Padilla Bay (PDB) NERR Water Quality Metadata
January – December 2009
Latest Update: June 30, 2025

I. Data Set and Research Descriptors

1) Principal investigator & contact persons:

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2) Entry verification –

Deployment data are uploaded from the YSI data logger to a Personal Computer (IBM compatible). Files are exported from EcoWatch in a comma-delimited format (.CDF) and uploaded to the CDMO where they undergo automated primary QAQC; automated depth/level corrections for changes in barometric pressure (cDepth or cLevel parameters); and become part of the CDMO's online provisional database. All pre- and post-deployment data are removed from the file prior to upload. During primary QAQC, data are flagged if they are missing or out of sensor range. The edited file is then returned to the Reserve for secondary QAQC where it is opened in Microsoft Excel and processed using the CDMO's NERRQAQC Excel macro. The macro inserts station codes, creates metadata worksheets for flagged data and summary statistics, and graphs the data for review. It allows the user to apply QAQC flags and codes to the data, remove any overlapping deployment data, append files, and export the resulting data file for upload to the CDMO. Upload after secondary QAQC results in ingestion into the database as provisional plus data, recalculation of cDepth or cLevel parameters, and finally tertiary QAQC by the CDMO and assimilation into the CDMO's authoritative online database. Where deployment overlap occurs between files, the data produced by the newly calibrated sonde is generally accepted as being the most accurate. For more information on QAQC flags and codes, see Sections 11 and 12.

Edited and raw files are archived on a PC hard drive at Padilla Bay NERR as well as on the Padilla Bay server. The Padilla Bay server is backed up as per Washington Department of Ecology protocols with backup files created weekly and monthly. Nicole Burnett completed this process of entry verification for the 2009 data. Nicole Burnett and Douglas Bulthuis completed final verification and this metadata documentation.

The following QAQC procedures were used to evaluate the turbidity data. If a value was between 100 and 1000 ntu the data around the high value were examined to determine if the value was due to a real turbidity event or some other cause such as biofouling. If the value was during real turbidity event it was flagged as 0 CTS meaning good data but turbidity spike. If the value over 100 ntu was deemed to be from some other cause, it was flagged either as suspect (1) or rejected (-3)and STS. All data over 1000 ntu were flagged -3 STS.

3) Research objectives – The Bay View Channel site has been set out to detect and monitor short-term variability and long-term changes in the southern part of Padilla Bay. The Ploeg Channel site has been set out to detect and monitor short-term variability and long-term change in the northern part of Padilla Bay for comparison and contrast with water quality in the southern part of the bay. The Joe Leary Slough site has been set at the mouth of the slough to measure the effects of tidal "closure" of the tide gates on water in the slough and to detect long-term changes in water quality in the slough associated with implementation of a non point source pollution watershed action plan. The Joe Leary Estuary site has been set out to improve data collection in Joe Leary Slough and replaces the Joe Leary Slough site. Although it is outside the tide gates (on the marine side of the tide gates) it provides data on the freshwater coming out of the tide gates when they are open. The Gong site has been set in the deep water strait west of the northern part of Padilla Bay to monitor short-term variability and long-term change in the waters that are a source for the tidal waters flowing into Padilla Bay. The four sites are set up to provide an indication of the salinity gradient from Joe Leary Slough (freshwater) through Bayview Channel (downstream of freshwater sources from Indian and No Name Sloughs) to Ploeg Channel (remote from freshwater sources

but in a tidal channel) to Gong on the marine end of the gradient. Measurements are taken every 15 minutes at the Bayview, Ploeg, Gong and Joe Leary sites, unless otherwise noted.

4) Research methods –

YSI 6600 sondes were deployed in Joe Leary Slough in a vertical position, 0.7 m from the bottom of the slough in a 4 in. diameter ABS pipe with a metal bar secured at the bottom as a stop. That portion of pipe around the sensors is cut out so that only two one-inch wide strips of deployment pipe remain around the sensor guard to allow water circulation around the probes. The ABS pipe is attached to a steel pipe that was driven into the sediment. (This slough was dredged in the fall of 2000 so the area of deployment is much deeper than it had been from 1995 to 2000. To keep the data comparable the YSI is deployed at the same height relative to Mean Sea Level. The slough near the deployment site slowly fills with sediment and is periodically dredged. The height above the bottom thus varies from year to year and during the year. This slough was dredged in the summer of 2006, and again early September to mid November 2009). Because the site was constantly being filled in with sediment it was decommissioned as a site on July 14th 2009 and replaced with Joe Leary Estuary.

