

NIW SWMP Site Metadata Form
January - December 1995
Updated: June 6, 2000

I. Data Set & Research Descriptors

1. Principal investigator(s) & contact persons

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2. Entry verification

The data are uploaded to the PC from the YSI dataloggers. Data plots are produced and examined using the PC6000 software. Files are also uploaded to a PC

in a comma delimited format. Comma delimited files are opened in EXCEL 5.0

software and edited by removing unnecessary headers, footers and spaces. Suspect data are evaluated, edited, and documented. Missing data due to YSI

maintenance (down time) are inserted into the spreadsheet and are denoted by

periods (.). Edited and raw files are archived using a SUN Sparc II workstation. Edited files are merged to contain one full month of data. All

1995 Thousand Acre and Caledonia files have been verified using Microsoft Excel

5.0 macro programs which discover outliers (values which fall outside the range

that the instrument is designed to measure - see section II.8 of this document)

and other erroneous data. Outliers were determined according to the instruments' manufacturers manual. After macros were run, files with suspicious

data were charted in Microsoft Excel to determine problems with probes. The

dissolved oxygen (DO) probe was most problematic. When the plot of DO ran

upward in an exponential fashion and also intermittently went outside the range

that the instrument was designed to measure and never returned to normal readings, the data were considered bad and removed from the data file.

These

macros are available on the NERRS CDMO home page. Elizabeth King edited and

archived the January-May 1995 Thousand Acre data. Chris Spruck edited and

archived June-December 1995 data. Tammy Dorman used the newly revised macro from March 11, 1997 and re-edited the data. Christopher Aadland and Rick Clutter proofed the final edited metadata and edited data files. During the fall of 1998 through January 1999, Ginger Ogburn-Matthews and Tonia Robinson revisited the 1995 data to investigate "odd" data peaks in the database. Additional anomalous data peaks have been described in this metadata, and some bad data which were found were removed and documented in January 1999.

3. Research Objectives

The objective of our project was to compare the water quality of a freshwater tidal creek, Caledonia Creek (CA), receiving runoff from a golf course to that of a tidal creek in Winyah Bay (TA), down river of the golf course and within the NIW NERR boundaries. Measurements are taken every 30 minutes over three week periods at the Caledonia Golf Course and over two week periods at the Thousand Acre station.

4. Research methods (YSI dataloggers)

Prior to the YSI Datalogger deployment, a 4" diameter PVC pipe was strapped to a treated 2" X 6" board; this board was then nailed into a pier piling at the Thousand Acre site and into a free standing 4" x 4" at the Caledonia site. Each YSI Datalogger is lowered into a PVC pipe which has two large windows cut out near the bottom for the probes to have direct contact with the water column. A stop bolt placed through the PVC pipe below the cut out windows maintains the YSI Datalogger at each site exactly one foot (30 cm) above the creek bottom. Every half hour over a two week period for Thousand Acre and a three week period for Caledonia, measurements of specific conductivity, salinity, percent saturation, dissolved oxygen, water temperature, pH, Turbidity (CA site only), and water level are recorded. Sampling intervals were selected due to biofouling of the dissolved oxygen membrane and expected battery life. At the end of each sampling interval, the YSI Datalogger is brought back into the laboratory for downloading, cleaning and recalibration. These procedures are carried out according to the methods as described in the YSI Operating Manual

(see sections 3 and 7). After approximately 24 hours of down time for cleaning and overnight recalibration (if necessary), the YSI dataloggers are redeployed. If necessary, a Hydrolab datalogger may be substituted for a YSI. All maintenance downtimes and membrane cleaning periods are recorded in a log book.

5. Site location and character

The North Inlet-Winyah Bay National Estuarine Research Reserve is located on the southeastern coast of the United States on the Atlantic Ocean in two tidal estuaries, North Inlet and Winyah Bay, near Georgetown, South Carolina. The North Inlet estuary, located approximately 10 km east of Georgetown, is a bar-built Class C type estuary (Pritchard, 1955)¹. The North Inlet estuary is composed of numerous winding tidal creeks, and is considered a pristine tidal estuary due to minimal anthropogenic impacts. The watershed drains a 24.8 km² area of mostly pine forest and a moderately developed residential watershed to the north. The Winyah Bay estuary, classified as a Class B type estuary by Pritchard (1955)¹, which originates in the Blue Ridge Mountains of North Carolina, is one of the largest river-estuary ecosystems on the Eastern Seaboard. It is located 14.4 km south of North Inlet. Winyah Bay drains the sub-basins of 6 major rivers which are heavily impacted by agriculture, mining, and industry. The rivers drain approximately 46,736 km² of uplands and marshes. Descriptions of the two sampling stations are as follows:

