

|   |          |   |        |                                   |        |   |               |                  |         |
|---|----------|---|--------|-----------------------------------|--------|---|---------------|------------------|---------|
| VESSEL<br>Northwest Explorer 2012       |          | CRUISE ID (e.g. 1NW12)  |        | PROJECT & LEG<br>GOA-IEP-JTL 2012 |        | If you download data after cast- fill this out<br>Filename= |               | STATION NO.<br>1 |         |
| CTD CAST #                              |          | LATITUDE  |        | LONGITUDE                         |        | G M T   |               | TIME (GMT)       |         |
| 001                                     | 5608.29N | 136   | 12.03W | 03                                | 00     | 12  | 03            | 05               |         |
| Sensor S/N (At Start of cruise or swap) |          | Local Time (ADT)  |        | 1                                 |        | 2   |               |                  |         |
| SBE type and S/N                        |          | COMMENT: Difficult conditions, factors that may affect measurements or aid processing |        |                                   |        |   |               |                  |         |
| RESS S/N                                |          | Weather: sunny, Partly cloudy   |        |                                   |        |   |               |                  |         |
| TEMP 1 & 2 S/N                          |          | Sea state: 2-3 ft seas  |        |                                   |        |   |               |                  |         |
| COND 1&2 S/N                            |          |   |        |                                   |        |   |               |                  |         |
| FLUOR S/N                               |          |   |        |                                   |        |   |               |                  |         |
| O2 (SBE43) S/N                          |          |   |        |                                   |        |   |               |                  |         |
| Transmissometer S/N                     |          |   |        |                                   |        |   |               |                  |         |
| PAR S/N                                 |          |   |        |                                   |        |   |               |                  |         |
| O2 SBE42S/N                             |          |   |        |                                   |        |   |               |                  |         |
| N/A DEPTH                               |          | Rosette Notes   |        | Hydro Sampling                    |        | CHLOR Samples   |               | Comments         |         |
| No. DESIRED                             |          | SALT #  | Nut #  | OXY #                             | Btl ID | Chl Vol   | Filter Vial # |                  | N/A No. |
| 1                                       | 601      |   | 1      |                                   |        |   |               |                  | 1       |
| 2                                       | 100      |   | 2      |                                   |        |   |               |                  | 2       |
| 3                                       | 50       |   | 3      |                                   | 6      | 199   | 6             |                  | 3       |
| 4                                       | 40       |   | 4      |                                   | 5      | 199   | 5             |                  | 4       |
| 5                                       | 30       |   | 5      |                                   | 4      | 199   | 4             |                  | 5       |
| 6                                       | 20       |   | 6      |                                   | 3      | 199   | 3             |                  | 6       |
| 7                                       | 10       |   | 7      |                                   | 2      | 199   | 2             |                  | 7       |
| 8                                       | 0        |   | 8      |                                   | 1      | 199   | 1             |                  | 8       |

Pycnocline Depth

Fluor Max Depth

2012

MAX DEPTH = 2012

|   |          |                        |               |                  |        |  |            |             |          |               |           |            |           |                |             |      |         |                   |              |
|---|----------|------------------------|---------------|------------------|--------|--|------------|-------------|----------|---------------|-----------|------------|-----------|----------------|-------------|------|---------|-------------------|--------------|
| VESSEL  |          | CRUISE ID (e.g. 1NW12) |               | PROJECT & LEG    |        | If you download data after cast- fill this out |            | STATION NO. |          |               |           |            |           |                |             |      |         |                   |              |
| Northwest Explorer 2012   |          | 1NW12                  |               | GOA-ERP-UTL 2012 |        | Filename=                                      |            | 3           |          |               |           |            |           |                |             |      |         |                   |              |
| CTD CAST #  | LATITUDE | DEG                    | MIN           | DEG              | MIN    | GMT  | TIME (GMT) | DRY BULB    | WET BULB | PRESSURE      | SEA STATE | VISIBILITY | WIND DIRN | WIND SPD (kts) | CLOUD (amt) | TYPE | WEATHER | BOTTO M DEPTH (m) | STA. NAME/ID |
| 00855   | 57.97    | N                      | 136           | 41.96            | W      | 0836   | 120955     | .           | .        | .             | x         | x          | .         | .              | x           | x    | x       | 2561              | SEALC0       |
| <p>Sensor S/N (At Start of cruise or swap)</p> <p>Local Time (ADT)</p> <p>1 2</p>   |          |                        |               |                  |        |  |            |             |          |               |           |            |           |                |             |      |         |                   |              |
| <p>COMMENT: Difficult conditions, factors that may affect measurements or aid processing</p> <p>Weather Sunny, Partly Cloudy</p> <p>Sea State 2-3 ft seas</p>                                   |          |                        |               |                  |        |  |            |             |          |               |           |            |           |                |             |      |         |                   |              |
| <p>SBE type and S/N</p> <p>PRESS S/N</p> <p>TEMP 1 &amp; 2 S/Ns</p> <p>COND 1&amp;2 S/Ns</p> <p>FLUOR S/N</p> <p>O2 (SBE43) S/N</p> <p>Transmittance S/N</p> <p>PAR S/N</p> <p>O2 SBE42 S/N</p> |          |                        |               |                  |        |  |            |             |          |               |           |            |           |                |             |      |         |                   |              |
| No  | DE       | PTH                    | Rosette Notes | Hydro Sampling   | SALT # | Nut #  | OXY #      | BI ID       | CHI VOL  | Filter Vial # | Comments  |            |           |                |             |      |         |                   | Ns           |
| 1   | 200      |                        |               |                  |        | 9  |            |             |          |               |           |            |           |                |             |      |         |                   | 1            |
| 2   | 100      |                        |               |                  |        | 10   |            |             |          |               |           |            |           |                |             |      |         |                   | 2            |
| 3   | 50       |                        |               |                  |        | 11   |            | 12          | 148      | 10            |           |            |           |                |             |      |         |                   | 3            |
| 4   | 40       |                        |               |                  |        | 12   |            | 11          | 148      | 11            |           |            |           |                |             |      |         |                   | 4            |
| 5   | 30       |                        |               |                  |        | 13   |            | 10          | 148      | 10            |           |            |           |                |             |      |         |                   | 5            |
| 6   | 20       |                        |               |                  |        | 14   |            | 9           | 148      | 9             |           |            |           |                |             |      |         |                   | 6            |
| 7   | 10       |                        |               |                  |        | 15   |            | 8           | 148      | 8             |           |            |           |                |             |      |         |                   | 7            |
| 8   | 0        |                        |               |                  |        | 16   |            | 7           | 148      | 7             |           |            |           |                |             |      |         |                   | 8            |

Pycnocline Depth

Fluor Max Depth

|   |     |                                 |   |                                    |    |   |      |                              |    |
|---|-----|---------------------------------|---|------------------------------------|----|---|------|------------------------------|----|
| VESSEL<br>Northwest Explorer 2012   |     | CRUISE ID (e.g. INW12)<br>1NW12 |   | PROJECT & LEG<br>GOA-IERP-UTL 2012 |    | If you download data after cast- fill this out<br>Filename= |      | STATION NO<br>5              |    |
| CTD<br>CAST #   |     | LATITUDE                        |   | LONGITUDE                          |    | GMT   |      | TIME (GMT)                   |    |
| 003   | 547 | 60                              | N | 137                                | 18 | W   | 0430 | 12                           | 25 |
| Sensor S/N (At Start of cruise or swap)   |     | Local Time (ADT)                |   | 1                                  |    | 2   |      |                              |    |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1 & 2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transducer S/N<br>PAR S/N<br>O2 SBE42 S/N |     |                                 |   |                                    |    |   |      |                              |    |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>Weather: Cloudy<br>Sea State: 8-9 ft                   |     |                                 |   |                                    |    |   |      |                              |    |
| NO DESIRED  |     | SALT #                          |   | NUT #                              |    | OXY #   |      | BUI ID CHL VOL Filter Vial # |    |
| 1 200   |     | 17                              |   | 18                                 |    | 19  |      | 10                           |    |
| 2 100   |     | 18                              |   | 19                                 |    | 17  |      | 5                            |    |
| 3 50  |     | 19                              |   | 17                                 |    | 16  |      | 4                            |    |
| 4 40  |     | 20                              |   | 17                                 |    | 15  |      | 3                            |    |
| 5 30  |     | 21                              |   | 16                                 |    | 14  |      | 2                            |    |
| 6 20  |     | 22                              |   | 15                                 |    | 13  |      | 1                            |    |
| 7 10  |     | 143                             |   | 23                                 |    | 25  |      |                              |    |
| 8 0   |     | 24                              |   | 13                                 |    |   |      |                              |    |
| Comments  |     | Pycnocline Depth                |   | Fluor Max Depth                    |    |   |      |                              |    |

|   |            |                        |        |                                   |        |  |               |                 |  |
|---|------------|------------------------|--------|-----------------------------------|--------|--|---------------|-----------------|--|
| VESSEL<br>Northwest Explorer 2012   |            | CRUISE ID (e.g. 1NW12) |        | PROJECT & LEG<br>GOA-ERP-UTL 2012 |        | If you download data after cast - fill this out<br>Filename= |               | STATION NO<br>6 |  |
| CTD CAST #  |            | LATITUDE               |        | LONGITUDE                         |        | G M T  |               | TIME (GMT)      |  |
| 004   | 56.05.81 N | 131.31.18 W            | 04     | 20                                | 11     | 2  | 15            | 05              |  |
| Sensor S/N (At Start of cruise or swap)   |            | Local Time (ADT)       |        | 1                                 |        | 2  |               |                 |  |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1 & 2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transmittometer S/N<br>PAR S/N<br>D2 SBE42 S/N                    |            |                        |        |                                   |        |  |               |                 |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>weather: cloudy<br>sea state: 2-3 ft<br>Bottle did not fire at depth 40 meters |            |                        |        |                                   |        |  |               |                 |  |
| DEPTH   |            | Rosette Notes          |        | Hydro Sampling                    |        | CHLOR Samples  |               | Comments        |  |
| NO  | DESIRE     | SALT #                 | Nut. # | OXY #                             | Bil ID | Chl Vol  | Filter Vial # |                 |  |
| 1   | 200        |                        | 25     |                                   |        |  |               |                 |  |
| 2   | 100        |                        | 26     |                                   |        |  |               |                 |  |
| 3   | 50         |                        | 27     |                                   |        |  |               |                 |  |
| 4   | 40         |                        | 28     |                                   |        |  |               |                 |  |
| 5   | 30         |                        | 29     |                                   |        |  |               |                 |  |
| 6   | 20         |                        | 30     |                                   |        |  |               |                 |  |
| 7   | 10         |                        | 31     |                                   |        |  |               |                 |  |
| 8   | 0          |                        | 32     |                                   |        |  |               |                 |  |
| Pycnocline Depth  |            | Fluor Max Depth        |        |                                   |        |  |               |                 |  |

|  |         |                         |                |                                   |       |   |       |                  |               |
|--|---------|-------------------------|----------------|-----------------------------------|-------|---|-------|------------------|---------------|
| VESSEL<br>Northwest Explorer 2012  |         | CRUISE ID (e.g. T1NW12) |                | PROJECT & LEG<br>GOA-ERP-UTL 2012 |       | If you download data after cast, fill this out<br>Filename= |       | STATION NO.<br>8 |               |
| CTD CAST #   |         | LATITUDE                |                | LONGITUDE                         |       | G M T   |       | TIME (GMT)       |               |
| DEG  | MIN     | DEG                     | MIN            | DAY                               | MO    | YR  | HR    | MIN              |               |
| 005  | 56      | 15                      | 99 N           | 37                                | 01    | 31  | W     | 00               | 50            |
| Sensor S/N (At Start of cruise or swap)  |         | Local Time (ADT)        |                | 1                                 |       | 2   |       |                  |               |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1 & 2 S/Ns<br>FLUOR S/N<br>O2 (SBE4) S/N<br>Transmittometer S/N<br>PAR S/N<br>O2 SBE42S/N |         |                         |                |                                   |       |   |       |                  |               |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>Weather: Cloudy<br>Sea State: 1-2 ft                      |         |                         |                |                                   |       |   |       |                  |               |
| No   | DESIRED | Rosette No/ies          | Hydro Sampling | SALT #                            | Nut # | OXY #   | BT ID | CHI VOL          | Filter Vial # |
| 1  | 200     |                         |                |                                   | 33    |   |       |                  |               |
| 2  | 100     |                         |                |                                   | 34    |   |       |                  |               |
| 3  | 50      |                         |                |                                   | 35    |   | 20    |                  | 6             |
| 4  | 40      |                         |                |                                   | 36    |   | 29    |                  | 5             |
| 5  | 30      |                         |                |                                   | 37    |   | 28    |                  | 4             |
| 6  | 20      |                         |                |                                   | 38    |   | 27    |                  | 3             |
| 7  | 10      |                         |                |                                   | 39    |   | 26    |                  | 2             |
| 8  | 0       |                         |                |                                   | 40    |   | 25    |                  | 1             |
| Comments   |         |                         |                |                                   |       |   |       |                  |               |
| Pycnocline Depth   |         |                         |                |                                   |       |   |       |                  |               |
| Fluor Max Depth  |         |                         |                |                                   |       |   |       |                  |               |
| BOTTO M DEPTH (m)<br>STA. NAME/ID<br>203<br>MAX DEPTH =  |         |                         |                |                                   |       |   |       |                  |               |

|   |  |                          |  |                                    |  |   |  |                     |  |
|---|--|--------------------------|--|------------------------------------|--|---|--|---------------------|--|
| VESSEL<br>Northwest Explorer 2012       |  | CRUISE ID (e.g., 11MW12) |  | PROJECT & LEG<br>GOA-IERP-UTL 2012 |  | If you download data after cast, fill this out<br>Filename= |  | STATION NO.<br>10   |  |
| CTD<br>CAST #                           |  | LATITUDE                 |  | LONGITUDE                          |  | G M T   |  | TIME (GMT)          |  |
| DEG MIN                                 |  | DEG MIN                  |  | DAY MO YR                          |  | HR MIN  |  | Temp (°C)           |  |
| 0656.13 N                               |  | 13620.12 W               |  | 05 JUL 12                          |  | 0212  |  | Temp (°C)           |  |
| Sensor S/N (At Start of cruise or swap) |  | Sensor S/N               |  | Sensor S/N                         |  | Sensor S/N  |  | Sensor S/N          |  |
| SBE type and S/N                        |  | SBE type and S/N         |  | SBE type and S/N                   |  | SBE type and S/N  |  | SBE type and S/N    |  |
| PRESS S/N                               |  | PRESS S/N                |  | PRESS S/N                          |  | PRESS S/N   |  | PRESS S/N           |  |
| TEMP 1 & 2 S/Ns                         |  | TEMP 1 & 2 S/Ns          |  | TEMP 1 & 2 S/Ns                    |  | TEMP 1 & 2 S/Ns   |  | TEMP 1 & 2 S/Ns     |  |
| COND 1 & 2 S/Ns                         |  | COND 1 & 2 S/Ns          |  | COND 1 & 2 S/Ns                    |  | COND 1 & 2 S/Ns   |  | COND 1 & 2 S/Ns     |  |
| FLUOR S/N                               |  | FLUOR S/N                |  | FLUOR S/N                          |  | FLUOR S/N   |  | FLUOR S/N           |  |
| O2 (SBE43) S/N                          |  | O2 (SBE43) S/N           |  | O2 (SBE43) S/N                     |  | O2 (SBE43) S/N  |  | O2 (SBE43) S/N      |  |
| Transmittometer S/N                     |  | Transmittometer S/N      |  | Transmittometer S/N                |  | Transmittometer S/N   |  | Transmittometer S/N |  |
| PAR S/N                                 |  | PAR S/N                  |  | PAR S/N                            |  | PAR S/N   |  | PAR S/N             |  |
| O2 SBE42S/N                             |  | O2 SBE42S/N              |  | O2 SBE42S/N                        |  | O2 SBE42S/N   |  | O2 SBE42S/N         |  |

