

QA/QC Log: Pine-Island—Levy County, 2002

Key to Log:

File Name: Name of excel files containing the data for that month. File names have two or three parts: 1) the two-letter site abbreviation (GJ, HB, BA, etc.), 2) the year and month (ie. -0201), and 3) the nature of the file (“-raw” contains the raw, unaltered data; “-QAQC” contains the quality controlled data set as well as all corrections; the file name that ends with the year and month is the quality controlled file containing only the corrected and finalized data—this is the file sent to the archive)

Deployments: Number of different sondes that recorded data during the month and the periods of dates/times of each deployment.

Condition of Sonde: The post-deployment condition of each sonde deployed during the month. This includes information on fouling, equipment failures and whether post-deployment checks were performed.

Removed Data: Tabulation of all data points removed from a given month. “Trimming on ends of data sets” is a record of all data points removed from either the beginning or the end of the different files in order to create a seamless monthly record (most points removed here were data not recorded in the water, but rather, were point recorded prior to deployment or following retrieval); “Removal of bad data” is a record of data deemed to be of low quality (for example, data out of range of instrument, instrument or probe failures, etc... See Word file “QAQCGuidelines.doc” for criteria used). Table columns give the parameter values deleted, the reason for the deletion (see abbreviations) and the dates and times of points deleted.

Corrected data: This is a record of all data points that were corrected. This includes corrections due to instrument drift, fouling, incorrect instrument calibration, etc. Included are probe readings in the standard pre- and post-deployment and excel formulae used to calculate corrected values. Inability to correct data due to lack of proper post-deployment check procedures or substandard sonde condition (eg heavily fouled) may also be noted here.

Missing data: This is a record of all missing data points not due to the QA/QC process (ie. not accounted for in “Removal of bad data”). A common cause for this missing data is a lag time between the retrieval of one sonde and the deployment of the second sonde or failure of the instrument to log data at a given time.

Problems and Anomalies: This is a record of troublesome trends or data points not removed from data set, but that could prove a problem in interpretation. Examples include sudden jumps in the data when sondes are changed out (reflecting drift in retrieved sonde or a lack of standardization between the two sondes). Notes regarding reliability of data (whether or not it is or may be faulty) may also be found here. **ALWAYS read this section before interpreting data.**

Abbreviations:

IF	=	Instrument Failure: Data logger returned values of -6999
PF	=	Probe Failure: Probe measuring individual parameter apparently malfunctioned.
ADL	=	Above Detection Limit: data logger returned a data point that is above the detection limit of the probe
BDL	=	Below Detection Limit: data logger returned a data point that is above the detection limit of the probe
SND	=	Sonde Not Deployed: evidence indicates that sonde was not in the water on-site when data was recorded
FOUL	=	Fouled: evidence indicates sonde was not functioning properly due to severe fouling
EXP	=	Exposed: Sonde was exposed to air due to low water level or some disturbance.
NMD	=	Next month's data: trimmed data belonged to next month
PMD	=	Previous month's data: trimmed data belonged to previous month

General Notes on Reliability of Data:

- 1) In general, measurements of temperature and depth are very reliable unless otherwise noted in “Problems and Anomalies”.
- 2) Salinity is typically reliable, but this data can be compromised by bad calibrations and fouling. These effects are most obvious as sudden discontinuities in the trend when sondes are changed. If the discontinuity that occurs with a sonde change is more than +/- 2 ppt in magnitude, the discontinuity is noted as a faulty trend.
- 3) Measurements of dissolved oxygen are often not reliable. Typically, oxygen measurements taken soon after a sonde is deployed are reliable, but reliability decreases during the deployment period due to instrument drift and fouling. The most unreliable oxygen data is that collected near the time the sonde is retrieved. ALWAYS read “Problems and Anomalies” before interpreting dissolved oxygen! Dissolved oxygen discontinuities of +/- 25% or more coincident with sonde changes are noted as faulty if they do not fall within the actual rate of change occurring before and after the sonde change.
- 4) The reliability of turbidity measurements is much like that of oxygen. Turbidity measurements are best early and worst late in the deployment period.
- 5) The reliability of chlorophyll measurements is unknown. We do not currently know what the measurements mean in a biological context. Confirmation studies are underway.
- 6) If the word "**faulty**" appears regarding a trend or data period, the data should be considered highly unreliable. Do not use this data (if it wasn't deleted altogether) for anything but a general guideline to potential conditions. This designation is only used regarding data known to be of very poor quality.
- 7) If the phrase "**may be faulty**" appears regarding a trend or data period, the data may not be reliable. Typically, the data appears to be of reasonably good quality and probably does reflect the real trends in environmental condition, but very strict interpretation is not recommended.
- 8) If a proper post-deployment check was not performed, reliability of all data for that deployment period must be considered suspect.

