QA/QC Log: Gulf Jackson, 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!

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.

JANUARY 2002-Gulf Jackson

File Name: GJ-0201-raw, GJ-0201-QAQC, GJ-0201

Deployments: (1); 1/18 – 2/8

Condition of Sondes: 1/18-2/8 (fouled; sonde resting on bottom when retrieved)

Removed Data:

Parameter(s)	Problem	Data points
All	IF	1/18 930-1130
All	SND	1/18 000-930
Chlorophyll	ADL	1/26 930-1130, 1230-1330, 2230-2300; 1/28 1000, 1200, 2330; 1/29 400-500, 2230; 1/30 030; 1/31 500, 1530

Corrected Data:

Specific Conductivity: 1/18 1100 – 1/31 2330,

standard 25.1, probe 22.0

Formula: =(-((22-25.1)/(B1033-B2))*(B2-B2))+E2

Salinity = (0.7143*SpCond)-2.9745

Oxygen 1/18 1100 – 1/31 2330

standard 100%, probe 112%

Formula: =(-((112-100)/(B1033-B2))*(B2-B2))+H2

Conversion for O2 concentration:

=7.47-(0.0858*D24)-(0.0636*R24)+(0.079*O24)

Turbidity 1/18 1100 – 1/31 2330

standard 0, probe –2.5; standard 100, probe 95.1

Formula: =(((((100/97.6)-1)*(J26))-(-2.5))*((B26-B2)/(B1033-B22)))+J26

Chlorophyll 1/18 1100 – 1/31 2330

No post-deployment data…not correctable.

Missing Data:

NONE

Problems and Anomalies:

1/26/2002; 22:00 Row repeated, second of two rows deleted.

Turbidity & Chlorophyll Late in month: Fouling produced large turbidity and chlorophyll spikes.

Turbidity 1/18 000-200; 1/29 300-830: ADL Retained as all were individual spikes.

FEBRUARY 2002 – Gulf Jackson

File Name: GJ-0202-raw, GJ-0202-QAQC, GJ-0202

Deployments: (3); 1/18 – 2/8, 2/8 – 2/13, 2/13 – 3/18

Condition of Sondes: 1/18-2/8 (fouled; sonde resting on bottom when retrieved); 2/8-2/13 (no problems indicated); 2/13-3/18 (severely fouled; wipers not working; no post-deployment check)

Removed Data:

Parameter(s)	Problem	Data Points
Chlorophyll	ADL	2/1 1500; 2/2 1230, 1630; 2/27 2330

Corrected Data:

2/1 000 – 2/8 1130

Specific Conductivity:

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

Oxygen: 2/1 000 – 2/8 1130

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

Turbidity: 2/1 000 – 2/8 1130

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

Chlorophyll: 2/1 000 – 2/8 1130

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

2/8-2/13

Specific Conductivity: 2/8 1200 – 2/13 1330

standard 23.1, probe 23.3

Formula: =(-((23.3-23.1)/(B605-B362))*(B362-B362))+E362

No salinity data was available, so a probe-deployment specific equation could not be derived.

The equation for the previous probe was used instead: Salinity = (0.7143*SpCond)-2.9745

Oxygen: 2/8 1200 – 2/13 1330

standard 100, probe 98.7

Formula: =(-((98.7-100)/(B605-B362))*(B362-B362))+G362

Conversion for O2 concentration:

=7.08-(0.0979*D362)-(0.0503*R362)+(0.086*O362)

Turbidity: 2/8 1200 – 2/13 1330

standard 0, probe -0.3; standard 100, probe 97.3

Formula: =(((((100/97.6)-1)*(J362))-(-0.3))*((B362-B362)/(B605-B362)))+J362

Chlorophyll: 2/8 1200 – 2/13 1330

standard 0.0, probe -0.1

Formula: =(-((-0.1-0)/(B605-B362))*(B363-B362))+K363

2/13-3/18

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

Missing Data:

2/8 1200 – 2/13 1330: Salinity not recorded and all other parameters shifted one column to the left. In addition, depth was not measured.