YSI 6600 sondes were deployed in Joe Leary Estuary which is near the tide gates on Joe Leary Slough but on the marine side starting March 25, 2009. The sonde is housed in an ABS pipe as described above. The ABS is attached to a wood piling and is positioned so that the sonde is 0.1 m above the bottom on the sloping edge of the slough.

YSI 6600 sondes were deployed in Padilla Bay in a tributary of Bayview Channel. They were deployed using the same design as that in Joe Leary Slough, except that the ABS pipe was attached to a 8 inch galvanized steel pile. The depth of the YSI was –1.1 m (depth below MLLW) and about 0.6 m above the bottom along the sloping edge of a small channel draining the surrounding intertidal flats.

YSI 6600 sondes were deployed in Ploeg Channel using the same design as that in Bayview Channel. The depth of the datalogger was –1.33 m (depth below MLLW) and 0.33 m above the bottom along the sloping edge of a channel draining the surrounding intertidal flats.

YSI 6600 sondes were deployed at the Gong site from 1/22/09 to 8/1/09. The sonde housing tube is located on the side of a 54 inch diameter oceanographic data buoy with an instrument tower and extends into the water so the sonde sits 1 meter below the surface of the water. That portion of sonde housing tube around the sensors (to bottom 8" of the tube) has ten 1 ½" holes and the bottom of tube is open to the water. This allows water to circulate around the probes while still having a substantial amount of pipe intact to protect the sonde and sensors. The buoy is anchored to the bottom (~ 18 m) with a 1250 lb lead anchor. The anchor system failed 8/1/09 and the buoy was not deployed again until 2010.

In all cases, measurements of temperature, specific conductivity, salinity, percent saturation of dissolved oxygen, dissolved oxygen concentration, depth, pH and turbidity are recorded every 15 minutes. At the end of each deployment, the YSI 6600 is brought back into the laboratory for downloading, cleaning, and recalibration. Before final cleaning and recalibration a post-deployment check is done that consists of recording sensor readings in the standard solutions. The results of these checks are used to help evaluate the validity of the logged data.

All calibrations are conducted according to the protocols in the YSI Environmental Operations Manual for the 6-Series Environmental Monitoring Systems. For the conductivity calibration a conductivity standard of 50 mS/cm was used. The pH calibration is a 2-point calibration using standard buffer solutions with a pH of 7 and 10. ROX oxygen probes only require yearly membrane maintenance and are calibrated in saturated water using 2 air stones to obtained 100% saturation. A 2-point calibration is used for the turbidity probe and the wiper pad is changed prior to each deployment. The standards used are distilled/deionized water for zero and 4000 NTU Formazin diluted to 100 NTU (January –March) or 126 NTU YSI turbidity standard for YSI (April – Current).

A Sutron Sat-Link2 transmitter was installed at the Joe Leary station from 12/20/05 to 7/24/09 and transmited data to the NOAA GOES satellite, NESDIS ID #3B004470 (Where # 3B004470 is the GOES ID for that particular station.) The same transmitter was installed at the Ploeg site on 10/7/09 and retains the NESDIS ID. A second Sutron Sat-Link2 transmitter was installed at the Bayview site on 09/02/09 and transmits data to the NOAA GOES satellite, NESDIS ID # 3B041136 (Where # 3B041136 is the GOES ID for that particular station.) The transmissions are scheduled hourly and contain four (4) data sets reflecting fifteen minute data sampling intervals. Upon receipt by the CDMO, the data undergoes the same automated primary QAQC process detailed in Section 2 above. The "real-time" telemetry data become part of the provisional dataset until undergoing secondary and tertiary QAQC and assimilation in the CDMO's authoritative online database. Provisional and authoritative data are available at http://cdmo.baruch.sc.edu.

