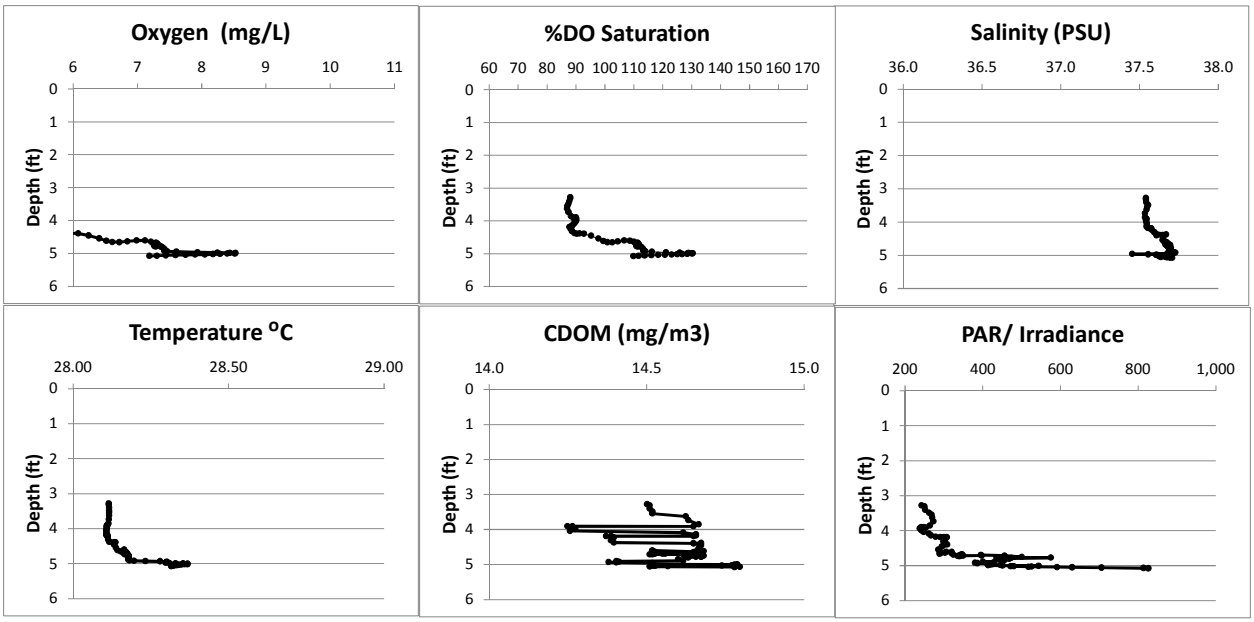


Figure 105. Profile of physicochemical properties of station No. 278E

Dissolved Oxygen and Oxygen saturation show an increasing tendency and water remains well oxygenated with values above 87% and within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values between 37 and 38.

Water Temperature remains very stable with values around 28 ^{O}C.

Colored Dissolved Organic Matter remains stable along the profile.

Photosynthetically Active Radiation varies with water depth and has a vertical attenuation coefficient of 1.64.

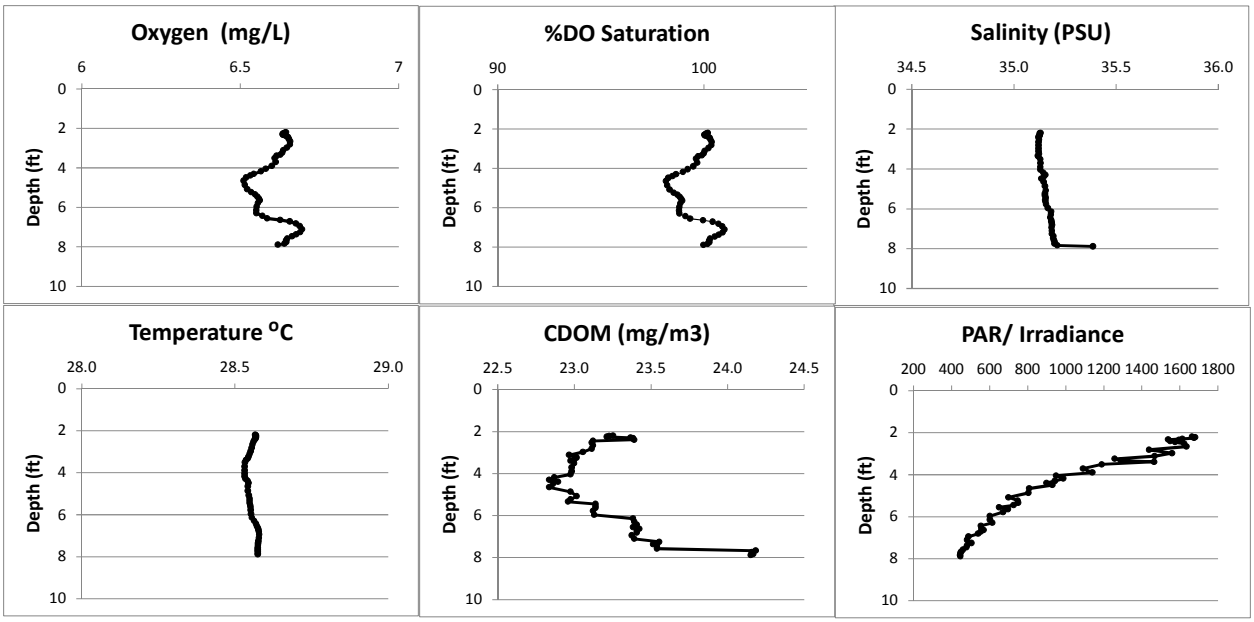


Figure 106. Profile of physicochemical properties of station No. 278F

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 35.

Water Temperature remains very stable with values around 28.5 ^{o}C.

Colored Dissolved Organic Matter remains stable along the profile.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation of 0.81.

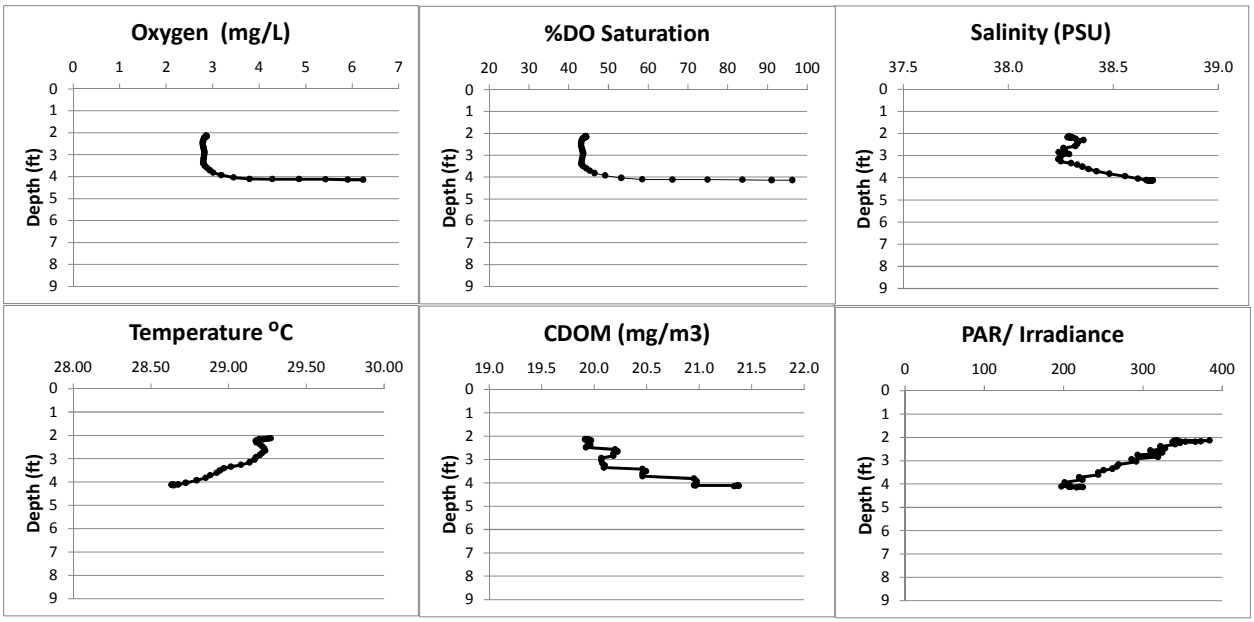


Figure 107. Profile of physicochemical properties of station No. 282A

Dissolved Oxygen and Oxygen saturation show an increasing tendency and water remains within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature remains very stable with values around 29 ^{o}C.

Colored Dissolved Organic Matter remains stable along the profile.

Photosynthetically Active Radiation varies with water depth and has a vertical attenuation coefficient of 0.90.

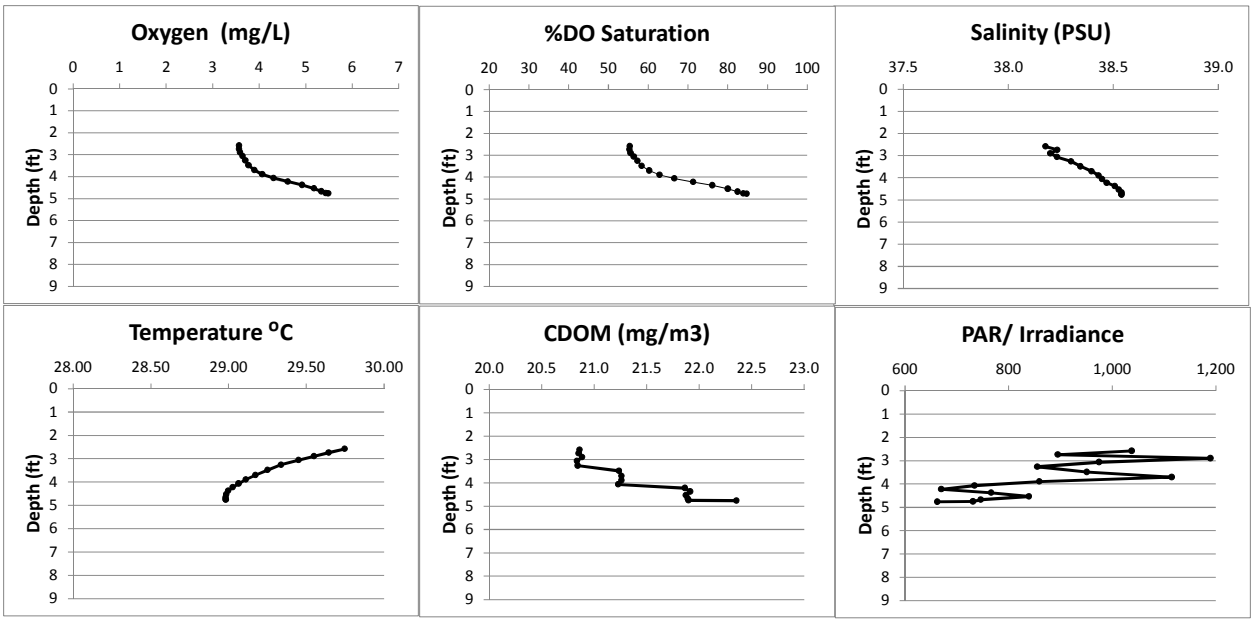


Figure 108. Profile of physicochemical properties of station No. 282B

Dissolved Oxygen and Oxygen saturation show an increasing tendency and water remains within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 38.

Water Temperature remains very stable with values around 29 °C.

Colored Dissolved Organic Matter remains stable along the profile.

Photosynthetically Active Radiation varies with water depth and has a vertical attenuation coefficient of 0.60.

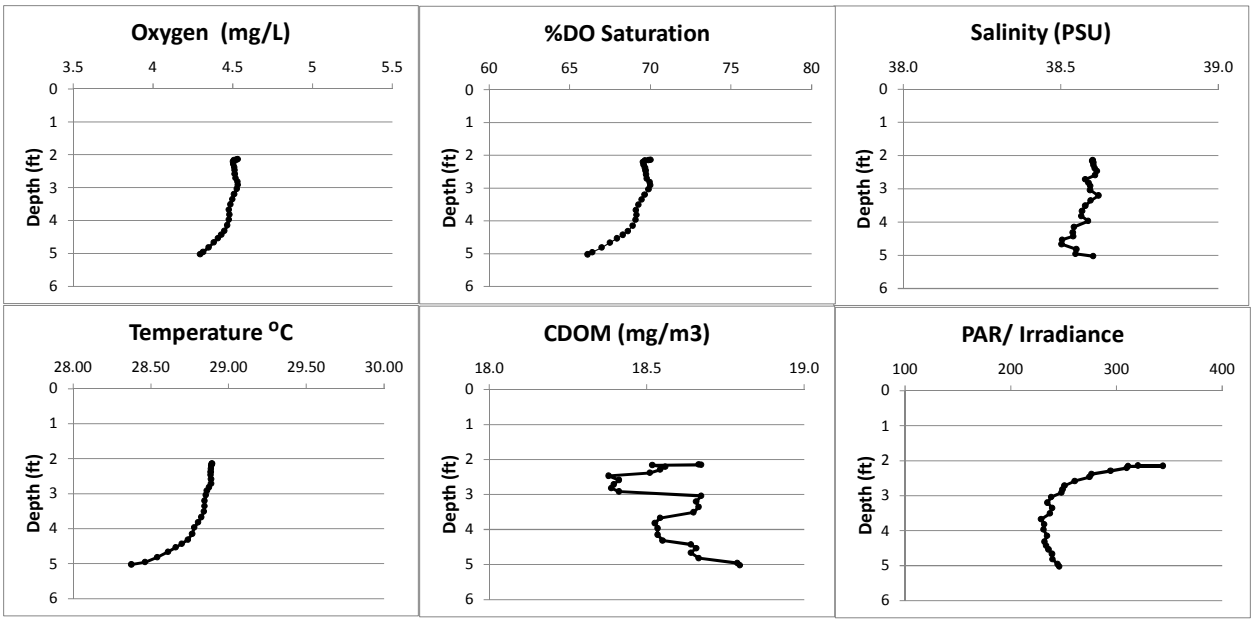


Figure 109. Profile of physicochemical properties of station No. 282C

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 38.5.

Water Temperature remains very stable with values around 29 °C.

Colored Dissolved Organic Matter remains stable along the profile.

Photosynthetically Active Radiation varies with water depth and has a vertical attenuation of 0.29.

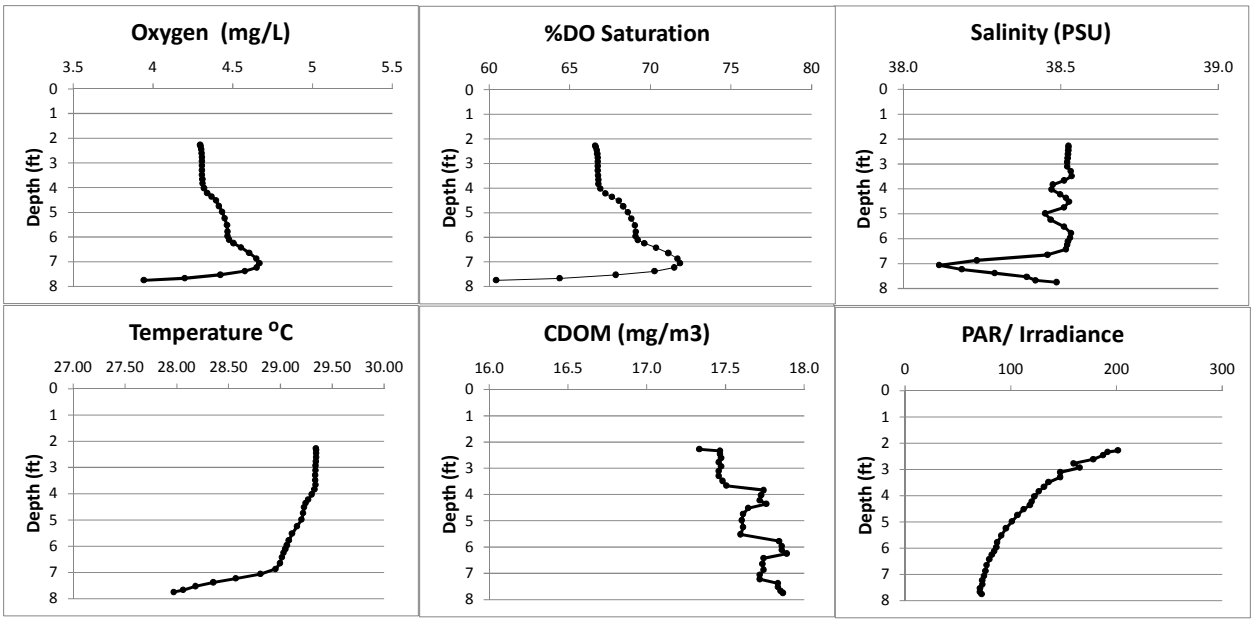


Figure 110. Profile of physicochemical properties of station No. 287A

Dissolved Oxygen and Oxygen saturation show an increasing tendency although water remains well oxygenated with all values above 42% DO Saturation, according to the regulation levels.

Salinity remains very stable with values around 33 and captures a decrease at 7 ft.

Water Temperature drops along the profile with a range of variation of about 1.5 ^{O}C.

Colored Dissolved Organic Matter remains stable along the profile.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.61.

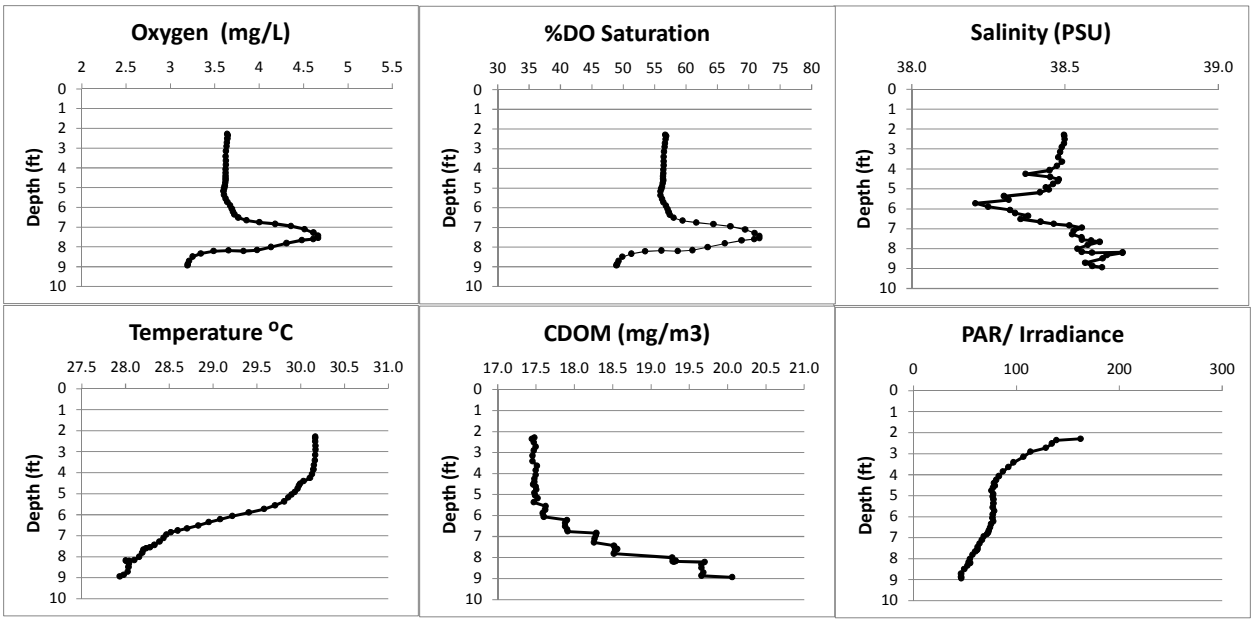


Figure 111. Profile of physicochemical properties of station No. 287B

Dissolved Oxygen and Oxygen saturation show an increasing tendency after 6.5 ft and water remains well oxygenated with all values above 42% DO Saturation, according to the regulation levels.

Salinity remains very stable with values around 38.5 and captures a slight decrease around 6 ft.

Water Temperature drops along the profile with a range of variation of about 2 °C.

Colored Dissolved Organic Matter increases along the profile.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.45.

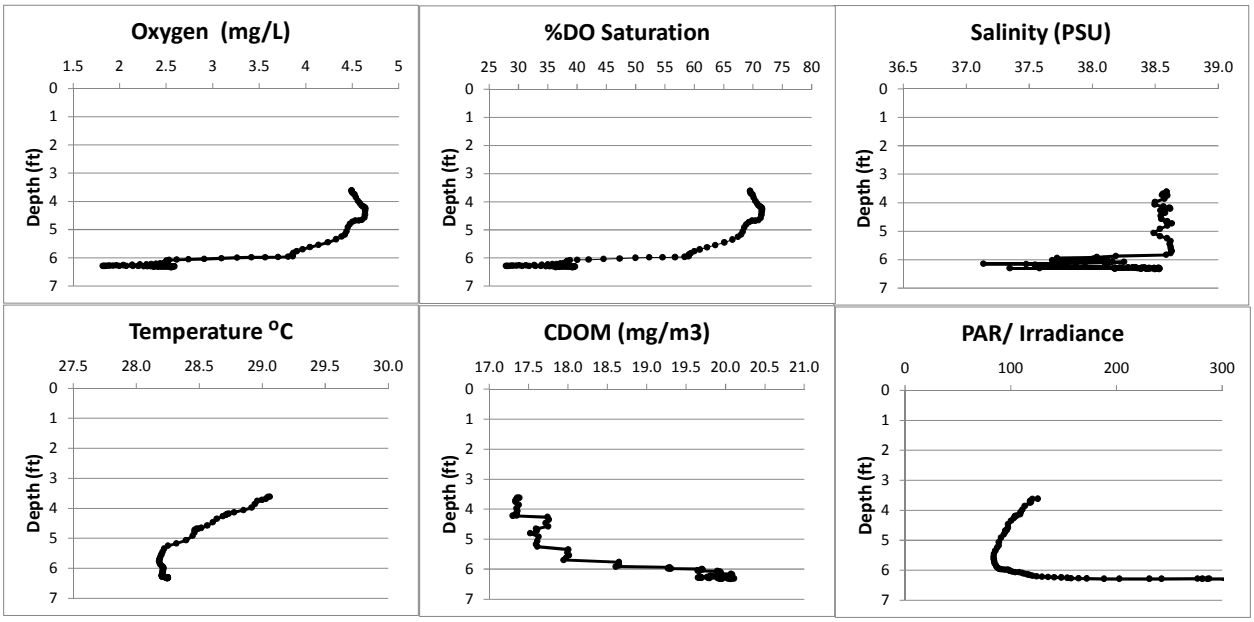


Figure 112. Profile of physicochemical properties of station No. 287C

Dissolved Oxygen and Oxygen saturation show a decreasing tendency downward and values DO concentration within a wide range, some of them exceeding the regulation levels. %DO saturation exceedances reached 38% (values below 42% DO Saturation).

Salinity remains stable with values between 38 and 39.

Water Temperature drops along the profile with a range of variation of about 1 °C.

Colored Dissolved Organic Matter remains very stable.

Photosynthetically Active Radiation varies with water depth without any trend.