Problems and Anomalies::

Oxygen: The sonde collected on 2/8 showed 93% as its final reading before being collected and post-deployment was found to read 112% in a 100% standard. When oxygen was corrected for this, the final reading for the deployment period was 81%. The sonde deployed on 2/8 showed 99.7% as its first reading; this appears closer to the uncorrected value rather than the corrected value for the previous

probe. Pre-deployment, the probe deployed on 2/8 showed an uncalibrated oxygen reading of 86.3% in a 100% standard. Could this discrepancy indicate the probe deployed on 2/8 was not calibrated correctly? Alternatively, the probe collected on 2/8 may not have been checked correctly post-deployment. This inconsistency indicates the data collected during this time period **may be faulty**.
Oxygen: The sonde deployed on 2/13 was severely fouled when collected on 3/18 and, as a result, was not given a post-deployment check. Oxygen crashed on 3/8 (probably as a result of the fouling), but appeared to be relatively stable prior to 3/6. The oxygen measurements taken by this sonde for the month of February are retained, but the data should be considered **faulty**. Also, since no post-deployment check was performed, no correction could be employed, thus the data is also not corrected for drift. The deployment period was obviously too long.
Specific Conductivity, Salinity, Turbidity & Chlorophyll: The sonde deployed on 2/13 was severely fouled when collected on 3/18 and, as a result, was not given a post-deployment check. Since no post-deployment check was performed, no correction could be employed, thus the data is also not corrected for drift. The deployment period was obviously too long. Data **may be faulty**.
Turbidity 2/1 1930-2030; 2/21 1330: ADL. Retained as all were individual spikes.

MARCH
ENTIRE MONTH'S DATA IS SUSPECT, SEE BELOW.

File Name: GJ-0203-raw , GJ-0203-QAQC, GJ-0203

Deployments: (2); 2/13 – 3/18, 3/18 – 4/8

Condition of Sondes: 2/13-3/18 (severely fouled; wipers not working; no post-deployment check); 3/18-4/8 (no post-deployment check; no information on sonde condition)

Removed Data:

Parameter(s)	Problem	Data Points
Specific Conductivity, Salinity, DO, Turbidity	FOUL	3/8 000 – 3/18 1130
Chlorophyll	PF	3/1/ 000 – 3/18 1130
Chlorophyll	ADL	3/27 1030-1100

Corrected Data:

2/13-3/18

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

3/18-4/8

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

Missing Data:

Problems and Anomalies:

3/30/2002; 22:00 Row repeated, second of two rows deleted

Specific Conductivity, Salinity, DO, Turbidity: 3/8 000 – 3/18 1130; All points were cut due to severe fouling. All these parameters showed decreasing or increasing trends as well as strong inconsistencies with sonde that was deployed on 3/18.

Turbidity 3/27 1100: ADL. Retained as it was an individual spike.

All data for this month must be considered **faulty due to long deployment periods, heavy fouling, and lack of post-deployment information on all deployed sondes. **Use data as a rough guideline only.**

APRIL

File Name: GJ-0204-raw, GJ-0204-QAQC, GJ-0204

Deployments: (3); 3/18-4/8, 4/8-4/23, 4/23-5/2

Condition of Sondes: 3/18-4/8 (no post-deployment check; no information on sonde condition); 4/8-4/23 (minor fouling; crab living inside sonde; "need to change membrane and wipers"); 4/23-5/2 (minor fouling; water in battery compartment; no post-deployment check)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	4/29 130, 1330, 1530, 1700; 4/30 400, 600, 830, 1030, 1730
All	EXP	4/8 1430
DO	BDL	4/7 1130-1230, 1400, 2230; 4/8 400, 900-930, 1130

Corrected Data:

3/18-4/8

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

4/8-4/23

Oxygen Saturation:

standard 100, probe 44.7

Below acceptable range--NOT CORRECTABLE

Specific Conductivity: 4/8-4/23

standard 22.3, probe 20.1

Formula: =(-((20.1-22.3)/(B1087-B368))*(B368-B368))+E368

Conversion for salinity

=(0.7048*Q368)-2.6283

Turbidity:

standard 100, probe 164.4; standard 0, probe 46.2

Formula: =(((((100/118.2)-1)*(J368))-(46.2))*((B368-B368)/(B1087-B368)))+J368

Correction resulted in many negative values; these were set to zero.

Chlorophyll:

standard 0, probe –0.7

Formula: =(-((-0.7-0)/(B1087-B368))*(B368-B368))+K368

4/23-5/2

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

Missing Data:

4/7/2002 230-300 – No data, two empty rows inserted for missing times

Problems and Anomalies:

Oxygen: 4/7 1130 - 4/8 1400, Oxygen values become very discontinuous during this time period. This is likely due to fouling of the probe late in a very long (20+ days) deployment period. However, there were no notes regarding the condition of this sonde after it was retrieved from the field. There also was no post-deployment check performed. As a result, fouling cannot be confirmed. Data recorded during this particular period **may be faulty**.

