Padilla Bay (PDB) NERR Water Quality Metadata
January - December 2001
Latest Update: July 1, 2021

I. Data Set & Research Descriptors

1) Principal investigator & contact persons:

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2) Entry verification:

The data are downloaded from the YSI 6000s or 6600s to a Windows based PC. Graphs of all data are printed using EcoWatch software and are examined for suspect, anomalous, or outlying data. Notes are made of any unusual data. The files are then exported as .csv files and the CDMO macros are used for final formatting and a second check for outliers and missing data. Macros distributed by the CDMO are designed to: a) check data files for missing data points; b) fill all cells that do not contain data with periods; c) convert the data columns to the CDMO approved formats for time, date and numeric variables; d) find all data that are out of acceptable range for the sensors and save the anomalous data to an outlier file; e) save the files as Excel worksheets and f) generate single parameter monthly graphs. After formatting the data, some files are more closely checked for anomalies in DeltaGraph Pro(r). Edited and raw files are archived on a PC hard drive and on a Macintosh hard drive at Padilla Bay NERR. The process of entry verification for the 2001 data was completed by Robin Cottrell. Robin Cottrell and Douglas Bulthuis completed final verification and metadata documentation.

3) Research objectives:

The Bay View Channel (BY) site was established to detect and monitor short-term variability and long-term changes in the south end of Padilla Bay. The Ploeg Channel (BP) site has been set out to monitor short-term variability and long-term change in the north end of Padilla Bay and to contrast and compare water quality to the south end. The Joe Leary Slough (JL) 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 the implementation of a non point source pollution watershed action plan. Measurements are taken every 30 minutes at all sites unless otherwise noted in data anomalies.

4) Research methods:

YSI 6000's or 6600's were deployed in Joe Leary Slough in a vertical position, 1.7 m from the bottom of the slough in a 4 in. diameter PVC pipe with a metal bar secured horizontally at the bottom of the pipe 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 PVC 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 the previous 5 years. To keep the data comparable the YSI is deployed at the same height relative to Mean Sea Level.)

YSI 6000's or 6600's 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 PVC pipe was attached to two steel pipes. The depth of the YSI was -1.1 m (depth below MLLW) and about 0.75 m above the bottom along the sloping edge of a small channel draining the surrounding intertidal flats. After weeks of lost dissolved oxygen data due to damaged membranes, a sensor protector was made out of "Gutter Guard", a plastic 1/4" mesh material that was formed

into a cylinder to fit inside the sensor guard to keep marine fauna from interfering with operation of the sensors. This was used in all the deployments
at this site beginning in April.

YSI 6000's or 6600's were deployed in Ploeg Channel using the same design as
that in Bayview Channel. The depth of the YSI was about -1.5 m (depth below
MLLW) and about 0.6 m above the bottom along the sloping edge of a channel
draining the surrounding intertidal flats. As in Bayview Channel (described
above) a sensor protector made out of "Gutter Guard", a plastic 1/4" mesh material, was used in all the deployments at this site.

In all cases, measurements of temperature, specific conductivity, salinity,
percent saturation of dissolved oxygen, depth, pH and turbidity are recorded
every half hour. At the end of each deployment, the YSI 6000 or 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, and are posted
in Section 13 of this document.

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. The KCl solution and Teflon membrane on the
dissolved oxygen probe are changed prior to each YSI 6000 or 6600 deployment and
the new oxygen membrane is allowed to stabilize overnight in water saturated air
before calibration. A 2-point calibration is used for the turbidity probe. The
standards used are distilled/deionized water for zero and 4000 NTU Formazin
solution diluted to 100 NTU.

5) Site location and character:

General: Padilla Bay (48° 30' N; 122° 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 invader 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 15 to 30 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. 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.

Joe Leary Slough Site: (48° 31' 05.3" N; 122° 28' 22.8" W) Joe Leary Slough drains land that is predominantly annual crop agriculture and pasture land 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 2000. 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 ± 5m.