FEBRUARY-2002

Files: Sondes: Pi020219;

Data: Pi-0202-raw, Pi-0202-QAQC, Pi-0202

Deployments: (1); 2/19-3/7

Condition of Sondes: 2/19-3/7 (No post-deployment condition information)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi020219	SND	2/15 1157 to 2/19 1135
Pi020219	NMD	3/1 000 to 3/11 935

Removal of bad data:

Parameter(s)	Reason	Data Points
NONE		

Corrected Data:

2/19-3/7

Specific Conductivity:

standard 23.3, probe 21.3

Formula: $=(-((21.3-23.3)/(\$B\$890-\$B\$1610))*(B890-\$B\$890))+E890$

Salinity $=(0.7143*R890)-3.033$

Oxygen:

pre-deployment O2: None

post-deployment O2: None

standard 100, probe 108.1; O2 correction = None

Formula: $=(-((108.1-100)/(\$B\$890-\$B\$1610))*(B890-\$B\$890))+G890$

Conversion for O2 concentration:

$=4.17-(0.18*D890)-(0.0558*S890)+(0.0859*P890)$

Turbidity:

standard 0, probe 0.1; standard 100, probe 101.1

Formula: $=((((100/101)-1)*(K890))-(0.1))*((B890-\$B\$890)/(\$B\$1610-\$B\$890))+K890$

Chlorophyll:

standard 0.0, probe 0.0

**Correction Unnecessary

Missing Data:

1) 2/1/2002 0:05 to 2/19/2002 12:05: before sondes were being deployed

Abnormalities in Data:

Time all data: Data were recorded 5 minutes over the hour and the half hour. Does not affect quality of data.

MARCH-2002

Files: Sondes: Pi020219, Pi020329;

Data: Pi -0203-raw, Pi -0203-QAQC, Pi-0203

Deployments: (); 2/19-3/6, 3/6-3/12, 3/12-3/29, 3/29-4/19

Condition of Sondes: 2/19-3/6 (No post-deployment condition information), 3/6-3/12 (No Data), 3/12-3/29 (No Data), 3/29-4/19 (No post-deployment check performed; Heavily fouled and batteries too low to run)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi020219	PMD	2/19 1235 to 3/1 000
Pi020219	SND	3/6 1235 to 3/11 935
Pi020329	SND	3/29 1005 to 3/29 1535
Pi020329	NMD	4/1 000 to 4/19 1535

Removal of bad data:

Parameter(s)	Reason	Data Points
Oxygen	PF	3/2 1935-3/3 1205; 3/4 335, 1205
Chlorophyll	ADL	3/2 1735-1805
Chlorophyll	PF	3/29-4/19

Corrected Data:

2/19-3/6

**This time period was continuous with February and was corrected as for that month (see above)

3/6-3/12

**No data

3/12-3/29

**No Data

3/29-4/19

**No corrections possible due to lack of post-deployment check.

Missing Data:

1) 3/6 935-3/29 1535: No data available for this time.

Abnormalities in Data:

Time all data: Data were recorded 5 minutes over the hour and the half hour. Does not affect quality of data.

Oxygen 3/2 1935-3/3 1205; 3/4 335, 1205: Diagnostic DO charge values above acceptable limits indicating probe malfunctioned. These data were **faulty** and were deleted.

Chlorophyll 3/29-4/19: Chlorophyll values very negative (~-10) for almost entire deployment period. During two periods chlorophyll readings were positive: once when chlorophyll readings spiked outside of detection limit of instrument (>400) and then once toward the end of the deployment period when biofouling was likely a problem. The constant negative values may have been a result of improper calibration of the instrument prior to deployment or from complete failure of probe. Either way, the data was deemed unreliable and **faulty** and was deleted.

APRIL-2002

Files: Sondes: Pi020329; Pi020419

Data: Pi -0204-raw, Pi -0204-QAQC, Pi -0204

Deployments: (2); 3/29-4/19, 4/19-5/1

Condition of Sondes: 3/29-4/19 (No post-deployment check performed; Heavily fouled and batteries too low to run), 4/19-5/1 (Sonde moderately fouled and DO membrane heavily fouled)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi020329	PMD	3/29 1005 3/31 2335
Pi020329	SND	4/19 1305 1535
Pi020419	SND	4/19 1000 1230
Pi020419	NMD	5/1 0:00 5/1/2002 16:00

Removal of bad data:

Parameter(s)	Reason	Data Points
Chlorophyll	PF	3/29-4/19
Oxygen	FOUL	4/10 305-4/19 1235
Turbidity	FOUL	4/10 305-4/19 1235

Corrected Data:

3/29-4/19

**No corrections possible due to lack of post-deployment check.

4/19-5/1

Specific Conductivity:

standard 30.25, probe 25.01

Formula: $= -((25.01 - 30.25) / (\$B\$1456 - \$B\$884)) * (B884 - \$B\$884) + E884$

Salinity $= (0.7649 * R884) - 5.7987$

Oxygen:

standard 100, probe -1.9

Below acceptable range--NOT CORRECTABLE

Turbidity:

standard 0, probe -0.1; standard 100, probe 101.0

Formula: $= (((((100/101.1) - 1) * (K884)) - (-0.1)) * ((B884 - \$B\$884) / (\$B\$1456 - \$B\$884))) + K884$

Chlorophyll:

standard 0.0, probe 0.3

Formula: $= -((0.3 - 0) / (\$B\$1456 - \$B\$884)) * (B884 - \$B\$884) + L884$

Missing Data:

1) In Pi020419, there was no "Fluorescence" column. This was added (as a column with no values) to the raw data set PI-0204.

