

**2003 Indian River Lease Area, Indian River County
Quality Assurance/Quality Control (QA/QC) Log**

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

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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.
If a proper post-deployment check was not performed, reliability of all data for that deployment period must be considered suspect.

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JANUARY--2003

Files: Data: IR-0301-raw, IR-0301-QAQC, IR-0301

Deployments: (2); 12/23-1/14, 1/14-2/3

Condition of Sondes: 12/23-1/14 (moderate fouling; repeated instrument failure), 1/14-2/3 (light fouling; complete sonde failure late in month)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	153 point during 1/1 000-1/14 1100
chlorophyll	PF	12/31 500 - 1/14 1100
oxygen	BDL	1/7 1330
All	IF	all but 20 points during 1/14-2/3

Corrected Data:

12/23-1/14

Specific Conductivity:

standard 10, probe 9.522

Formula: $= -((9.522-10)/(\$B\$2136-\$B\$1079))*(B1079-\$B\$1079)+E1079$

Salinity $= (0.6972 * R1079) - 2.306$

Oxygen:

standard 100, probe 27.2

NOT CORRECTABLE—see below

Turbidity:

standard 0, probe -3.2; standard 100, probe NA

Formula: $= -((-3.2-0)/(\$B\$2136-\$B\$1079))*(B1079-\$B\$1079)+K1079$

Chlorophyll:

standard 0.0, probe 689.8

NOT CORRECTABLE—see below

1/14-2/3

**No corrections applied (see below)

Problems and Anomalies:

Oxygen 12/23-1/14: DO probe read 27.2% in 100% standard during post-deployment check. This value is below the correctable limit (85%). There was moderate fouling (~40% coverage) on the probes. However, the data itself showed no decreasing trend as would be expected if the probe were reading 73% below what it should. The data near the end of this deployment period was also not substantially different than the start of the next deployment period (1/14-2/3). These suggest that perhaps the post-deployment check was incorrect. All the original data were retained, but **may be faulty** due to drift or biofouling. Interpret with caution.

Oxygen 1/7 1100-1500: Oxygen suddenly dropped and at one point (1330) went negative. The cause of the drop is unknown: 1) the drop was not permanent suggesting common probe malfunctions did not occur, 2) turbidity was not spiking suggesting there was not some object lodged in sonde, 3) salinity held steady indicating there was not a change in water source, 4) depth was ~5ft indicating the sonde was not exposed, and 5) the DO membrane was intact and DO charge was ~50 indicating no problems with the membrane. Except for the one negative point the data were retained.

Chlorophyll 13/31 500 – 1/14: During post-deployment check chlorophyll probe read 689.8 in 0.0 standard and the wiper was not parking correctly (it may have been partially or completely blocking the optical sensor). The

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data appeared normal until 12/31 500 when it started reading discontinuously high values, and it continued doing that until it was retrieved on 1/14. The data during the period 12/31 500 to 1/14 was deemed **faulty** and was deleted. The remainder of the data 12/23-12/31 430 was retained but **may be faulty** due to drift or biofouling.

Salinity 1/14 1100: Salinity increased from ~20ppt to ~24ppt coincident with sonde changing. This discontinuity is **faulty**.

All parameters 1/14-2/3: No data was recorded after 1/23 and only 20 data points were recorded between 1/14 and 1/23. Due to general lack of data during this deployment period, no corrections were applied. The original data were retained but **may be faulty**. Interpret with caution!

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FEBRUARY--2003

Files: Data: IR-0302-raw, IR-0302-QAQC, IR-0302

Deployments: (3); 1/14-2/3, 2/3-2/19, 2/19-3/6

Condition of Sondes: 1/14-2/3 (light fouling, complete sonde failure during this month), 2/3-2/19 (complete sonde failure), 2/19-3/6 (complete sonde failure)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	all except 2/9 130

Corrected Data:

1/14-2/3

**No corrections applied.

2/3-2/19

**No corrections applied.

2/19-3/6

**No corrections applied.

Problems and Anomalies:

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MARCH--2003

Files: Data: IR-0303-raw, IR -0303-QAQC, IR-0303

Deployments: (4); 2/19-3/6, 3/6-3/19, 3/19-3/25, 3/25-4/3

Condition of Sondes: 2/19-3/6 (complete instrument failure), 3/6-3/19 (complete instrument failure), 3/19-3/25 (complete instrument failure), 3/25-4/3 (complete instrument failure)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	all points

Corrected Data:

2/19-4/3

**No corrections applied

Problems and Anomalies:

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APRIL--2003

Files: Data: IR-0304-raw, IR-0304-QAQC, IR-0304

Deployments: (5); 3/25-4/3, 4/3-4/17, 4/17-4/22, 4/22-4/30, 4/30-5/9

Condition of Sondes: 3/25-4/3 (complete instrument failure), 4/3-4/17 (very light fouling), 4/17-4/22 (complete instrument failure), 4/22-4/30 (very light fouling), 4/30-5/9 (very light fouling)

Removed Data:

Parameter(s)	Problem	Data Points

Corrected Data:

3/25-4/3

**No data

4/3-4/17

Specific Conductivity:

standard 10, probe 10.38

Formula: $= -((10.38-10)/(\$B\$788-\$B\$118))* (B118-\$B\$118))+D118$

Salinity $= (0.7238*Q118)-3.438$

Oxygen:

pre-deployment O2: 105.1

post-deployment O2: na

standard 100, probe 97.7;

Formula: $= -((97.7-105.1)/(\$B\$788-\$B\$118))* (B118-\$B\$118))+F118 + (100-105.1)$

Conversion for O2 concentration: $= 4.58 - (0.125 * C118) - (0.0495 * R118) + (0.07 * O118)$

Turbidity:

standard 0, probe 3.4; standard 100, probe na

Formula: $= J118 - 3.4$

Chlorophyll:

standard 0.0, probe 44

**Not corrected (see below).

4/17-4/22

**No data

4/22-4/30

Specific Conductivity:

standard 10, probe 9.807

Formula: $= -((9.807-10)/(\$B\$1411-\$B\$1038))* (B1038-\$B\$1038))+D1038$

Salinity $= (0.7298*Q1038)-3.7729$

Oxygen:

pre-deployment O2: 105.6

post-deployment O2: 104.375

standard 100, probe 105.2;

Formula: $= -((104.375-105.6)/(\$B\$1411-\$B\$1038))* (B1038-\$B\$1038))+F1038 + (100-105.6)$

Conversion for O2 concentration: $= 2.68 - (0.0749 * C1038) - (0.0229 * R1038) + (0.0676 * O1038)$

Turbidity:

standard 0, probe -2.8; standard 100, probe na

Formula: $= J1038 + 2.8$

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Chlorophyll:

standard 0.0, probe -.4

Formula: $=(-((-0.4-0)/(\$B\$1411-\$B\$1038))*(\text{B}1038-\$B\$1038))+\text{K}1038$

4/30-5/9

Specific Conductivity:

standard 10, probe 9.943

Formula: $=(-((9.943-10)/(\$B\$434-\$B\$2))*(\text{B}2-\$B\$2))+\text{D}2$

Salinity $=(0.7418*\text{Q}2)-4.4247$

Oxygen:

pre-deployment O2: 101.77

post-deployment O2: 99.6

standard 100, probe 99.6

Formula: $=(-((101.77-99.6)/(\$B\$434-\$B\$2))*(\text{B}2-\$B\$2))+\text{F}2 + (100-99.6)$

Conversion for O2 concentration: $=3.42-(0.0909*\text{C}2)-(0.027*\text{R}2)+(0.0651*\text{O}2)$

Turbidity:

standard 0, probe 0.3; standard 100, probe 127.2

Formula: $=((((127.2/100)-1)*(\text{J}2))-(0.3))*((\text{B}2-\$B\$2)/(\$B\$434-\$B\$2)))+\text{J}2$

Chlorophyll:

standard 0.0, probe 0.1

Formula: $=(-((0.1-0)/(\$B\$386-\$B\$2))*(\text{B}2-\$B\$2))+\text{K}2$

Problems and Anomalies:

Turbidity 4/3-4/17: Standard correction not employed. The baseline values for the entire period was about 3NTU rather than zero.

Chlorophyll 4/3-4/17: Correction not employed. The baseline values for the period was near zero and if the correction was applied, the baseline would have been -44. As a result the original data were retained.

However, the probe read many very high values (up to 500), suggesting it was not operating properly. This data is likely **faulty** and should be interpreted with caution.

Turbidity 4/3-4/17: Standard correction not employed. The baseline values for the entire period was about -2NTU rather than zero.

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MAY--2003

Files: Data: IR-0305-raw, IR-0305-QAQC, IR-0305

Deployments: (4); 4/30-5/9, 5/9-5/19, 5/19-5/30, 5/30-6/17

Condition of Sondes: 4/30-5/9 (very light fouling), 5/9-5/19 (very light fouling; DO probe malfunction), 5/19-5/30 (very light fouling), 5/30-6/17 (DO probe malfunction)

Removed Data:

Parameter(s)	Problem	Data Points
Oxygen	PF	5/9-5/19
Oxygen	PF	5/30-6/17

Corrected Data:

4/30-5/9

Specific Conductivity:

standard 10, probe 9.943

Formula: $= -((9.943-10)/(\$B\$434-\$B\$2))* (B2-\$B\$2))+D2$

Salinity $= (0.7418*Q2)-4.4247$

Oxygen:

pre-deployment O2: 101.77

post-deployment O2: 99.6

standard 100, probe 99.6

Formula: $= -(((101.77-99.6)/(\$B\$434-\$B\$2))* (B2-\$B\$2))+F2 + (100-99.6)$

Conversion for O2 concentration: $= 3.42 - (0.0909*C2) - (0.027*R2) + (0.0651*O2)$

Turbidity:

standard 0, probe 0.3; standard 100, probe 127.2

Formula: $= (((((127.2/100)-1)*(J2)) - (0.3))* ((B2-\$B\$2)/(\$B\$434-\$B\$2)))+J2$

Chlorophyll:

standard 0.0, probe 0.1

Formula: $= -((0.1-0)/(\$B\$386-\$B\$2))* (B2-\$B\$2))+K2$

5/9-5/19

Specific Conductivity:

standard 10, probe 8.61

Formula: =1.39+D435, Bad calibration

Salinity $= (0.7174*Q435)-3.286$

Oxygen:

**Not corrected

Turbidity:

standard 0, probe-3.6; standard 100, probe 118.5

Formula: =3.6+J435, Bad calibration

Chlorophyll:

standard 0.0, probe -2.9

Formula: =2.9+K435, Bad calibration

5/19-5/30

Specific Conductivity:

standard 10, probe 7.7

Formula: $= -((7.7-10)/(\$B\$1442-\$B\$913))* (B913-\$B\$913))+D913$

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Salinity $= (0.7425 * Q913) - 4.4826$

Oxygen:

pre-deployment O2: 102.5

post-deployment O2: 107.06

standard 100, probe 103.3; O2 correction =

Formula: $= -((103.3 - 102.5) / (\$B\$1445 - \$B\$913)) * (B913 - \$B\$913) + F913 + (100 - 102.5)$

Conversion for O2 concentration: $= 3.16 - (0.0776 * C913) - (0.0297 * R913) + (0.0648 * O913)$

Turbidity:

standard 0, probe 14.2; standard 100, probe 70.4

**Not corrected (see below)

Chlorophyll:

standard 0.0, probe 1.2

Formula: $= -((1.2 - 0) / (\$B\$1442 - \$B\$913)) * (B913 - \$B\$913) + K913$

5/30-6/17

Specific Conductivity:

standard 10, probe 10.79

Formula: $= -((10.79 - 10) / (\$B\$485 - \$B\$2)) * (B2 - \$B\$2) + D2$

Salinity $= (0.753 * Q2) - 5.0823$

Oxygen:

**Not corrected. Probe failure (see below).

Turbidity:

standard 0, probe -3.1; standard 100, probe na

Formula: $= 3.1 + J2$

Chlorophyll:

standard 0.0, probe -.8

Formula: $= K2 + 0.8$

Problems and Anomalies:

All parameters 5/9-5/19: This sonde appears to have not been calibrated correctly; as a result the parameters were not corrected in the usual way. DO was reading -50% almost the entire deployment period indicating probe was malfunctioning. DO was **faulty** and was deleted.

Salinity 5/9: Discontinuity. When sondes were changed out on 5/9, salinity went from 32.9ppt to 28.4ppt. This discontinuity is **faulty**. All the salinity values for the deployment period 5/9-5/19 **may be faulty** due to the calibration problems mentioned above. Interpret with caution.

Salinity 5/19: Discontinuity. When sondes were changed out on 5/19, salinity went from 30.0ppt to 33.6ppt. This discontinuity is **faulty**.

Turbidity 5/19-5/30: Turbidity was not corrected. If the turbidity correction was applied to the data, values of -14 would appear at the end of the data record. This suggests the post-deployment check values were incorrect. The original data was retained but **may be faulty**.

Oxygen 5/30-6/17: Probe read -50% entire deployment period. Deployment notes indicate probe was not working when sonde was deployed. The data were **faulty** and were deleted.

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JUNE--2003

Files: Data: IR-0306-raw, IR-0306-QAQC, IR-0306

Deployments: (3); 5/30-6/17, 6/17-6/25, 6/25-7/3

Condition of Sondes: 5/30-6/17 (DO probe failed), 6/17-6/25 (ok), 6/25-7/3 (ok)

Removed Data:

Parameter(s)	Problem	Data Points
Oxygen	PF	5/30-6/17
Oxygen	PF	6/24 1115-6/25 845

Corrected Data:

5/30-6/17

Specific Conductivity:

standard 10, probe 10.79

Formula: $= -((10.79-10)/(\$B\$485-\$B\$2))* (B2-\$B\$2))+D2$

Salinity $= (0.753*Q2)-5.0823$

Oxygen:

**Not corrected. Probe failure (see below).

Turbidity:

standard 0, probe -3.1; standard 100, probe na

Formula: $= 3.1+J2$

Chlorophyll:

standard 0.0, probe -.8

Formula: $= K2+0.8$

6/17-6/25

Specific Conductivity:

standard 10, probe 10.39

Formula: $= -((10.39-10)/(\$B\$868-\$B\$486))* (B486-\$B\$486))+D486$

Salinity $= (0.7261*Q486)-3.6395$

Oxygen:

**Not corrected. Probe failure (see below).

Turbidity:

standard 0, probe 5.5; standard 100, probe na

Formula: $= J486-5.5$

Chlorophyll:

standard 0.0, probe .8

Formula: $= -((0.8-0)/(\$B\$868-\$B\$486))* (B486-\$B\$486))+K486$

6/25-7/3

Specific Conductivity:

standard 10, probe 9.51

Formula: $= -((9.51-10)/(\$B\$386-\$B\$2))* (B2-\$B\$2))+D2$

Salinity $= (0.73*Q2)-3.8803$

Oxygen:

pre-deployment O2: 99.7

post-deployment O2: 103.26

standard 100, probe 104

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Formula: $=(-((103.26-99.7)/(\$B\$386-\$B\$2))*(\text{B2}-\$B\$2))+\text{F2}+(100-99.7)$

Conversion for O2 concentration: $=3.46-(0.0893*\text{C2})-(0.0275*\text{R2})+(0.0644*\text{O2})$

Turbidity:

standard 0, probe -0.2; standard 123, probe 93.5

Formula: $=((((123/93.7)-1)*(\text{J2}))(-0.2))*((\text{B2}-\$B\$2)/(\$B\$386-\$B\$2))+\text{J2}$

Chlorophyll:

standard 0.0, probe 0.1

Formula: $=(-((0.1-0)/(\$B\$386-\$B\$2))*(\text{B2}-\$B\$2))+\text{K2}$

Problems and Anomalies:

Oxygen 5/30-6/17: Probe read ~50% entire deployment period. Deployment notes indicate probe was not working when sonde was deployed. The data were **faulty** and were deleted.