Bayview Channel Site: (48° 29' 46.6" N; 122° 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 YSI 6000 or 6600 is located in a tributary channel to Bayview Channel. The tributary drains predominately eelgrass (Zostera marina and Z. Japonica) covered intertidal flats. Depth range at this site is about 2 - 5 meters from MLLW to MHHW. Bottom sediments beneath the deployment site are fine silt and clay overlying sand. 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.

Ploeg Channel Site: (48° 33' 23.5" N; 122° 31' 46.7" W) Ploeg Channel floods and drains intertidal flats at the north end of Padilla Bay that are comprised of mud flats and eelgrass beds (Zostera marina and Z. Japonica) in approximately equal amounts. Depth range at this site is about 2 - 5 meters from MLLW to MHHW. Bottom sediments beneath the deployment site are fine to medium sands. The Ploeg Channel site was added to the sites being monitored as part of the Padilla Bay NERR System-Wide Monitoring Program in July 2001 as part of the SWMP expansion. The Ploeg Channel site was selected to extend the geographic coverage and to indicate if there is a north to south gradient in water quality in Padilla Bay. A fourth site will be added in 2002 in the deep channel west of Ploeg Channel. At that time the Ploeg Channel site will be one site along a gradient from fresh water sources to marine sources of water to Padilla Bay. 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.

6) Data collection period:

Deployment and retrieval times are listed below. The times indicate the first
and last measurements made with each deployment.

BEGAN	ENDED
Joe Leary Site	
12/20/00, 15:30:00	01/16/01, 13:00:00
01/16/01, 13:30:00	01/31/01, 11:30:00
01/31/01, 12:00:00	02/20/01, 10:30:00
02/20/01, 11:00:00	03/13/01, 14:30:00
03/13/01, 15:00:00	03/28/01, 13:30:00
03/28/01, 14:00:00	04/12/01, 09:30:00
04/12/01, 10:00:00	04/19/01, 14:30:00
04/19/01, 15:00:00	05/08/01, 14:00:00
05/08/01, 14:30:00	05/21/01, 14:30:00
05/21/01, 15:00:00	06/07/01, 14:00:00
06/07/01, 14:30:00	06/26/01, 14:00:00
06/26/01, 14:30:00	07/10/01, 13:30:00
07/10/01, 14:00:00	07/24/01, 11:00:00
07/24/01, 11:30:00	08/09/01, 12:00:00
08/09/01, 12:30:00	08/22/01, 13:00:00
08/22/01, 13:30:00	09/11/01, 14:30:00
09/11/01, 15:00:00	09/27/01, 12:00:00
09/27/01, 12:30:00	10/09/01, 15:00:00
10/09/01, 15:30:00	10/31/01, 13:00:00
10/31/01, 13:30:00	11/20/01, 14:30:00
11/20/01, 15:00:00	12/05/01, 15:00:00
12/05/01, 16:00:00	01/03/02, 15:00:00
Bayview Channel Site	
12/14/00, 10:00:00	01/23/01, 14:00:00
01/23/01, 14:30:00	03/23/01, 15:30:00
03/23/01, 16:00:00	04/04/01, 14:00:00
04/04/01, 14:30:00	04/26/01, 09:30:00
04/26/01, 10:00:00	05/22/01, 14:00:00
05/22/01, 14:30:00	06/15/01, 09:30:00
06/15/01, 10:00:00	07/10/01, 09:00:00
07/10/01, 09:30:00	07/27/01, 11:30:00
07/27/01, 12:00:00	08/10/01, 10:00:00
08/10/01. 10:30:00	08/30/01, 14:30:00
08/30/01, 15:00:00	09/20/01, 08:00:00
09/20/01, 08:30:00	10/24/01, 13:30:00
10/24/01, 14:00:00	11/24/01, 11:00:00
11/24/01, 11:30:00	12/19/01, 14:00:00
12/19/01, 14:30:00	01/15/02, 12:30:00
Ploeg Channel Site	
06/15/01, 09:30:00	07/10/01, 08:30:00
07/10/01, 09:30:00	07/27/01, 11:00:00
07/27/01, 11:30:00	08/30/01, 14:00:00