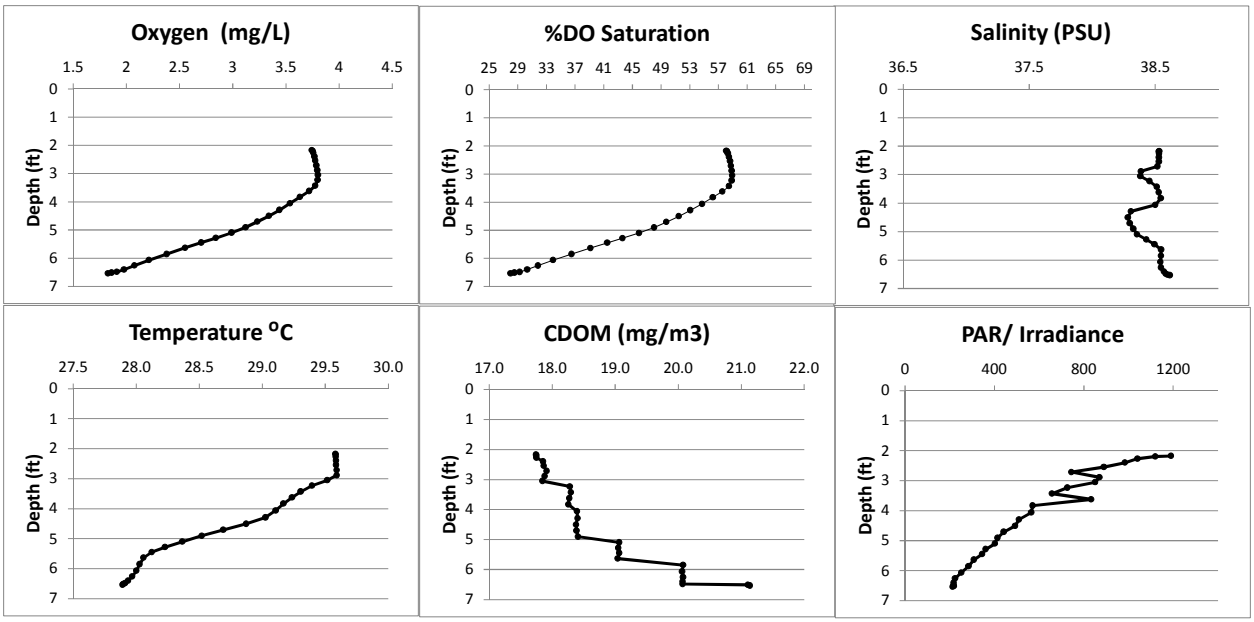


Figure 113. Profile of physicochemical properties of station No. 290A

Dissolved Oxygen and Oxygen saturation show a decreasing tendency downward and values DO concentration within a wide range, some of them exceeding the regulation levels (values below 42% DO Saturation).

Salinity remains stable with values around 38.5.

Water Temperature drops along the profile with a range of variation of about 1.7 ^{o}C.

Colored Dissolved Organic Matter increases along the profile.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.22.

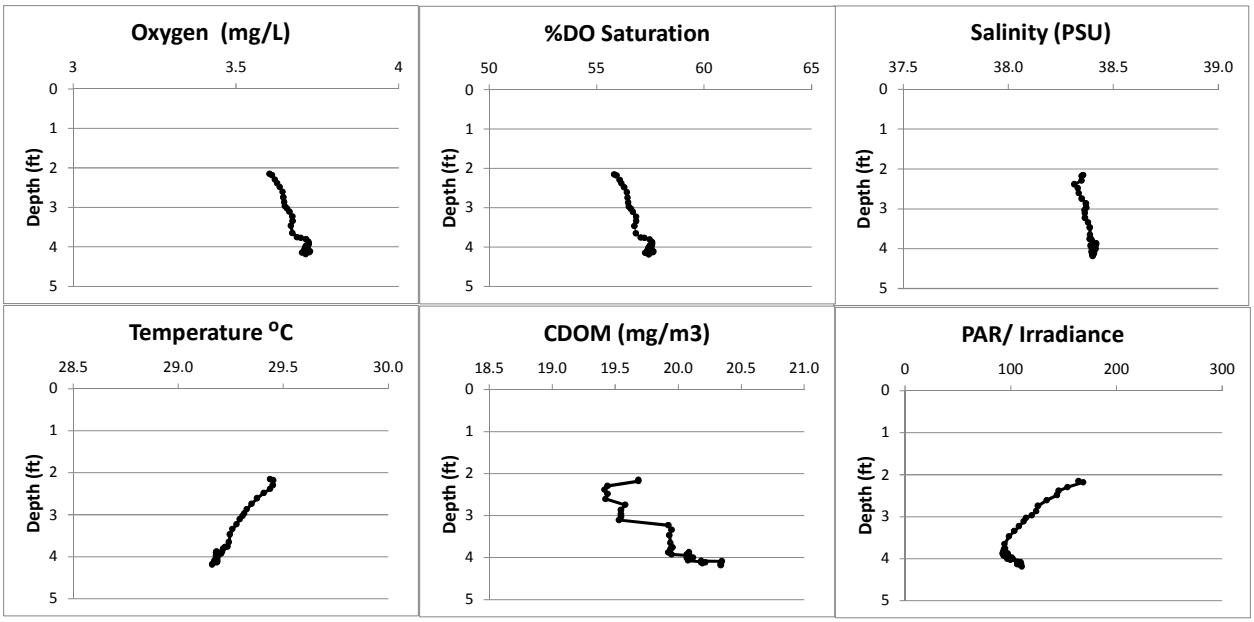


Figure 114. Profile of physicochemical properties of station No. 290B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values within the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 38.5.

Water Temperature remains very stable with values around 29 °C.

Colored Dissolved Organic Matter remains stable throughout the profile.

Photosynthetically Active Radiation varies with water depth and has a vertical attenuation of 0.71.

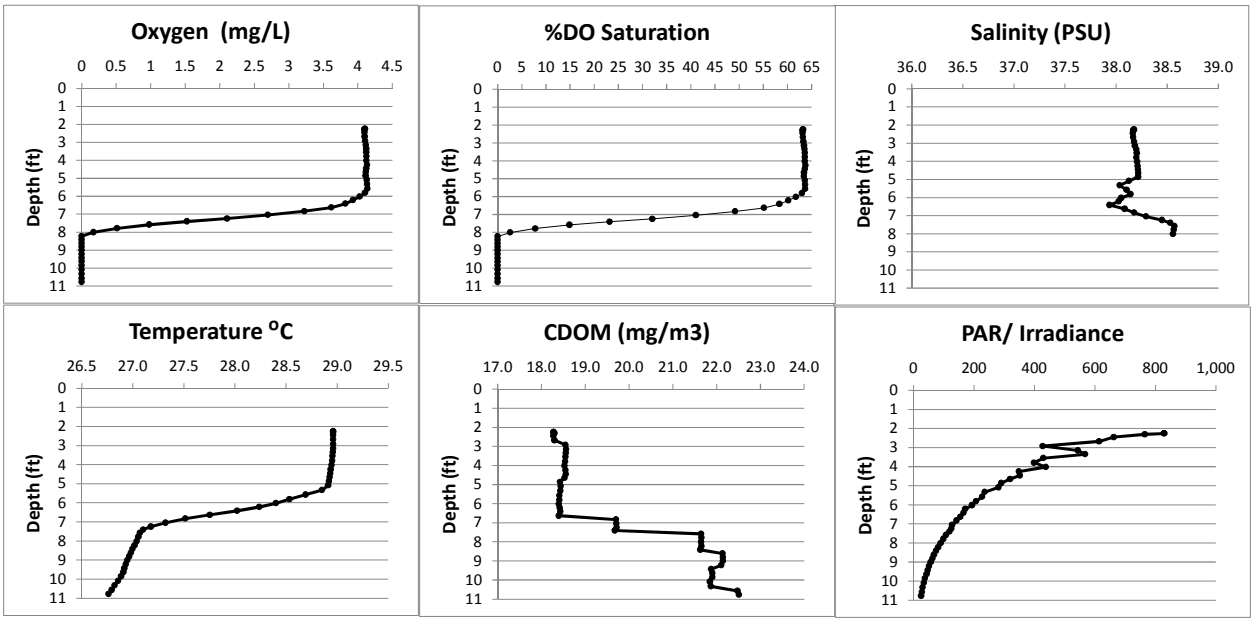


Figure 115. Profile of physicochemical properties of station No. 293A

Dissolved Oxygen and Oxygen saturation show a decreasing tendency downward and values DO concentration within a wide range, some of them exceeding the regulation levels (values below 42% DO Saturation).

Salinity remains stable with values around 38.

Water Temperature drops along the profile with a range of variation of about 2 °C.

Colored Dissolved Organic Matter increases along the profile.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 1.28.

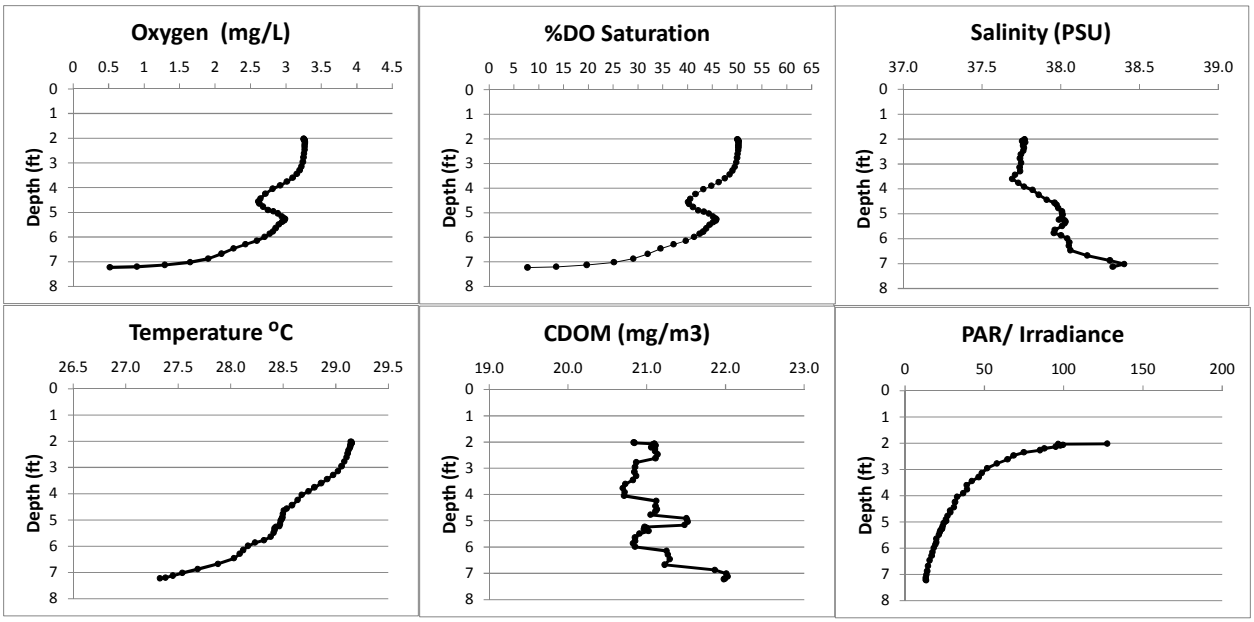


Figure 116. Profile of physicochemical properties of station No. 293B

Dissolved Oxygen and Oxygen saturation show a decreasing tendency downward and values DO concentration within a wide range, some of them exceeding the regulation levels (values below 42% DO Saturation).

Salinity remains stable with values around 38.

Water Temperature drops along the profile with a range of variation of about 2 ^{o}C.

Colored Dissolved Organic Matter remains very stable along the profile.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 1.29.

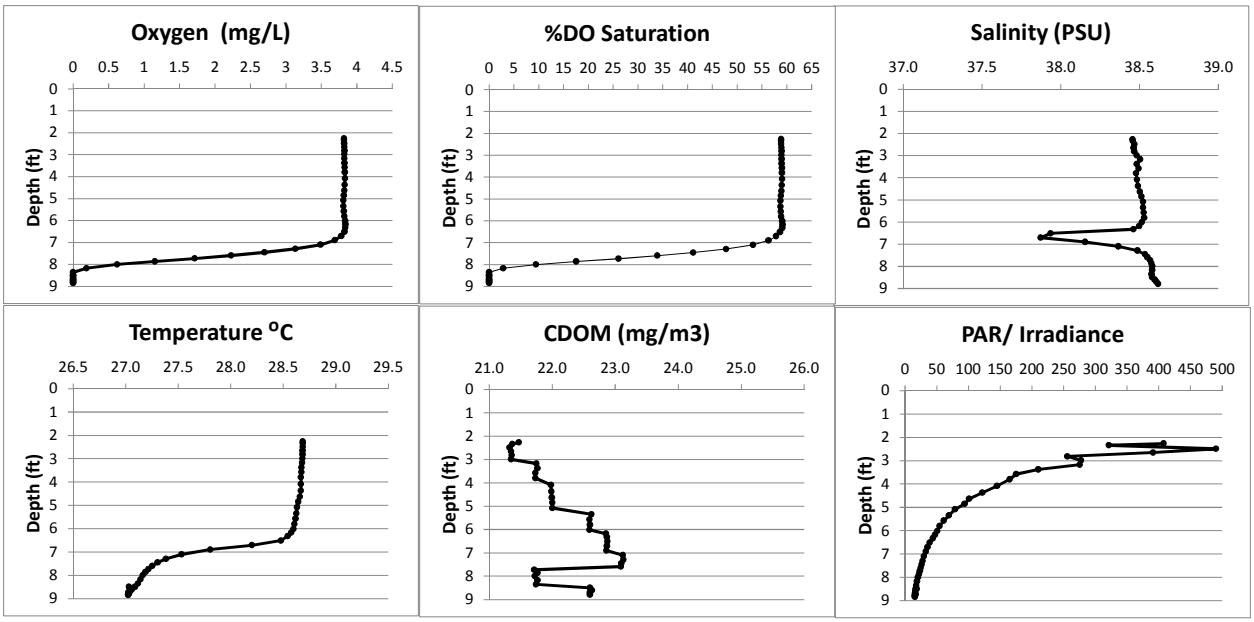


Figure 117. Profile of physicochemical properties of station No. 293C

Dissolved Oxygen and Oxygen saturation show a decreasing tendency downward and values DO concentration within a wide range, some of them exceeding the regulation levels (values below 42% DO Saturation).

Salinity remains stable with values around 38.

Water Temperature drops along the profile with a range of variation of about 1.7 ^{O}C.

Colored Dissolved Organic Matter remains very stable throughout the profile.

Photosynthetically Active Radiation exponentially decreases with water depth with some oscillations and has a vertical attenuation coefficient of 1.65.

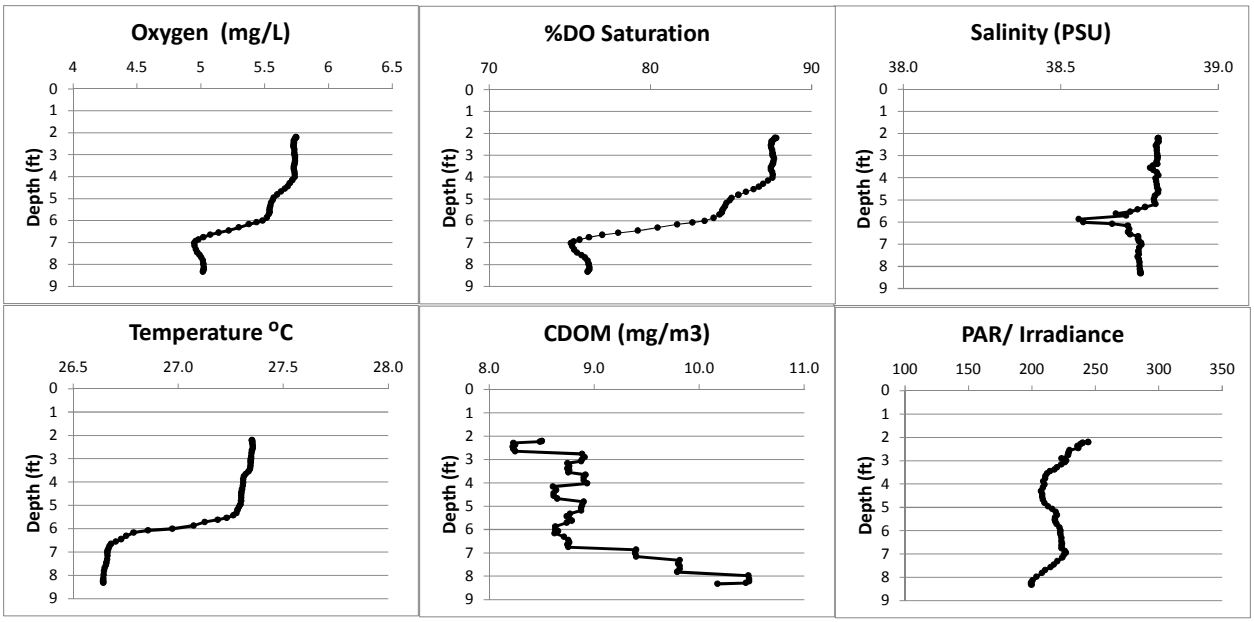


Figure 118. Profile of physicochemical properties of station No. 458A

Dissolved Oxygen and Oxygen saturation show a decreasing tendency downward and water remains well oxygenated with values within the regulation levels (all values above 42% DO Saturation).

Salinity remains stable with values around 38.

Water Temperature drops along the profile with a range of variation of about 1 °C.

Colored Dissolved Organic Matter increases along the profile.

Photosynthetically Active Radiation slightly varies along the profile.

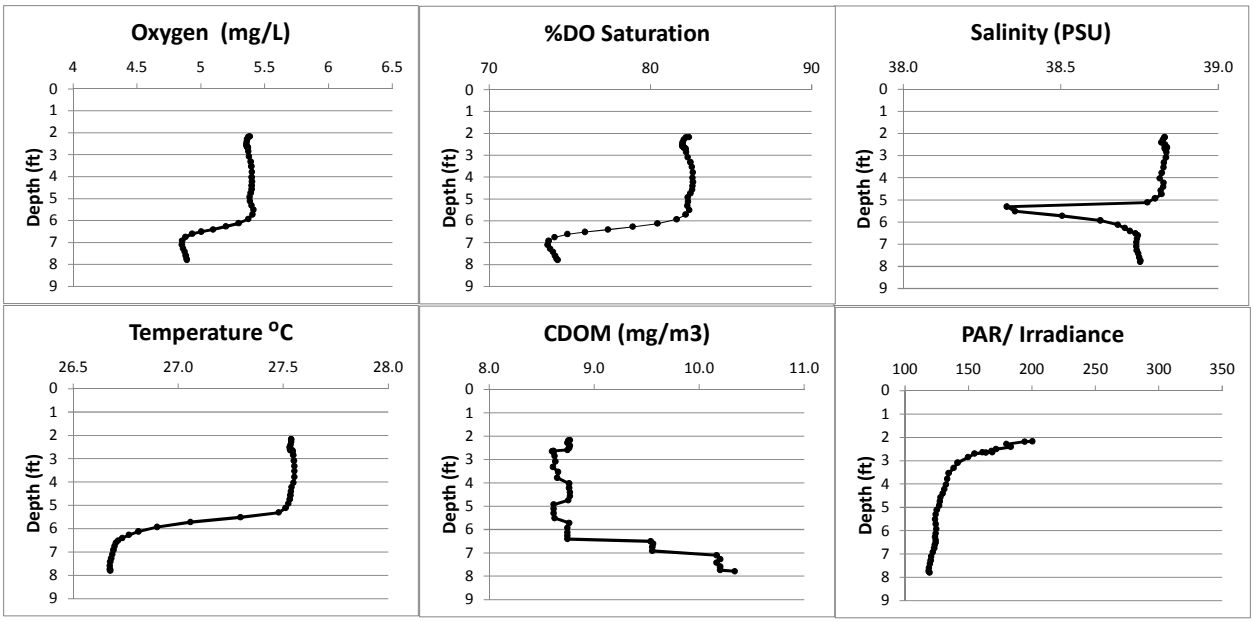


Figure 119. Profile of physicochemical properties of station No. 458B

Dissolved Oxygen and Oxygen saturation show a decreasing tendency downward and water remains well oxygenated with values within the regulation levels (all values above 42% DO Saturation).

Salinity remains stable with values around 38.

Water Temperature drops along the profile with a range of variation of about 1 °C.

Colored Dissolved Organic Matter remains stable throughout the profile.

Photosynthetically Active Radiation varies with water depth and has a vertical attenuation of 0.23.

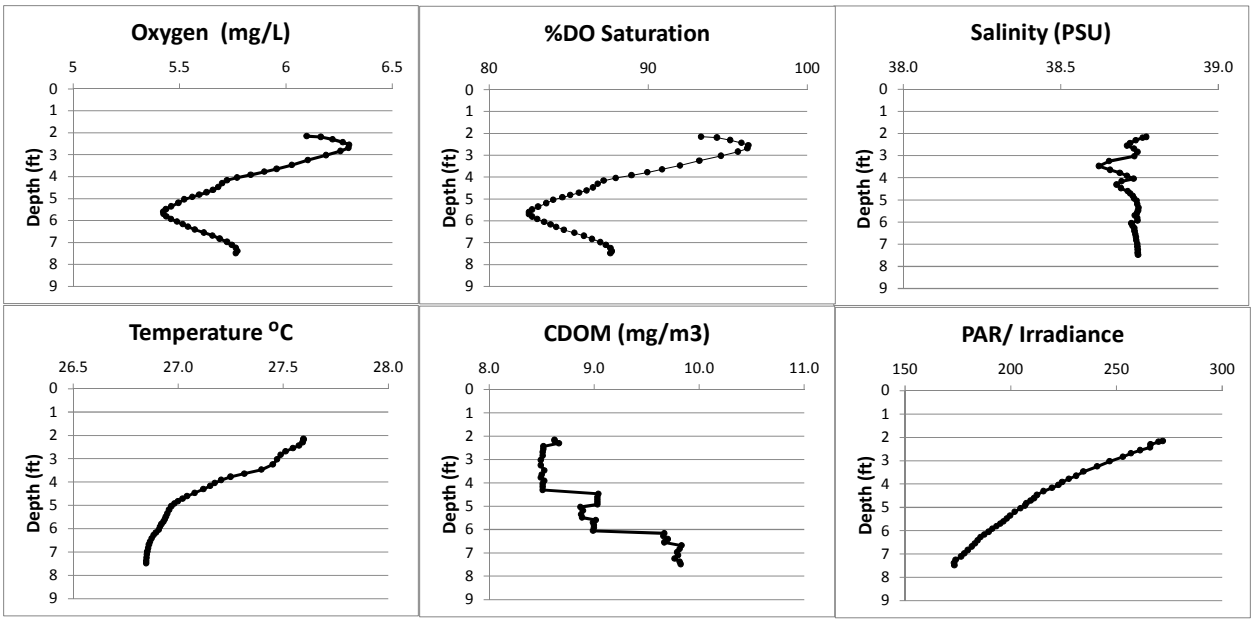


Figure 120. Profile of physicochemical properties of station No. 459A

Dissolved Oxygen and Oxygen saturation show a decreasing tendency downward and water remains well oxygenated with values within the regulation levels (all values above 42% DO Saturation).

Salinity remains stable with values around 38.5.

Water Temperature drops along the profile with a range of variation of about 1 °C.

Colored Dissolved Organic Matter remains stable throughout the profile.

Photosynthetically Active Radiation varies with water depth and has a vertical attenuation of 0.28.

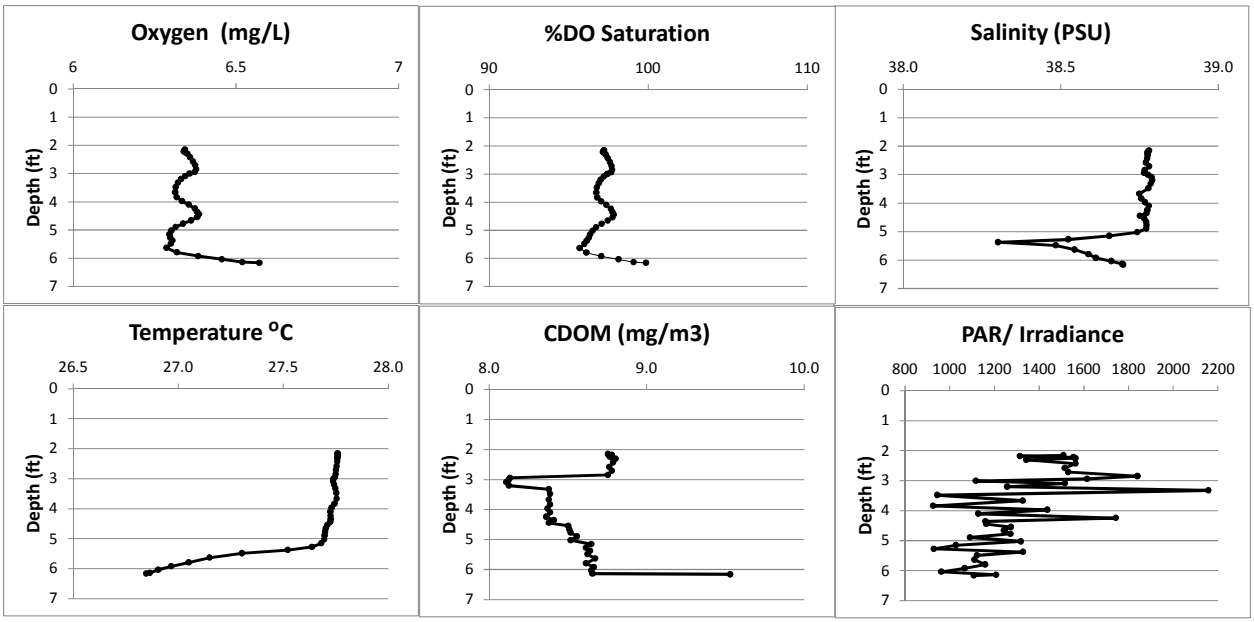


Figure 121. Profile of physicochemical properties of station No. 459B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values within the regulation levels (all values above 42% DO Saturation).

