

Sapelo Island (SAP) NERR Water Quality Metadata
(January - December 1995)
Latest Update: August 14, 2000

I. Data Set and Research Descriptors

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2. Entry Verification:

The data are downloaded to an IBM compatible computer from the Hydrolab Datasonde I, Hydrolab Datasonde III, Hydrolab Recorder, or YSI 6000UPG as a raw file. The YSI 6000 data are reviewed using the YSI computer program PC6000 that accompanies the YSI 6000 data logger. After the file is uploaded from the datalogger, PC6000 is used to plot the data and perform basic statistical analysis (i.e., min., max., mean, std. dev.) The information obtained from this printout is used during file review to detect any gross outliers such as data taken when the datalogger was removed from the water or those caused by instrument failure. Based on past measurements in the waters near Sapelo Island, it was determined that the following data should be checked:

Salinity < 5 ppt or >35 ppt
pH < 6.5 or > 8.5
Temperature < 10 C or >30 C

Upon close examination of the questionable data, the data that did appear accurate was kept in the data set while the rest was removed and classified as missing data. The edited data are formatted according to the guidelines given in the CDMO manual. The data are imported into a Microsoft Excel file that contains the current month's cumulative recordings. When a complete month of

data has been recorded the file is ready for review. The data review includes several steps. The first step is to format the data so that the parameter columns are in the correct order and the data has the correct number of decimal place holders by using the Column Reformat CDMO Excel 5.0 Macro. Secondly, the Date Hour Count CDMO Excel 5.0 macro is used to determine if there are any dates and times that data was not recorded due to maintenance, battery failure, or other causes. Missing dates and times are inserted into the file and a period is inserted into the cells where data would normally be. The reason for the missing data is recorded on the Water Quality Editing Log. Next, the data are filtered using the Find Variable Outlier CDMO Excel 5.0 macro to find readings outside the instrument measurement range and the "normal" range for the site in question. Data outside the instrument range is/are removed from the file and a period is inserted to the cell(s). An explanation for the missing dates and times are recorded onto the Water Quality Editing Log. Data that was outside the "normal" range of water quality for a particular site is investigated for validity based on weather data, field observations, QC checks, PC6000 printouts, and instrument diagnostics. If the data is/are rejected from the file a period is inserted to the cell(s) and an explanation for the missing dates and times are recorded onto the Water quality Editing Log. The information recorded on the Water Quality Editing Log is transferred to the Metadata form. The Metadata form is submitted with the data file to the CDMO. Greg Schultz, reserve fellow, was responsible for the QA/QC of the database.

3. Research Objectives:

The purpose of research was only to perform long-term water quality monitoring and not a specific experiment. Sapelo Island is only accessible by passenger ferry. Due to its isolation, the salt marsh and tidal waters of the SINERR show little evidence of human impact. The Marsh Landing site receives a

large amount of boat traffic, as it is the primary access point for the approximately 100 residents, commuters and daily visitors plus barge off loading. The Barn Creek site receives moderate boat traffic, and is near a mechanic shop on land and several residences. The Flume Dock site is a relatively isolated location compared to the other two sites.

4. Research Methods:

Water quality monitoring began at the Flume Dock and Marsh Landing sites in August 1986. The Barn Creek site was added in May 1995. Monitoring units are hung vertically from a float or floating dock so they hang two meters below the water's surface. Hydrolab units were used exclusively until May 1995. After May 1995, YSI units were used as well as the Hydrolabs.

The sondes are calibrated prior to deployment following manufacturers instructions. pH is calibrated using purchased 7.00 and 10.00 pH buffers. Conductivity is calibrated using a solution made from KCl. DO is calibrated by using current barometric pressure and % saturation and a new DO membrane is used for each deployment. The probes are cleaned three times weekly while deployed when the warmer months increase the rate of fouling. The dissolved oxygen probes are cleaned once weekly with a cotton swab and soaked in methanol, while the other probes are cleaned with cotton swabs or pipe cleaners and de-ionized water. After two weeks the units are returned to the lab for downloading, cleaning, and recalibration, according to the manufacturers manual. No post calibration verifications were performed. Data were collected at 30-minute intervals.

5. Site Location and Character:

The Sapelo Island National Estuarine Research Reserve is located in a tidal estuary on the western side of Sapelo Island on the coast of Georgia. The Duplin River, actually a tidal lagoon, that receives little fresh water and opens into Doboy Sound, ca. 5-km inland from the Atlantic Ocean. The marsh is inundated twice daily by unequal tides with a mean range of 2.1m. Salinity

ranges from 10 to 25 ppt. The surrounding area vegetation is dominated by salt marsh with *Spartina alterniflora* being the predominate flora. There are three monitoring stations located within the reserve.

