Kachemak Bay Research Reserve (KAC) NERR Water Quality Metadata
January - December 2010
Latest update: 07/22/2014

I. Data Set and Research Descriptors

1) Principal Investigators & Contact Persons

Contact Persons:
Joel Markis, Fishery Biologist II, 907-226-4658, joel.markis@alaska.gov
Oriana Badajos, Fishery Biologist I, 907-226-4662, oriana.badajos@alaska.gov
Angela Doroff, Research Coordinator, Tel: 907-226-4654, angela.doroff@alaska.gov

Address:
Kachemak Bay Research Reserve
95 Sterling Highway, Suite 2
Homer, AK 99603
Tel: 907-226-4658
Fax: 907-235-4794

2) Entry verification

Deployment data are uploaded from the YSI data logger to a Personal Computer (IBM compatible). Files are exported from EcoWatch in a comma-delimited format (.CDF) and uploaded to the CDMO where they undergo automated primary QAQC; automated depth/level corrections for changes in barometric pressure (cDepth or cLevel parameters); and become part of the CDMO's online provisional database. Excessive pre- and post-deployment data are removed from the file prior to upload with up to 2 hours of pre- and post-deployment data retained to assist in data management. During primary QAQC, data are flagged if they are missing or out of sensor range. The edited file is then returned to the Reserve for secondary QAQC where it is opened in Microsoft Excel and processed using the CDMO's NERRQAQC Excel macro. The macro inserts station codes, creates metadata worksheets for flagged data and summary statistics, and graphs the data for review. It allows the user to apply QAQC flags and codes to the data, remove remaining pre- and post-deployment data, append files, and export the resulting data file for upload to the CDMO. Upload after secondary QAQC results in ingestion into the database as provisional plus data, recalculation of cDepth or cLevel parameters, and finally tertiary QAQC by the CDMO and assimilation into the CDMO's authoritative online database. Where deployment overlap occurs between files, the data produced by the newly calibrated sonde is generally accepted as being the most accurate. For more information on QAQC flags and codes, see Sections 11 and 12. Joel Markis was 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. In Kachemak Bay, there are two permanent water quality monitoring stations (Homer and Seldovia), each having two data sondes. 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, one data logger is suspended 1-meter below the surface ("Surface"), and one data logger is suspended 1-meter from the bottom ("Deep"). 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 of 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 in-flowing water, in the path of the Seldovia instruments, initially supports a marine system, while the northern 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

Both telemetered instruments ("Deep") are stationary and 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 of the ocean floor (actual depth changes with respect to the tides). The surface sondes are attached to a buoy and a sonde guard that slides vertically on a cable to ensure that the sonde remains 1-meter below the surface as the tide is changing.

Calibration and deployment were performed monthly using methods outlined in the YSI Operations Manual. If a rapid pulse DO probe is used, the dissolved oxygen (DO) membrane is replaced and allowed to season in water for at least 6 hours before the DO sensor is calibrated. The following sensors are calibrated using standards purchased from YSI: pH (7 and 10), conductivity (50 mS/cm), and turbidity (123 NTU). Depth is calibrated at zero.

A Sutron Sat-Link2 transmitter was installed at the Homer Dolphin Deep station on 12/13/05 and transmits data to the NOAA GOES satellite, NESDIS ID # 3B00077A WQ. A Sutron Sat-Link2 transmitter was installed at the Seldovia Deep station on 07/31/2007 and transmits data to the NOAA GOES satellite, NESDIS ID # 3B040240 WQ. The transmissions are scheduled hourly and contain four (4) data sets reflecting fifteen minute data sampling intervals. Upon receipt by the CDMO, the data undergoes the same automated primary QAQC process detailed in Section 2 above. The "real-time" telemetry data become part of the provisional dataset until undergoing secondary and

tertiary QAQC and assimilation in the CDMO's authoritative online database. Provisional and authoritative data are available at http://cdmo.baruch.sc.edu.

5) Site location and character

Kachemak Bay is located approximately 200 kilometers south of Anchorage on the western shore of the Kenai Peninsula. Kachemak Bay, at 59.6º N and 151.5º 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 encompasses both the inner and outer bays. 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 41-meters, and a maximum of 169-meters. 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 59.60203ºN 151.40877ºW. The "deep" sonde is deployed at a depth 1 meter from the bottom, in water fluctuating between 7.5 and 16.8 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 32.4 ppt, as the instrument's location in the stratified water column is dependent on tide height, with a tidal range of 8.1 meters. 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 59.44097ºN 151.72089ºW, approximately 25 kilometers southwest 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 4.3 and 13.0 meters. The access to Seldovia is limited to boat or air, as the site is located off the highway system. The bottom habitat is predominantly sand. Pollutants in the area are minimal. Throughout the year, salinity has ranged from 25.0 to 33.9 ppt at this site with a tidal range of 8.0 meters.