08/30/01, 14:30:00	09/20/01, 07:30:00
09/20/01, 08:00:00	10/24/01, 13:30:00
10/24/01, 14:00:00	12/19/01, 14:00:00
12/19/01, 14:30:00	01/15/02, 11:00:00

7) Distribution

According to the Ocean and Coastal Resource Management Data Dissemination Policy for the NERRS System-wide Monitoring Program, 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 the 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 section 1. Principal investigators and contact persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under general information link on CDMO homepage) and online at the CDMO homepage http://cdmo.baruch.sc.edu/. Data are available in text tab-delimited format, Microsoft Excel spreadsheet format and comma-delimited format.

8) Associated researchers and projects:

There were several research projects in Padilla Bay being conducted by graduate students and staff at Padilla Bay NERR. Contact the Research Coordinator for further information. Some of these studies used data collected by the dataloggers and some collected ancillary water quality data at other sites in Padilla Bay. However, none of the studies were focused on water quality, nor did any have a water quality objective.

II. Physical Structure Descriptors

9) Variable sequence, range of measurements, units, resolution, and accuracy:

YSI 6000/6600 datalogger

Variable	Range of Measurements	Resolution	Accuracy
Date	1-12, 1-31, 00-99 (Mo,Day,Yr)	1 mo, 1 day, 1 yr	NA
Time	0-24, 0-60, 0-60 (Hr,Min,Sec)	1 hr, 1 min, 1 s	NA
Temp	-5 to 45 (c)	0.01 C	+/- 0.15C
Sp COND	0-100(mS/cm)	0.01mS/cm	+/-0.5% Of reading + 0.001mS/Cm
Salinity	0-70 Parts per thousand (ppt)	0.01 ppt	+/- 1% of Reading or 0.1 ppt, (whichever is greater)
DO	0-200 (% air saturation)	0.1% @air sat	+/-2% @air Saturation
DO	200-500 (% air saturation	0.1% @ air sat	+/- 6% @ Saturation
DO	0-20 (mg/l)	0.01 mg/l	+/- 0.2mg/l
DO	20-50 (mg/l)	0.01 mg/l	+/- 0.6mg/l
Depth (shallow)	0-9.1 (m)	0.001m	+/- 0.018m
PH	2-14 units	0.01 units	+/- 0.2units
Turb	0-1000 NTU	0.1 NTU	+/- 5% of Reading or 2 NTU (whichever is greater)

Data columns are separated by tabs. Each file contains a two line column header at the top of the page which identifies measurements and units for each column.

10) Coded variable indicator and variable code definitions:

File definitions: YSI deployment site/month/year (e.g. by0901=Bayview Channel
data from September 2001), by=Bayview Channel, bp=Ploeg Channel, jl=Joe Leary.

11) Data anomalies:

January 1-31, 2001
Bayview Channel
During the following periods salinity and specific conductivity data were abnormally low so they were deleted, it was probably because the probe orifice
was packed with debris:
01/01/2001 00:00:00 - 01/23/2001 14:00:00
All dissolved oxygen and pH data were deleted for the month due to the following
reasons:
The logger at this site was switched on 01/23/2001 but the DO membrane was
damaged during both deployments (probably by crustaceans found in the sensor
guard). The pH values through 01/23/2001 showed an abrupt drop and subsequent
erratic record that corresponded with change in DO and salinity. The next pH
probe installed through the end of the month was found to be bad after retrieval.
In the following records the turbidity values were deleted, they were high and
erratic, cause unknown:
01/12/2001 23:00:00
01/28/2001 11:00:00
01/29/2001 09:00:00, 11:00:00