COMMENT: Difficult conditions, factors that may affect measurements or aid processing  
 Weather: Cloudy  
 Sea State: 1-2 ft

| No | DEPTH | Reset/Notes | Hydro Sampling |       | CHLOR Samples |       | Comments | NS |
|----|-------|-------------|----------------|-------|---------------|-------|----------|----|
|    |       |             | SALT #         | Nut # | OXY #         | BI ID |          |    |
| 1  | 200   |             | 144            | 41    |               |       |          | 1  |
| 2  | 100   |             |                | 43    |               |       |          | 2  |
| 3  | 50    |             |                | 43    |               | 2     |          | 3  |
| 4  | 40    |             |                | 44    |               | 35    |          | 4  |
| 5  | 30    |             |                | 45    |               | 34    |          | 5  |
| 6  | 20    |             |                | 46    |               | 33    |          | 6  |
| 7  | 10    |             |                | 47    |               | 33    |          | 7  |
| 8  | 0     |             |                | 48    |               | 31    |          | 8  |

Pycnocline Depth  
 Fluor Max Depth



|                                   |  |                         |  |                         |  |                   |  |   |  |                       |  |
|-----------------------------------|--|-------------------------|--|-------------------------|--|-------------------|--|---|--|-----------------------|--|
| VESSEL<br>Northwest Explorer 2012 |  | CRUISE ID (e.g. 11NW12) |  | PROJECT & LEG<br>11NW12 |  | GOA-IEEP-UTL 2012 |  | If you download data after cast- fill this out<br>Filename= |  | STATION NO.<br>11     |  |
| CTD<br>CAST #                     |  | LATITUDE<br>DEG MIN     |  | LONGITUDE<br>DEG MIN    |  | GMT<br>DAY MO YR  |  | TIME<br>(GMT) HR MIN  |  | DRY BULB<br>Temp (°C) |  |
| 0675643.85 N                      |  | 13648.35 W              |  | 0556112                 |  | 1501              |  |   |  | WET BULB<br>Temp (°C) |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | PRESSURE<br>(mb)      |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | SEA STATE<br>X        |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | VISIBILITY<br>X       |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | WIND<br>DIRN (deg)    |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | WIND<br>SPD (kts)     |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | CLOUD (amt)           |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | TYPE                  |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | WEATHER               |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | BOTTO<br>M DEPTH (m)  |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | STA<br>NAME/ID        |  |
|                                   |  |                         |  |                         |  |                   |  |   |  | 2019<br>Max Depth =   |  |

Sensor S/N (At Start of cruise or swap out, Local Time (ADT))  
 SBE type and S/N  
 PRESS S/N  
 TEMP 1 & 2 S/Ns  
 COND 1&2 S/Ns  
 FLUOR S/N  
 O2 (SBE43) S/N  
 Transducer S/N  
 PAR S/N  
 O2 SBE42 S/N

COMMENT: Difficult conditions, factors that may affect measurements or aid processing  
 Weather: cloudy  
 Sea State: 1-2 ft

| N/A | DEPTH | Rosette Notes | Hydro Sampling |       | CHLOR Samples |                              | Comments | N/A |
|-----|-------|---------------|----------------|-------|---------------|------------------------------|----------|-----|
|     |       |               | SALT #         | Nut # | OXY #         | Btl ID Chl Vol Filter Vial # |          |     |
|     | 1     | 300           |                | 49    |               |                              |          | 1   |
|     | 2     | 100           |                | 50    |               |                              |          | 2   |
|     | 3     | 50            |                | 51    |               | 42 150                       | 6        | 3   |
|     | 4     | 40            |                | 52    |               | 41 150                       | 5        | 4   |
|     | 5     | 30            |                | 53    |               | 40 150                       | 4        | 5   |
|     | 6     | 20            |                | 54    |               | 39 150                       | 3        | 6   |
|     | 7     | 10            |                | 55    |               | 38 150                       | 2        | 7   |
|     | 8     | 0             |                | 56    |               | 37 150                       | 1        | 8   |

Pycnocline Depth

Fluor Max Depth

|   |  |                         |  |                        |  |                    |  |   |  |                             |  |
|---|--|-------------------------|--|------------------------|--|--------------------|--|---|--|-----------------------------|--|
| VESSEL<br>Northwest Explorer 2012   |  | CRUISE ID (e.g., 1NW12) |  | PROJECT & LEG<br>1NW1A |  | GOA-IERP-UTL 2012  |  | If you download data after cast, fill this out<br>Filename= |  | STATION NO.<br>015          |  |
| CTD<br>CAST #   |  | LATITUDE<br>DEG MIN     |  | LONGITUDE<br>DEG MIN   |  | G M T<br>DAY MO YR |  | TIME<br>(GMT) HR MIN  |  | DRY BULB WET BULB           |  |
| 0085623.94 N  |  | 13750.54 W              |  | 060011                 |  | 2107               |  |   |  |                             |  |
| Sensor S/N (At Start of cruise or swap)   |  | SBE type and S/N        |  | PRESS S/N              |  | TEMP 142 S/N       |  | COND 142 S/N  |  | FLUOR S/N                   |  |
| 02 SBE42S/N   |  | 02 SBE43 S/N            |  | 02 SBE43 S/N           |  | 02 SBE43 S/N       |  | 02 SBE43 S/N  |  | 02 SBE43 S/N                |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>Weather: Cloudy, windy<br>Sea state: 8-4 ft<br>Internal time was not originally set, we set it today<br>Deployed from 40m, were missed during upcast red's<br>downcast to obtain missing depths<br>Due to problems with software two files were saved (one<br>upcast + one downcast) |  |                         |  |                        |  |                    |  |   |  |                             |  |
| No. DESIRED   |  | No. OBTAINED            |  | SALT #                 |  | NUT #              |  | OXY #   |  | BH ID CHL VOL Filter Vial # |  |
| 1 206   |  | 1 206                   |  | 57                     |  |                    |  |   |  |                             |  |
| 2 100   |  | 2 100                   |  | 58                     |  |                    |  |   |  |                             |  |
| 3 30  |  | 3 30                    |  | 59                     |  |                    |  |   |  |                             |  |
| 4 50  |  | 4 50                    |  | 60                     |  |                    |  |   |  |                             |  |
| 5 40  |  | 5 40                    |  | 61                     |  |                    |  |   |  |                             |  |
| 6 20  |  | 6 20                    |  | 62                     |  |                    |  |   |  |                             |  |
| 7 10  |  | 7 10                    |  | 63                     |  |                    |  |   |  |                             |  |
| 8 0   |  | 8 0                     |  | 145                    |  |                    |  |   |  |                             |  |
| Pycnocline Depth  |  | Fluor Max Depth         |  |                        |  |                    |  |   |  |                             |  |



| VESSEL  |               | CRUISE ID (e.g. 1NM12) |           | PROJECT & LEG     |       | If you download data after cast- fill this out |               | STATION NO. |          |           |            |           |          |             |            |         |               |             |
|---|---------------|------------------------|-----------|-------------------|-------|--|---------------|-------------|----------|-----------|------------|-----------|----------|-------------|------------|---------|---------------|-------------|
| Northwest Explorer 2012   |               |                        |           | GOA-IERP-JUL 2012 |       | Filename=                                      |               | 013         |          |           |            |           |          |             |            |         |               |             |
| CTD CAST #  | LATITUDE      | LONGITUDE              |           | G M T             |       | TIME (GMT)                                     | DRY BULB      | WET BULB    | PRESSURE | SEA STATE | VISIBILITY | WIND DIRN | WIND SPD | CLOUD (amt) | CLOUD TYPE | WEATHER | BOTTO M DEPTH | STA NAME/ID |
| 009   | 56 34.27 N    | 137 19.71 W            | 06 JUL 12 | 1502              |       |  |               |             |          |           |            |           |          |             |            |         | 200.18        | SELE60      |
| Sensor S/N (At Start of cruise or swap) Local Time (ADT)  |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| SBE type and S/N  |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| PRESS S/N   |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| TEMP 1 & 2 S/Ns   |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| COND 1 & 2 S/Ns   |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| FLUOR S/N   |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| O2 (SBE43) S/N  |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| Transducer S/N  |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| PAR S/N   |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| O2 SBE43 S/N  |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| <p>COMMENT: Difficult conditions, factors that may affect measurements or aid processing</p> <p>Weather: Cloudy</p> <p>Sea State: 2-3 ft seas</p> <p>Upcast + downcast were recorded as individual casts due to software &amp; sampling issues.</p> |               |                        |           |                   |       |  |               |             |          |           |            |           |          |             |            |         |               |             |
| Na DEPTH  | Rosette Notes | Hydro Sampling         |           | CHLOR Samples     |       | Comments                                       |               |             |          |           |            |           |          |             |            |         |               |             |
| No DESIRED  |               | SALT #                 | Nut #     | OXY #             | BI ID | CHL VOL  | Filter Vial # |             |          |           |            |           |          |             |            |         |               |             |
| 1   | 200           |                        | 65        |                   |       |  |               |             |          |           |            |           |          |             |            |         |               | 1           |
| 2   | 100           |                        | 66        |                   |       |  |               |             |          |           |            |           |          |             |            |         |               | 2           |
| 3   | 50            |                        | 67        |                   |       |  |               |             |          |           |            |           |          |             |            |         |               | 3           |
| 4   | 46            |                        | 68        |                   |       |  |               |             |          |           |            |           |          |             |            |         |               | 4           |
| 5   | 30            |                        | 69        |                   |       |  |               |             |          |           |            |           |          |             |            |         |               | 5           |
| 6   | 20            |                        | 70        |                   |       |  |               |             |          |           |            |           |          |             |            |         |               | 6           |
| 7   | 10            |                        | 71        |                   |       |  |               |             |          |           |            |           |          |             |            |         |               | 7           |
| 8   | 0             |                        | 72        |                   |       |  |               |             |          |           |            |           |          |             |            |         |               | 8           |

Pycnocline Depth

Fluor Max Depth

|   |  |                         |  |                                   |  |   |  |                              |  |
|---|--|-------------------------|--|-----------------------------------|--|---|--|------------------------------|--|
| VESSEL<br>Northwest Explorer 2012   |  | CRUISE ID (e.g. 11NW12) |  | PROJECT & LEG<br>GOA-ERP-UTL 2012 |  | If you download data after cast, fill this out<br>Filename= |  | STATION NO.<br>0315          |  |
| CTD CAST #  |  | LATITUDE                |  | LONGITUDE                         |  | G M T   |  | TIME (GMT)                   |  |
| DEG MIN   |  | DEG MIN                 |  | DAY MO YR                         |  | HR MIN  |  | Temp (°C)                    |  |
| 01 05 68.0  |  | 01 N 135.0              |  | 10 30 11                          |  | 21 45   |  | 57                           |  |
| Sensor S/N (At Start of cruise or swap)   |  | SBE type and S/N        |  | PRESS S/N                         |  | TEMP 1 & 2 S/Ns   |  | COND 1 & 2 S/Ns              |  |
| 10156808  |  | SBE43                   |  | 10156808                          |  | 10156808  |  | 10156808                     |  |
| FLUOR S/N   |  | O2 (SBE43) S/N          |  | Transducer S/N                    |  | PAR S/N   |  | O2 SBE43S/N                  |  |
| 10156808  |  | 10156808                |  | 10156808                          |  | 10156808  |  | 10156808                     |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing |  |                         |  |                                   |  |   |  |                              |  |
| Depth: Port 12, 2000m   |  |                         |  |                                   |  |   |  |                              |  |
| SEA STATE: 2-4 ft   |  |                         |  |                                   |  |   |  |                              |  |
| MAX. DEPTH = 110  |  |                         |  |                                   |  |   |  |                              |  |
| No. DESIRED   |  | Rosetta Notes           |  | Hydro Sampling                    |  | CHLOR Samples   |  | Comments                     |  |
| No. DESIRED   |  | SALT #                  |  | Nut #                             |  | OXY #   |  | Btl ID Chl Vol Filter Vial # |  |
| 1   |  | 110                     |  | 73                                |  |   |  |                              |  |
| 2   |  | 80                      |  | 74                                |  | 60  |  | 130                          |  |
| 3   |  | 40                      |  | 75                                |  | 59  |  | 130                          |  |
| 4   |  | 30                      |  | 76                                |  | 58  |  | 130                          |  |
| 5   |  | 20                      |  | 77                                |  | 57  |  | 130                          |  |
| 6   |  | 10                      |  | 78                                |  | 56  |  | 130                          |  |
| 7   |  | 0                       |  | 79                                |  | 55  |  | 130                          |  |
| 8   |  |                         |  |                                   |  |   |  |                              |  |