1) Thousand Acre (TA) - (lat. 33:18:2; long. 79:15:4) The Thousand Acre monitoring site is located in Thousand Acre marsh tidal creek approximately 30 meters northeast of the west bridge of Thousand Acre marsh. The creek empties into the northern side of the mid portion of Winyah Bay and directly drains pine forested upland and wetlands. Salinity ranges from 0 to 15 ppt. Georgetown, 5 km upstream from the Thousand Acre site and on the southern side of Winyah Bay, is the home port for a number of heavy industries including a steel plant, paper mill, chemical plant, and a coal fired power plant. A public sewage treatment plant is also located in Georgetown.

2) Caledonia Golf Course(CA) - (lat. 33:27; long. 79:10) The Caledonia site is located in a rectangular man-made pond, which is open on the western side to the headwaters of the tidally influenced Caledonia Creek. The datalogger is located approximately 8 meters from the bank of the eastern corner of the pond. A freshwater holding pond that is designed to receive runoff from the golf course, drains into the man-made pond where the datalogger is located. A portion of Caledonia Creek borders the Caledonia Golf Course and drains into the Waccamaw River. The site is approximately 15 km upstream from the Thousand Acre site, and salinities are typically less than 0.5 ppt.

6. Data collection period

Thousand Acre data collection began January 1, 1995, and Caledonia data collection began June 6, 1995. All sampling is ongoing.

7. Associated researchers and projects

A water chemistry program is associated with the NIW core monitoring program.

Variables sampled include: chlorophyll, dissolved organic carbon, nitrate-nitrite, orthophosphate, and ammonia. (See documentation on the NIW WWW home page for further details). TA is our permanent monitoring station for the NERR National Monitoring Program. This station is also included in our NIW core monitoring program. Caledonia is not currently included in our water chemistry monitoring program.

II. Physical Structure Descriptors

8. Variable sequence, column format, range of measurements, units, resolution, accuracy

YSI 6000 datalogger

Variable	Range of Measurements	Resolution	
Accuracy			
Date	1-12, 1-31, 00-99 (Mo,Day,Yr)	1 mo, 1 day, 1 yr	NA
Time	0-24, 0-60, 0-60 (Hr,Min,Sec)	1 hr, 1 min, 1 s	NA
Temp	-5 to 45 (c)	0.01 C	+/-
0.15C			
Sp COND	0-100 (mS/cm)	0.01mS/cm	+/-0.5%
Of			
reading + 0.001mS/Cm			

Salinity of	0-70 Parts per thousand (ppt)	0.01 ppt	+/- 1%
Reading or	0.1 ppt, (whichever is greater)		
DO @air	0-200 (% air saturation)	0.1% @air sat	+/-2%
Saturation			
DO @	200-500 (% air saturation)	0.1% @ air sat	+/- 6%
Saturation			
DO	0-20 (mg/l)	0.01 mg/l	+/-
0.2mg/l			
DO	20-50 (mg/l)	0.01 mg/l	+/-
0.6mg/l			
Depth (shallow)	0-9.1 (m)	0.001m	+/-
0.018m			
PH	2-14 units	0.01 units	+/-
0.2units			
*Turb	0-1000 NTU	0.1 NTU	+/- 5%
of			
Reading or	2 NTU (whichever is greater)		
* Turbidity can go as high as 1300 or 1500 NTUs)			

Hydrolab DataSonde

Variable	Range of Measurements	Resolution	
Accuracy			
Date	1-12, 1-31, 00-99 (Mo,Day,Yr)	1 mo, 1 day, 1 yr	NA
Time	0-24, 0-60, 0-60 (Hr,Min,Sec)	1 hr, 1 min, 1 s	NA
Temp	-5 to 50 (C)	0.01 C	+/-
0.15C			
Sp COND	0-100 (mS/cm)	0.01mS/cm	+/-0.5%
Salinity	0-70 Parts per thousand (ppt)	0.1 ppt	+/-
0.2ppt			
DO @air	0-200 (% air saturation)	0.1% @air sat	+/-2%
Saturation			
DO	0-20 (mg/l)	0.01 mg/l	+/-
0.2mg/l			
Level	0-10 (m)	0.01m	+/-
0.09m			
PH	2-14 units	0.01 units	+/-
0.2units			

Data columns are separated by tabs

9. Coded Variable indicator and Variable code definitions
 Site definitions: CA = Caledonia golf course; TA = Thousand Acre

10. Data anomalies (suspect data)

Any questionable outlying data points (suspect data) between January 1, 1995 and December 31,

1995.