5) Site location and character –

General: Padilla Bay (48º 30' N; 122º 30' W) is a shallow embayment in northern Puget Sound. The tide flats are dominated by the eelgrass *Zostera marina*, which covers approximately 3,000 ha. *Zostera japonica*, a recent introduction to the region, now covers about 350 ha of the bay. Tides are mixed semi-diurnal with a mean range of 1.55 m. Salinity varies from about 23 to 32 PSU. Padilla Bay is an "orphaned" estuary in that the Skagit River no longer empties directly into it. Most of the land in the 9300 ha Padilla Bay watershed is agricultural, and is drained by four sloughs which empty into the bay through tide gates. The salinity in Padilla Bay reflects both the sloughs that flow into the bay and the greater Puget Sound-Georgia Basin estuary in which Padilla Bay is located. Major freshwater flows into this area of the Puget Sound-Georgia Basin estuary come from the Fraser and Nooksack Rivers to the north and from the Skagit River to the south. The small Samish River discharges directly north of Padilla Bay.

Joe Leary Slough Site: (48º 31' 05.3" N; 122º 28' 22.8" W) Joe Leary Slough drains land that is predominantly annual crop agriculture, pasture land, and berries with some low-density housing. The slough is characterized by high fecal and nutrient inputs, high turbidity, and low dissolved oxygen concentrations. During the summer, there is low flow and the depth ranges from 0.5-1.5 m. During winter flooding, the slough can reach a depth of 4 m. There is a dam at the mouth of the slough with twelve 4 ft. diameter outfall pipes that have one-way hinged tide gates. Upstream water flows out of Joe Leary Slough when water height in Padilla Bay is lower than water height in Joe Leary Slough (i.e. ebbing tide and low water). Some saline water from Padilla Bay seeps through the tide gates during high water. The bottom of the slough is composed of very soft sediment, which is periodically dredged, most recently October 2006. The deployment site is on the freshwater side of the tide gates. The latitude/longitude were measured with a Trimble GeoExplorer II and differentially corrected with post processing providing a manufacturer's stated accuracy of ± 5 m.

Joe Leary Estuary Site: (48º 31' 08.1" N; 122º 28' 29.9" W) The site description is the same as for Joe Leary Slough site except that Joe Leary Estuary site is located on the marine side of the tide gates. This site is characterized by fully marine water ranging in salinity 23 to 32 PSU when the tide gates are closed and by water that is fully fresh (0.5 PSU) when the tide gates are open. The switch from marine to fresh water and vice versa occurs rapidly (< 1 hour) each time there is a tide change. The latitude/longitude were measured with a handheld GPS unit with an accuracy of ± 6.7m.

Bayview Channel Site: (48º 29' 46.6" N; 122º 30' 01.8" W) Bayview Channel, a major Padilla Bay tributary/distributary, floods and drains intertidal flats including eelgrass beds, mats of macroalgae, and flats without macro-vegetation. The datalogger is located in a tributary channel to Bayview Channel. The tributary drains predominately eelgrass (*Zostera marina* and *Z. japonica*) covered intertidal flats. Bottom sediments beneath the deployment site are fine silt and clay overlying sand. Depth at this site is –1.5 m (depth below MLLW). Pollutants entering the bay include with general non-point source, agricultural non-point source, and fecal coliform bacteria from agriculture, failing septic tanks and wildlife. The latitude/longitude were measured with a Trimble GeoExplorer II and differentially corrected with post processing providing a manufacturer's stated accuracy of ± 5 m.

Ploeg Channel Site: (48º 33' 23.5" N; 122º 31' 46.7" W) Ploeg Channel floods and drains intertidal flats at the north end of Padilla Bay that are comprised of intertidal flats with eelgrass beds (*Zostera marina* and *Z. japonica*) and intertidal flats without macro-vegetation in approximately equal amounts. Bottom sediments beneath the deployment site are fine silt. Depth at this site is –1.5 m (depth below MLLW). Pollutants entering the bay include general non-point source, agricultural non-point source, and fecal coliform bacteria from agriculture, failing septic tanks and wildlife. The latitude/longitude were measured with a Trimble GeoExplorer II and differentially corrected with post processing providing a manufacturer's stated accuracy of ± 5 m.

Gong Site: (48º 33' 30" N; 122º 34' 21" W) The Gong site is located at –18 m water depth on a gradually sloping bottom (from –1 m to –75 m over 2 km) in the strait between Samish and Guemes Islands. Water in the strait flows north and south with tidal currents, the net water movement is apparently south toward the inlet to Guemes Channel. Water from the strait flows onto the intertidal flats in the northern part of Padilla Bay with each tidal cycle. Bottom sediments are mud. YSI 6600 sondes are deployed near the surface at this site 0.5 m below the water surface. The only apparent pollution sources are the general sources of pollution to the Strait of Georgia and Northwest Straits. The latitude/longitude were measured with a Trimble GeoExplorer II and differentially corrected with post processing providing a manufacturer's stated accuracy of ± 5 m.

