

Kachemak Bay Research Reserve (KAC) NERR Water Quality Metadata
January - December 2005
Latest update: August 13, 2020

I. Data Set and Research Descriptors

1) Principal Investigators & Contact Persons

Address:

Kachemak Bay Research Reserve
95 Sterling Highway, Suite 2
Homer, AK 99603
Tel: 907-235-4799
Fax: 907-235-4794

Contact Persons:

Scott Pegau: Research Coordinator
Email: (Scott_Pegau@fishgame.state.ak.us)
Judy Hamilton:
Email: (Judy_Hamilton@fishgame.state.ak.us)

2) Entry Verification

For the Homer and Seldovia sites, the 15-minute data are uploaded to the PC from both the YSI Model 6200 Data Acquisition System via modem at 60-minute intervals, and the YSI 6600 Sonde Data Logger upon recovery. The text files are initially viewed with Ecowatch software, and graphs are produced to look for suspect data as may result from probe failure. Notes are made of any unusual data, and sensors are reconditioned as necessary.

The text data files are run through a Matlab routine created by Scott Pegau for processing. This routine is attached at the end of this report. The routine is set to output data every 15 minutes to match data collection intervals. The routine looks for data collected within 7.5 minutes of the desired output time. Data that were recorded when the instruments were out of the water are deleted from the beginning and end of each record. These data are identified by unusual depth and salinity data (usually near zero). The routine outputs a data file listing the missing data points, fills all cells that do not contain data with blanks, and finds and removes all data points that fall outside the range of what the data logger is designed to measure, or are out of realistic ranges for Kachemak Bay. The routine then processes the data through several filters to flag suspect data points that are greater than 4 standard deviations from data gathered in the 12-hour period surrounding the point. It can remove the data point or just flag it as suspicious. In addition, a graphing capability is included to produce single and multi-parameter graphs on a monthly or yearly basis. The routine outputs monthly files with

column widths formatted to the correct number of decimal places based on YSI sensor specifications.

Anomalous data are evaluated to determine whether to flag or delete the suspect values. Data are flagged if they fall outside the normal values seen at the site, or outside the range of measurements and accuracy established for the sensors. Data outside the "normal" range of water quality for a particular site were investigated for validity based on weather data, field observations, QC checks, and instrument diagnostics. Data are deleted if anomalies are attributed to sensor malfunction or fouling of the sensors by aquatic organisms, debris, or sediment. In addition, sensor readings that differ significantly (>10%) from calibration standards suggest that the sensor was fouled during deployment. After corrections are made to the text files, and anomalies noted in the metadata report, the edited files are exported as tab delimited (*.txt). The monthly text files are then combined to produce the yearly data file that is sent to the CDMO. Raw (*.csv) files are also sent to the CDMO for archival. Scott Pegau is responsible for these tasks.

3) Research Objectives

The YSI electronic data loggers are programmed to measure the water temperature, specific conductivity, dissolved oxygen, depth, pH, and turbidity conditions at 15-minute intervals. There are four permanent data logger sites at two locations in Kachemak Bay. One site is located on the northeast side of the Bay at the end of the Homer Spit, and the other on the southwest side of the Bay in Seldovia. At each site a data logger is suspended 1-meter below the surface ("Surface"), and one data logger 1-meter from the bottom ("Deep"). The deep site is in the same location as the previous Homer Dolphin site. The Seldovia Deep site is at the previous Seldovia site. At both locations the surface sondes are horizontally within a couple meters of the deep sondes.

The circulation in Kachemak Bay is driven primarily by the 8-meter tidal flux. Regional circulation is characterized by generally cyclonic ocean currents in the Gulf of Alaska flowing onto the shelf off Cook Inlet. Nutrient rich bottom water is upwelled and mixed with surface water. These enriched waters may enter into Kachemak Bay, the inflow tending to stay along the southern shore flowing past the Seldovia instruments, while water flowing out of the bay stays along the Inner Bay and north shore, flowing past the Homer instruments. These trapped coastal flows separate the bay into two distinct ecosystems, and the instruments are positioned to reflect this distinction. Within each system there is vertical stratification of the water. The vertical placement of the sondes is designed to help elucidate the differences in circulation of the surface and deep waters.

As the inflowing water proceeds up the bay, fresh water runoff from the surrounding ice fields and watersheds dilute the salinity and increase the sediment load in the path of the Homer instruments. The inflowing water, in the path of the Seldovia instruments initially supports a marine system, while the north out flowing water of the Homer instruments is more estuarine. The Kachemak Bay water quality instruments capture this difference with deployments along the north and south shores. These data will be used to

supplement studies on primary productivity, larval distribution, settlement, recruitment, growth rates, community dynamics, and biodiversity in the bay.

4) Research Methods

The permanent sites of the Homer and Seldovia instruments have YSI 6600 Sonde Data Loggers connected to 6200 Data Acquisition Systems that are used for data collection. The Data Acquisition System is connected via modem to a computer at the Research Reserve. The raw data is collected in 15-minute intervals, stored on the 6200 DCP and interrogated, or downloaded, by our office computer hourly. Both instruments are housed in ABS pipe mounted vertically on the ferry docks of Homer and Seldovia. The pipes are positioned to ensure that the sensors are approximately 1 meter above the bottom.

Calibration and deployment occurred monthly using methods outlined in the YSI Operating and Service Manual. After cleaning the data loggers, the dissolved oxygen (DO) membrane is replaced and allowed to season in water-saturated air for 12 hours before the DO sensor is calibrated. The pH, conductivity, depth, and turbidity sensors are calibrated using the following standards purchased from YSI (except depth): pH 7 and 10, conductivity standards of 50 mS/cm, respectively, and depth of 0. Turbidity standard of 123 NTU is purchased from YSI.

5) Site Location and Character

Kachemak Bay is located approximately 200 kilometers south of Anchorage, on the western shore of the Kenai Peninsula. Kachemak Bay, at 59.6° N and 151.5° W, is a temperate regional fjord with hydrographic conditions unique among the NERR system estuaries. The tidal range of 8 meters is among the largest in the world, and salinity ranges from near zero at stream mouths to 33.0 PSU at the entrance to the inner Bay. The bay is 35 kilometers wide at its mouth and approximately 57 kilometers long. The head of Kachemak Bay is located to the northeast at the Fox River Flats, and the mouth lies to the southwest, along a line between Anchor Point and Point Pogibshi. The 6 kilometer long Homer Spit that extends into the Bay from the northern shoreline splits Kachemak Bay into inner and outer bays. The Kachemak Bay NERR comprises the entire inner Bay and the outer Bay. Water flows between the inner and outer Bays through a narrow opening formed between the Spit and the southern shoreline. The Bay has an average depth of 45 meters, and a maximum of 200 m. Fresh water introduced primarily by the Fox, Bradley, and Martin Rivers and Sheep Creek at the head of the Bay, flows along the northwest shore of the inner Bay.

The Homer YSI data logger site is located on the north side of Kachemak Bay at 59.6028°N and 151.4081°W. Data for the Homer instruments was collected from January through December 2005. The “deep” sonde is deployed at a depth 1 meter from the bottom, in water fluctuating between 8.0 and 17.0 meters. The “surface” data sonde is deployed at a nominal depth of 1 meter. The bottom habitat is predominantly sand. Pollutants in the area are from the excessive boat traffic at the entrance of the Homer

harbor, and a nearby fish waste outfall line. Throughout the year, salinity has ranged from 20.5 to 31.7 ppt, as the instrument's location in the stratified water column is dependent on tide height, with a tidal range of 8.1m. It is predominately an estuarine environment during summer months when glacial runoff is highest, and during the winter months it reverts to a more marine-like system with glacial runoff at a minimum.

The Seldovia YSI data logger site is located on the south side of Kachemak Bay at 59.4413°N, 151.7186°W, approximately 24 kilometers west of the Homer site. As with the Homer site, the data loggers are situated on the ferry terminal dock, with one instrument 1 meter below the surface, and one 1 meter above the bottom, in water fluctuating between 5.0 and 13.3 meters. The access to Seldovia is limited to boat or air, as the site is located off the highway system. The power and phone line connection are occasionally inoperative due to the remote location and position at the end of the power grid. The bottom habitat is predominantly rocky substrate. Pollutants in the area are minimal. Throughout the year, salinity has ranged from 25.0 to 32.9psu at this site with a tidal range of 8m.

6) Data Collection Period

Monitoring at the Homer Dolphin Deep and both Seldovia sites was continuous throughout 2005. The Homer Dolphin Surface sonde was removed December 7 due to icing conditions. Deployment and retrieval dates and times for 2005 are listed below:

Began	Ended	Sonde	Comments
a) Homer Dolphin Deep			
12/20/04, 11:31	01/17/05, 11:01	Neptune	
01/17/05, 11:15	02/14/05, 09:45	Nansen	Turbidity and pH probes replaced, sonde sent for repairs
02/14/05, 10:01	03/17/05, 09:46	Calypso	pH probe replaced before deployment; urchin and shrimp in guard
03/17/05, 10:16	04/18/05, 09:31	Neptune	crab in guard; 6026 turb probe
04/18/05, 09:46	05/16/05, 09:01	Nautilus	
05/16/05, 09:30	06/20/05, 09:46	Calypso	DO electrodes refurbished
06/20/05, 10:16	07/11/05, 09:46	Neptune	DO electrodes refurbished; 6026 turb probe
07/11/05, 10:01	08/15/05, 09:16	Nautilus	DO membrane punctured
08/15/05, 09:46	09/15/05, 09:16	Calypso	
09/15/05, 09:30	10/20/05, 09:00	Amundsen	
10/20/05, 09:31	11/17/05, 10:31	Calypso	Three crabs and three seastars in guard
11/17/05, 11:00	12/07/05, 09:00	Amundsen	
12/07/05, 09:30	01/11/06, 11:01	Nautilus	

b) Homer Dolphin Surface

12/20/04, 11:16	01/17/05, 10:31	Zeus	Moderate algae fouling on sonde and probes; refurbished DO electrodes
01/17/05, 11:00	02/14/05, 09:15	Amundsen	
02/14/05, 10:00	03/17/05, 10:00	Kozloff	
03/17/05, 10:46	04/18/05, 09:01	Zeus	Heavy algae fouling on sonde and probes; DO electrodes refurbished
04/18/05, 09:30	05/16/05, 08:45	Amundsen	Moderate algae fouling on sonde and probes; DO electrodes refurbished
05/16/05, 09:30	06/20/05, 09:30	Cortez	Heavy barnacle and green algae fouling on sonde and all probes; turbidity probe not parking at 180°
06/20/05, 10:00	07/11/05, 09:15	Amundsen	Heavy barnacle and green algae fouling on sonde; DO membrane punctured
07/11/05, 10:00	08/15/05, 09:00	Nansen	
08/15/05, 09:30	09/15/05, 09:15	Cortez	Heavy algae fouling on sonde and all probes
09/15/05, 09:45	10/20/05, 08:45	Kozloff	Light to moderate fouling on guard and all probes
10/20/05, 09:15	11/17/05, 10:15	Cortez	DO membrane ruptured; turbidity probe fell off
11/17/05, 10:45	12/07/05, 09:00	Kozloff	

c) Seldovia Deep

12/21/04, 11:01	01/18/05, 10:31	Calypso	Urchin between probes; DO membrane punctured, refurbished DO electrodes
01/18/05, 10:46	02/15/05, 09:46	Neptune	Chl wiper not moving, parking incorrectly; shrimp in guard; 6026 turb probe
02/15/05, 10:01	03/18/05, 09:31	Nautilus	Heavy bryozoan fouling on guard
03/18/05, 10:01	04/19/05, 08:31	Calypso	Urchin in guard
04/19/05, 08:46	05/17/05, 08:31	Neptune	Chl probe fell apart; 6026 turb probe
05/17/05, 09:01	06/21/05, 08:31	Nautilus	Hermit crab in guard, egg cases between probes
06/21/05, 09:01	07/12/05, 08:31	Calypso	Snail and hermit crab in guard; refurbished DO electrodes

07/12/05, 09:01	08/16/05, 08:45	Neptune	6026 turb probe; turb wiper not moving at retrieval
08/16/05, 09:01	08/24/05, 08:58	Nautilus	Sonde failure due to water in connector
08/24/05, 09:15	09/16/05, 08:31	Neptune	
09/16/05, 09:00	10/19/04, 08:46	Calypso	
10/19/05, 09:01	11/18/05, 09:46	Neptune	Light algae/barnacle fouling, shrimp in guard
11/18/05, 10:17	12/08/05, 10:31	Calypso	
12/08/05, 11:01	01/25/06, 12:00	Nansen	Sonde stopped working 12/16, retrieved by divers because of problems with deployment apparatus
d) Seldovia Surface			
12/21/04, 10:45	01/18/05, 10:15	Kozloff	Refurbished DO electrodes
01/18/05, 11:01	02/15/05, 09:46	Zeus	pH probe changed before deployment
02/15/05, 10:15	03/18/05, 09:30	Amundsen	
03/18/05, 10:00	04/19/05, 08:30	Kozloff	Sonde and guard heavily fouled with algae, some barnacles; DO electrodes refurbished
04/19/05, 09:01	05/17/05, 08:31	Zeus	DO membrane not taut; light algae fouling on sonde, guard, probes
05/17/05, 09:00	06/21/05, 08:30	Nansen	Light to moderate barnacle fouling on sonde, guard, probes; small snail in guard
06/22/05, 08:15	07/12/05, 08:30	Cortez	Moderate algae fouling on sonde, guard, probes; small barnacles at base of pH and turbidity probes; hermit crab in guard
07/12/05, 09:00	08/16/05, 08:45	Amundsen	Light to moderate algae/barnacle fouling of sonde, guard, probes
08/16/05, 09:00	09/16/05, 08:30	Nansen	Light to moderate algae/barnacle fouling of sonde, guard, probes
09/16/05, 09:00	10/19/05, 08:45	Cortez	Light algae/barnacle fouling on sonde, guard, probes; DO membrane torn
10/19/05, 09:00	11/18/05, 10:00	Nansen	Light barnacle fouling and one small crab in guard
11/18/05, 10:30	12/08/05, 10:45	Cortez	Light barnacle fouling on

12/08/05, 11:00

01/12/06, 09:45

Kozloff

7) Distribution

According to the Ocean and Coastal Resource Management Data Dissemination Policy for the NERRS System-wide Monitoring Program, NOAA/ERD retains the rights 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 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 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, 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, Microsoft Excel spreadsheet format, and comma-delimited format.

8) Associated Researchers and Projects

The USGS, in conjunction with KBBR and the City of Homer, is conducting a sediment transport monitoring program at Munson Point in Homer. This study uses an ARGUS camera array that collects hourly images of the beach area each day. To better understand the forces associated with the sediment transport, a wave gauge is moored in 3 m MLLW of water. More information about this project can be found at <http://zuma.nwra.com/homer/>.

The data is being combined with hydrographic survey data to examine water exchange between Kachemak Bay and Lower Cook Inlet. The sonde data provides the temporal context while the survey data provides the spatial information.