Oxygen 6/24 1115-6/25 845: DO charge exceeded upper acceptable limit (75) during this time, leveling off at 100 within just a few hours. This suggests the DO membrane was damaged. As a result, post-deployment check could not provide sufficient information to correct remaining data. For the remaining time period, the original data were retained but **may be faulty** due to drift or fouling. Interpret with caution.

Oxygen 6/25-7/21: The different sondes used during this time returned very different ranges of values. The sonde deployed during 6/25-7/3 had numerous tidally fluctuating values that fell to near 0%, the sonde deployed during 7/3-7/11 didn't go lower than the 40%, and the sonde deployed during 7/11-7/21 again had many values near 0%. When the sondes were changed on 7/3, DO increased from 6.7% to 72%; when the sondes were changed on 7/11, DO went decreased from 69% to 16%. This between-sonde variation is likely faulty, but determining which sondes were functioning improperly is not possible. The sonde deployed from 7/29-8/11 also had numerous values near 0%; this sonde was the exact same sonde (same identification number: 02DO973) used during 6/25-7/3. The identification numbers for the remaining sondes were either not recorded or were not consistent, so determining whether a certain sonde was consistently problematic is also not possible. However, the problems described above do suggest that of the two sondes being changed out at Indian River, either one is reading too high or one is reading too low. The data should be interpreted with caution.

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JULY-2003

Files: Data: IR-0307-raw, IR-0307-QAQC, IR-0307

Deployments: (5); 6/25-7/3, 7/3-7/11, 7/11-7/21, 7/21-7/29, 7/29-8/11

Condition of Sondes: 6/25-7/3 (ok), 7/3-7/11 (turbidity wiper not parking), 7/11-7/21 (ok), 7/21-7/29 (no data), 7/29-8/11 (very light fouling)

Removed Data:

Parameter(s)	Problem	Data Points

Corrected Data:

6/25-7/3

Specific Conductivity:

standard 10, probe 9.51

Formula: $= -((9.51-10)/(\$B\$386-\$B\$2))* (B2-\$B\$2) + D2$

Salinity $= (0.73*Q2) - 3.8803$

Oxygen:

pre-deployment O2: 99.7

post-deployment O2: 103.26

standard 100, probe 104

Formula: $= -((103.26-99.7)/(\$B\$386-\$B\$2))* (B2-\$B\$2) + F2 + (100-99.7)$

Conversion for O2 concentration: $= 3.46 - (0.0893*C2) - (0.0275*R2) + (0.0644*O2)$

Turbidity:

standard 0, probe -0.2; standard 123, probe 93.5

Formula: $= (((((123/93.7)-1)*(J2)) - (-0.2))* (B2-\$B\$2)/(\$B\$386-\$B\$2)) + J2$

Chlorophyll:

standard 0.0, probe 0.1

Formula: $= -((0.1-0)/(\$B\$386-\$B\$2))* (B2-\$B\$2) + K2$

7/3-7/11

Specific Conductivity:

standard 10, probe 10.35

Formula: $= -((10.35-10)/(\$B\$771-\$B\$388))* (B388-\$B\$388) + D388$

Salinity $= (0.7528*Q388) - 5.1016$

Oxygen:

pre-deployment O2: 79.95

post-deployment O2: 96.5

standard 100, probe 92

Formula: $= -((96.5-79.95)/(\$B\$771-\$B\$388))* (B388-\$B\$388) + F388 + (100-77.9)$

Conversion for O2 concentration: $= 2.94 - (0.0709*C388) - (0.0227*R388) + (0.062*O388)$

Turbidity:

standard 0, probe -0.8; standard 100, probe na

Formula: $= -((-0.8-0)/(\$B\$771-\$B\$388))* (B388-\$B\$388) + J388$

Chlorophyll:

standard 0.0, probe 0.7

Formula: $= -((0.7-0)/(\$B\$771-\$B\$388))* (B388-\$B\$388) + K388$

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7/11-7/21

Specific Conductivity:

standard 10, probe 9.76

Formula: $= -((10.35-10)/(\$B\$1248-\$B\$772))*(B772-\$B\$772))+D772$

Salinity $= (0.7385*Q772)-4.287$

Oxygen:

pre-deployment O2: 111.5

post-deployment O2: 103.1

standard 100, probe 105.6

Formula: $= -((103.1-111.5)/(\$B\$1248-\$B\$772))*(B772-\$B\$772))+F772 + (100-111.5)$

Conversion for O2 concentration: $= 3.26-(0.083*C772)-(0.0264*R772)+(0.0642*O772)$