6) Data collection period

Monitoring at Homer Deep, Seldovia Deep, and Seldovia Surface was continuous throughout 2010. The Homer Surface site was sampled continuously from 04/07/10 – 10/21/10, and was removed during the winter months when ice formed on the surface waters at this site. Deployment and retrieval dates and times for 2010 are listed below:

Station	Start Date	Start Time	End Date	End Time	Sonde ID	Comments
Homer Surface	01/01/10	--	04/07/10	--	--	Sonde not deployed due to ice
Homer Surface	04/07/10	15:30	05/11/10	11:45	Foxtrot	
Homer Surface	05/11/10	12:15	05/31/10	23:45	Hotel	Power failure on 6/1-6/22; no data
Homer Surface	06/22/10	14:45	07/22/10	12:15	Foxtrot	
Homer Surface	07/22/10	13:00	08/17/10	10:45	Hotel	
Homer Surface	08/17/10	11:30	09/08/10	09:45	Foxtrot	
Homer Surface	09/08/10	10:30	10/21/10	14:00	Hotel	
Homer Surface	10/21/10	--	12/31/10	--	--	Sonde not deployed due to ice
Homer Deep	12/16/09	15:00	02/02/10	15:00	Golf	
Homer Deep	02/02/10	15:15	03/04/10	11:45	Echo	
Homer Deep	03/04/10	12:15	04/07/10	15:30	Golf	
Homer Deep	04/07/10	15:45	05/11/10	12:15	Echo	
Homer Deep	05/11/10	12:45	06/22/10	14:00	Golf	
Homer Deep	06/22/10	14:30	07/22/10	12:45	Echo	
Homer Deep	07/22/10	13:00	08/17/10	11:15	Golf	
Homer Deep	08/17/10	11:45	09/08/10	10:30	Echo	
Homer Deep	09/08/10	10:45	10/21/10	14:15	Golf	
Homer Deep	10/21/10	14:30	11/17/10	14:00	Charlie	11/17-11/19 sonde malfunction; no data
Homer Deep	11/19/10	15:15	12/20/10	12:00	Charlie	Sonde batteries died 12/14; replaced on 12/16
Homer Deep	12/20/10	12:30	01/25/2011	15:15	Golf	

Data collection period (continued)

Station	Start Date	Start Time	End Date	End Time	Sonde ID	Comments
Seldovia Surface	12/15/09	15:15	01/13/10	12:00	Foxtrot	
Seldovia Surface	01/13/10	12:30	02/02/10	08:15	Charlie	
Seldovia Surface	02/02/10	11:30	03/01/10	12:30	Alpha	
Seldovia Surface	03/01/10	12:45	04/05/10	10:30	Charlie	
Seldovia Surface	04/06/10	11:15	05/12/10	11:30	Alpha	
Seldovia Surface	05/12/10	12:00	06/23/10	10:45	Charlie	
Seldovia Surface	06/23/10	11:30	07/21/10	13:30	Alpha	
Seldovia Surface	07/21/10	13:45	08/18/10	10:45	Charlie	
Seldovia Surface	08/18/10	11:15	09/09/10	10:30	Alpha	
Seldovia Surface	09/09/10	11:00	10/15/10	07:15	Charlie	Power failure 10/15-10/20
Seldovia Surface	10/20/10	13:00	11/18/10	12:45	Alpha	
Seldovia Surface	11/18/10	13:00	12/21/10	12:00	Foxtrot	
Seldovia Surface	12/21/10	12:30	01/26/2012	13:45	Alpha	
Seldovia Deep	12/15/09	15:15	01/13/10	11:45	Delta	
Seldovia Deep	01/13/10	12:15	02/02/10	11:15	Bravo	
Seldovia Deep	02/02/10	11:30	03/01/10	12:00	Delta	
Seldovia Deep	03/01/10	12:30	04/05/10	11:00	Bravo	
Seldovia Deep	04/06/10	11:15	05/12/10	11:45	Delta	
Seldovia Deep	05/12/10	12:15	06/23/10	10:45	Bravo	
Seldovia Deep	06/23/10	11:00	07/21/10	13:00	Delta	
Seldovia Deep	07/21/10	13:30	08/18/10	10:45	Bravo	
Seldovia Deep	08/18/10	11:00	09/09/10	11:00	Delta	
Seldovia Deep	09/09/10	11:30	10/20/10	12:30	Echo	
Seldovia Deep	10/20/10	13:00	11/18/10	12:30	Delta	
Seldovia Deep	11/18/10	13:15	12/21/10	12:15	Echo	
Seldovia Deep	12/21/10	12:45	01/26/2011	14:00	Delta	