Abnormalities in Data:

Chlorophyll 3/29-4/19: Chlorophyll values very negative (~-10) for almost entire deployment period. During two periods chlorophyll readings were positive: once when chlorophyll readings spiked outside of detection limit of instrument (>400) and then once toward the end of the deployment period when biofouling was likely a problem. The constant negative values may have been a result of improper calibration of the instrument prior to deployment or from complete failure of probe. Either way, the data was deemed unreliable and **faulty** and was deleted.

Dissolved Oxygen 3/29-4/19: Sonde became heavily fouled during this deployment period and so data was not correctable. Suspected fouled portion of record deleted (4/10 305-4/19 1235). Rest of oxygen data for this period is original data and so **may be faulty**. Interpret with caution.

Turbidity 4/10 305-4/19 1235: Sonde became heavily fouled during this deployment period resulting in many consistent spikes above the detection limit of the probe (>1000NTU) towards the end of the deployment period. Suspected fouled portion of record deleted; this was the same time period deleted from the oxygen data. Rest of turbidity data for this period is original data and so **may be faulty**. Interpret with caution.

Time 4/19 1235-1300: Difference in time increment (the accidental measurement of parameters 5 minutes later than intended) was corrected. This will not affect reliability of measurements.

Salinity 4/19 1235-1300: When sondes changed, salinity increased 10.0ppt probably because of fouling in Pi020329. This discontinuity is **faulty**.

Dissolved Oxygen 4/19-5/1: After the sonde for this time period was retrieved on 5/1, the post-calibration check showed the oxygen probe to read -1.9% in a 100% standard and inspection indicated probe was fouled. However, the values measured by the probe did not decline sharply near the end of the deployment period as would be expected of a fouled probe. When the sondes were changed on 5/1, the oxygen readings by the retrieved sonde were 69-75% and the readings of the new sonde were 83-87%. Although this discontinuity **may be faulty**, the small magnitude of the discontinuity suggests the retrieved sonde was not malfunctioning as was previously suggested by the post-deployment check. This further suggests that the post-deployment check was performed incorrectly and that the data recorded by the sonde was not severely influenced by fouling or drift. The original, uncorrected data are retained, but should be interpreted with caution as they **may be faulty**.

MAY-2002

Files: Sondes: Pi020419, Pi020501, Pi020515

Data: Pi -0205-raw, Pi -0205-QAQC, Pi -0205

Deployments: (3); 4/19-5/1, 5/1-5/15, 5/15-5/31, 5/31-6/26

Condition of Sondes: 4/19-5/1 (Sonde moderately fouled and DO membrane heavily fouled), 5/1-5/15 (moderate to heavy biofouling), 5/15-5/31 (no post-deployment check due to heavy fouling), 5/31-6/26 (Unit was not turned on—no data)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi020419	PMD	4/19 1000-4/30 2330
Pi020419	SND	5/1 1130-1600
Pi020501	SND	5/1 1149; 5/15 1530-5/16 730

Removal of bad data:

Parameter(s)	Problem	Data Points
Salinity	PF	5/1 1200-5/15 1330
Oxygen	FOUL	5/9 330-5/15 1330
Turbidity	FOUL	5/9 330-5/15 1330

Corrected Data:

4/19-5/1

**This time period was continuous with April and was corrected as for that month (see above)

5/1-5/15

Specific Conductivity:

standard 1.413, probe 2.240

Correction not applied due to problems with probe (see "Abnormalities..." below).

Oxygen:

standard 100, probe 3.5

Below acceptable range--NOT CORRECTABLE

Turbidity:

standard 0, probe -2.3; standard 100, probe 98.4

Formula:

Chlorophyll:

standard 0.0, probe 1.0

Formula:

5/15-5/31

**No corrections possible due to heavy biofouling preventing post-deployment check.

Missing Data:

1) 5/1/2002 11:30: Lag time between retrieval and deployment.

2) 5/15/2002 13:30 to 14:30: Sonde recording file Pi020515 did not start recording until 15:00, but previous sonde was retrieved just after 13:00.

3) In Pi020515, there was no "Fluorescence" column. This was added (as a column with no values) to the raw data set PI-0205.