Turbidity:

standard 0, probe 4.3; standard 100, probe na

Formula: $= -4.3+J772$

Chlorophyll:

standard 0.0, probe -0.5

Formula: $= -((-0.5-0)/(\$B\$1248-\$B\$772))*(B772-\$B\$772))+K772$

7/21-7/29

**No Data

7/29-8/11

Specific Conductivity:

standard 10, probe 10.71

Formula: $= -((10.71-10)/(\$B\$624-\$B\$2))*(B2-\$B\$2))+D2$

Salinity $= (0.7328*Q2)-4.0085$

Oxygen:

pre-deployment O2: 109.1

post-deployment O2: na

standard 100, probe 101.4;

Formula: $= -((101.5-109.1)/(\$B\$624-\$B\$2))*(B2-\$B\$2))+F2 + (100-109.1)$

Conversion for O2 concentration: $= 2.07-(0.052*C2)-(0.0185*R2)+(0.0644*O2)$

Turbidity:

standard 0, probe 11; standard 100, probe na

Formula: $= J2-11$

Chlorophyll:

standard 0.0, probe -.6

Formula: $= -((-0.6-0)/(\$B\$624-\$B\$2))*(B2-\$B\$2))+K2$

Problems and Anomalies:

Oxygen 6/25-7/21: The different sondes used during this time returned very different ranges of values. The sonde deployed during 6/25-7/3 had numerous tidally fluctuating values that fell to near 0%, the sonde deployed during 7/3-7/11 didn't go lower than the 40%, and the sonde deployed during 7/11-7/21 again had many values near 0%. When the sondes were changed on 7/3, DO increased from 6.7% to 72%; when the sondes were changed on 7/11, DO went decreased from 69% to 16%. This between-sonde variation is likely faulty, but determining which sondes were functioning improperly is not possible. The sonde deployed from 7/29-8/11 also had numerous values near 0%; this sonde was the exact same sonde (same identification number: 02DO973) used during 6/25-7/3. The identification numbers for the remaining sondes were either not recorded or were not consistent, so determining whether a certain sonde was consistently problematic is also not possible. However, the problems described above do suggest that of the two sondes being changed out at Indian River, either one is reading too high or one is reading too low. The data should be interpreted with caution.

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Salinity 7/3: When the sondes were changed on 7/3, salinity increased from 31.8ppt to 35.5ppt. This increase is **faulty**. Interpret with caution.

Salinity 7/11: When the sondes were changed on 7/11, salinity decreased from 36.7ppt to 31.9ppt. This decrease is **faulty**. Interpret with caution.

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AUGUST--2003

Files: Data: IR-0308-raw, IR-0308-QAQC, IR-0308

Deployments: (3); 7/29-8/11, 8/11-8/22, 8/22-9/8

Condition of Sondes: 7/29-8/11 (very light fouling), 8/11-8/22 (ok), 8/22-9/8 (very light probe fouling)

Removed Data:

Parameter(s)	Problem	Data Points

Corrected Data:

7/29-8/11

Specific Conductivity:

standard 10, probe 10.71

Formula: $=(-((10.71-10)/(\$B\$624-\$B\$2))*(B2-\$B\$2))+D2$

Salinity $=(0.7328*Q2)-4.0085$

Oxygen:

pre-deployment O2: 109.1

post-deployment O2: na

standard 100, probe 101.4;

Formula: $=(-((101.5-109.1)/(\$B\$624-\$B\$2))*(B2-\$B\$2))+F2 +(100-109.1)$

Conversion for O2 concentration: $=2.07-(0.052*C2)-(0.0185*R2)+(0.0644*O2)$

Turbidity:

standard 0, probe 11; standard 100, probe na

Formula: $=J2-11$

Chlorophyll:

standard 0.0, probe -.6

Formula: $=(-((-0.6-0)/(\$B\$624-\$B\$2))*(B2-\$B\$2))+K2$

8/11-8/22

Specific Conductivity:

standard 10, probe 9.745

Formula: $=(-((9.745-10)/(\$B\$1157-\$B\$625))*(B625-\$B\$625))+D625$

Salinity $=(0.7287*Q625)-3.7637$

Oxygen:

pre-deployment O2: 100.9

post-deployment O2: 108.23

Formula: $=(-((108.23-100.9)/(\$B\$1157-\$B\$625))*(B625-\$B\$625))+F625 +(100-100.9)$

Conversion for O2 concentration: $=2.61-(0.076*C625)-(0.0161*R625)+(0.0662*O625)$

Turbidity:

standard 0, probe -1.4; standard 100, probe na

Formula: $=J625+1.4$

Chlorophyll:

standard 0.0, probe -.3

Formula: $=(-((-0.3-0)/(\$B\$1157-\$B\$625))*(B625-\$B\$625))+K625$

8/22-9/8

Specific Conductivity:

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standard 10, probe 10.1

Formula: $= -((10.1 - 10) / (\$B\$1969 - \$B\$1158)) * (B1158 - \$B\$1158) + D1158$

Salinity $= (0.7353 * Q1158) - 4.1246$

Oxygen:

pre-deployment O2: 100.66

post-deployment O2: 127.84

standard 100, probe 86.5;

**Not Corrected. See below.

Turbidity:

standard 0, probe 49.8; standard 100, probe na

Formula: $= J1158 - 49.8$

Chlorophyll:

standard 0.0, probe -.5

Formula: $= -((-0.5 - 0) / (\$B\$1961 - \$B\$1158)) * (B1158 - \$B\$1158) + K1158$

Problems and Anomalies:

Turbidity 7/29-8/11: During post-deployment check, probe read 11.0 in the 0.0 standard. All the way through the deployment period, the lowest readings were ~11. This suggests that the probe did not drift, but rather was not calibrated correctly before deployment and so was reading 11NTU too high the entire time. 11.0 was subtracted from all values and any instrument drift that occurred during this time was not correctable. The data **may be faulty** and should be interpreted with caution.