7) Distribution

NOAA retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The PI retains the right to be fully credited for having collected and processed the data. The NERRS retains the right to be fully credited for having collected and process the data. Following academic courtesy standards, the NERR site where the data were collected should be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. 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.

Requested citation format:
National Estuarine Research Reserve System (NERRS). 2012. System-wide Monitoring Program. Data accessed from the NOAA NERRS Centralized Data Management Office website: http://cdmo.baruch.sc.edu/; *accessed* 12 October 2012.

NERR water quality data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see Principal Investigators and Contact Persons), from the Data

Manager at the Centralized Data Management Office (please see personnel directory under the general information link on the CDMO home page) and online at the CDMO home page http://cdmo.baruch.sc.edu/. Data are available in comma delimited format.

8) Associated researchers and projects

The USGS, in conjunction with the Kachemak Bay Research Reserve 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. More information about this project can be found at http://zuma.nwra.com/homer/.

The data are 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.

In addition, these data complement the other concurrent System-Wide Monitoring Program modules such as meteorological and nutrient data collection.

II. Physical Structure Descriptors

9) Sensor specifications

The Kachemak Bay NERR deployed eight 6600EDS sondes in 2010. All sondes were deployed with Temperature/Conductivity, pH, and turbidity probes. Sondes deployed at Homer Deep and Seldovia Deep had rapid-pulse DO probes until August 2010 when we switched to only using ROX probes. The surface sondes used exclusively ROX optical probes all year.

Sensor specifications, continued (YSI 6600EDS data sonde):

Parameter	Units	Sensor Type	Model	Range	Accuracy	Resolution
Temperature	Celsius (C)	Thermistor	6560	-5 to 50 °C	+/-0.15 °C	0.01 °C
Conductivity	milli-Siemens per cm (mS/cm)	4-electrode cell with autoranging	6560	0 to 100 mS/cm	+/-0.5% of reading + 0.001 mS/cm	0.001 mS/cm to 0.1 mS/cm (range dependent)
Salinity	parts per thousand (ppt)	Calculated from conductivity and temperature		0 to 70 ppt	+/- 1.0% of reading or 0.1 ppt, whichever is greater	0.01 ppt
Dissolved Oxygen %	percent air saturation (%)	Rapid Pulse – Clark type, polarographic	6562	0 to 500 % air saturation	0-200 % air saturation, +/- 2 % of the reading or 2 % air saturation, whichever is greater; 200-500 % air saturation, +/- 6 % of the reading	0.1 % air saturation
Dissolved Oxygen mg/L	milligrams per Liter (mg/L); Calculated from % air saturation, temp and salinity	Rapid Pulse – Clark type, polarographic	6562	0 to 50 mg/L	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	0.01 mg/L
Dissolved Oxygen %	% Saturation	Optical probe w/ mechanical cleaning	6150 ROX	0 to 500% air saturation	0-200% air saturation: +/- 1% of the reading or 1% air saturation, whichever is greater; 200-500% air saturation: +/- 15% or reading	0.1% air saturation
Dissolved Oxygen mg/L	milligrams/Liter (mg/L)	Optical probe w/ mechanical cleaning	6150 ROX	0 to 50 mg/L	0-20 mg/L: +/-0.1 mg/l or 1% of the reading, whichever is greater; 20 to 50 mg/L: +/- 15% of the reading	0.01 mg/L
Depth	feet or meters (m)	Stainless steel strain gauge		0 to 30 ft (9.1 m)	+/- 0.06 ft (0.018 m)	0.001 ft (0.001 m)
pH	pH units	Glass combination electrode	6561 and 6561FG	0 to 14 units	+/- 0.2 units	0.01 units
Turbidity	nephelometric turbidity units (NTU)	Optical, 90 ° scatter, with mechanical cleaning	6136	0 to 1000 NTU	+/- 2 % reading or 0.3 NTU (whichever is greater)	0.1 NTU