6) Data collection period –

Data collection was continuous from January 1 to December 31, 2009 at Bayview Channel and Ploeg Channel except as noted in the flagged data (explained in section 11). Data collection was continuous from January 30, 2009 to August 1, 2009 at Gong Surface site and from March 25, 2010 to December 31, 2009 at Joe Leary Estuary site except as noted in the flagged data (explained in section 11).
Deployment and retrieval times are listed below. The times indicate the first and last measurements made with each deployment. Initial collection began at Bayview and Joe Leary sites in 1995, at the Ploeg Channel site in 2001, at the Gong Surface site in 2003, and at the Joe Leary Estuary site in 2009.

Bayview Channel

Date	Time	Date	Time
12/16/2008	14:0	1/14/2009	14:00
1/14/2009	14:30	2/12/2009	15:00
2/12/2009	15:15	3/12/2009	9:30
3/12/2009	9:45	4/9/2009	9:00
4/9/2009	9:15	5/8/2009	8:15
5/8/2009	8:30	6/11/2009	9:15
6/11/2009	9:30	7/1/2009	8:45
7/1/2009	9:00	8/12/2009	10:15
8/12/2009	10:30	9/17/2009	12:30
9/17/2009	12:45	9/24/2009	9:00
9/24/2009	9:15	10/14/2009	10:45
10/14/2009	11:00	11/11/2009	11:00
11/11/2009	11:15	12/17/2009	8:45
12/17/2009	9:00	1/13/2010	13:00

Ploeg Channel

Date	Time	Date	Time
12/16/2008	14:45	1/14/2009	14:45
1/14/2009	15:00	2/12/2009	14:30
2/12/2009	15:00	3/12/2009	9:00
3/12/2009	9:15	4/9/2009	8:15
4/9/2009	8:30	5/8/2009	7:30
5/8/2009	7:45	6/11/2009	8:30
6/11/2009	8:45	7/8/2009	7:45
7/8/2009	8:00	8/12/2009	9:45
8/12/2009	10:00	9/17/2009	10:30
9/17/2009	10:45	10/14/2009	10:00
10/14/2009	10:15	11/11/2009	10:15
11/11/2009	10:30	11/12/2009	14:00
11/12/2009	14:15	12/17/2009	8:15
12/17/2009	8:30	12/18/2009	13: 15
12/18/2009	14:00	1/13/2010	13:15

Gong Surface

Date	Time	Date	Time
1/30/2009	12:15	2/12/2009	14:15

2/12/2009	14:30	3/12/2009	8:45
3/12/2009	9:00	4/9/2009	8:00
4/9/2009	8:15	5/8/2009	7:45
5/8/2009	8:00	6/11/2009	8:45
6/11/2009	9:00	7/8/2009	8:15
7/8/2009	8:30	8/4/2009	9:15

Joe Leary Slough

Date	Time	Date	Time
12/16/2008	12:30	1/14/2009	16:15
1/14/2009	16:30	2/12/2009	11:30
2/12/2009	18:00	2/25/2009	11:30
2/25/2009	11:45	3/25/2009	14:00
3/25/2009	14:30	4/8/2009	10:45
4/8/2009	11:00	5/14/2009	9:0
5/14/2009	9:30	5/19/2009	12:30
5/19/2009	13:45	6/16/2009	13:15
6/16/2009	13:30	7/14/2009	13:00

Joe Leary Estuary

Date	Time	Date	Time
3/25/2009	13:45	4/22/2009	13:00
4/22/2009	13:15	5/14/2009	8:00
5/14/2009	8:30	6/16/2009	13:00
6/16/2009	13:15	7/14/2009	12:45
7/14/2009	13:00	8/12/2009	7:15
8/12/2009	7:30	9/18/2009	9:00
9/18/2009	9:15	10/14/2009	7:00
10/14/2009	7:15	11/11/2009	8:00
11/11/2009	8:15	12/17/2009	9:30
12/17/2009	9:45	1/13/2009	14:00

7) Distribution –

NOAA/ERD retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The PI retains the right to be fully credited for having collected and processed the data. Following academic courtesy standards, the PI and NERR site where the data were collected will be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. Manuscripts resulting from this NOAA/OCRM supported research that are produced for publication in open literature, including refereed scientific journals, will acknowledge that the research was conducted under an award from the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration. The data set enclosed within this package/transmission is only as good as the quality assurance and quality control procedures outlined by the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal government does not assume liability to the Recipient or third persons, nor will the Federal government reimburse or

indemnify the Recipient for its liability due to any losses resulting in any way from the use of this data.