II. Physical Structure Descriptors

9) Sensor Specifications:

YSI 6600/YSI 6600EDS data logger

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: 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 dependent)

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

Parameter: Dissolved Oxygen % saturation
Units: percent air saturation (%)
Sensor Type: Rapid Pulse – Clark type, polarographic
Model #: 6562
Range: 0 to 500 % air saturation
Accuracy: 0-200 % air saturation, +/- 2 % of the reading or 2 % air saturation, whichever is greater; 200-500 % air saturation, +/- 6 % of the reading
Resolution: 0.1 % air saturation

Parameter: Dissolved Oxygen mg/L (Calculated from % air saturation, temperature and salinity)
Units: milligrams per Liter (mg/L)
Sensor Type: Rapid Pulse – Clark type, polarographic
Model #: 6562
Range: 0 to 50 mg/L
Accuracy: 0 to 20 mg/L, +/- 2 % of the reading or 0.2 mg/L, whichever is greater; 20 to 50 mg/L, +/- 6 % of the reading
Resolution: 0.01 mg/L

Parameter: Vented Level – Deep (Depth)
Units: feet or meters (ft or m)

Sensor Type: Stainless steel strain gauge
Range: 0 to 656 ft (200 m)
Accuracy: +/- 1 ft (0.3 m)
Resolution: 0.001 ft (0.001 m)

Parameter: pH
Units: units
Sensor Type: Glass combination electrode
Model #: 6561
Range: 0 to 14 units
Accuracy: +/- 0.2 units
Resolution: 0.01 units

Parameter: Turbidity
Units: nephelometric turbidity units (NTU)
Sensor Type: Optical, 90 ° scatter, with mechanical cleaning
Model #: 6136
Range: 0 to 1000 NTU
Accuracy: +/- 5 % reading or 2 NTU (whichever is greater)
Resolution: 0.1 NTU

The reliability of the dissolved oxygen (DO) data after 96 hours post-deployment for non-EDS (Extended Deployment System) data sondes may be problematic due to fouling which forms on the DO probe membrane during some deployments (Wenner et al. 2005). Many reserves have upgraded to YSI 6600 EDS data sondes, which increase DO accuracy and longevity by reducing the environmental effects of fouling. The user is therefore advised to consult the metadata and to exercise caution when utilizing the DO data beyond the initial 96-hour time period. However, this potential drift is not always problematic for some uses of the data (i.e., periodicity analysis). It should be noted that the amount of fouling is site specific and that not all data are affected. The Research Coordinator at the specific NERR site should be contacted concerning the reliability of the DO data because of the site and seasonal variation in the fouling of the DO sensor. A mixture of EDS and non-EDS sondes is used at KBNERR.

The NERRS System-Wide Monitoring Program utilizes YSI data sondes that can be equipped with either depth or water level sensors. Both sensors measure water depth, but by convention, level sensors refer to atmospherically vented measurements and depth refers to non-vented measurements. Standard calibration protocols for the non-vented sensor use the atmosphere pressure at the time of calibration. Therefore, changes in atmospheric pressure between calibrations appear as changes in water depth. The error is equal to approximately 1.03 cm for every 1millibar change in atmospheric pressure. This error is eliminated for level sensors because they are vented to the atmosphere throughout the deployment time interval. If proper atmospheric pressure data are available, non-vented sensor depth measurements can be corrected for deployments between calibrations. Readings for both vented and non-vented sensors are automatically compensated for water density changes due to variations in temperature and salinity. The

Research Coordinator at the specific NERR site should be contacted in order to obtain information regarding atmospheric pressure data availability. All sensors used at KBNERR use depth sensors.

10) Coded variable definitions

File name definitions: Reserve/deployment site/file definition/year
(ex: kacsswq2004 = Seldovia surface water quality data from 2004).

Sampling station:	Sampling site code:	Station code:
Homer Dolphin Surface	HS	kachswq
Homer Dolphin Deep	HD	kachdwq
Seldovia Surface	SS	kacsswq
Seldovia Deep	SD	kacsdwq

11) Anomalous/Suspect Data

Outliers in the data are defined to be any point greater than 4 standard deviations from the mean of the 12-hour period surrounding that point.

Although surface sondes are nominally positioned at 1m water depth, on occasion they have become temporarily caught on dock projections during deployment, and are submerged with the rising tide. This results in a short data series where water deeper than 1m has been sampled. Since the sondes are functioning normally, these data have been left in the record.

Turbidity outliers are most commonly related to fish and invertebrates within the sonde guard, and these data have been deleted from the record (see section 12, Deleted Data).

Between sonde rotations we typically encounter the following jumps in data as a result of calibration offsets and probe accuracy:

pH:	+/- 0.02
DO %:	+/- 10
DO Conc:	+/- 1 mg/l

January 1-31, 2005

Homer Dolphin Deep

a) DO readings are high during the deployment from 01/01 00:00 to 01/17/2005

11:00, so all DO data from this time series should be considered suspicious.

b) pH Outlier: 01/08/2005: 18:45 - 19:15, 01/09/2005: 19:15 - 20:00. The pH probe was malfunctioning from 01/17/2005 11:15 to 1/31/2005 23:45, so all data within this time series is considered suspicious.

c) The Turbidity probe was not working from 01/17/2005 11:15 to 1/31/2005 23:45.

Homer Dolphin Surface

a) DO Conc Outlier: 01/18/2005: 20:00.

b) pH Outlier: 01/22/2005: 03:00, 13:30, 01/25/2005: 05:45, 01/28/2005: 18:15, 01/29/2005: 18:45.

Seldovia Surface

DO Conc Outlier: 01/25/2005: 22:15, 01/26/2005: 22:45.

February 1-28, 2005

Homer Dolphin Deep

- a) DO Percent Outlier: 02/07/2005: 18:45 - 19:15, 02/09/2005: 00:00, 02/14/2005: 10:00 - 10:15, 02/20/2005: 18:45 - 19:15, 02/21/2005: 18:45 - 19:00, 02/22/2005: 19:45 - 20:15, 02/23/2005: 20:15, 02/24/2005: 20:45 - 21:00, 02/25/2005: 20:30 - 20:45, 02/26/2005: 21:45, 02/27/2005: 10:00, 22:15 - 22:30, 02/28/2005: 10:30 - 10:45.
- b) DO Conc Outlier: 02/07/2005: 18:45 - 19:15, 02/14/2005: 10:00, 02/20/2005: 18:45 - 19:15, 02/21/2005: 19:00, 02/22/2005: 19:45 - 20:15, 02/23/2005: 20:15, 02/24/2005: 20:45 - 21:00, 02/25/2005: 20:30 - 20:45, 02/26/2005: 21:45, 02/27/2005: 10:00, 22:15 - 22:30, 02/28/2005: 10:30 - 10:45.
- c) pH Outlier: 02/07/2005: 21:15 - 21:30. The pH probe was malfunctioning from 02/01/2005 00:00 to 02/14/2005 09:45, so all data within this time series are considered suspicious.
- d) The Turbidity probe was not working from 02/01/2005 00:00 to 02/14/2005 09:45.

Homer Dolphin Surface

DO Conc Outlier: 02/04/2005: 11:30.

March 1-31, 2005

Homer Dolphin Deep

- a) DO readings during the deployment from 02/14 at 10:00 to 03/17 at 09:45 seem low, but pre- and post-calibration values are close to those values collected in situ. The data are considered suspicious.
- b) DO Percent Outlier: 03/01/2005: 11:00 - 11:15, 03/06/2005: 16:45 - 17:15, 03/08/2005: 19:15 - 19:30, 03/09/2005: 19:45 - 20:00, 03/11/2005: 08:15, 20:45 - 21:00, 03/12/2005: 09:15, 1:30 - 21:45, 03/14/2005: 10:00, 10:30, 03/15/2005: 23:15, 03/23/2005: 18:45 - 19:00, 03/24/2005: 19:30 - 19:45, 03/25/2005: 08:00, 20:15 - 20:30, 03/27/2005: 21:15.
- c) DO Conc Outlier: 03/01/2005: 11:00 - 11:15, 03/06/2005: 17:15, 03/08/2005: 19:15 - 19:30, 03/09/2005: 19:45 - 20:00, 03/11/2005: 08:15, 20:45 - 21:00, 03/12/2005: 09:15, 21:30 - 21:45, 03/14/2005: 10:00, 10:30, 03/15/2005: 23:15, 03/23/2005: 18:45 - 19:00, 03/24/2005: 19:30 - 19:45, 03/25/2005: 20:15 - 20:30.
- d) pH Outlier: 03/03/2005: 07:30, 03/30/2005: 15:00, 17:45.

Homer Dolphin Surface

- a) The DO readings recorded during the deployment at this site from 3/17 at 10:45 to 4/18 at 9:00 are lower than those recorded during deployments in the periods immediately before and after. However, the values for this deployment are within the range we normally expect for DO during this time of year. Post-calibration values for DO in this deployment were also somewhat low, so the DO data collected during this deployment should be considered suspicious.

Seldovia Surface

DO Percent Outlier: 03/17/2005: 15:15.

DO Conc Outlier: 03/14/2005: 11:15.

April 1-30, 2005

Homer Dolphin Deep

- a) DO Percent Outlier: 04/06/2005: 18:45 - 19:00, 04/13/2005: 03:45, 04/19/2005: 17:30, 04/20/2005: 18:00 - 18:15, 04/22/2005: 18:00, 04/23/2005: 06:00, 04/27/2005: 10:00 - 10:15.
- b) DO Conc Outlier: 04/06/2005: 19:00, 04/13/2005: 00:30, 03:45, 04/19/2005: 17:30, 04/20/2005: 18:00 - 18:15, 04/22/2005: 18:00, 04/23/2005: 06:00, 04/24/2005: 08:00, 04/27/2005: 10:00 - 10:15, 04/29/2005: 10:45.
- c) pH Outlier: 04/05/2005: 09:30, 14:45, 04/28/2005: 23:00, 04/29/2005: 20:30.

Homer Dolphin Surface

DO Percent Outlier: 04/03/2005: 17:00.

Seldovia Deep

Early in the deployment (04/19 8:46 to 05/17/2005 08:31) the chlorophyll probe fell apart. Water inundated the connector, adversely affecting the sonde's electronics. All data collected during this deployment are considered suspicious.

Seldovia Surface

- a) The DO membrane used during the deployment at this site from 04/19 at 09:01 to 05/17/2005 at 08:31 was not taut upon retrieval. All DO data collected during this time should be considered suspect.
- b) DO Conc Outlier: 04/03/2005: 17:00.

May 1-31, 2005

Homer Dolphin Deep

- a) DO Percent Outlier: 05/08/2005: 07:45 - 08:00, 05/09/2005: 08:30, 09:00, 05/11/2005: 09:45, 05/29/2005: 00:15, 11:45.
- b) DO Conc Outlier: 05/08/2005: 07:45 - 08:00, 05/09/2005: 08:30 - 09:00, 05/11/2005: 09:45, 05/29/2005: 00:00 - 00:15, 11:45, 05/31/2005: 14:45.
- c) pH Outlier: 05/04/2005: 16:15, 05/19/2005: 09:45, 05/25/2005: 23:45, 05/26/2005: 04:00, 05/30/2005: 06:30, 07:15.

Seldovia Deep

Early in the deployment (04/19 8:46 to 05/17/2005 08:31) the chlorophyll probe fell apart. Water inundated the connector, adversely affecting the sonde's electronics. All data collected during this deployment are considered suspicious.

Seldovia Surface

DO Percent Outlier: 05/22/2005: 08:00.

- a) DO Conc Outlier: 05/22/2005: 08:00.

June 1-30, 2005

Homer Dolphin Deep

- a) DO Percent Outlier: 06/09/2005: 08:45, 10:00, 06/10/2005: 10:15, 06/21/2005: 19:30 - 19:45.
- b) DO Conc Outlier: 06/09/2005: 08:45, 10:00, 06/10/2005: 10:15, 06/21/2005: 19:30 - 19:45.

c) pH Outlier: 06/21/2005: 19:30 - 19:45

Seldovia Deep

a) DO Percent Outlier: 06/05/2005: 11:00, 06/07/2005: 21:15, 06/20/2005: 23:00.

b) DO Conc Outlier: 06/05/2005: 11:00, 06/07/2005: 21:15, 06/20/2005: 23:00.

Seldovia Surface

pH Outlier: 06/20/2005: 22:30.

July 1-31, 2005

Homer Dolphin Deep

The DO membrane (sonde deployed 07/11 to 08/15) was punctured upon retrieval and may have contributed to some of the following records:

a) DO Percent Outlier: 07/01/2005: 03:15, 07/02/2005: 04:45 - 05:15, 07/03/2005: 05:15, 06:00, 07/10/2005: 10:30, 07/11/2005: 10:00, 07/13/2005: 12:15 - 12:30, 07/15/2005: 02:15 - 02:30, 07/16/2005: 03:15, 07/19/2005: 18:30, 07/20/2005: 07:00 - 07:30, 07/22/2005: 08:30 - 08:45, 07/23/2005: 22:00, 07/24/2005: 22:45 - 23:00, 07/30/2005: 03:30, 07/31/2005: 05:00 - 05:30.

b) DO Conc Outlier: 07/01/2005: 03:15, 07/02/2005: 04:45 - 05:15, 07/03/2005: 05:15, 06:00, 07/06/2005: 10:15, 07/10/2005: 10:30, 07/11/2005: 10:00, 07/12/2005: 11:30, 07/13/2005: 12:15 - 12:30, 07/15/2005: 02:15 - 02:30, 07/16/2005: 03:00 - 03:15, 07/18/2005: 03:45 - 04:15, 07/19/2005: 18:30, 07/20/2005: 07:00 - 07:30, 07/22/2005: 08:30 - 08:45, 07/23/2005: 22:00, 07/24/2005: 22:45 - 23:00, 07/30/2005: 03:30, 07/31/2005: 05:00 - 05:30.

c) The pH data collected during the approximate first half of the deployment period from 07/11 at 10:00 to 08/15/2005 at 9:15 are low and sporadic, and the trends do not appear to be accurate. All pH data from this deployment should be considered suspicious. The aforementioned DO membrane rupture may be responsible for the suspicious trends as well as the following pH Outliers: 07/11/2005: 10:00, 07/12/2005: 20:45, 07/14/2005: 13:30, 07/15/2005: 14:00, 07/16/2005: 05:00, 07/20/2005: 07:30, 16:45, 07/23/2005: 13:00, 07/25/2005: 18:00, 07/27/2005: 04:15, 07/29/2005: 04:30, 07/30/2005: 19:15, 07/31/2005: 05:30.

Seldovia Deep

a) DO Percent Outlier: 07/17/2005: 00:45, 07/25/2005: 16:00.

b) DO Conc Outlier: 07/17/2005: 00:45, 07/25/2005: 16:00.