Oxygen: 4/8-4/23 Oxygen was not correctable during this period due to the post-deployment probe reading being less than 85%. Field notes indicate that battery compartment of sonde deployed on 4/23 was filled with water when retrieved on 5/2. This may have caused a problem with sonde. Because the original data record for the period of 4/8-4/23 was perfectly aligned with the record for 4/23-5/2, I have not deleted any of the record. This inexplicable outcome could have resulted from incorrect handling

procedures during the pre and post-deployment checks and calibrations. Oxygen data for this period is original data and so **may be faulty**. Interpret with caution.
Turbidity 4/4 100, 530, 1400, 1600, 1900-2100, 2230, 2330; 4/5 730, 1300, 1500-1600; 4/22 2300-2330: ADL. Retained as all were individual spikes.
Turbidity 4/8-4/23: Numerous negative turbidity values (< -8 NTU) were set to zero.

MAY

File Name: GJ-0205-raw, GJ-0205-QAQC, GJ-0205

Deployments: (3); , 4/23-5/2, 5/2-5/15, 5/15-5/24, 5/24-6/13?

Condition of Sondes: 4/23-5/2 (minor fouling; water in battery compartment; no post-deployment check); 5/2-5/15 (moderate fouling Cond Cell Constant below acceptable range: 4.2); 5/15-5/24 (Cond Cell Constant below acceptable range: 4.2); 5/24-6/13 (NO DATA SHEETS)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	5/1 1030, 1200
Chlorophyll	BDL	5/11 630, 1200, 2130; 5/12 100, 1330, 1430
Oxygen	FOUL	5/11 2300-5/15 1030

Corrected Data:

4/23-5/2

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

5/2-5/15:

Oxygen Saturation:

standard 100, probe 46.6

Below acceptable range--NOT CORRECTABLE

Specific Conductivity:

standard 1.413, probe 1.860

Formula: =(-((1.86-1.413)/(B695-B71))*(B71-B71))+E71

Conversion for salinity

=(0.696*Q71)-2.4125

Turbidity:

standard 100, probe 101.8; standard 0, probe 10.6

Formula: =(((((100/91.2)-1)*(J71))-(10.6))*((B71-B71)/(B695-B71)))+J71

Correction resulted in one negative value; this was set to zero.

Chlorophyll:

standard 0, probe 23.5

Formula: =(-((23.5-0)/(B695-B71))*(B71-B71))+K71

Correction resulted in many negative values; these were set to zero.

5/15-5/24:

Oxygen Saturation:

standard 100, probe 106.1

Formula: =(-((106.1-100)/(B1134-B696))*(B696-B696))+G696

Conversion for [oxygen]

=6.45-(0.0702*D696)-(0.0461*R696)+(0.0731*O696)

Specific Conductivity:

standard 1.413, probe 1.572

Formula: =(-((1.572-1.413)/(B1134-B696))*(B696-B696))+E696

Conversion for salinity

=(0.6977*Q696)-2.3625

Turbidity:

standard 100, probe 93.2; standard 0, probe 2.6

Formula: =(((((100/90.6)-1)*(J696))-(2.6))*((B696-B696)/(B1134-B696)))+J696

Chlorophyll:

standard 0, probe 0.9

Formula: =(-((0.9-0)/(B1134-B696))*(B696-B696))+K696

5/24-5/31

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

Missing Data:

NONE

Problems and Anomalies:

5/22/2002 1800 -- Row repeated, second of two rows deleted

Salinity: 5/2-5/15 & 5/15-5/24 Conductivity cell constant (4.2) below acceptable range (4.6-5.45) for entire period of deployment. This may have caused the sharp discontinuities present at the times of sonde changes. Data was retained but should be considered **faulty**.

Dissolved Oxygen: 5/2-5/15: Sonde became heavily fouled during this very long deployment period and so data was not correctable. Suspected fouled portion of record deleted. Rest of oxygen data for this period is original data and so **may be faulty**. Interpret with caution.

Turbidity 5/14 1400: ADL. Retained as it was an individual spike.

JUNE

File Name: GJ-0206-raw, GJ-0206-QAQC, GJ-0206

Deployments: (3); 5/24-6/13; 6/13-6/27; 6/27-7/16

Condition of Sondes: 5/24-6/13 (probes completely fouled); 6/13-6/27 (cracked battery compartment contained water, but still worked; website showed the sonde was functioning well); 6/27-7/16 (probes fouled; Chl wiper missing; DO charge below acceptable range upon retrieval)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	6/13 1030 (-6999)
Dissolved Oxygen	FOUL	6/10 130-6/13 1030
Dissolved Oxygen	PF, FOUL	6/27 1030 – 6/30 2330

Corrected Data:

5/24-6/13

Specific Conductivity:

