**HRECOS Schodack Landing Water Quality Metadata**

**Last updated: 03/24/2025**

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**Station Overview**
Location: Schodack Island State Park (42.4996 N, 73.7768 W)

Data collection period: 05/09/2008 – present

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

*Chlorophyll measurements ceased 12/12/2011

**Water elevation calculated using a formula; see below.

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**Station Description:**
The hydrologic site for Schodack Landing is immediately south of the Schodack Island State Park boat launch and the instrument housing is fixed to the steel bulkhead. Total water depth at mean low water is about 2 m and the instrument is about 0.5 m above the bottom. With the shoreline position of the deployment the data represent the relatively shallow areas of this portion of the Hudson River. Cross-channel sampling shows this part of the River is well-mixed for DO, and dissolved ions (conductivity, pH) but there are tidal increases in turbidity near the shoreline. The site is about 10 miles downstream of Albany.

Water elevation is calculated in real-time since it was surveyed in (NAVD88) on 11/25/2012 (Water Elevation = -1.48265 + sonde depth). Because the depth sensor is not vented to the atmosphere, we adjust depth measurements for barometric pressure using the following equation:

*Corrected Depth = Depth + ((1013- Barometric Pressure) * .0102)*

This correction is performed in real-time on all data since 9/23/2011 00:00:00 EST. Data is recorded by a CR800 logger.

Chlorophyll measurements ended 12/12/2011 when it was decided that data from this instrument were not informative.

In August of 2022, site equipment was upgraded from YSI 6600 to YSI EXO2.

**Summary of Cross Channel Analysis:**
Based on summer sampling in 2009, solutes (gases, conductivity) were homogeneous across the channel and so the near-shore continuous record can probably be considered representative of the cross-section. Not surprisingly, turbidity, suspended sediment and chlorophyll varied considerably over space and time with most patterns appearing related to tide stage. At sampling times near low water and early in the flood tide the locations are dramatically different with rapid changes in which portion of the channel shows highest concentrations. At other time the three locations are similar and so a single sampling point would be more representative of the suspended sediment in the cross section. The full report is given as appendix A.

**Special Remarks:**

| Date | Remark |
|---|---|
| **8/2/2022** | 6600 sonde was replaced with a YSI EXO2. |
| **August 2024-March 2024** | Ongoing telemetry issues. Expect data gaps during this time period. |

**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

**YSI 6600 Sensor Specifications**
Consult description and remarks for upgrade dates.

Parameter: Temperature
Units: Celsius (C)
Sensor Type: Thermistor
Model#: 6560
Range: -5 to 45 C
Accuracy: +/- 0.15 C
Resolution: 0.01 C

Parameter: Conductivity
Units: mS/cm
Sensor Type: nickel electrode
Model#: 6560
Range: 0-100 mS/cm
Accuracy: 0 to 100: +/- 0.5% of reading or 0.001 mS/cm
Resolution: 0.001 mS/cm to 0.1 mS/cm

Parameter: Salinity
Units: parts per thousand (ppt)
Sensor Type: Calculated from conductivity and temperature

Parameter: Dissolved Oxygen % saturation
Sensor Type: Optical probe w/ mechanical cleaning
Model#: 6150 ROX
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: +/- 15% 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#: 6150 ROX
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#: 6589
Range: 0 to 14 units
Accuracy: +/- 0.2 units
Resolution: 0.01 units

Parameter: Turbidity
Units: nephelometric turbidity units (NTU)
Sensor Type: Optical
Model#: 6136
Range: 0 to 1000 NTU
Accuracy: +/-2% of reading or 0.3 NTU (whichever is greater
Resolution: 0.1 NTU

Parameter: Chlorophyll
Units: RFU, micrograms/Liter
Sensor Type: Optical probe
Model#: 6025
Range: 0 to 400 ug/Liter; 0 to 100 RFU
Accuracy: Dependent on methodology
Resolution: 0.1 ug/L chl a, 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.

*Salinity:*

The 6600 series sondes report salinity in parts per thousand (ppt) units, the EXO sondes report practical salinity units (psu).

*Turbidity:*

The 6600 series sondes report turbidity in nephelometric turbidity units (NTU), the EXO sondes use formazin nephelometric units (FNU).

*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**

Final Report – HRECOS Installation at Schodack Island State Park
Stuart Findlay
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HRF Award # 001/07E
October 30, 2009

The original proposal to the Hudson River Foundation had several major goals and all these have been met and surpassed over the last two years.

1. Installation – A functional, multi-variable water quality and meteorological site has been established at the SISP in collaboration with Gary Wall of the USGS. The site has been operational with very minor gaps since spring of 2008.

2. Field sampling – To determine how well the shore-mounted site captures variability across the channel we collected water samples from the east and west shore over a 24 hr period using ISCO Automatic samplers. During the last ten hours we sampled three points across the channel cross-section with surface, mid-depth and near-bottom samples. Solutes (gases, conductivity) were homogeneous across the channel and so the near-shore continuous record can probably be considered representative of the cross-section. Not surprisingly, turbidity, suspended sediment and chlorophyll varied considerably over space and time with most patterns appearing related to tide stage. The Figure below shows the suspended matter concentrations at the East, Mid and Western channel sites over an ebbing-flooding transition. At sampling times near low water and early in the flood tide the locations are dramatically different with rapid changes in which portion of the channel shows highest concentrations. At other time the three locations are fairly similar and so a single sampling point would be more representative of the suspended sediment in the cross section.