Dissolved Oxygen Qualifier (Rapid Pulse / Clark type sensor):
The reliability of dissolved oxygen (DO) data collected with the rapid pulse / Clark type sensor 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. 2001). Some Reserves utilize the YSI 6600 EDS data sondes, which increase DO accuracy and longevity by reducing the environmental effects of fouling. Optical DO probes have further improved data reliability. The user is therefore advised to consult the metadata for sensor type information and to exercise caution when utilizing rapid pulse / Clark type sensor DO data beyond the initial 96-hour time period. Potential drift is not always problematic for some uses of the data, i.e. periodicity analysis. It should also be noted that the amount of fouling is very site specific and that not all data are affected. If there are concerns about fouling impacts on DO data beyond any information documented in the metadata and/or QAQC flags/codes, please contact the Research Coordinator at the specific NERR site regarding site and seasonal variation in fouling of the DO sensor.

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

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

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

Salinity Units Qualifier:

In 2013, EXO sondes were approved for SWMP use and began to be utilized by Reserves. While the 6600 series sondes report salinity in parts per thousand (ppt) units, the EXO sondes report practical salinity units (psu). These units are essentially the same and for SWMP purposes are understood to be equivalent, however psu is considered the more appropriate designation. Moving forward the NERR System will assign psu salinity units for all data regardless of sonde type.

Turbidity Qualifier:

In 2013, EXO sondes were approved for SWMP use and began to be utilized by Reserves. While the 6600 series sondes report turbidity in nephelometric turbidity units (NTU), the EXO

sondes use formazin nephelometric units (FNU). These units are essentially the same but indicate a difference in sensor methodology, for SWMP purposes they will be considered equivalent. Moving forward, the NERR System will use FNU/NTU as the designated units for all turbidity data regardless of sonde type. If turbidity units and sensor methodology are of concern, please see the Sensor Specifications portion of the metadata.

10) Coded variable definitions

File name definitions: Reserve/deployment site/file definition/year
(ex: kacsswq2010 = Kachemak Bay/Seldovia Surface/WaterQuality/2010).

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

11) QAQC flag definitions

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

-5 Outside High Sensor Range
-4 Outside Low Sensor Range
-3 Data Rejected due to QAQC
-2 Missing Data
-1 Optional SWMP Supported Parameter
0 Data Passed Initial QAQC Checks
1 Suspect Data
2 *Open - reserved for later flag*
3 Calculated data: non-vented depth/level sensor correction for changes in barometric pressure
4 Historical Data: Pre-Auto QAQC
5 Corrected Data

12) QAQC code definitions

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

General Errors

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

Corrected Depth/Level Data Codes

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

Sensor Errors

SBO	Blocked optic
SCF	Conductivity sensor failure
SDF	Depth port frozen
SDG	Suspect due to sensor diagnostics

SDO	DO suspect
SDP	DO membrane puncture
SIC	Incorrect calibration / contaminated standard
SNV	Negative value
SOW	Sensor out of water
SPC	Post calibration out of range
SQR	Data rejected due to QAQC checks
SSD	Sensor drift
SSM	Sensor malfunction
SSR	Sensor removed / not deployed
STF	Catastrophic temperature sensor failure
STS	Turbidity spike
SWM	Wiper malfunction / loss

Comments

CAB*	Algal bloom
CAF	Acceptable calibration/accuracy error of sensor
CAP	Depth sensor in water, affected by atmospheric pressure
CBF	Biofouling
CCU	Cause unknown
CDA*	DO hypoxia (<3 mg/L)
CDB*	Disturbed bottom
CDF	Data appear to fit conditions
CFK*	Fish kill
CIP*	Surface ice present at sample station
CLT*	Low tide
CMC*	In field maintenance/cleaning
CMD*	Mud in probe guard
CND	New deployment begins
CRE*	Significant rain event
CSM*	See metadata
CTS	Turbidity spike
CVT*	Possible vandalism/tampering
CWD*	Data collected at wrong depth
CWE*	Significant weather event

13) Post deployment information

Homer Surface (HS):