1) Marsh Landing: located on the lower Duplin River on Sapelo Island (Latitude: 31° 25' 4"N, Longitude 81° 17' 46"W). Water passing the Marsh landing site during flood tide originates from the Doboy Sound. The Doboy receives input from the Atlantic Ocean, and the Altamaha River via the Intra-Coastal Waterway. The water is pushed up the river or up smaller tidal creeks and some is pushed onto the marsh surface by the flood tide and recedes into the main channel during ebb tide. The dock itself is used as the main dock to the island where the ferry makes several daily runs. There are also several small boats that are docked there.

2) Barn Creek: located on a tributary of the Duplin river between the Marsh Landing and Flume Dock sites (Latitude: 31° 26' 21N, Longitude 81° 16' 43"W). It is impacted by a small boat dock, a mechanic shop nearby on land, as well as several houses near its marshes.

3) Flume Dock: located on the upper Duplin River on Sapelo Island (Latitude: 31° 28' 58N, Longitude 81° 16' 3"W). It is influenced by tidal currents which flood the marsh on high tides and recede into the channel of the river and its side creeks. It receives far less boat traffic than the Marsh Landing site.

6. Data collection period:

Data collection began at the Flume Dock on August 23, 1986, at Marsh Landing on August 27, 1986, and at the Barn Creek site on May 24, 1995. Measurements were taken every hour from January 1 until May 21 and taken every half hour from May 22 to December 31.

7. Associated researchers and projects:

A variety of ecological research projects are conducted in the SINERR by

researchers associated with the University of Georgia Marine Institute. In addition, the Marine Institute has conducted meteorological and hydrological monitoring since 1986.

II. Physical Structure Descriptors

8. Variable sequence, column format, range of measurement, units:

Hydrolab Datasonde I

Variable Name	Range of measurement	Resolution	Accuracy
Date	1-12, 1-31, 00-99 (Mo., Day, Yr.)	1 month, 1 day, 1 yr.	NA
Time	0-24, 0-60, 0-60 (Hr, min., Sec)	1 hr, 1 min, 1 s	NA
Temp	-5 to 50 (C)	0.01 C	+/-0.15 C
pH	2 to 14 (units)	0.01 unit	+/-0.2 units
SpCond	0 to 100 (mS/cm)	0.01 mS/cm	+/- 0.5%
Salinity	0 to 70 (ppt)	0.1 ppt	+/-0.2 ppt

Hydrolab Datasonde III

Variable Name	Range of measurement	Resolution	Accuracy
Date	1-12, 1-31, 00-99 (Mo., Day, Yr.)	1 month, 1 day, 1 yr.	NA
Time	0-24, 0-60, 0-60 (Hr, min., Sec)	1 hr, 1 min, 1 s	NA
Temp	-5 to 50 (C)	0.01 C	+/-0.15 C
SpCond	0 to 100 (mS/cm)	0.01 mS/cm	+/- 0.5%
Salinity	0 to 70 (ppt)	0.1 ppt	+/-0.2 ppt
DO	0-200 (%air Saturation)	0.1% @air sat	+/-2% @
air sat.			
DO	0-20 (mg/L)	0.01 mg/L	+/-0.2 mg/L
pH	2 to 14 (units)	0.01 unit	+/-0.2 units

Hydrolab Recorder

Variable Name	Range of Measurements	Resolution	Accuracy
Date	1-12, 1-31, 00-99 (mo., day, yr.)	1 mo., 1 day, 1year	
NA			
Time	0-24, 0-60, 0-60 (hr, min, sec)	1 hr, 1 min, 1 sec	
NA			
Temp	-5 to 50 (degrees C)	0.01 C	
+/- 0.15 C			
SpCond	0 to 100 (mS/cm)	0.01 mS/cm	+/- 0.5%
Salinity	0-70 (ppt)	.1 ppt	+/-
0.2			
ppt			
DO%	0-200 (% air saturation)	0.1% air saturation	
+/- 2%			
DO	0-20 (mg/L)	0.01 mg/L	+/- 0.2
mg/L			
pH	2-14 (units)	0.01 unit	+/-
0.2			