Pycnocline Depth

Fluor Max Depth

|   |  |                        |  |                                   |  |   |  |                              |  |
|---|--|------------------------|--|-----------------------------------|--|---|--|------------------------------|--|
| VESSEL<br>Northwest Explorer 2012   |  | CRUISE ID (e.g. 1NW12) |  | PROJECT & LEG<br>GOA-ERP-JUL 2012 |  | If you download data after cast, fill this out<br>Filename= |  | STATION NO.<br>032           |  |
| CTD<br>CAST #   |  | LATITUDE               |  | LONGITUDE                         |  | G M T   |  | TIME (GMT)                   |  |
| DEG MIN   |  | DEG MIN                |  | DAY MO YR                         |  | HR MIN  |  | Temp (°C)                    |  |
| 21 15 68 6. 09 N  |  | 125 19. 7 W            |  | 10 01 12                          |  | 1736  |  | Temp (°C)                    |  |
| Sensor S/N (At Start of cruise or swap)   |  | Local Time (ADT)       |  | 1 2                               |  | DRY BULB  |  | WET BULB                     |  |
| SBE type and S/N  |  | PRESS S/N              |  | TEMP 1 & 2 S/Ns                   |  | COND 1&2 S/Ns   |  | FLUOR S/N                    |  |
| O2 (SBE43) S/N  |  | Transmittometer S/N    |  | PAR S/N                           |  | O2 SBE42S/N   |  |                              |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>weather: Cloudy<br>sea state: 8-3-3 seas |  |                        |  |                                   |  |   |  |                              |  |
| No. DEPTH   |  | Rosette Notes          |  | Hydro Sampling                    |  | CHLOR Samples   |  | Comments                     |  |
| No. DESIRED   |  | SALT #                 |  | Nut #                             |  | OXY #   |  | Bil ID Chl Vol Filter Vial # |  |
| 1 100   |  |                        |  | 80                                |  |   |  |                              |  |
| 2 50  |  |                        |  | 81                                |  |   |  | 66 140 6                     |  |
| 3 40  |  |                        |  | 82                                |  |   |  | 65 140 5                     |  |
| 4 30  |  |                        |  | 83                                |  |   |  | 64 140 4                     |  |
| 5 20  |  |                        |  | 84                                |  |   |  | 63 140 3                     |  |
| 6 10  |  |                        |  | 85                                |  |   |  | 62 140 2                     |  |
| 7 0   |  |                        |  | 86                                |  |   |  | 61 140 1                     |  |
| 8   |  |                        |  |                                   |  |   |  |                              |  |

Pycnocline Depth

Fluor Max Depth

|   |  |                        |  |                                   |  |   |  |                              |  |
|---|--|------------------------|--|-----------------------------------|--|---|--|------------------------------|--|
| VESSEL<br>Northwest Explorer 2012   |  | CRUISE ID (e.g. 1NWT2) |  | PROJECT & LEG<br>GOA-ERP-UTL 2012 |  | If you download data after cast, fill this out<br>Filename= |  | STATION NO.<br>433           |  |
| CTD<br>CAST #   |  | LATITUDE               |  | LONGITUDE                         |  | G M T   |  | TIME (GMT)                   |  |
| DEG MIN   |  | DEG MIN                |  | DAY MO YR                         |  | HR MIN  |  | Tamp (°C)                    |  |
| 01 25 23.44 N   |  | 135 27.11 W            |  | 10 01 12                          |  | 03 30   |  | .                            |  |
| Sensor S/N (At Start of cruise or swap)   |  | Local Time (ADT)       |  | 1                                 |  | 2   |  |                              |  |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1&2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transmittometer S/N<br>PAR S/N<br>O2 SBE42S/N |  |                        |  |                                   |  |   |  |                              |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>Weather: Cloudy<br>Sea State: 2-3 ft                     |  |                        |  |                                   |  |   |  |                              |  |
| N/A DEPTH   |  | Rosette Notes          |  | Hydro Sampling                    |  | CHLOR Samples   |  | Comments                     |  |
| No. DESIRED   |  | SALT #                 |  | NUT #                             |  | OXY #   |  | Btl ID Chl Vol Filter Vial # |  |
| 1 150   |  | 85                     |  | 85                                |  | 78  |  | 140 6                        |  |
| 2 100   |  | 85                     |  | 85                                |  | 78  |  | 140 6                        |  |
| 3 50  |  | 85                     |  | 85                                |  | 78  |  | 140 6                        |  |
| 4 40  |  | 85                     |  | 85                                |  | 78  |  | 140 6                        |  |
| 5 30  |  | 85                     |  | 85                                |  | 78  |  | 140 6                        |  |
| 6 20  |  | 85                     |  | 85                                |  | 78  |  | 140 6                        |  |
| 7 10  |  | 85                     |  | 85                                |  | 78  |  | 140 6                        |  |
| 8 0   |  | 85                     |  | 85                                |  | 78  |  | 140 6                        |  |
| N/A   |  | N/A                    |  | N/A                               |  | N/A   |  | N/A                          |  |

Pycnocline Depth

Fluor Max Depth

|                                   |  |                        |  |                                    |  |   |  |                         |  |
|-----------------------------------|--|------------------------|--|------------------------------------|--|---|--|-------------------------|--|
| VESSEL<br>Northwest Explorer 2012 |  | CRUISE ID (e.g. INW12) |  | PROJECT & LEG<br>GOA-IERP-UTL 2012 |  | If you download data after cast, fill this out<br>Filename= |  | STATION NO<br>934       |  |
| CTD<br>CAST #                     |  | LATITUDE<br>DEG MIN    |  | LONGITUDE<br>DEG MIN               |  | GMT<br>DAY MO YR  |  | TIME (GMT)<br>HR MIN    |  |
| DEG MIN                           |  | DEG MIN                |  | DAY MO YR                          |  | HR MIN  |  | DRY BULB<br>Temp (°C)   |  |
| 1356.6.58 N                       |  | 83.48.09 W             |  | 03 01 12                           |  | 2205  |  | WET BULB<br>Temp (°C)   |  |
|                                   |  |                        |  |                                    |  |   |  | PRESSURE<br>(mb)        |  |
|                                   |  |                        |  |                                    |  |   |  | SEA STATE<br>VISIBILITY |  |
|                                   |  |                        |  |                                    |  |   |  | WIND<br>DIRN (deg)      |  |
|                                   |  |                        |  |                                    |  |   |  | WIND<br>SPD (kts)       |  |
|                                   |  |                        |  |                                    |  |   |  | CLOUD (amt)             |  |
|                                   |  |                        |  |                                    |  |   |  | TYPE                    |  |
|                                   |  |                        |  |                                    |  |   |  | WEATHER                 |  |
|                                   |  |                        |  |                                    |  |   |  | BOTTO<br>M DEPTH (m)    |  |
|                                   |  |                        |  |                                    |  |   |  | STA.<br>NAME/ID         |  |
|                                   |  |                        |  |                                    |  |   |  | 10675420                |  |
|                                   |  |                        |  |                                    |  |   |  | MAX DEPTH = 200.44      |  |

Sensor S/N (At Start of cruise or swap)  
Local Time (ADT)

COMMENT: Difficult conditions, factors that may affect measurements or aid processing  
Under cloudy sky. 8-30-2002

ISBE type and S/N  
PRESS S/N  
TEMP 1 & 2 S/Ns  
COND 1&2 S/Ns  
FLUOR S/N  
O2 (SBE4) S/N  
Transmissometer S/N  
PAR S/N  
O2 SBE42S/N

| NO DESIRED | Rosette Notes | Hydro Sampling |       | CHLOR Samples |       | Comments | NIS No. |
|------------|---------------|----------------|-------|---------------|-------|----------|---------|
|            |               | SALT #         | Nut # | OXY #         | BI ID |          |         |
| 1          | 200           | 146            | 95    | 69            |       |          | 1       |
| 2          | 100           | 96             |       |               |       |          | 2       |
| 3          | 50            | 97             |       |               | 78    | 130      | 6       |
| 4          | 40            | 98             |       |               | 77    | 130      | 5       |
| 5          | 30            | 99             |       |               | 76    | 130      | 4       |
| 6          | 20            | 100            |       |               | 75    | 130      | 3       |
| 7          | 10            | 101            |       |               | 74    | 130      | 2       |
| 8          | 0             | 102            |       |               | 73    | 130      | 1       |

Pycnocline Depth

Fluor Max Depth



|  |  |                        |  |                                   |  |   |  |                             |  |
|--|--|------------------------|--|-----------------------------------|--|---|--|-----------------------------|--|
| VESSEL<br>Northwest Explorer 2012  |  | CRUISE ID (e.g. 1NW12) |  | PROJECT & LEG<br>GOA-ERP-UTL 2012 |  | If you download data after cast- fill this out<br>Filename= |  | STATION NO.<br>037          |  |
| CTD<br>CAST #  |  | LATITUDE<br>DEG MIN    |  | LONGITUDE<br>DEG MIN              |  | GMT<br>DAY MO YR  |  | TIME (GMT)<br>HR MIN        |  |
| 014  |  | 56 36 . 55 N           |  | 115 59 . 69 W                     |  | 11 5 41   |  | 12 17 47                    |  |
| Sensor S/N (At Start of cruise or swapout, local time (ADT))<br>SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>CONO 1&2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transducer S/N<br>PAR S/N<br>O2 SBE42S/N |  |                        |  |                                   |  |   |  |                             |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>Weather: Cloudy<br>sea state: 1-2 ft seas   |  |                        |  |                                   |  |   |  |                             |  |
| No DESIRED   |  | SALT #                 |  | Nul #                             |  | OXY #   |  | BU ID Chl VOL Filter Vial # |  |
| 1 200  |  |                        |  | 103                               |  |   |  |                             |  |
| 2 100  |  |                        |  | 104                               |  |   |  |                             |  |
| 3 50   |  |                        |  | 105                               |  | 04 130  |  | 6                           |  |
| 4 40   |  |                        |  | 106                               |  | 03 130  |  | 5                           |  |
| 5 30   |  |                        |  | 107                               |  | 08 130  |  | 4                           |  |
| 6 20   |  |                        |  | 108                               |  | 01 130  |  | 3                           |  |
| 7 10   |  |                        |  | 109                               |  | 00 130  |  | 2                           |  |
| 8 0  |  |                        |  | 110                               |  | 00 130  |  | 1                           |  |
| PTH  |  | Rosette Notes          |  | Hydro Sampling                    |  | CHLOR Samples   |  | Comments                    |  |
| N/S  |  |                        |  |                                   |  |   |  |                             |  |
| No.  |  |                        |  |                                   |  |   |  |                             |  |

Pycnocline Depth

Fluor Max Depth

MAX DEPTH = 000.86

| VESSEL   |               | CRUISE ID (e.g. INW12) |           | PROJECT & LEG    |               | If you download data after cast- fill this out |            | STATION NO.   |           |           |           |            |           |                |             |      |         |                   |              |
|--|---------------|------------------------|-----------|------------------|---------------|--|------------|---------------|-----------|-----------|-----------|------------|-----------|----------------|-------------|------|---------|-------------------|--------------|
| Northwest Explorer 2012  |               |                        |           | GOA-ERP-UTL 2012 |               | Filename=                                      |            | 038           |           |           |           |            |           |                |             |      |         |                   |              |
| CTD CAST #   | LATITUDE      |                        | LONGITUDE |                  | G M T         |  | TIME (GMT) | DRY BULB      | WET BULB  | PRESSURE  | SEA STATE | VISIBILITY | WIND DIRN | WIND SPD (kts) | CLOUD (amt) | TYPE | WEATHER | BOTTO M DEPTH (m) | STA. NAME/ID |
| 515  | 15            | 41                     | 13        | 44               | 11            | 30   | 12         | 21            | 10        | .         | .         | .          | .         | .              | .           | .    | .       | 103.5             | 10           |
| DEG  | MIN           | DEG                    | MIN       | DAY              | MO            | YR   | HR         | MIN           | Temp (°C) | Temp (°C) | (mb)      | .          | (deg)     | (kts)          | .           | .    | .       | (m)               |              |
| Sensor S/N (At Start of cruise or swap) Local Time (ADT) 1 2<br>SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1 & 2 S/Ns<br>FLUOR S/N<br>O2 (SBE4) S/N<br>Transmittometer S/N<br>PAR S/N<br>O2 SBE42S/N |               |                        |           |                  |               |  |            |               |           |           |           |            |           |                |             |      |         |                   |              |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>GOA-ERP-UTL 2012<br>15-04-11-30-12-21-10  |               |                        |           |                  |               |  |            |               |           |           |           |            |           |                |             |      |         |                   |              |
| NO DESIRED   | Rosette Nodes | SALT #                 | Nut #     | OXY #            | CHLOR Samples | Bl ID  | Chl VOL    | Filter Vial # | Comments  |           |           |            |           |                |             |      |         |                   | NS           |
| 1  | 150           |                        | 111       |                  |               |  |            |               |           |           |           |            |           |                |             |      |         | 1                 |              |
| 2  | 100           |                        | 113       |                  |               |  |            |               |           |           |           |            |           |                |             |      |         | 2                 |              |
| 3  | 50            |                        | 113       |                  |               | 96   | 130        | 6             |           |           |           |            |           |                |             |      |         | 3                 |              |
| 4  | 20            |                        | 114       |                  |               | 89   | 130        | 5             |           |           |           |            |           |                |             |      |         | 4                 |              |
| 5  | 20            |                        | 115       |                  |               | 82   | 130        | 4             |           |           |           |            |           |                |             |      |         | 5                 |              |
| 6  | 20            |                        | 116       |                  |               | 87   | 130        | 3             |           |           |           |            |           |                |             |      |         | 6                 |              |
| 7  | 10            |                        | 117       |                  |               | 86   | 130        | 2             |           |           |           |            |           |                |             |      |         | 7                 |              |
| 8  | 0             |                        | 118       |                  |               | 85   | 130        | 1             |           |           |           |            |           |                |             |      |         | 8                 |              |