Turbidity 8/11-8/22: During post-deployment check, probe read -1.4 in the 0.0 standard. All the way through the deployment period, the lowest readings were ~-1.4. This suggests that the probe did not drift, but rather was not calibrated correctly before deployment and so was reading 1.4NTU too low the entire time. 1.4 was added from all values and any instrument drift that occurred during this time was not correctable. The data **may be faulty** and should be interpreted with caution.

Oxygen 8/22-9/8: Following retrieval from the field, probe read 127.84 in moist air; during post-deployment check, it read 86.5 in 100 standard. If the correction based on this value was applied, many very negative values (~-20) would occur. Because of this, the correction was not applied. The original data were retained but **may be faulty** due to fouling or drift.

Turbidity 8/22-9/8: During post-deployment check, probe read 49.8 in the 0.0 standard. All the way through the deployment period, the lowest readings were ~49.8. This suggests that the probe did not drift, but rather was not calibrated correctly before deployment and so was reading 49.8NTU too high the entire time. 49.8 was subtracted from all values and any instrument drift that occurred during this time was not correctable. The data **may be faulty** and should be interpreted with caution.

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Quality Assurance/Quality Control (QA/QC) Log**

SEPTEMBER--2003

Files: Data: IR-0309-raw, IR-0309-QAQC, IR-0309

Deployments: (3); 8/22-9/8, 9/8-9/19, 9/19-10/3

Condition of Sondes: 8/22-9/8 (very light fouling), 9/8-9/19 (ok), 9/19-10/3

Removed Data:

Parameter(s)	Problem	Data Points

Corrected Data:

8/22-9/8

Specific Conductivity:

standard 10, probe 10.1

Formula: $=(-((10.1-10)/(\$B\$1969-\$B\$1158))* (B1158-\$B\$1158))+D1158$

Salinity $=(0.7353*Q1158)-4.1246$

Oxygen:

pre-deployment O2: 100.66

post-deployment O2: 127.84

standard 100, probe 86.5;

**Not Corrected. See below.

Turbidity:

standard 0, probe 49.8; standard 100, probe na

Formula: $=J1158-49.8$

Chlorophyll:

standard 0.0, probe -.5

Formula: $=(-((-0.5-0)/(\$B\$1961-\$B\$1158))* (B1158-\$B\$1158))+K1158$

9/8-9/19

Specific Conductivity:

standard 10, probe 9.94

Formula: $=(-((9.94-10)/(\$B\$1342-\$B\$814))* (B814-\$B\$814))+D814$

Salinity $=(0.7305*Q814)-3.8647$

Oxygen:

pre-deployment O2: 99.35

post-deployment O2: 105.13

standard 100, probe 103.2

**Not Corrected. See below.

Turbidity:

standard 0, probe.1; standard 100, probe na

Formula: $=J814-0.1$

Chlorophyll:

standard 0.0, probe 0.3

Formula: $=(-((0.3-0)/(\$B\$1342-\$B\$814))* (B814-\$B\$814))+K814$

9/19-10/3

Specific Conductivity:

standard 10, probe 11.2

Formula: $=(-((10.1-10)/(\$B\$2014-\$B\$1343))* (B1343-\$B\$1343))+D1343$

**2003 Indian River Lease Area, Indian River County
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Salinity $= (0.7261 * Q1343) - 3.6362$

Oxygen:

pre-deployment O2: 99.85

post-deployment O2: 101.93

standard 100, probe 114.1

Formula: $= -((99.85 - 101.93) / (\$B\$2014 - \$B\$1343)) * (B1343 - \$B\$1343) + F1343 + (100 - 99.85)$

Conversion for O2 concentration: $= 3.06 - (0.0801 * C1343) - (0.0235 * R1343) + (0.0647 * O1343)$

Turbidity:

standard 0, probe 50; standard 100, probe na

Formula: $= J1343 - 50$

Chlorophyll:

standard 0.0, probe -.3

Formula: $= -((0.3 - 0) / (\$B\$2014 - \$B\$1343)) * (B1343 - \$B\$1343) + K1343$

Problems and Anomalies:

Oxygen 8/22-9/8: Following retrieval from the field, probe read 127.84 in moist air; during post-deployment check, it read 86.5 in 100 standard. If the correction based on this value was applied, many very negative values (~-20) would occur. Because of this, the correction was not applied. The original data were retained but **may be faulty** due to fouling or drift.