NERR water quality data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see Principal Investigators and Contact Persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under the general information link on the CDMO home page) and online at the CDMO home page http://cdmo.baruch.sc.edu/. Data are available in text tab-delimited format.

8) Associated researchers and projects– The Padilla Bay NERR collects weather parameters that include Temperature, Relative Humidity, Barometric Pressure, Wind Speed, Wind Direction, LI-COR and Precipitation. The weather station is located at the Southern end of Padilla Bay and can be viewed in near real-time at http://cdmo.baruch.sc.edu.

In addition, water samples are collected at all 4 YSI sites and are filtered for nutrients and chlorophyll a.
*See Meteorological and Nutrient data at http://cdmo.baruch.sc.edu for more information.

II. Physical Structure Descriptors

9) Sensor specifications –

PDB NERR deployed 6600EDS sondes in 2009. All of the sondes are configured the same way.

YSI 6600EDS data sonde:

Parameter: Temperature
Units: Celsius (C)
Sensor Type: Thermistor
Model#: 6560
Range: -5 to 50 C
Accuracy: +/- 0.15
Resolution: 0.01 C

Parameter: Conductivity
Units: milli-Siemens per cm (mS/cm)
Sensor Type: 4-electrode cell with autoranging
Model#: 6560
Range: 0 to 100 mS/cm
Accuracy: +/- 0.5% of reading + 0.001 mS/cm
Resolution: 0.001 mS/cm to 0.1 mS/cm (range dependant)

Parameter: Salinity
Units: parts per thousand (ppt)
Sensor Type: Calculated from conductivity and temperature
Range: 0 to 70 ppt
Accuracy: +/- 1.0% of reading pr 0.1 ppt, whichever is greater
Resolution: 0.01 ppt

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

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: +/- 15% of the reading
Resolution: 0.01 mg/L

Parameter: Non-vented Level - Shallow (Depth)
Units: feet or meters (ft or m)
Sensor Type: Stainless steel strain gauge
Range: 0 to 30 ft (9.1 m)
Accuracy: +/- 0.06 ft (0.018 m)
Resolution: 0.001 ft (0.001 m)

Parameter: pH –EDS flat glass probe
Units: pH units
Sensor Type: Glass combination electrode
Model#: 6561 or 6561FG
Range: 0 to 14 units
Accuracy: +/- 0.2 units
Resolution: 0.01 units

Parameter: Turbidity
Units: nephelometric turbidity units (NTU)
Sensor Type: Optical, 90 degree scatter, with mechanical cleaning
Model#: 6136
Range: 0 to 1000 NTU
Accuracy: +/- 2% of reading or 0.3 NTU (whichever is greater)
Resolution: 0.1 NTU

Depth Qualifier:
The NERR System-Wide Monitoring Program utilizes YSI data sondes that can be equipped with either vented or non-vented depth/level sensors. Readings for both vented and non-vented sensors are automatically compensated for water density change due to variations in temperature and salinity; but for all non-vented depth measurements, changes in atmospheric pressure between calibrations appear as changes in water depth. The error is equal to approximately 1.03 cm for every 1 millibar change in atmospheric pressure, and is eliminated for vented sensors because they are vented to the atmosphere throughout the deployment time interval.

Beginning in 2006, NERR SWMP standard calibration protocol calls for all non-vented depth sensors to read 0 meters at a (local) barometric pressure of 1013.25 mb (760 mm/hg). To achieve this, each site calibrates their depth sensor with a depth offset number, which is calculated using the actual atmospheric pressure at the time of calibration and the equation provided in the SWMP calibration sheet or digital calibration log. This offset procedure standardizes each depth calibration for the entire NERR System. If accurate atmospheric pressure data are available, non-vented sensor depth measurements at any NERR can be corrected.

In 2010, the CDMO began automatically correcting depth/level data for changes in barometric pressure as measured by the Reserve's associated meteorological station during data ingestion. These corrected depth/level data are reported as cDepth and cLevel, and are assigned QAQC flags and codes based on QAQC protocols. Please see sections 11 and 12 for QAQC flag and code definitions.