August 1-31, 2005

Homer Dolphin Deep

The DO membrane (sonde deployed 07/11 to 08/15) was punctured upon retrieval and may have contributed to the following records:

a) DO Percent Outlier: 08/01/2005: 06:00 - 06:15, 08/03/2005: 07:00, 08/06/2005: 21:00 - 21:15, 08/07/2005: 21:30, 08/10/2005: 22:15, 23:00 - 23:15, 08/13/2005: 00:45 - 01:00, 08/14/2005: 02:30 - 02:45, 08/15/2005: 03:15, 03:45, 08/18/2005: 06:15 - 06:30, 08/23/2005: 08:45, 21:30, 08/30/2005: 04:30, 08/31/2005: 05:45 - 06:15.

b) DO Conc Outlier: 08/01/2005: 06:00 - 06:15, 08/03/2005: 07:00, 08/06/2005: 21:00 - 21:15, 08/07/2005: 21:30, 08/10/2005: 22:15, 23:00 - 23:15, 08/13/2005: 00:45 - 01:00, 08/14/2005: 02:30 - 02:45, 08/15/2005: 03:15, 03:45, 08/18/2005:

06:15 - 06:30, 08/19/2005: 07:15, 08/23/2005: 08:45, 21:30, 08/24/2005: 21:30,
08/30/2005: 04:30, 08/31/2005: 05:45 - 06:15.

- c) pH Outlier: 08/02/2005: 14:15, 08/06/2005: 20:15, 08/07/2005: 14:45,
08/09/2005: 20:15, 08/10/2005: 12:00, 08/13/2005: 08:45, 08/16/2005: 00:30,
13:30, 08/24/2005: 08:00, 08/25/2005: 02:15, 21:00, 08/29/2005: 18:30.

Homer Dolphin Surface

The DO membrane (sonde deployed 07/11 to 08/15) was punctured upon retrieval
and may have contributed to the following record:

DO Conc Outlier: 08/14/2005: 17:30.

Seldovia Deep

- a) DO Percent Outlier: 08/08/2005: 16:30, 08/11/2005: 08:45.
b) DO Conc Outlier: 08/08/2005: 16:30, 08/11/2005: 08:45, 08/15/2005: 01:00,
08/24/2005: 09:15.

Seldovia Surface

- a) DO Percent Outlier: 08/21/2005: 22:45.
b) DO Conc Outlier: 08/21/2005: 21:45, 22:45.

September 1-30, 2005

Homer Dolphin Deep

- a) DO Percent Outlier: 09/01/2005: 06:00, 09/02/2005: 06:45 - 07:00, 09/03/2005:
08:00 - 08:15, 09/04/2005: 08:15 - 08:30, 09/05/2005: 08:45, 09/06/2005: 09:15 -
09:30, 09/11/2005: 00:15 - 00:30, 09/18/2005: 07:45 - 08:00, 09/20/2005: 10:15,
09/24/2005: 06:45.
b) DO Conc Outlier: 09/01/2005: 06:00, 09/02/2005: 06:45 - 07:00, 09/03/2005:
08:00 - 08:15, 09/04/2005: 08:15 - 08:30, 09/05/2005: 08:45, 09/06/2005: 09:15 -
09:30, 09/11/2005: 00:15 - 00:30, 09/18/2005: 07:45 - 08:00, 09/20/2005: 10:15,
09/24/2005: 06:45.
c) pH Outlier: 09/01/2005: 02:30, 09/04/2005: 09:30, 09/09/2005: 08:45,
09/15/2005: 09:30, 09/26/2005: 12:15, 09/27/2005: 12:45, 09/28/2005: 04:45.

Homer Dolphin Surface

DO Conc Outlier: 09/03/2005: 10:30, 11:00.

Seldovia Deep

- a) DO Percent Outlier: 09/12/2005: 07:00, 09/14/2005: 09:45.
b) DO Conc Outlier: 09/12/2005: 07:00, 09/14/2005: 09:45.

October 1-31, 2005

Homer Dolphin Deep

- a) DO Percent Outlier: 10/05/2005: 21:00 - 21:15, 10/06/2005: 21:45 - 22:00,
10/07/2005: 22:15, 10/12/2005: 09:45, 10/13/2005: 09:15, 10/14/2005: 05:00 -
05:15, 10/16/2005: 06:45, 19:15, 10/19/2005: 16:00, 10/21/2005: 08:30, 21:30,
22:00, 10/26/2005: 01:15, 10/27/2005: 03:00, 03:45, 17:30, 10/28/2005: 17:30 -
17:45.
b) DO Conc Outlier: 10/05/2005: 21:15, 10/06/2005: 21:45 - 22:00, 10/13/2005:
09:15, 10/14/2005: 05:00 - 05:15, 10/16/2005: 19:15, 10/19/2005: 16:00,
10/20/2005: 09:30, 10/21/2005: 08:30, 10/27/2005: 03:00, 03:45, 10/28/2005:
17:45.

- c) pH Outlier: 10/02/2005: 07:15, 10/03/2005: 00:15, 16:00, 10/08/2005: 13:45, 10/20/2005: 06:00.

Seldovia Deep

There is an unexplained drop in pH from 10/19 at 09:15 to 10/22/2005 at 02:46. These data should be considered suspicious.

November 1-30, 2005

Homer Dolphin Deep

- a) DO Percent Outlier: 11/01/2005: 19:30, 11/02/2005: 19:45 - 20:00, 11/12/2005: 17:15 - 17:45, 11/13/2005: 17:30, 18:00 - 18:15, 11/15/2005: 19:30.
b) DO Conc Outlier: 11/01/2005: 19:30, 11/02/2005: 20:00, 11/12/2005: 17:15 - 17:45, 11/13/2005: 17:30, 18:00, 11/15/2005: 19:30.
c) pH Outlier: 11/13/2005: 03:45, 18:45 - 19:00, 11/14/2005: 19:00, 11/25/2005: 09:30, 11/27/2005: 13:30, 11/28/2005: 08:30.

Homer Dolphin Surface

The turbidity probe fell from its port sometime during this deployment, apparently 11/08/2005 at 10:30. Water in the probe connector caused problems with sonde electronics. All data collected from this point until the end of the deployment at 11/17/2005 at 10:15 are considered suspicious, and some have been deleted (see Deleted Data).

Seldovia Deep

The sonde deployed from 11/18 at 10:15 to 12/08/2005 at 09:45 at this site collected data at intervals that occasionally exceeded 15 minutes (up to 18 minute intervals).

December 1-31, 2005

Homer Dolphin Deep

- a) pH Outlier: 12/03/2005: 08:15, 12/04/2005: 16:30, 20:30.
b) DO Percent Outlier: 12/10/2005: 17:15, 12/20/2005: 16:30.
d) DO Conc Outlier: 12/10/2005: 17:15, 12/15/2005: 08:00, 12/20/2005: 16:30.

Seldovia Deep

The sonde deployed from 11/18 at 10:15 to 12/08/2005 at 09:45 at this site collected data at intervals that occasionally exceeded 15 minutes (up to 18 minute intervals). The sonde deployed from 12/08 at 10:00 to 12/31/2005 at 23:45 stopped collecting data at 12/16 at 22:30 for unknown reasons, but post-calibrated normally.

12) Deleted Data

January 1-31, 2005

Homer Dolphin Deep

- a) High Turbidity: 01/10/2005: 20:00, 01/13/2005: 04:15, 21:00, 22:30, 01/14/2005: 14:45.
b) Negative Turbidity: 01/17/2005: 11:15 - 02/14: 09:45.

Homer Dolphin Surface

Turbidity Outlier: 01/28/2005: 20:30.

Seldovia Deep

Turbidity Outlier: 01/06/2005: 13:00, 01/08/2005: 08:15, 01/14/2005: 00:00.

DO membrane was ruptured upon retrieval (01/18/05), with damage likely occurring on 01/08/2005 at 04:30. All data collected from this point until the next sonde deployment (01/18/05 at 10:30) have been deleted from the record.

High Turbidity: 01/01/2005: 02:30, 01/06/2005 13:00, 01/18/2005 10:45

February 1 – 28, 2005

Homer Dolphin Surface

Turbidity Outlier: 02/10/2005: 04:45.

Seldovia Deep

Turbidity Outlier: 02/18/2005: 11:30.

Seldovia Surface

High Turbidity: 02/14/2005: 07:15.

March 1-31, 2005

Homer Dolphin Deep

a) High Turbidity: 03/15/2005: 08:00, 03/21/2005: 14:15.

b) Turbidity Outlier: 03/03/2005: 07:30, 03/30/2005: 15:00, 17:45.

April 1-30, 2005

Homer Dolphin Deep

Turbidity Outlier: 04/05/2005: 09:30, 14:45, 04/28/2005: 23:00, 04/29/2005: 20:30.

Homer Dolphin Surface

a) High Turbidity: 04/15/2005: 16:00, 22:15, 04/17/2005: 14:15, 21:45, 22:45.

b) Turbidity Outlier: 04/03/2005: 08:30, 04/04/2005: 03:15, 04/16/2005: 18:00, 18:45.

Seldovia Deep

a) High Turbidity: 04/25/2005: 04:45.

b) Turbidity Outlier: 04/25/2005: 05:00.

The chlorophyll probe on the sonde deployed 04/19/2005 fell apart, probably early in the deployment. This likely affected salinity and DO and probably explains the following.

c) Specific Conductivity and Salinity out of range: 04/20/2005: 09:30.

d) DO Percent out of range: 04/19/2005: 12:45, 14:00, 14:30, 19:00, 19:30 - 20:30, 21:00, 21:45 - 22:30, 23:00, 23:45, 04/20/2005: 00:30, 01:30, 02:15, 03:00 - 03:15, 04:15, 08:30, 09:15, 09:45, 10:45, 11:15, 11:45, 13:45, 14:15, 15:30, 16:15 - 16:30, 17:00, 18:00 - 18:15, 19:00, 20:15, 21:00, 21:30 - 21:45, 22:15 - 22:30, 04/21/2005: 00:15.

Seldovia Surface

a) High Turbidity: 04/16/2005: 11:00.

b) Turbidity Outlier: 04/04/2005: 07:15, 04/06/2005: 06:00, 04/09/2005: 22:45, 04/12/2005: 06:45, 04/13/2005: 09:45, 04/14/2005: 11:30, 04/17/2005: 10:15, 04/18/2005: 03:15, 08:30, 22:15 - 22:30.

May 1-31, 2005

Homer Dolphin Deep

- a) High Turbidity: 05/16/2005: 19:30.
- b) Turbidity Outlier: 05/04/2005: 16:15, 05/19/2005: 09:45, 05/25/2005: 23:45, 05/26/2005: 04:00, 05/30/2005: 06:30, 07:15.

Homer Dolphin Surface

The turbidity probe wiper on the sonde deployed from 05/16 to 06/20/2005 was partly obscuring the optics upon retrieval, and the entire sonde and all probes were heavily encrusted with barnacles. These factors may be responsible for all or part of the following deleted records:

- a) High Turbidity: 05/31/2005: 19:15 - 19:30, 22:00, 23:15.
- b) Negative Turbidity: 05/16/2005: 09:45 - 05/17: 05:45, 06:15 - 06:45, 07:15 - 05/18/2005: 03:30, 04:00 - 05/19/2005: 08:15, 08:45 - 05/20/2005: 04:00, 05:15 - 05/22/2005: 04:30, 05:45, 06:15 - 06:30, 07:00 - 05/23/2005: 05:15, 05:45 - 17:00, 17:30 - 05/24/2005: 05:45, 06:15 - 16:45, 18:00 - 19:15, 19:45 - 21:00, 21:30 - 05/25/2005: 06:30, 07:00 - 07:15, 09:15, 10:00, 10:45 - 11:45, 12:30 - 14:00, 14:30, 15:15 - 17:15, 18:15, 19:00 - 22:00, 22:30, 23:00 - 05/26/2005: 04:15, 04:45 - 05:30, 06:00 - 07:00, 07:45, 09:45, 10:30 - 10:45, 11:15 - 12:30, 13:00 - 13:15, 13:45 - 17:45, 23:30 - 05/27/2005: 01:00, 02:00 - 02:15, 08:00, 08:30 - 08:45, 13:30.

Seldovia Deep

- a) Turbidity Outlier: 05/31/2005: 23:00.

The chlorophyll probe on the sonde deployed from 04/19 to 05/17/2005 fell apart, probably early in the deployment. This likely affected salinity and DO and probably explains the following.

- b) Salinity out of range: 05/11/2005: 03:45 - 05:00, 05/12/2005: 03:30 - 06:15, 17:30 - 19:45, 05/13/2005: 03:00 - 07:45, 16:30 - 22:15, 05/14/2005: 02:30 - 09:30, 16:15 - 05/15/2005: 11:45, 16:15 - 05/17/2005: 08:30.

Seldovia Surface

- a) High Turbidity: 05/11/2005: 08:00.
- b) Turbidity Outlier: 05/17/2005: 02:30.

June 1-30, 2005

Homer Dolphin Deep

High Turbidity: 06/09/2005: 13:15.

Repeated negative turbidity measurements occurred during the deployment from 06/20 10:15 to 07/11/2005 09:45, possibly due to a faulty calibration. All turbidity data from this deployment have been deleted.

Homer Dolphin Surface

The turbidity probe wiper on the sonde deployed from 05/16 to 06/20/2005 was partly obscuring the optics upon retrieval, and the entire sonde and all probes were heavily encrusted with barnacles. These factors may be responsible for all or part of the following deleted records (with the exception of one turbidity outlier, noted below):

- a) High Turbidity: 06/01/2005: 00:00, 03:15 - 03:30, 05:15, 17:00, 17:45 - 18:00, 18:30 - 20:00, 21:15, 21:45 - 22:00, 22:45 - 23:00, 06/02/2005: 01:45 - 02:15, 04:00 - 05:00, 07:00, 08:00, 08:30, 09:30, 11:00 - 11:15, 16:15, 19:45 - 20:30,

- 21:15, 22:00, 22:30, 06/03/2005: 00:15, 05:15, 06:00, 08:30, 09:30, 10:45 - 11:30, 12:15, 14:45, 16:00, 17:45 - 18:15, 20:45, 21:30 - 21:45, 06/04/2005: 03:00 - 03:15, 07:00, 09:45 - 10:15, 13:15, 19:45 - 20:00, 22:00 - 22:15, 23:15 - 06/05/2005: 00:00, 00:45 - 01:15, 02:00, 05:30, 10:45, 13:45 - 14:00, 19:30, 22:00, 06/06/2005: 00:45, 01:15, 01:45, 02:45, 12:15, 14:00, 16:00, 20:45, 06/07/2005: 00:00, 13:15, 06/09/2005: 16:30, 06/11/2005: 17:30, 06/12/2005: 04:30, 06/13/2005: 15:00.
- b) Negative Turbidity: 06/07/2005: 01:30, 06/08/2005: 14:15.
 - c) Turbidity Outlier: 06/08/2005: 12:45, 06/14/2005: 08:45 - 09:00, 06/15/2005: 04:15, 06/19/2005: 18:15. The following record was made from an un-fouled sonde with a properly functioning turbidity probe on the next deployment: 06/24/2005: 02:45 - 03:00.