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

Oxygen:

standard 100, probe 14.4 ERROR: Out of Range

Below acceptable range--NOT CORRECTABLE

Turbidity

**No post-deployment information

Chlorophyll

**No post-deployment information

6/13-6/27

Specific Conductivity:

standard 1.413, probe 1.98

Formula: =(-((1.98-1.413)/(B1270-B600))*(B600-B600))+E600

Salinity =(0.7302*Q600)-3.8495

Oxygen:

standard 100, probe 92.4

Formula: =(-((92.4-100)/(B1270-B600))*(B600-B600))+G600

Conversion for O2 concentration:

=5.54-(0.0545*D600)-(0.0344*R600)+(0.0659*O600)

Turbidity:

standard 0, probe 6.0; standard 100, probe 88.8

Formula: =(((((100/82.8)-1)*(J600))-(6))*((B600-B600)/(B1270-B600)))+J600

Chlorophyll:

standard 0.0, probe 0.2

Formula: =(-((0.2-0)/(B1270-B600))*(B600-B600))+K600

6/27-7/16

Specific Conductivity:

standard 1.413, probe 2.05

Formula: =(-((2.05-1.413)/(B2179-B1271))*(B1442-B1271))+E1442

Salinity =(0.7165*Q1442)-3.233

Oxygen:

standard 100, probe 6.9

Below acceptable range--NOT CORRECTABLE

Turbidity:

standard 0, probe 19.9; standard 100, probe 91.5

Formula: =(((((100/71.6)-1)*(J1442))-(19.9))*((B1442-B1271)/(B2179-B1271)))+J1442

Chlorophyll:

standard 0.0, probe 4.0

Formula: =(-((4-0)/(B2179-B1271))*(B1442-B1271))+K1442

Missing Data:

Problems and Anomalies:

Turbidity: 6/9 2230 ADL

Dissolved Oxygen: 5/24-6/13: Sonde became heavily fouled during this very long deployment period and so data was not correctable. Suspected fouled portion of record deleted. Rest of oxygen data for this period is original data and so **may be faulty**. Interpret with caution.

Dissolved Oxygen: 6/27 1030-6/30 2330: When the 6/27-7/16 sonde was recovered, it was fouled, showed a DO charge well below the tolerable limit (16.5), read 6.9% in a 100 standard and resulted in a DO record that was highly erratic. This indicated all data was **faulty**, and the bad DO charge indicated a probe failure. The probe was deployed for too long of a period. All DO data for this period was removed.

Salinity: 6/27 : The 6/13-6/27 sonde started to report a decline near the end of its deployment period. When the new sonde was deployed on 6/27 salinity jumped to ~34.5ppt. An independent check of salinity taken at the time the sondes were changed showed a salinity of 32ppt. This suggests the retrieved sonde was reading too low and the deployed sonde was reading a bit too high, but within acceptable limits. The subsequent salinity drop on 6/30 is also unexplained, but there is no evidence to suggest the drop is not natural.

JULY

File Name: GJ-0207-raw, GJ-0207-QAQC, GJ-0207

Deployments: (4); 6/27-7/16, 7/16-7/17, 7/17-7/24, 7/24-8/22

Condition of Sondes: 6/27-7/16 (probes fouled; Chl wiper missing; DO charge below acceptable range upon retrieval); 7/16-7/17 (sonde not functional; deployment and retrieval times unknown); 7/17-7/24 (DO probe malfunctioning; deployment and retrieval times unknown); 7/24-8/22 (a lot of fouling; chl wiper not operating properly)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	7/16 900-1600; 7/16 1730-7/17 800; 7/17 900 –7/18 1530; 7/18 1630-1730; 7/18 1830-7/22 730, 830-900, 1130, 1330-1400, 1530, 1730, 2130; 7/22 2330-7/23 000, 100, 230, 330-430
Dissolved Oxygen	PF	7/1 000-7/16 845

Corrected Data:

6/27-7/16

Specific Conductivity:

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

Oxygen:

DO charge outside acceptable range—data compromised

Below acceptable range--NOT CORRECTABLE

Turbidity: -

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

Chlorophyll:

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

7/17-7/24

Specific Conductivity:

standard 1.413, probe 2.372

Formula: =(-((2.372-1.413)/(B1127-B791))*(B850-B791))+E850

Salinity =(0.7302*Q850)-3.8495

Oxygen:

standard 100, probe 72.5

Below acceptable range—NOT CORRECTABLE

Turbidity:

standard 0, probe 2.4; standard 100, probe 100.1

Formula: =(((((100/97.7)-1)*(J850))-(2.4))*((B850-B791)/(B1127-B791)))+J850

Chlorophyll:

standard 0.0, probe –0.7

Formula: =(-((-0.7-0)/(B1127-B791))*(B850-B791))+K850

7/24-8/22

Specific Conductivity:

standard 23.5, probe 6.2

Formula: =(-((6.2-23.5)/(B2518-B1127))*(B1127-B1127))+E1127

Salinity =(0.6998*Q1127)-2.5543

Oxygen:

standard 100, probe 9.0

Below acceptable range—NOT CORRECTABLE

Turbidity:

standard 0, probe 0.8; standard 100, probe 91.1

Formula: =(((((100/90.3)-1)*(J1127))-(0.8))*((B1127-B1127)/(B2518-B1127)))+J1127

Chlorophyll:

standard 0.0, probe 0.2

Formula: =(-((0.2-0)/(B2518-B1127))*(B1127-B1127))+K1127

Missing Data:

All Parameters 7/16-7/17: No Data. Sonde not functional.