Salinity remains stable with values between 38 and 39.

Water Temperature drops throughout the profile with a range of variation of about 1 °C.

Colored Dissolved Organic Matter remains stable throughout the profile.

Photosynthetically Active Radiation varies with water depth with some oscillations and has a vertical attenuation of 0.29.

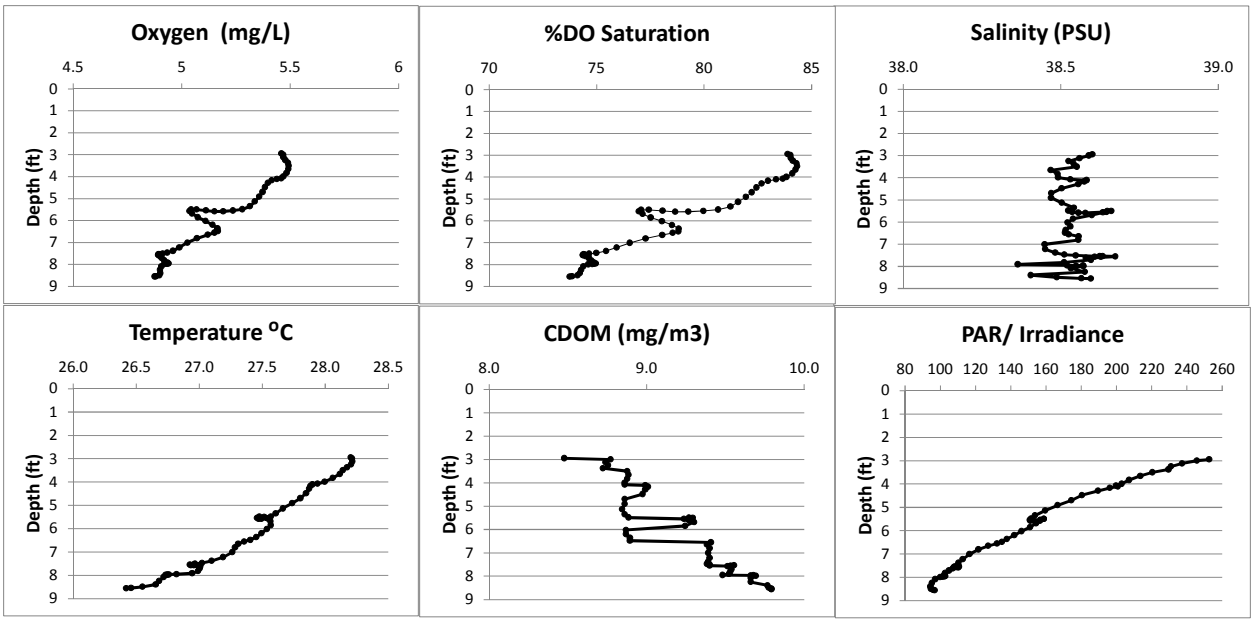


Figure 122. Profile of physicochemical properties of station No. 472A

Dissolved Oxygen and Oxygen saturation show a steady decline although water remains well oxygenated with all values above 42% DO Saturation, according to the regulation levels.

Salinity remains very stable with values around 38.5.

Water Temperature drops along the profile with a range of variation of about 1.5 °C.

Colored Dissolved Organic Matter remains very stable.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.57.

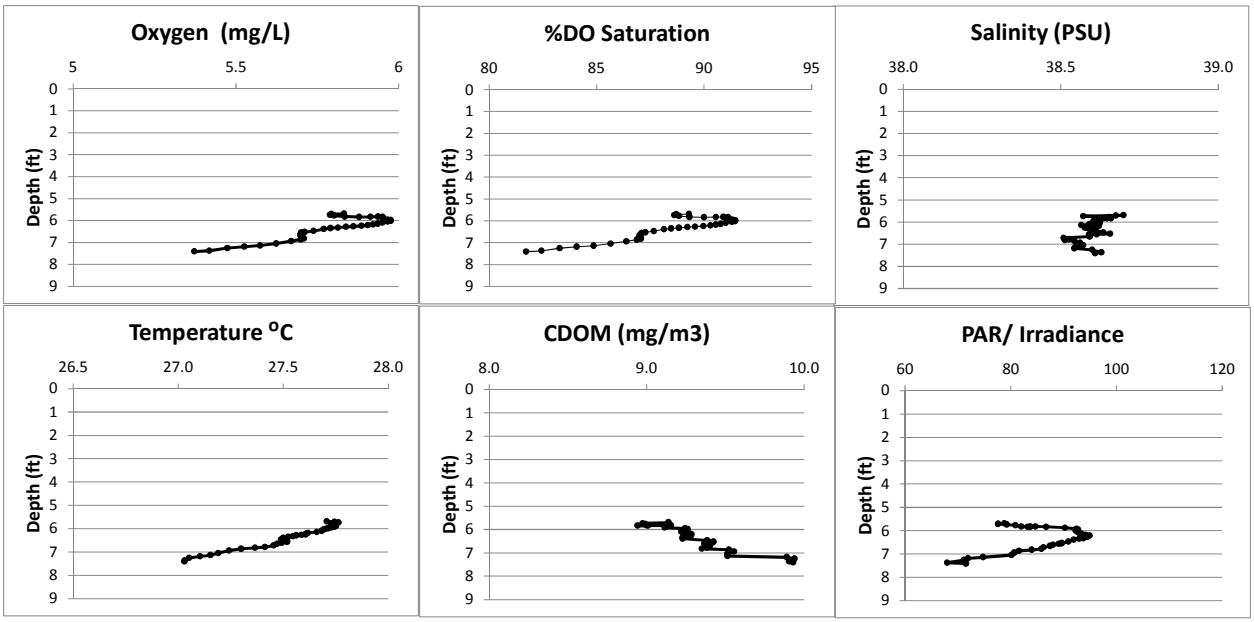


Figure 122. Profile of physicochemical properties of station No. 472B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with values between 70 and 80% and within the regulation levels.

Salinity remains very stable with values around 38.5.

Water Temperature remains very stable.

Colored Dissolved Organic Matter remains very stable.

Photosynthetically Active Radiation varies with water depth without any trend.

FKC02

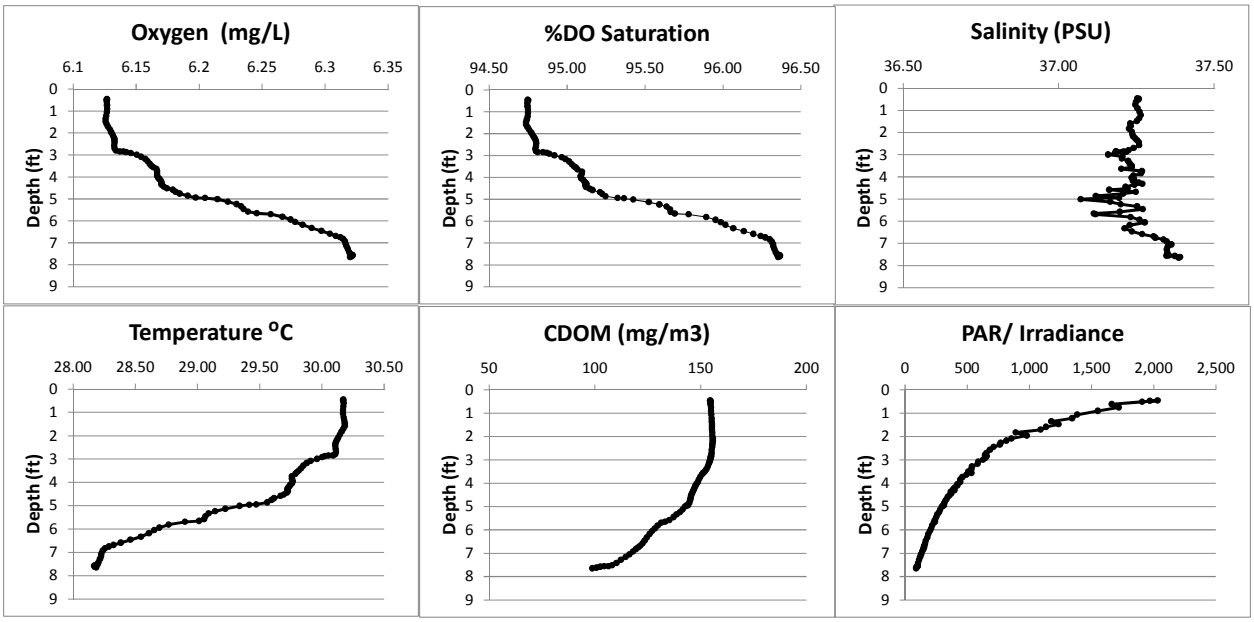


Figure 123. Profile of physicochemical properties of station No. 266C

Dissolved Oxygen and Oxygen saturation do not change significantly and readings are around 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature drops along the profile with a range of variation of about 2 ^{O}C.

Colored Dissolved Organic Matter slightly decreases downward from 156 to 99 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 1.30.

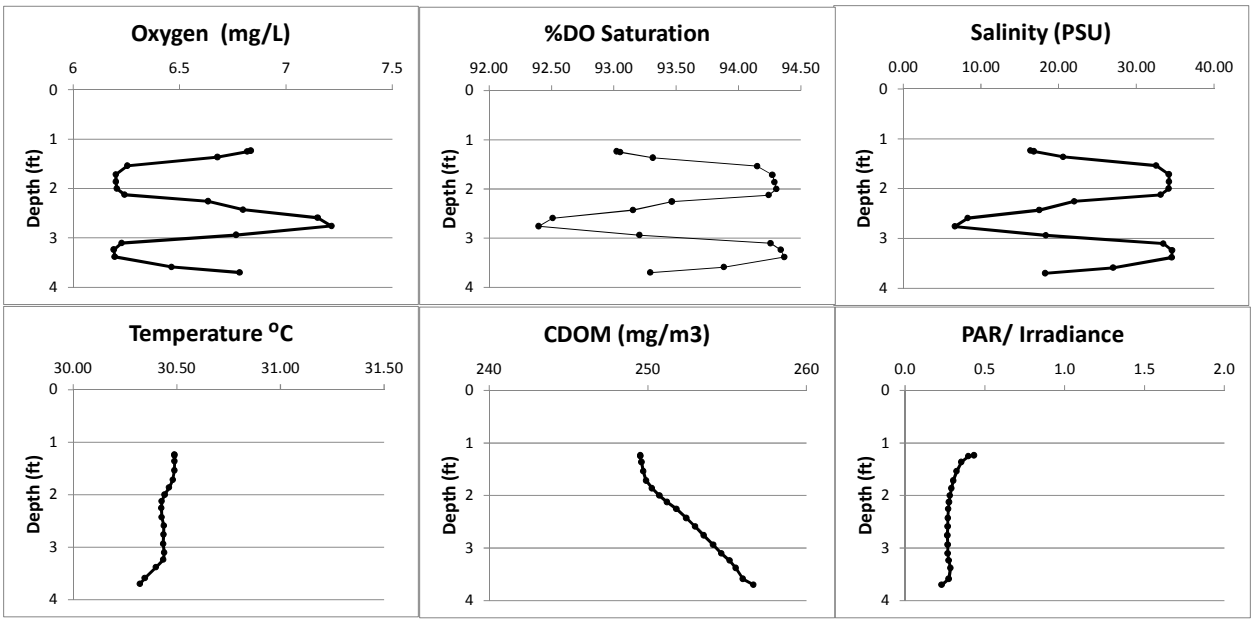


Figure 124. Profile of physicochemical properties of station No. 266B

Dissolved Oxygen and Oxygen saturation are practically constant. Given the sensitivity of the sensors it is possible to observe some oscillation along the profile but the change is of only 2%. All values are above 42% DO Saturation, without exceeding the regulation levels.

Salinity remains very stable with values around 30.

Water Temperature remains very stable with values around 30°C.

Colored Dissolved Organic Matter remains stable with an average value of 252 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.50.

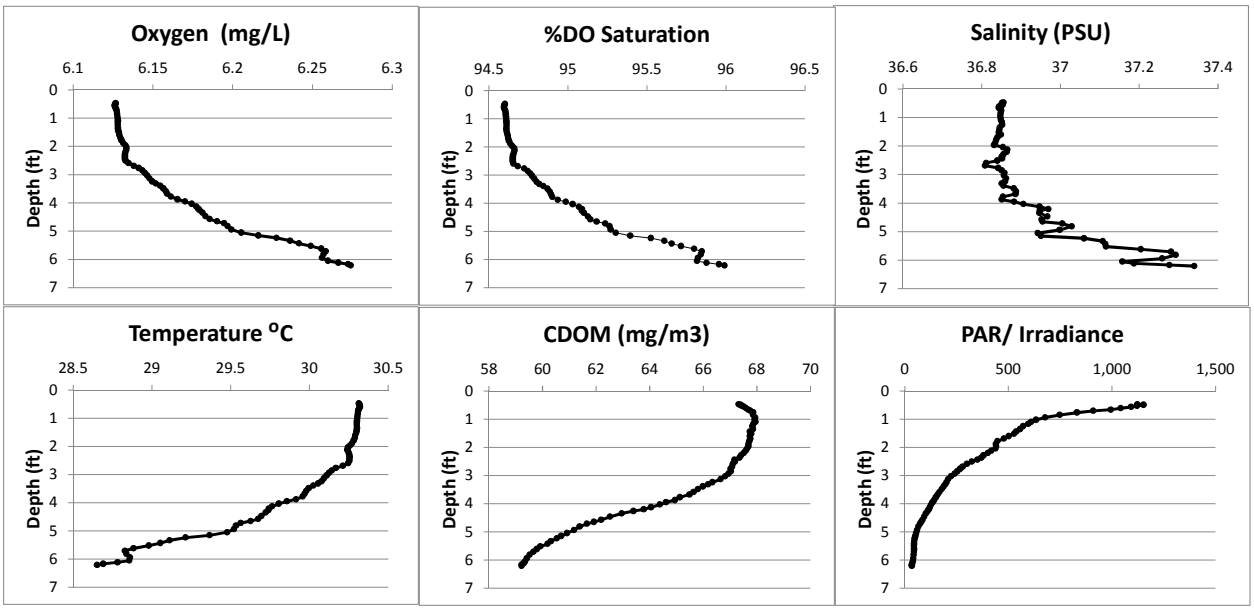


Figure 125. Profile of physicochemical properties of station No. 266A

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y remains stable around 37.

Water Temperature drops along the profile with a range of variation of about 1.7 ^{o}C.

Colored Dissolved Organic Matter does not change significantly and values oscillate around 65 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 2.00.

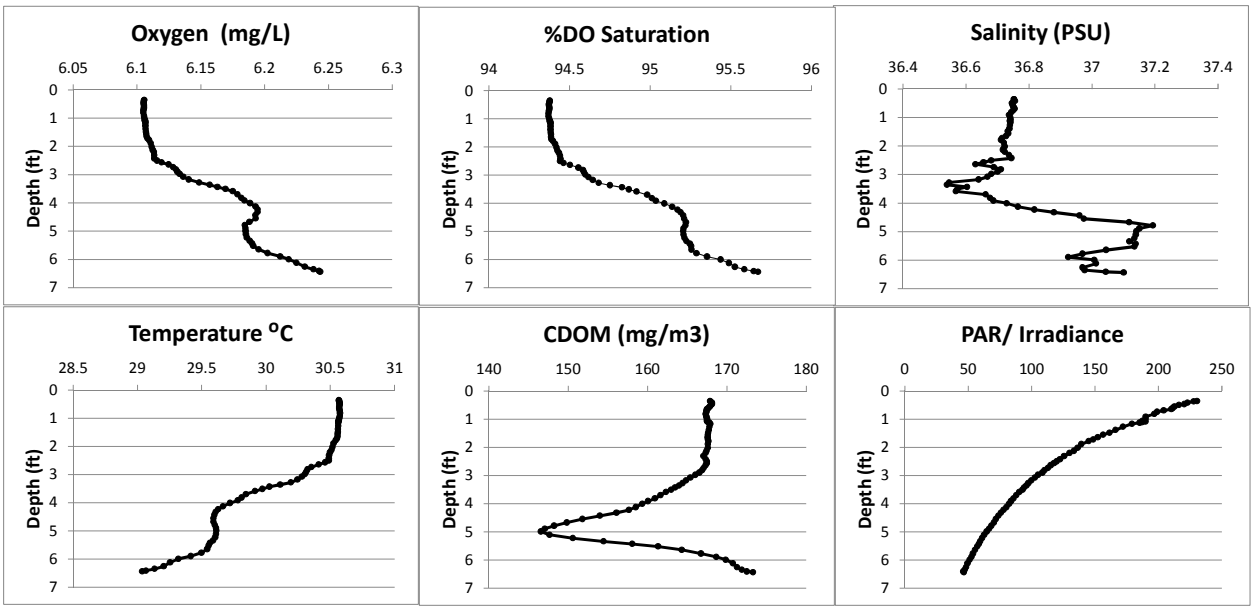


Figure 126. Profile of physicochemical properties of station No. 277A

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 94%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y remains very stable around 37.

Water Temperature drops along the profile with a range of variation of about 1.5 ^{o}C.

Colored Dissolved Organic Matter decreases with water depth from 168 to 147 mg m^{-3}at about 5ft when an increment is observed.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 0.86.

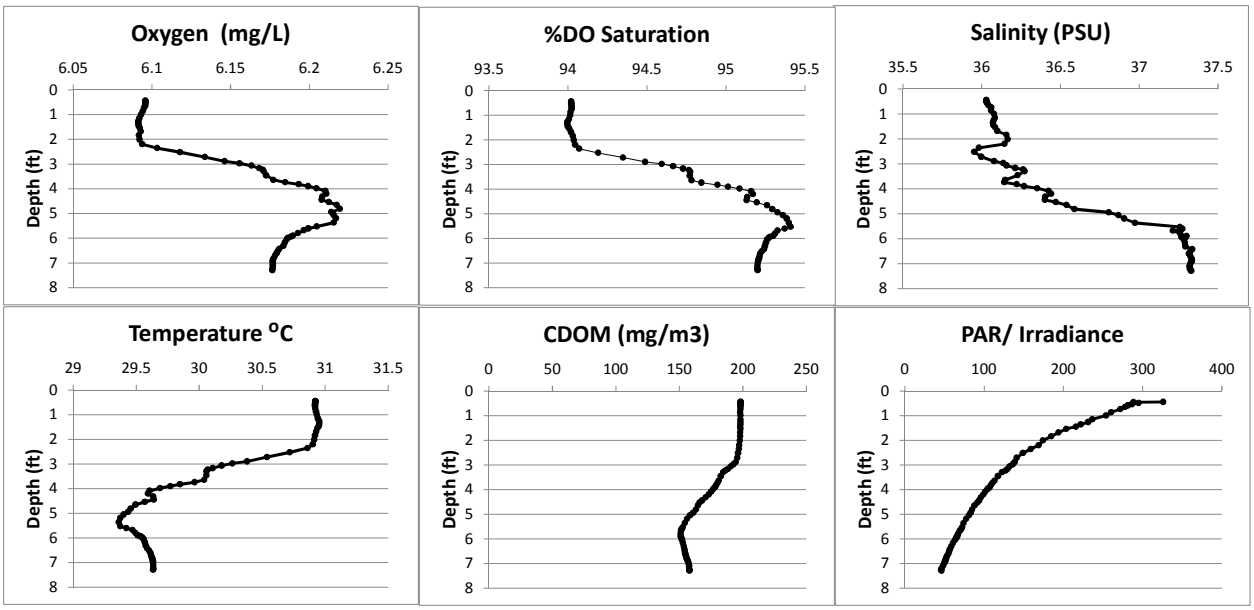


Figure 127. Profile of physicochemical properties of station No. 277C

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y remains very stable around 37.

Water Temperature drops along the profile with a range of variation of about 1.5 ^{o}C.

Colored Dissolved Organic Matter slightly decreases from 198 to 151 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 0.88.

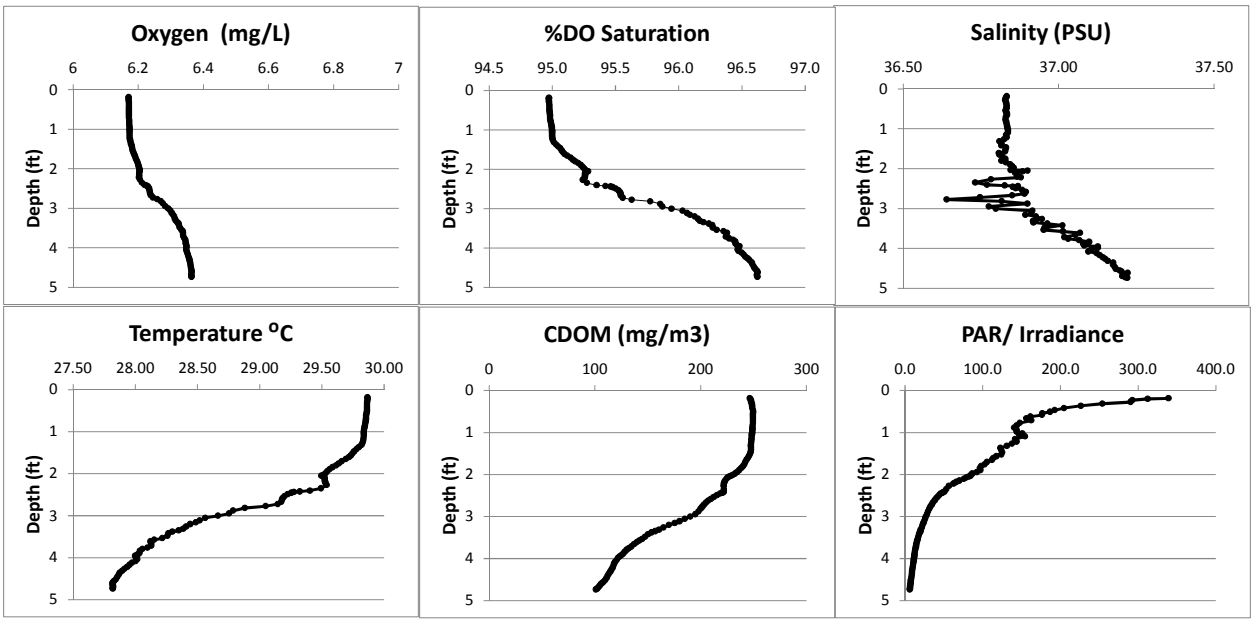


Figure 128. Profile of physicochemical properties of station No. 277B

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 96%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y remains stable around 37.

Water Temperature drops along the profile with a range of variation of about 3.5 ^{o}C.

Colored Dissolved Organic Matter slightly decreases with water depth from 258 to 101 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth with some oscillations and has a vertical attenuation coefficient of 0.85.