Turbidity 8/22-9/8: During post-deployment check, probe read 49.8 in the 0.0 standard. All the way through the deployment period, the lowest readings were ~49.8. This suggests that the probe did not drift, but rather was not calibrated correctly before deployment and so was reading 49.8NTU too high the entire time. 49.8 was subtracted from all values and any instrument drift that occurred during this time was not correctable. The data **may be faulty** and should be interpreted with caution.

Oxygen 9/8-9/19: Following retrieval from the field, probe read 105.13 in moist air; during post-deployment check, it read 103.2 in 100 standard. If the correction based on this value was applied, numerous negative values (~-5) would occur. Because of this, the correction was not applied. The original data were retained but **may be faulty** due to fouling or drift.

Turbidity 9/19-10/3: During post-deployment check, probe read 50 in the 0.0 standard. All the way through the deployment period, the lowest readings were ~50. This suggests that the probe did not drift, but rather was not calibrated correctly before deployment and so was reading 50NTU too high the entire time. 50 was subtracted from all values and any instrument drift that occurred during this time was not correctable. The data **may be faulty** and should be interpreted with caution.

**2003 Indian River Lease Area, Indian River County
Quality Assurance/Quality Control (QA/QC) Log**

OCTOBER--2003

Files: Data: IR-0310-raw, IR-0310-QAQC, IR-0310

Deployments: (4); 9/19-10/3, 10/3-10/17, 10/17-10/27, 10/27-11/7

Condition of Sondes: 9/19-10/3 (very light fouling), 10/3-10/17 (ok), 10/17-10/27 (very light fouling), 10/27-11/7 (ok)

Removed Data:

Parameter(s)	Problem	Data Points

Corrected Data:

9/19-10/3

Specific Conductivity:

standard 10, probe 11.2

Formula: $=(-((10.1-10)/(\$B\$2014-\$B\$1343))*(B1343-\$B\$1343))+D1343$

Salinity $=(0.7261*Q1343)-3.6362$

Oxygen:

pre-deployment O2: 99.85

post-deployment O2: 101.93

standard 100, probe 114.1

Formula: $=(-((99.85-101.93)/(\$B\$2014-\$B\$1343))*(B1343-\$B\$1343))+F1343 +(100-99.85)$

Conversion for O2 concentration: $=3.06-(0.0801*C1343)-(0.0235*R1343)+(0.0647*O1343)$

Turbidity:

standard 0, probe 50; standard 100, probe na

Formula: $=J1343-50$

Chlorophyll:

standard 0.0, probe -.3

Formula: $=(-((0.3-0)/(\$B\$2014-\$B\$1343))*(B1343-\$B\$1343))+K1343$

10/3-10/17

Specific Conductivity:

standard 10, probe 10.34

Formula: $=(-((10.34-10)/(\$B\$1347-\$B\$674))*(B674-\$B\$674))+D674$

Salinity $=(0.7155*Q674)-3.148$

Oxygen:

pre-deployment O2: 102.65

post-deployment O2: na

standard 100, probe 107.6

Formula: $=(-((102.65-107.6)/(\$B\$1347-\$B\$674))*(B674-\$B\$674))+F674 +(100-102.65)$

Conversion for O2 concentration: $=2.29-(0.0685*C674)-(0.0139*R674)+(0.0674*O674)$

Turbidity:

standard 0, probe 0.2; standard 100, probe na

Formula: $=((((123/123)-1)*(J674))-(0.2))*((B674-\$B\$674)/(\$B\$1347-\$B\$674))+J674$

Chlorophyll:

standard 0.0, probe 0.1

Formula: $=(-((0.1-0)/(\$B\$1347-\$B\$674))*(B674-\$B\$674))+K674$

10/17-10/27

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Specific Conductivity:

standard 10, probe 11.61

Formula: $= -((11.61 - 10) / (\$B\$1828 - \$B\$1349)) * (B1349 - \$B\$1349) + D1349$

Salinity $= (0.7171 * Q1349) - 3.1606$

Oxygen:

pre-deployment O2: 103.82

post-deployment O2: 104.32

standard 100, probe 87.5

Formula: $= -((104.32 - 103.82) / (\$B\$1828 - \$B\$1349)) * (B1349 - \$B\$1349) + F1349 + (100 - 103.82)$

Conversion for O2 concentration: $= 2.24 - (0.0646 * C1349) - (0.0214 * R1349) + (0.0702 * O1349)$

Turbidity:

standard 0, probe 1.0; standard 100, probe na

Formula: $= (((((123/123) - 1) * (J1349)) - (1)) * ((B1349 - \$B\$1349) / (\$B\$1828 - \$B\$1349))) + J1349$

Chlorophyll:

standard 0.0, probe -.6

Formula: $= -((-0.6 - 0) / (\$B\$1828 - \$B\$1349)) * (B1349 - \$B\$1349) + K1349$

10/27-11/7

Specific Conductivity:

standard 10, probe 10.8

Formula: $= -((10.8 - 10) / (\$B\$2355 - \$B\$1829)) * (B1829 - \$B\$1829) + D1829$

Salinity $= (0.7262 * Q1829) - 3.5859$

Oxygen:

pre-deployment O2: 101.47

post-deployment O2: 107.15

standard 100, probe 106.2

Formula: $= -((107.15 - 101.47) / (\$B\$2355 - \$B\$1829)) * (B1829 - \$B\$1829) + F1829 + (100 - 101.47)$