Problems and Anomalies:

7/7/2002 200 -- Row repeated, second of two rows deleted

7/22 1400 -- Row repeated, second of two rows deleted

Salinity 7/1-7/16: Salinity drops precipitously during the last few days of this record. This could be fouling, but an independent check of salinity when the sonde was retrieved indicates that salinity was ~15ppt. Apparently, this drop in salinity was real. The sonde was actually measuring a bit high.

Dissolved Oxygen 7/17-7/24: Oxygen was not correctable during this period due to the post-deployment probe reading being less than 85%. Many data points missing from record due to instrument failure. Because the original data record for the period of 7/17-7/24 was perfectly aligned with the record for 7/24-8/22, I have not deleted any of this record. This inexplicable outcome could have resulted from incorrect handling procedures during the pre and post-deployment checks and calibrations. Oxygen data for this period is original data and so **may be faulty**. Interpret with caution.

Dissolved Oxygen 7/24-7/31: Oxygen was not correctable during this period due to the post-deployment probe reading being less than 85%. Because the remaining portion of the month of July fell within the first seven days of the deployment period, I have not deleted any of this record. Oxygen data for this period is original data and so **may be faulty**. Interpret with caution.

AUGUST

File Name: GJ-0208-raw, GJ-0208-QAQC, GJ-0208

Deployments: (2); 7/24-8/22, 8/22-9/11

Condition of Sondes: 7/24-8/22 (a lot of fouling; chl wiper not operating properly); 8/22-9/11 (instruments failed repeatedly (01L0308 AC); no post-deployment information)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	8/22 1100-8/23 1300; 8/23 1400-8/27 430; 8/27 530-8/28 2230; 8/28 2330-8/29 2000; 8/29 2100-8/31 2330
Oxygen	FOUL	8/9 1930-8/22 1000

Corrected Data:

7/24-8/22

Specific Conductivity:

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

Oxygen:

Below acceptable range--NOT CORRECTABLE

Turbidity: -

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

Chlorophyll:

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

8/22-9/11

**All parameters for this deployment period were not correctable due to lack of post-deployment check.

Missing Data:

Problems and Anomalies:

Dissolved Oxygen 8/9 1930-8/22 1000: Sonde became heavily fouled during this very long deployment period and so data was not correctable. Suspected fouled portion of record deleted. Rest of oxygen data for this period is original data and so **may be faulty**. Interpret with caution.

Salinity entire month: Independent check of salinity on 8/22 indicated salinity was 21ppt, not 30ppt as indicated by CLAMMRS sonde. However, the two CLAMMRS sondes (when they were functioning) on 8/22 recorded similar salinities. Uncertain whether sondes recorded correct salinity; values **may be faulty**.

Depth 8/9 2130-2200: sonde recorded negative values for depth. No other parameters deviated from trend however (suggesting sonde was not exposed to air), so depth values were zeroed.