Jul-95 Data anomalies (suspect data)

Caledonia (CA)

Date	Time	to	Date	Time	Variable
	Reason				
07/09/95	02:00:00				DOsat&DOmg/L
	bad data				
07/09/95	04:30:00				DOsat&DOmg/L
	bad data				
07/16/95	08:00:00	---	07/16/95	09:00:00	Turbidity
	lens obstruction				
07/16/95	13:00:00				Turbidity
	lens obstruction				
07/16/95	17:00:00				Turbidity
	lens obstruction				
07/18/95	13:00:00				DOsat&DOmg/L
	bad data				
07/26/95	05:30:00	---	07/26/95	06:30:00	DOsat&DOmg/L
	bad data				
07/30/95	16:30:00				DOsat&DOmg/L
	bad data				
07/31/95	17:00:00				DOsat&DOmg/L
	bad data				
07/31/95	18:30:00	---	07/31/95	20:00:00	DOsat&DOmg/L
	bad data				

Rain events occurred on 07/07/95, 07/08/95, 07/22/95, and 07/27/95 that may have affected

Turbidity. All DO data was negative, therefore considered bad data.

YSI recorded this data.

Aug-95 Data anomalies (suspect data)

Caledonia (CA)

Date	Time	to	Date	Time	Variable
	Reason				
08/01/95	09:30:00	---	08/01/95	10:00:00	DOsat&DOmg/L
	bad data				
08/01/95	11:30:00	---	08/01/95	13:30:00	DOsat&DOmg/L
	bad data				
08/18/95	13:00:00	---	08/18/95	13:30:00	DOsat&DOmg/L
	bad data				
08/19/95	18:00:00	---	08/19/95	18:30:00	DOsat&DOmg/L
	bad data				
08/19/95	19:30:00	---	08/19/95	20:30:00	DOsat&DOmg/L
	bad data				
08/19/95	22:00:00	---	08/20/95	00:30:00	DOsat&DOmg/L
	bad data				
08/20/95	12:30:00				DOsat&DOmg/L
	bad data				
08/20/95	13:30:00				DOsat&DOmg/L
	bad data				
08/20/95	14:30:00	---	08/20/95	18:00:00	DOsat&DOmg/L

bad data					
08/20/95	20:00:00				DOSat&DOmg/L
bad data					
08/20/95	21:00:00	---	08/20/95	21:30:00	DOSat&DOmg/L
bad data					
08/21/95	03:30:00				DOSat&DOmg/L
bad data					
08/21/95	16:30:00	---	08/21/95	18:30:00	DOSat&DOmg/L
bad data					
08/21/95	21:30:00				DOSat&DOmg/L
bad data					
08/22/95	15:30:00	---	08/22/95	17:30:00	DOSat&DOmg/L
bad data					
08/23/95	13:30:00	---	08/23/95	17:30:00	DOSat&DOmg/L
bad data					
08/31/95	02:00:00				DOSat&DOmg/L
bad data					
08/31/95	13:00:00	---	08/31/95	15:00:00	DOSat&DOmg/L
bad data					

Rain events occurred on 07/27/95, 08/18/95, and 08/23/95. All DO data was negative and therefore considered bad data.
YSI recorded this data.

Sep-95 Data anomalies (suspect data)
Caledonia (CA)

Date	Time	to	Date	Time	Variable
Reason					
09/01/95	14:30:00				
DOSat&DOmg/L bad data					
09/01/95	15:30:00	---	09/01/95	16:00:00	
DOSat&DOmg/L bad data					
09/01/95	17:00:00	---	09/01/95	17:30:00	
DOSat&DOmg/L bad data					
09/02/95	21:00:00	---	09/02/95	21:30:00	
DOSat&DOmg/L bad data					
09/03/95	16:30:00	---	09/03/95	21:00:00	
DOSat&DOmg/L bad data					
09/04/95	17:30:00	---	09/04/95	20:30:00	
DOSat&DOmg/L bad data					

All DO data was negative, therefore considered bad data.
YSI recorded this data.