Abnormalities in Data:

Dissolved Oxygen 4/19-5/1: After the sonde for this time period was retrieved on 5/1, the post-calibration check showed the oxygen probe to read -1.9% in a 100% standard and inspection indicated

probe was fouled. However, the values measured by the probe did not decline sharply near the end of the deployment period as would be expected of a fouled probe. When the sondes were changed on 5/1, the oxygen readings by the retrieved sonde were 69-75% and the readings of the new sonde were 83-87%. Although this discontinuity **may be faulty**, the small magnitude of the discontinuity suggests the retrieved sonde was not malfunctioning as was previously suggested by the post-deployment check. This further suggests that the post-deployment check was performed incorrectly and that the data recorded by the sonde was not severely influenced by fouling or drift. The original, uncorrected data are retained, but should be interpreted with caution as they **may be faulty**.

Salinity 5/1-5/15: Salinity measurements start a little low (~3ppt) and then decrease over the course of the sonde deployment period to a low of ~13ppt. When a new sonde was deployed, salinity was measured as ~23.7ppt rather than 13ppt. The diagnostic conductivity cell constant was below the acceptable range prior to the 5/1-5/15 deployment period, suggesting the probe was not functioning properly during this period. When this sonde was retrieved on 5/15 it was also heavily fouled; declining salinity was associated with concurrent declines in dissolved oxygen and increases in turbidity as would be expected of a heavily fouled sonde. This problem could not be corrected; in fact, if the correction had been employed, the corrected salinities near the end of the deployment period would have been less than 10ppt--values that would be even more incorrect than the original uncorrected data. These data were deemed **faulty** and were deleted.

Dissolved Oxygen 5/1-5/15: Sonde became heavily fouled during this deployment period. The oxygen probe reading (3.5%) in the 100% standard was outside of the acceptable range and so the data was not correctable. Suspected fouled portion of record was deemed **faulty** and was deleted (5/9 330-5/15 1330). Rest of oxygen data for this period is original data and so **may be faulty**. Interpret with caution.

Turbidity 5/9-5/15: Sonde became heavily fouled during this deployment period resulting in many consistent spikes above the detection limit of the probe (>1000NTU) towards the end of the deployment period. Suspected fouled portion of record (5/9 330-5/15 1330) was deemed **faulty** and was deleted; this was the same time period deleted from the oxygen data.

Dissolved Oxygen 5/15-5/31: Sonde became heavily fouled during this deployment period. The sonde was too fouled to perform a post-deployment check, so the data was not correctable. Suspected fouled portion of record was deemed **faulty** and was deleted (5/23 000-5/31 900). Rest of oxygen data for this period is original data and so **may be faulty**. Interpret with caution.

Turbidity 5/15-5/31: Sonde became heavily fouled during this deployment period resulting in many consistent spikes above the detection limit of the probe (>1000NTU) towards the end of the deployment period. Suspected fouled portion of record (5/23 000-5/31 900) was deemed **faulty** and was deleted; this was the same time period deleted from the oxygen data.

All parameters 5/31 930-5/31 2330: Unit was not turned on before deployment--no data.

JUNE-2002

Files: Sondes: None

Data: None

Deployments: (2); 5/31-6/26, 6/25-7/19

Condition of Sondes: 5/31-6/26 (Unit not turned on—no data), 6/26-7/19 (No data, reason unknown)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points

Removal of bad data:

Parameter(s)	Problem	Data Points

Corrected Data:

Missing Data:

6/1 000-6/30 2330

Problems and Anomalies:

All parameters 6/1 000-6/30 2330: No Data.

JULY-2002

Files: Sondes: Pi020719;

Data: Pi -0207-raw, Pi -0207-QAQC, Pi -0207

Deployments: (2); 6/26-7/19, 7/19-8/7

Condition of Sondes: 6/26-7/19 (No data, reason unknown), 7/19-8/7 (No post-deployment information or check procedure)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi020719	NMD	8/1 000-8/7 1100

Removal of bad data:

Parameter(s)	Problem	Data Points

Corrected Data:

6/26-7/19

**No data

7/19-8/7

**No corrections possible due to lack of post-deployment information and check

Missing Data:

7/1-7/19 No Data.

Problems and Anomalies:

All parameters 7/1 000-7/19 930: No data.

All parameters 7/19-8/7: No post-deployment information or check procedure. All original data is retained and **may be faulty** due to drift and biofouling.

Dissolved Oxygen 7/19-7/31: Oxygen measurements begin declining on ~7/27 and continue to decline through the end of the sonde's deployment period (8/7). This is probably due to biofouling, but there is no information to corroborate this conclusion. The original data are retained, but should be interpreted with caution as the decline in oxygen measured here is likely **faulty**.

Turbidity 7/26 830: ADL. Since this was a single turbidity spike, it was retained.