Site	Deploy Date	Retrieval Date	Sonde	DO probe	DO (%)	Depth (m)	SpCond (50 mS/cm)	pH (7)	pH (10)	Turb (0 NTU)	Turb (123 NTU)	Comments
HS	01/01/2010	04/07/2010	--	--	--	--	--	--	--	--	--	No sonde deployed due to ice
HS	04/07/2010	05/11/2010	Foxtrot	ROX	98.2	-0.205	51.82	7.08	10.06	3.2	122.0	
HS	05/11/2010	06/22/2010	Hotel	ROX	100.0	-0.015	53.39	7.01	9.92	12.1	127.5	Stopped collecting data on 5/31 due to power failure.
HS	06/22/2010	07/22/2010	Foxtrot	ROX	100.6	-0.077	48.92	7.09	10.15	2.8	129.4	
HS	07/22/2010	08/17/2010	Hotel	ROX	100.8	-0.042	50.51	7.11	10.19	2.5	129.5	
HS	08/17/2010	09/08/2010	Foxtrot	ROX	99.5	-0.031	50.31	7.18	10.17	2.3	138.5	
HS	09/08/2010	10/21/2010	Hotel	ROX	95.5	-0.175	48.69	7.15	10.13	2.9	127.0	
HS	10/21/2010	12/31/2010	--									No sonde deployed due to ice

Homer Deep (HD):

Site	Deploy Date	Retrieval Date	Sonde	DO Probe	DO (%)	Depth (m)	SpCond (50 mS/cm)	pH (7)	pH (10)	Turb (0 NTU)	Turb (123 NTU)	Comments
HD	12/16/2009	02/02/2010	Golf	RP	103.4	-0.200	50.71	7.07	10.06	0.4	77.4	Turb probe 6026 (calibrate to 100 ntu); Turb Read low
HD	02/02/2010	03/04/2010	Echo	RP	97.2	-0.180	50.04	7.03	10.08	1.1	132.1	
HD	03/04/2010	04/07/2010	Golf	RP	92.2	-0.028	49.50	7.04	10.05	-0.2	98.9	Turb probe 6026 (calibrate to 100 ntu)
HD	04/07/2010	05/11/2010	Echo	RP	105	-0.214	53.22	7.02	9.93	0.6	123.8	
HD	05/11/2010	06/22/2010	Golf	RP	94	-0.057	54.37	7.09	10.11	0.5	104.8	Turb probe 6026 (calibrate to 100 ntu)
HD	06/22/2010	07/22/2010	Echo	RP	77	-0.09	50.53	7.1	10.06	-0.4	124.2	DO Probe Malfunction (values drift all deployment)
HD	07/22/2010	08/17/2010	Golf	RP	94.9	-0.055	50.85	7.03	10.09	0.9	100.1	Turb probe 6026 (calibrate to 100 ntu)
HD	08/17/2010	09/08/2010	Echo	ROX	101.1	-0.006	50.42	6.99	10.14	0.1	100.5	New ROX probe
HD	09/08/2010	10/21/2010	Golf	ROX	92.5	-0.198	50.58	7.13	10.15	1.2	98.8	Turb probe 6026 (calibrate to 100 ntu)
HD	10/21/2010	11/17/2010	Charlie	ROX	102.3	0.176	50.21	7.08	10.77	-0.9	127.7	
HD	11/17/2010	11/19/2010	Golf	ROX	101.7	0.151	50.22	7.05	10.07	0.4	100	Turb probe 6026 (calibrate to 100 ntu)
HD	11/19/2010	12/20/2010	Charlie	ROX	99.6	-0.154	50.27	7.00	9.99	0.4	120.6	
HD	12/20/2010	12/31/2010	Golf	ROX	101.3	0.022	49.85	7.03	10.11	0.7	105.1	Temp probe reading Low by 0.96 °C

Seldovia Surface (SS):