10) Coded variable definitions –

Sampling station:	Sampling site code:	Station code:
Bayview Channel	BY	pdbbywq
Ploeg Channel	BP	pdbbpwq
Joe Leary	JL	pdbjlwq
Joe Leary Estuary	JE	pdbjewq
Gong Surface	GS	pdbgswq

11) QAQC flag definitions –

QAQC flags provide documentation of the data and are applied to individual data points by insertion into the parameter's associated flag column (header preceded by an F_). During primary automated QAQC (performed by the CDMO), -5, -4, and -2 flags are applied automatically to indicate data that is missing and above or below sensor range. All remaining data are then flagged 0, passing initial QAQC checks. During secondary and tertiary QAQC 1, -3, and 5 flags may be used to note data as suspect, rejected due to QAQC, or corrected.

-5 Outside High Sensor Range
-4 Outside Low Sensor Range
-3 Data Rejected due to QAQC
-2 Missing Data
-1 Optional SWMP Supported Parameter
0 Data Passed Initial QAQC Checks
1 Suspect Data
2 Depth collected from surface or near surface sonde
3 Calculated data: non-vented depth/level sensor correction for changes in barometric pressure
4 Historical Data: Pre-Auto QAQC
5 Corrected Data

12) QAQC code definitions –

QAQC codes are used in conjunction with QAQC flags to provide further documentation of the data and are also applied by insertion into the associated flag column. There are three (3) different code categories, general, sensor, and comment. General errors document general problems with the deployment or YSI datasonde, sensor errors are sensor specific, and comment codes are used to further document conditions or a problem with the data. Only one general or sensor error and one comment code can be applied to a particular data point, but some comment codes (marked with an * below) can be applied to the entire record in the F_Record column.

General Errors

GIC	No instrument deployed due to ice
GIM	Instrument malfunction
GIT	Instrument recording error; recovered telemetry data
GMC	No instrument deployed due to maintenance/calibration
GNF	Deployment tube clogged / no flow
GOW	Out of water event
GPF	Power failure / low battery
GQR	Data rejected due to QA/QC checks
GSM	See metadata

Corrected Depth/Level Data Codes

GCC	Calculated with data that were corrected during QA/QC
GCM	Calculated value could not be determined due to missing data
GCR	Calculated value could not be determined due to rejected data
GCS	Calculated value suspect due to questionable data
GCU	Calculated value could not be determined due to unavailable data

Sensor Errors

SBO	Blocked optic

SCF	Conductivity sensor failure
SDF	Depth port frozen
SDG	Suspect due to sensor diagnostics
SDO	DO suspect
SDP	DO membrane puncture
SFD	Depth from a surface or near surface sonde deployed from a floating platform, does not reflect the depth of the water column or tidal change
SIC	Incorrect calibration / contaminated standard
SNV	Negative value
SOW	Sensor out of water
SPC	Post calibration out of range
SQR	Data rejected due to QAQC checks
SSD	Sensor drift
SSM	Sensor malfunction
SSR	Sensor removed / not deployed
STF	Catastrophic temperature sensor failure
STS	Turbidity spike
SWM	Wiper malfunction / loss
SXD	Depth from a surface or near surface sonde deployed at a fixed depth, offset to substrate may be applied

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 (<3 mg/L)
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

13) Post deployment information –

End of deployment post-calibration readings in standard solutions.

Site

Bayview Channel

Date	SpCond (mS/cm)	DO%	pH (7)	pH (10)	Turb (o)	Turb (100)
1/14/2009	50.40	101.8	7.03	10.02	0.1	98.7
2/12/2009	50.66	102.4	7.05	10.06	-0.3	90.3
3/12/2009	49.41	99.2	7.04	10.07	-0.3	97.1

4/9/2009	49.74	100.9	7.05	10.04	0.0	98.7	
5/8/2009	49.80	102.7	7.06	10.03	0.2	118.2	* changed type of turbidity standard
6/11/2009	49.52	100.7	6.94	9.93	0.1	126.6	
7/1/2009	50.98	99.6	7.00	10.06	0.0	124.9	
8/12/2009	49.24	102.6	6.97	9.99	0.0	127.2	
9/17/2009	49.20	101.1	6.61	8.71	0.0	129.1	
9/24/2009	49.74	100.9	7.08	10.09	0.0	124.5	
10/14/2009	50.36	102.2	6.35	8.97	0.1	127.7	
11/11/2009	49.84	101.7	7.15	10.14	0.1	125.2	
12/17/2009	50.28	101.9	6.98	9.99	0.0	125.6	
1/13/2010	50.58	99.8	7.01	9.98	-0.2	96.2	