Seldovia Deep

Turbidity Outlier: 06/03/2005: 14:00, 06/20/2005: 04:30, 06/22/2005: 04:30.

Seldovia Surface

The sonde (deployed 05/17 to 06/21/2005) guard was moderately fouled with barnacles and a snail was inside. These animals may be responsible for all or part of the following deleted records:

- a) High Turbidity: 06/06/2005: 20:45 - 22:30, 23:15 - 06/07/2005: 00:15, 01:45 - 02:15, 03:30 - 03:45, 05:45 - 06:30, 07:15 - 07:30, 09:30 - 10:45, 11:15, 12:45, 14:45 - 15:00, 20:30 - 20:45, 21:30 - 21:45, 22:15, 23:15, 23:45 - 06/08/2005: 00:00, 01:15, 08:00, 09:30 - 10:00, 13:30 - 13:45, 18:15, 19:45, 22:30, 06/09/2005: 02:30, 08:00 - 08:45, 10:15, 11:15, 06/10/2005: 09:45, 10:45, 06/11/2005: 08:45, 12:15, 14:15, 17:00, 18:00, 19:00 - 19:15, 20:30, 23:15, 06/12/2005: 11:30, 12:00 - 12:15, 06/13/2005: 09:15, 15:30, 06/16/2005: 16:45, 06/17/2005: 22:30, 06/18/2005: 10:45, 06/19/2005: 05:30, 06:45, 10:00, 12:30, 06/20/2005: 06:45, 09:30, 16:00, 16:30, 20:00, 23:45 - 06/21/2005: 00:15, 02:45.
- b) Turbidity Outlier: 06/06/2005: 07:45, 06/14/2005: 06:30.

July 1-31, 2005

Homer Dolphin Deep

Repeated negative turbidity measurements occurred during the deployment from 06/20 9:45 to 07/11/2005 09:45, possibly due to a faulty calibration. All turbidity data from this deployment have been deleted.

Turbidity Outlier: 07/11/2005: 10:00, 07/12/2005: 20:45, 07/14/2005: 13:30, 07/15/2005: 14:00, 07/16/2005: 05:00, 07/19/2005 06:45; 07/20/2005: 07:30, 16:45, 07/23/2005: 13:00, 07/25/2005: 18:00, 07/27/2005: 04:15, 07/29/2005: 04:30, 07/30/2005: 19:15, 07/31/2005: 05:30.

Homer Dolphin Surface

Both sondes deployed at this site (06/20 to 07/11 and 07/11 to 08/15/2005) were retrieved with heavy algal and light to moderate barnacle fouling of the sonde, guard, and all probes. These factors may have contributed to the following deleted records:

- a) High Turbidity: 07/09/2005: 08:30, 11:45 - 12:00, 12:30 - 12:45, 15:00, 22:00, 07/19/2005: 01:30.
- b) Turbidity Outlier: 07/19/2005: 01:15, 07/23/2005: 21:00, 07/24/2005: 21:00.

Seldovia Deep

- a) High Turbidity: 07/04/2005: 18:00 - 18:15.
 - b) Turbidity Outlier: 07/05/2005: 09:30.
- Seldovia Surface
- a) High Turbidity: 07/23/2005: 06:30.
 - b) Turbidity Outlier: 07/24/2005: 20:15, 07/27/2005: 02:15, 03:15.

August 1-31, 2005

Homer Dolphin Deep

- a) High Turbidity: 08/01/2005: 20:15, 08/03/2005: 20:45, 08/04/2005: 22:15, 08/06/2005: 07:30, 08/08/2005: 09:15, 11:45, 08/11/2005: 05:15, 16:15, 08/14/2005: 12:15, 08/17/2005: 13:30, 08/20/2005: 11:00, 08/22/2005: 08:45.
- b) Turbidity Outlier: 08/02/2005: 14:15, 08/06/2005: 20:15, 08/07/2005: 14:45, 08/09/2005: 20:15, 08/10/2005: 12:00, 08/13/2005: 08:45, 08/16/2005: 00:30, 13:30, 08/24/2005: 08:00, 08/25/2005: 02:15, 21:00, 08/29/2005: 18:30.

Homer Dolphin Surface

The sonde (deployed 07/11 to 08/15) was retrieved with heavy algal and light barnacle fouling of the sonde, guard, and all probes. These factors may have contributed to the following deleted records:

High Turbidity: 08/02/2005: 13:15, 19:15, 23:45, 08/03/2005: 01:15, 17:30, 08/04/2005: 05:45, 10:45 - 11:00, 13:30, 14:30, 16:15, 17:15 - 18:00, 20:00, 20:45, 08/05/2005: 06:30 - 07:00, 07:30, 14:00 - 14:15, 15:30, 19:45, 21:30 - 21:45, 08/06/2005: 02:45, 05:15 - 05:30, 21:15, 22:15 - 23:15, 23:45 - 08/07/2005: 00:00, 08:30, 10:30, 11:15, 11:45 - 12:15, 13:30 - 14:30, 15:00, 15:30 - 16:15, 18:15, 19:00, 19:45 - 23:45, 08/08/2005: 00:30 - 03:45, 11:00 - 13:45, 18:15 - 18:45, 22:45 - 23:30, 08/09/2005: 01:15 - 03:15, 04:00 - 04:15, 05:30 - 06:15, 10:45, 12:30 - 13:15, 14:00 - 15:00, 15:45, 16:15 - 16:45, 19:30 - 19:45, 20:15 - 21:00, 22:30, 08/10/2005: 00:30 - 01:15, 02:15 - 03:00, 03:45 - 04:30, 05:30, 06:45 - 07:45, 09:30, 11:00 - 12:15, 16:00 - 17:15, 20:15, 22:15 - 22:30, 23:00, 23:45 - 08/11/2005: 01:15, 02:00, 02:45, 03:45, 04:45 - 05:00, 06:45, 07:30, 08:30, 10:00 - 10:15, 11:30, 12:15 - 13:00, 14:30, 16:00, 17:00, 17:45 - 18:00, 19:30, 23:45, 08/12/2005: 00:15 - 00:30, 01:45, 02:15 - 02:30, 03:00 - 03:15, 03:45 - 04:00, 04:30 - 04:45, 06:00, 06:45 - 07:00, 09:00, 14:30, 15:30 - 15:45, 16:45 - 17:00, 17:45, 18:30, 21:15, 21:45, 08/13/2005: 02:15, 04:30 - 04:45, 06:15, 07:00 - 07:15, 18:00, 08/14/2005: 04:00 - 04:15, 05:45, 08:15, 17:45 - 18:00, 18:30 - 19:00, 20:15, 23:00, 08/15/2005: 01:30 - 01:45, 03:30 - 03:45, 04:15 - 04:45, 06:00 - 06:45, 07:15 - 07:45, 08:45 - 09:00, 08/16/2005: 03:45 - 04:00.

Seldovia Deep

The turbidity probe wiper would not move during post-calibration, and the possible miscommunication with the sonde may be responsible for the following records:

- a) High Turbidity: 08/11/2005: 03:30.
- b) Turbidity Outlier: 08/03/2005: 01:15, 08/13/2005: 15:00.

Seldovia Surface

Turbidity Outlier: 08/07/2005: 07:30, 08/08/2005: 12:45.

September 1-30, 2005

Homer Dolphin Deep

- a) High Turbidity: 09/03/2005: 13:00, 17:45, 09/07/2005: 04:45, 09/24/2005: 10:15, 09/25/2005: 06:30.
- b) Turbidity Outlier: 09/01/2005: 02:30, 09/04/2005: 09:30, 09/09/2005: 08:45, 09/15/2005: 09:30, 09/26/2005: 12:15, 09/27/2005: 12:45, 09/28/2005: 04:45.

Homer Dolphin Surface

The sonde (deployed 08/15 to 09/15/2005) was retrieved with heavy algal fouling of the sonde, guard, and all probes. These factors may have contributed to the following deleted records:

High Turbidity: 09/05/2005: 02:30 - 03:00, 03:45 - 04:00, 13:30, 23:45, 09/06/2005: 00:30, 01:00 - 01:15, 02:00, 02:45 - 04:30, 05:15, 05:45 - 06:45, 08:30, 10:30 - 11:30, 12:30 - 12:45, 13:15 - 13:30, 14:30 - 15:15, 16:30 - 18:30, 19:00 - 21:15, 22:15 - 23:30, 09/07/2005: 00:30 - 01:45, 02:45 - 03:45, 04:45 - 06:00, 07:00 - 09:30, 10:45 - 12:15, 12:45 - 13:45, 15:00 - 15:45, 16:45 - 17:45, 18:45 - 20:00, 21:15 - 22:15, 23:30 - 09/08/2005: 03:00, 04:15 - 05:45, 06:45 - 08:15, 09:45 - 11:00, 11:45, 12:30 - 13:30, 14:30 - 15:45, 16:15, 17:00 - 18:15, 18:45, 19:15 - 20:45, 22:00 - 23:15, 23:45, 09/09/2005: 00:15 - 01:45, 02:15 - 02:30, 03:00 - 04:30, 05:15, 06:00 - 07:15, 08:45 - 09:45, 11:15 - 12:00, 13:00 - 13:45, 14:45 - 16:30, 17:30 - 18:30, 19:30 - 20:30, 21:30 - 22:30, 23:00 - 23:15, 23:45 - 09/10/2005: 03:45, 04:15 - 05:15, 05:45, 06:30 - 08:00, 08:45 - 10:15, 10:45 - 12:15, 12:45 - 14:30, 15:00 - 19:00, 19:30 - 20:45, 21:15 - 23:15, 23:45 - 09/11/2005: 01:15, 02:00 - 03:45, 04:30 - 06:45, 07:15 - 09:30, 10:00 - 12:00, 12:45 - 15:30, 16:00 - 09/15/2005: 09:15.

Seldovia Deep

Turbidity Outlier: 09/17/2005: 21:45, 09/21/2005: 17:30, 09/27/2005: 05:00.

Seldovia Surface

- a) High Turbidity: 09/04/2005: 12:15, 09/06/2005: 16:00.
- b) Turbidity Outlier: 09/03/2005: 08:00, 09/14/2005: 08:45.

October 1-31, 2005

Homer Dolphin Deep

- a) High Turbidity: 10/01/2005: 15:30, 16:00, 10/04/2005: 21:30, 10/15/2005: 00:30, 01:15, 10/18/2005: 06:15, 10/31/2005: 22:45.
- b) Turbidity Outlier: 10/02/2005: 07:15, 10/03/2005: 00:15, 16:00, 10/08/2005: 13:45, 10/20/2005: 06:00.

Seldovia Deep

- a) High Turbidity: 10/09/2005: 20:30.
- b) Turbidity Outlier: 10/08/2005: 21:15, 10/11/2005: 00:15, 12:15, 10/14/2005: 07:30, 21:15, 10/17/2005: 20:00.

Seldovia Surface

- a) DO data recorded after DO membrane was compromised during deployment: 10/14/2005: 17:15 - 10/19/2005 08:45.

November 1-30, 2005

Homer Dolphin Deep

- a) High Turbidity: 11/22/2005: 06:30, 17:15, 11/29/2005: 05:45.
- b) Turbidity Outlier: 11/13/2005: 03:45, 18:45 - 19:00, 11/14/2005: 19:00, 11/25/2005: 09:30, 11/27/2005: 13:30, 11/28/2005: 08:30.

Homer Dolphin Surface

The turbidity probe fell from its port sometime during this deployment, apparently 11/08/2005 at 10:30. Water in the probe connector caused problems with sonde electronics. All data collected from this point until the end of the deployment at 11/17/2005 at 10:15 are considered suspicious (see Anomalous/Suspect Data), and the following have been deleted:

- a. Specific conductivity and salinity out of range: 11/08/2005: 20:00, 21:00, 23:15, 11/09/2005: 07:30, 08:45, 11:15, 11/12/2005: 05:30, 11/13/2005: 09:30, 12:00, 15:15, 16:30, 11/14/2005: 03:15, 15:45.
- b. DO percent out of range: 11/08/2005: 23:00, 23:30 - 23:45, 11/09/2005: 01:30, 02:30 - 03:00, 03:30 - 04:00, 05:15 - 05:45, 06:15, 06:45, 07:15 - 07:45, 08:15, 08:45 - 10:15, 11:00 - 11:15, 11/11/2005: 13:00, 18:45, 20:45, 21:15 - 11/12/2005: 12:15, 14:00 - 22:45, 23:15 - 11/13/2005: 03:00, 04:15, 05:15 - 05:30, 12:00, 13:00, 14:00 - 14:15, 15:00, 18:00 - 19:15, 11/14/2005: 03:15, 05:45, 17:45, 19:45 - 20:00, 11/15/2005: 03:15, 03:45, 05:00, 06:45 - 07:45, 08:15 - 11:15, 13:00, 14:30, 15:00 - 20:45, 11/16/2005: 04:00, 04:45, 14:00, 16:00, 16:30 - 16:45, 17:45.
- c. High Turbidity: 11/08/2005: 11:30, 12:30, 13:00, 13:45, 18:30, 19:00, 11/11/2005: 07:00, 11/13/2005: 05:15, 11/14/2005: 17:45, 14:15.
- d. Negative Turbidity: 11/08/2005: 12:45, 13:15, 14:00, 15:00, 15:30 - 18:15, 18:45, 11/11/2005: 06:45, 07:15, 11/13/2005: 05:30 - 10:30, 11:00 - 11:15, 11:45, 13:00, 15:15, 16:30, 17:00 - 17:15, 23:00 - 23:45, 11/14/2005: 00:15 - 00:30, 01:15 - 02:00, 02:45 - 03:00, 11:00 - 12:00, 13:15, 13:45, 14:30, 15:30 - 16:15, 18:45, 19:15, 19:45 - 20:00, 11/15/2005: 03:15, 08:15, 08:45, 10:15, 10:45 - 13:30, 14:30, 15:00 - 15:30, 11/16/2005: 15:00, 18:15 - 11/17/2005: 10:15.
- f) Turbidity Outlier: 11/04/2005: 02:15.

Seldovia Deep

The sonde deployed from 11/18 at 10:15 to 12/08/2005 at 09:45 at this site collected data at intervals that occasionally exceeded 15 minutes (up to 18 minute intervals).

- a) High Turbidity: 11/12/2005: 01:15.
- b) Turbidity Outlier: 11/03/2005: 23:30.

