

HRECOS Pier 84 Water Quality Metadata

Last updated: 03/24/2025

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Station Overview

Location: Pier 84, New York, NY ([40.764628 N, 74.003186 W](#))

Data collection period: 12/21/2012 – present

Parameters: pH, dissolved oxygen, specific conductance, salinity, turbidity, water temperature, and water depth above sonde*

*See below for correction equation

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Station Description:

The purpose of the Hudson River Park Pier 84 station is to generate a consistent stream of water quality and atmospheric data to the general public and interested stakeholders. The goal in collecting this data is to ultimately inform Hudson River management policies, restoration efforts, and extreme event planning. This station was selected due to its location near the NYC Harbor and in lower Manhattan, one of the world's most heavily developed and densely populated urban environments.

The Hudson River Park Pier 84 station is located on the southeastern piling at the end of Pier 84's finger pier. The water depth at this location ranges from 4.5 to 6 meters. Sensors are deployed on a YSI EXO2 sonde, approximately 2 meters off the bottom.

Data is recorded every 15 minutes by a CR200 datalogger.

*Depth measurements at this site are not corrected for the influence of atmospheric pressure (see [here](#) for more information). This calculation can be performed manually using the following equation and concurrent barometric pressure measurements from the weather component of this station:

$$\text{Corrected depth} = \text{measured depth} + ((1013 - \text{barometric pressure}) * .0102)$$

Special Remarks:

Date	Remark
7/24/2014 – 12/31/2014	All depth data flagged as suspicious due to erratic and jumping values, possibly due to a fouled depth port.
02/01/2015-03/01/2015	Sensors may have been exposed to air at low tide during several instances, possibly causing ice to form on sensors and persist through multiple tidal cycles. Data will be flagged accordingly.
9/8/2015	Both sondes equipped with new C/T sensor
1/26/2017 – 2/16/2017	pH and Conductivity sensors failed. Instrument recalibrated on 4/13/2017.
4/28/2017	pH module replaced
7/24/2017	Conductivity probe failure
9/19/2017	Sonde failure
6/28/2023-7/12/2023	Communication failure. Data gap during this period.
January 2023	Expect data gaps due to inconsistent power supply
August 2024	Station was vandalized and telemetry equipment was stolen. Station continues to collect data, but they are not available in real-time.

Distribution Terms:

HRECOS requests that attribution be given whenever HRECOS material is reproduced and re-disseminated and the HRECOS Coordinator be notified prior to publications including any part of the data. Example citation: "Hudson River Environmental Conditions Observing System. 2012. Albany Hydrologic Station data. Accessed April 13th, 2016. <http://www.hrecos.org/>."

Data Quality Assurance:

Data collection and verification have been performed on all parameters (except velocity; see below) since the establishment of this station (January 2011) according to the HRECOS Quality Assurance Project Plan, which is available at www.hrecos.org

Remark on velocity: The level gage and velocity meter have been maintained by the U.S. Geological Survey since their adoption/installation by the agency in September 2016. Water elevation is verified by USGS annually, while velocity is only a working dataset and is primarily purposed for short-term operational use. USGS-verified data may have been corrected based on field measurements, sensor calibrations, sensor cleanings, and other observations using standard USGS methodology. Unverified data is provisional and is subject to revision.

Code Definitions

Flag code definitions:

A	Accepted data
P	Provisional data
S	Suspect data, consult comment codes
R	Rejected data, consult comment codes
C	Corrected data, consult comment codes

Comment code definitions:

General Errors

[GIM]	instrument malfunction
[GIT]	instrument recording error, recovered telemetry data
[GMC]	no instrument deployed due to maintenance/calibration
[GPF]	power failure/low battery
[GQR]	rejected due to QAQC checks
[GSM]	see metadata
[GIC]	no instrument deployed due to ice
[GNF]	deployment tube clogged/no flow
[GOW]	out of water event

