Kachemak Bay Research Reserve (KAC) NERR Water Quality Metadata
January - December 2012
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I. Data Set and Research Descriptors

1) Principal Investigators & Contact Persons

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2) Entry verification

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

The Chlorophyll probe is calibrated at zero in DI water. QA/QC of this parameter is conducted by comparing sonde data to our monthly grab samples that are analyzed on a Turner 10-AU Spectrophotometer (see Nutrient data/metadata for 2011). Sonde data are accepted or rejected based on this comparison. The estimates of chlorophyll concentration produced by the YSI chlorophyll probe are meant to complement the more accurate results obtained by the monthly grab samples.

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 33.3 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 2012. The Homer Surface site was sampled from 05/31/2012 – 11/14/2012, and was removed during the winter months when ice formed on the surface waters at this site. Deployment and retrieval dates and times for 2012 are listed below:

Station	Start Date Start Time	End Date End Time	Sonde ID	Comments
Homer Surface 3	01/01/2012 00:00	05/31/2012 12:00		Not deployed due to ice
Homer Surface 3	05/31/2012 12:15	06/27/2012 10:15	H	New site – Homer Surface 3 (H3)
Homer Surface 3	06/27/2012 11:30	07/19/2012 12:30	B	
Homer Surface 3	07/19/2012 13:00	08/30/2012 12:00	N	
Homer Surface 3	08/30/2012 12:15	10/04/2012 11:30	O	
Homer Surface 3	10/04/2012 12:00	11/14/2012 15:15	N	
Homer Surface 3	11/14/2012 15:30	12/12/2012 23:45		Not deployed due to ice
Homer Deep	12/21/2011 15:00	01/17/2012 13:15	C	
Homer Deep	01/17/2012 14:15	02/22/2012 13:15	E	
Homer Deep	02/22/2012 13:30	03/28/2012 09:30	C	
Homer Deep	03/28/2012 10:00	04/19/2012 14:45	E	
Homer Deep	04/19/2012 16:00	05/30/2012 08:45	C	
Homer Deep	05/30/2012 09:00	06/27/2012 10:00	E	
Homer Deep	06/27/2012 10:15	07/18/2012 11:45	C	
Homer Deep	07/18/2012 12:15	08/30/2012 10:30	E	
Homer Deep	08/30/2012 10:45	10/04/2012 11:15	C	
Homer Deep	10/04/2012 12:00	11/14/2012 15:00	E	
Homer Deep	11/14/2012 15:15	12/07/2012 15:15	F	
Homer Deep	12/07/2012 15:30	01/08/2013 11:30	E	

Data collection period (continued)

Station	Start Date/Time	End Date/Time	Sonde ID	Comments
Seldovia Surface	11/23/2011 11:15	01/18/2012 11:45	G	
Seldovia Surface	01/18/2012 12:15	02/23/2012 13:30	F	
Seldovia Surface	02/23/2012 14:00	03/27/2012 13:15	H	
Seldovia Surface	03/27/2012 14:00	04/18/2012 12:30	F	
Seldovia Surface	04/18/2012 13:00	05/29/2012 11:00	H	
Seldovia Surface	05/29/2012 11:30	06/28/2012 10:45	F	
Seldovia Surface	06/28/2012 11:30	07/17/2012 10:45	L	
Seldovia Surface	07/17/2012 11:15	08/28/2012 11:00	M	
Seldovia Surface	08/28/2012 11:30	10/01/2012 12:45	L	
Seldovia Surface	10/01/2012 13:15	11/14/2012 11:15	B	
Seldovia Surface	11/14/2012 12:00	12/07/2012 12:30	L	
Seldovia Surface	12/07/2012 13:15	01/09/2013 11:45	B	
Seldovia Deep	11/23/2011 11:00	01/18/2012 11:30	A	
Seldovia Deep	01/18/2012 12:00	02/23/2012 13:30	D	
Seldovia Deep	02/23/2012 14:00	03/27/2012 13:00	A	
Seldovia Deep	03/27/2012 13:30	04/18/2012 12:30	D	
Seldovia Deep	04/18/2012 13:00	05/29/2012 11:00	A	
Seldovia Deep	05/29/2012 11:30	06/28/2012 10:45	D	
Seldovia Deep	06/28/2012 11:15	07/17/2012 10:45	A	
Seldovia Deep	07/17/2012 11:15	07/31/2012 12:45	H	
Seldovia Deep	07/31/2012 13:15	08/28/2012 10:45	A	
Seldovia Deep	08/28/2012 11:15	10/01/2012 12:45	H	
Seldovia Deep	10/01/2012 13:15	11/14/2012 11:15	A	
Seldovia Deep	11/14/2012 12:00	12/07/2012 12:30	H	
Seldovia Deep	12/07/2012 13:00	01/09/2013 11:45	A	

7) Distribution

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

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

8) Associated researchers and projects

The 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 seven 6600EDS sondes and five 6600V4 sondes in 2012. All sondes were deployed with Temperature/Conductivity, pH, and turbidity probes. Both of the deep stations used ROX probes exclusively throughout the year, while both of the surface stations alternated between ROX and rapid pulse DO probes (see section 13). Before July 1, 2012, we only had one chlorophyll probe, so it was deployed every other month at the Seldovia Surface station. Starting in July, we purchased 4 new 6600V4 sondes and additional probes. The V4 sondes were deployed at the surface stations with 3 optical probes: Chlorophyll; ROX; and Turbidity.