SEPTEMBER

File Name: GJ-0209-raw, GJ-0209-QAQC, GJ-0209

Deployments: (3); 8/22-9/11, 9/11-9/24, 9/24-10/4

Condition of Sondes: 8/22-9/11 (instruments failed repeatedly (01L0308 AC); no post-deployment information); 9/11-9/24 (instrument failed repeatedly (01L0308 AA); minimal fouling); 9/24-10/4 (very little fouling)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	9/6 000-9/11 1200, 9/11 1600-1700, 2200-2300; 9/12 000-030, 130, 1030-1100, 1300-1330, 1500, 1600, 1700-1730, 1830-1930, 2030-2100, 2200-2230; 9/13 000-030, 200, 500-730, 830, 930, 1100-1230, 1330-1400, 1800, 1900, 2100-2200; 9/13 2300-9/14 030, 130, 3300-400, 500, 600-700, 830, 1400, 1600-1700, 1900-1930, 2030-2100, 2200-2300; 9/15 030-200, 300, 400, 530-600, 730-800, 900-930, 1100-1200, 1330, 9/15 1500-9/16 430, 530-730, 930, 1030, 1230-1330, 1430-2230, 2330; 9/17 030-130, 230-500, 600, 700-900, 1000-1300, 1430, 1530-1600, 1730-9/18 000, 100-130, 300-500, 600, 700, 800, 930, 1030, 1130, 1230, 1330-1430, 1530-1730, 1830-2200, 2130-2230; 9/19 030-330, 430, 530-600, 700, 800-830, 930, 1200-1400, 1500-1730, 1830, 1930-2200, 2300-9/20 000, 130-230, 400, 530-700, 800-900, 1000-1400, 1530, 1700-2000, 2100-9/21 230, 330-800, 900, 1030-1130, 1230-1300, 1400-1600, 1700-1730, 1900, 2030-2100, 2300-9/22 200, 300-400, 500-600, 700-930, 1030-1200, 1330-1430, 1530-1600, 1800-1900, 2000, 21000, 2330; 9/23 030-100, 200-230, 430, 530, 700, 830, 1200-1230, 1400-1430, 1630, 2000-2030, 2200-9/24 030, 330-430, 530, 1000-1030

Corrected Data:

8/22-9/11

**All parameters for this deployment period were not correctable due to lack of post-deployment check.

9/11-9/24

Specific Conductivity:

standard 1.413, probe 2.210

Formula: =(-((2.21-1.413)/(B1127-B507))*(B507-B507))+E507

Salinity =(0.7163*Q507)-3.2209

Oxygen:

standard 100, probe 97.5

Formula: =(-((97.5-100)/(B1127-B507))*(B507-B507))+G507

Conversion for O2 concentration:

=7.68-(0.0803*D507)-(0.0367*R507)+(0.0666*O507)

Turbidity:

standard 0, probe 2.7; standard 100, probe 101.4

Formula: =(((((100/98.7)-1)*(J507))-(2.7))*((B507-B507)/(B1127-B507)))+J507

Chlorophyll:

standard 0.0, probe –0.2

Formula: =(-((-0.2-0)/(B1127-B507))*(B507-B507))+K507

9/24-10/4

Specific Conductivity:

standard 1.413, probe 1.930

Formula: =(-((2.21-1.413)/(B1127-B507))*(B507-B507))+E507

Salinity =(0.7163*Q507)-3.2209

Oxygen:

standard 100, probe 73.0

Below acceptable range--NOT CORRECTABLE

Turbidity:

standard 0, probe 1.1; standard 100, probe 104.0

Formula: =(((((100/98.7)-1)*(J507))-(2.7))*((B507-B507)/(B1127-B507)))+J507

Chlorophyll:

standard 0.0, probe 5.0

Formula: =(-((-0.2-0)/(B1127-B507))*(B507-B507))+K507

Missing Data:

Problems and Anomalies:

All parameters 8/22-9/11: Instrument failed repeatedly, returning many values of –6999. All data points during this deployment period were uncorrectable due to lack of post-deployment check. Pervasive instrument failure means all data **may be faulty**.

All parameters 9/11-9/24: Instrument failed repeatedly, returning many values of –6999. Pervasive instrument failure means all data **may be faulty**.

Oxygen Saturation 9/11-9/24: Oxygen (when measurements occurred) increased tremendously near end of deployment period. post-deployment check indicated it read 97.5% in 100% standard, but when compared to next deployed probe, the oxygen values recorded from 9/11-9/24 could be faulty.

Oxygen 9/24-10/4: In post-deployment check, probe read 73% in 100% standard, so it could not be corrected. Probe deployed immediately after it failed, so confirmation of *in-situ* readings was not possible. Original oxygen data was retained but **may be faulty**.

OCTOBER

File Name: Data: GJ-0210-raw, GJ-0210-QAQC, GJ-0210

Deployments: (3); 9/24-10/4, 10/4-10/22, 10/22-11/4

Condition of Sondes: 9/24-10/4 (very little fouling); 10/4-10/22 (instrument failed repeatedly (01L0308AD); unit lightly fouled, but probes affected); 10/22-11/4 (sonde body heavily fouled, readings affected)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	most during 10/4-10/22

Corrected Data:

9/24-10/4

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

10/4-10/22

Specific Conductivity:

standard 1.413, probe 2.1

Formula:

Salinity

Oxygen:

standard 100, probe 22.4

**Below acceptable range--NOT CORRECTABLE

Turbidity:

standard 0, probe 9999.9; standard 100, probe 9999.9

**Turbidity NOT CORRECTABLE

Chlorophyll:

standard 0.0, probe 14.5

**Correction not applied (see below)

10/22-11/4

Specific Conductivity:

standard 10, probe 10.25

Formula:

Salinity

Oxygen:

standard 100, probe 65.3

**Below acceptable range--NOT CORRECTABLE

Turbidity:

standard 0, probe 13.2; standard 100, probe 189.6

Formula:

Chlorophyll:

standard 0.0, probe 3.1

Formula:

Problems and Anomalies:

Oxygen 9/24-10/4: In post-deployment check, probe read 73% in 100% standard, so it could not be corrected. Probe deployed immediately after it failed, so confirmation of *in-situ* readings was not possible. Original oxygen data was retained but **may be faulty**.

