|  |  |
| --- | --- |
| **Metadata: Pier 84 Water Quality**  **C:\HRECOS\HRECOS_logo.small.TIFLocation:** Pier 84, New York, NY ([40.764628 N, 74.003186 W](https://maps.google.com/maps?q=40+45%2752.66%22+N,+74+00%2711.47%22+W&hl=en&ll=40.764222,-74.002748&spn=0.00321,0.004823&sll=42.769037,-74.00485&sspn=0.003103,0.015965&t=h&z=18))  **Data collection period:** 12/21/2012 – present  **Parameters:** acidity, dissolved oxygen, specific conductance, turbidity,  water temperature, depth | |
| **Disclaimer**: HRECOS is a research project. No warranty—either express or implied—is made for any information presented by this program. | |
| **Contacts**:  Brittney Flaten, HRECOS Coordinator  NY State Dept. of Environmental Conservation  256 Norrie Point Way  Staatsburg, NY 12580  Phone: 845-889-4745  Email: brittney.flaten [at] dec.ny.gov | Carrie Roble, Station Manager  Hudson River Park Trust  353 West Street, Pier 40, 2nd Fl.  New York, NY 10014  Email: croble [at] hrpt.ny.gov |
| **Station details:**  The purpose of the Hudson River Park Pier 84 station is to generate a consistent and precise 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 (40°45'52.66"N, 74°00'11.47"W). 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 and record Dissolved Oxygen (mg/L and %sat), pH, Specific Conductance (µS/cm) and Salinity (ppt), Turbidity (NTU), Depth\* (m), and Water Temperature (°C) (see sensor specs section for details).  Data is recorded by a CR200 datalogger and transmitted to the HRECOS database via a Raven XT Cellular Modem.  \*Depth measurements at this site are not corrected for the influence of atmospheric pressure (see [here](http://www.ysi.com/parametersdetail.php?Depth-8) 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:  *Corrected depth = measured depth + ((1013 - barometric pressure) \* .0102)* | |
| **Special remarks / notes:**   * 7/24 – 12/31/2014 – All depth data flagged as suspicious due to erratic and jumping values, possibly due to a fouled depth port. * Feb-March 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 model * 1/26/2017 – 2/16/2017 – 14L pH and Conductivity sensors failed. Instrument recalibrated on 4/13/2017. * 4/28/2017 – 12J pH module replaced and recalibrated * 7/24/2017 – 16H Conductivity probe not reading on EXO program. Replaced and recalibrated. * 9/19/2017 – Sonde 16H show flat line in data. Replaced and recalibrated w/ 14L on 9/20. * 10/11/2017 – Deployed Sonde 14L at Pier 84 and power cycled station. | |
| **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. Pier 84 Station data. Accessed April 13th, 2016. <http://www.hrecos.org/>.” | |
| **Data Quality Assurance:**  Data collection and verification have been performed since the establishment of this station (December 2012) according to the HRECOS Quality Assurance Project Plan, which is available at [www.hrecos.org.](http://www.hrecos.org) See relevant section on following pages for comment code definitions. | |
| **QAQC 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 | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Units | Sensor type | Model | Range | Accuracy | Resolution | Other |
| **Acidity** | Hydrogen ion concentration (pH) | Glass combination electrode | 599702 | 0 – 14 units | ±0.1 pH units within ±10˚C of calibration temp; ±0.2 pH units for entire temp range | 0.01 units | NA |
| **Conductivity** | Microsiemens per cm (µS/cm) | 4-electrode cell with auto ranging | 599870-01 | 0 – 200 µS/cm | 0 to 100: ±0.5% of reading or 0.001 mS/cm, whichever is greater.; 100 to 200: ±1% of reading | 0.0001 – 0.01 µS/cm (range dependent) | NA |
| **Dissolved oxygen** | Air saturation (%)  ¾¾¾¾  mg/L | Optical  ¾¾¾¾  Calculated | 599199-01 | 0 – 500%  ¾¾¾¾  0 – 50 mg/L | 0 – 200%: ±1%  200 – 500%: ±5%  ¾¾¾¾  0 – 20 mg/L: ±-0.1 mg/L or 1% (whichever is greater);  20 – 50 mg/L: ±5% | 0.1%  ¾¾¾¾  0.01 mg/L | NA |
| **Salinity** | Practical salinity units (PSU) | Calculated from conductivity and temperature | 599870-01 |  |  |  | NA |
| **Turbidity** | Formazin Nephelometric Unit (FNU) | Optical | 599101-01 | 0 – 4000 FNU | 0 to 999: 0.3 or ±2% of reading, 1000 to 4000: ±5% of reading | 0 to 999 = 0.1 FNU | NA |
| **Water level** | Meters (m) | Pressure Transducer | Integral in EXO2 sonde | 0 – 10 m | 0 – 15 ft: ±0.01 ft (0.003 m);  15 – 35 ft: ±0.065%;  35 – 50 ft (0.006 m) | Max. traceable rate of change: 3 ft/minute | Non-vented |
| **Water temperature** | Celsius (°C) | Thermistor | 599870-01 | -5 to 35 °C | ±0.04% FS (±0.004 m or ±0.013 ft) | 0.001 °C | NA |

**Table 1. YSI EXO2 sensor specifications.**

**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.





****

****