AUGUST-2002

Files: Sondes: Pi020719, Pi020807, Pi020826;

Data: Pi -0208-raw, Pi -0208-QAQC, Pi -0208

Deployments: (3); 7/19-8/7, 8/7-8/26, 8/26-9/17

Condition of Sondes: 7/19-8/7 (No post-deployment information or check procedure), 8/7-8/26 (No information regarding fouling; Turbidity probe malfunctioned), 8/26-9/17 (No information regarding sonde condition)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi020719	PMD	7/19 1000-7/31 2330
Pi020807	SND	8/26 1230-1500
Pi020826	SND	8/26 1030-1200
Pi020826	NMD	9/1 000-9/17 1030

Removal of bad data:

Parameter(s)	Problem	Data Points
Turbidity	PF	8/7 1030-8/26 1200
Chlorophyll	ADL	8/12 1800

Corrected Data:

7/19-8/7

**No corrections possible due to lack of post-deployment information and check

8/7-8/26

Specific Conductivity:

standard 1.413, probe 1.675

Formula: $= -((1.675 - 1.413) / (\$B\$1226 - \$B\$311)) * (B311 - \$B\$311) + E311$

Salinity $= (0.7185 * R311) - 3.3093$

Oxygen:

standard 100, probe 56.3

Below acceptable range--NOT CORRECTABLE

Turbidity:

**Probe failure—NOT CORRECTABLE

Chlorophyll:

standard 0.0, probe 50.8

Application made many values strongly negative—correction factor not applied.

8/26-9/17

Specific Conductivity:

standard 1.413, probe 2.333

Formula: $= -((2.333 - 1.413) / (\$B\$2279 - \$B\$1227)) * (B1227 - \$B\$1227) + E1227$

Salinity $= (0.6922 * R1227) - 2.264$

Oxygen:

standard 100, probe 63.1

Below acceptable range--NOT CORRECTABLE

Turbidity:

standard 0, probe 6.6; standard 100, probe 90.4

Formula: $= (((((100/83.8) - 1) * (K1227)) - (6.6)) * ((B1227 - \$B\$1227) / (\$B\$2279 - \$B\$1227))) + K1227$

Chlorophyll:

standard 0.0, probe 5.7

Formula: $= -((5.7 - 0) / (\$B\$2279 - \$B\$1227)) * (B1227 - \$B\$1227) + L1227$

Missing Data:

NONE

Problems and Anomalies:

All parameters 7/19-8/7: No post-deployment information or check procedure. All original data is retained and **may be faulty** due to drift and biofouling.

Dissolved Oxygen 8/1-8/7: Oxygen measurements begin declining on ~7/27 and continue to decline through the end of the sonde's deployment period (8/7). This is probably due to biofouling, but there is no information to corroborate this conclusion. The original data are retained, but should be interpreted with caution as the decline in oxygen measured here is likely **faulty**.

Salinity and Dissolved Oxygen 8/7: The sudden discontinuity in salinity (2.5ppt) and dissolved oxygen (90%) on this date is a result of the sondes being changed. The discontinuities are **faulty**.

Turbidity 8/7 1030-8/26 1200: Turbidity increased to above the detection limit of the probe (>1000NTU) about halfway through the deployment period and more or less stayed there. The post-deployment check showed the probe to read >1400NTU in both standards (0NTU & 100NTU). Post-deployment notes also indicated the probe was not functioning properly. This data series was deemed **faulty** and was deleted.

Dissolved Oxygen 8/7-8/26: These data although affected by drift and/or biofouling could not be corrected. Original data were retained but should be interpreted with caution as they are likely **faulty**.

Chlorophyll 8/7-8/26: The chlorophyll probe read 50.8 in 0.0 standard in post-deployment check. If this was used as a correction factor, many points became strongly negative (-50) by the end of the deployment period. Either the probe was malfunctioning, the effects of biofouling were intermittent, or the post-deployment check was conducted improperly; however, there was no evidence from which to draw a conclusion. Because application of a correction factor made the data trend strongly negative (and obviously incorrect), no correction was performed. The original data were retained but are likely **faulty**.

Dissolved Oxygen 8/26-9/17: In the post-deployment check, the oxygen probe read 63.1% in a 100% standard. There is some evidence (declining oxygen readings during the second half of the deployment period) that drift and/or biofouling affected probe. The original data were retained but should be interpreted with caution as they are likely **faulty**.