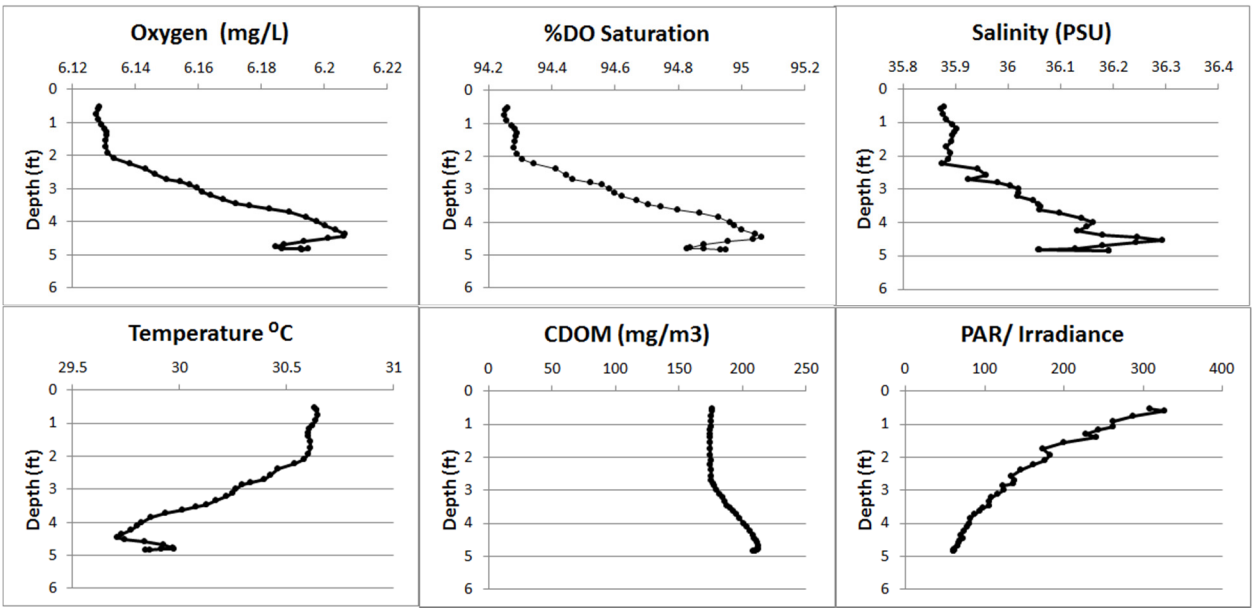


Figure 129. Profile of physicochemical properties of station No. 282C

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y remains stable around 36.

Water Temperature y remains stable with a slight drop along the profile within a range of variation of less than 1 ^{o}C.

Colored Dissolved Organic Matter slightly increases with water depth from 174 to 213 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth with some oscillations and has a vertical attenuation coefficient of 1.24.

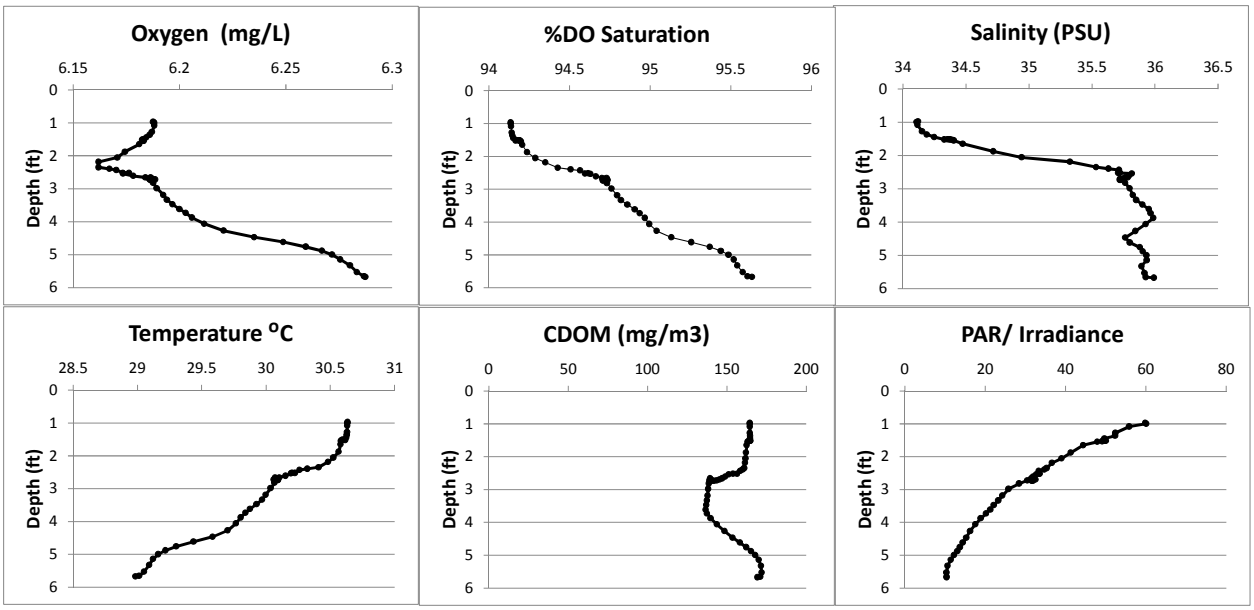


Figure 130. Profile of physicochemical properties of station No. 282A

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y remains stable around 35.

Water Temperature y remains stable with a slight drop along the profile within a range of variation of 1.7 ^{o}C.

Colored Dissolved Organic Matter remains stable around 155 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.28.

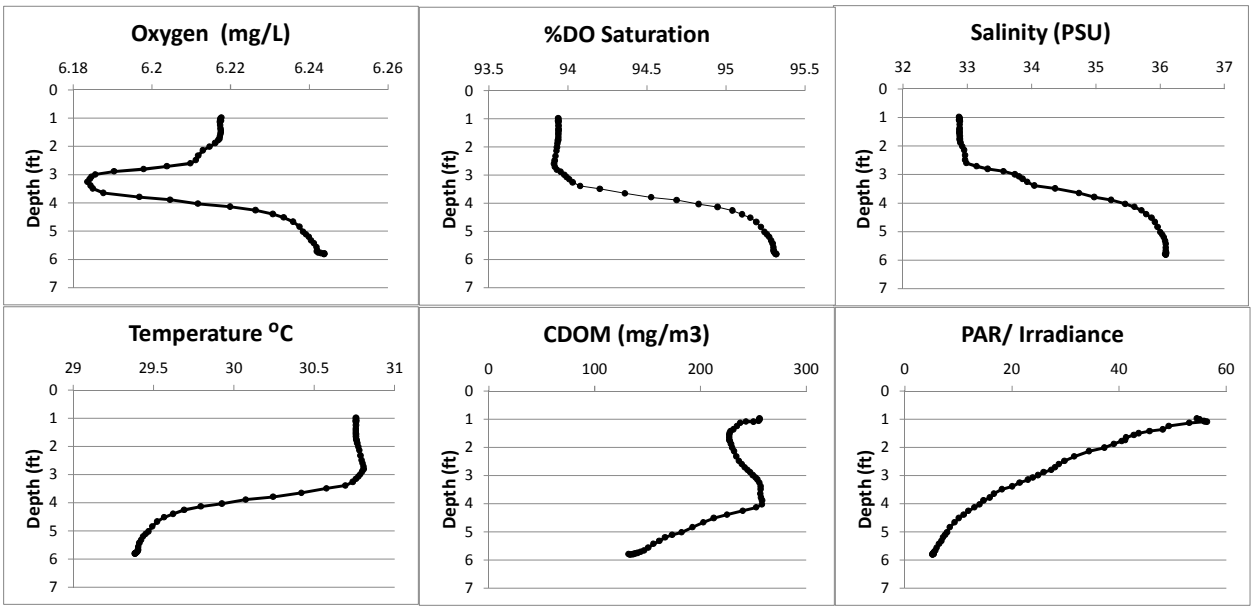


Figure 131. Profile of physicochemical properties of station No. 282B

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 94%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y remains very stable around 34.

Water Temperature drops along the profile with a range of variation of about 1.4 ^{o}C.

Colored Dissolved Organic Matter oscillates until about 4 ft depth, then decreases with water depth from 258 to 132 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 1.64.

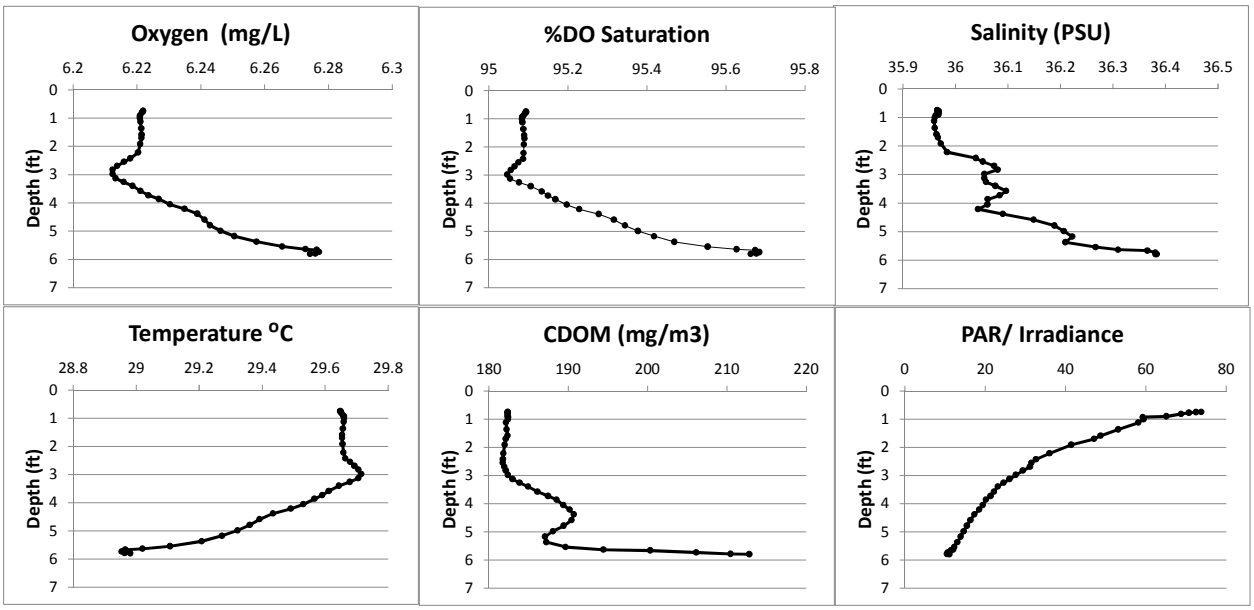


Figure 132. Profile of physicochemical properties of station No. 287C

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y remains very stable around 36 PSU.

Water Temperature remains very stable around 29 ^{o}C.

Colored Dissolved Organic Matter slightly increases with water depth from 148 to 182 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 1.19.

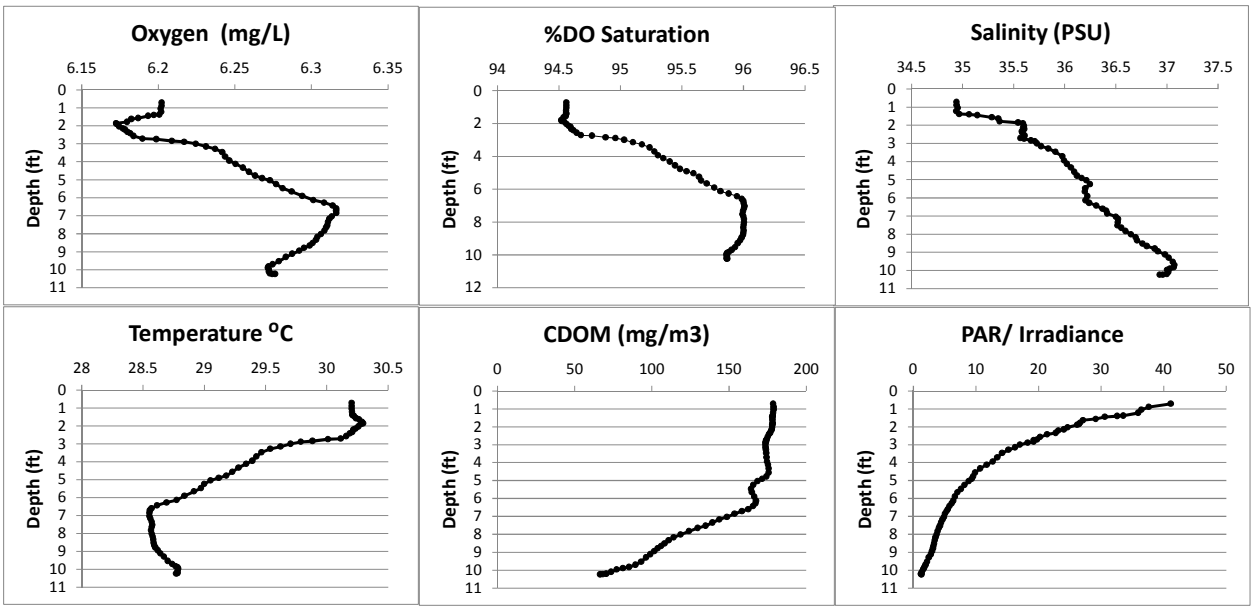


Figure 133. Profile of physicochemical properties of station No. 287A

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y slightly increases along the profile with values up to 37 at the bottom.

Water Temperature drops along the profile with a range of variation of about 1.7 ^{o}C.

Colored Dissolved Organic Matter decreases with water depth from 66 to 179 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 1.09.

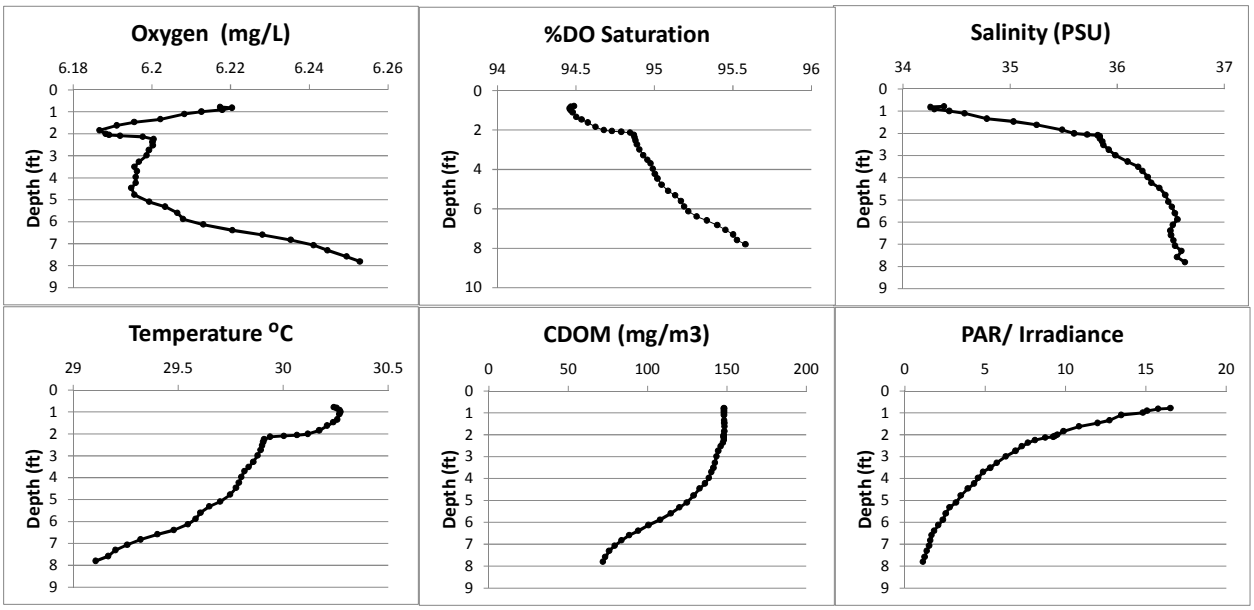


Figure 134. Profile of physicochemical properties of station No. 287B

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y shows an increasing tendency with a change of 2.4 PSU.

Water Temperature shows a decreasing tendency with a range of variation of about 1.2 ^{o}C.

Colored Dissolved Organic Matter decreases with water depth from 72 to 148 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 1.22.

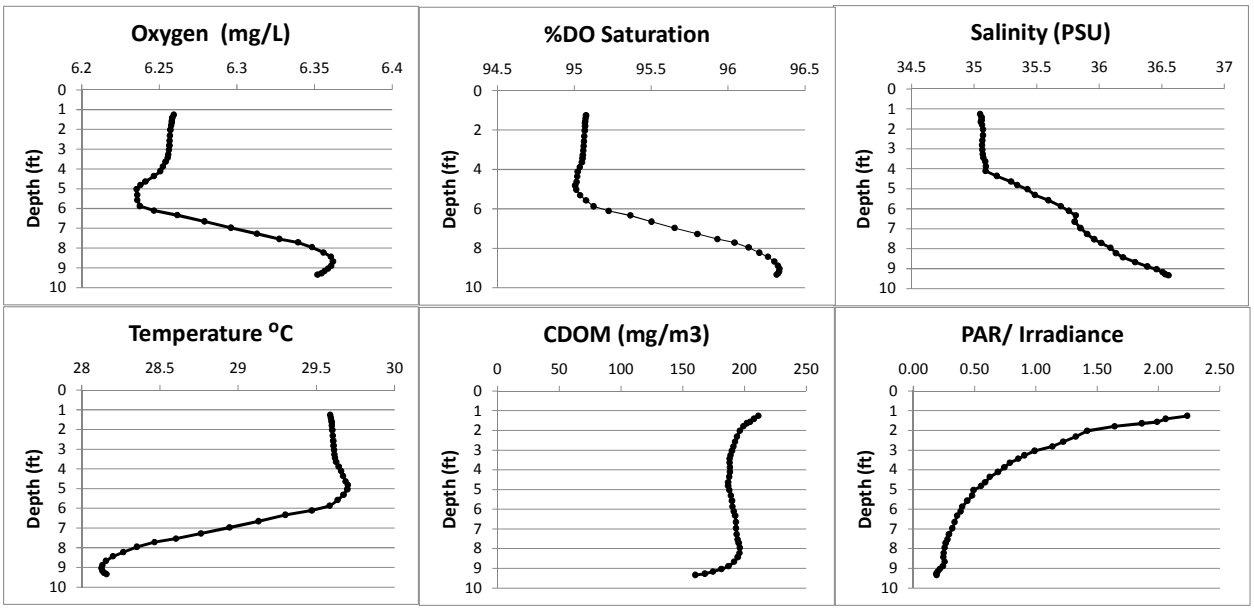


Figure 135. Profile of physicochemical properties of station No. 293C

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 96%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 36.

Water Temperature remains stable up approximately 5 ft then drops along the profile with a range of variation of about 1.6 ^{o}C.

Colored Dissolved Organic Matter drops slightly from 211 to 160 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.94.

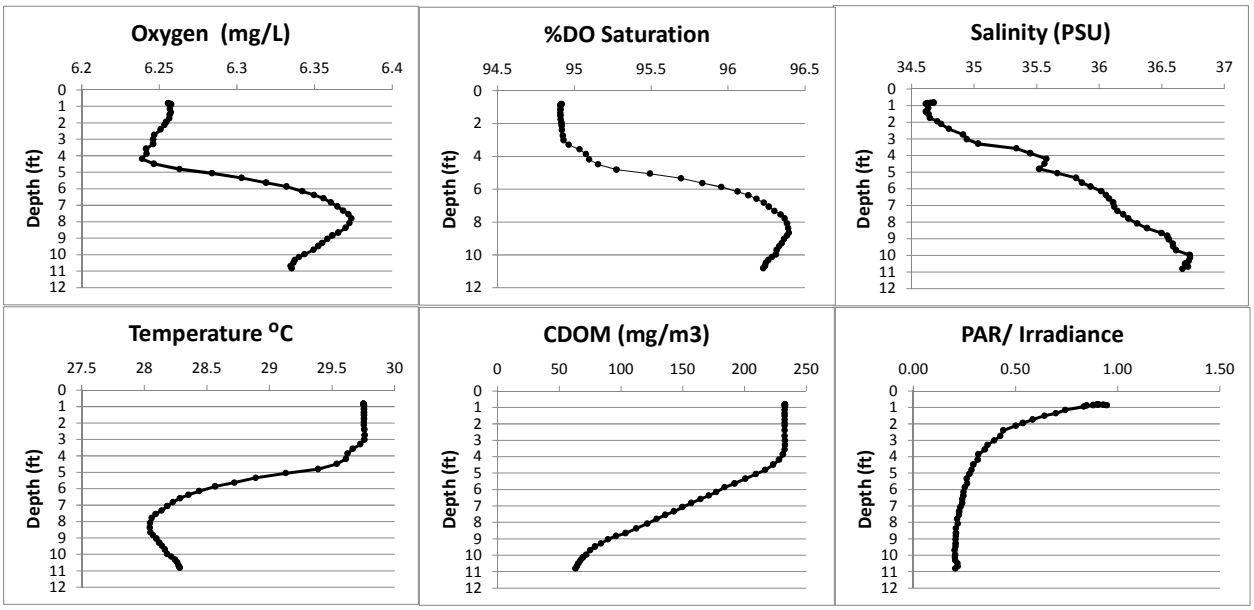


Figure 136. Profile of physicochemical properties of station No. 293A

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 96%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows an increasing tendency with depth and a change of about 2 PSU.

Water Temperature drops along the profile until 8 ft depth with a range of variation of about 1.7 ^{o}C.

Colored Dissolved Organic Matter drops from 233 to 63 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with increasing water depth and has a vertical attenuation coefficient of 0.48.

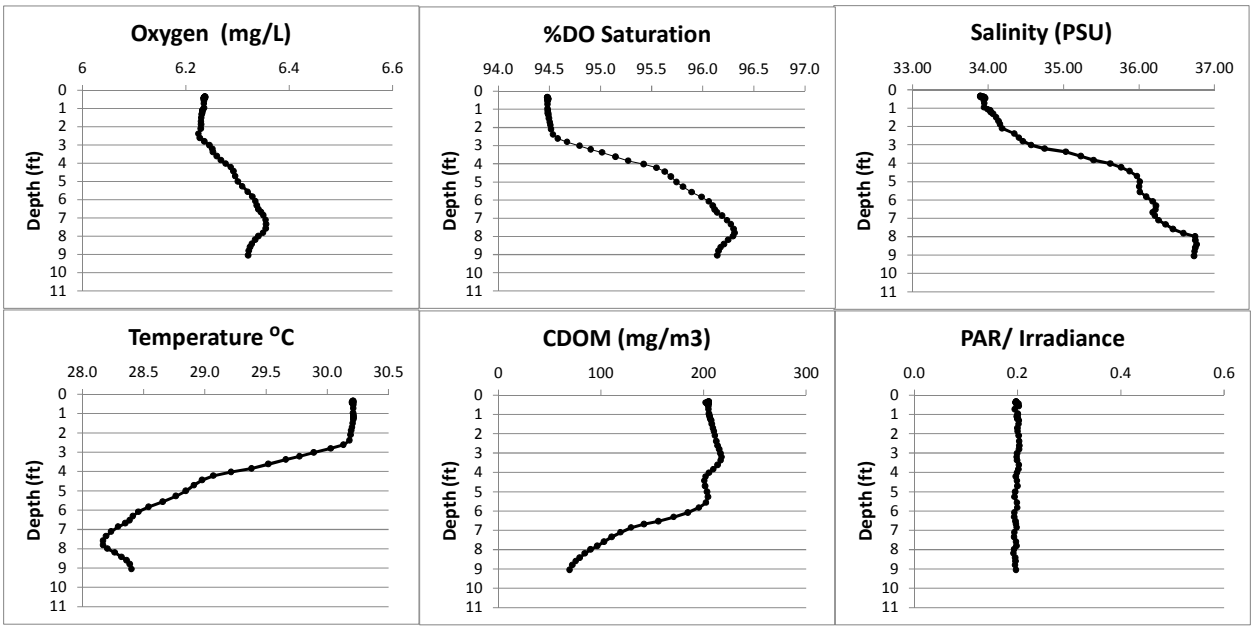


Figure 137. Profile of physicochemical properties of station No. 293B

Dissolved Oxygen and Oxygen saturation do not change significantly and values oscillate around 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity y shows an increasing tendency with depth and a change of about 3 PSU.