Joe Leary
From January 1, 00:00:00 to January 16, 13:00:00 the logger was deployed about
6" above the bottom of the deployment pipe because the chain securing it was too
short. This resulted in the logger being positioned above the large cutouts in
the deployment pipe that allow free flow of water around the sensors. Data
collected during this period should be interpreted with caution.
During the following periods turbidity data were high and erratic (probably due
to debris caught in the pipe obscuring the sensor) so they were deleted:
01/05/2001 20:30:00 - 21:00:000
1/07/2001 18:30:00 - 01/16/2001 13:00:00
The following records include zero or slightly negative depth readings, the data
were not deleted because salinity and dissolved oxygen data indicate the sensors

were submerged:
01/29/2001 01:30:00 - 03:00:00

February 1 - 28, 2001
Bayview Channel
All dissolved oxygen and pH data were deleted for the month due to a bad pH
probe and damaged DO membrane.
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
02/03/2001 17:30:00
02/09/2001 17:00:00
02/10/2001 15:30:00
02/12/2001 04:30:00
02/15/2001 02:30:00
02/28/2001 18:00:00

Joe Leary
None

March 1 - 31, 2001
Bayview Channel
During the following periods dissolved oxygen and pH data were deleted due to a
damaged DO membrane and bad pH probe.
03/01/2001 00:00:00 - 03/23/2001 15:30:00
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
03/01/2001 00:30:00
03/06/2001 05:00:00
03/22/2001 06:00:00, 14:00:00, 20:00:00
03/26/2001 12:00:00
Small negative turbidities (<-1.0 NTU) were recorded during the following periods probably due to small calibration error:
03/24/2001 06:00:000, 7:00:00, 07:30:00
03/28/2001 22:00:00, 20:30:00
03/29/2001 21:00:00
03/30/2001 23:30:00
No data were collected during the following period because loggers were being
switched at this time:
03/23/2001 16:00:00

Joe Leary
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
03/17/2001 12:00:00
03/25/2001 10:30:00 - 03/28/2001 13:30:00
There is no pH data for the following deployment time because there was no probe
installed in the logger:

03/28/2001 14:00:00 - 03/31/2001 23:30:00

April 1 - 30, 2001
Bayview Channel
This was the first deployment using "Gutter Guard", a plastic 1/4" mesh that is
formed into a cylinder to fit inside the sensor guard to keep marine fauna from
interfering with operation of the sensors. It appeared to work, as there was no
dissolved oxygen membrane damage during this deployment.
Small negative turbidity (<-1.0 NTU) was recorded during the following period
probably due to a small calibration error:
04/02/2001 01:30:00
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
04/15/2001 17:00:00
04/27/2001 19:30:00

Joe Leary
During the following periods turbidity data were high and erratic so they were
deleted; 4/09 through 4/12 anomalous data were due to biofouling of the logger:
04/09/2001 23:00:00 - 04/12/2001 09:30:00
04/29/2001 13:30:00
There is no pH data for the following times because there was no probe installed
in the logger for that deployment:
04/01/2001 00:00:00 - 04/12/2001 09:30:00
Dissolved oxygen data were deleted for the following period because the data
were unreliable, the probe was found to be bad when it could not be calibrated
after deployment:
04/19/2001 15:00:00 - 04/30/2001 23:30:00

May 1 - 31, 2001
Bayview Channel
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
05/07/2001 23:30:00
05/08/2001 21:00:00
05/22/2001 12:30:00

Joe Leary
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
05/02/2001 07:00:00

05/30/2001 10:30:00
The following records have elevated turbidities that are probably due to storm
events:
05/01/2001 19:00:00 - 19:30:00
05/03/2001 16:30:00 - 17:30:00
05/19/2001 07:00:00
Dissolved oxygen data were deleted for the following periods because the data
were suspect, the probe could not be calibrated after this deployment so it was
replaced:
05/01/2001 00:00:00 - 05/08/2001 14:00:00
Dissolved oxygen values from the deployment beginning 5/8 at 14:30 and running
to 5/21 at 14:30 has a downward trend, most evident in the last 4-5 days, which
may be due to fouling of the probe. The last DO value at 14:30 was 19% and the
first value on the new logger at 15:00 was 55.9%. The probe was operating
properly in the post-deployment check. Low DO values are not uncommon at this
site (<30%) but the data from the last few days of this deployment should be
interpreted with caution.