SEPTEMBER-2002

Files: Sondes: Pi020826, Pi020917, Pi020924;

Data: Pi -0209-raw, Pi -0209-QAQC, Pi -0209

Deployments: (3); 8/26-9/17, 9/17-9/24, 9/24-10/4

Condition of Sondes: 8/26-9/17 (No information regarding sonde condition), 9/17-9/24 (Light fouling), 9/24-10/4 (OK)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi020826	PMD	8/26 1030-8/31 2330
Pi020826	SND	9/17 1100-1330
Pi020917	SND	9/17 1350; 9/24 1330-1500
Pi020924	SND	9/24 1200-1330
Pi020924	NMD	10/1 000-10/4 1430

Removal of bad data:

Parameter(s)	Problem	Data Points
Oxygen	PF	9/21 630; 9/22 630-830; 9/23 430-900; 9/24 300-330, 530-1030, 1200

Corrected Data:

8/26-9/17

**This time period was continuous with August and was corrected as for that month (see above)

9/17-9/24

Specific Conductivity:

standard 1.413, probe 2.820

Formula: $= -((2.82 - 1.413)/(\$B\$1132 - \$B\$798)) * (B798 - \$B\$798) + E798$

Salinity $= (0.7096 * R798) - 2.9541$

Oxygen:

pre-deployment O2: None

post-deployment O2: 98.05

standard 100, probe 96.3; O2 correction = 97.2

Formula: $= -((97.2 - 100)/(\$B\$798 - \$B\$1132)) * (B798 - \$B\$798) + G798$

Conversion for O2 concentration: $= 4.04 - (0.107 * D798) - (0.0358 * S798) + (0.0664 * P798)$

Turbidity:

standard 0, probe 19.4; standard 100, probe 102

Formula: $= (((((100/82.6) - 1) * (K798)) - (19.4)) * ((B798 - \$B\$798)/(\$B\$1132 - \$B\$798))) + K798$

Chlorophyll:

standard 0.0, probe 7.5

Formula: $= -((7.5 - 0)/(\$B\$1132 - \$B\$798)) * (B798 - \$B\$798) + L798$

9/24-10/4

Specific Conductivity:

standard 1.413, probe 2.310

Formula: $= -((2.31 - 1.413)/(\$B\$1611 - \$B\$1134)) * (B1134 - \$B\$1134) + E1134$

Salinity $= (0.7094 * R1134) - 2.8996$

Oxygen:

pre-deployment O2: 99.69

post-deployment O2: 103.48

standard 100, probe 96.9; O2 correction = 100.19

**No correction necessary

Turbidity:

standard 0, probe 1.2; standard 100, probe 99.7

Formula: $=((((100/98.5)-1)*(K1134))-(1.2))*((B1134-$$$1134)/(B1611-$$$1134))+K1134$

Chlorophyll:

standard 0.0, probe 3.2

Formula: $=(-((3.2-0)/($B$1611-$$$1134))*(B1134-$$$1134))+L1134$

Missing Data:

9/17 1100-1330: SND

9/24 1330: SND

Problems and Anomalies:

Dissolved Oxygen 8/26-9/17: In the post-deployment check, the oxygen probe read 63.1% in a 100% standard. There is some evidence (declining oxygen readings during the second half of the deployment period with a strong discontinuity (74.7% to 130%) occurring when the sondes were changed) that drift and/or biofouling affected probe. The original data were retained but should be interpreted with caution as the declining oxygen levels during the later portion of this period are likely **faulty**.

Salinity 8/26-9/17: Salinity steadily decreases during the later portion of this time period. When the sondes were changed on 9/17 salinity increased from 19.6 to 25.3ppt. The steady decrease in salinity towards the end of this time period is likely **faulty** and the sudden discontinuity on 9/17 is **faulty**.

Turbidity 9/4 1630, 9/10 1500, 9/14 1130: ADL. These spikes were greater than the detection limit of the probe, but they were retained as they are individual spikes.

OCTOBER-2002

Files: Sondes: Pi020924, Pi021004, Pi021021;

Data: Pi -0210-raw, Pi -0210-QAQC, Pi -0210

Deployments: (3); 9/24-10/4, 10/4-10/21, 10/21-11/1

Condition of Sondes: 9/24-10/4 (OK), 10/4-10/21 (very light fouling; chlorophyll probe not working upon retrieval), 10/21-11/1 (light fouling)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi020924	PMD	9/24-9/30 2330
Pi020924	SND	10/4 1330-1430
Pi021004	SND	10/4 900-1200; 10/21 1000-1400
Pi021021	SND	10/21 830-930
Pi021021	NMD	11/1 000-1630

Removal of bad data:

Parameter(s)	Problem	Data Points
NONE		

Corrected Data:

9/24-10/4

**This time period was continuous with September and was corrected as for that month (see above)

10/4-10/21

Specific Conductivity:

standard 1.413, probe 2.581

Formula: $= -((2.581 - 1.413) / (\$B\$981 - \$B\$173)) * (B173 - \$B\$173) + E173$

Salinity $= (0.698 * R173) - 2.3237$

Oxygen:

pre-deployment O2: 102.9

post-deployment O2: 91.9

standard 100, probe 96.7; O2 correction = 94.3

Formula: $= -((94.3 - 100) / (\$B\$981 - \$B\$173)) * (B173 - \$B\$173) + G173$

Conversion for O2 concentration: $= 3.76 - (0.1017 * D173) - (0.0362 * S173) + (0.068 * P173)$