Sensor Errors

[SBO]	blocked optic
[STF]	catastrophic temperature sensor failure
[SCF]	conductivity sensor failure
[SDF]	depth port frozen
[SDP]	DO membrane puncture
[SDO]	DO suspect
[SIC]	incorrect calibration/contaminated standard
[SNV]	negative value
[SPC]	post calibration out of range
[SSD]	sensor drift
[SSM]	sensor malfunction
[SOW]	sensor out of water
[SSR]	sensor removed (not deployed)
[STS]	turbidity spike
[SWM]	wiper malfunction/loss

Comments

(CAB)	algal bloom
(CAF)	acceptable calibration/accuracy error of sensor
(CAP)	depth sensor in water, affected by atmospheric pressure
(CBF)	biofouling
(CCU)	cause unknown
(CDA)	DO hypoxia < 28 percent saturation
(CDB)	disturbed bottom
(CDF)	data appear to fit conditions
(CFK)	fish kill
(CIP)	surface ice present at sample station
(CLT)	low tide
(CMC)	in field maintenance/cleaning
(CMD)	mud in probe guard

(CND)	new deployment begins
(CRE)	significant rain event
(CSM)	see metadata
(CTS)	turbidity spike
(CVT)	possible vandalism/tampering
(CWD)	data collected at wrong depth
(CWE)	significant weather event

YSI EXO2 Sensor Specifications:

Consult description and remarks for upgrade dates.

Parameter: Temperature

Units: Celsius (C)

Sensor Type: Thermistor

Model#: 599870-01

Range: -5 to 50 C

Accuracy: -5 to 35: +/- 0.01, 35 to 50: +/- .005

Resolution: 0.01 C

Parameter: Conductivity

Units: mS/cm

Sensor Type: 4-electrode cell with autoranging

Model#: 599870-01

Range: 0-200 mS/cm

Accuracy: 0 to 100: +/- 0.5% of reading or 0.001 mS/cm; 100 to 200: +/- 1% of reading

Resolution: 0.001 mS/cm to 0.1 mS/cm

Parameter: Salinity

Units: practical salinity units (psu)/parts per thousand (ppt)

Sensor Type: Calculated from conductivity and temperature

Range: 0 to 70 psu

Accuracy: +/- 1.0% of reading pr 0.1 ppt, whichever is greater

Resolution: 0.01 psu

Parameter: Dissolved Oxygen % saturation

Sensor Type: Optical probe w/ mechanical cleaning

Model#: 599100-01

Range: 0 to 500% air saturation

Accuracy: 0-200% air saturation: +/- 1% of the reading or 1% air saturation, whichever is greater 200-500% air saturation: +/- 5% or reading

Resolution: 0.1% air saturation

Parameter: Dissolved Oxygen mg/L (Calculated from % air saturation, temperature, and salinity)

Units: milligrams/Liter (mg/L)

Sensor Type: Optical probe w/ mechanical cleaning

Model#: 599100-01

Range: 0 to 50 mg/L

Accuracy: 0-20 mg/L: +/-0.1 mg/l or 1% of the reading, whichever is greater 20 to 50 mg/L: +/- 5% of the reading

Resolution: 0.01 mg/L

Parameter: pH

Units: pH units

Sensor Type: Glass combination electrode

Model#: 599701 (guarded) or 599702 (wiped)

Range: 0 to 14 units

Accuracy: +/- 0.01 units within +/- 10° of calibration temperature, +/- 0.02 units for entire temperature range
Resolution: 0.01 units

Parameter: Turbidity

Units: formazin nephelometric units (FNU)

Sensor Type: Optical, 90-degree scatter

Model#: 599101-01

Range: 0 to 4000 FNU

Accuracy: 0 to 999 FNU: 0.3 FNU or +/-2% of reading (whichever is greater); 1000 to 4000 FNU +/-5% of reading