June 1 - 30, 2001
Bayview Channel

During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
06/13/2001 11:30:00
06/16/2001 12:30:00

Joe Leary

July 1 - 31, 2001
Bayview Channel
During the following period turbidity was high and erratic so it was deleted,
cause unknown:
07/07/2001 08:30:00

Joe Leary
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
07/05/2001 07:30:00
07/07/2001 09:00:00
During the following period the pH value was deleted because it was high and

erratic. The loggers were switched close to the sample time and the probe probably did not have time to equilibrate at the site before a reading was made.
The values recorded before and after this time on the two different loggers are
the same.
07/10/2001 14:00:00

Ploeg Channel
The following times turbidity reported a negative value and/or a zero value:
7/1/2001 9:30:00
7/4/2001 11:30:00
7/8/2001 22:00:00
7/9/2001 1:00:00 - 5:00:00
Most of the records during the following time span contain small negative turbidity readings (<-2.0 NTU). These are probably due to a calibration error
because there were no more negative turbidity readings after this logger was
replaced.
7/10/2001 9:30:00 - 7/27/2001 11:00:00
During the following period, dissolved oxygen data were deleted because upon
retrieval, a barnacle was discovered growing in the middle of the DO membrane.
There was no obvious indication in the data record of when it attached so all
the DO data for this deployment were considered unreliable and deleted.
07/27/2001 11:30:00 - 07/31/2001 23:30:00

August 1 - 31, 2001
Bayview Channel
Small negative turbidities (<-1.0 NTU) were recorded during the following periods probably due to small calibration error:
08/01/2001 19:00:00
08/07/2001 05:30:00
During the following period turbidity data were over 1000 NTU due to probe
failure (the wiper parked over the optic port and stayed there) so they were
deleted:
08/13/2001 16:00:00 - 08/30/2001 14:30:00

Joe Leary
During the following period turbidity data was high and erratic so it was deleted, cause unknown:
08/08/2001 12:30:00

Ploeg Channel
During the following period dissolved oxygen data were deleted because upon

retrieval a barnacle was discovered growing in the middle of the membrane. There
was no obvious indication in the record of when it attached so all the DO data
for this deployment were considered unreliable and deleted.
08/01/2001 00:00:00 - 08/30/2001 14:00:00

September 1 - 30, 2001
Bayview Channel
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
09/09/2001 02:00:00
09/16/2001 05:30:00, 23:30:00
09/23/2001 05:30:00
During the following time period all the data were deleted because the sonde was
not deployed at the correct depth as indicated by shallow depth and low salinity
readings. The instrument was apparently temporarily hung up on something inside
the deployment tube because the midnight reading on 09/21/2001 was taken at the
correct depth.
09/20/2001 08:30:00 - 23:30:00

Joe Leary
During the following period turbidity data was high and erratic so it was
deleted, cause unknown:
09/23/2001 05:30:00

Ploeg Channel
The following times turbidity reported a negative value and/or a zero value:
9/12/2001 22:00:00
9/13/2001 21:30:00
9/14/2001 1:30:00
9/15/2001 1:00:00
Most of the records during the following time span contain small negative
turbidity readings (<-1.0 NTU). These are probably due to a calibration error
because they only appear in the data from one logger:
9/20/2001 13:30:00 - 9/29/2001 17:30:00
During the following time period salinity (and therefore specific conductivity)
was low and erratic so it was deleted,
cause unknown:
09/26/2001 09:00:00 - 20:00:00
Dissolved oxygen (mg/L) during this time period 09/26/2001 09:00:00 - 20:00:00
were also deleted due to slightly high (< 0.2 mg/L higher) values because the
calculation of that value is partly based on salinity, which was reading about

2.0 to 2.5 ppt lower during this period than the days before and after.

October 1 - 31, 2001
Bayview Channel
During the following time period salinity and specific conductivity were low and
erratic so it was deleted, cause unknown:
10/02/2001 01:00:00 - 03:00:00
Dissolved oxygen values in mg/L during this time period will be slightly high (<
0.2 mg/L higher) because the calculation of that value is partly based on salinity, which was reading about 2.0 ppt lower during this period than the days
before and after.