Seldovia Surface

- a) High Turbidity: 11/05/2005: 22:00, 11/07/2005: 14:15, 11/08/2005: 01:00, 11/09/2005: 06:15, 07:00, 15:30, 11/10/2005: 04:45, 11/11/2005: 23:30, 11/12/2005: 09:00, 11/13/2005: 05:30, 11/14/2005: 21:45, 11/15/2005: 00:00, 00:30, 01:45, 02:15, 03:45, 04:15 - 04:30, 05:30 - 05:45, 09:00, 09:30, 10:30, 11/17/2005: 03:15, 06:00, 06:30, 07:30, 13:45, 11/18/2005: 05:00, 05:45.
- b) Negative Turbidity: 11/18/2005: 10:30 - 14:45, 15:45 - 16:15, 16:45, 21:45 - 22:45, 11/19/2005: 00:00 - 09:15, 11/22/2005: 04:45, 06:00, 06:30 - 07:00, 07:30 - 08:15, 11:45 - 14:00, 11/28/2005: 11:45, 12:30, 11/29/2005: 01:30, 11:30, 12:00 - 12:45, 11/30/2005: 00:45, 01:15 - 02:15, 02:45 - 03:00, 08:45 - 09:15, 10:15, 10:45 - 12:45, 13:15 - 13:45, 18:45, 20:30, 23:45.

December 1 – 31, 2005

Homer Dolphin Deep

- a) Turbidity Outlier: 12/03/2005: 08:15, 12/04/2005: 16:30, 20:30, 12/08/2005: 16:45, 12/20/2005: 16:30, 12/23/2005: 13:45, 12/24/2005 16:45.
- b) High Turbidity: 12/16/2005: 09:30.

Seldovia Deep

The sonde deployed at this site from 12/08 at 10:00 through the end of December stopped collecting data at 12/16 at 22:30 for unknown reasons, but post-calibrated normally.

High Turbidity: 12/11/2005: 09:15, 10:30, 13:15.

Seldovia Surface

Negative Turbidity: 12/01/2005: 01:00, 01:30, 02:00 - 05:00, 06:00 - 06:15, 08:00, 08:30 - 17:30, 19:00, 20:30 - 21:15, 22:00 - 22:15, 22:45, 23:30, 12/02/2005: 00:30 - 06:30, 07:00 - 07:15, 07:45 - 10:15, 10:45 - 12:00, 12:30 - 16:30, 17:00, 17:30, 12/04/2005: 16:45, 12/07/2005: 07:15 - 09:00, 10:45, 17:45 - 20:45.

13) Missing Data

Data are missing due to equipment failure where no probes deployed, maintenance/calibration of equipment (See Section 6), or elimination of data due to calibration (both pre and post) problems. For more details about missing data, contact the Research Coordinator at the Kachemak Bay Research Reserve.

January 1-31, 2005

Homer Dolphin Surface

01/19/2005	13:00:00 - 13:30:00
01/19/2005	22:45:00
01/20/2005	02:00:00 - 02:15:00
01/20/2005	09:45:00
01/20/2005	11:00:00
01/20/2005	12:00:00
01/20/2005	13:15:00
01/21/2005	12:15:00
01/21/2005	13:45:00
01/21/2005	14:15:00
01/21/2005	14:45:00 - 15:00:00
01/21/2005	16:00:00 - 16:30:00
01/21/2005	17:00:00 - 17:15:00
01/21/2005	17:45:00
01/21/2005	18:45:00
01/21/2005	20:30:00
01/22/2005	01:30:00 - 02:45:39
01/22/2005	03:30:00
01/22/2005	04:30:00
01/22/2005	12:30:00

01/22/2005	13:00:39 - 13:15:39
01/22/2005	13:45:39 - 14:00:39
01/22/2005	14:30:39
01/22/2005	15:15:40
01/22/2005	15:45:39
01/22/2005	18:00:40 - 19:00:39
01/22/2005	19:30:39 - 19:45:39
01/22/2005	20:15:39
01/22/2005	21:45:40 - 22:00:39
01/23/2005	04:00:39
01/24/2005	16:00:39
01/24/2005	16:45:40
01/24/2005	17:15:39 - 17:45:39
01/24/2005	18:30:40 - 19:15:39
01/25/2005	00:15:40
01/25/2005	01:00:40
01/25/2005	01:45:40 - 02:00:39
01/25/2005	05:00:40 - 05:30:40
01/25/2005	06:00:40 - 07:15:39
01/25/2005	07:45:39 - 08:00:39
01/25/2005	14:15:40 - 14:30:39
01/25/2005	16:00:40 - 18:00:39
01/25/2005	19:00:39 - 19:15:39
01/25/2005	22:30:40
01/26/2005	01:00:40 - 01:45:39
01/26/2005	02:15:39
01/26/2005	02:45:39
01/26/2005	03:15:39 - 04:15:39
01/26/2005	04:45:39 - 09:00:39
01/26/2005	14:30:40 - 15:30:39
01/26/2005	16:30:40 - 20:30:39
01/27/2005	18:15:40
01/28/2005	06:15:39
01/28/2005	06:45:39 - 07:15:39
01/28/2005	16:15:39
01/28/2005	17:00:39 - 18:00:39
01/28/2005	18:30:39 - 19:45:39
01/28/2005	21:00:39 - 22:15:39
01/29/2005	05:45:39 - 06:30:39
01/29/2005	07:00:39 - 08:45:39
01/29/2005	09:45:40 - 10:30:39
01/29/2005	11:00:39
01/29/2005	15:00:40
01/29/2005	16:15:39 - 18:30:39
01/30/2005	08:00:39

February 1-28, 2005

Homer Dolphin Surface

02/03/2005	19:15:40
02/03/2005	23:15:39
02/04/2005	00:30:40
02/04/2005	11:00:39
02/05/2005	02:00:40
02/08/2005	03:00:39 - 03:15:39
02/09/2005	14:30:39
02/09/2005	15:00:39 - 16:15:39
02/12/2005	05:00:39 - 06:15:39
02/12/2005	15:00:40 - 15:45:39
02/12/2005	16:15:39
02/12/2005	17:30:39 - 18:15:39
02/13/2005	14:00:40 - 14:30:39
02/14/2005	04:00:40
02/14/2005	04:30:39
02/14/2005	09:30:40 - 09:45:40

March 1-31, 2005

Homer Dolphin Deep

03/07/2005	09:46:00 – 03/17/2005 10:16:00
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Homer Dolphin Surface

03/21/2005	22:30:00
03/22/2005	13:15:00

April 1-30, 2005

Homer Dolphin Surface

04/21/2005	01:45:40 - 02:00:39
04/21/2005	02:30:39 - 11:30:39
04/21/2005	12:00:39 - 12:15:39
04/21/2005	12:45:39 - 13:45:39
04/21/2005	14:15:39 - 17:30:39
04/21/2005	18:00:39 - 18:15:39
04/21/2005	18:45:40 - 19:45:39
04/21/2005	20:45:40 - 21:15:39
04/21/2005	21:45:39
04/21/2005	22:30:40 - 23:00:39
04/21/2005	23:30:39
04/22/2005	00:00:39 - 00:15:39
04/22/2005	01:15:40
04/22/2005	01:45:39
04/22/2005	02:15:39 - 02:45:39
04/22/2005	03:30:40
04/22/2005	04:00:39
04/22/2005	04:30:39

04/22/2005	05:00:39
04/22/2005	05:30:39 - 06:00:39
04/22/2005	06:30:39
04/22/2005	07:00:39 - 07:15:39
04/22/2005	07:45:39 - 08:15:39
04/22/2005	09:00:40 - 09:15:39
04/22/2005	10:00:40 - 10:30:39
04/22/2005	11:00:39
04/22/2005	11:30:39 - 11:45:39
04/22/2005	12:15:39 - 13:30:39
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04/22/2005	17:00:39 - 17:15:39
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04/22/2005	20:00:40
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04/22/2005	21:30:39
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04/22/2005	22:45:39 - 23:15:39
04/23/2005	00:00:40 - 00:15:39
04/23/2005	01:00:40
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04/23/2005	02:00:39
04/23/2005	02:30:39 - 02:45:39
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04/23/2005	06:00:39 - 06:30:39
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04/23/2005	08:15:39
04/23/2005	08:45:39
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04/23/2005	10:15:39 - 10:30:39
04/23/2005	11:00:39
04/23/2005	11:30:39 - 12:00:39
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04/25/2005	02:45:40

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04/25/2005	07:45:39 - 08:00:39
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04/26/2005	23:30:40
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04/27/2005	01:00:40
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04/27/2005	13:30:40 - 14:15:39
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04/27/2005	16:00:39
04/27/2005	16:45:40
04/27/2005	17:45:40 - 18:00:39
04/27/2005	18:45:40 - 19:00:39
04/27/2005	19:45:40 - 20:00:39
04/27/2005	20:45:40
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04/27/2005	21:45:39
04/27/2005	22:30:40
04/28/2005	01:45:40 - 02:00:39
04/28/2005	02:45:40 - 03:00:39
04/28/2005	03:30:39 - 03:45:39
04/28/2005	04:30:40
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04/28/2005	05:45:40
04/28/2005	06:15:39
04/28/2005	07:00:40 - 07:15:39
04/28/2005	08:00:40
04/28/2005	09:00:40
04/28/2005	09:45:40
04/28/2005	10:30:40
04/28/2005	11:00:39
04/28/2005	12:15:39
04/28/2005	12:45:39
04/28/2005	13:15:39
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04/28/2005	15:30:40 - 15:45:39
04/28/2005	16:15:39 - 16:30:39
04/28/2005	17:00:39
04/28/2005	17:45:40
04/28/2005	18:30:40
04/28/2005	19:00:39
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04/28/2005	21:15:40
04/28/2005	21:45:39
04/28/2005	22:30:40
04/29/2005	02:30:40
04/29/2005	03:15:40
04/29/2005	04:00:40 - 04:30:39
04/29/2005	05:00:39
04/29/2005	05:30:39 - 06:30:39
04/29/2005	07:00:39
04/29/2005	07:30:39
04/29/2005	08:00:39
04/29/2005	08:45:40
04/29/2005	09:30:40
04/29/2005	10:00:39 - 10:15:39
04/29/2005	10:45:39
04/29/2005	11:15:39
04/29/2005	12:45:40
04/29/2005	14:30:40

04/29/2005	15:00:39 - 15:15:39
04/29/2005	15:45:39 - 16:00:39
04/29/2005	17:00:40
04/29/2005	17:30:39 - 17:45:39
04/29/2005	18:15:39 - 19:30:39
04/29/2005	20:00:39 - 20:30:39
04/29/2005	21:00:39
04/29/2005	21:30:39 - 22:00:39
04/29/2005	22:30:39 - 23:00:39
04/29/2005	23:45:40
04/30/2005	00:00:39 – 00:15:39
04/30/2005	00:45:39 - 01:00:39
04/30/2005	01:45:40 - 02:30:39
04/30/2005	03:00:39 - 04:15:39
04/30/2005	04:45:39 - 05:00:39
04/30/2005	05:30:39 - 06:00:39
04/30/2005	06:30:39
04/30/2005	07:00:39 - 07:30:39
04/30/2005	08:15:40 - 08:30:39
04/30/2005	09:15:40 - 10:45:39
04/30/2005	11:30:40
04/30/2005	12:15:40
04/30/2005	13:00:40 - 13:15:39
04/30/2005	14:00:40
04/30/2005	14:30:39 - 15:00:39
04/30/2005	15:30:39 - 16:15:39
04/30/2005	17:00:40 - 17:15:39
04/30/2005	18:00:40 - 19:30:39
04/30/2005	20:00:39
04/30/2005	20:30:39 - 23:00:39
04/30/2005	23:30:39 - 23:45:39

Seldovia Deep

04/19/2005	19:15:00
04/20/2005	04:30:00

May 1-31, 2005

Homer Dolphin Deep

05/16/2005	09:01:00 – 09:30:59
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Homer Dolphin Surface

05/01/2005	00:45:40
05/01/2005	01:15:39 - 01:30:39
05/01/2005	02:15:40 - 02:30:39
05/01/2005	03:00:39 - 03:45:39
05/01/2005	04:30:40 - 04:45:39
05/01/2005	05:30:40 - 06:00:39
05/01/2005	06:45:40 - 07:15:39

05/01/2005	07:45:39 - 10:15:39
05/01/2005	11:00:40 - 11:15:39
05/01/2005	11:45:39 - 12:30:39
05/01/2005	13:15:40 - 13:45:39
05/01/2005	14:30:40
05/01/2005	15:30:40 - 15:45:39
05/01/2005	16:15:39 - 17:30:39
05/01/2005	18:15:40 - 19:45:39
05/01/2005	20:15:39 - 21:30:39
05/01/2005	22:15:40
05/01/2005	22:45:39
05/01/2005	23:15:39
05/01/2005	23:45:39 - 05/02/2005 00:00:39
05/02/2005	00:30:39
05/02/2005	01:00:39
05/02/2005	01:30:39
05/02/2005	02:00:39 - 02:15:39
05/02/2005	03:00:40 - 03:15:39
05/02/2005	03:45:39
05/02/2005	04:30:40
05/02/2005	05:00:39 - 05:15:39
05/02/2005	05:45:39
05/02/2005	06:15:39
05/02/2005	07:15:40 - 07:30:39
05/02/2005	08:00:39
05/02/2005	09:00:40
05/02/2005	09:30:39
05/02/2005	10:00:39
05/02/2005	10:45:40
05/02/2005	11:15:39 - 11:30:39
05/02/2005	12:00:39 - 12:15:39
05/02/2005	12:45:39 - 13:00:39
05/02/2005	13:30:39 - 13:45:39
05/02/2005	14:30:40 - 15:00:39
05/02/2005	15:30:39
05/02/2005	16:00:39 - 16:15:39
05/02/2005	16:45:39 - 17:00:39
05/02/2005	17:30:39 - 19:00:39
05/02/2005	19:30:39 - 20:30:39
05/02/2005	21:00:39
05/02/2005	21:30:39 - 22:15:39
05/02/2005	22:45:39 - 05/03/2005 00:00:39
05/03/2005	00:30:39 - 00:45:39
05/03/2005	01:15:39 - 01:30:39
05/03/2005	02:00:39 - 02:15:39
05/03/2005	02:45:39

05/03/2005	03:15:39
05/03/2005	03:45:39
05/03/2005	04:15:39
05/03/2005	05:00:40
05/03/2005	05:30:39
05/03/2005	06:00:39
05/03/2005	06:30:39 - 06:45:39
05/03/2005	07:15:39 - 08:00:39
05/03/2005	08:30:39 - 10:00:39
05/03/2005	10:30:39 - 10:45:39
05/03/2005	11:15:39 - 12:00:39
05/03/2005	12:30:39
05/03/2005	13:00:39 - 13:30:39
05/03/2005	14:15:40 - 14:30:39
05/03/2005	15:15:40
05/03/2005	15:45:39 - 16:15:39
05/03/2005	17:00:40 - 17:15:39
05/03/2005	18:00:40
05/03/2005	18:45:40
05/03/2005	19:15:39 - 22:45:39
05/03/2005	23:15:39 - 05/04/2005 01:00:39
05/04/2005	01:30:39 - 02:00:39
05/04/2005	02:30:39 - 02:45:39
05/04/2005	03:15:39 - 03:30:39
05/04/2005	04:00:39
05/04/2005	04:30:39
05/04/2005	05:00:39
05/04/2005	05:30:39
05/04/2005	06:00:39
05/04/2005	06:45:40
05/04/2005	07:30:40
05/04/2005	08:00:39
05/04/2005	08:45:40 - 09:30:39
05/04/2005	10:30:40 - 11:00:39
05/04/2005	11:30:39 - 11:45:39
05/04/2005	11:45:39 - 14:30:39
05/04/2005	15:45:39 - 16:15:39
05/04/2005	16:45:39 - 17:00:39
05/04/2005	18:00:40 - 18:30:39
05/04/2005	19:00:39 - 19:00:39
05/04/2005	19:45:40
05/04/2005	20:45:40 - 21:00:39
05/04/2005	22:45:40 - 23:00:39
05/04/2005	23:30:39 - 23:45:39
05/05/2005	00:30:40 - 02:00:39
05/05/2005	02:45:40 - 03:00:39