Resolution: 0 to 999 FNU: 0.01 FNU, 1000 to 4000 FNU: 0.1 FNU

Parameter: Chlorophyll

Units: micrograms/Liter, RFU

Sensor Type: Optical probe

Model#: 599102-01

Range: 0 to 400 ug/Liter; 0 to 100 RFU

Accuracy: Dependent on methodology

Resolution: 0.1 ug/L chl a, 0.1% RFU

Parameter: Phycocyanin

Units: micrograms/Liter, RFU

Sensor Type: Optical probe

Model#: 599102-01

Range: 0 to 100 ug/Liter; 0 to 100 RFU

Accuracy: Dependent on methodology

Resolution: 0.1 ug/L PC, 0.1% RFU

Remarks on Sensor Specifications and Units

Conductivity:

Historically, specific conductivity data from HRECOS sites was reported in millisiemens/cm. However beginning in 2019, reporting switched to microsiemens/cm. All data files available on hrecos.org have been converted to reflect this change.

Chlorophyll and Phycocyanin Disclaimer:

YSI chlorophyll sensors (6025 or 599102-01) are designed to serve as a proxy for chlorophyll concentrations in the field for monitoring applications and complement traditional lab extraction methods; therefore, there are accuracy limitations associated with the data that are detailed in the YSI manual.

Appendix A

Quarterly Report: Station Maintenance and Characterizing variability at HRECOS sites.

July 1, 2013 through August 31, 2013

Prepared by:

Stuart Findlay, Cary Institute of Ecosystem Studies, Millbrook, NY

Transmitted to Alene Onion, HRECOS Coordinator on October 10, 2013

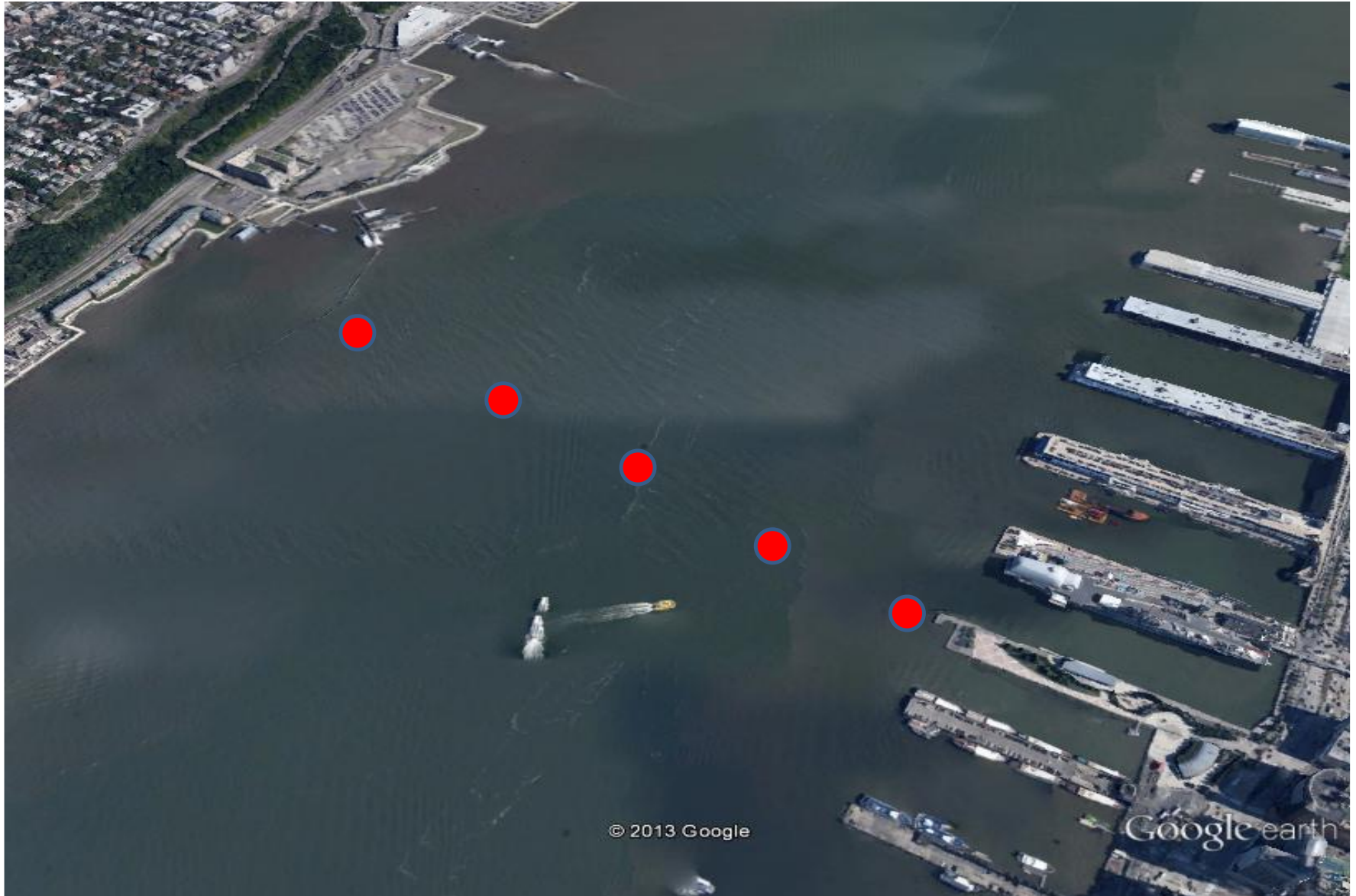
Station Maintenance: During this reporting period we changed the Schodack sonde (8/21) and did QAQC on 2nd quarter data from the Piermont, Marist and Schodack hydrological sites.