Water Temperature drops along the profile with a range of variation of about 2 ^{o}C.

Colored Dissolved Organic Matter decreases with water depth from around 200 to 70 mg m^{-3}.

Photosynthetically Active Radiation remains close to zero.

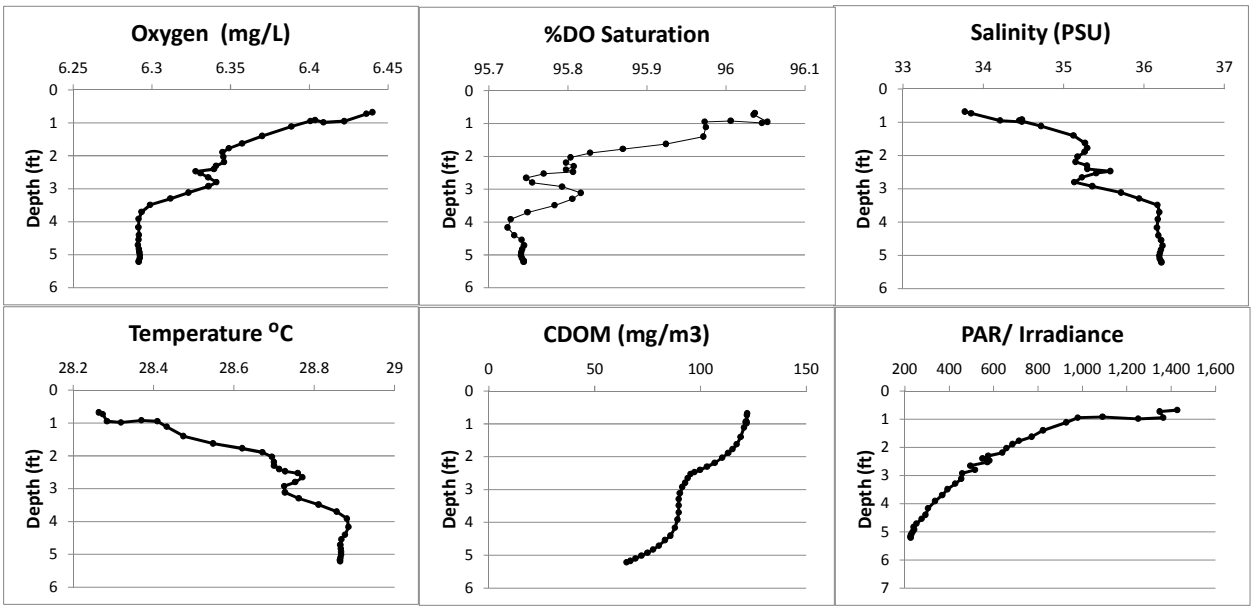


Figure 138. Profile of physicochemical properties of station No. 290A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.8%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows a decreasing tendency with depth and a change of about 2.5 PSU.

Water Temperature shows a decreasing tendency but the change is only of 0.6 ^{o}C.

Colored Dissolved Organic Matter drops from 122 to 65 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth from values around 1400 to 225 and has a vertical attenuation coefficient of 1.26.

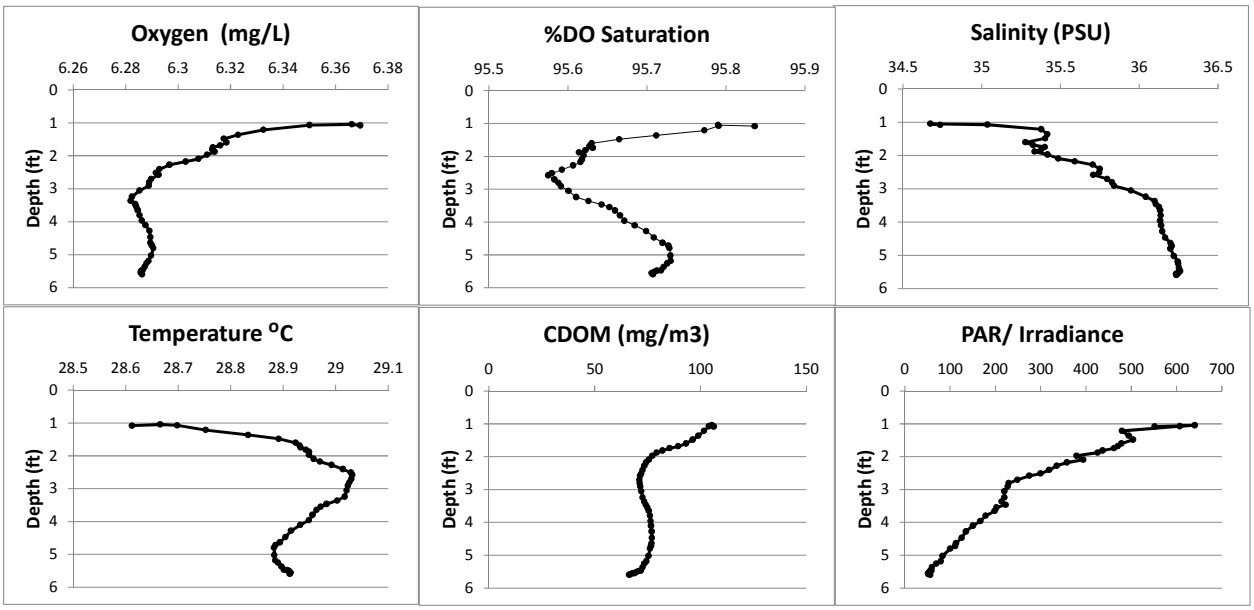


Figure 139. Profile of physicochemical properties of station No. 290C

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with average values of 95.8%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows a decreasing tendency with depth and a change of about 2.5 PSU.

Water Temperature shows a decreasing tendency but the change is only of 0.6 ^{o}C.

Colored Dissolved Organic Matter drops from 122 to 65 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth from values around 1400 to 225 and has a vertical attenuation coefficient of 1.26.

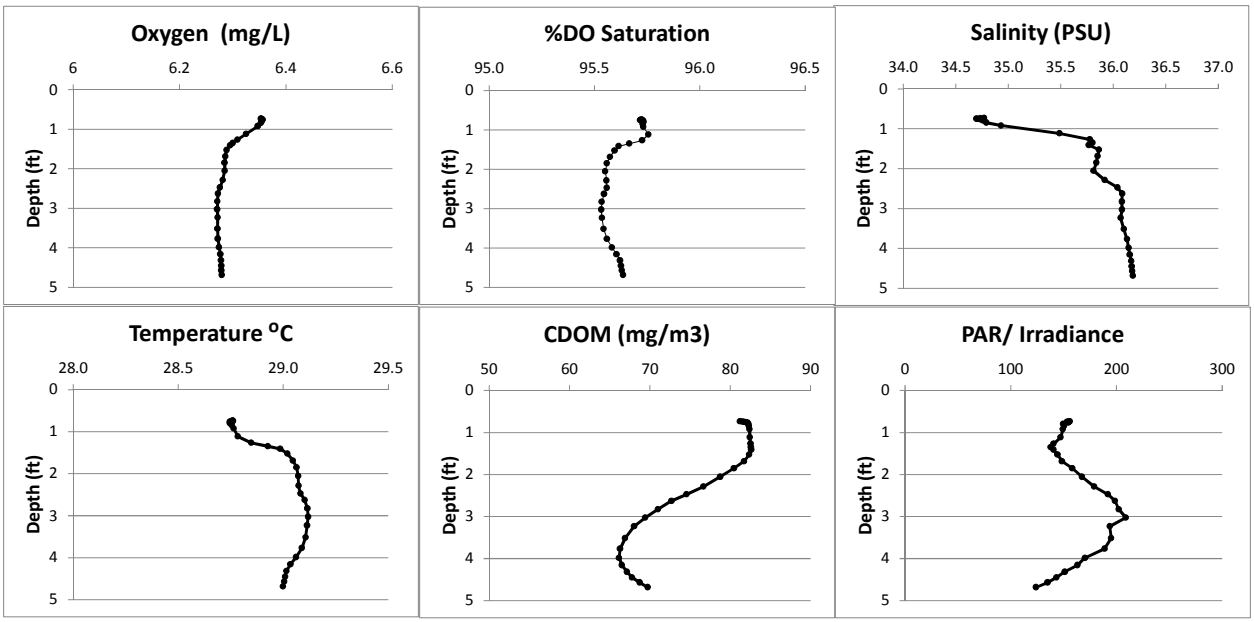


Figure 140. Profile of physicochemical properties of station No. 290B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.6%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows an increasing tendency with depth and a change of about 1.5 PSU.

Water Temperature remains very stable with values around 29.0 ^{o}C.

Colored Dissolved Organic Matter drops from 122 to 65 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth until about 1.3 ft then oscillates between 124 and 209.

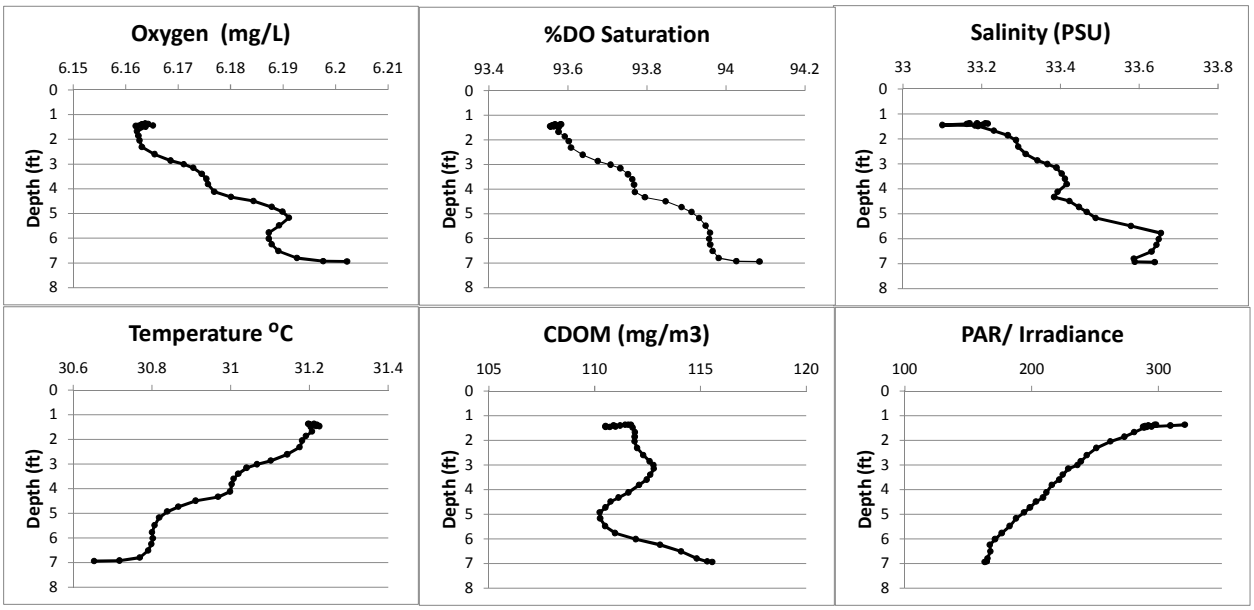


Figure 141. Profile of physicochemical properties of station No. 278B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 93.7%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 33.4.

Water Temperature remains very stable with a range of variation of less than 1 ^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 112 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.37.

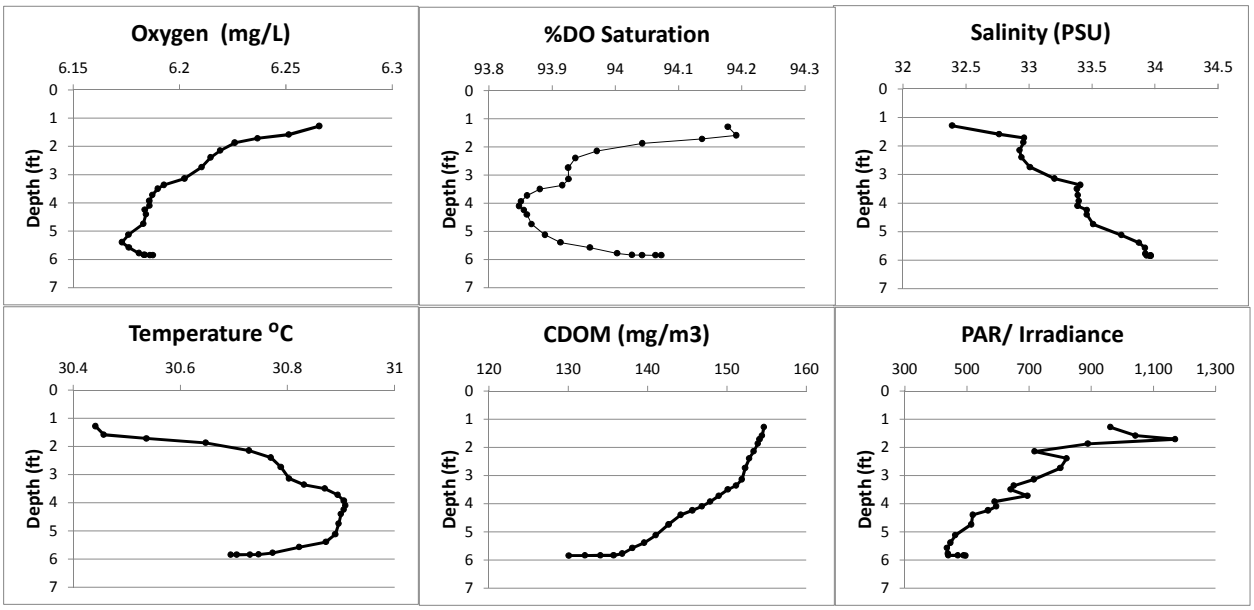


Figure 142. Profile of physicochemical properties of station No. 278C

Dissolved Oxygen and Oxygen saturation display a decrease until 4 ft depth, but then the values slightly increase. Water remains well oxygenated with an average value of 94%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows an increase but the range of variation is about 1.6 PSU.

Water Temperature is practically constant. Given the sensitivity of the sensors it is possible to define an increasing tendency until 4 ft water depth but the change is of only 0.5^{o}C.

Colored Dissolved Organic Matter decreases with water depth from 155 to 130 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth with some oscillations and has a vertical attenuation coefficient of 0.60.

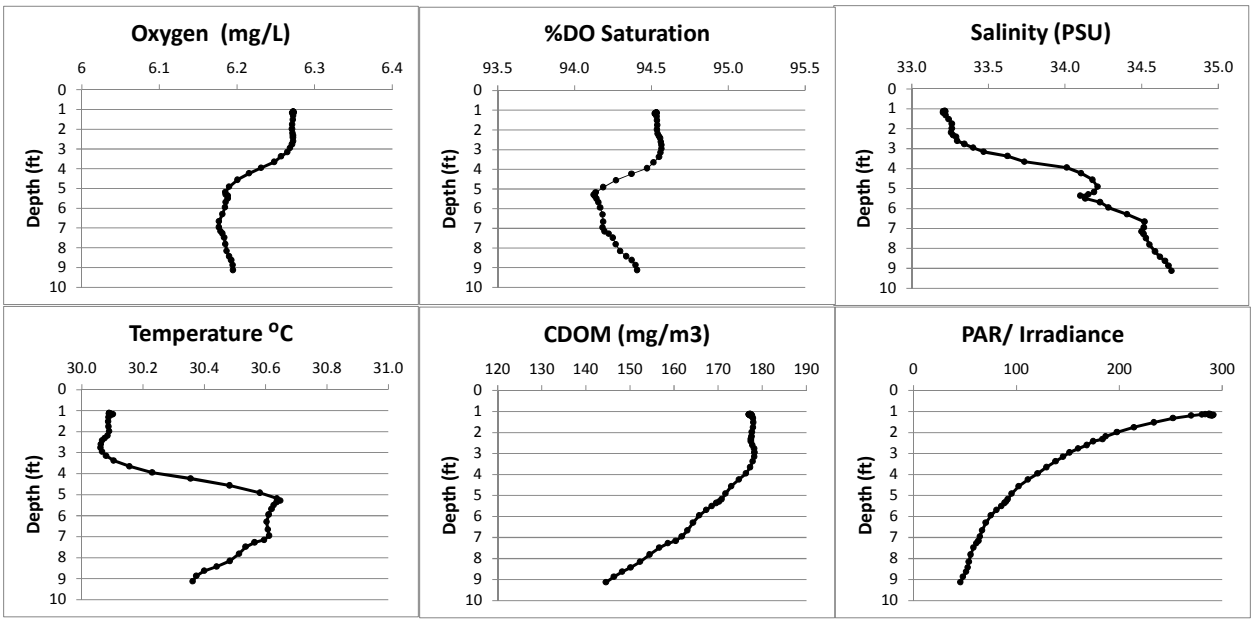


Figure 143. Profile of physicochemical properties of station No. 278A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 94%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows an increase and the range of variation is about 4.1 PSU.

Water Temperature is practically constant. Given the sensitivity of the sensors it is possible to define an increasing tendency until about 5 ft but the change is of only 0.6^{o}C.

Colored Dissolved Organic Matter decreases with water depth from 145 to 258 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with water depth and has a vertical attenuation coefficient of 0.77.

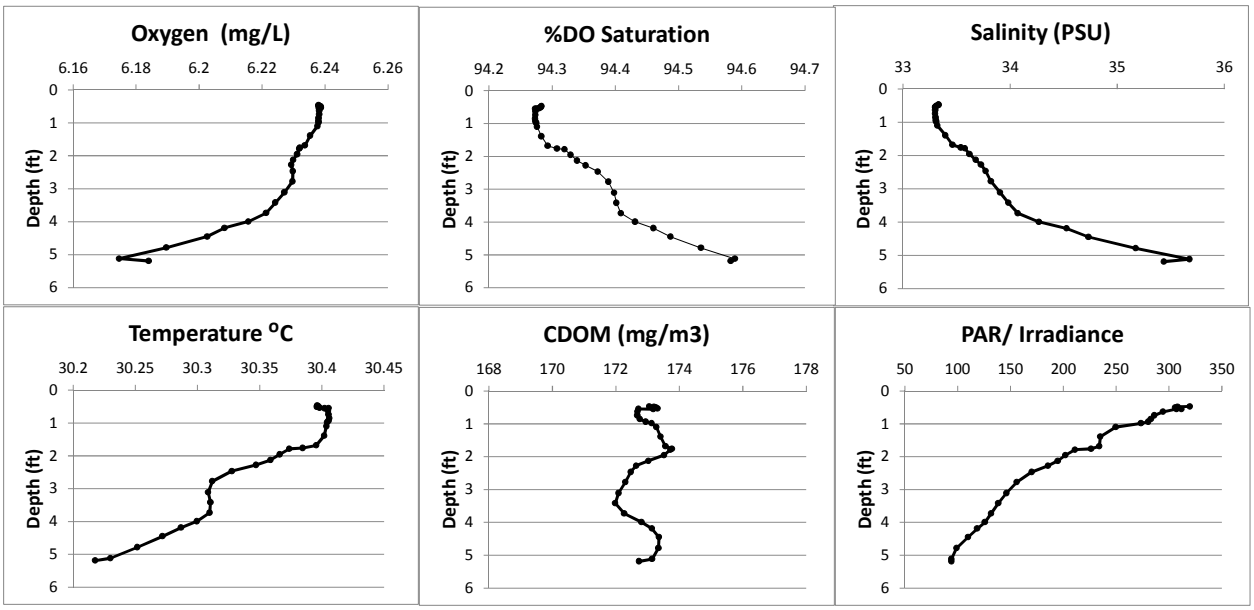


Figure 144. Profile of physicochemical properties of station No. 278D

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 94.4%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows continuous increase. Range of variation is about 2.4 PSU

Water Temperature remains very stable with an average value of 30.4^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 173 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.86.

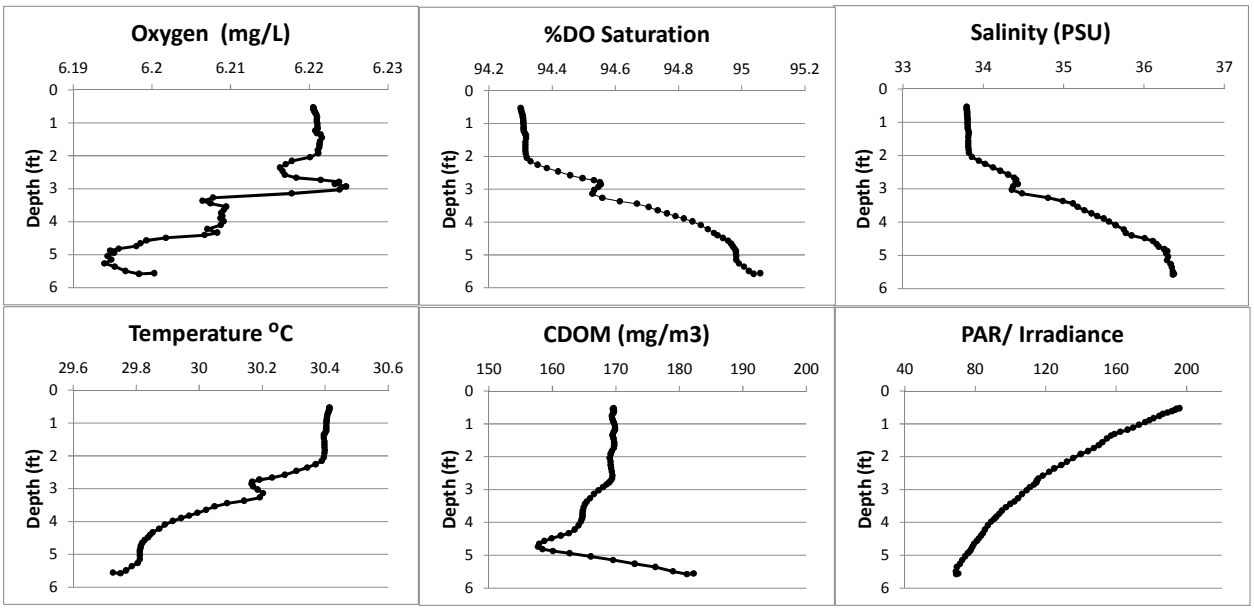


Figure 145. Profile of physicochemical properties of station No. 278E

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 94.6%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows continuous increase. Range of variation is about 2.6 PSU.

Water Temperature remains very stable with an average value of 30.1^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 168 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.69.

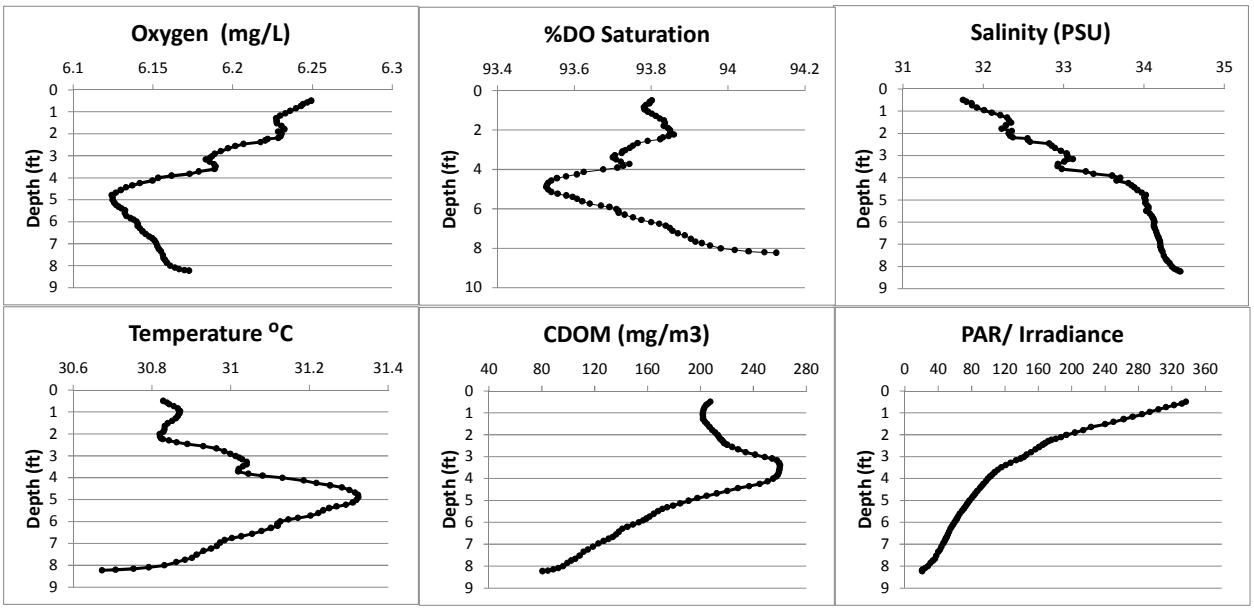


Figure 146. Profile of physicochemical properties of station No. 278F

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 93.8%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows continuous increase. Range of variation is about 2.7 PSU.