05/05/2005	03:30:39
05/05/2005	04:00:39 - 04:15:39
05/05/2005	05:00:40 - 05:15:39
05/05/2005	06:00:40 - 06:15:39
05/05/2005	07:00:40 - 07:15:39
05/05/2005	07:45:39
05/05/2005	08:15:39
05/05/2005	08:45:39 - 09:30:39
05/05/2005	10:00:39 - 10:45:39
05/05/2005	11:15:39
05/05/2005	11:45:39
05/05/2005	12:15:39 - 12:45:39
05/05/2005	13:15:39 - 13:45:39
05/05/2005	14:45:40
05/05/2005	15:30:40 - 19:15:39
05/05/2005	21:00:40 - 21:30:39
05/06/2005	00:45:40
05/06/2005	01:15:39 - 02:00:39
05/06/2005	02:30:39 - 05:30:39
05/06/2005	06:00:39 - 06:45:39
05/06/2005	07:15:39 - 08:15:39
05/06/2005	11:45:39 - 12:00:39
05/06/2005	12:30:39 - 16:45:39
05/06/2005	17:30:40 - 17:45:39
05/06/2005	18:15:39
05/06/2005	18:45:39 - 19:00:39
05/07/2005	01:00:39 - 01:15:39
05/07/2005	02:00:40 - 04:00:39
05/07/2005	04:30:39 - 06:30:39
05/07/2005	07:15:40 - 07:45:39
05/07/2005	08:30:40 - 08:45:39
05/07/2005	10:15:40 - 10:30:39
05/07/2005	11:15:40 - 11:30:39
05/07/2005	14:30:40
05/07/2005	15:00:39 - 17:15:39
05/07/2005	17:45:39
05/07/2005	18:45:40
05/07/2005	19:15:39
05/07/2005	19:45:39
05/07/2005	20:30:40
05/07/2005	21:15:40 - 22:00:39
05/07/2005	22:30:39
05/07/2005	23:00:39
05/07/2005	23:30:39 - 23:45:39
05/08/2005	00:15:39
05/08/2005	00:45:39

05/08/2005	01:30:40
05/08/2005	02:15:40 - 03:30:39
05/08/2005	04:00:39 - 04:15:39
05/08/2005	05:00:40
05/08/2005	05:30:39 - 09:15:39
05/08/2005	10:30:39
05/08/2005	11:00:40 - 11:30:39
05/08/2005	11:45:39
05/08/2005	12:45:40
05/08/2005	13:15:39 - 15:00:39
05/08/2005	16:00:40 - 17:00:39
05/08/2005	17:30:39 - 18:30:39
05/08/2005	19:00:39 - 20:45:39
05/08/2005	21:15:40 - 22:00:39
05/08/2005	22:30:39
05/08/2005	23:00:39 - 23:30:39
05/09/2005	00:00:39
05/09/2005	00:45:40
05/09/2005	01:15:39
05/09/2005	02:00:40 - 03:30:39
05/09/2005	04:15:40 - 05:00:39
05/09/2005	05:30:39 - 09:00:39
05/09/2005	09:30:39 - 11:30:39
05/09/2005	12:15:40 - 13:15:39
05/09/2005	13:45:39 - 14:00:39
05/09/2005	14:45:40
05/09/2005	15:30:40 - 15:45:39
05/09/2005	16:15:39 - 18:15:39
05/09/2005	18:45:39 - 19:15:39
05/09/2005	19:45:39
05/09/2005	20:30:40
05/09/2005	23:45:40
05/10/2005	00:45:40
05/10/2005	01:30:40 - 03:15:39
05/10/2005	04:00:40 - 09:30:39
05/10/2005	10:30:40 - 10:30:39
05/10/2005	11:00:39
05/10/2005	13:00:39 - 13:15:39
05/10/2005	13:45:39
05/10/2005	14:30:40 - 14:45:39
05/10/2005	15:30:40 - 17:00:39
05/10/2005	17:30:39 - 19:45:39
05/10/2005	20:15:39 - 20:30:39
05/10/2005	20:45:40 - 21:15:39
05/10/2005	22:00:40
05/10/2005	22:45:40

05/10/2005	23:30:40 - 05/11/2005 02:00:39
05/11/2005	02:30:39 - 02:45:39
05/11/2005	03:15:39 - 03:30:39
05/11/2005	04:00:39
05/11/2005	04:45:40 - 06:45:39
05/11/2005	07:15:39
05/11/2005	07:45:39 - 08:30:39
05/11/2005	10:30:39
05/11/2005	12:00:40
05/11/2005	12:30:39
05/11/2005	14:00:40
05/11/2005	14:45:40
05/11/2005	15:15:39
05/11/2005	15:45:39 - 16:15:39
05/11/2005	16:45:39
05/11/2005	17:15:39 - 18:00:39
05/11/2005	19:00:40 - 19:45:39
05/11/2005	21:30:40 - 22:00:39
05/11/2005	23:00:40
05/12/2005	06:30:39
05/12/2005	07:00:39 - 07:30:39
05/12/2005	08:00:39
05/12/2005	09:30:40 - 10:00:39
05/12/2005	10:30:39 - 12:00:39
05/12/2005	13:00:40 - 16:45:39
05/12/2005	17:30:40
05/12/2005	18:15:40
05/12/2005	19:30:39 - 20:45:39
05/12/2005	21:15:39 - 21:30:39
05/13/2005	02:00:39 - 02:15:39
05/13/2005	02:45:39 - 03:15:39
05/13/2005	03:45:39 - 05:15:39
05/13/2005	05:45:39 - 06:15:39
05/13/2005	07:00:40 - 07:30:39
05/13/2005	11:15:40 - 11:30:39
05/13/2005	12:15:40 - 17:00:39
05/13/2005	17:45:40
05/13/2005	18:30:40
05/13/2005	19:15:40 - 21:15:39
05/13/2005	22:00:40
05/13/2005	22:30:39 - 05/14/2005 09:00:39
05/14/2005	09:45:40 - 10:45:39
05/14/2005	11:15:39 - 11:30:39
05/14/2005	12:00:39 - 13:15:39
05/14/2005	14:15:40
05/14/2005	15:15:40 - 22:45:39

05/14/2005	23:15:39 - 23:45:39
05/15/2005	00:15:39 - 02:15:39
05/15/2005	03:00:40 - 04:15:39
05/15/2005	05:00:40
05/15/2005	05:30:39 - 07:30:39
05/15/2005	08:00:39 - 13:15:39
05/15/2005	13:45:39 - 14:15:39
05/15/2005	15:00:40 - 15:30:39
05/15/2005	16:00:39 - 23:45:39
05/16/2005	00:15:39 - 00:30:39
05/16/2005	02:45:40
05/16/2005	03:30:40 - 03:45:39
05/16/2005	04:15:39 - 08:45:40
Seldovia Surface	
05/25/2005	07:30:40 - 11:30:40

June 1-30, 2005

Homer Dolphin Deep	
06/20/2005	09:46:00 – 10:16:00

Homer Dolphin Surface	
06/20/2005	09:30:40

Seldovia Deep	
06/21/2005	09:45:00
06/21/2005	11:30:00
06/21/2005	17:45:00
06/21/2005	21:15:59
06/21/2005	21:45:59
06/21/2005	23:45:00
06/22/2005	05:30:00
06/22/2005	08:00:00
06/22/2005	10:45:00
06/22/2005	13:15:59
06/22/2005	20:00:00
06/22/2005	22:15:59
06/23/2005	05:00:00
06/23/2005	07:45:00
06/23/2005	14:15:00
06/23/2005	15:30:59
06/23/2005	16:45:00
06/23/2005	17:15:00
06/23/2005	20:15:00
06/23/2005	20:45:59
06/24/2005	00:30:59
06/24/2005	02:45:00
06/24/2005	04:45:00
06/24/2005	11:30:00

06/24/2005	14:30:59
06/24/2005	18:45:00
06/24/2005	22:00:00
06/25/2005	06:45:00
06/25/2005	13:15:00
06/25/2005	16:45:59
06/25/2005	19:15:00
06/25/2005	21:30:59
06/26/2005	00:30:00
06/26/2005	01:15:00
06/26/2005	12:00:00
06/26/2005	18:00:00
06/27/2005	02:45:59
06/27/2005	09:30:00
06/27/2005	21:30:00
06/28/2005	06:30:59
06/28/2005	08:30:00
06/28/2005	19:45:00
06/28/2005	22:00:59
06/29/2005	01:45:00
06/29/2005	14:00:59
06/29/2005	15:30:00
06/29/2005	16:15:00
06/29/2005	21:00:00
06/29/2005	22:30:59
06/30/2005	01:15:59
06/30/2005	08:15:59
06/30/2005	14:00:00
06/30/2005	19:45:59

July 1-31, 2005

Homer Dolphin Surface

07/11/2005	09:30:40 - 09:45:40
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Seldovia Deep

07/01/2005	01:45:00
07/01/2005	02:30:59
07/01/2005	04:45:59
07/01/2005	07:30:59
07/01/2005	08:45:00
07/01/2005	11:30:59
07/01/2005	13:30:00
07/01/2005	14:00:00
07/01/2005	16:45:00
07/01/2005	22:45:00 - 07/02/2005 00:00:51
07/02/2005	01:15:00
07/02/2005	06:15:00

07/02/2005	08:45:00
07/02/2005	10:30:00
07/02/2005	11:15:00
07/02/2005	12:15:59
07/02/2005	14:30:00
07/02/2005	16:15:00
07/02/2005	18:30:59
07/03/2005	01:15:00
07/03/2005	02:15:00
07/03/2005	12:00:59
07/03/2005	13:00:00
07/03/2005	14:00:00
07/03/2005	21:45:00
07/03/2005	22:15:00
07/03/2005	23:00:00
07/04/2005	02:30:59
07/04/2005	07:45:04
07/04/2005	21:30:59
07/04/2005	22:45:00
07/05/2005	03:30:00
07/05/2005	09:15:00
07/05/2005	15:30:59
07/05/2005	18:00:59
07/05/2005	21:30:59
07/06/2005	11:45:11
07/06/2005	15:30:00
07/07/2005	02:00:00
07/07/2005	10:00:00
07/07/2005	13:00:00
07/07/2005	18:00:00
07/07/2005	20:30:59
07/07/2005	21:15:05
07/07/2005	21:45:00
07/07/2005	23:15:59
07/08/2005	07:00:59
07/08/2005	09:30:00
07/08/2005	11:45:00
07/08/2005	12:45:59
07/08/2005	13:15:59
07/08/2005	15:00:00
07/08/2005	15:30:00
07/08/2005	21:30:00
07/08/2005	22:45:59
07/09/2005	04:15:00
07/09/2005	21:45:00
07/09/2005	23:30:00

07/10/2005	00:30:00
07/10/2005	02:00:59
07/10/2005	04:00:00
07/10/2005	06:15:59
07/10/2005	07:45:59
07/10/2005	08:45:00
07/10/2005	10:00:00
07/10/2005	12:00:59
07/10/2005	20:15:00
07/10/2005	22:15:59
07/11/2005	02:00:00
07/11/2005	03:15:00
07/11/2005	04:45:00
07/11/2005	06:15:00
07/11/2005	07:45:59
07/11/2005	11:30:00
07/11/2005	14:15:59
07/11/2005	20:45:00
07/11/2005	23:30:00
07/12/2005	03:15:59
07/12/2005	05:45:00
07/12/2005	08:00:59
07/12/2005	08:45:00

August 1-31, 2005

Homer Dolphin Deep

08/15/2005 09:16:00 – 09:46:00

Seldovia Deep

08/21/2005 22:15:00 – 08/24/2005 09:00:39

September 1-30, 2005

None

October 1-31, 2005

Homer Dolphin Deep

10/20/2005 09:00:50 - 09:31:00

Homer Dolphin Surface

10/05/2005 15:30:40

10/05/2005 17:45:40 - 10/06/2005 01:45:40

10/06/2005 06:00:40 - 13:00:40

10/06/2005 18:15:40 - 10/07/2005 02:30:40

10/07/2005 06:30:40 - 13:45:40

10/07/2005 18:45:40 - 10/08/2005 03:30:40

November 1-30, 2005

Homer Dolphin Deep

11/17/2005	10:31:00 – 11:00:47
Homer Dolphin Surface	
11/03/2005	16:45:40 - 11/04/2005 02:00:40
11/04/2005	16:45:40
11/05/2005	04:45:40
11/05/2005	15:15:40
11/05/2005	15:45:40 - 16:30:40
11/07/2005	06:15:40 - 06:30:40
11/07/2005	09:00:40 - 09:15:40
11/07/2005	17:45:40
11/07/2005	18:15:40 - 18:30:40
11/07/2005	19:00:40 - 19:30:40
11/08/2005	02:00:40
11/08/2005	04:15:40
11/08/2005	06:45:40
11/08/2005	07:45:40 - 10:15:40
11/08/2005	10:45:40 - 11:15:40
11/08/2005	11:45:40 - 12:00:40
11/08/2005	19:15:41 - 19:45:40
11/09/2005	00:30:40 - 00:45:40
11/09/2005	02:15:40
11/09/2005	03:15:40
11/09/2005	08:30:40
11/09/2005	10:45:40
11/09/2005	12:15:40
11/09/2005	20:45:40
11/09/2005	21:15:40
11/11/2005	16:45:40
11/13/2005	10:45:40
11/13/2005	11:30:40
11/13/2005	12:15:40 - 12:45:40
11/13/2005	13:15:40 - 13:45:40
11/13/2005	14:30:40
11/13/2005	15:30:40 - 16:00:40
11/13/2005	16:45:40
11/14/2005	00:00:40
11/14/2005	00:45:40 - 01:00:40
11/14/2005	02:30:40
11/14/2005	03:30:40 - 04:15:40
11/14/2005	04:45:40 - 05:00:40
11/14/2005	05:30:40
11/14/2005	12:15:40 - 12:45:40
11/14/2005	13:30:40
11/14/2005	14:00:40 - 14:15:40
11/14/2005	14:45:40 - 15:15:40
11/14/2005	16:30:40 - 17:00:40