Site	Deploy Date	Retrieval Date	Sonde	DO probe	DO (%)	Depth (m)	SpCond (50 mS/cm)	pH (7)	pH (10)	Turb (0 NTU)	Turb (123 NTU)	Comments
SS	12/15/2009	01/13/2010	Foxtrot	ROX	98.2	-0.232	49.58	7.12	10.14	2.7	124.7	
SS	01/13/2010	02/02/2010	Charlie	ROX	99.5	-0.189	50.55	7.11	10.12	-1.1	123.1	
SS	02/02/2010	03/01/2010	Alpha	ROX	98.6	-0.357	50.70	7.07	10.11	2.4	130.6	
SS	03/01/2010	04/06/2010	Charlie	ROX	97.7	-0.279	51.10	6.97	9.89	10.9	131.6	
SS	04/06/2010	05/12/2010	Alpha	ROX	93.3	-0.037	56.22	7.08	10.01	18.0	126.3	
SS	05/12/2010	06/23/2010	Charlie	ROX	101.1	-0.051	52.17	7.00	9.86	6.4	129.0	
SS	06/23/2010	07/21/2010	Alpha	ROX	97.5	-0.075	50.48	6.97	10.09	0.9	123.2	
SS	07/21/2010	08/18/2010	Charlie	ROX	99.6	-0.058	49.60	7.02	10.06	0.8	127.3	
SS	08/18/2010	09/09/2010	Alpha	ROX	101.3	0.067	50.54	7.05	10.16	-0.2	136.0	
SS	09/09/2010	10/20/2010	Charlie	ROX	98.6	-0.131	50.13	6.91	9.96	-4.0	127.9	
SS	10/20/2010	11/18/2010	Alpha	ROX	101.7	0.160	50.34	7.06	10.08	0.1	121.8	
SS	11/18/2010	12/21/2010	Foxtrot	ROX	101.5	-0.012	50.40	7.06	10.12	0.5	112.2	
SS	12/21/2010	12/31/2010	Alpha	ROX	101.4	0.034	50.62	7.04	10.11	0.7	133.6	

Seldovia Deep (SD):

Site	Deploy Date	Retrieval Date	Sonde	DO probe	DO (%)	Depth (m)	SpCond (50 mS/cm)	pH (7)	pH (10)	Turb (0 NTU)	Turb (123 NTU)	Comments
SD	12/15/2009	01/13/2010	Delta	RP	42.8	-0.283	50.37	7.14	10.12	2.6	123.3	DO probe malfunction
SD	01/13/2010	02/02/2010	Bravo	RP	99.6	-0.190	50.99	6.80	9.87	1.0	97.8	Turb probe 6026 (calibrate to 100 ntu); pH a little low
SD	02/02/2010	03/01/2010	Delta	RP	99.5	-0.339	50.63	7.09	10.15	0.3	132.4	
SD	03/01/2010	04/06/2010	Bravo	RP	71.5	-0.272	26.00	7.18	10.05	3.9	97.8	Turb probe 6026 (calibrate to 100 ntu); T/C probe failure
SD	04/06/2010	05/12/2010	Delta	RP	62.6	-0.039	56.15	7.09	10.00			DO probe malfunction. Drifted the whole deployment. Failed warm up test.
SD	05/12/2010	06/23/2010	Bravo	RP	102.1	-0.073	53.14	7.09	10.03	-0.1	106.6	DO did not stabilize; just kept decreasing
SD	06/23/2010	07/21/2010	Delta	RP	64.5	-0.084	50.78	7.06	10.05	-0.4	125.7	DO Probe malfunction; sensor drift all deployment
SD	07/21/2010	08/18/2010	Bravo	RP	95.2	-0.055	50.48	7.07	10.14	0.4	106.1	
SD	08/18/2010	09/09/2010	Delta	ROX	101.4	-0.004	50.57	7.06	10.07	0.0	132.1	New ROX probe
SD	09/09/2010	10/20/10	Echo	ROX	93.5	-0.176	49.75	7.13	10.29	2.4	128.5	New pH probe
SD	10/20/10	11/18/2010	Delta	ROX	101.7	0.158	50.93	7.07	10.09	0.0	133.1	
SD	11/18/2010	12/21/2010	Echo	ROX	101.6	-0.010	49.60	7.04	10.08	0.0	107.2	
SD	12/21/2010	12/31/2010	Delta	ROX	100.2	0.026	50.66	7.03	10.07	0.8	130.5	Temp probe Low by 0.08 °C

14) Other remarks/notes

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

Homer Deep site was inspected from 1/25 11:45 to 12:00 during the middle of a deployment. It was decided to leave the sonde in because it was clean and in working order. The sonde was left in for longer than the four week maximum required by the NERRS SOPs. DO data continued to be affected from 1/25 12:15-30.

For the Homer Deep site from 4/7 15:45 to 5/11 11:45 deployment DO is 6% higher than deployments surrounding it. Therefore, this data has been marked suspect.

Seldovia Surface & Homer Surface sites move up and down on a cable. Sometimes the sonde gets hung-up on the cable, causing out of water events. <1.5 meter and >0.1 meter data are retained. These instances have been marked either 1 or -3 GSM CWD in the data, based on how severe the impact was on the data.