Turbidity:

standard 0, probe 6.8; standard 100, probe 128.1

Formula: $= (((((100 / 121.3) - 1) * (K173)) - (6.8)) * ((B173 - \$B\$173) / (\$B\$981 - \$B\$173))) + K173$

Chlorophyll:

standard 0.0, probe 703.5

**Chlorophyll NOT CORRECTABLE

10/21-11/1

Specific Conductivity:

standard, probe

Formula: $= -((2.19 - 1.413) / (\$B\$1516 - \$B\$982)) * (B982 - \$B\$982) + E982$

Salinity

Oxygen:

pre-deployment O2: 97.5

post-deployment O2: 100.0

standard 100, probe 89.1; O2 correction = 94.6

Formula: $= -((94.6 - 100) / (\$B\$1516 - \$B\$982)) * (B982 - \$B\$982) + G982$

Conversion for O2 concentration: $=3.76-(0.1017*D982)-(0.0362*S982)+(0.068*P982)$

Turbidity:

standard 0, probe -7.1; standard 100, probe 106.1

Formula: $=((((100/106.7)-1)*(K982))-(-1.3))*((B982-$$$982)/($$1516-$$$982))+K982$

Chlorophyll:

standard 0.0, probe -1.2

Formula:

Missing Data:

10/4 1300: SND

Problems and Anomalies:

Turbidity 10/10 1600, 10/22 2300: ADL. Although these values were above the detection limit of the probe, they were retained as they were individual spikes.

Chlorophyll 10/4-10/21: There was a wiper problem during the post-deployment check that prevented verification of proper probe function (the probe read 703.5 in a 0.0 standard). As a result, the data could not be corrected for probe drift or biofouling. The original data are retained and **may be faulty**.

However, there was little evidence of fouling during this period, and chlorophyll tends to not drift much, so the data probably reflects real trends in the environment.

NOVEMBER-2002

Files: Sondes: Pi021021, Pi021101, Pi021126;

Data: Pi -0211-raw, Pi -0211-QAQC, Pi -0211

Deployments: (3);10/21-11/1, 11/1-11/26, 11/26-12/10

Condition of Sondes: 10/21-11/1 (light fouling) 11/1-11/26 (heavily fouled; severe fouling effects on data), 11/26-12/10 (very light fouling on DO membrane)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi021021	PMD	10/21 830-10/31 2330
Pi021021	SND	11/1 1330-1630
Pi021101	SND	11/1 830-1200; 11/26 1230-1500
Pi021126	SND	11/26 900-1130
Pi021126	NMD	12/1 000-12/10 1530

Removal of bad data:

Parameter(s)	Problem	Data Points
Oxygen	FOUL	11/12 230-11/26 1130
Turbidity	FOUL	11/16 000-11/26 1130
Chlorophyll	PF	11/1 1430-11/26 1130

Corrected Data:

10/21-11/1

**This time period was continuous with October and was corrected as for that month (see above)

11/1-11/26

Specific Conductivity:

standard 10.0, probe 8.53

Formula: $= -((8.53 - 10) / (\$B\$1210 - \$B\$31)) * (B31 - \$B\$31) + E31$

Salinity $= (0.6976 * R31) - 2.3024$

Oxygen:

pre-deployment O2: 102.8

post-deployment O2: 34.4

standard 100, probe 21.6;

**Below acceptable range--NOT CORRECTABLE

Turbidity:

standard 0, probe 1559; standard 100, probe 1559

**Turbidity NOT CORRECTABLE

Chlorophyll:

standard 0.0, probe 702.4

**Chlorophyll NOT CORRECTABLE

11/26-12/10

Specific Conductivity:

standard 10.0, probe 10.2

Formula: $= -((10.2 - 10) / (\$B\$1885 - \$B\$1211)) * (B1211 - \$B\$1211) + E1211$

Salinity $= (0.7164 * R1211) - 3.1273$

Oxygen:

pre-deployment O2: 100.4

post-deployment O2: 112.9

standard 100, probe 71.4; O2 correction = 112.9 (see below)

Formula: $= -((112.9 - 100) / (\$B\$1885 - \$B\$1211)) * (B1211 - \$B\$1211) + G1211$

Conversion for O2 concentration: $= 4.39 - (0.193 * D1211) - (0.0597 * S1211) + (0.0865 * P1211)$

Turbidity:

standard 0, probe 0.5; standard 100, probe 100.0

Formula: $= (((((100/99.5) - 1) * (K1211)) - (0.5)) * ((B1211 - \$B\$1211) / (\$B\$1885 - \$B\$1211))) + K1211$

Chlorophyll:

standard 0.0, probe 3.9

Formula: $= -((3.9 - 0) / (\$B\$1885 - \$B\$1211)) * (B1211 - \$B\$1211) + L1211$

Missing Data:

11/1 1330-1400 SND

Problems and Anomalies:

Salinity 11/10 -11/26: Salinity decreased suddenly starting on ~11/10 then fluctuated around 18ppt until 11/26 when the sondes were changed. When the sondes were changed, salinity increased from ~20ppt to ~26ppt, suggesting that the sonde deployed from 11/1-11/26 was not functioning properly by the end of the deployment period. The discontinuity associated with the sonde change is **faulty**, but whether the decrease on 11/10 and consistent low salinity values thereafter are faulty is unknown. Biofouling evident in the oxygen and turbidity readings and as noted in the post-deployment check may have contributed to the poor performance of the sonde late in the deployment period. Data should be interpreted with caution.