11/14/2005	17:30:40
11/14/2005	18:00:40
11/14/2005	20:15:40 - 22:30:40
11/15/2005	00:15:40 - 03:00:40
11/15/2005	03:30:40
11/15/2005	04:00:40 - 04:45:40
11/15/2005	05:15:40 - 05:30:40
11/15/2005	08:00:40
11/15/2005	13:45:40 - 14:15:40
11/15/2005	14:45:40
11/16/2005	15:15:40
11/17/2005	10:45:40 - 12:45:40
11/22/2005	12:00:40 - 12:15:40
Seldovia Surface	
11/24/2005	06:45:40
11/24/2005	07:30:40 - 07:45:40

December 1 – 31, 2005

Homer Dolphin Deep

12/07/2005	09:30 - 13:00
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Seldovia Deep

12/16/2005	22:45 – 12/31/2005 23:45.
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14) Post Deployment Information

End of Deployment Post-Calibration Readings in Standard Solutions:

(** = *not recorded*)

Site	Retrieval Date	SpCond50 (mS/cm)	pH (7.00)	Turbidity (0 NTU)	DO (% air sat)	Depth (m)
HD	01/17/05	50.53	7.04	0.4	112.6	0.045
	02/14/05	49.63	7.83	-999.9	96.0	0.050
	03/17/05	50.34	7.15	5.2	92.5	0.184
	04/18/05	50.41	7.02	-0.5	104.1	-0.197
	05/16/05	50.53	7.08	0.6	104.5	**
	06/20/05	50.09	7.09	0.2	82.6	0.212
	07/11/05	50.02	7.01	-7.8	101.5	-0.005
	08/15/05	49.95	6.87	-0.1	97.7	0.120
	09/15/05	49.46	7.05	0.2	103.8	-0.149
	10/20/05	50.53	6.92	0.3	96.0	-0.145
	11/17/05	50.26	7.02	0.0	99.1	-0.092
	12/07/05	49.47	7.03	0.0	92.2	-0.040
	01/11/06	50.46	7.55	1.0	108.6	-0.212
HS	01/17/05	50.66	7.07	-0.1	114.3	0.040
	02/14/05	49.94	7.13	-0.4	96.8	0.060

	03/17/05	49.49	6.97	0.6	115.5	0.583
	04/18/05	49.69	7.24	0.3	84.3	-0.187
	05/16/05	47.29	7.06	2.0	37.7	-0.092
	06/20/05	46.18	7.22	0.3	97.4	0.208
	07/11/05	48.48	6.97	0.3	92.2	-0.003
	08/15/05	47.03	7.07	20.6	95.4	0.121
	09/15/05	49.32	7.20	0.8	99.8	-0.122
	10/20/05	50.70	7.05	0.1	92.2	-0.145
	11/17/05	50.38	7.04	**	142.5	-0.093
	12/07/05	51.50	6.93	0.0	114.7	-0.052
SD	01/18/05	50.05	6.97	0.2	89.4	-0.222
	02/15/05	50.50	6.90	-0.1	71.5	0.230
	03/18/05	51.30	7.05	0.0	93.6	0.241
	04/19/05	50.41	7.05	0.7	99.1	**
	05/17/05	50.81	7.14	-0.9	54.1	**
	06/21/05	50.30	7.19	0.1	97.9	-0.157
	07/12/05	49.68	7.02	0.7	89.4	-0.066
	08/16/05	50.38	6.68	0.3	107.0	0.042
	09/16/05	51.38	6.98	0.0	104.3	-0.038
	10/19/05	50.48	7.05	0.1	101.8	-0.083
	11/18/05	49.55	7.12	0.6	95.5	-0.268
	12/08/05	48.71	6.98	-0.4	99.5	-0.306
	01/25/06	51.23	6.99	0.3	93.6	-0.256
SS	01/18/05	49.64	7.07	0.0	98.5	-0.726
	02/15/05	49.81	7.11	-0.2	102.6	0.226
	03/18/05	50.55	6.92	0.0	101.3	0.233
	04/19/05	48.77	7.01	10.8	80.4	-0.677
	05/17/05	49.70	6.97	2.3	26.3	**
	06/21/05	47.35	6.98	2.9	98.6	0.139
	07/12/05	49.87	7.12	1.2	100.8	-0.071
	08/16/05	49.53	6.95	0.5	97.4	0.046
	09/16/05	49.10	7.31	1.6	101.6	-0.155
	10/19/05	50.55	7.12	0.3	108.8	-0.083
	11/18/05	49.89	6.88	0.0	95.8	-0.275
	12/08/05	50.83	7.16	-2.6	95.2	-0.314
	01/12/06	50.05	6.68	0.5	100.4	0.313

15) Other Remarks/Notes

On 08/13/2020 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) There were a few instances at this NERR site where turbidity recorded small negative values (-0001 and -0002). Because turbidity has a range of accuracy of ± 2 NTU, the technician did not delete or edit these values in any way.

b) Below is the matlab routine used to process water quality data. An electronic copy is available from Scott Pegau at scott_pegau@fishgame.state.ak.us.

```
% kbsonde.m This routine converts the sonde data into the CDMO format
% W. Scott Pegau 1/10/2003
```

```
%modifications as 1/22/04 -changed the program to pull data within 15 minutes every
1/2 hour
% disabled many filters to reduce confusion at CDMO
```

```
%modification on 12/06/04 - add minimum spike size to the spike filters.
%modifications on 12/29/04 - change output format to align with the new CDMO
format, remove the access database output
```

```
clear all
```

```
%Adding some operating triggers 1=yes 0=no
print_graphs=0;
process_monthly=1;
chl_on=0;
fluor_on=0;
tmint=15; % this is the binning time interval
tstp=15; %this is the time step
minspike=5; %what percentage of the mean does a spike need to be before being rejected
st_id='sswq'; % the letter designator for the station
```

```
%set up variables and matrix needed to parse the data
date_time=[]; temper=[]; cond=[]; sal=[]; doperc=[]; doconc=[]; pH=[]; depth=[];
turb=[]; chl=[]; fluor=[]; errcode = [];
w='';
fignumber = 2;
```

```
% Read in all *.cdf comma delimited files
```

```
[file_list,n_file]=list_file('*.cdf'); %currently assumes that list_file.m and all *.cdf files
are in the working directory
```

```
for i=1:n_file %Begin loop to read in the data and append into a single matrix
    file_name_current_in=file_list(i,:);
```

```
    %chl_on=1;      % to re-turn on switches, if were turned off in prior loop
    %fluor_on=1;
```

```
    % remove empty characters from each filename
    fname_length=size(file_name_current_in,2);
    j=0;
    while file_name_current_in(1,fname_length-j)==' '
        file_name_current_in=file_name_current_in(1,1:fname_length-j-1);
        j=j+1;
    end
```

```
    fname_length=size(file_name_current_in,2); %let the user know the file being
processed
    fprintf( '%s\n',file_name_current_in);
```

```
    %Begin reading the data in
    fid=fopen(file_name_current_in);
```

```
    %assume 2 lines of header in a .cdf file
    HDR=fgetl(fid); %DETERMINE THE NUMBER AND NAME OF VARIABLES
    HERE
    units=fgetl(fid); %DETERMINE THE UNITS OF THE VARIABLES HERE
```

```
    %determine the variables in the file
    ww=findstr(HDR,w); %find commas in the header
    ww=[ww length(HDR)]; %accounts for a header beyond the last comma
    fprintf(' %d Variables in the file \r\n',length(ww))
```

```
    %determine the variables of interest
    %this set of routines looks through the header to determine where the desired data is
    dc=findstr(HDR,'Date'); dcc=find(ww>dc); date_col=dcc(1);
    dc=findstr(HDR,'Time'); dcc=find(ww>dc); time_col=dcc(1);
    dc=findstr(HDR,'Temp'); dcc=find(ww>dc); temp_col=dcc(1);
    dc=findstr(HDR,'SpCond'); dcc=find(ww>dc); cond_col=dcc(1);
    dc=findstr(HDR,'Salinity'); dcc=find(ww>dc); sal_col=dcc(1);
    dc=findstr(HDR,'DO%'); if ~isempty(dc); dcc=find(ww>dc); doperc_col=dcc(1); end;
    dc=findstr(HDR,'DO %'); if ~isempty(dc); dcc=find(ww>dc); doperc_col=dcc(1); end;
    dc=findstr(HDR,'DO Conc'); dcc=find(ww>dc); doconc_col=dcc(1);
    dc=findstr(HDR,'Depth'); dcc=find(ww>dc); depth_col=dcc(1);
```

```

dc=findstr(HDR,'pH'); dcc=find(ww>dc(1)); pH_col=dcc(1);
dc=findstr(HDR,'Turbidity'); dcc=find(ww>dc); turb_col=dcc(1);
dc=findstr(HDR,'Chloro');
    if isempty(dc);
        no_chl=1;
        fprintf('No chlorophyll data. Chlorophyll processing off. \r\n');
    else;
        no_chl=0;
        dcc=find(ww>dc); chl_col=dcc(1);
    end;
dc=findstr(HDR,'Fluor');
    if isempty(dc);
        no_fluor=1;
        fprintf('No fluorescence data. Fluor turned off \r\n');
    else;
        no_fluor=0;
        dcc=find(ww>dc); fluor_col=dcc(1);
    end;

clear ww;

while 1; %read in each line of data and parse the data out
    a=fgetl(fid);
    if ~ischar(a), break, end;
    a=strcat(',',a,','); %add commas at the beginning and end of the string for parsing
    ww=findstr(a,w); %find commas

    %separate the date information
    if strcmp(a(ww(date_col)+1),''); %this if statement is necessary if a file was
manipulated in excel prior to being input into this routine
        d=datenum(a(ww(date_col)+2:ww(date_col+1)-
2))+datenum(a(ww(time_col)+2:ww(time_col+1)-2)); %reads in date and time columns
        date_time=[date_time;d]; %store as number in a vector
    else
        d=datenum(a(ww(date_col)+1:ww(date_col+1)-
1))+datenum(a(ww(time_col)+1:ww(time_col+1)-1)); %reads in date and time columns
        date_time=[date_time;d]; %store as number in a vector
    end

    %read in the data
    tt=str2num(a(ww(temp_col)+1:ww(temp_col+1)-1)); temper=[temper;tt];
    tt=str2num(a(ww(cond_col)+1:ww(cond_col+1)-1)); cond=[cond;tt];
    tt=str2num(a(ww(sal_col)+1:ww(sal_col+1)-1)); sal=[sal;tt];
    tt=str2num(a(ww(doperc_col)+1:ww(doperc_col+1)-1)); doperc=[doperc;tt];
    tt=str2num(a(ww(doconc_col)+1:ww(doconc_col+1)-1)); doconc=[doconc;tt];

```

```

tt=str2num(a(ww(depth_col)+1:ww(depth_col+1)-1)); depth=[depth;tt];
tt=str2num(a(ww(pH_col)+1:ww(pH_col+1)-1)); pH=[pH;tt];
tt=str2num(a(ww(turb_col)+1:ww(turb_col+1)-1)); turb=[turb;tt];
if chl_on
    if no_chl;
        tt=NaN;
        chl=[chl;tt];
    else;
        tt=str2num(a(ww(chl_col)+1:ww(chl_col+1)-1));
        chl=[chl;tt];
    end;
end;
if fluor_on;
    if no_fluor;
        tt=NaN;
        fluor=[fluor;tt];
    else;
        tt=str2num(a(ww(fluor_col)+1:ww(fluor_col+1)-1));
        fluor=[fluor;tt];
    end;
end;

end;
fclose(fid);

end

%SORT THE DATA BY DATE

tdata=[date_time temper cond sal doperc doconc depth pH turb chl ]; % removed fluoro
tdata=sortrows(tdata,1);
date_time=tdata(:,1); temper=tdata(:,2); cond=tdata(:,3); sal=tdata(:,4);
doperc=tdata(:,5); doconc=tdata(:,6); depth=tdata(:,7); pH=tdata(:,8);
turb=tdata(:,9);
if chl_on; chl=tdata(:,10); end;
if fluor_on; fluor=tdata(:,11); end;

%BEGIN CLEANING UP THE DATA

%throw out obvious bad or missing data
%the limits are in part from CDMO absolute rejection criteria
%I trust the calcs on temperature the most so if it is out the rest of the data is assumed to
be garbage

```

```
good_data=find(temper>-5&temper<40&cond>10&depth>0); %finding "good"  
temperature and conductivity data (conductivity test to ensure in water)
```

```
date_time=date_time(good_data); %only keep "good" data  
temper=temper(good_data);  
cond=cond(good_data);  
sal=sal(good_data);  
doperc=doperc(good_data);  
doconc=doconc(good_data);  
depth=depth(good_data);  
pH=pH(good_data);  
turb=turb(good_data);  
if chl_on; chl=chl(good_data); end;  
if fluor_on; fluor=fluor(good_data); end;
```

```
%identify gaps caused by bad or missing data  
kk=find(diff(date_time)>(tstp*.0104166667/15+.001));  
fnamr=fopen('report.txt','w');  
for i=1:length(kk);  
    fprintf(fnamr,' %s %s \r\n',datestr(date_time(kk(i))),datestr(date_time(kk(i)+1)));  
end
```

```
%print the time covered by this data  
fprintf('\r\n Begining date %s \r\n',datestr(date_time(1)));  
fprintf('End date %s \r\n',datestr(date_time(end)));
```

```
%PROBABLY WANT PLOTS OF LARGE DATA SET TO IDENTIFY PROBLEMS
```

```
%process complete months of data
```

```
[Y,M,D,H,MI,S]=datevec(date_time); %separate out the date info  
%begin looping over years  
for I=Y(1):Y(end); %loop over years  
    yyy=find(Y==I);  
    %plot the years worth of data to look for oddities  
    yjd=date_time(yyy)-datenum(I-1,12,31);  
    stdate=min(yjd); endate=max(yjd);  
    figure;  
    subplot(7,1,1); plot(yjd,temper(yyy),'k'); axis([stdate endate -2 15]);  
    ylabel('Temperature');  
    subplot(7,1,2); plot(yjd,sal(yyy),'k'); axis([stdate endate 22 33]); ylabel('Salinity');  
    subplot(7,1,3); plot(yjd,doperc(yyy),'k'); axis([stdate endate 80 130]); ylabel('DO  
percent');
```

```

subplot(7,1,4); plot(yjd,depth(yyy),'k'); axis([stdate endate 2 17]); ylabel('Depth');
subplot(7,1,5); plot(yjd,pH(yyy),'k'); axis([stdate endate 7.5 8.5]); ylabel('pH');
subplot(7,1,6); plot(yjd,turb(yyy),'k'); axis([stdate endate -100
200]);ylabel('Turbidity');
if chl_on; subplot(7,1,7); plot(yjd,chl(yyy),'k'); axis([stdate endate -10
30]);ylabel('Chlorophyll'); xlabel('Julian day'); end;
set(gcf,'Paperposition',[.5 .5 7 10])
year_title=num2str(Y(yyy(1))); subplot(7,1,1); title(year_title);
pause(5);

if print_graphs; print; end

for J=1:12; %loop over months
mmm=find(M(yyy)==J); %find data within a month
if ~isempty(mmm)&process_monthly; %continue if data in the month is available
mmm=mmm+yyy(1)-1; %adjust month pointer to full data set

ftemper=[]; fcond=[]; fsal=[]; fdoperc=[]; fdoconc=[]; fdepth=[]; fpH=[]; fturb=[];
fchl=[]; fjcd=[]; % ffluor=[];

with
mdate_time=date_time(mmm); %pull out the single month of data to work

mtemper=temper(mmm);
mcond=cond(mmm);
msal=sal(mmm);
mdoperc=doperc(mmm);
mdoconc=doconc(mmm);
mdepth=depth(mmm);
mpH=pH(mmm);
mturb=turb(mmm);
if chl_on; mchl=chl(mmm); end;
if fluor_on; mfluor=fluor(mmm); end;
mjd=mdate_time-datenum(I-1,12,31);

%save monthly data in matlab file
fnm=datestr(datenum(I,J,1),2);
fnam=strcat(st_id,fnm(1:2),fnm(7:8));
fprintf('Year is %u and month is %u \r\n',Y(mmm(1)),M(mmm(1)));
if chl_on; eval(['save ' fnam ' mjd mdate_time mtemper mcond msal
mdoperc mdoconc mdepth mpH mturb mchl']);
else eval(['save ' fnam ' mjd mdate_time mtemper mcond msal mdoperc
mdoconc mdepth mpH mturb']);
end;