Ploeg Channel

Date	SpCond (mS/cm)	DO%	pH (7)	pH (10)	Turbidity (o)	Turb (100)	
1/14/2009	49.98	102.2	7.12	10.07	0.2	99.8	
2/12/2009	50.68	101.6	7.01	9.96	-0.2	100.2	
3/12/2009	50.21	99.1	7.04	10.06	-0.1	98.9	
4/9/2009	49.89	100.8	7.07	10.02	0.0	99.1	
5/8/2009	49.27	102.3	7.01	9.99	0.20	125.0	* changed type of turbidity standard
6/11/2009	50.12	100.7	7.07	10.06	0.0	124.1	
7/8/2009	49.78	102.4	7.03	9.99	0.0	124.3	
8/12/2009	49.25	100.5	6.90	9.92	-0.5	115.6	
9/17/2009	46.42	101.4	6.96	9.94	0.1	124.3	
10/14/2009	49.75	102.2	7.03	10.03	0.3	126.2	
11/11/2009	49.09	102.1	7.06	10.03	0.0	122.2	
12/17/2009	50.18	94.9	7.12	10.09	0.1	124.3	
1/13/2009	50.05	99.4	6.92	9.90	0.0	126.5	

Gong Surface

Date	SpCond (mS/cm)	DO%	pH (7)	pH (10)	Turbidity (o)	Turb (100)	
2/12/2009	51.40	100.5	7.01	9.98	-0.4	100.3	*First deployment
3/12/2009	48.97	102.8	7.08	10.06	-0.1	96.6	
4/9/2009	49.74	100.7	7.06	10.04	0.1	99.3	
5/8/2009	49.54	102.4	6.52	9.23	0.5	120.6	* changed type of turbidity standard
6/1/2009	50.19	102.3	7.06	10.01	-0.1	124.6	
7/8/2009	50.05	101.2	7.03	9.99	0.1	125.2	
8/4/2009	49.79	100.9	7.14	10.20	0.0	127.8	*Last deployment

Joe Leary Slough

Date	SpCond (mS/cm)	DO%	pH (7)	pH (10)	Turbidity (o)	Turb (100)
1/14/2009	50.18	102.1	7.15	10.10	0.4	99.3
2/12/2009	50.32	100.7	6.99	9.94	-0.1	101.0

2/24/2009	50.50	100.1	7.04	9.95	0.0	97.8	
3/25/2009	50.52	102.3	7.04	10.00	0.1	104.8	
4/8/2009	50.60	101.2	7.03	10.02	0.1	93.6	
5/14/2009	50.16	96.9	7.18	9.56	0.0	119.6	* changed type of turbidity standard
5/15/2009	49.92	100.6	6.96	9.95	0.0	126.0	
6/16/2009	49.77	38.3	6.86	8.89	0.4	113.3	
7/14/2009	49.99	1	5.49	5.77	0.1	125.2	*Last deployment

Joe Leary Estuary

Date	SpCond (mS/cm)	DO%	pH (7)	pH (10)	Turbidity (o)	Turb (100)	
5/14/2009	50.86	102.3	7.07	10.07	0.0	116.7	* changed type of turbidity standard
6/16/2009	50.18	101.3	7.04	10.01	-0.1	125.5	
7/14/2009	49.89	101.3	7.02	10.02	0.0	124.1	
8/12/2009	49.87	100.9	6.90	9.87	0.0	125.4	
9/18/2009	49.14	100.6	6.93	9.92	0.1	125.2	
10/14/2009	50.00	101.4	7.03	10.02	0.0	125.7	
11/11/2009	49.59	101.8	6.96	9.91	0.0	125.2	
12/17/2009	50.02	102.1	7.03	10.06	0.1	126.1	
1/13/2009	49.97	99.9	7.00	9.95	0.1	126.6	

14) Other remarks/notes –

Data are missing due to equipment or associated specific probes not being deployed, equipment failure, time of maintenance or calibration of equipment, or repair/replacement of a sampling station platform. Any NANs in the dataset stand for "not a number" and are the result of low power, disconnected wires, or out of range readings. If additional information on missing data is needed, contact the Research Coordinator at the reserve submitting the data.