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
Chlorophyll	micrograms/Liter (µg/L)	Optical probe w/ mechanical cleaning	6025	~0 to 400 µg/L	The accuracy of the in vivo measurement will be completely dependent on the method of calibration	0.1 µg/L Chl 0.1% RFU

				0 to 100 RFU		

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

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.

Chlorophyll Fluorescence Disclaimer:

YSI chlorophyll sensors (6025 or 599102-01) are designed to serve as a proxy for chlorophyll concentrations in the field for monitoring applications and complement traditional lab extraction methods; therefore, there are accuracy limitations associated with the data that are detailed in the YSI manual including interference from other fluorescent species, differences in calibration method, and effects of cell structure, particle size, organism type, temperature, and light on sensor measurements.

10) Coded variable definitions

File name definitions: Reserve/deployment site/file definition/year
(ex: kacsswq2012 = Kachemak Bay/Seldovia Surface/WaterQuality/2012).

Sampling station	Sampling site code	Station code
Homer Surface 3	H3	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
SCS	Chlorophyll spike
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	Calibration Date	Sonde	SpCond (50 mS/cm)	DO (%)	DO probe	pH (7)	pH (10)	Turb (0 NTU)	Turb (123 NTU)	Depth (m)	Chl (0)	Comments
HS	01/09/2012											Not deployed due to ice
HS	02/17/2012											Not deployed due to ice
HS	03/26/2012											Not deployed due to ice
HS	04/19/2012											Not deployed due to ice
HS	05/31/2012	H	50.25	98.9	ROX	6.94	9.98	2.1	124.1	-0.062		Deployed at new location on ferry dock
HS	06/26/2012	B	50.11	97.3	ROX	7.02	10.07	0.4	120.4	0.029	0.7	depth issue (calibrated out of range)
HS	07/17/2012	N	49.24	99.3	ROX	7.09	10.01	2.0	121.9	-0.078	1.5	High fouling; chl very high; turb very high
HS	08/27/2012	O	49.93	102.0	ROX	7.05	10.13	-0.2	122.6	0.042	0.1	
HS	09/21/2012	N	50.11	100.0	ROX	7.02	10.06	2.0	120.1	-0.158	-0.4	
HS	11/13/2012											Not deployed due to ice
HS	12/05/2012											Not deployed due to ice

Homer Deep (HD):

Site	Calibration Date	Sonde	SpCond (50 mS/cm)	DO (%)	DO Probe	pH (7)	pH (10)	Turb (0 NTU)	Turb (123 NTU)	Depth (m)	Comments
HD	12/20/2011	C	50.11	101.4	ROX	7.05	10.05	0.5	100.2	0.160	
HD	01/09/2012	E	51.00	101.2	ROX	7.00	10.10	1.5	126.6	0.085	
HD	02/17/2012	C	51.05	97.3	ROX	7.16	10.18	1.2	121.8	-0.341	
HD	03/26/2012	E	49.74	99.9	ROX	7.07	10.12	1.0	118.1	-0.143	
HD	04/19/2012	C	49.75	98.9	ROX	7.13	10.11	0.5	137.1	-0.094	
HD	05/17/2012	E	49.83	93.1	ROX	7.07	10.15	1.2	113.9	-0.058	
HD	06/26/2012	C	50.24	98.2	ROX	7.02	10.08	0.5	121.7	0.001	
HD	07/17/2012	E	50.65	98.4	ROX	7.08	10.09	0.4	121.2	-0.102	
HD	08/24/2012	C	49.01	102.4	ROX	7.12	10.18	-194.2	1486	0.047	Power surge during deployment; turbidity probe dead.
HD	09/21/2012	E	50.04	99.9	ROX	7.08	10.09	1.7	126.1	-0.160	
HD	11/13/2012	F	49.94	100.5	ROX	7.01	10.09	-0.2	128.3	-0.037	
HD	12/05/2012	E	49.92	100.0	ROX	7.05	10.07	0.3	129.0	0.009	

Seldovia Surface (SS):