Water Temperature remains stable with an average value of 31^{o}C.

Colored Dissolved Organic Matter drops after 3.5 ft from values around 260 to 81 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.05.

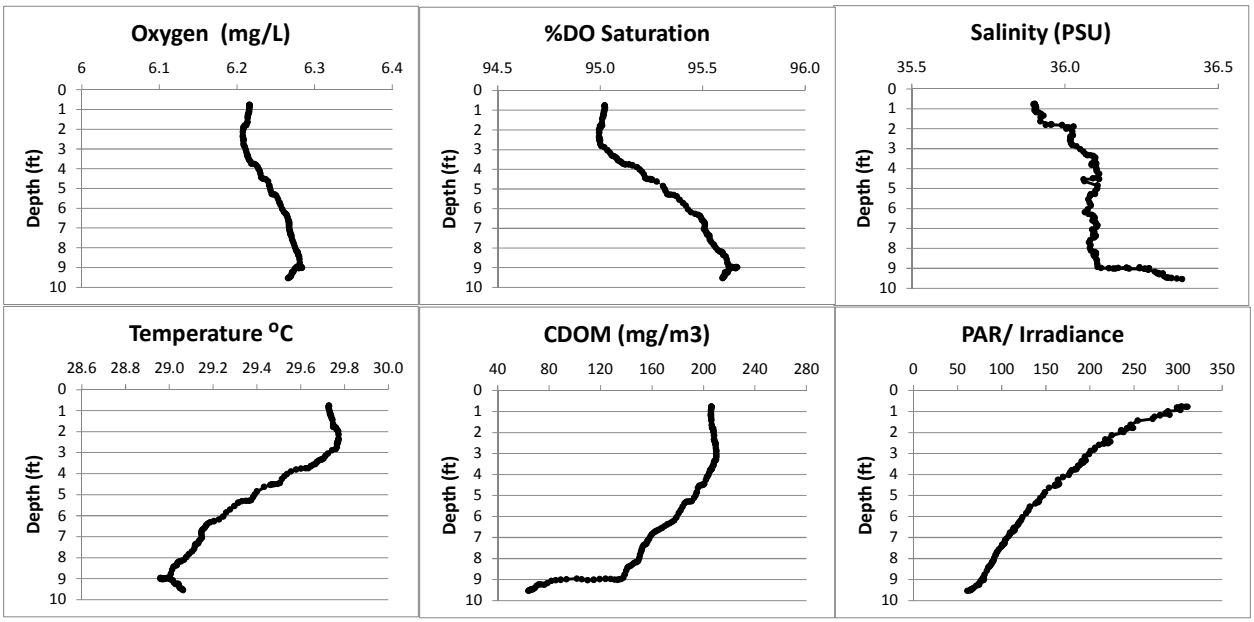


Figure 147. Profile of physicochemical properties of station No. Station 472B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.3%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 36.1 PSU.

Water Temperature remains very stable with an average value of 29.4^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 168 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.53.

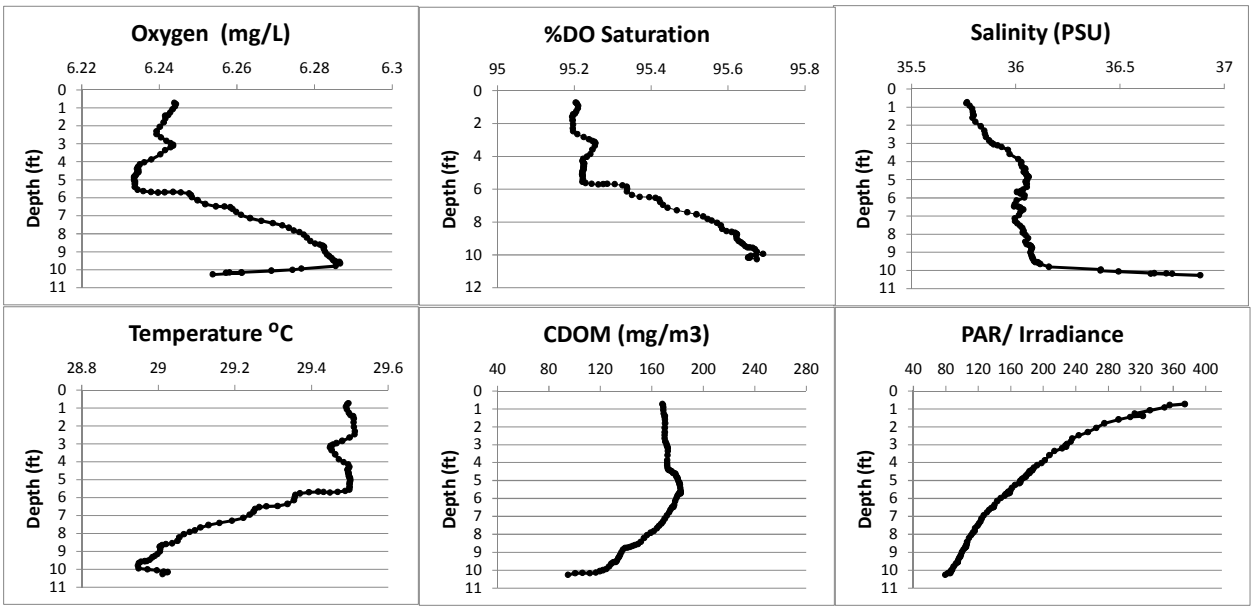


Figure 148. Profile of physicochemical properties of station No. 472A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.4%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 36.1 PSU.

Water Temperature remains very stable with an average value of 29.3^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 161 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.47.

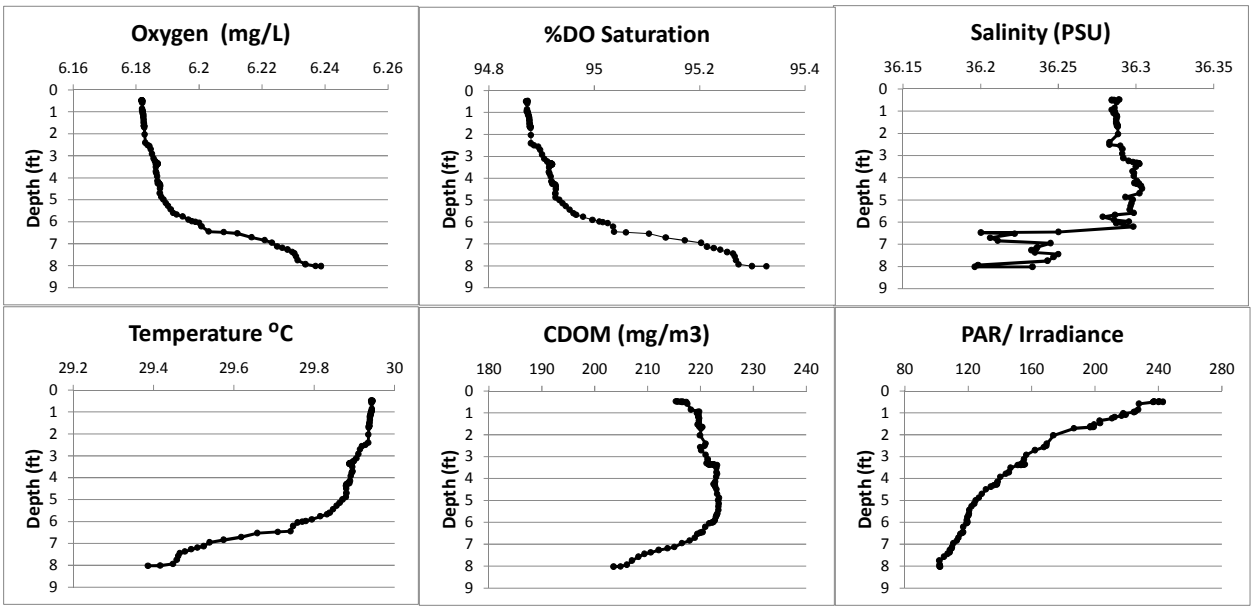


Figure 149. Profile of physicochemical properties of station No. 459A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 36.3 PSU.

Water Temperature remains very stable with an average value of 29.8^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 220 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.37.

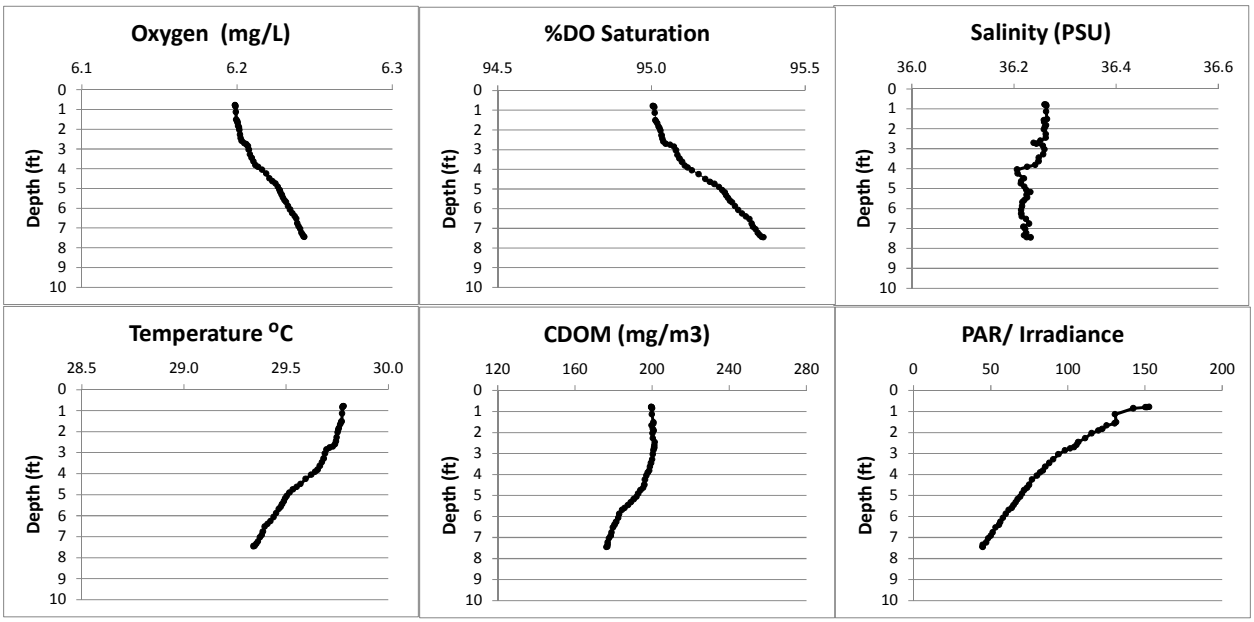


Figure 150. Profile of physicochemical properties of station No. 459B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.2%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 36.2 PSU.

Water Temperature remains very stable with an average value of 29.6^{o}C. Given the sensitivity of the sensors it is possible to define a slight increasing tendency but the change is of 0.4^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 193 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.58.

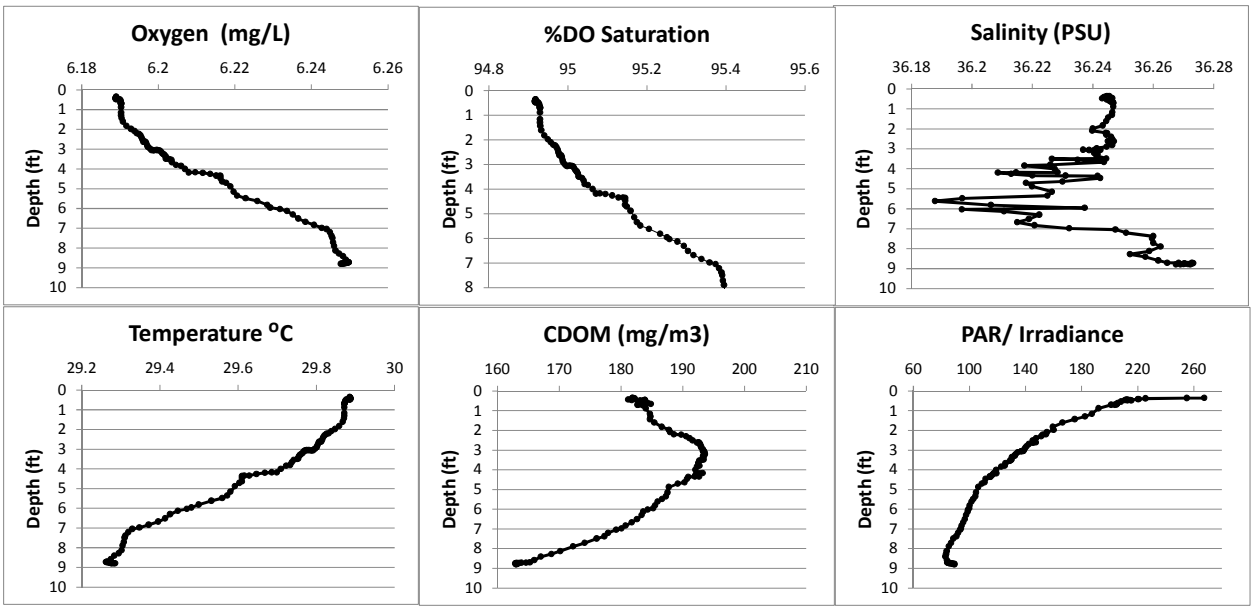


Figure 151. Profile of physicochemical properties of station No. 458B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.1%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 36.2 PSU.

Water Temperature remains very stable with an average value of 29.6^{o}C. Given the sensitivity of the sensors it is possible to define a slight increasing tendency but the change is of 0.6^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 184 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.36.

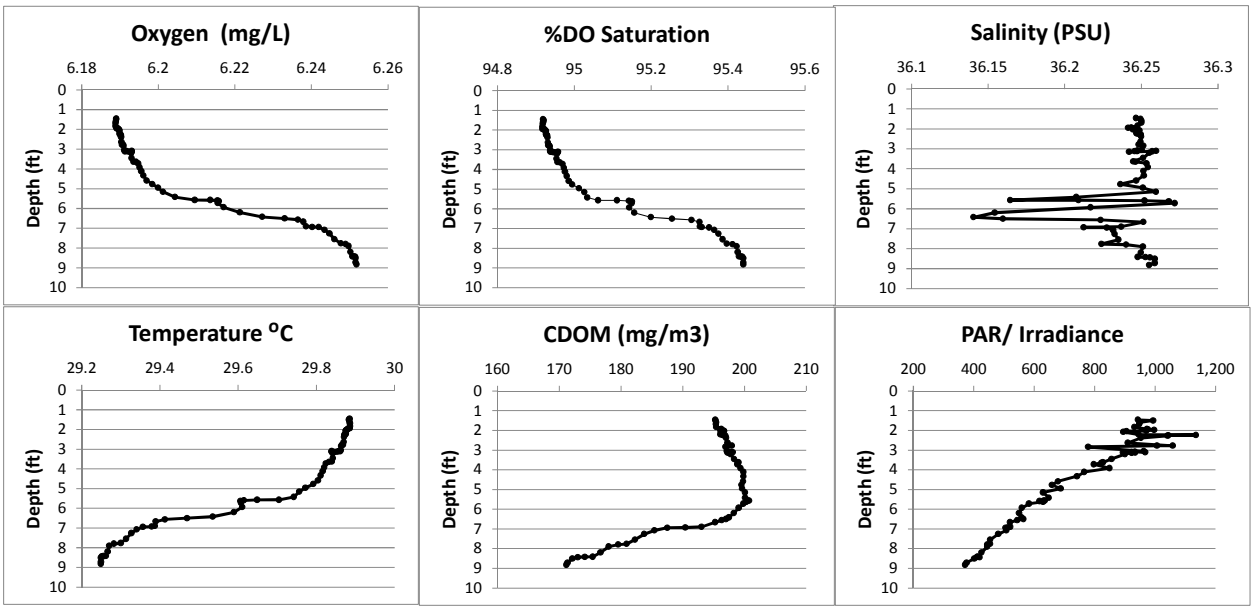


Figure 152. Profile of physicochemical properties of station No. 458A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.1%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 36.2 PSU.

Water Temperature remains very stable with an average value of 29.7^{o}C. Given the sensitivity of the sensors it is possible to define a slight increasing tendency but the change is of 0.6^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 194 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth with some oscillations and has a vertical attenuation coefficient of 0.45.

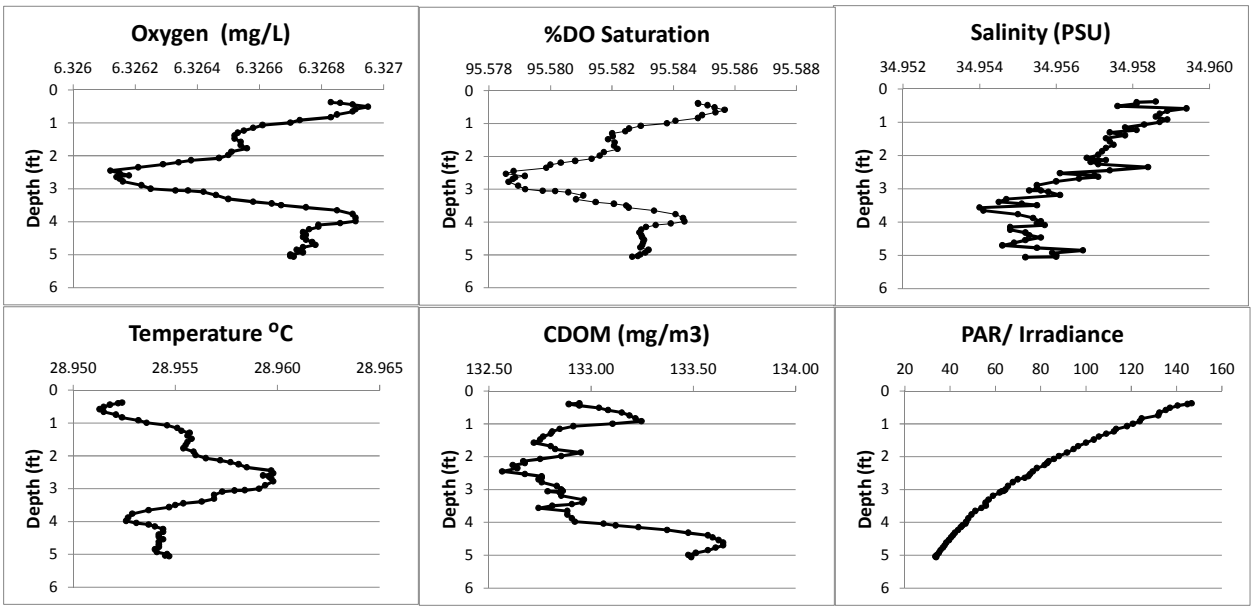


Figure 153. Profile of physicochemical properties of station No. 148C

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.6%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 35.

Water Temperature remains very stable with an average value of 29^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 133 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth from 147 to 34 and has a vertical attenuation coefficient of 1.03.

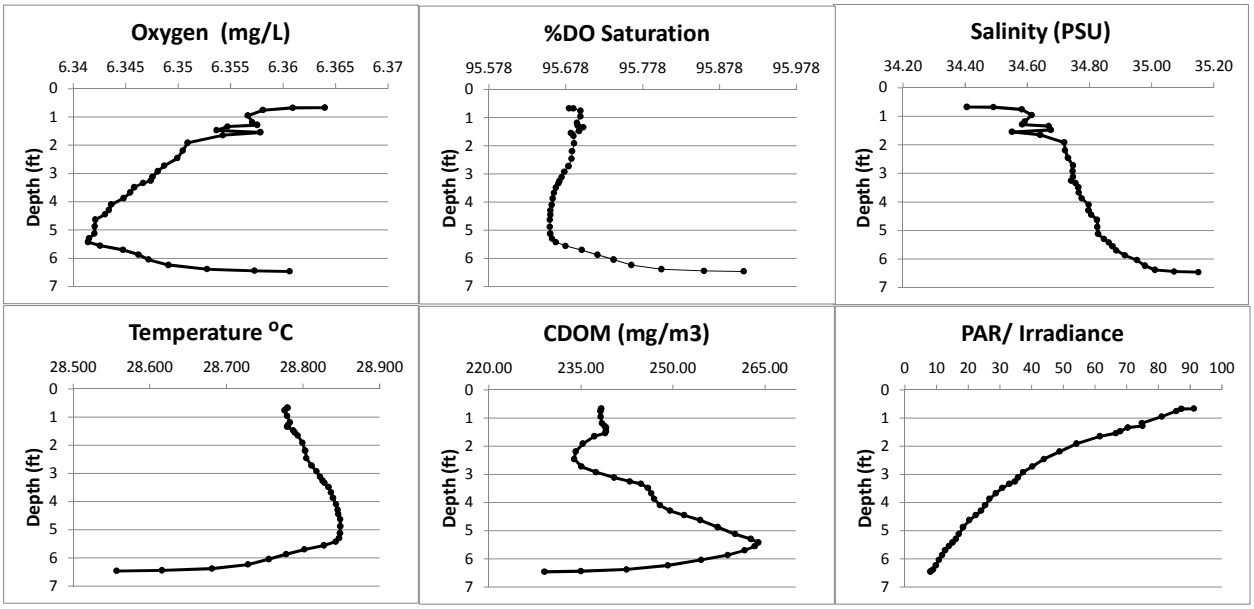


Figure 154. Profile of physicochemical properties of station No. 148A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.7%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 34.8 PSU.

Water Temperature remains very stable with an average value of 28.8^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 245 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.30.

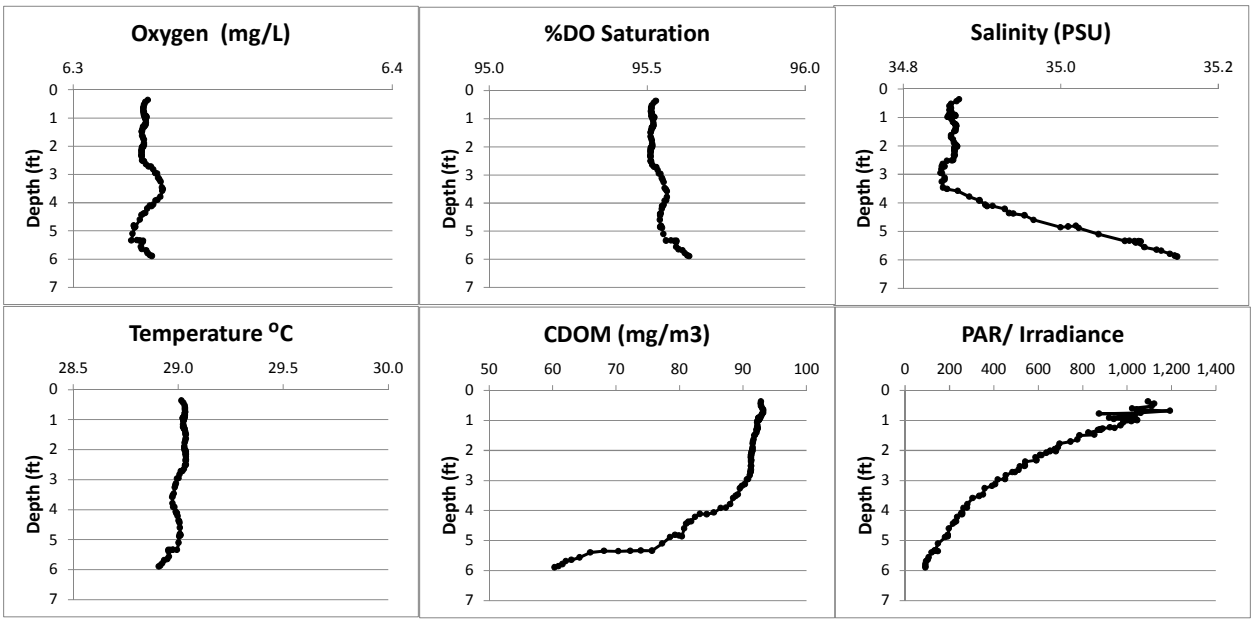


Figure 155. Profile of physicochemical properties of station No. 148B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 95.5%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with an average value of 34.9.