Pycnocline Depth

Fluor Max Depth

| VESSEL   |               | CRUISE ID (e.g. INWH12) |       | PROJECT & LEG    |     | If you download data after cast- fill this out |          | STATION NO. |          |           |           |                |             |      |         |                   |             |
|--|---------------|-------------------------|-------|------------------|-----|--|----------|-------------|----------|-----------|-----------|----------------|-------------|------|---------|-------------------|-------------|
| Northwest Explorer 2012  |               |                         |       | GOA-ERP-UTL 2012 |     | Filename=                                      |          | 039         |          |           |           |                |             |      |         |                   |             |
| CTD CAST #   | LATITUDE      | LONGITUDE               |       | G M T            |     | TIME (GMT)                                     | DRY BULB | WET BULB    | PRESSURE | SEA STATE | WIND DIRN | WIND SPD (kts) | CLOUD (amt) | TYPE | WEATHER | BOTTO M DEPTH (m) | STA NAME/ID |
| 01   | 05 44.05 N    | 135 36.98 W             |       | 11 30 12         |     | 03 07  |          |             |          | x         | x         |                | x           | x    | x       | 1385              | 0105        |
| Sensor S/N (At Start of cruise or swap)<br>SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1 & 2 S/Ns<br>FLUOR S/N<br>02 (SBE4) S/N<br>TRANSMITTER S/N<br>PAR S/N<br>02 SBE42 S/N |               |                         |       |                  |     |  |          |             |          |           |           |                |             |      |         |                   |             |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>OCEANIC BOTTOM STUDY<br>SEA STATE 1-2.5-2.0   |               |                         |       |                  |     |  |          |             |          |           |           |                |             |      |         |                   |             |
| NO. DESIRED  | ROSETTE NOTES | SALT #                  | NUT # | OXY #            | BID | CHI VOL  | FILTER   | VIAL #      | Comments |           |           |                |             |      |         |                   |             |
| 1  | 100           |                         | 119   |                  | 96  | 130  | 6        |             |          |           |           |                |             |      |         |                   |             |
| 2  | 50            |                         | 180   |                  | 96  | 130  | 6        |             |          |           |           |                |             |      |         |                   |             |
| 3  | 40            |                         | 181   |                  | 95  | 130  | 5        |             |          |           |           |                |             |      |         |                   |             |
| 4  | 30            |                         | 182   |                  | 94  | 130  | 4        |             |          |           |           |                |             |      |         |                   |             |
| 5  | 50            |                         | 183   |                  | 93  | 130  | 3        |             |          |           |           |                |             |      |         |                   |             |
| 6  | 10            |                         | 184   |                  | 92  | 130  | 2        |             |          |           |           |                |             |      |         |                   |             |
| 7  | 0             |                         | 185   |                  | 91  | 130  | 1        |             |          |           |           |                |             |      |         |                   |             |
| 8  |               |                         |       |                  |     |  |          |             |          |           |           |                |             |      |         |                   |             |

Pycnocline Depth

Fluor Max Depth

MAX DEPTH = 100.99

|  |               |                         |               |                   |            |  |               |             |             |
|--|---------------|-------------------------|---------------|-------------------|------------|--|---------------|-------------|-------------|
| VESSEL   |               | CRUISE ID (e.g. 11NW12) |               | PROJECT & LEG     |            | If you download data after cast- fill this out |               | STATION NO. |             |
| Northwest Explorer 2012  |               | 11NW12                  |               | GOA-IERP-UTL 2012 |            | Filename =                                     |               | 1140        |             |
| CTD CAST #   | LATITUDE      | LONGITUDE               | G M T         |                   | TIME (GMT) | DRY BULB                                       | WET BULB      | PRESSURE    | SEA STATE   |
| DEG MIN  | DEG MIN       | DAY MO YR               | HR MIN        | Temp (C)          | Temp (C)   | (mb)   | (deg)         | (kts)       | CLOUD (amt) |
| 41 75 45 . 09 N  | 135 31 . 09 W | 11 10 11                | 12 03 42      |                   |            |  |               |             |             |
| Sensor S/N (At Start of cruise or swap) Local Time (ADT)   |               |                         |               |                   |            |  |               |             |             |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1 & 2 S/Ns<br>FLUOR S/N<br>O2 (SBE4) S/N<br>Transmittometer S/N<br>PAR S/N<br>O2 SBE42S/N |               |                         |               |                   |            |  |               |             |             |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>weather sunny, partly cloudy sea state 0-1 ft             |               |                         |               |                   |            |  |               |             |             |
| NO. DESIRED  | Rosette Notes | Hydro Sampling          | CHLOR Samples | Comments          |            |  |               |             |             |
|  |               | SALT #                  | Nut #         | OXY #             | Btl ID     | Chl Vol  | Filter Vial # |             |             |
| 1  | 50            |                         | 106           |                   | 102        | 130  | 6             |             |             |
| 2  | 40            |                         | 107           |                   | 101        | 130  | 5             |             |             |
| 3  | 30            |                         | 108           |                   | 100        | 130  | 4             |             |             |
| 4  | 20            |                         | 109           |                   | 99         | 130  | 3             |             |             |
| 5  | 10            |                         | 110           |                   | 98         | 130  | 2             |             |             |
| 6  | 0             |                         | 147           | 131               | 98         | 97   | 120           | 1           |             |
| 7  |               |                         |               |                   |            |  |               |             |             |
| 8  |               |                         |               |                   |            |  |               |             |             |

Pycnocline Depth

Fluor Max Depth

MAX DEPTH = 10.31

| VESSEL                                  | CRUISE ID (e.g., INW12)   | PROJECT & LEG     | File name = | STATION NO. |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
|---|---|-------------------|-------------|-------------|-------|--------|--------|---------------|----------|-----------|------------------|-----|---|---|-------|-------|-------------|------|---------|---------------|-------------|--|--|
| Northwest Explorer 2012                 | INW18   | GOA-IERP-JUL 2012 |             | 042         |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| CTD CAST #                              | DEG   | MIN               | DEG         | MIN         | DAY   | MO     | YR     | HR            | MIN      | Temp (°C) | Temp (°C)        | (m) | X | X | (deg) | (kts) | CLOUD (amt) | TYPE | WEATHER | BOTTO M DEPTH | STA NAME/ID |  |  |
| 1856                                    | 54  | .15               | N           | 136         | 17.9  | W      | 10     | 01            | 12       |           |                  |     |   |   |       |       |             |      |         |               | 1994SDEEP   |  |  |
| Sensor S/N (At Start of cruise or swap) |   |                   |             |             |       |        |        |               |          |           | Local Time (LDT) |     |   |   |       |       |             |      |         |               |             |  |  |
| SBE type and S/N                        | COMMENT: Difficult conditions, factors that may affect measurements or aid processing |                   |             |             |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| PRESS S/N                               | (Observer: Cloudy Partly sunny sea state 3-4 ft seas)                                 |                   |             |             |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| TEMP 1 & 2 S/Ns                         |   |                   |             |             |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| COND 1&2 S/Ns                           |   |                   |             |             |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| FLUOR S/N                               |   |                   |             |             |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| O2 (SBE43) S/N                          |   |                   |             |             |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| Transducer S/N                          |   |                   |             |             |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| PAR S/N                                 |   |                   |             |             |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| OZ SBE42SN                              |   |                   |             |             |       |        |        |               |          |           |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| No DESIRED                              | Rosette Notes   | Hydro Sampling    | SALT #      | Nut #       | OXY # | Btl ID | Ch VOL | Filter Vial # | Comments | No.       |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| 1                                       | 200   |                   |             | 139         |       |        |        |               |          | 1         |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| 2                                       | 100   |                   |             | 133         |       |        |        |               |          | 2         |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| 3                                       | 50  |                   |             | 134         |       |        |        |               |          | 3         |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| 4                                       | 40  |                   |             | 135         |       |        |        |               |          | 4         |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| 5                                       | 30  |                   |             | 136         |       |        |        |               |          | 5         |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| 6                                       | 20  |                   |             | 137         |       |        |        |               |          | 6         |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| 7                                       | 10  |                   |             | 138         |       |        |        |               |          | 7         |                  |     |   |   |       |       |             |      |         |               |             |  |  |
| 8                                       | 0   |                   |             | 139         |       |        |        |               |          | 8         |                  |     |   |   |       |       |             |      |         |               |             |  |  |



| VESSEL<br>Northwest Explorer 2012   |                     | CRUISE ID (e.g. 1NW12) |                | PROJECT & LEG<br>1NW12 |               | GOA-IERP-UTL 2012 |          | If you download data after cast- fill this out<br>Filename= |         | STATION NO.<br>1643  |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
|---|---------------------|------------------------|----------------|------------------------|---------------|-------------------|----------|---|---------|----------------------|--|----|---------------------|----------------|----------------|--|---------------|--|----------|-----|--------|-------|-------|--------|---------|---------------|---|----|--|--|-----|--|--|--|---|---|----|--|--|-----|--|-----|----|---|---|----|--|--|-----|--|-----|-----|---|---|----|--|--|-----|--|-----|-----|---|---|----|--|--|-----|--|-----|-----|---|---|----|--|--|-----|--|-----|-----|---|---|---|--|--|-----|--|-----|-----|---|---|--|--|--|--|--|--|--|--|
| CTD<br>CAST #   |                     | LATITUDE               |                | LONGITUDE              |               | G M T             |          | TIME<br>(GMT)   |         | DRY BULB<br>WET BULB |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| DEG MIN   |                     | DEG MIN                |                | DAY MO YR              |               | HR MIN            |          | Temp (C)  |         | Temp (C)             |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| 19 56 59  |                     | 31 N                   |                | 136 02                 |               | 17 W              |          | 18 26 11  |         | 12 20 28             |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| Sensor SN (At Start of cruise or swap pul local Time (ADT))   |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| SBE type and SN   |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| PRESS SN  |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| TEMP 1 & 2 S/Ns   |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| COND 1 & 2 S/Ns   |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| FLUOR SN  |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| O2 (SBE43) SN   |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| Transducer SN   |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| PAR SN  |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| O2 SBE42SN  |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>Weather: Sunny, Baitly clouds<br>Sea State: 2-4 ft seas  |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| MAX DEPTH = 88.5  |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| <table border="1"> <thead> <tr> <th rowspan="2">No</th> <th rowspan="2">DEPTH<br/>No DESIRED</th> <th rowspan="2">Receipts Notes</th> <th colspan="2">Hydro Sampling</th> <th colspan="2">CHLOR Samples</th> <th rowspan="2">Comments</th> <th rowspan="2">No.</th> </tr> <tr> <th>SALT #</th> <th>Nut #</th> <th>OXY #</th> <th>Bil ID</th> <th>Chl Vol</th> <th>Filter Vial #</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>80</td> <td></td> <td></td> <td>140</td> <td></td> <td></td> <td></td> <td>1</td> </tr> <tr> <td>2</td> <td>50</td> <td></td> <td></td> <td>141</td> <td></td> <td>114</td> <td>20</td> <td>6</td> </tr> <tr> <td>3</td> <td>40</td> <td></td> <td></td> <td>142</td> <td></td> <td>113</td> <td>130</td> <td>5</td> </tr> <tr> <td>4</td> <td>30</td> <td></td> <td></td> <td>143</td> <td></td> <td>110</td> <td>130</td> <td>4</td> </tr> <tr> <td>5</td> <td>20</td> <td></td> <td></td> <td>145</td> <td></td> <td>111</td> <td>130</td> <td>3</td> </tr> <tr> <td>6</td> <td>10</td> <td></td> <td></td> <td>145</td> <td></td> <td>110</td> <td>130</td> <td>2</td> </tr> <tr> <td>7</td> <td>0</td> <td></td> <td></td> <td>146</td> <td></td> <td>109</td> <td>130</td> <td>1</td> </tr> <tr> <td>8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> |                     |                        |                |                        |               |                   |          |   |         |                      |  | No | DEPTH<br>No DESIRED | Receipts Notes | Hydro Sampling |  | CHLOR Samples |  | Comments | No. | SALT # | Nut # | OXY # | Bil ID | Chl Vol | Filter Vial # | 1 | 80 |  |  | 140 |  |  |  | 1 | 2 | 50 |  |  | 141 |  | 114 | 20 | 6 | 3 | 40 |  |  | 142 |  | 113 | 130 | 5 | 4 | 30 |  |  | 143 |  | 110 | 130 | 4 | 5 | 20 |  |  | 145 |  | 111 | 130 | 3 | 6 | 10 |  |  | 145 |  | 110 | 130 | 2 | 7 | 0 |  |  | 146 |  | 109 | 130 | 1 | 8 |  |  |  |  |  |  |  |  |
| No  | DEPTH<br>No DESIRED | Receipts Notes         | Hydro Sampling |                        | CHLOR Samples |                   | Comments | No.   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
|   |                     |                        | SALT #         | Nut #                  | OXY #         | Bil ID            |          |   | Chl Vol | Filter Vial #        |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| 1   | 80                  |                        |                | 140                    |               |                   |          | 1   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| 2   | 50                  |                        |                | 141                    |               | 114               | 20       | 6   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| 3   | 40                  |                        |                | 142                    |               | 113               | 130      | 5   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| 4   | 30                  |                        |                | 143                    |               | 110               | 130      | 4   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| 5   | 20                  |                        |                | 145                    |               | 111               | 130      | 3   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| 6   | 10                  |                        |                | 145                    |               | 110               | 130      | 2   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| 7   | 0                   |                        |                | 146                    |               | 109               | 130      | 1   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |
| 8   |                     |                        |                |                        |               |                   |          |   |         |                      |  |    |                     |                |                |  |               |  |          |     |        |       |       |        |         |               |   |    |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |    |  |  |     |  |     |     |   |   |   |  |  |     |  |     |     |   |   |  |  |  |  |  |  |  |  |