Conversion for O2 concentration: $= 3.37 - (0.099 * C1829) - (0.0271 * R1829) + (0.0688 * O1829)$

Turbidity:

standard 0, probe 0.5; standard 100, probe na

Formula: $= ((((((123/123) - 1) * (J1829)) - (0.5)) * ((B1829 - \$B\$1829) / (\$B\$2355 - \$B\$1829)))) + J1829$

Chlorophyll:

standard 0.0, probe -0.1

Formula: $= -((-0.1 - 0) / (\$B\$2355 - \$B\$1829)) * (B1829 - \$B\$1829) + K1829$

Problems and Anomalies:

Turbidity 9/19-10/3: During post-deployment check, probe read 50 in the 0.0 standard. All the way through the deployment period, the lowest readings were ~50. This suggests that the probe did not drift, but rather was not calibrated correctly before deployment and so was reading 50NTU too high the entire time. 50 was subtracted from all values and any instrument drift that occurred during this time was not correctable. The data **may be faulty** and should be interpreted with caution.

**2003 Indian River Lease Area, Indian River County
Quality Assurance/Quality Control (QA/QC) Log**

NOVEMBER--2003

Files: Data: IR-0311-raw, IR-0311-QAQC, IR-0311

Deployments: (3); 10/27-11/7, 11/7-11/25, 11/25-12/8

Condition of Sondes: 10/27-11/7 (ok), 11/7-11/25 (very light fouling), 11/25-12/8 (very light fouling)

Removed Data:

Parameter(s)	Problem	Data Points

Corrected Data:

10/27-11/7

Specific Conductivity:

standard 10, probe 10.8

Formula: $=(-((10.8-10)/(\$B\$2355-\$B\$1829))* (B1829-\$B\$1829))+D1829$

Salinity $=(0.7262*Q1829)-3.5859$

Oxygen:

pre-deployment O2: 101.47

post-deployment O2: 107.15

standard 100, probe 106.2

Formula: $=(-((107.15-101.47)/(\$B\$2355-\$B\$1829))* (B1829-\$B\$1829))+F1829 + (100-101.47)$

Conversion for O2 concentration: $=3.37-(0.099*C1829)-(0.0271*R1829)+(0.0688*O1829)$

Turbidity:

standard 0, probe 0.5; standard 100, probe na

Formula: $=((((123/123)-1)*(J1829))-(0.5))* ((B1829-\$B\$1829)/(\$B\$2355-\$B\$1829))+J1829$

Chlorophyll:

standard 0.0, probe -0.1

Formula: $=(-((-0.1-0)/(\$B\$2355-\$B\$1829))* (B1829-\$B\$1829))+K1829$

11/7-11/25

Specific Conductivity:

standard 10, probe 10.41

Formula: $=(-((10.41-10)/(\$B\$1392-\$B\$527))* (B527-\$B\$527))+D527$

Salinity $=(0.7132*Q527)-2.9818$

Oxygen:

pre-deployment O2: 100.35

post-deployment O2: 117.42

standard 100, probe 119.2; O2 correction =

Formula: $=(-((117.42-100.35)/(\$B\$1392-\$B\$527))* (B527-\$B\$527))+F527 + (100-100.35)$

Conversion for O2 concentration: $=3.6-(0.109*C527)-(0.036*R527)+(0.0721*O527)$

Turbidity:

standard 0, probe 0.4; standard 100, probe na

Formula: $=((((123/123)-1)*(J527))-(0.4))* ((B527-\$B\$527)/(\$B\$1392-\$B\$527))+J527$

Chlorophyll:

standard 0.0, probe 0.2

Formula: $=(-((0.2-0)/(\$B\$1392-\$B\$527))* (B527-\$B\$527))+K527$

11/25-12/8

Specific Conductivity:

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standard 10, probe 9.2

Formula: $= -((9.2-10)/(\$B\$2013-\$B\$1393))*(B1393-\$B\$1393)+D1393$

Salinity $= (0.7148*Q1393)-3.0044$

Oxygen:

pre-deployment O2: 100.6

post-deployment O2: na

standard 100, probe 106.9

Formula: $= -((106.9-100.6)/(\$B\$2013-\$B\$1393))*(B1393-\$B\$1393)+F1393 + (100-100.6)$

Conversion for O2 concentration: $= 4.92 - (0.13*C1393) - (0.0474*R1393) + (0.0735*O1393)$

Turbidity:

standard 0, probe 3.7; standard 100, probe na

Formula: $= (((((123/123)-1)*(J1393))-(3.7))*((B1393-\$B\$1393)/(\$B\$2013-\$B\$1393)))+J1393$

Chlorophyll:

standard 0.0, probe 0.1

Formula: $= -((0.1-0)/(\$B\$2013-\$B\$1393))*(B1393-\$B\$1393)+K1393$

Problems and Anomalies:

Oxygen 11/7: Discontinuity. DO increased from ~25% to ~61% coincident with the changing of the sondes. This discontinuity is **faulty**. There is a period of low DO measurements ~25% just prior to the sonde changing that **may be faulty** for the same reason the discontinuity is.