Nov-95 Data anomalies (suspect data)
Caledonia (CA)

Date	Time	to	Date	Time	Variable
Reason					
11/02/95	11:30:00	---	11/02/95	13:00:00	
DOSat&DOmg/L bad data					
11/15/95	04:00:00			04:30:00	Turbidity
lens obstruction					

Hydrolab recorded data from 11/01/95 00:00:00-11/01/95 07:30:00. YSI recorded data from 11/02/95 11:00:00-11/17/95 05:00:00. Rain events occurred on 11/13/95 and 11/14/95 that might have caused the turbidity obstruction. DO data was negative and therefore considered bad data.

Dec-95 Data anomalies (suspect data)

Caledonia (CA)

Date	Time	to	Date	Time	Variable
Reason					
12/18/95	17:30:00	(unusually high number)			Turbidity
	Unknown				

The instrument may have just been deployed for the next run, thereby disturbing the bottom and causing the turbidity to be unusually high.

May-95 Data anomalies (suspect data)

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
Reason					
05/08/95	15:00:00	---	05/08/95	19:00:00	
	DOsat&DOmg/L out of range				
05/08/95	23:30:00	---	05/09/95	05:30:00	
	DOsat&DOmg/L out of range				
05/09/95	11:00:00	---	05/09/95	11:30:00	All
Variable/cal changed					
05/09/95	12:00:00	---	05/09/95	19:30:00	
	DOsat&DOmg/L out of range				
05/10/95	01:00:00	---	05/10/95	06:00:00	
	DOsat&DOmg/L out of range				
05/10/95	13:00:00	---	05/10/95	18:30:00	
	DOsat&DOmg/L out of range				
05/11/95	02:00:00	---	05/11/95	06:00:00	
	DOsat&DOmg/L out of range				
05/11/95	05:30:00				Turbidity
	out of range				
05/11/95	13:30:00	---	05/11/95	19:30:00	
	DOsat&DOmg/L out of range				
05/11/95	20:00:00				Turbidity
	out of range				
05/12/95	04:00:00	---	05/12/95	04:30:00	
	DOsat&DOmg/L out of range				
05/12/95	15:00:00	---	05/12/95	21:00:00	
	DOsat&DOmg/L out of range				

05/13/95	16:00:00	---	05/13/95	22:00:00	
	DOsat&DOmg/L			out of range	
05/13/95	17:00:00	---	05/13/95	18:00:00	Turbidity
	out of range				
05/14/95	06:30:00	---	05/14/95	07:30:00	Turbidity
	out of range				
05/14/95	08:30:00				Turbidity
	out of range				
05/14/95	17:00:00	---	05/14/95	19:00:00	
	DOsat&DOmg/L			out of range	
05/14/95	18:30:00	---	05/14/95	20:30:00	Turbidity
	out of range				
05/14/95	20:30:00	---	05/14/95	22:30:00	
	DOsat&DOmg/L			out of range	
05/14/95	22:30:00				Turbidity
	out of range				
05/15/95	08:30:00	---	05/15/95	10:00:00	Turbidity
	out of range				
05/15/95	17:30:00				Turbidity
	out of range				
05/15/95	17:30:00	---	05/15/95	23:30:00	
	DOsat&DOmg/L			out of range	
05/16/95	10:30:00	---	05/16/95	11:30:00	
	DOsat&DOmg/L			out of range	
05/16/95	19:30:00	---	05/17/95	00:30:00	
	DOsat&DOmg/L			out of range	
05/16/95	19:30:00				Turbidity
	out of range				
05/17/95	03:00:00				Turbidity
	out of range				
05/17/95	05:00:00				Turbidity
	out of range				
05/17/95	10:30:00	---	05/17/95	12:30:00	
	DOsat&DOmg/L			out of range	
05/18/95	10:30:00	---	05/18/95	13:30:00	
	DOsat&DOmg/L			out of range	
05/18/95	16:00:00				Turbidity
	out of range				
05/19/95	06:30:00				Turbidity
	out of range				
05/08/95	1500		05/19/95	0830	

DOsat, DOmg/L, Salinity, pH values are questionable
but not Sp Cond - those values look reasonable. A YSI was deployed 05/08
-05/19
and it
looks as if the calibrations were off. The pH values constantly decline
over the
course of the
YSI deployment.

There was a change in variables or in the calibration of the unit between
05/09/95 11:00-
11:30:00.

There was a rain storm on 05/05/95 and on 05/19/95. All DO and Turbidity data was out of range of the instrument reading >99999.0. Hydrolab was used the rest of the month.