Oxygen 11/1-11/26: Sonde became heavily fouled during this deployment period. The oxygen probe reading (21.6%) in the 100% standard was outside of the acceptable range and so the data was not correctable. Suspected fouled portion of record was deemed **faulty** and was deleted (11/12 230-11/26 1130). Rest of oxygen data for this period is original data and so **may be faulty**. Interpret with caution.

Turbidity 11/1-11/26: Sonde became heavily fouled during this deployment period resulting in many consistent spikes towards the end of the deployment period. Suspected fouled portion of record (11/16 000-11/26 1130) was deemed **faulty** and was deleted. Fouling may have started before this deleted period as suggested by the declining oxygen and salinity values. The remaining data **may be faulty** and should be interpreted with caution.

Chlorophyll 11/1-11/26: PF. For most of month the probe read 500 and during post-deployment check it read 702.4 in a 0.0 standard. Data for this entire period was **faulty** and was deleted.

Oxygen 11/26-12/10: The value used to correct oxygen over this deployment period was based solely on those readings taken immediately following the retrieval of the sonde (mean = 112.9%) rather than on that recorded during the post-deployment check (71.4%). The reason is that when the sondes were changed on 12/10, oxygen readings decreased from 114% to 109%. If the post-deployment check value was used, the decrease at the sonde change would be from 143% to 109%; however, if the readings taken after retrieval were used, the difference would be 102% to 109%. This suggests that the post-deployment check was performed incorrectly. These data should not be faulty in any way.

DECEMBER-2002

Files: Sondes: Pi021126, Pi021210;

Data: Pi-0212-raw, Pi -0212-QAQC, Pi -0212

Deployments: (2);11/26-12/10, 12/10-1/6

Condition of Sondes: 11/26-12/10 (very light fouling on DO membrane), 12/10-1/6 (very light fouling)

Removed Data:

Trimming on ends of data sets:

File	Reason	Data Points
Pi021126	PMD	11/26 900-11/30 2330
Pi021126	SND	12/10 1330-1530
Pi021210	SND	12/10 1000-1300
Pi021210	NMD	1/1 000-1/6 1800

Removal of bad data:

Parameter(s)	Problem	Data Points
Chlorophyll	PF	12/10 1330-1/6 1800

Corrected Data:

11/26-12/10

**This time period was continuous with November and was corrected as for that month (see above)

12/10-1/6

Specific Conductivity:

standard 1.413, probe 3.51

Formula: $= -(((3.51 - 1.413) / (\$B\$1739 - \$B\$461)) * (B461 - \$B\$461)) + E461$

Salinity $= (0.7075 * R461) - 2.7417$

Oxygen:

pre-deployment O2: 104.5%

post-deployment O2: 120%

standard 100, probe 115%; O2 correction = 117.5%

Formula: $= -(((117.5 - 100) / (\$B\$1739 - \$B\$461)) * (B461 - \$B\$461)) + G461$

Conversion for O2 concentration: $= 4.53 - (0.205 * D461) - (0.061 * S461) + (0.0874 * P461)$

Turbidity:

standard 0, probe 26.8; standard 100, probe 105.9

Formula: $= ((((((100 / 79.1) - 1) * (K461)) - (26.8)) * ((B461 - \$B\$461) / (\$B\$1739 - \$B\$461)))) + K461$

**Turbidity correction not applied—see details below

Chlorophyll:

standard 0.0, probe 689.9

**Chlorophyll NOT CORRECTABLE

Missing Data:

Problems and Anomalies:

Chlorophyll 12/10-1/6: PF. For most of month the probe read 500 and during post-deployment check it read 698.9 in a 0.0 standard. Post-deployment records also indicate the wiper was not parking correctly. Data for this entire period was **faulty** and was deleted.

Turbidity 12/10-1/6: The turbidity correction was not applied. During the post-deployment check the turbidity probe read 26.8 in the 0.0 standard and 105.9 in the 100 standard. However, for most of the deployment period, the probe was recording a baseline turbidity of ~1.0-3.0. If the correction were

applied, these baseline values would be about -25.0, obviously incorrect. This suggests the probe did not read correctly in the standard or the post-deployment check was performed incorrectly. Whatever the cause, the original data are retained and so **may be faulty** due to uncorrected drift. Interpret with caution.