units

YSI 6000UPG

Variable Name	Range of Measurements	Resolution	Accuracy
Date	1-12, 1-31, 00-99 (mo., day, yr.)	1 mo., 1 day, 1year	
NA			
Time	0-24, 0-60, 0-60 (hr, min, sec)	1 hr, 1 min, 1 sec	
NA			
Temp	-5-45 (degrees C)	0.01 C	+/-
0.15			
C			
SpCond	0-100 (mS/cm)	0.01 mS/cm	+/- 0.5%
of			
reading + 0.001mS/cm			
Salinity	0-70 (ppt)	0.01 ppt	+/-
1.0%			
of reading or 0.1 ppt (whichever is greater)			
DO%	0-200 (% air saturation)	0.1% air saturation	
+/- 2%			
DO%	200-500 (% air saturation)	0.1% air saturation	
+/- 6%			
DO	0-20 (mg/L)	0.01 mg/L	+/- 0.2
mg/L			
DO	20-50 (mg/L)	0.01 mg/L	+/-
0.6			
mg/L			
pH	2-14 (units)	0.01 unit	+/-
0.2			
units			
Turbidity	0-1000 (NTU)	0.1 NTU	+/-
5%			
or			
		2 NTU (if	
larger)			

9. Coded variable indicator and variable code definitions:

Site definitions: ML = Marsh Landing, FD = Flume Dock, BC = Barn Creek

10. Data Anomalies (suspect data):

April, 1995

FD: 4/4 10:30 - 4/25 9:30 noisy DO, all values removed

May, 1995

FD: 5/13 9:00 DO spike removed
5/29 02:00 DO out of range (negative value);
removed

June, 1995

ML: 6/27 09:30 - 6/30 23:30 all - sonde failure
FD: 6/1 23:00 DO - out of range (negative
values);
removed

values); removed	6/2 06:00, 09:00	DO - out of range (negative
values); removed	6/4 06:00	DO - out of range (negative
values); removed	6/5 01:30, 07:00	DO - out of range (negative
	6/24 21:30 - 6/28 08:30	all - sonde failure
July, 1995		
BC: values removed	7/10 12:30 - 7/14 09:00	DO - unreasonably large
ML	7/1 00:00 - 7/3 11:00	all - sonde failure
August, 1995		
BC:	8/9 10:00 - 8/11 10:00	noisy DO removed
	8/11 10:30 - 8/25 9:30	%DO, DO - suspected membrane
puncture; removed		
ML:	8/7 11:00 - 8/14 11:30	pH probe error; removed
FD	8/23 12:30 - 8/24 07:30	all - sonde stopped
recording time		
September, 1995		
BC:	9/8 10:00 - 9/22 9:00	%DO, DO - noisy, suspected
membrane		
	Puncture; removed	
ML	9/23 01:00 - 9/26 10:00	all - sonde failure
FD:	9/5 10:00 - 9/6 08:30	all - sonde stopped recording
time		
October, 1995		
BC:	10/2 3:30 - 10/6 9:30	all - sonde had technical failure
	10/13 11:00 - 10/20 11:00	DO well beyond saturation;
removed		
ML	10/24 11:00 - 10/31 23:30	all - sonde failure
FD	10/31 12:00 - 10/31 23:30	all - sonde failure
November, 1995		
BC	11/3 13:00 - 11/17 11:00	all - sonde failure
ML	11/1 00:00 - 11/7 11:30	all - sonde failure
	11/7 12:00 - 11/21 12:00	pH probe failure
FD	11/1 00:00 - 11/14 10:30	all - sonde failure
	11/25 13:30 - 11/29 10:00	noisy %DO, DO removed
	11/29 10:30 - 11/29 11:30	all - sonde failure
December, 1995		
ML:	12/19 13:30 - 12/31 23:30	all - sonde failure
FD:	12/22 13:30 - 16:00	all - out of water reason unknown

12/23 15:00 - 16:30	all - out of water reason unknown
12/30 05:00	discontinuity in DO; removed
12/30 05:30	discontinuity in pH; removed

11. Missing Data:

In all cases, depth was fixed at approximately 2 meters.

Note: FD Jan-May 21 data was taken in hourly increments

January, 1995:

BC	1/1 00:00 - 1/31 23:30	site not set up yet
ML	1/1 00:00 - 1/31 23:30	site not in use due to dock
repair		
FD	1/1 00:00 - 1/31 23:30	%DO, DO, depth, turb - sonde not equipped

February, 1995:

BC	2/1 00:00 - 2/28 23:30	site not set up yet
ML	2/1 00:00 - 2/28 23:30	site not in use due to dock
repair		
FD	2/1 00:00 - 2/28 23:30	%DO, DO, depth, turb - sonde not equipped

March, 1995:

BC	3/1 00:00 - 3/31 23:30	site not set up yet
ML	3/1 00:00 - 3/31 23:30	site not in use due to dock
repair		
FD	3/1 00:00 - 3/31 23:30	%DO, DO, depth, turb not measured

April, 1995:

BC	4/1 00:00 - 4/30 23:30	site not set up yet
ML	4/1 00:00 - 4/30 23:30	site not in use due to dock
repair		
FD	4/1 00:00 - 4/30 23:30	%DO, depth, turb not measured
	4/1 00:00 - 4/4 09:30	DO not measured
	4/4 10:00	all - Sonde out of water for
cleaning		
	4/4 10:30 - 4/25 9:30	noisy DO, all values removed
	4/25 10:00	all -Sonde out of water for
cleaning		
	4/25 11:00 - 4/30 23:30	DO not measured

May, 1995:

BC	5/1 00:00 - 5/24 10:30	site not set up yet
	5/24 11:00 - 5/31 23:30	%DO, depth, turb not
measured		
ML	5/1 00:00 - 5/22 08:30	all - site not in use
	5/22 09:00 - 5/31 23:00	%DO, DO, depth, turb - not
measured by		
	DS3	
FD	5/1 00:00 - 5/22 10:00	readings were taken in hourly
	increments	
	5/1 00:00 - 5/22 10:00	%DO, DO mg/L, depth, turb not
measured		

	5/13 9:00	DO spike removed
	5/19 12:00	sonde out of water
	5/22 10:30 - 5/31 23:30	%DO, DO mg/L, depth, turb
not measured		
	5/22 09:30 - 10:00	sonde out of water for cleaning
	5/29 02:00	DO - out of range (negative
values);		
removed		
June, 1995:		
BC	6/1 00:00 - 6/30 23:30	%DO, depth, turb not measured
	6/16 9:30 - 6/30 8:30	DO not measured
ML	6/1 00:00 - 6/27 09:00	%DO, depth, turb not measured
	6/1 00:00 - 6/19 10:00	DO not measured
	6/5 08:30	all - probe out of water for
cleaning		
	6/19 10:30	all - probe out of water for
cleaning		
	6/27 09:30 - 6/30 23:30	all - sonde failure
FD	6/1 00:00 - 6/30 23:30	%DO, depth, turb not measured
	6/1 23:00	DO - out of range (negative
values);		
removed		
	6/2 06:00, 09:00	DO - out of range (negative
values);		
removed		
	6/4 06:00	DO - out of range (negative
values);		
removed		
	6/5 01:30, 07:00	DO - out of range (negative
values);		
removed		
	6/5 10:30 - 6/14 09:30	DO not measured
	6/24 21:30 - 6/28 08:30	all - sonde failure
	6/28 09:00	all - out of water for cleaning
	6/28 09:30 - 6/30 23:30	DO not measured
July, 1995		
BC	7/1 00:00 - 7/31 23:30	%DO, depth, turb not measured
	7/10 12:30 - 7/14 09:00	DO - unreasonably large
values removed		
ML	7/1 00:00 - 7/3 11:00	all - sonde failure
	7/3 11:30 - 7/31 23:30	%DO, DO, depth, turb not measured
	7/19 10:00	all - out of water for cleaning
	7/24 13:00	all - out of water for cleaning
	7/28 11:30	all - out of water for cleaning
	7/31 11:00	all - out of water for cleaning
FD	7/1 00:00 - 7/31 23:30	%DO, DO, depth, turb not measured
	7/3 09:00	all - out of water for cleaning
	7/12 09:00	all - out of water for cleaning
	7/17 10:00	all - out of water for cleaning
	7/19 09:00	all - out of water for cleaning

August, 1995:

BC	8/1 00:00 - 8/31 23:30	depth, turb not measured
	8/1 00:00 - 8/11 10:00	%DO not measured
	8/9 10:00 - 8/11 10:00	noisy DO; removed
	8/11 10:30 - 8/25 9:30	%DO, DO - suspected membrane
puncture removed		
	8/18 8:00	all - sonde out of water for
cleaning		
	8/24 9:30	all - sonde out of water for
cleaning		
ML	8/1 00:00 - 8/31 23:30	%DO, DO, depth, turb not measured
	8/7 11:00 - 8/14 11:30	pH probe error; removed
FD	8/1 00:00 - 8/23 12:00	%DO, DO, depth, turb not measured
	8/23 12:30 - 8/24 07:30	all - sonde stopped
recording time		
	8/24 08:00 - 09:00	all - out of water for cleaning
	8/24 9:30 - 8/31 23:30	%DO, depth, turb not measured
September, 1995:		
BC	9/1 00:00 - 9/30 23:30	depth, turb not measured
	9/8 10:00 - 9/22 9:00	%DO, DO - noisy, suspected
membrane		
	puncture; removed	
	9/22 09:30	all - probes out of water for
	maintenance	
	9/22 10:00 - 9/30 23:30	%DO not measured
ML	9/1 00:00 - 9/30 23:30	%DO, DO, depth, turb not measured
	9/1 10:30	all - out of water for cleaning
	9/23 01:00 - 9/26 10:00	all - sonde failure
	9/29 11:00	all - sonde out of water for
cleaning		
FD	9/1 00 - 9/30 23:30	%DO, depth, turb not measured
	9/5 10:00 - 9/6 08:30	all - sonde stopped recording
time		
	9/6 09:00 - 9/30 23:30	DO not measured
October, 1995		
BC	10/1 00:00 - 10/31 23:30	turb, depth not measured
	10/1 00:00 - 10/2 03:00	%DO not measured
	10/2 3:30 - 10/6 9:30	all - sonde had technical failure
	10/13 10:30	all - probes out of water for
	maintenance	
	10/13 11:00 - 10/20 11:00	DO well beyond saturation;
removed		
ML	10/1 00:00 - 10/31 23:30	%DO, DO, depth, turb not measured
	10/24 11:00 - 10/31 23:30	all - sonde failure
FD	10/1 00:00 - 10/31 23:30	depth, turb not measured
	10/1 00:00 - 10/3 12:00	%DO, DO not measured
	10/17 09:30	all - sonde out of water for
cleaning		
	10/17 10:00 - 10/31 11:30	%DO, DO not measured
	10/31 12:00 - 10/31 23:30	all - sonde failure

November, 1995:

BC	11/1 00:00 - 11/30 23:30	depth, turb not measured
	11/3 13:00 - 11/17 11:00	all - sonde failure
	11/17 11:30 - 11/30 23:30	%DO, DO not measured
ML	11/1 00:00 - 11/30 23:30	depth, turb not measured
	11/1 00:00 - 11/7 11:30	all - sonde failure
	11/7 12:00 - 11/21 12:00	pH probe failure
	11/21 12:30 - 11/30 23:30	%DO not measured
FD	11/1 00:00 - 11/30 23:30	depth, turb not measured
	11/1 00:00 - 11/14 10:30	all - sonde failure
	11/25 13:30 - 11/29 10:00	noisy %DO, DO removed
	11/29 10:30 - 11/29 11:30	all - sonde failure
	11/29 12:00 - 11/30 23:30	%DO, DO not measured

December, 1995:

BC	12/1 00:00 - 12/31 23:30	turb not measured
	12/1 00:00 - 12/15 10:00	depth not measured
	12/1 00:00 - 12/1 10:30	%DO, DO not measured
ML	12/1 00:00 - 12/5 11:30	%DO, depth, turb not
measured		
	12/5 12:00 - 12/19 13:00	%DO, DO, depth, turb - DS3 does
not		
	measure	
	12/19 13:30 - 12/31 23:30	all - sonde failure
FD	12/1 00:00 - 12/31 23:30	%DO, depth, turb not measured
	12/1 00:00 - 12/11 10:30	DO not measured
	12/15 02:30	temp, pH not measured
	12/22 13:30 - 16:00	all - out of water reason unknown
	12/23 15:00 - 16:30	all - out of water reason unknown
	12/30 05:00	discontinuity in DO; removed
	12/30 05:30	discontinuity in pH; removed

12. Other Remarks

Deployment Dates:

Hydrolab sonde = H YSI sonde = Y

BC
 5/22 H
 5/24 H
 6/2 H
 6/16 H
 6/30 H
 7/1 Y
 7/14 H
 7.28 Y
 8/11 Y
 8/25 Y
 9/8 Y
 9/22 H
 10/6 Y
 10/20 Y
 11/17 H
 12/1 Y

12/15 Y

FD

1/1 H

1/3 H

1/17 H

1/31 H

2/14 H

2/28 H

3/14 H

3/28 H

4/1 H

4/11 Y

4/25 H

5/8 H

5/22 Y

6/5 h

6/14 H

6/28 H

7/1 H

7/12 H

7/26 H

8/9 H

8/24 H

9/5 H

9/19 H

10/3 Y

10/17 H

11/14 Y

11/28 H

12/11 H

ML

5/22 H

6/5 H

6/19 Y

7/3 H

7/17 H

&/31 H

8/14 H

8/28 H

9/12 H

9/26 H

10/10 H

11/7 Y

11/21 H

12/5 H