Jun-95 Data anomalies (suspect data)

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
06/24/95	15:30:00				DOsat& DOmg/L
Reason out of range					

Hydrolab recorded data from 06/01/95 00:00:00-06/05/95 07:30:00 & 06/19/95 13:00:00-06/30/95 23:30:00.

YSI recorded data from 06/05/95 12:00:00-06/19/95 07:00:00. A rain storm occurred on 06/24/95 (2.35") that may have affected the DO readings which were out of range of the instrument >99999.0.

August-95 Data anomalies (suspect data)

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
08/28/95	0600			0930	DOmg/L & sat
Reason Probe/membrane going bad?					
08/29/95	1200	---	08/31/95	2330	pH
data values jumping around					

DO values jump up right before the maintenance time 10:00:00. pH values jump erratically from the first sampling after deployment and never settles out

November-95 Data anomalies (suspect data)

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
11/10/95	1500		11/22/95	10:00	pH
Reason pH data values constantly decline from beginning of deployment is cause for suspect.					

December-95 Data anomalies (suspect data)

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
12/21/95	1300		12/26/95	1500	level
Reason unrealistic values for conditions Data were deleted					

11. Missing Data

Every two weeks at TA and three weeks at CA, there is a period of approximately 24 hours of missing data due to maintenance and calibration requirements.

Jan-95 Missing Data

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
	Reason				
01/01/95	00:00:00	---	01/31/95	23:30:00	Turb, pH
	no probes				
01/03/95	09:00:00	---	01/03/95	13:30:00	All
	maintenance				
01/16/95	09:30:00	---	01/17/95	11:30:00	All
	maintenance				

Hydrolab recorded this data.

Feb-95 Missing Data

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
	Reason				
02/01/95	00:00:00	---	02/28/95	23:30:00	Turb, pH
	no probes				
02/01/95	09:00:00	---	02/02/95	15:30:00	All
	maintenance				
02/15/95	09:00:00	---	02/15/95	13:30:00	All
	maintenance				

Hydrolab recorded this data.

Mar-95 Missing Data

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
	Reason				
03/01/95	00:00:00	---	03/31/95	23:30:00	Turb, pH
	no probes				
03/01/95	09:00:00	---	03/01/95	15:30:00	All
	maintenance				
03/20/95	09:00:00	---	03/20/95	15:30:00	All
	maintenance				

Hydrolab recorded this data.

Apr-95 Missing Data

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
	Reason				
04/01/95	00:00:00	---	04/30/95	23:30:00	Turb, pH

no probes					
04/07/95	09:00:00	---	04/07/95	14:30:00	All
maintenance					
04/24/95	08:00:00	---	04/30/95	23:30:00	All
maintenance					

Hydrolab recorded this data.

May-95 Missing Data

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
05/01/95	00:00:00	---	05/8/95	14:30:00	All
Reason					
maintenance					
05/08/95	15:00:00	---	05/08/95	19:00:00	
DOsat&DOmg/L			out of range		
05/08/95	23:30:00	---	05/09/95	05:30:00	
DOsat&DOmg/L			out of range		
05/09/95	11:00:00	---	05/09/95	11:30:00	All
Variable/cal changed					
05/09/95	12:00:00	---	05/09/95	19:30:00	
DOsat&DOmg/L			out of range		
05/10/95	01:00:00	---	05/10/95	06:00:00	
DOsat&DOmg/L			out of range		
05/10/95	13:00:00	---	05/10/95	18:30:00	
DOsat&DOmg/L			out of range		
05/11/95	02:00:00	---	05/11/95	06:00:00	
DOsat&DOmg/L			out of range		
05/11/95	05:30:00				Turbidity
out of range					
05/11/95	13:30:00	---	05/11/95	19:30:00	
DOsat&DOmg/L			out of range		
05/11/95	20:00:00				Turbidity
out of range					
05/12/95	04:00:00	---	05/12/95	04:30:00	
DOsat&DOmg/L			out of range		
05/12/95	15:00:00	---	05/12/95	21:00:00	
DOsat&DOmg/L			out of range		
05/13/95	16:00:00	---	05/13/95	22:00:00	
DOsat&DOmg/L			out of range		
05/13/95	17:00:00	---	05/13/95	18:00:00	Turbidity
out of range					
05/14/95	06:30:00	---	05/14/95	07:30:00	Turbidity
out of range					
05/14/95	08:30:00				Turbidity
out of range					
05/14/95	17:00:00	---	05/14/95	19:00:00	
DOsat&DOmg/L			out of range		
05/14/95	18:30:00	---	05/14/95	20:30:00	Turbidity
out of range					
05/14/95	20:30:00	---	05/14/95	22:30:00	
DOsat&DOmg/L			out of range		
05/14/95	22:30:00				Turbidity
out of range					