Pycnocline Depth

Fluor Max Depth

|  |       |                                 |     |                                    |     |   |     |                              |           |
|--|-------|---------------------------------|-----|------------------------------------|-----|---|-----|------------------------------|-----------|
| VESSEL<br>Northwest Explorer 2012  |       | CRUISE ID (e.g. 11W12)<br>11W12 |     | PROJECT & LEG<br>GOA-JERP-UTL 2012 |     | If you download data after cast- fill this out<br>Filename= |     | STATION NO.<br>444           |           |
| CTD<br>CAST #  |       | LATITUDE                        |     | LONGITUDE                          |     | G M T   |     | TIME (GMT)                   |           |
| DEG  | MIN   | DEG                             | MIN | DAY                                | MO  | YR  | HR  | MIN                          |           |
| 090  | 52.00 | 143                             | N   | 10                                 | 06  | 12  | 00  | 05                           |           |
| Sensor S/N (At Start of cruise or swap out Local Time (ADT))   |       |                                 |     |                                    |     |   |     |                              |           |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1&2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transmissometer S/N<br>PAR S/N<br>SBE 42 S/N |       |                                 |     |                                    |     |   |     |                              |           |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>SBE43M, 8 samples positive clearly<br>SBE42M, 3-4 sec   |       |                                 |     |                                    |     |   |     |                              |           |
| No DEPT#   |       | Rosette Notes                   |     | Hydro Sampling                     |     | CHLOR Samples   |     | Comments                     |           |
| No DEPT#   |       | SALT #                          |     | Nul #                              |     | OXY #   |     | Btl ID Chl Vol Filler Vial # |           |
| 1  | 30    |                                 | 148 |                                    | 174 |   | 86  |                              | 120 171 6 |
| 2  | 40    |                                 | 148 |                                    | 149 |   | 149 |                              | 119 149 5 |
| 3  | 20    |                                 | 149 |                                    | 149 |   | 118 |                              | 118 149 4 |
| 4  | 20    |                                 | 150 |                                    | 150 |   | 117 |                              | 130 3     |
| 5  | 10    |                                 | 151 |                                    | 151 |   | 116 |                              | 130 2     |
| 6  | 0     |                                 | 152 |                                    | 152 |   | 115 |                              | 130 1     |
| 7  |       |                                 |     |                                    |     |   |     |                              |           |
| 8  |       |                                 |     |                                    |     |   |     |                              |           |
| Pycnocline Depth<br>Fluor Max Depth  |       |                                 |     |                                    |     |   |     |                              |           |

| VESSEL  |               | CRUISE ID (e.g. 1NMW12) |           | PROJECT & LEG     |       | If you download data after cast- fill this out |               | STATION NO. |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
|---|---------------|-------------------------|-----------|-------------------|-------|--|---------------|-------------|----------|----------|-----------|------------|-----------|----------------|-------------|------|---------|-------------------|--------------|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|
| Northwest Explorer 2012   |               | 1NMW12                  |           | GOA-IERP-UTL 2012 |       | Filename=                                      |               | 445         |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| CTD CAST #  | LATITUDE      |                         | LONGITUDE |                   | G M T |  | TIME (GMT)    | DRY BULB    | WET BULB | PRESSURE | SEA STATE | VISIBILITY | WIND DIRN | WIND SPD (kts) | CLOUD (amt) | TYPE | WEATHER | BOTTO M DEPTH (m) | STA. NAME/ID |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| 21  | 57            | 21                      | 1         | 36                | 04    | 60   | W             | 13          | 30       | 1        | 2         | 14         | 50        |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| Sensor S/N (At Start of cruise or swapout time (ADT)) <table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |               |                         |           |                   |       |  |               |             |          |          |           |            |           |                |             |      |         |                   |              | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  |  |  |  |  |  |  |  |
| 1   | 2             | 3                       | 4         | 5                 | 6     | 7  | 8             |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
|   |               |                         |           |                   |       |  |               |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1&2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transmittometer S/N<br>PAR S/N<br>O2 SBE42S/N   |               |                         |           |                   |       |  |               |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>WEATHER: CLOUDY/overcast + rainy<br>Sea Swell: 9-5 ft seas   |               |                         |           |                   |       |  |               |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| DEPTH   | ROSETTE Notes | HYDRO Sampling          |           | CHLOR Samples     |       | Comments                                       |               |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| NO DESIRED  |               | SALT #                  | Nut #     | OXY #             | BI ID | CHL VOL  | Filter Vial # |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| 1   | 50            |                         | 152       |                   | 126   |  | 6             |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| 2   | 40            |                         | 154       |                   | 125   |  | 5             |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| 3   | 30            |                         | 155       |                   | 124   |  | 4             |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| 4   | 20            |                         | 156       |                   | 122   |  | 3             |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| 5   | 10            |                         | 157       |                   | 120   |  | 2             |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| 6   | 0             |                         | 158       |                   | 119   |  | 1             |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| 7   |               |                         |           |                   |       |  |               |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
| 8   |               |                         |           |                   |       |  |               |             |          |          |           |            |           |                |             |      |         |                   |              |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |

Pycnocline Depth

Fluor Max Depth

MAX DEPTH = 91.65

| VESSEL   |               | CRUISE ID (e.g. 1NW12) |                | PROJECT & LEG    |               | If you download data after cast, fill this out |               | STATION NO.           |                       |                  |                         |                        |                      |             |      |         |                            |                 |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|---------------|------------------------|----------------|------------------|---------------|--|---------------|-----------------------|-----------------------|------------------|-------------------------|------------------------|----------------------|-------------|------|---------|----------------------------|-----------------|----|----|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Northwest Explorer 2012  |               | 1NW12                  |                | GOA-ERP-UTL 2012 |               | Filename=                                      |               | 046                   |                       |                  |                         |                        |                      |             |      |         |                            |                 |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CTD<br>CAST #  | LATITUDE      |                        | LONGITUDE      |                  | G M T         |  | TIME<br>(GMT) | DRY BULB<br>Temp (°C) | WET BULB<br>Temp (°C) | PRESSURE<br>(mb) | SEA STATE<br>VISIBILITY | WIND<br>DIRN.<br>(deg) | WIND<br>SPD<br>(kts) | CLOUD (amt) | TYPE | WEATHER | BOTTO<br>M<br>DEPTH<br>(m) | STA.<br>NAME/ID |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | DEG           | MIN                    | DEG            | MIN              | DAY           | MO   |               |                       |                       |                  |                         |                        |                      |             |      |         |                            |                 | YR | HR | MIN |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 02   | 25            | 19                     | 46             | N                | 136           | 12   | 26            | W                     | 13                    | 10               | 1                       | 2                      | 11                   | 7           | 08   |         |                            |                 |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sensor S/N (At Start of cruise or swap-out, local time (ADT)) <table border="1"> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table> |               |                        |                |                  |               |  |               |                       |                       |                  |                         |                        |                      |             |      |         |                            |                 |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |               |                        |                |                  |               |  |               |                       |                       |                  |                         |                        |                      |             |      |         |                            |                 |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>WEATHER: Cloudy/overcast, low visibility<br>SEA STATE: 3-4 ft seas  |               |                        |                |                  |               |  |               |                       |                       |                  |                         |                        |                      |             |      |         |                            |                 |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1&2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transmittometer S/N<br>PAR S/N<br>O2 SBE42S/N  |               |                        |                |                  |               |  |               |                       |                       |                  |                         |                        |                      |             |      |         |                            |                 |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DEPTH  | Rosetta Notes |                        | Hydro Sampling |                  | CHLOR Samples |  | Comments      |                       |                       |                  |                         |                        |                      |             |      |         |                            |                 |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No. DESIRED  |               |                        | SALT #         | Nut #            | OXY #         | Bit ID   | Chl Vol       | Filter Vial #         |                       |                  |                         |                        |                      |             |      |         |                            |                 |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1  | 150           |                        |                |                  | 159           |  |               |                       |                       |                  |                         |                        |                      |             |      |         |                            | 1               |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2  | 100           |                        |                |                  | 160           |  |               |                       |                       |                  |                         |                        |                      |             |      |         |                            | 2               |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3  | 50            |                        |                |                  | 161           |  |               |                       | 132                   |                  |                         |                        |                      |             |      |         |                            | 3               |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4  | 40            |                        |                |                  | 162           |  |               |                       | 131                   |                  |                         |                        |                      |             |      |         |                            | 4               |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5  | 30            |                        |                |                  | 163           |  |               |                       | 130                   |                  |                         |                        |                      |             |      |         |                            | 5               |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6  | 20            |                        |                |                  | 164           |  |               |                       | 129                   |                  |                         |                        |                      |             |      |         |                            | 6               |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7  | 10            |                        |                |                  | 165           |  |               |                       | 128                   |                  |                         |                        |                      |             |      |         |                            | 7               |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8  | 0             |                        |                |                  | 166           |  |               |                       | 127                   |                  |                         |                        |                      |             |      |         |                            | 8               |    |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Pycnocline Depth

Fluor Max Depth

MAX DEPTH = 51.42

|  |         |                        |       |                                    |        |   |               |                    |     |
|--|---------|------------------------|-------|------------------------------------|--------|---|---------------|--------------------|-----|
| VESSEL<br>Northwest Explorer 2012  |         | CRUISE ID (e.g. 1NW12) |       | PROJECT & LEG<br>GOA-IERP-UTL 2012 |        | If you download data after cast- fill this out<br>Filename= |               | STATION NO.<br>047 |     |
| CTD<br>CAST #  |         | LATITUDE               |       | LONGITUDE                          |        | G M T   |               | TIME (GMT)         |     |
| DEG  | MIN     | DEG                    | MIN   | DAY                                | MO     | YR  | HR            | MIN                | SEC |
| 02   | 35      | 71                     | 50    | 13                                 | 01     | 12  | 18            | 00                 |     |
| Sensor S/N (At Start of cruise or swap)  |         | Sensor S/N             |       | Sensor S/N                         |        | Sensor S/N  |               | Sensor S/N         |     |
| PRESS S/N  |         | TEMP 1 & 2 S/Ns        |       | COND 1&2 S/Ns                      |        | FLUOR S/N   |               | O2 (SBE43) S/N     |     |
| PAR S/N  |         | Transmittance S/N      |       | PAR S/N                            |        | O2 SBE42 S/N  |               |                    |     |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>Weather: Cloudy / overcast<br>Sea State: 3-4 ft |         |                        |       |                                    |        |   |               |                    |     |
| DEPTH  |         | Rosette Notes          |       | Hydro Sampling                     |        | CHLOR Samples   |               | Comments           |     |
| NO   | DESIRED | SALT #                 | NUT # | OXY #                              | Btl ID | Chl Vol   | Filter Vial # |                    |     |
| 1  | 200     |                        | 167   |                                    |        |   |               | 1                  |     |
| 2  | 100     |                        | 168   |                                    |        |   |               | 2                  |     |
| 3  | 50      |                        | 169   |                                    | 138    |   | 6             | 3                  |     |
| 4  | 40      |                        | 170   |                                    | 137    |   | 5             | 4                  |     |
| 5  | 30      |                        | 171   |                                    | 136    |   | 4             | 5                  |     |
| 6  | 20      |                        | 172   |                                    | 135    |   | 3             | 6                  |     |
| 7  | 10      |                        | 173   |                                    | 134    |   | 2             | 7                  |     |
| 8  | 0       |                        | 174   |                                    | 133    |   | 1             | 8                  |     |

Pycnocline Depth

Fluor Max Depth



| VESSEL  |               | CRUISE ID (e.g. 1NW12) |           | PROJECT & LEG    |        | If you download data after cast- fill this out |               | STATION NO. |          |          |           |            |            |          |             |      |         |                   |              |
|---|---------------|------------------------|-----------|------------------|--------|--|---------------|-------------|----------|----------|-----------|------------|------------|----------|-------------|------|---------|-------------------|--------------|
| Northwest Explorer 2012   |               | 1 NW12                 |           | GOA-ERP-UTL 2012 |        | Filename=                                      |               | 056         |          |          |           |            |            |          |             |      |         |                   |              |
| CTD CAST #  | LATITUDE      |                        | LONGITUDE |                  | G M T  |  | TIME (GMT)    | DRY BULB    | WET BULB | PRESSURE | SEA STATE | VISIBILITY | WIND DIRN. | WIND SPD | CLOUD (amt) | TYPE | WEATHER | BOTTO M DEPTH (m) | STA. NAME/ID |
| 18457   | 02. 04 N      | 137 06. 19 S W         | 14 30 11  | 12 15 33         |        |  |               |             |          |          |           |            |            |          |             |      |         | 16735             | EGH/05       |
| Sensor S/N (At Start of cruise or swap) Local Time (ADT) 1 2<br>SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1&2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transmittometer S/N<br>PAR S/N<br>O2 SBE42S/N |               |                        |           |                  |        |  |               |             |          |          |           |            |            |          |             |      |         |                   |              |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>Location: cloudy overcast<br>20.8.2012 0-324 2005  |               |                        |           |                  |        |  |               |             |          |          |           |            |            |          |             |      |         |                   |              |
| NO DESIRED  | Rosette Notes | Hydro Sampling         |           | CHLOR Samples    |        | Comments                                       |               |             |          |          |           |            |            |          |             |      |         |                   |              |
|   |               | SALT #                 | Nut #     | OXY #            | Bil ID | Chl VOL  | Filter Vial # |             |          |          |           |            |            |          |             |      |         |                   |              |
| 1 200   |               |                        | 175       |                  |        |  |               |             |          |          |           |            |            |          |             |      |         |                   |              |
| 2 100   |               |                        | 176       |                  |        |  |               |             |          |          |           |            |            |          |             |      |         |                   |              |
| 3 50  |               |                        | 177       |                  | 144    | 130  | 6             |             |          |          |           |            |            |          |             |      |         |                   |              |
| 4 40  |               |                        | 178       |                  | 143    | 130  | 5             |             |          |          |           |            |            |          |             |      |         |                   |              |
| 5 30  |               |                        | 179       |                  | 142    | 130  | 4             |             |          |          |           |            |            |          |             |      |         |                   |              |
| 6 20  |               |                        | 180       |                  | 141    | 130  | 3             |             |          |          |           |            |            |          |             |      |         |                   |              |
| 7 10  |               |                        | 181       |                  | 140    | 130  | 2             |             |          |          |           |            |            |          |             |      |         |                   |              |
| 8 0   |               |                        | 182       |                  | 139    | 130  | 1             |             |          |          |           |            |            |          |             |      |         |                   |              |

Pycnocline Depth

Fluor Max Depth

MAX DEPTH = 200.64

|  |                     |                        |       |                                    |  |   |          |                    |          |
|--|---------------------|------------------------|-------|------------------------------------|--|---|----------|--------------------|----------|
| VESSEL<br>Northwest Explorer 2012  |                     | CRUISE ID (e.g. 1NW12) |       | PROJECT & LEG<br>GOA-IERP-JUL 2012 |  | If you download data after cast- fill this out<br>Filename= |          | STATION NO.<br>058 |          |
| CTD<br>CAST #  | LATITUDE<br>DEG MIN | LONGITUDE<br>DEG MIN   |       | G M T<br>DAY MO YR                 |  | TIME<br>(GMT)   | DRY BULB | WET BULB           | PRESSURE |
| 0255652  | 45 N                | 13728.86W              |       | 14 JUL 12                          |  | 1106  |          |                    |          |
| Sensor S/N (At Start of cruise or swap out local time (ADT))<br>SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1 & 2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transducer S/N<br>PAR S/N<br>O2 SBE42S/N |                     |                        |       |                                    |  |   |          |                    |          |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>WEATHER: Partly cloudy, partly overcast<br>sea state: 2-3 ft seas   |                     |                        |       |                                    |  |   |          |                    |          |
| NO DESIRE  | ROSETTE NO.         | SALT #                 | Nut # | OXY #                              | CHI OR Samples<br>Btl ID CHI VOL Filter Vial # | Comments  |          |                    |          |
| 1  | 200                 |                        | 183   |                                    |  |   |          |                    |          |
| 2  | 150                 |                        | 184   |                                    |  |   |          |                    |          |
| 3  | 50                  |                        | 185   |                                    | 150  |   |          |                    |          |
| 4  | 40                  |                        | 186   |                                    | 149  |   |          |                    |          |
| 5  | 30                  |                        | 187   |                                    | 148  |   |          |                    |          |
| 6  | 20                  |                        | 188   |                                    | 147  |   |          |                    |          |
| 7  | 10                  |                        | 189   |                                    | 146  |   |          |                    |          |
| 8  | 0                   |                        | 190   |                                    | 145  |   |          |                    |          |