```

```

        %loop through the month averaging available data into proscribed time step
        intervals and filling gaps with NaN
        %also applying a filter to the data
        date_int=tstp*.0104166667/15; %interval that averages are collected
        t_int=tmint*.0104166667/15; %interval around the time step within which
        data is averaged
        fnamo=strcat(fnam,'.txt');
        fido=fopen(fnamo,'w');

        fprintf(fido,'STNCODE\tSMPLDATE\tUSRCODES\tSMPLTIME\tTemp\tSpCond\tSal\t
        DO_pct\tDO_mgl\tDepth\tpH\tTurb\r\n');
        %
        fprintf(fido,'MM/DD/YYYY \t hh:mm:ss \t C \t mS/cm \t ppt \t percent \t
        mg/L \t m \t \t NTU \r\n');
        stncode = strcat('kac',st_id);
        for II=datetime(I,J,1):date_int:datetime(I,J+1,1);
            cdate=datestr(II,23); ctime=datestr(II,15);
            cjd=II-datetime(I-1,12,31);
            ll=find(mdate_time>(II-t_int/2)&mdate_time<=(II+t_int/2)); %find data +/-
            1/2 the time interval minutes from desired output time
            lm=find(mdate_time>(II-.5)&mdate_time<=(II+.5)); %find data within 12
            hours for filtering purpose (should expand to allow data out of the month)
            if ~isempty(ll); %ensure there is some data
                uthime=datestr(mdate_time(ll(1)),13); % pulls out the actual time for the
                usrcodes column

                ctemper=nanmean(mtemper(ll)); ccond=nanmean(mcond(ll));
                csal=nanmean(msal(ll)); cdoperc=nanmean(mdoperc(ll));
                cdoconc=nanmean(mdoconc(ll)); cdepth=nanmean(mdepth(ll));
                cpH=nanmean(mpH(ll)); cturb=nanmean(mturb(ll));
                if chl_on; cchl=nanmean(mchl(ll)); end;
                %
                if fluor_on; cfluor=nanmean(mfluor(ll)); end;

                %ADDING INDIVIDUAL COMPONENT FILTERS
                %BEWARE OF ALL FILTERS
                %absolute data rejection filters as specified by CDMO or more
                restrictive based on realistic values
                if ctemper<-2|ctemper>25; ctemper=NaN; errcode=[errcode; 1,II]; end;
                %CDMO -5 to 45
                if ccond<0|ccond>100; ccond=NaN; errcode=[errcode; 2,II];
                end;%CDMO cond 0 to 100
                if csal<10|csal>36; csal=NaN; errcode=[errcode; 3,II]; end; %CDMO
                salinity 10 to 36
                if cdoperc<0|cdoperc>199; cdoperc=NaN; cdoconc=NaN;
                errcode=[errcode; 4, II]; end; %CDMO doperc 0 to 200
                if cpH<4|cpH>12; cpH=NaN; errcode=[errcode; 5,II]; end; %CDMO
                pH 2 to 14

```

```

        if cturb>400; cturb=NaN; errcode=[errcode;6,II]; end;
        if cturb<-2; cturb=NaN; errcode=[errcode;7,II]; end;
        if chl_on&cchl>50; cchl=NaN; errcode=[errcode;8 ,II]; end;
        if chl_on&cchl<0; cchl=NaN; errcode=[errcode; 9,II]; end;
%         if fluor_on&cfluor<0; cfluor=NaN; fprintf(fnamr,'negative
fluorescence on %s \r\n',datestr(II)); end;

```

%outlier filter; the filter looks for data within 12 hours of the data point and removes the data point if it is

% more than 4 standard deviations from the mean (not applied to temperature and salinity because of the two layer system)

%1/22/04 many of these filters commented out to ease getting CDMO approval

%I am reporting the out data as suspicious

```

        if
(cdoperc>(nanmean(mdoperc(lm))+4*nanstd(mdoperc(lm)))|cdoperc<(nanmean(mdoperc(lm))-4*nanstd(mdoperc(lm))))&(abs(nanmean(mdoperc(lm))-cdoperc)>(nanmean(mdoperc(lm))*minspike/100));
        % cdoperc=NaN;
        errcode=[errcode; 10,II];
        end;
        if
(cdoconc>(nanmean(mdoconc(lm))+4*nanstd(mdoconc(lm)))|cdoconc<(nanmean(mdoconc(lm))-4*nanstd(mdoconc(lm))))&(abs(nanmean(mdoconc(lm))-cdoconc)>(nanmean(mdoconc(lm))*minspike/100));
        % cdoconc=NaN;
        errcode=[errcode; 11,II];
        end;
        if
(cpH>(nanmean(mpH(lm))+4*nanstd(mpH(lm)))|cpH<(nanmean(mpH(lm))-4*nanstd(mpH(lm))))&(abs(nanmean(mpH(lm))-cpH)>(nanmean(mpH(lm))*minspike/100));
        % cpH=NaN;
        errcode=[errcode; 12,II];
        end;
        if
(cturb>(nanmean(mturb(lm))+4*nanstd(mturb(lm)))|cturb<(nanmean(mturb(lm))-4*nanstd(mturb(lm))))&(abs(nanmean(mturb(lm))-cturb)>25); %using a different
minimum spike measure
        cturb=NaN;
        errcode=[errcode; 13 ,II];
        end;

```

```

        if
(chl_on&(cchl>(nanmean(mchl(lm))+4*nanstd(mchl(lm))))|cchl<(nanmean(mchl(lm))-
4*nanstd(mchl(lm))))&(abs(nanmean(mchl(lm))-
cchl)>(nanmean(mchl(lm))*minspike/100));
        cchl=NaN;
        errcode=[errcode; 14,II];
    end;
%         if
fluor_on&(cfluor>(nanmean(mfluor(lm))+4*nanstd(mfluor(lm))))|cfluor<(nanmean(mchl(
lm))-4*nanstd(mfluor(lm)))));
%         cfluor=NaN;
%         fprintf(fnamr,'Fluorescence outlier on %s \r\n',datestr(II));
%         end;

%Print out the data in CDMO format

fprintf(fido,'%s\t%s\t%s\t%s\t%04.1ft%06.2ft%04.1ft%05.1ft%04.1ft%05.2ft%04.1f
\t%04.0f\r\n',stncode, cdate, utime, ctime, ctemper, ccond, csal, cdoperc, cdoconc,
cdepth, cpH, cturb);

        %save filtered data to compare against raw data
        ftemper=[ftemper;ctemper]; fcond=[fcond;ccond]; fsal=[fsal;csal];
fdoperc=[fdoperc;cdoperc]; fjd=[fjd;cjd];
fdoconc=[fdoconc;cdoconc]; fdepth=[fdepth;cdepth]; fpH=[fpH;cpH];
fturb=[fturb;cturb];
        if chl_on; fchl=[fchl;cchl]; end;
%         if fluor_on; ffluor=[ffluor;cfluor]; end;
    end;
end;
fclose(fido);

%plot the monthly data

figure(fignumber);
subplot(3,1,1); plot(mjd,mdepth,'-k',fjd,fdepth,'r'); ylabel('Depth');
subplot(3,1,2); plot(mjd,mtemper,'-k',fjd,ftemper,'r'); ylabel('Temperature');
subplot(3,1,3); plot(mjd,msal,'-k',fjd,fsal,'r'); ylabel('Salinity'); xlabel('Julian
Day');

set(gcf,'Paperposition',[.5 .5 7 10])
subplot(3,1,1); title(fnam);
plotfnam1= strcat(fnam, '1');
if print_graphs; print; end;
fignumber=fignumber+1;

figure(fignumber);

```

```

        subplot(4,1,1); plot(mjd,mdoperc,'-k',fjd,fdoperc,'.r'); ylabel('DO percent');
        subplot(4,1,2); plot(mjd,mpH,'-k',fjd,fpH,'.r'); ylabel('pH');
        subplot(4,1,3); plot(mjd,mturb,'-k',fjd,fturb,'.r'); ylabel('Turbidity');
        if chl_on; subplot(4,1,4); plot(mjd,mchl,'-k',fjd,fchl,'.r');
ylabel('Chlorophyll'); xlabel('Julian Day'); end;
        set(gcf,'Paperposition',[.5 .5 7 10])
        subplot(4,1,1); title(fnam);
        plotfnam2= strcat(fnam, '2');
        if print_graphs; print; end;
        fignumber=fignumber+1;
        pause(5)

    end
end
end;
    for errloop=1:14;
        % Finds all errcodes of each number
        kk=find(errcode(:,1)==errloop);
        % Assigning messages for error codes
        if errloop==1; errprint='Temperature Out of Range';end;
        if errloop==2; errprint='Sp Cond Out of Range';end;
        if errloop==3; errprint='Salinity Out of Range';end;
        if errloop==4; errprint='DO Percent Out of Range';end;
        if errloop==5; errprint='pH Out of Range';end;
        if errloop==6; errprint='High Turbidity';end;
        if errloop==7; errprint='Negative Turbidity';end;
        if errloop==8; errprint='High Chlorophyll';end;
        if errloop==9; errprint='Negative Chlorophyll';end;
        if errloop==10; errprint='DO Percent Outlier';end;
        if errloop==11; errprint='DO Conc Outlier';end;
        if errloop==12; errprint='pH Outlier';end;
        if errloop==13; errprint='Turbidity Outlier';end;
        if errloop==14; errprint='Chlorophyll Outlier';end;
        % Prints error code message
        fprintf(fnamr,'\r\n %s %s \r\n',errprint, ':');
        % Cycles through errors of same errcode
        for count=1:length(kk);

            if count == 1;
                fprintf(fnamr, '\r\n %s: ', datestr(errcode(kk(count),2),23));
            if length(kk)==1;
                fprintf(fnamr, '%s, ', datestr(errcode(kk(count),2),15));
            else
                if (errcode(kk(count+1),2)-errcode(kk(count),2)) >
(tstp*.0104166667/15+.001);
                    fprintf(fnamr, '%s, ', datestr(errcode(kk(count),2),15));

```

```

else
    begseq=errcode(kk(count),2); %start of sequence
    begcount=count;
end
end

elseif count==length(kk);
    if (errcode(kk(count),2)-errcode(kk(count-1),2)) <
(tstp*.0104166667/15+.001); %is sequential with previous
        endseq=errcode(kk(count),2);
        if begcount>1 & (floor(begseq)-floor(errcode(kk(begcount-1),2)))<1;
            if (floor(endseq)-floor(begseq))>=1;
                fprintf(fnamr,'%s - %s: %s',datestr(begseq,15), datestr(endseq,23),
datestr(endseq,15));
            else;
                fprintf(fnamr,'%s - %s, ',datestr(begseq,15), datestr(endseq,15));
            end;
        else
            if (floor(errcode(kk(count),2))-floor(errcode(kk(count-1),2)))>=1;
                fprintf(fnamr,'\r\n %s: %s, ',datestr(errcode(kk(count),2),23),
datestr(errcode(kk(count),2),15));
            else;
                fprintf(fnamr,'%s, ', datestr(errcode(kk(count),2),15));
            end;
        end;
    elseif (floor(errcode(kk(count),2))-floor(errcode(kk(count-1),2)))>1;
        fprintf(fnamr,'\r\n %s: %s, ',datestr(errcode(kk(count),2),23),
datestr(errcode(kk(count),2),15));
    else;
        fprintf(fnamr,'%s, ', datestr(errcode(kk(count),2),15));
    end;
else;
    if (errcode(kk(count),2)-errcode(kk(count-1),2)) <
(tstp*.0104166667/15+.001); %is sequential with previous
        if (errcode(kk(count+1),2)-errcode(kk(count),2)) >
(tstp*.0104166667/15+.001); %check if at end of sequence
            endseq=errcode(kk(count),2);
            if begcount>1;
                if (floor(begseq)-floor(errcode(kk(begcount-1),2)))<1;
                    if (floor(endseq)-floor(begseq))>=1;
                        fprintf(fnamr,'%s - %s: %s, ', datestr(begseq,15),
datestr(endseq,23), datestr(endseq,15));
                    else;
                        fprintf(fnamr,'%s - %s, ', datestr(begseq,15), datestr(endseq,15));
                    end;
                end;
            end;
        end;
    end;
end;

```

```

else;
    if (floor(errcode(kk(count),2))-floor(errcode(kk(count-1),2)))>=1;
        fprintf(fnamr,'\r\n %s: %s - %s: %s, ',datestr(begseq,6),
datestr(begseq,15),datestr(endseq,6), datestr(endseq,15));
    else;
        fprintf(fnamr,'\r\n %s: %s - %s, ', datestr(begseq,23),
datestr(begseq,15),datestr(endseq,15));
    end;
end;
else;
    if (floor(endseq)-floor(begseq))>=1;
        fprintf(fnamr,'\r\n %s: %s - %s: %s, ',datestr(begseq,23),
datestr(begseq,15),datestr(endseq,6), datestr(endseq,15));
    else;
        fprintf(fnamr,'%s - %s, ', datestr(begseq,15),datestr(endseq,15));
    end;
end;
end;
else; %not in sequence with previous
    if (errcode(kk(count+1),2)-errcode(kk(count),2)) <
(tstp*.0104166667/15+.001); %check if at begining of sequence
        begseq=errcode(kk(count),2); %start of sequence
        begcount=count;
    else;
        if (floor(errcode(kk(count),2))-floor(errcode(kk(count-1),2)))>=1;
            fprintf(fnamr,'\r\n %s: %s, ',datestr(errcode(kk(count),2),23),
datestr(errcode(kk(count),2),15));
        else;
            fprintf(fnamr,'%s, ', datestr(errcode(kk(count),2),15));
        end;
    end;
end;
end;
end;
end;
end;

fclose(fnamr);

```