Bayview Channel
From 1/8/09 at 14:00 to 1/9/09 at 1:30 the salinity and specific conductivity were very low because of a large flooding event caused by heavy rains and melting mountain snow.

For the deployment starting 2/12 9:45 and ending 3/12 9:30 the depth sensor became partially blocked. The data did appear within the normal range but should be interpreted with caution.

It appears that the sonde may have been hooked it up wrong when the new sonde was deployed, or the sonde may have gotten hung up in the tube when being deployed. During infield maintenance to hook up telemetry on 9/2 the problem was discovered andfixed. Other parameters are marked as suspect. even though the water column tends to be pretty mixed.

Ploeg Channel
From 1/8/09 at 15:00 to 1/9/09 at 1:30 the salinity and specific conductivity were low because of a large flooding event caused by heavy rains and melting mountain snow.

For the deployment starting 11/11/09 at 10:30 and ending 11/12/09 at 14:00 all of the data has been rejected. The specific sonde deployed does work correctly when it is hooked up to the telemetry equipment.

From 12/17/09 at 8:30 to 12/18/09 at 13:30 the date and time were set wrong on the sonde so data was not collected until the date and time were corrected.

For the deployment starting 8/12/09 at10:00 to 9/17/09 at 10:45 SpCond , salinity and depth were marked as suspect because of fouling that clogged the depth channel and conductivity channel. SpCond was also suspect due to a low post calibration.

Gong Surface

On 06/30/2025 this dataset was updated to include updated QAQC flags and codes for the Gong Surface surface site at PDB reserve. The GS sonde is a surface sonde that is attached to a floating buoy. The sonde sits in a tube built into the buoy and there is a bolt at the bottom of the tube which sits 1 m below the surface, therefore the sonde's position does not change relative to the buoy. The depth data collected by the sonde reflects the depth the sonde is under the surface of the water. The buoy, and therefore sonde, experiences wave action, unlike the stable platform of the other sites. Any changes in depth are from barometric pressure changes (prior to correction) and wave action. The overall depth at the buoy location changes based on the fluctuation of the tide and ranges from 16 to 21m. The buoy is anchored to the bottom (~ 18 m) with an anchor.

The Gong Surface site experiences tug and oil tanker traffic and large waves (3-4 feet) that often affected the depth at this site.

On 2/12/09 at 14:30 the sonde may not have been fully deployed when sonde was measuring.

From 3/12 /09 at 9:00 to 3/15/09 at 7:00 the turbidity values spike often. It is unknown if these values are caused by something in the sensor guard that was blocking the turbidity optic or if these are really values.

From 8/1/09 at 16:15 all data is rejected because the buoy became detached from its anchoring system and was found a significant distance away from its site. The data from 8/1/09 at 00:00 to 8/1/09 at 16:00 is marked as suspect because it is not known the exact time the buoy detached from the anchor system.

Joe Leary Slough

From 1/5/09 at 5:45 to 2/5/09 at 14:15 the tide gates remained partially open so there was unusually high saltwater intrusion to the site.

From 1/8/09 at 16:15 to 1/15/09 at 12:15 turbidity was high because of a flooding event produced by high rain and snow melt.

From 1/26/09 at 8:00 to 2/12/09 at 11:30 there was debris wrapped all around the sensor guard.

For the deployment starting 2/12/09 at 12:00 and ending 2/25/09 11:30 the sonde time was not set correctly. The date and time in original data file was manipulated to show the correct times. All of the data for this deployment should be interpreted with caution because debris was wrapped around the sensor guard.

Starting 4/8/09 at 11:00 and ending 7/14/09 at 13:12 the site was being filled in with sediment and debris was constantly wrapped around the sensor guard. Depending on the state of the site data was either rejected or marked as suspect. All data should be interpreted with caution.

Joe Leary Estuary

Data from 2/25 11:45 to 3/3 16:15 is marked -3 GSM CWD. The sonde was incorrectly attached to the shorter end of the deployment chain on 2/25. During station maintenance on 3/3 the issue was noted and fixed.

Starting around 9/7/09 and lasting approximately until 11/11/09 there was intermittent dredging occurring on the fresh water side of the tide gates. This does not appear to be reflected in the data except for a few instances when the turbidity values may be a bit higher overall with some spikes.