Salinity 10/22 1230-1300: The sudden discontinuity in salinity (4.5ppt) on this date is a result of the sondes being changed. The discontinuity is **faulty**.

Oxygen 10/4-10/22: Data for this period was sparse, so a time when biofouling or a probe failure occurred could not be determined. However, the post-deployment check showed the probe to read 22.4% in a 100% standard and this sonde's final reading (10/22 1230) was 57% while the new sonde's first reading (10/22 1300) was 97%. The oxygen data for the period was deemed **faulty** and was deleted.

Chlorophyll 10/4-10/22: During post-deployment check, probe read 14.5 in a 0.0 standard. Application of the correction factor would have caused most data points to become very negative. This suggested the probe was not reading correctly during the post-deployment check. As a result, this data **may be faulty** and should be interpreted with caution.

Oxygen 9/24-10/4: In post-deployment check, probe read 65.3% in 100% standard, so it could not be corrected. As confirmation, this sonde's final reading (11/4 1100) was 42.5% while the new sonde's first reading (11/4 1130) was 79.6%. The body of the sonde was heavily fouled suggesting that biofouling depressed the oxygen readings of this deployment period. The original oxygen data was retained but is likely **faulty** due to drift and/or fouling. Interpret with caution.

NOVEMBER

File Name: GJ-0211-raw, GJ-0211-QAQC, GJ-0211

Deployments: (3); 10/22-11/4, 11/4-11/22, 11/22-12/4

Condition of Sondes: 10/22-11/4 (sonde body heavily fouled, readings affected), 11/4-11/22 (some instrument failure (02A1254AB); very heavy fouling of probes), 11/22-12/4 (instrument failure (01L0308AC); light probe fouling)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	75 points during 11/4-11/22 period
All	IF	300 points during 11/22-11/30 period
Salinity, Oxygen, Turbidity	FOUL	11/17 000-11/22 1200

Corrected Data:

10/22-11/4

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

11/4-11/22

Specific Conductivity:

standard 10, probe 9.02

Formula: =(-((10-1.413)/(B1036-B169))*(B169-B169))+E169

Salinity =(0.6987*Q169)-2.345

Oxygen:

standard 100, probe 11.0

**Below acceptable range--NOT CORRECTABLE

Turbidity:

standard 0, probe 19.5; standard 100, probe 186.5

**Correction not applied (see below)

Chlorophyll:

standard 0.0, probe 10.5

Formula: =(-((10.5-0)/(B1036-B169))*(B169-B169))+K169

11/22-12/4

Specific Conductivity:

standard 10, probe 10.3

Formula: =(-((10.3-103)/(B1603-B1037))*(B1037-B1037))+E1037

Salinity =(0.711*Q1037)-2.0926

Oxygen:

standard 100, probe 100.4

**Oxygen not corrected, probe reading within range

Turbidity:

standard 0, probe 2.5; standard 100, probe 107

Formula: =(((((100/104.5)-1)*(J1037))-(2.5))*((B1037-B1037)/(B1603-B1037)))+J1037

Chlorophyll:

standard 0.0, probe 0.3

Formula: =(-((0.3-0)/(B1603-B1037))*(B1037-B1037))+K1037

Missing Data:

Problems and Anomalies:

Oxygen 9/24-10/4: In post-deployment check, probe read 65.3% in 100% standard, so it could not be corrected. As confirmation, this sonde's final reading (11/4 1100) was 42.5% while the new sonde's first reading (11/4 1130) was 79.6%. The body of the sonde was heavily fouled and turbidity readings were very high suggesting that biofouling depressed the oxygen readings of this deployment period. The original oxygen data was retained but should be considered **faulty** due to drift and/or fouling. Interpret with caution.

Turbidity 11/1 1100-11/4: Turbidity probe was apparently heavily fouled as it was recording very high values that stopped when the sondes were changed on 11/4. Applying the correction factor did not improve the severely affected portion of the data record. The severely affected portion of the record was deemed faulty and was deleted.