05/15/95	08:30:00	---	05/15/95	10:00:00	Turbidity
	out of range				
05/15/95	17:30:00				Turbidity
	out of range				
05/15/95	17:30:00	---	05/15/95	23:30:00	
	DOSat&DOmg/L			out of range	
05/16/95	10:30:00	---	05/16/95	11:30:00	
	DOSat&DOmg/L			out of range	
05/16/95	19:30:00	---	05/17/95	00:30:00	
	DOSat&DOmg/L			out of range	
05/16/95	19:30:00				Turbidity
	out of range				
05/17/95	03:00:00				Turbidity
	out of range				
05/17/95	05:00:00				Turbidity
	out of range				
05/17/95	10:30:00	---	05/17/95	12:30:00	
	DOSat&DOmg/L			out of range	
05/18/95	10:30:00	---	05/18/95	13:30:00	
	DOSat&DOmg/L			out of range	
05/18/95	16:00:00				Turbidity
	out of range				
05/19/95	06:30:00				Turbidity
	out of range				
05/19/95	09:00:00	---	05/19/95	09:30:00	All
	maintenance				
05/19/95	10:00:00	---	05/31/95	23:30:00	Turb, pH
	no probes				

YSI recorded this data. There was a rain storm on 05/05/95 and on 05/19/95.

All out of

range values were >99999.0 and were removed from the records.

Jun-95 Missing Data

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
	Reason				
06/01/95	00:00:00	---	06/05/95	07:30:00	pH, Turb
	no probe				
06/05/95	08:00:00	---	06/05/95	11:30:00	All
	maintenance				
06/05/95	12:00:00	---	06/19/95	07:00:00	Turb
	no probe				
06/06/95	23:00:00	---	06/07/95	01:00:00	All
	low battery power				
06/07/95	06:30:00	---	06/07/95	11:00:00	All
	low battery power				
06/19/95	07:30:00	---	06/19/95	12:30:00	All
	maintenance				
06/19/95	13:00:00	---	06/30/95	23:30:00	pH, Turb
	no probe				
06/24/95	15:30:00				
	DOSat&DOmg/L			out of range	

Hydrolab recorded data from 06/01/95 00:00:00-06/05/95 07:30:00 &
 06/19/95
 13:00:00-
 06/30/95 23:30:00.

YSI recorded data from 06/05/95 12:00:00-06/19/95 07:00:00. A rain storm
 occurred on 06/24/95 (2.35") that may have affected the DO readings which
 were
 out of
 range of
 the instrument >99999.0.

Jul-95 Missing Data

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
07/01/95	00:00:00	---	07/18/95	07:30:00	pH, Turb
	Reason				
	no probe				
07/05/95	08:00:00	---	07/05/95	15:00:00	All
	maintenance				
07/18/95	08:00:00	---	07/18/95	09:00:00	All
	maintenance				
07/18/95	09:30:00	---	07/31/95	08:00:00	Turbidity
	no probe				
07/31/95	08:30:00	---	07/31/95	15:00:00	All
	maintenance				
07/31/95	15:30:00	---	07/31/95	23:30:00	Turbidity
	no probe				

Hydrolab recorded data from 07/01/95 00:00:00-07/18/95 07:30:00.

YSI recorded data from 07/18/95 09:00:00-07/31/95 23:30:00.

Aug-95 Missing Data

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
08/01/95	00:00:00	---	08/31/95	23:30:00	
	Reason				
	Turbidity no probe				
08/14/95	09:30:00	---	08/14/95	16:00:00	All
	maintenance				
08/15/95	14:00:00	---	08/16/95	08:30:00	All
	maintenance				
08/28/95	10:00:00	---	08/29/95	11:30:00	All
	maintenance				

YSI recorded data.

Sep-95 Missing Data

Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
09/01/95	00:00:00	---	09/30/95	23:30:00	Turb
	Reason				
	no probe				
09/01/95	09:00:00	---	09/01/95	12:30:00	All

09/11/95	maintenance 08:00:00	---	09/12/95	08:30:00	All
09/25/95	maintenance 09:00:00	---	09/25/95	15:30:00	All
	maintenance				

YSI recorded data.