Joe Leary

Ploeg Channel
Records during the following time span contain small negative turbidity readings
(<1.0 NTU). These are probably due to a calibration error because they only
appear in the data from one logger:
10/01/01 10:00:00 - 10/21/01 07:30:00.

November 1 - 30, 2001
Bayview Channel
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
11/07/2001 04:30:00
11/13/2001 23:30:00
The following time period includes many small negative turbidity readings (< -2
NTU). These negative readings are probably due to a calibration error because
they only appear in the data from one logger:
11/24/2001 11:30:00 - 11/29/2001 08:00:00

Joe Leary
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
11/18/2001 22:30:00
11/20/2001 02:30:00

Ploeg Channel
During the following period turbidity was high and erratic so it was deleted,
cause unknown:

11/21/2001 22:30:00

December 1 - 31, 2001
Bayview Channel
The following time period includes many small negative turbidity readings (< -2
NTU). These negative readings are probably due to a calibration error because
they only appear in the data from one logger:
12/02/2001 07:00:00 - 12/19/2001 13:30:00
During the following period turbidity was high and erratic so it was deleted,
cause unknown:
12/19/2001 17:30:00
No data were collected during the following period because loggers were being
switched at this time:
12/19/2001 14:30:00

Joe Leary
During the following period turbidity was high and erratic so it was deleted,
cause unknown:
12/17/2001 18:30:00
The following records contain no data due to low batteries that were intermittent before shutting down completely:
12/14/2001 23:00:00
12/15/2001 06:30:00 - 21:30:00
12/16/2001 00:00:00
12/17/2001 20:00:00 - 12/31/2001 23:30:00

Ploeg Channel
During the following periods turbidity data were high and erratic so they were
deleted, cause unknown:
12/4/2001 8:00:00
12/8/2001 2:00:00

12) Missing data:

Missing data are denoted by a period in the data set. Data are missing due to
equipment failure where no probes were deployed, maintenance/calibration of
equipment, elimination of obvious outliers, or elimination of data due to calibration (both pre and post) problems. For more details on deleted data, see
the Anomalous Data Section (11.). To find out more details about missing data,
contact the Research Coordinator at the site submitting the data.

13) Post deployment information

End of deployment post-calibration readings in standard solutions:

Site Date	pH (Std. 7)	Sp. Conductivity (mS/cm) (Std. 50)	Turbidity (Std. 100 NTU)	DO (Air Sat.) (Std. 100%)
BY				
01/23/01	7.12	(unstable, debris in probe)	97.2	damaged
03/23/01	7.67	49.54	109.8	damaged
04/04/01	6.85	49.76	95.6	100.7
04/26/01	7.14	50.69	104.0	99.2
05/22/01	7.03	49.73	100.0	96.0
06/15/01	7.04	48.95	103.0	102.3
07/10/01	7.11	50.58	99.7	99.5
07/27/01	7.10	49.28	97.9	102.7
08/10/01	7.06	40.63	102.2	95.6
08/30/01	6.95	50.31	malfunction	98.6
09/20/01	7.05	49.20	99.3	100.8
10/24/01	7.12	50.02	98.7	101.7
11/24/01	6.79	50.16	99.6	100.1
12/19/01	7.00	50.41	99.4	100.2
01/15/02	7.12	48.95	97.7	damaged

Site	Date	pH (Std. 7)	Sp.Conductivity(mS/cm) (Std. 50)	Turbidity (Std. 100 NTU)	DO (Air Sat.) (Std. 100%)
JL	01/16/01	6.90	50.17	100.5	101.5
	01/31/01	7.04	50.12	100.7	98.9
	02/20/01	7.03	49.67	101.2	100.8
	03/13/01	6.96	49.94	101.3	102.7
	03/28/01	7.05	49.60	104.0	98.3
	04/12/01	(no probe)	50.39	96.8	99.1
	04/19/01	7.23	50.50	99.0	101.8
	05/08/01	6.97	50.28	101.7	99.9
	05/21/01	7.05	50.22	94.8	101.5
	06/07/01	7.11	49.39	97.1	97.0
	06/26/01	7.04	50.42	103.1	97.4
	07/10/01	7.10	49.59	102.3	99.2
	07/24/01	7.06	50.31	100.3	97.9
	08/09/01	7.08	49.37	99.7	99.2
	08/22/01	6.95	49.58	97.0	94.5
	09/11/01	7.05	49.92	107.6	98.1
	09/27/01	6.98	50.18	98.0	99.0
	10/09/01	7.04	49.83	98.3	101.2
	10/31/01	7.02	49.93	98.2	100.3
	11/20/01	6.98	50.15	98.5	96.6
	12/05/01	7.12	49.87	100.2	96.1
	01/03/02	6.82	49.14	99.1	104.5