Salinity, Oxygen and Turbidity 11/17 000-11/22 1200: Turbidity values were consistently high and oxygen and salinity values were very low (~40% and 14ppt, respectively). When a new sonde was deployed turbidity returned to normal, oxygen returned to about 100%, and salinity increased to 27ppt. The probes of this sonde were completely covered in barnacles when retrieved. The post-deployment check showed oxygen to read 11% in a 100% standard and specific conductivity to read 9 in a 10ppt standard. All evidence indicates heavy biofouling affected measurements during this time. The affected portions of these records were deemed **faulty** and were deleted. The remaining data **may be faulty** due to drift and biofouling and should be interpreted with caution.

December

File Name: GJ-0212-raw, GJ-0212-QAQC, GJ-0212

Deployments: (3); 11/22-12/4, 12/4-12/23, 12/23-1/6

Condition of Sondes: 11/22-12/4 (instrument failure (01L0308AC); light probe fouling), 12/4-12/23 (moderate probe fouling), 12/23-1/6 (almost complete instrument failure; light probe fouling; post-deployment calibration problems)

Removed Data:

Parameter(s)	Problem	Data Points
All	IF	118 points during 12/1 000-12/4 1000
All	IF	all but 12 points during 12/23-12/31
Turbidity	PF	12/23-12/31
Chlorophyll	PF	12/23-12/31

Corrected Data:

11/22-12/4

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

12/4-12/23

Specific Conductivity:

standard 25.1, probe 31.8

NOT CORRECTED —suspect incorrect post-deployment check (see below)

Oxygen:

standard 100, probe 29.6

NOT CORRECTED —suspect incorrect post-deployment check (see below)

Turbidity:

standard 0, probe 2.1; standard 100, probe 120

Formula:

Chlorophyll:

standard 0.0, probe 0.3

Formula:

12/23-1/6

Specific Conductivity:

standard 1.413, probe 1.86

Formula: =(-((1.86-1.413)/(B1754-B1089))*(B1498-B1089))+E1498

Salinity =(0.7062*Q1498)-2.6624

Oxygen:

standard 100, probe 623.5

NOT CORRECTED—probe failure during post-deployment check

Turbidity:

standard 0, probe –1.8; standard 100, probe 128.3

NOT CORRECTED—probe failure

Chlorophyll:

standard 0.0, probe 716.2

NOT CORRECTED —probe failure during post-deployment check

Missing Data:

Problems and Anomalies:

Oxygen 12/4-12/23: The oxygen probe read 29.6% in 100% standard, a result that would typically suggest data deletion was necessary. However, when the sondes were changed on 12/23, there was no discontinuity in the oxygen data. Additionally, there were no turbidity spikes or oxygen declines that would be indicative of fouling affecting the record. This suggests an incorrect post-deployment check. In fact, the post-deployment check was performed four days after the sonde was retrieved from the field and it had some moderate fouling on the DO membrane; this could have led to the problems. All oxygen data was retained.

Salinity 12/4-12/23: The specific conductivity probe read 31.8 in a 25.1 standard. If this correction was applied, the last couple of data points for the deployment period read ~19ppt rather than ~24ppt. When the new sonde was deployed on 12/23, salinity read ~29ppt. Whether or not a correction was applied the discontinuity at sonde changing is significant and **faulty**. The sonde deployed from 12/23-1/6 and the sonde deployed from 1/6-1/21 failed almost completely, so it was impossible to determine whether or not the sonde deployed on 12/23 was the source of the discontinuity. However, because the sonde deployed from 12/4-12/23 was allowed to sit, covered in fouling organisms, for 4 days prior to the post-deployment check being performed, it was assumed that this sonde was the likely source of the problem. As a result salinity was not corrected. The original data were retained but **may be faulty**.

Oxygen 12/23-1/6: During the post-deployment check the oxygen probe read 623% in 100% standard suggesting a probe failure during the check procedure (field notes indicate the DO membrane was not intact at time of check). Oxygen readings during this deployment period did not appear anomalous relative to oxygen readings from other parts of the month. The original data were retained but **may be faulty** due to instrument drift or biofouling.

Turbidity 12/23-1/6: The turbidity probe was not functioning properly during the post-deployment check (the wiper was parking over the optics). During the deployment period, the probe read increasingly more negative values (as low as –20NTU). Even after applying a correction, most of this data was still below the acceptable level (-8NTU). This turbidity data was deemed **faulty** and was deleted.

Chlorophyll 12/23-1/6: Not correctable due to probe failure during post-deployment check (probe read 716 in 0.0 standard). The readings during the deployment period were consistent with a probe functioning properly, suggesting the probe only failed during the post-deployment check. The wiper was parking over the optics during the post-deployment check, so that was the likely culprit; there was no evidence to sugest the same happened during the deployment period. The original data were retained, but **may be faulty** due to drift or biofouling. There was also one point during this period (1/4 2300) that was above the detection limit of the probe; it was deemed **faulty** and was deleted.