Oct-95 Missing Data
Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
	Reason				
10/01/95	00:00:00	---	10/31/95	23:30:00	
	Turbidity no probe				
10/09/95	09:00:00	---	10/10/95	11:00:00	All
	maintenance				
10/15/95	22:30:00	---	10/15/95	23:00:00	All
	low battery				
10/16/95	05:30:00	---	10/16/95	11:00:00	All
	low battery				
10/16/95	20:30:00	---	10/17/95	00:30:00	All
	low battery				
10/17/95	06:30:00	---	10/17/95	12:00:00	All
	low battery				
10/17/95	20:00:00	---	10/18/95	01:30:00	All
	low battery				
10/18/95	06:30:00	---	10/18/95	13:30:00	All
	low battery				
10/18/95	21:30:00	---	10/19/95	04:30:00	All
	low battery				
10/19/95	05:30:00	---	10/19/95	14:00:00	All
	low battery				
10/19/95	20:30:00	---	10/24/95	14:30:00	All
	maintenance				

YSI recorded data.

Nov-95 Missing Data
Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
	Reason				
11/01/95	00:00:00	---	11/30/95	23:30:00	
	Turbidity no probe				
11/08/95	10:30:00	---	11/10/95	14:30:00	All
	maintenance				
11/22/95	10:30:00	---	11/28/95	12:30:00	All
	maintenance				
11/28/95	13:00:00	---	11/30/95	23:30:00	pH,
	Turb no probes				

YSI recorded data from 11/01/95 00:00:00-11/22/95 10:00:00. Hydrolab
recorded
data from
11/28/95 13:00:00-11/30/95 23:30:00.

Dec-95 Missing Data
Thousand Acre (TA)

Date	Time	to	Date	Time	Variable
12/01/95	00:00:00	---	12/21/95	01:00:00	pH
	no probe				
12/01/95	00:00:00	---	12/31/95	23:30:00	Turbidity
	no probe				
12/08/95	09:00:00	---	12/11/95	11:30:00	All
	maintenance				
12/21/95	01:30:00	---	12/21/95	12:30:00	All
	maintenance				
12/21/95	1300	---	12/26/95	1500	level
	unrealistic values for conditions				
12/25/95	06:00:00	---	12/25/95	07:30:00	All
	low battery power				
12/25/95	20:00:00	---	12/25/95	21:00:00	All
	low battery power				
12/26/95	03:30:00	---	12/26/95	11:30:00	All
	low battery power				
12/26/95	15:30:00	---	12/31/95	23:30:00	All
	low battery power				

Hydrolab recorded data from 12/01/95 00:00:00-12/21/95 01:30:00. YSI
recorded
data from
12/21/95 13:00:00-12/31/95 23:30:00.

Jun-95 Missing Data
Caledonia (CA)

Date	Time	to	Date	Time	Variable
06/01/95	00:00:00	---	06/06/95	08:30:00	All
	not deployed				
06/28/95	08:30:00	---	06/28/95	16:30:00	All
	maintenance				

YSI recorded this data.

Jul-95 Missing Data
Caledonia (CA)

Date	Time	to	Date	Time	Variable
07/09/95	02:00:00				
	D0sat&D0mg/L	bad data			
07/09/95	04:30:00				
	D0sat&D0mg/L	bad data			
07/18/95	13:00:00				
	D0sat&D0mg/L	bad data			
07/19/95	09:00:00	---	07/19/95	15:00:00	All
	maintenance				
07/26/95	05:30:00	---	07/26/95	06:30:00	

	DOSat&DOmg/L	bad data			
07/30/95	16:30:00				
	DOSat&DOmg/L	bad data			
07/31/95	17:00:00				
	DOSat&DOmg/L	bad data			
07/31/95	18:30:00	---	07/31/95	20:00:00	
	DOSat&DOmg/L	bad data			

All DO data was negative, therefore considered bad data.
YSI recorded this data.