Pycnocline Depth

Fluor Max Depth

MAX DEPTH = 206.43

|  |  |                        |  |                        |  |                  |  |   |  |                    |  |
|--|--|------------------------|--|------------------------|--|------------------|--|---|--|--------------------|--|
| VESSEL<br>Northwest Explorer 2012  |  | CRUISE ID (e.g. 1NM12) |  | PROJECT & LEG<br>1NW12 |  | GOA-ERP-UTL 2012 |  | If you download data after cast, fill this out<br>Filename= |  | STATION NO.<br>054 |  |
| CTD CAST #   |  | LATITUDE               |  | LONGITUDE              |  | G M T            |  | TIME (GMT)  |  | DRY BULB           |  |
| DEG MIN  |  | DEG MIN                |  | DAY MO                 |  | YR               |  | HR MIN  |  | Temp (°C)          |  |
| 180 42   |  | 25 N                   |  | 138 09                 |  | 174 W            |  | 15 26   |  | 1 2 50 81          |  |
| Sensor S/N (At Start of cruise or swap out Local Time (ADT))   |  |                        |  |                        |  |                  |  |   |  |                    |  |
| SBE type and S/N   |  |                        |  |                        |  |                  |  |   |  |                    |  |
| PRESS S/N  |  |                        |  |                        |  |                  |  |   |  |                    |  |
| TEMP 1 & 2 S/N   |  |                        |  |                        |  |                  |  |   |  |                    |  |
| COND 1&2 S/N   |  |                        |  |                        |  |                  |  |   |  |                    |  |
| FLUOR S/N  |  |                        |  |                        |  |                  |  |   |  |                    |  |
| O2 (SBE43) S/N   |  |                        |  |                        |  |                  |  |   |  |                    |  |
| Transducer S/N   |  |                        |  |                        |  |                  |  |   |  |                    |  |
| PAR S/N  |  |                        |  |                        |  |                  |  |   |  |                    |  |
| O2 SBE 42 S/N  |  |                        |  |                        |  |                  |  |   |  |                    |  |
| <p>COMMENT: Difficult conditions, factors that may affect measurements or aid processing</p> <p>USEFULLY<br/>SEA STATE</p> <p>Bottom depth was unable to be determined but was known to be greater than 3000 meters.</p> |  |                        |  |                        |  |                  |  |   |  |                    |  |
| No. OF PTH   |  | Roseette Notes         |  | Hydro Sampling         |  | CHLOR Sampling   |  | Comments  |  | No.                |  |
| No. DESIRED  |  | SALT #                 |  | NO. #                  |  | OXY #            |  | Btl ID Chl Vol. Filler Vial #                               |  | No.                |  |
| 1 200  |  | 149                    |  | 191                    |  | 88               |  |   |  | 1                  |  |
| 2 100  |  |                        |  | 198                    |  |                  |  |   |  | 2                  |  |
| 3 50   |  |                        |  | 193                    |  |                  |  | 136   |  | 3                  |  |
| 4 40   |  |                        |  | 194                    |  |                  |  | 135   |  | 4                  |  |
| 5 30   |  |                        |  | 195                    |  |                  |  | 134   |  | 5                  |  |
| 6 20   |  |                        |  | 196                    |  |                  |  | 133   |  | 6                  |  |
| 7 10   |  |                        |  | 197                    |  |                  |  | 132   |  | 7                  |  |
| 8 0  |  |                        |  | 198                    |  |                  |  | 131   |  | 8                  |  |

Pycnocline Depth

Fluor Max Depth

|   |      |                        |       |                                   |        |   |               |                    |     |
|---|------|------------------------|-------|-----------------------------------|--------|---|---------------|--------------------|-----|
| VESSEL<br>Northwest Explorer 2012   |      | CRUISE ID (e.g. 1NM12) |       | PROJECT & LEG<br>GOA-ERP-UTL 2012 |        | If you download data after cast- fill this out<br>Filename= |               | STATION NO.<br>455 |     |
| CTD CAST #  |      | LATITUDE               |       | LONGITUDE                         |        | G M T   |               | TIME (GMT)         |     |
| DEG   | MIN  | DEG                    | MIN   | DAY                               | MO     | YR  | HR            | MIN                | SEC |
| 081   | 57   | 00                     | 29    | N                                 | 18     | 08  | 15            | 30                 | 11  |
| Sensor S/N (At Start of cruise or swap-out Local Time (ADT))  |      |                        |       |                                   |        |   |               |                    |     |
| SBE type and S/N  |      |                        |       |                                   |        |   |               |                    |     |
| PRESS S/N   |      |                        |       |                                   |        |   |               |                    |     |
| TEMP 1 & 2 S/Ns   |      |                        |       |                                   |        |   |               |                    |     |
| COND 1&2 S/Ns   |      |                        |       |                                   |        |   |               |                    |     |
| FLUOR S/N   |      |                        |       |                                   |        |   |               |                    |     |
| O2 (SBE43) S/N  |      |                        |       |                                   |        |   |               |                    |     |
| TRANSMISSION S/N  |      |                        |       |                                   |        |   |               |                    |     |
| PAR S/N   |      |                        |       |                                   |        |   |               |                    |     |
| D2 SBE42S/N   |      |                        |       |                                   |        |   |               |                    |     |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>WEATHER ON 08/08/12 - CLOUDY (NO RAIN)<br>SEA STATE 1-2/3 SWS<br>NO SIGNIFICANT WIND INCREASED DUE TO PUMP SWINGING LEFT ON THE INSTRUMENT   |      |                        |       |                                   |        |   |               |                    |     |
| Sensor S/N (At Start of cruise or swap-out Local Time (ADT))<br>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 |      |                        |       |                                   |        |   |               |                    |     |
| NAI DEPTH   |      | Rosette No/Se          |       | Hydro Sampling                    |        | CHLOR Samples   |               | Comments           |     |
| NO DESIRED  |      | SALT #                 | Nut # | OXY #                             | Bit ID | Ch Vol  | Filter Vial # |                    |     |
| 1   | 0600 |                        | 199   |                                   |        |   |               |                    | 1   |
| 2   | 1000 |                        | 200   |                                   |        |   |               |                    | 2   |
| 3   | 1500 |                        | 201   |                                   | 168    | 130   | 6             |                    | 3   |
| 4   | 2000 |                        | 202   |                                   | 161    | 130   | 5             |                    | 4   |
| 5   | 2500 |                        | 203   |                                   | 160    | 130   | 4             |                    | 5   |
| 6   | 3000 |                        | 204   |                                   | 159    | 130   | 3             |                    | 6   |
| 7   | 3500 |                        | 205   |                                   | 158    | 130   | 2             |                    | 7   |
| 8   | 4000 |                        | 206   |                                   | 157    | 130   | 1             |                    | 8   |

Pycnocline Depth

Fluor Max Depth

| VESSEL   |          | CRUISE ID (e.g. 1NW12) |           | PROJECT & LEG     |       | If you download data after cast- fill this out |               | STATION NO. |          |           |           |            |              |             |             |               |         |                     |               |
|--|----------|------------------------|-----------|-------------------|-------|--|---------------|-------------|----------|-----------|-----------|------------|--------------|-------------|-------------|---------------|---------|---------------------|---------------|
| Northwest Explorer 2012  |          | 1NW12                  |           | GOA-IERP-UTL 2012 |       | Filename =                                     |               | 057         |          |           |           |            |              |             |             |               |         |                     |               |
| CTD<br>CAST #  | LATITUDE |                        | LONGITUDE |                   | G M T |  | TIME<br>(GMT) | DRY BULB    | WET BULB | PRESSURE  | SEA STATE | VISIBILITY | WIND<br>DIRN | WIND<br>SPD | CLOUD (amt) | CLOUD<br>TYPE | WEATHER | BOTTO<br>M<br>DEPTH | STA<br>NAMEID |
|  | DEG      | MIN                    | DEG       | MIN               | DAY   | MO   | YR            | HR          | MIN      | Temp (°C) | Temp (°C) | (mb)       | (deg)        | (kts)       | (%)         |               |         | (m)                 |               |
| 020857   | 10       | 40                     | N         | 27                | 57    | 09   | W             | 15          | 30       | 11        | 12        | 00         | 09           | 08          |             |               |         | 3580                | 04160         |
| Sensor S/N (At Start of cruise or swap)<br>SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1&2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transmittometer S/N<br>PAR S/N<br>O2 SBE42S/N |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>weather cloudy period<br>20.2000-2.57 2003  |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| Local Time (ADT)   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| 1 2  |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| MAX DEPTH = 0145   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| Comments   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| Hydro Sampling   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| SALT # Nut # OXY # Btl ID Chl Vol Filter Vial #  |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| CHLOR Samples  |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| No DESIREL   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| Rosette Notes  |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| No   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| 1 200 207 168 130 6 161 130 2 163 130 1  |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| 2 100 208  |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| 3 20 200 167 130 5 161 130 3 163 130 1   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| 4 40 210 167 130 5 161 130 3 163 130 1   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| 5 20 211 166 130 4 161 130 3 163 130 1   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| 6 20 212 165 130 3 161 130 3 163 130 1   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| 7 10 213 164 130 2 161 130 3 163 130 1   |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |
| 8 0 214 163 130 1 161 130 3 163 130 1  |          |                        |           |                   |       |  |               |             |          |           |           |            |              |             |             |               |         |                     |               |

Pycnocline Depth

Fluor Max Depth



| VESSEL   |          | CRUISE ID (e.g. 1NW12) |           | PROJECT & LEG    |     | If you download data after cast- fill this out |            | STATION NO. |          |           |           |            |           |          |             |      |         |              |              |   |
|--|----------|------------------------|-----------|------------------|-----|--|------------|-------------|----------|-----------|-----------|------------|-----------|----------|-------------|------|---------|--------------|--------------|---|
| Northwest Explorer 2012  |          | 1NW12                  |           | GOA-ERP-UTL 2012 |     | Filename=                                      |            | 059         |          |           |           |            |           |          |             |      |         |              |              |   |
| CTD CAST #   | LATITUDE |                        | LONGITUDE |                  | GMT |  | TIME (GMT) | DRY BULB    | WET BULB | PRESSURE  | SEA STATE | VISIBILITY | WIND DIRN | WIND SPD | CLOUD (amt) | TYPE | WEATHER | BOTTOM DEPTH | STA. NAME/ID |   |
|  | DEG      | MIN                    | DEG       | MIN              | DAY | MO   | YR         | HR          | MIN      | Temp (°C) | Temp (°C) | (mb)       | (deg)     | (kts)    | (%)         |      |         | (m)          |              |   |
| 009  | 17       | 19                     | 137       | 05               | 16  | 01   | 12         | 17          | 45       |           |           |            |           |          |             |      |         | 5564         | SL 1410      |   |
| Sensor S/N (At Start of cruise or swap you local Time (ADT)) <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>                          |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| SBE type and S/N <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>  |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| PRESS S/N <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>   |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| TEMP 1 & 2 S/Ns <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>   |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| COND 1&2 S/Ns <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>   |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| FLUOR S/N <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>   |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| O2 (SBE4) S/N <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>   |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| Transducer S/N <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>  |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| PAR S/N <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>   |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| O2 SBE4 S/N <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>   |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table> |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| DEPTH <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>   |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| No DESIRED <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>  |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| Hydro Sampling <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>  |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| CHLOR Samples <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>   |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |
| Comments <table border="1"> <tr> <td>1</td> <td>2</td> </tr> </table>  |          |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              | 1            | 2 |
| 1  | 2        |                        |           |                  |     |  |            |             |          |           |           |            |           |          |             |      |         |              |              |   |

|  |     |                         |     |                        |    |                  |    |  |          |                    |          |
|--|-----|-------------------------|-----|------------------------|----|------------------|----|--|----------|--------------------|----------|
| VESSEL<br>Northwest Explorer 2012  |     | CRUISE ID (e.g. 11NW12) |     | PROJECT & LEG<br>11W12 |    | GOA-ERP-UTL 2012 |    | If you download data after cast- fill this out |          | STATION NO.<br>661 |          |
| CTD<br>CAST #  |     | LATITUDE                |     | LONGITUDE              |    | G M T            |    | TIME (GMT)                                     |          | FILENAME =         |          |
| DEG  | MIN | DEG                     | MIN | DAY                    | MO | YR               | HR | MIN  | DRY BULB | WET BULB           | TEMP (C) |
| 130  | 57  | 29                      | 13  | 16                     | 5  | 4                | 1  | 2  | 1        | 0                  | 1        |
| Sensor S/N (At Start of cruise or swap)  |     | SBE Type and S/N        |     | PRESS S/N              |    | TEMP 1 & 2 S/Ns  |    | COND 1 & 2 S/Ns                                |          | FLUOR S/N          |          |
| 02 SBE42SN   |     | 02 SBE42SN              |     | 02 SBE42SN             |    | 02 SBE42SN       |    | 02 SBE42SN                                     |          | 02 SBE42SN         |          |
| PAR S/N  |     | TSM-SCORPIUS S/N        |     | TSM-SCORPIUS S/N       |    | TSM-SCORPIUS S/N |    | TSM-SCORPIUS S/N                               |          | TSM-SCORPIUS S/N   |          |
| 02 SBE42SN   |     | 02 SBE42SN              |     | 02 SBE42SN             |    | 02 SBE42SN       |    | 02 SBE42SN                                     |          | 02 SBE42SN         |          |
| <p>COMMENT: Difficult conditions, factors that may affect measurements or aid processing</p> <p>WEATHER: overcast cloudy</p> <p>SEA STATE: 4-5 ft seas</p> |     |                         |     |                        |    |                  |    |  |          |                    |          |
| NID  |     | DPH                     |     | Rosetta Notes          |    | Hydro Sampling   |    | CHLOR Samples                                  |          | Comments           |          |
| NO DESIRED   |     |                         |     |                        |    | SALT #           |    | Nul #  |          | OXY #              |          |
| 1  |     | 000                     |     |                        |    | 203              |    |  |          | 186                |          |
| 2  |     | 100                     |     |                        |    | 204              |    |  |          | 179                |          |
| 3  |     | 50                      |     |                        |    | 205              |    |  |          | 178                |          |
| 4  |     | 40                      |     |                        |    | 206              |    |  |          | 177                |          |
| 5  |     | 30                      |     |                        |    | 207              |    |  |          | 176                |          |
| 6  |     | 20                      |     |                        |    | 208              |    |  |          | 175                |          |
| 7  |     | 10                      |     |                        |    | 209              |    |  |          | 130                |          |
| 8  |     | 0                       |     |                        |    | 210              |    |  |          | 130                |          |
| NID  |     | DPH                     |     | Rosetta Notes          |    | Hydro Sampling   |    | CHLOR Samples                                  |          | Comments           |          |
| NO DESIRED   |     |                         |     |                        |    | SALT #           |    | Nul #  |          | OXY #              |          |
| 1  |     | 000                     |     |                        |    | 203              |    |  |          | 186                |          |
| 2  |     | 100                     |     |                        |    | 204              |    |  |          | 179                |          |
| 3  |     | 50                      |     |                        |    | 205              |    |  |          | 178                |          |
| 4  |     | 40                      |     |                        |    | 206              |    |  |          | 177                |          |
| 5  |     | 30                      |     |                        |    | 207              |    |  |          | 176                |          |
| 6  |     | 20                      |     |                        |    | 208              |    |  |          | 175                |          |
| 7  |     | 10                      |     |                        |    | 209              |    |  |          | 130                |          |
| 8  |     | 0                       |     |                        |    | 210              |    |  |          | 130                |          |