Water Temperature remains very stable with an average value of 29^{o}C.

Colored Dissolved Organic Matter remains stable with an average value of 87 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth from 1194 to 92 and has a vertical attenuation coefficient of 1.49.

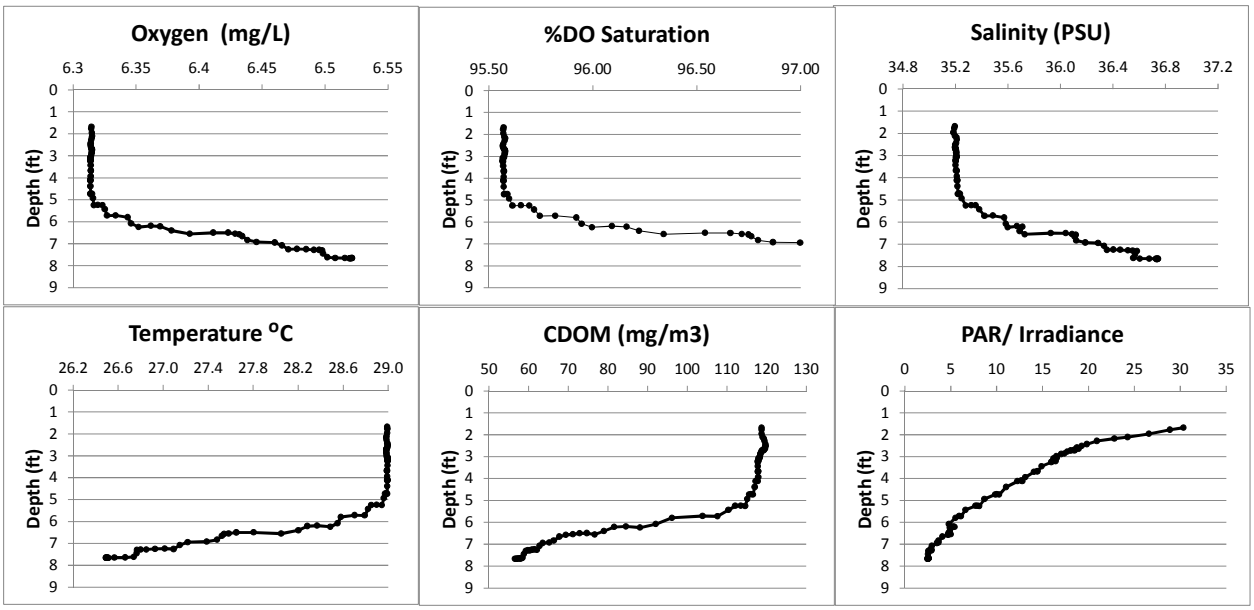


Figure 156. Profile of physicochemical properties of station No. 147B

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 96.2%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows continuous increase. Range of variation is about 1.6 PSU.

Water Temperature decreases with water depth. Range of variation is about 2.5^{o}C.

Colored Dissolved Organic Matter drops from 120 to 57 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.32.

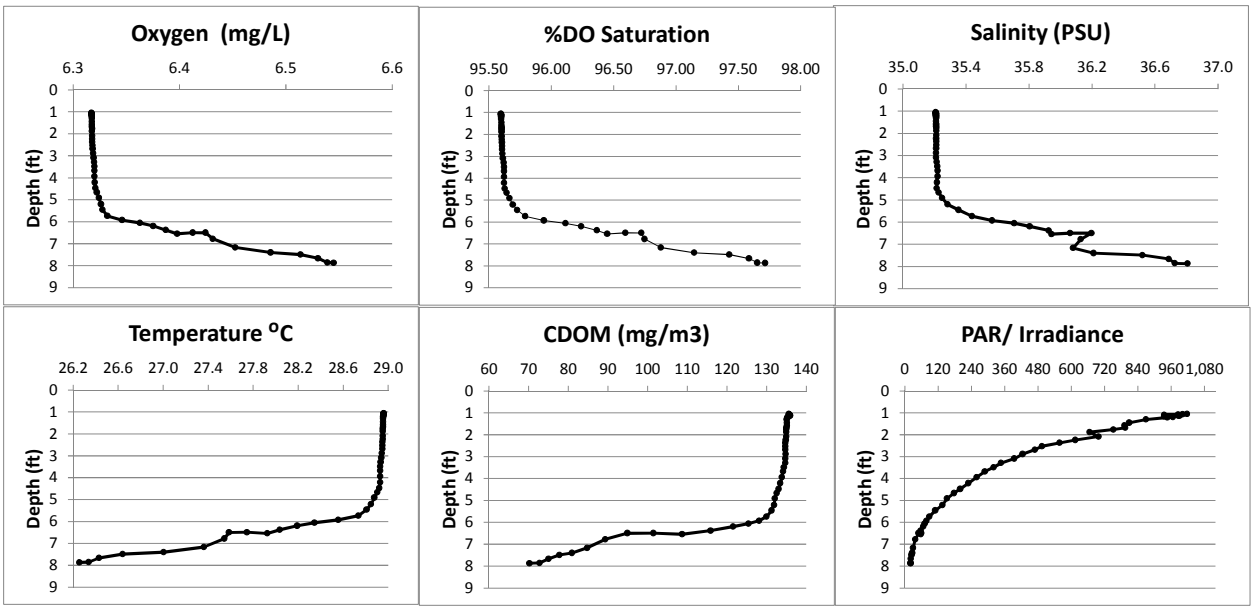


Figure 157. Profile of physicochemical properties of station No. 147A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 96%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows continuous increase. Range of variation is about 1.6 PSU.

Water Temperature decreases with water depth. Range of variation is about 2.7^{o}C.

Colored Dissolved Organic Matter drops from 136 to 70 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.84.

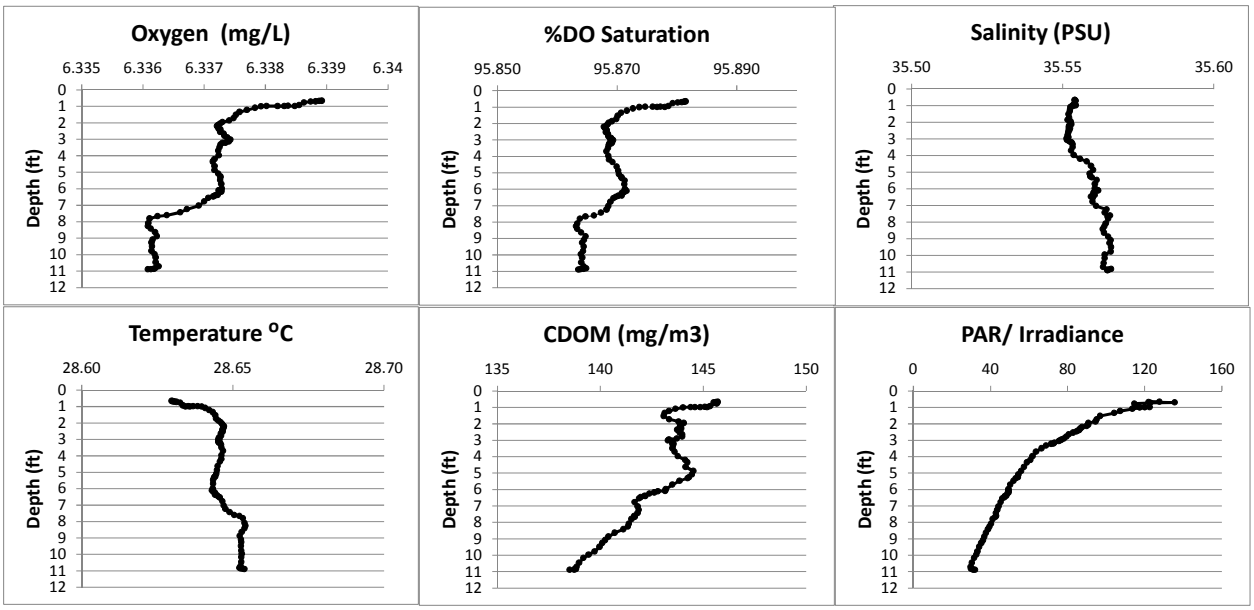


Figure 158. Profile of physicochemical properties of station No. 137B

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.9%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains constant with an average value of 35.6 PSU.

Water Temperature remains constant with an average value of 28.6^{o}C.

Colored Dissolved Organic Matter does not change significantly and averages 143 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.45.

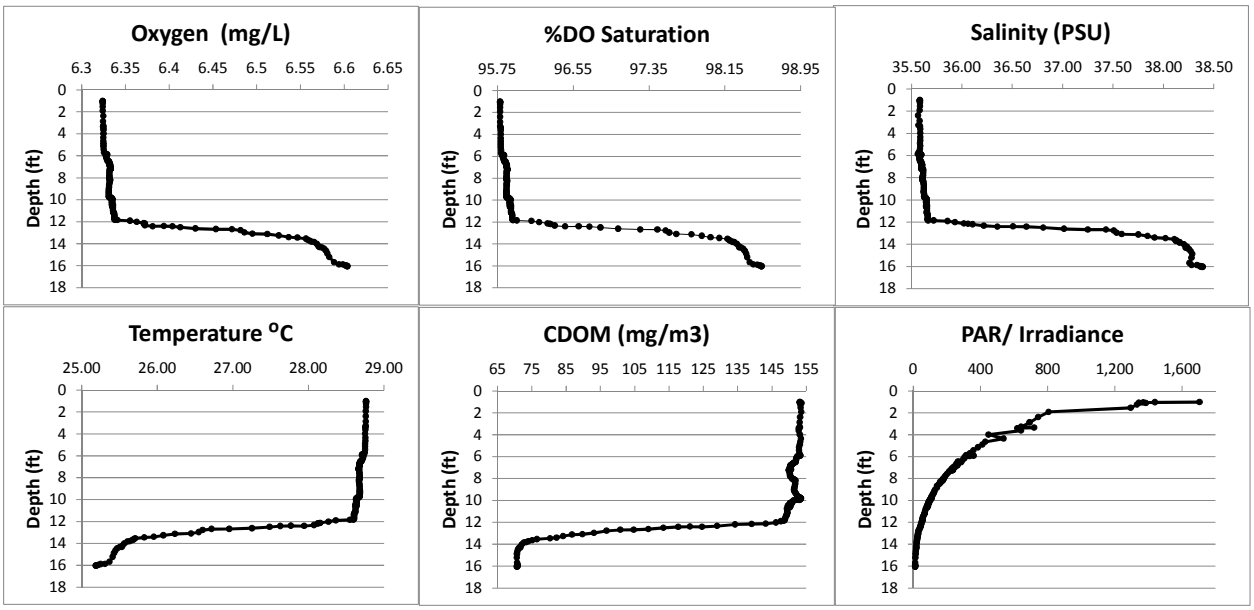


Figure 159. Profile of physicochemical properties of station No. 137A

Dissolved Oxygen and Oxygen saturation do not change significantly and water remains well oxygenated with an average value of 96.3%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity shows continuous increase. Range of variation is about 2.8 PSU.

Water Temperature decreases with water depth. Range of variation is about 3.6^{o}C.

Colored Dissolved Organic Matter drops from 137 to 71 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.95.

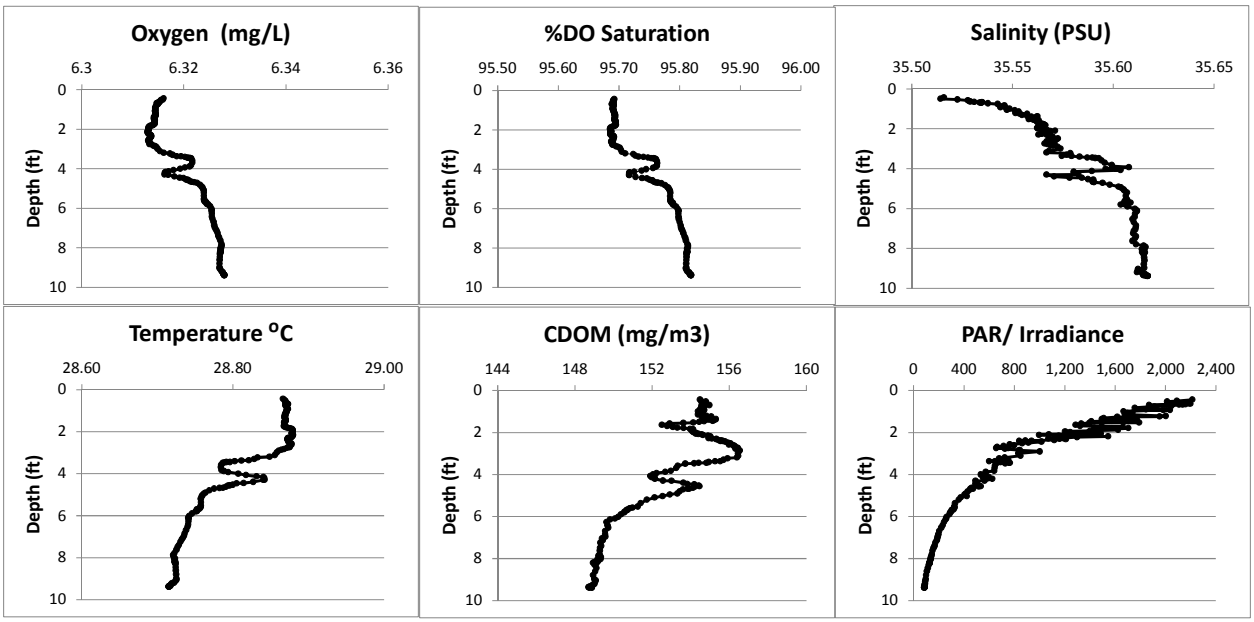


Figure 160. Profile of physicochemical properties of station No. Station 137C

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.7%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains constant with an average value of 35.6 PSU.

Water Temperature remains constant with an average value of 28.8^{o}C.

Colored Dissolved Organic Matter does not change significantly and averages 153 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth with some oscillations and has a vertical attenuation coefficient of 1.26.

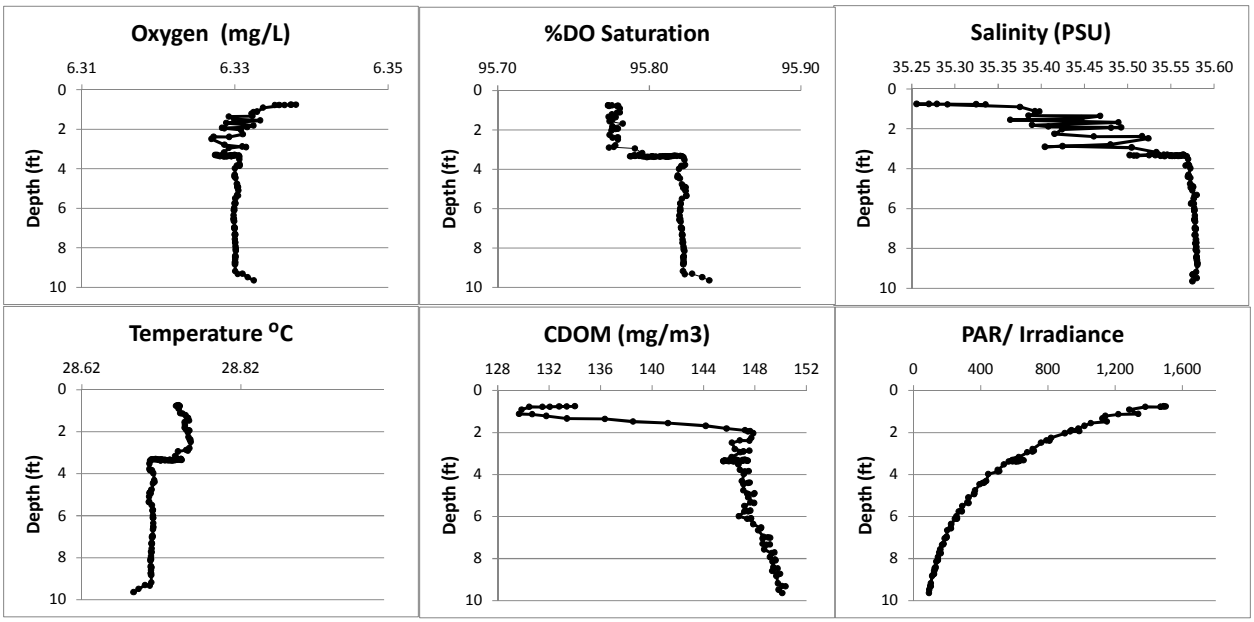


Figure 161. Profile of physicochemical properties of station No. 137D

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.8%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains constant with an average value of 35.5 PSU.

Water Temperature remains constant with an average value of 28.7^{o}C.

Colored Dissolved Organic Matter does not change significantly and averages 146 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 1.02.

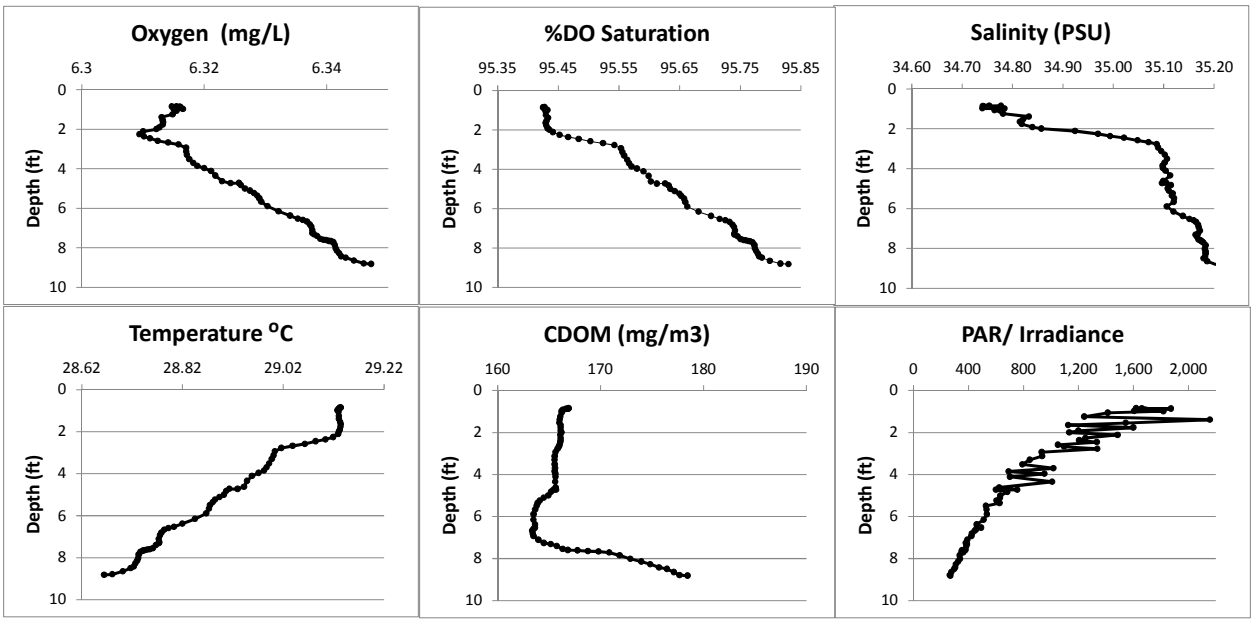


Figure 162. Profile of physicochemical properties of station No. 132C

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.6%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains constant with an average value of 35.1 PSU.

Water Temperature remains constant with an average value of 28.9^{o}C.

Colored Dissolved Organic Matter does not change significantly and averages 167mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth with some oscillations and has a vertical attenuation coefficient of 0.75.

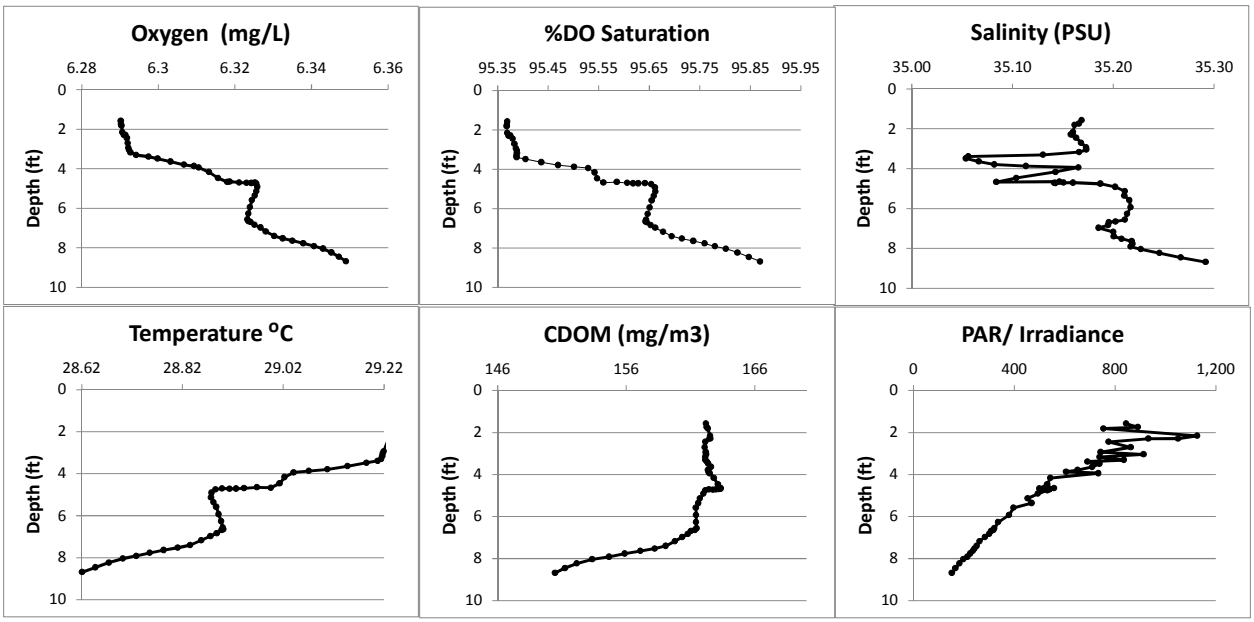


Figure 163. Profile of physicochemical properties of station No. 132B

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.6%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains constant with an average value of 35.2 PSU.

Water Temperature remains constant with an average value of 29^{o}C.

Colored Dissolved Organic Matter does not change significantly and averages 161mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth with some oscillations and has a vertical attenuation coefficient of 0.85.