Aug-95 Missing Data
Caledonia (CA)

Date	Time	to	Date	Time	Variable
	Reason				
08/01/95	09:30:00	---	08/01/95	10:00:00	
	DOSat&DOmg/L	bad data			
08/01/95	11:30:00	---	08/01/95	13:30:00	
	DOSat&DOmg/L	bad data			
08/09/95	09:30:00	---	08/10/95	11:30:00	All
	maintenance				
08/18/95	13:00:00	---	08/18/95	13:30:00	
	DOSat&DOmg/L	bad data			
08/19/95	18:00:00	---	08/19/95	18:30:00	
	DOSat&DOmg/L	bad data			
08/19/95	19:30:00	---	08/19/95	20:30:00	
	DOSat&DOmg/L	bad data			
08/19/95	22:00:00	---	08/20/95	00:30:00	
	DOSat&DOmg/L	bad data			
08/20/95	12:30:00				
	DOSat&DOmg/L	bad data			
08/20/95	13:30:00				
	DOSat&DOmg/L	bad data			
08/20/95	14:30:00	---	08/20/95	18:00:00	
	DOSat&DOmg/L	bad data			
08/20/95	20:00:00				
	DOSat&DOmg/L	bad data			
08/20/95	21:00:00	---	08/20/95	21:30:00	
	DOSat&DOmg/L	bad data			
08/21/95	03:30:00				
	DOSat&DOmg/L	bad data			
08/21/95	16:30:00	---	08/21/95	18:30:00	
	DOSat&DOmg/L	bad data			
08/21/95	21:30:00				
	DOSat&DOmg/L	bad data			
08/22/95	15:30:00	---	08/22/95	17:30:00	
	DOSat&DOmg/L	bad data			
08/23/95	13:30:00	---	08/23/95	17:30:00	
	DOSat&DOmg/L	bad data			
08/30/95	08:30:00	---	08/30/95	17:30:00	All
	maintenance				
08/31/95	02:00:00				
	DOSat&DOmg/L	bad data			
08/31/95	13:00:00	---	08/31/95	15:00:00	

DOsat&DOmg/L bad data

Rain events occurred on 07/27/95, 08/18/95, and 08/23/95. All DO data was negative and therefore considered bad data.
YSI recorded this data.

Sep-95 Missing Data
Caledonia (CA)

Date	Time	to	Date	Time	Variable
09/01/95	14:30:00				
	DOsat&DOmg/L	bad data			
09/01/95	15:30:00	---	09/01/95	16:00:00	
	DOsat&DOmg/L	bad data			
09/01/95	17:00:00	---	09/01/95	17:30:00	
	DOsat&DOmg/L	bad data			
09/02/95	21:00:00	---	09/02/95	21:30:00	
	DOsat&DOmg/L	bad data			
09/03/95	16:30:00	---	09/03/95	21:00:00	
	DOsat&DOmg/L	bad data			
09/04/95	17:30:00	---	09/04/95	20:30:00	
	DOsat&DOmg/L	bad data			
09/05/95	12:30:00	---	09/20/95	17:30:00	All
		maintenance			

All DO data was negative therefore considered bad data.
YSI recorded data.

Oct-95 Missing Data
Caledonia (CA)

Date	Time	to	Date	Time	Variable
10/09/95	12:00:00	---	10/11/95	15:00:00	All
	maintenance				
10/11/95	15:30:00	---	10/31/95	23:30:00	pH,
Turb	no probes				

YSI recorded data from 10/01/95 00:00:00-10/09/95 11:30:00. Hydrolab recorded data from 10/11/95 15:30:00-10/31/95 23:30:00.

Nov-95 Missing Data
Caledonia (CA)

Date	Time	to	Date	Time	Variable
11/01/95	00:00:00	---	11/01/95	07:30:00	
	Turbidity	no probe			
11/01/95	00:00:00	---	11/17/95	05:00:00	pH
	no probe				
11/01/95	08:00:00	---	11/02/95	11:00:00	All
	maintenance				
11/02/95	11:30:00	---	11/02/95	13:00:00	

DO%, DOmg/L	bad data				
11/17/95 05:30:00	---	11/30/95	23:30:00		All
maintenance					

Hydrolab recorded data from 11/01/95 00:00:00-11/01/95 07:30:00.
 YSI recorded data from 11/02/95 11:00:00-11/17/95 05:00:00.
 DO data was negative and therefore considered bad data.

Dec-95 Missing Data

Caledonia (CA)

Date	Time	to	Date	Time	Variable
	Reason				
12/01/95	00:00:00	---	12/18/95	17:00:00	All
	maintenance				
12/18/95	17:30:00	---	12/28/95	17:00:00	pH
	no probe				
12/28/95	17:30:00	---	12/31/95	23:30:00	All
	battery died				

YSI recorded data.

12. Other Remarks/Notes

Sampling times were off by 00:01:19sec from 09/01/95 12:00-09/11/95 12:30:00 on the September 1995 TA dataset and were corrected.