Site	Calibration Date	Sonde	SpCond (50 mS/cm)	DO (%)	DO Probe	pH (7)	pH (10)	Turb (0 NTU)	Turb (123 NTU)	Depth (m)	Chl (0)	Comments
SS	11/21/2011	G	50.66	99.4	ROX	6.66	9.77	1.1	129.2	-0.113		pH reading very low
SS	01/17/2012	F	50.34	90.5	RP	7.09	10.2	0.7	125.9	0.081	0.3	
SS	02/22/2012	H	44.07	98.6	ROX	7.13	10.09	1.9	119.4	-0.315		pH dead or bad calibration- reading very low for entire deployment; also Hotel collecting depth in feet instead of m
SS	03/26/2012	F	50.11	94.0	RP	7.12	10.15	0.1	114.2	-0.142	0.7	
SS	04/17/2012	H	48.22	95.8	ROX	6.91	9.86	0.8	133.0	-0.574		
SS	05/18/2012	F	49.56	100.9	RP	7.11	10.16	0.5	115.2	-0.062	-0.1	
SS	06/26/2012	L	48.18	98.8	ROX	7.08	10.07	0.2	122.1	0.004	0.0	
SS	07/17/2012	M	49.72	98.9	ROX	7.02	10.08	6.6	130.3	0.019	3.5	High turbid from fouling
SS	08/24/2012	L	49.75	101.5	ROX	7.12	10.15	1.8	121.0	0.051	2.0	
SS	09/21/2012	B	49.32	98.9	ROX	7.10	10.09	0.6	122.8	-0.131	0.6	
SS	11/08/2012	L	49.71	99.3	ROX	7.04	10.02	-1.0	122.2	-0.037	0.5	
SS	12/05/2012	B	49.45	99.1	ROX	7.08	10.10	0.3	127.2	-0.137	-0.5	

Seldovia Deep (SD):

Site	Calibration Date	Sonde	SpCond (50 mS/cm)	DO (%)	DO Probe	pH (7)	pH (10)	Turb (0 NTU)	Turb (123 NTU)	Depth (m)		Comments
SD	11/21/2011	A	50.12	100.7	ROX	7.07	10.06	0.4	133.7	0.517		
SD	01/17/2012	D	50.29	100.5	ROX	7.03	10.05	0.1	125.5	0.080		
SD	02/17/2012	A	50.40	97.3	ROX	7.11	10.14	1.9	124.5	-0.282		
SD	03/26/2012	D	50.09	100.8	ROX	7.17	10.25	-0.2	118.2	-0.103		
SD	04/17/2012	A	49.73	98.9	ROX	7.07	10.05	0.2	122.6	-0.086		
SD	05/18/2012	D	50.32	99.1	ROX	7.13	10.18	0.1	117.4	-0.058		High turbid from fouling
SD	06/26/2012	A	50.15	99.6	ROX	7.02	10.04	0.1	124.9	0.008		
SD	07/17/2012	H	50.32	100.6	ROX	7.02	10.04	0.0	118.8	0.037		
SD	07/30/2012	A	51.04	98.6	ROX	7.07	10.16	1.2	125.8	0.007		
SD	08/24/2012	H	49.37	102.2	ROX	7.15	10.17	0.1	123.2	0.058		
SD	09/21/2012	A	49.69	99.2	ROX	7.10	10.16	0.8	121.4	-0.161		
SD	11/08/2012	H	49.99	100.7	ROX	7.05	10.08	-0.7	122.3	-0.053		
SD	12/05/2012	A	17.6	26.6	ROX	7.09	9.46	0.2	195.8	-0.135		On 12/22/12 Temp and DO probes died. Breaker to dock was blown; telemetry battery was dead.

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.

On 5/9/12 UAF divers assessed our deep sites and took pictures. Sonde placement in the tube was good.

On 5/31/12 we pulled the Homer Surface site and moved it 34 meters to the east. It is now attached to a safer location on the ferry dock. Please note that the Kachemak Bay water quality stations Homer (HO), Homer Dolphin Surface (HS), and Homer Surface 3 (H3) have been a progression of stations all sampling the same water mass in essentially the same location. Users may choose to combine data from all 3 of these stations to examine long-term trends.

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. <1.0 meter and >0.4 meter data are retained. It is also possible for the sonde to get pushed down in the tube further than normal when it gets hung on the cable, this happened at SS between June 4th and 5th of 2012.

From 06/27/2012 11:30 to 07/19/2012 12:30 Homer Surface 3 (H3) depth data is marked -3 SSM CSM. The sonde came back with depth reading -20 and an error was received during calibration.

On 09/24/2012 15:45 at Homer Deep, the turbidity probe failed for unknown reasons. On 09/24/2012 17:45, the battery voltage spiked from 11.8 to 12.3 and most probes had erroneous readings. The battery voltage continued to increase until 09/24/2012 20:45 when it reached 13.3. All other probes continued to function normally, but the turbidity probe was erroneous for the rest of the deployment. We determined that a bad ground caused voltage to travel down to the sonde.

At Seldovia Surface from 10/1 13:15 to 10/15 7:45 depth data is marked 1 CSM and other parameters are marked 0 CSM. We are unsure of what happened here. The sonde may have been hung up in the tube, although other parameters appear ok while depth seems depressed the entire time. There is also the possibility that the depth port was blocked in some way. Something that has not been determined was affected the depth data, other parameters appear in line with what is typical for the site.

On 12/23/12 22:15 at Seldovia Deep sonde, there was a catastrophic temperature sensor and DO failure. All data from 12/23/12 22:15-12/31/12 23:45 have been rejected. The cause of this is unknown. When we arrived in Seldovia, the power breaker to the dock had been shut off and the telemetry battery was dead.