Station Characterization: We conducted a characterization of the cross-section at Pier 84 on July 8 working from the Riverkeeper boat.

Beginning at the east side adjacent to the existing sonde we used a comparable sonde logging at 30 sec intervals to describe conditions laterally across the River with vertical measurements at five separate locations (see image and all Figures in attached PPT). Site A is near the shore-mounted sonde on the Pier, Site E is just outside the line of pilings near the West shore. At each location the sonde was held near surface, 5 m 10 m and 15 m where depths allowed for several minutes to acquire multiple readings. All data discussed below are plotted against depth as recorded by the sonde. Values reported by the shore-mounted sonde for a 4-hour period surrounding the time of field measurements are shown as a blue box on the y-axis of site A for comparison.

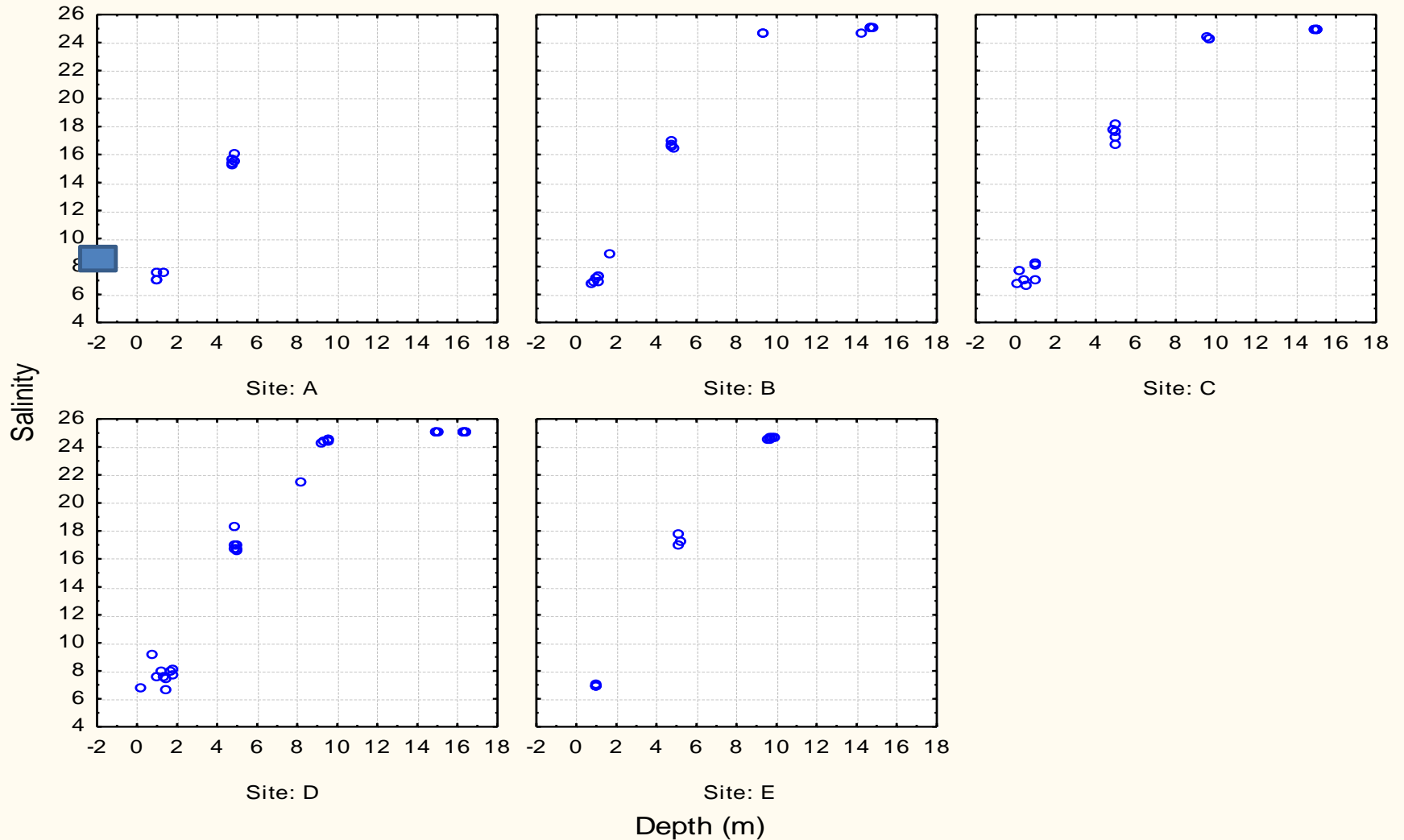
As expected, these observations show a great deal of vertical variability in all variables almost certainly as a result of stratification of saltier bottom water and fresher surface water. This variation in water masses will appear as temporal variation as the tides change and this is evident in the shore-mounted records but not from the single snapshot cross-section captured in this field sampling. In general, there were distinct increases in salinity and decreases in dissolved oxygen with depth as would be expected in a stratified system. Turbidity shows surprisingly little variation across the section or among depths which may simply be related to the timing of sampling of this particular cross-section. The shore-mounted sonde reported considerably higher turbidity than even the adjacent surface water measurements which may result from either lack of cross-comparability in the instruments or a very localized source of suspended sediments. The shore sonde is a newer model and reports turbidity in FNU which are supposed to be roughly equivalent to NTU as recorded by the 6600 used for the channel measurements. Aside from Turbidity, the shore site does a reasonable job of capturing conditions across this cross-section under these conditions. This cross-section is expected to show very high temporal variability as water masses mix and salt-water and potentially the turbidity maximum move past Pier 84.