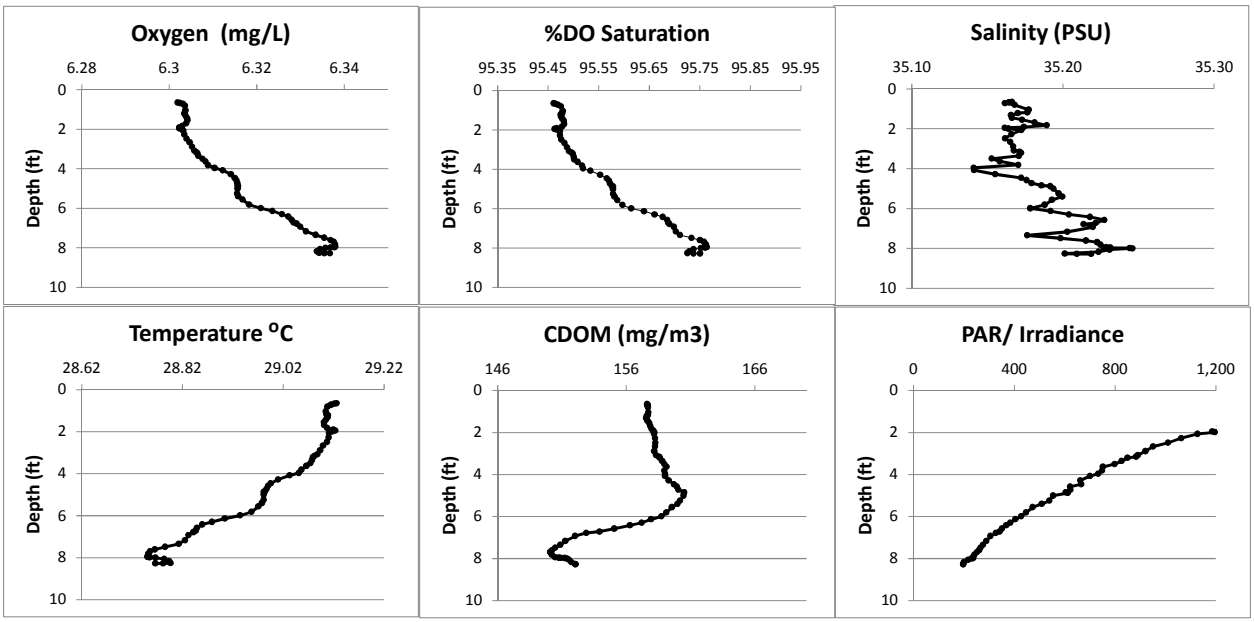


Figure 164. Profile of physicochemical properties of station No. 132A

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.6%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains constant with an average value of 35.2 PSU.

Water Temperature remains constant with an average value of 29^{o}C.

Colored Dissolved Organic Matter does not change significantly and averages 156 mg m^{-3}.

Photosynthetically Active Radiation decreases with water depth and has a vertical attenuation coefficient of 0.88.

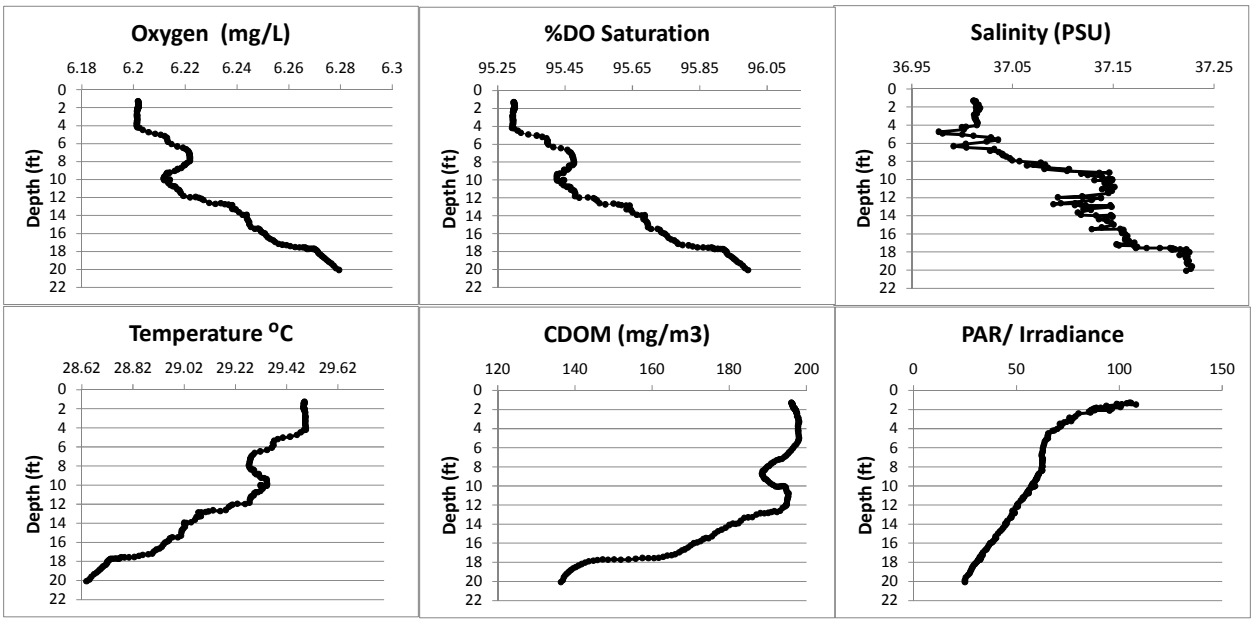


Figure 165. Profile of physicochemical properties of station No. 29C

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.6%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature drops along the profile with a range of variation of about 0.9 ^{o}C.

Colored Dissolved Organic Matter decreases with water depth from around 198 to 84 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth and has a vertical attenuation coefficient of 0.18.

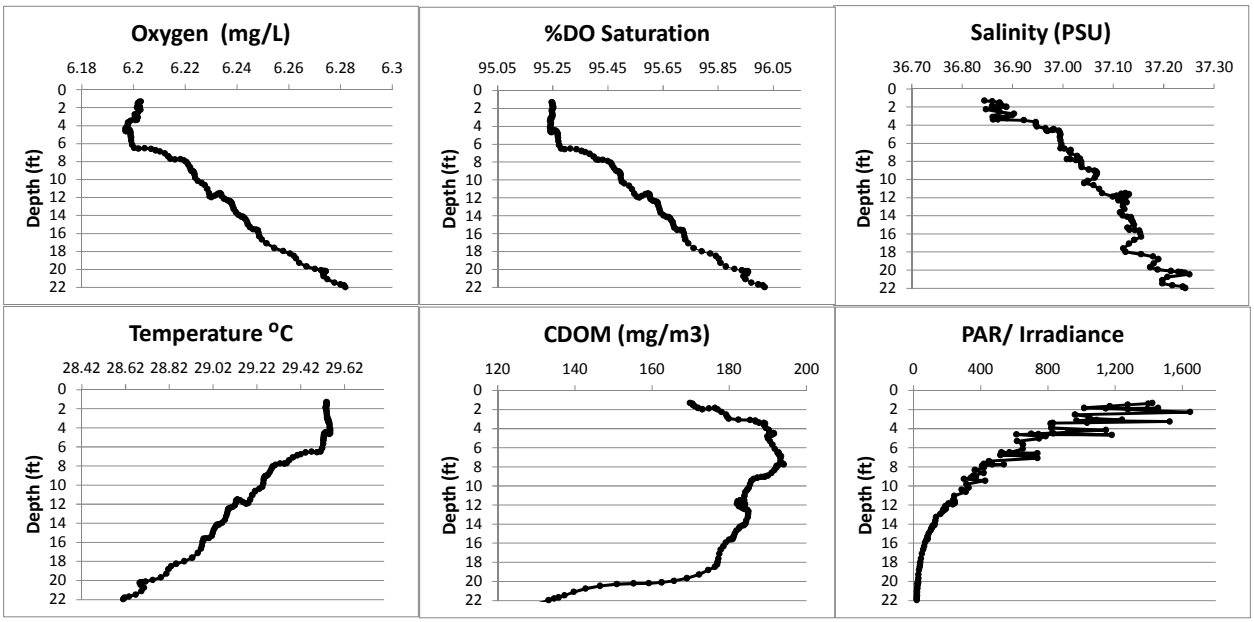


Figure 166. Profile of physicochemical properties of station No. 29A

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.5%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature drops along the profile with a range of variation of about 1 ^{o}C.

Colored Dissolved Organic Matter ranges between 127 and 194 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth with some oscillations and has a vertical attenuation coefficient of 0.71.

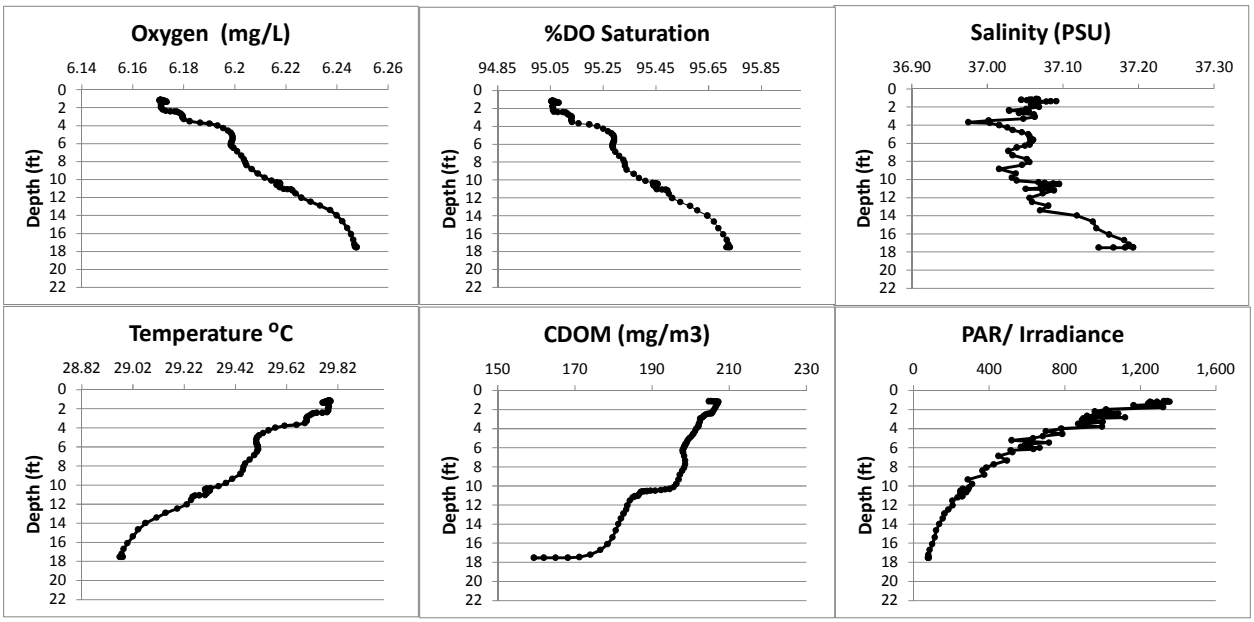


Figure 167. Profile of physicochemical properties of station No. 29B

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.3%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 37.1.

Water Temperature drops along the profile with a range of variation of 0.8 ^{o}C.

Colored Dissolved Organic Matter drops along the profile with a range of variation of 48 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth with some oscillations and has a vertical attenuation coefficient of 0.56.

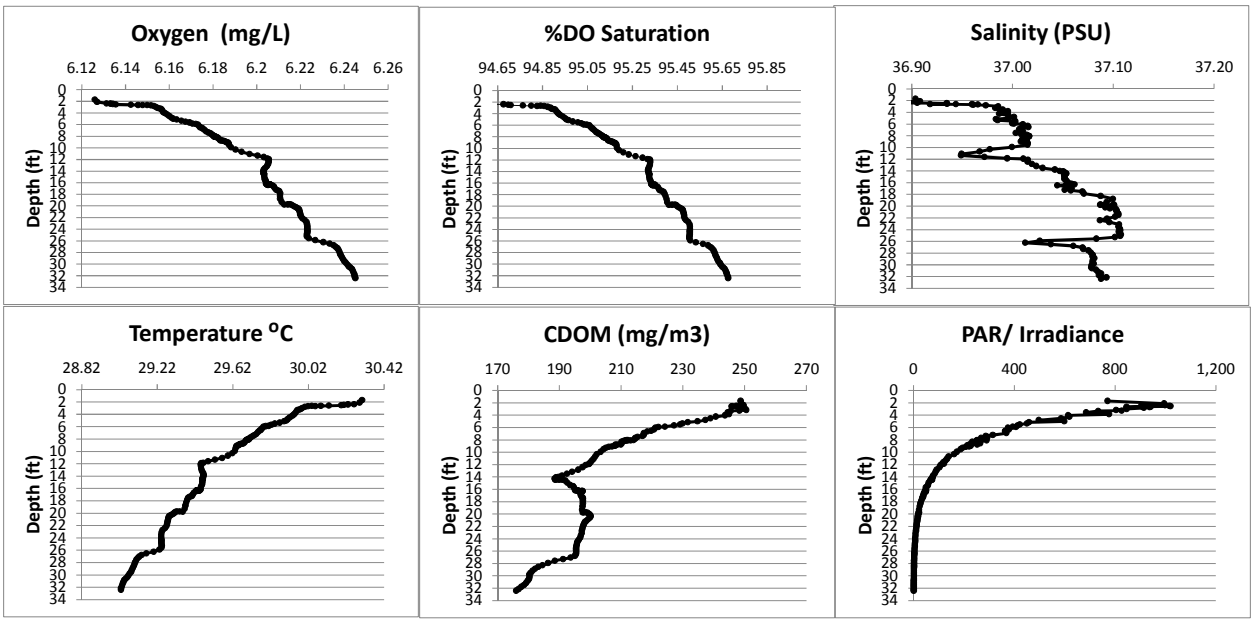


Figure 168. Profile of physicochemical properties of station No. 28A

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.3%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature drops along the profile with a range of variation of 1.3 ^{o}C.

Colored Dissolved Organic Matter drops along the profile with a range of variation of 75 mg m^{-3}.

Photosynthetically Active Radiation decreases with increasing water depth with some oscillations and has a vertical attenuation coefficient of 0.71.

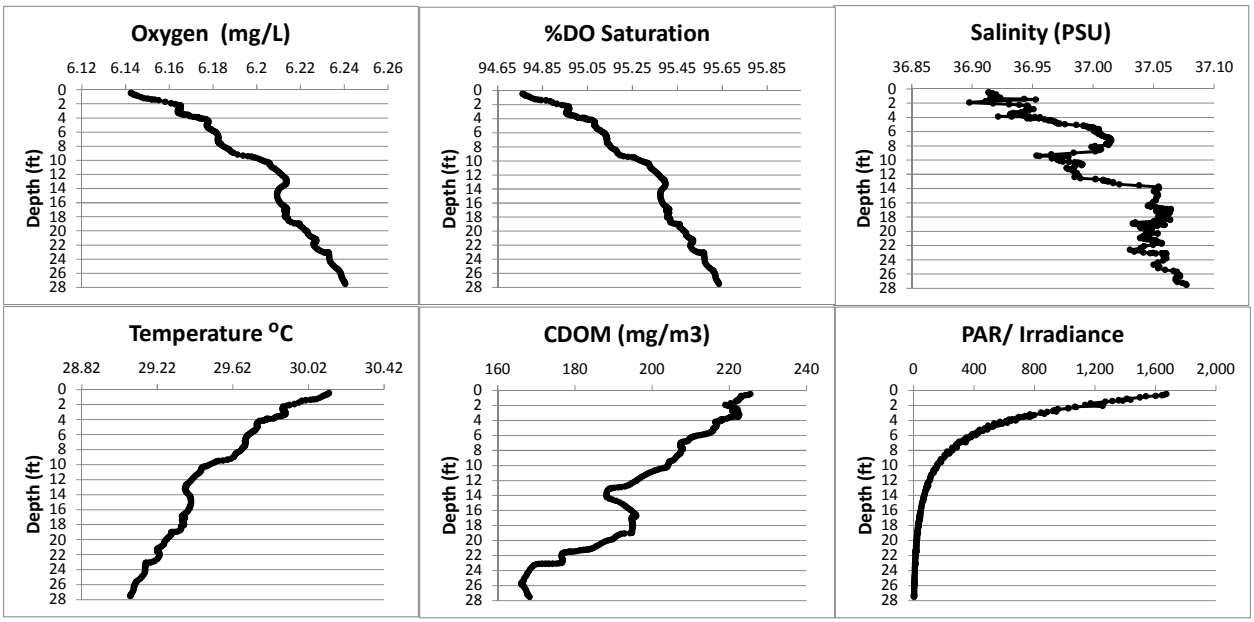


Figure 169. Profile of physicochemical properties of station No. 28B

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.3%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature drops along the profile with a range of variation of 1.1 ^{o}C.

Colored Dissolved Organic Matter drops along the profile with a range of variation of 59 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with increasing water depth with some oscillations and has a vertical attenuation coefficient of 0.81.

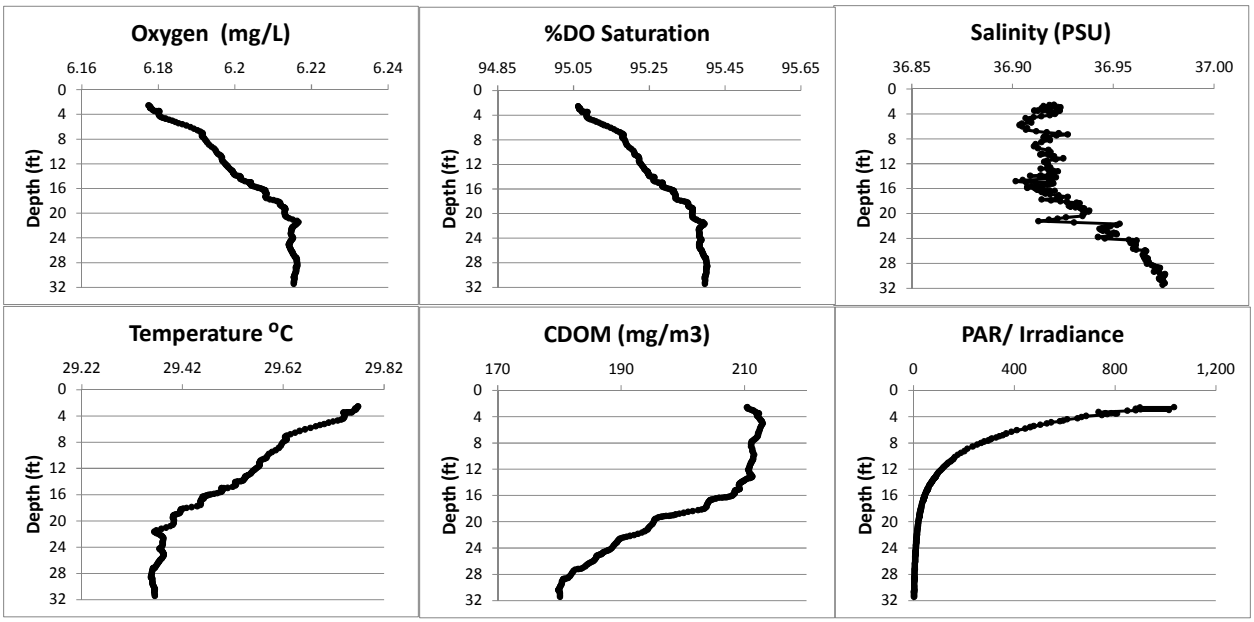


Figure 170. Profile of physicochemical properties of station No. 28C

Dissolved Oxygen and Oxygen saturation remains constant and water remains well oxygenated with an average value of 95.3%, without exceeding the regulation levels (all values above 42% DO Saturation).

Salinity remains very stable with values around 37.

Water Temperature drops along the profile but the change is only of 0.4 ^{o}C.

Colored Dissolved Organic Matter drops along the profile with a range of variation of 33 mg m^{-3}.

Photosynthetically Active Radiation exponentially decreases with increasing water depth and has a vertical attenuation coefficient of 0.74.

Literature Cited

APHA. 1995. Automated method for molybdate-reactive silica. In A. D. Eaton, L. S. Clesceri, and A. E. Greenberg (Eds.), Standard Methods for the Examination of Water and Wastewater.

Boyer, J. N. and H. O. Briceño. 2010. FY2009 Annual Report of the Water Quality Monitoring Project for the Florida Keys National Marine Sanctuary. EPA Agreement #X7-96410604-6. SERC Tech. Report #T-497.

Brand, L. E., and A. Compton. 2007. Long-term increase in Karenia brevis abundance along the Southwest Florida coast. Harmful Algae 6: 232-252.

Briceño, H. O., and J. N. Boyer. 2009. Little Venice Water Quality Monitoring Project, FDEP Contract Number SP 645 Final Report. SERC Contribution #T-443.

Briceño, H.O. and Boyer, J. N. 2013. FY2012 Annual Report of the Water Quality Monitoring Project for the Florida Keys National Marine Sanctuary. EPA Agreement #X7-96410604-6. SERC Tech. Report #T-628.

Doren, Robert F., Joel C. Trexler, Andrew D. Gottlieb, Matthew C. Harwell. 2009. Ecological indicators for system-wide assessment of the greater everglades ecosystem restoration program. Ecological Indicators 9s. s2-s16

EPA. 1979. Handbook for Analytical Quality Control in Water and Wastewater Laboratories. EPA 600/4-79-019. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH.

EPA. 1993. Water Quality Protection Program for the Florida Keys National Marine Sanctuary: Phase II Report. Battelle Ocean Sciences, Duxbury, MA and Continental Shelf Associates, Inc., Jupiter, FL.

Frankovich, T. A., and R. D. Jones. 1998. A rapid, precise, and sensitive method for the determination of total nitrogen in natural waters. Mar. Chem. 60:227-234.

Gibson, P., J. N. Boyer, and N. P. Smith. 2007. Nutrient mass flux between Florida Bay and the Florida Keys National Marine Sanctuary. Estuaries and Coasts 31: 21-32.

Grasshoff, K. 1983a. Determination of nitrate. In K. Grasshoff, M. Erhardt, and K. Kremeling (Eds.), Methods of Seawater Analysis. Verlag Chemie, Weinheim, Germany.

Grasshoff, K. 1983b. Determination of nitrite. In K. Grasshoff, M. Erhardt, and K. Kremeling (Eds.), Methods of Seawater Analysis. Verlag Chemie, Weinheim, Germany.

Hu, C., and many others. 2002. Satellite images track “black water” event off Florida coast. EOS 83: 281-285.

Jurado, J., G. L. Hitchcock, and P. B. Ortner. 2007. Seasonal variability in nutrient and phytoplankton distributions on the southwest Florida inner shelf. Bulletin of Marine Science 80: 21-43.

Klein, C. J. III, and S. P. Orlando. 1994. A spatial framework for water quality management in the Florida Keys National Marine Sanctuary. Bull. Mar. Sci. 54: 1036-1044.

Koroleff, F. 1983. Determination of ammonia. In K. Grasshoff, M. Erhardt, and K. Kremeling (Eds.), Methods of Seawater Analysis. Verlag Chemie, Weinheim, Germany.

Lapointe, B. and Mark W. Clark. 1990. Final Report: Spatial and Temporal Variability in Trophic State of Surface Waters in Monroe County During 1989-1990. Unpublished Report: Florida Keys Land and Sea Trust, Marine Conservation Program, Marathon, Florida. 81 p.

Lee, T. N., E. Johns, D. Wilson, E. Williams, and N. Smith. 2002. Transport processes linking South Florida coastal ecosystems, pp. 309-342. In: J. W. Porter and K. G. Porter (eds.), The Everglades, Florida Bay, and Coral Reefs of the Florida Keys. CRC Press. Boca Raton.

Murphy, J., and J. P. Riley. 1962. A modified single solution method for the determination of phosphate in natural water. Anal. Chim. Acta 27: 31-36.

Solórzano, L. and J. Sharp. 1980. Determination of total dissolved phosphorus and particulate phosphorus in natural waters. Limnol. Oceanogr. 25: 754-758.

Walsh, T. W. 1989. Total dissolved nitrogen in seawater: a new high temperature combustion method and a comparison with photo-oxidation. Mar. Chem. 26: 295-311.

Yentsch, C. S., and D. W. Menzel. 1963. A method for determination of phytoplankton chlorophyll and phaeophytin by fluorescence. Deep Sea Res. 10: 221-231.