Site	Date	pH (Std. 7)	Sp. Conductivity (mS/cm) (Std. 50)	Turbidity (Std. 100 NTU)	DO (Air Sat.) (Std. 100%)
BP	07/10/01	7.05	50.14	98.1	99.8
	07/27/01	7.01	49.85	98.8	99.5
	08/30/01	7.20	49.00	104.0	damaged
	09/20/01	6.99	48.88	101.7	98.9
	10/24/01	7.12	49.82	102.1	97.9
	12/19/01	6.94	49.86	79.1	99.0
	01/15/02	7.22	48.91	96.9	104.7

14) Other Remarks/notes

On 07/01/2021 this dataset was updated to include embedded QAQC flags for anomalous/suspect data. System-wide monitoring data beginning in 2007 were processed to allow for QAQC flags and codes to be embedded in the data files rather than detailed in the metadata alone (as in the anomalous/suspect, deleted, and missing data sections above). Prior to 2006, rejected data were deleted from the dataset so they are unavailable to be used at all, but suspect data were only noted in the metadata document. Suspect data flags <1> were embedded retroactively in order to allow suspect data to be easily identified and filtered from the dataset if desired for analysis and reporting purposes.
No other flags or codes were embedded in the dataset and users should still refer to the detailed explanations above for more information.

a) Major rain and/or storm events are noted in section 11, Data anomalies.
b) Any time a reference is made to turbidity data being negative and/or zero, it was recorded as a negative in the raw data file and a zero in the edited data file due to the formatting of Excel. The technician edited none of these data points by hand nor did he/she delete any of them.

b) Joe Leary:

From April 25 to 27 salinity values >20 ppt, pH> 8 and turbidity values <20 NTU all indicate something may have been caught in one or more of the tide gates so it could not completely close at high tide. This would allow marine water to flow into the fresh water side of the slough.

All parameters reflect the effects of a rain event on June 12. Temperature,
salinity and pH drop, and depth, turbidity and dissolved oxygen peak.

High turbidities beginning on dates October 19, 25, 27 and 31 correspond to rain
events, more than 5.5 inches of rainfall for this month.

High turbidities beginning on the 14th, 19th and the 20th of November are probably due to storm events, wind maximum on the 14th was 43.1 mph and on the
20th 41.7 mph.

c) Bayview Channel

The lowest recorded depths (< 0.1 m) this month occurred during the following
dates and times, they correspond to the lowest tides of the year, -3.3' and -
3.4' respectively. Salinity and dissolved oxygen data indicate the sensors
remained submerged.
06/22/01 11:00; 11:30
06/23/01 12:00; 12:30

High turbidities and low salinities October 22 through October 24 correspond
with strong winds, up to 39.4 mph, and low tides.

High turbidities beginning on the 14th and on the 20th of November are probably
due to storm events, wind maximum on the 14th was 43.1 mph and on the 20th 41.7
mph.

High turbidities and low-tide low salinities on December 13 - 18 correspond to a
storm event in which nearly 2 inches of rain fell and winds reached 43.4 mph.

d) Ploeg Channel

High turbidities from October 22 - 24 coincide with a storm event with winds up
to 39.4 mph.

High turbidities and low-tide low salinities on December 13 - 18 correspond to a
storm event in which nearly 2 inches of rain fell and winds reached 43.4 mph.