PIER 84 Cross-section July 2013



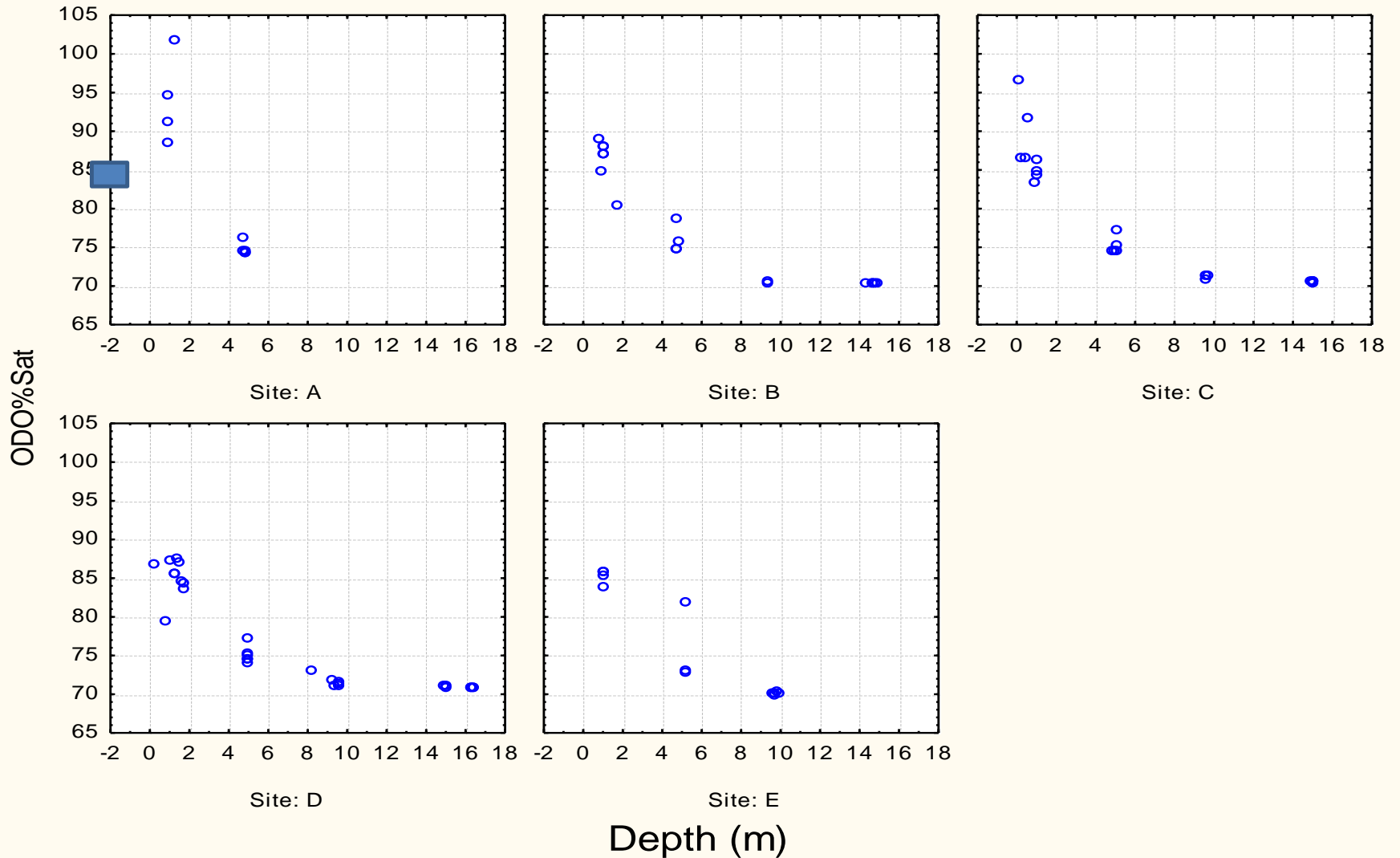
Salinity

Site A is East side (adjacent to shore sonde), Site E is West side



Dissolved Oxygen (% Saturation)

Site A is East side (adjacent to shore sonde), Site E is West side



Turbidity

Site A is East side (adjacent to shore sonde), Site E is West side