Pycnocline Depth

Fluor Max Depth

|  |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
|--|---------------------|-----------------------------------|--------------------------------------|------------------------------------|---|---|----------------------|--------------------|--------------------|--------------------|-------------------|---------------------|---------|-------------------------|----------------|
| VESSEL<br>Northwest Explorer 2012  |                     | CRUISE ID (e.g. 11NW12)<br>11NW12 |                                      | PROJECT & LEG<br>GOA-IEEP-UTL 2012 |   | If you download data after cast- fill this out<br>Filename= |                      | STATION NO.<br>469 |                    |                    |                   |                     |         |                         |                |
| CTD<br>CAST #  | LATITUDE<br>DEG MIN | LONGITUDE<br>DEG MIN              | G M T<br>DAY MO YR                   |                                    | TIME<br>(GMT)<br>HR MIN                       | DRY BULB<br>Temp (C)  | WET BULB<br>Temp (C) | PRESSURE<br>(mb)   | SEA STATE<br>(deg) | WIND<br>DIRN (deg) | WIND<br>SPD (kts) | CLOUD (amt)<br>TYPE | WEATHER | BOTTO<br>M DEPTH<br>(m) | STA<br>NAME/ID |
| 2315734.519  | N                   | 113638.68                         | W                                    | 16                                 | 01  | 12  | 0059                 |                    |                    |                    |                   |                     |         | 5725                    | FEI10          |
| Sensor S/N (At Start of cruise or swap)<br>Sensor S/N  |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| SBE type and S/N   |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| PRESS S/N  |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| TEMP 1 & 2 S/Ns  |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| COND 1&2 S/Ns  |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| FLUOR S/N  |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| O2 (SBE43) S/N   |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| Transmittometer S/N  |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| PAR S/N  |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| O2 SBE42S/N  |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>weather: Partly cloudy/sunny<br>sea state: 3-4 ft Sca |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| MAX DEPTH = 202.50   |                     |                                   |                                      |                                    |   |   |                      |                    |                    |                    |                   |                     |         |                         |                |
| NA DEPTH   | Toshiba Notes       |                                   | Hydro Sampling<br>SALT # Nut # OXY # |                                    | CHLOR Samples<br>Bil ID Chl VOL Filter Vial # |   | Comments             |                    | NAIS               |                    |                   |                     |         |                         |                |
| No DESIRED   |                     |                                   |                                      |                                    |   |   |                      |                    | No.                |                    |                   |                     |         |                         |                |
| 1 200  |                     |                                   | 231                                  |                                    |   |   |                      |                    | 1                  |                    |                   |                     |         |                         |                |
| 2 100  |                     |                                   | 232                                  |                                    |   |   |                      |                    | 2                  |                    |                   |                     |         |                         |                |
| 3 50   |                     |                                   | 233                                  |                                    | 186 130                                       |   | 5                    |                    | 3                  |                    |                   |                     |         |                         |                |
| 4 40   |                     |                                   | 234                                  |                                    | 185 130                                       |   | 5                    |                    | 4                  |                    |                   |                     |         |                         |                |
| 5 30   |                     |                                   | 235                                  |                                    | 184 130                                       |   | 2                    |                    | 5                  |                    |                   |                     |         |                         |                |
| 6 20   |                     |                                   | 236                                  |                                    | 183 130                                       |   | 3                    |                    | 6                  |                    |                   |                     |         |                         |                |
| 7 10   |                     |                                   | 237                                  |                                    | 182 130                                       |   | 2                    |                    | 7                  |                    |                   |                     |         |                         |                |
| 8 0  |                     |                                   | 238                                  |                                    | 181 130                                       |   | 1                    |                    | 8                  |                    |                   |                     |         |                         |                |

Pycnocline Depth

Fluor Max Depth



|   |  |   |  |                        |  |                  |  |   |  |                     |  |
|---|--|---|--|------------------------|--|------------------|--|---|--|---------------------|--|
| VESSEL<br>Northwest Explorer 2012       |  | CRUISE ID (e.g. 1NW12)  |  | PROJECT & LEG<br>1NW12 |  | GOA-ERP-JTL 2012 |  | if you download data after cast- fill this out<br>Filename= |  | STATION NO.<br>064  |  |
| CTD<br>CAST #                           |  | LATITUDE  |  | LONGITUDE              |  | G M T            |  | TIME<br>(GMT)   |  | BOTTO<br>M<br>DEPTH |  |
| DEG MIN                                 |  | DEG MIN   |  | DAY MO YR              |  | HR MIN           |  | Temp (°C)   |  | Temp (°C)           |  |
| 238573.9                                |  | 57.13   |  | 16.02                  |  | 16.02            |  | 11.2  |  | 16.02               |  |
| Sensor S/N (At Start of cruise or swap) |  | Local Time (AOT)  |  | 1                      |  | 2                |  |   |  | MAX DEPTH =         |  |
| SBE type and S/N                        |  | COMMENT: Difficult conditions, factors that may affect measurements or aid processing |  |                        |  |                  |  |   |  |                     |  |
| PRESS S/N                               |  | 0025157 Sunny 16 July 2004  |  |                        |  |                  |  |   |  |                     |  |
| TEMP 1 & 2 S/Ns                         |  | SEA STATE 2-3 m 200   |  |                        |  |                  |  |   |  |                     |  |
| COND 1&2 S/Ns                           |  |   |  |                        |  |                  |  |   |  |                     |  |
| FLUOR S/N                               |  |   |  |                        |  |                  |  |   |  |                     |  |
| O2 (SBE43) S/N                          |  |   |  |                        |  |                  |  |   |  |                     |  |
| Transducer S/N                          |  |   |  |                        |  |                  |  |   |  |                     |  |
| PAR S/N                                 |  |   |  |                        |  |                  |  |   |  |                     |  |
| O2 SBE42 S/N                            |  |   |  |                        |  |                  |  |   |  |                     |  |
| NIT DEPTH                               |  | Rosette Notes   |  | Hydro Sampling         |  | CHLOR Samples    |  | Comments  |  | NIT                 |  |
| NO DESIRED                              |  | SALT #  |  | NUT #                  |  | OXY #            |  | BIL ID CHL VOL Filter Vial #                                |  | No.                 |  |
| 1                                       |  | 151   |  | 846                    |  | 102              |  | 102   |  | 1                   |  |
| 2                                       |  | 40  |  | 247                    |  | 197              |  | 190   |  | 2                   |  |
| 3                                       |  | 30  |  | 218                    |  | 196              |  | 190   |  | 3                   |  |
| 4                                       |  | 80  |  | 249                    |  | 195              |  | 190   |  | 4                   |  |
| 5                                       |  | 10  |  | 250                    |  | 194              |  | 130   |  | 5                   |  |
| 6                                       |  | 0   |  | 251                    |  | 193              |  | 150   |  | 6                   |  |
| 7                                       |  |   |  |                        |  |                  |  |   |  | 7                   |  |
| 8                                       |  |   |  |                        |  |                  |  |   |  | 8                   |  |

Pycnocline Depth

Fluor Max Depth

| VESSEL<br>Northwest Explorer 2012   |       | CRUISE ID (e.g. 1NW12)<br>1NW12 |                | PROJECT & LEG<br>GOA-IERP-UTL 2012 |               | if you download data after cast- fill this out<br>Filename= |          | STATION NO.<br>465   |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
|---|-------|---------------------------------|----------------|------------------------------------|---------------|---|----------|----------------------|---------|---------------|-------|---------------|----------------|--|---------------|--|----------|----|--------|-------|-------|-------|---------|---------------|---|----|--|--|-----|--|-----|-----|---|--|---|-----|--|--|-----|--|-----|-----|---|--|---|-----|--|--|-----|--|-----|-----|---|--|---|-----|--|--|-----|--|-----|-----|---|--|---|----|--|--|-----|--|-----|-----|---|--|---|---|--|--|-----|--|-----|-----|---|--|---|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|
| CTD<br>CAST #   |       | LATITUDE<br>DEG MIN             |                | LONGITUDE<br>DEG MIN               |               | G M T<br>DAY MO YR  |          | TIME<br>(GMT) HR MIN |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 03457   |       | 57.26 N                         |                | 13639.58 W                         |               | 17301   |          | 121510               |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| Sensor S/N (At Start of cruise or swapout/Local Time (ADT))   |       | PRESS S/N                       |                | TEMP 1 & 2 S/Ns                    |               | COND 1&2 S/Ns   |          | FLUOR S/N            |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
|   |       |                                 |                |                                    |               |   |          |                      |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| D2 (SBE43) S/N  |       | TRANSDUCER S/N                  |                | PAR S/N                            |               | O2 SBE42S/N   |          |                      |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
|   |       |                                 |                |                                    |               |   |          |                      |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing   |       |                                 |                |                                    |               |   |          |                      |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <table border="1"> <thead> <tr> <th rowspan="2">No</th> <th rowspan="2">DEPTH</th> <th rowspan="2">Rosette Notes</th> <th colspan="2">Hydro Sampling</th> <th colspan="2">CHLOR Samples</th> <th rowspan="2">Comments</th> <th rowspan="2">No</th> </tr> <tr> <th>SALT #</th> <th>Nut #</th> <th>OXY #</th> <th>BI ID</th> <th>Chl Vol</th> <th>Filter Vial #</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>50</td> <td></td> <td></td> <td>254</td> <td></td> <td>204</td> <td>130</td> <td>6</td> <td></td> </tr> <tr> <td>2</td> <td>110</td> <td></td> <td></td> <td>255</td> <td></td> <td>203</td> <td>136</td> <td>5</td> <td></td> </tr> <tr> <td>3</td> <td>330</td> <td></td> <td></td> <td>256</td> <td></td> <td>202</td> <td>130</td> <td>4</td> <td></td> </tr> <tr> <td>4</td> <td>200</td> <td></td> <td></td> <td>257</td> <td></td> <td>201</td> <td>130</td> <td>3</td> <td></td> </tr> <tr> <td>5</td> <td>10</td> <td></td> <td></td> <td>258</td> <td></td> <td>200</td> <td>130</td> <td>2</td> <td></td> </tr> <tr> <td>6</td> <td>0</td> <td></td> <td></td> <td>259</td> <td></td> <td>199</td> <td>130</td> <td>1</td> <td></td> </tr> <tr> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> |       |                                 |                |                                    |               |   |          |                      |         | No            | DEPTH | Rosette Notes | Hydro Sampling |  | CHLOR Samples |  | Comments | No | SALT # | Nut # | OXY # | BI ID | Chl Vol | Filter Vial # | 1 | 50 |  |  | 254 |  | 204 | 130 | 6 |  | 2 | 110 |  |  | 255 |  | 203 | 136 | 5 |  | 3 | 330 |  |  | 256 |  | 202 | 130 | 4 |  | 4 | 200 |  |  | 257 |  | 201 | 130 | 3 |  | 5 | 10 |  |  | 258 |  | 200 | 130 | 2 |  | 6 | 0 |  |  | 259 |  | 199 | 130 | 1 |  | 7 |  |  |  |  |  |  |  |  |  | 8 |  |  |  |  |  |  |  |  |  |
| No  | DEPTH | Rosette Notes                   | Hydro Sampling |                                    | CHLOR Samples |   | Comments | No                   |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
|   |       |                                 | SALT #         | Nut #                              | OXY #         | BI ID   |          |                      | Chl Vol | Filter Vial # |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 1   | 50    |                                 |                | 254                                |               | 204   | 130      | 6                    |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 2   | 110   |                                 |                | 255                                |               | 203   | 136      | 5                    |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 3   | 330   |                                 |                | 256                                |               | 202   | 130      | 4                    |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 4   | 200   |                                 |                | 257                                |               | 201   | 130      | 3                    |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 5   | 10    |                                 |                | 258                                |               | 200   | 130      | 2                    |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 6   | 0     |                                 |                | 259                                |               | 199   | 130      | 1                    |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 7   |       |                                 |                |                                    |               |   |          |                      |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 8   |       |                                 |                |                                    |               |   |          |                      |         |               |       |               |                |  |               |  |          |    |        |       |       |       |         |               |   |    |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |     |  |  |     |  |     |     |   |  |   |    |  |  |     |  |     |     |   |  |   |   |  |  |     |  |     |     |   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |

Pycnocline Depth

Fluor Max Depth

MAX DEPTH = 71.95



VESSEL Northwest Explorer 2012  
 CRUISE ID (e.g. 11NW12) 1NW12  
 PROJECT & LEG GOA-IERP-UTL 2012  
 If you download data after cast, fill this out  
 STATION NO. 066

| CTD CAST # | LATITUDE |       | LONGITUDE |        | GMT |    |    | TIME (GMT) | DRY BULB | WET BULB | PRESSURE | SEA STATE | VISIBILITY | WIND DIRN. | WIND SPD (kts) | CLOUD (amt) | TYPE | WEATHER | BOTTO M DEPTH (m) | STA. NAME/ID |
|------------|----------|-------|-----------|--------|-----|----|----|------------|----------|----------|----------|-----------|------------|------------|----------------|-------------|------|---------|-------------------|--------------|
|            | DEG      | MIN   | DEG       | MIN    | DAY | MO | YR |            |          |          |          |           |            |            |                |             |      |         |                   |              |
| 0355       | 25       | 4.06N | 136       | 47.42E | 17  | 30 | 12 | 16         | 57       |          |          |           |            |            |                |             |      |         | 147               | SEK          |

Sensor S/N (At Start of cruise or swap) \_\_\_\_\_  
 Local Time (ADT) \_\_\_\_\_  
 1 2

COMMENT: Difficult conditions, factors that may affect measurements or aid processing  
 4000m - 2000m/overcast  
 2-3m

S&E type and S/N \_\_\_\_\_  
 PRESS S/N \_\_\_\_\_  
 TEMP 1 & 2 S/Ns \_\_\_\_\_  
 COND 1&2 S/Ns \_\_\_\_\_  
 FLUOR S/N \_\_\_\_\_  
 O2 (SBE43) S/N \_\_\_\_\_  
 Transmissometer S/N \_\_\_\_\_  
 PAR S/N \_\_\_\_\_  
 O2 SBE42S/N \_\_\_\_\_

| NIS | DEPTH | No. DESIRED | Rosette Notes | Hydro Sampling |       | CHLOR Samples |        | Comments | NIS |
|-----|-------|-------------|---------------|----------------|-------|---------------|--------|----------|-----|
|     |       |             |               | SALT #         | Nut # | OXY #         | BII ID |          |     |
| 1   | 100   |             |               |                | 260   |               |        |          | 1   |
| 2   | 50    |             |               |                | 261   |               | 210    | 130      | 6   |
| 3   | 40    |             |               |                | 262   |               | 209    | 130      | 5   |
| 4   | 30    |             |               |                | 263   |               | 208    | 130      | 4   |
| 5   | 20    |             |               |                | 264   |               | 207    | 130      | 3   |
| 6   | 10    |             |               |                | 265   |               | 206    | 130      | 2   |
| 7   | 0     |             |               |                | 266   |               | 205    | 130      | 1   |
| 8   |       |             |               |                |       |               |        |          |     |

Pycnocline Depth \_\_\_\_\_  
 Fluor Max Depth \_\_\_\_\_

|   |  |                        |  |                        |  |                   |  |   |  |                       |  |
|---|--|------------------------|--|------------------------|--|-------------------|--|---|--|-----------------------|--|
| VESSEL<br>Northwest Explorer 2012   |  | CRUISE ID (e.g. 1NW12) |  | PROJECT & LEG<br>1NW12 |  | GOA-IERP-UTL 2012 |  | If you download data after cast, fill this out<br>Filename= |  | STATION NO.<br>067    |  |
| CTD CAST #  |  | LATITUDE               |  | LONGITUDE              |  | G M T             |  | TIME (GMT)  |  | DRY BULB              |  |
| DEG MIN   |  | DEG MIN                |  | DAY MO YR              |  | HR MIN            |  | Temp (C)  |  | Temp (C)              |  |
| 03 57   |  | 50 51 N                |  | 13 55 17 30 1          |  | 12 18 30          |  |   |  |                       |  |
| Sensor S/N (At Start of cruise or swap) Local Time (ADT)  |  |                        |  |                        |  |                   |  |   |  |                       |  |
| SBE type and S/N  |  |                        |  |                        |  |                   |  |   |  |                       |  |
| PRESS S/N   |  |                        |  |                        |  |                   |  |   |  |                       |  |
| TEMP 1 & 2 S/Ns   |  |                        |  |                        |  |                   |  |   |  |                       |  |
| COND 1 & 2 S/Ns   |  |                        |  |                        |  |                   |  |   |  |                       |  |
| FLUOR S/N   |  |                        |  |                        |  |                   |  |   |  |                       |  |
| O2 (SBE43) S/N  |  |                        |  |                        |  |                   |  |   |  |                       |  |
| Transmittance S/N   |  |                        |  |                        |  |                   |  |   |  |                       |  |
| PAR S/N   |  |                        |  |                        |  |                   |  |   |  |                       |  |
| O2 SBE42 S/N  |  |                        |  |                        |  |                   |  |   |  |                       |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>WEATHER<br>SEA STATE<br>Recasted due to data acquisition timeout |  |                        |  |                        |  |                   |  |   |  |                       |  |
| NO DESIRED  |  | Rosette Notes          |  | Hydro Sampling         |  | CHLOR Samples     |  | Comments  |  | No                    |  |
| NO DESIRED  |  | SALT #                 |  | NUT #                  |  | OXY #             |  | Btl ID  |  | Chl Vol Filler Vial # |  |
| 1 900   |  |                        |  | 267                    |  |                   |  | 216   |  | 130                   |  |
| 2 00  |  |                        |  | 268                    |  |                   |  | 216   |  | 130                   |  |
| 3 50  |  |                        |  | 269                    |  |                   |  | 216   |  | 130                   |  |
| 4 40  |  |                        |  | 270                    |  |                   |  | 215   |  | 130                   |  |
| 5 30  |  |                        |  | 271                    |  |                   |  | 214   |  | 130                   |  |
| 6 20  |  |                        |  | 272                    |  |                   |  | 213   |  | 130                   |  |
| 7 10  |  |                        |  | 273                    |  |                   |  | 212   |  | 130                   |  |
| 8 0   |  |                        |  | 274                    |  |                   |  | 211   |  | 130                   |  |
| Pycnocline Depth<br>Fluor Max Depth   |  |                        |  |                        |  |                   |  |   |  |                       |  |

|   |  |                        |  |                         |  |                              |  |  |  |   |  |
|---|--|------------------------|--|-------------------------|--|------------------------------|--|--|--|---|--|
| VESSEL<br>Northwest Explorer 2012   |  | CRUISE ID (e.g. 1NW12) |  | PROJECT & LEG<br>1 NW12 |  | GOA-ERP-UTL 2012             |  | If you download data after cast- fill this out |  | STATION NO.<br>468  |  |
| CTD<br>CAST #   |  | LATITUDE               |  | LONGITUDE               |  | G M T                        |  | TIME<br>(GMT)                                  |  | DRY BULB<br>WET BULB<br>PRESSURE<br>SEA STATE<br>VISIBILITY<br>WIND<br>DIRN<br>WIND<br>SPD<br>(kts)<br>CLOUD (amt)<br>TYPE<br>WEATHER |  |
| DEG MIN   |  | DEG MIN                |  | DAY MO YR               |  | HR MIN                       |  | Temp (°C)                                      |  | Temp (°C) (mb)  |  |
| 0375342.59 N  |  | 132.11                 |  | 28 W 17501              |  | 12 31 17                     |  |  |  |   |  |
| Sensor S/N (At Start of cruise or swap)   |  |                        |  |                         |  |                              |  |  |  |   |  |
| SBE type and S/N  |  |                        |  |                         |  |                              |  |  |  |   |  |
| PRESS S/N   |  |                        |  |                         |  |                              |  |  |  |   |  |
| TEMP 1 & 2 S/Ns   |  |                        |  |                         |  |                              |  |  |  |   |  |
| COND 1&2 S/Ns   |  |                        |  |                         |  |                              |  |  |  |   |  |
| FLUOR S/N   |  |                        |  |                         |  |                              |  |  |  |   |  |
| O2 (SBE4) S/N   |  |                        |  |                         |  |                              |  |  |  |   |  |
| Transmissometer S/N   |  |                        |  |                         |  |                              |  |  |  |   |  |
| PAR S/N   |  |                        |  |                         |  |                              |  |  |  |   |  |
| O2 SBE42S/N   |  |                        |  |                         |  |                              |  |  |  |   |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing |  |                        |  |                         |  |                              |  |  |  |   |  |
| USE MAX 1<br>SEA STATE  |  |                        |  |                         |  |                              |  |  |  |   |  |
| MAX DEPTH = 201.45  |  |                        |  |                         |  |                              |  |  |  |   |  |
| MAX DEPTH =   |  |                        |  |                         |  |                              |  |  |  |   |  |
| NIS DEPTH   |  | ROSETTE NOTES          |  | HYDRO SAMPLING          |  | CHLOR SAMPLING               |  | Comments                                       |  | NIS   |  |
| NO DESIRED  |  |                        |  | SALT # NUT # OXY #      |  | Btl ID Chl Vol Filler Vial # |  |  |  | No.   |  |
| 1 200   |  |                        |  | 275                     |  |                              |  |  |  | 1   |  |
| 2 100   |  |                        |  | 276                     |  |                              |  |  |  | 2   |  |
| 3 50  |  |                        |  | 277                     |  | 202 30                       |  |  |  | 3   |  |
| 4 40  |  |                        |  | 278                     |  | 201 30                       |  |  |  | 4   |  |
| 5 30  |  |                        |  | 279                     |  | 220 30                       |  |  |  | 5   |  |
| 6 20  |  |                        |  | 280                     |  | 219 30                       |  |  |  | 6   |  |
| 7 10  |  |                        |  | 281                     |  | 218 30                       |  |  |  | 7   |  |
| 8 0   |  |                        |  | 282                     |  | 217 30                       |  |  |  | 8   |  |

Pycnocline Depth

Fluor Max Depth

| VESSEL   |   | CRUISE ID (e.g., INW12) |               | PROJECT & LEG     |          | If you download data after cast - fill this out |          | STATION NO. |            |            |         |             |      |         |                |             |
|--|---|-------------------------|---------------|-------------------|----------|---|----------|-------------|------------|------------|---------|-------------|------|---------|----------------|-------------|
| Northwest Explorer 2012  |   | INW12                   |               | GOA-IERP-UTL 2012 |          | Filename=                                       |          | 470         |            |            |         |             |      |         |                |             |
| CTD CAST #   | LATITUDE  | LONGITUDE               | G M T         | TIME (GMT)        | DRY BULB | WET BULB  | PRESSURE | SEA STATE   | VISIBILITY | WIND DIRN. | WIN SPD | CLOUD (amt) | TYPE | WEATHER | BOTTO M DEPTH  | STA NAME/ID |
| 1385138.04 N   | 13743.12 W  | 18301                   | 12            | 1515              |          |   |          | X           | X          |            |         | X           | X    | X       | 2475 SE 411 ft |             |
| Sensor S/N (At Start of cruise or swap) [ou] Local Time (AOBT) |   |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| SBE type and S/N   | COMMENT: Difficult conditions, factors that may affect measurements or aid processing |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| PRESS S/N  |   |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| TEMP 1 & 2 S/Ns  |   |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| COND 1&2 S/Ns  |   |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| FLUOR S/N  |   |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| O2 (SBE43) S/N   |   |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| Translucometer S/N   |   |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| PAR S/N  |   |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| OZ SBE42S/N  |   |                         |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| MISC DEPTH   | Rosette Notes   | Hydro Sampling          | CHLOR Samples | Comments          |          |   |          |             |            |            |         |             |      |         |                |             |
| No DESIRED   | SALT #  | Nut #                   | OXY #         | Btl ID            | Chl Vol  | Filter Vial #                                   |          |             |            |            |         |             |      |         |                |             |
| 1  |   | 283                     |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| 2  |   | 284                     |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| 3  |   | 285                     |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| 4  |   | 286                     |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| 5  |   | 287                     |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| 6  |   | 288                     |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| 7  |   | 289                     |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |
| 8  |   | 290                     |               |                   |          |   |          |             |            |            |         |             |      |         |                |             |

| VESSEL  |                | CRUISE ID (e.g. 11NW12) |                | PROJECT & LEG    |               | If you download data after cast- fill this out |            | STATION NO. |          |          |           |            |            |          |            |         |                  |             |
|---|----------------|-------------------------|----------------|------------------|---------------|--|------------|-------------|----------|----------|-----------|------------|------------|----------|------------|---------|------------------|-------------|
| Northwest Explorer 2012   |                | 11NW12                  |                | GOA-ERP-UTL 2012 |               | Filename =                                     |            | 44-2        |          |          |           |            |            |          |            |         |                  |             |
| CTD CAST #  | LATITUDE       |                         | LONGITUDE      |                  | G M T         |  | TIME (GMT) | DRY BULB    | WET BULB | PRESSURE | SEA STATE | VISIBILITY | WIND DIRN. | WIND SPD | CLOUD TYPE | WEATHER | BOTTOM DEPTH (m) | STA NAME/ID |
| 034   | 57°28.0' N     | 128°15.29' W            | 1830           | 12               | 0039          | .  | .          | .           | .        | .        | x         | x          | (deg)      | (kts)    | .          | .       | 290357465        |             |
| Sensor S/N (At Start of cruise or swapout Local Time (ADT))                           |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| SBE type and S/N  |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| PRESS S/N   |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| TEMP 1 & 2 S/Ns   |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| COND 1&2 S/Ns   |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| FLUOR S/N   |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| O2 (SBE43) S/N  |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| Transducer S/N  |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| PAR S/N   |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| O2 SBE42S/N   |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| USABILITY   |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| GOOD  |                |                         |                |                  |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| ML DEPTH  | Roseette Notes |                         | Hydro Sampling |                  | CHLOR Samples |  | Comments   |             |          |          |           |            |            |          |            |         |                  |             |
| NO DESIRED  |                |                         | SALT #         | Nut #            | OXY #         | BI ID  | CHL VOL    | Filter      | Vial #   |          |           |            |            |          |            |         |                  |             |
| 1   | 200            |                         |                | 241              |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| 2   | 100            |                         |                | 242              |               |  |            |             |          |          |           |            |            |          |            |         |                  |             |
| 3   | 86             |                         |                | 243              |               | 234  | 130        | 6           |          |          |           |            |            |          |            |         |                  |             |
| 4   | 40             |                         |                | 244              |               | 238  | 130        | 5           |          |          |           |            |            |          |            |         |                  |             |
| 5   | 30             |                         |                | 245              |               | 232  | 130        | 4           |          |          |           |            |            |          |            |         |                  |             |
| 6   | 20             |                         |                | 246              |               | 231  | 130        | 3           |          |          |           |            |            |          |            |         |                  |             |
| 7   | 10             |                         |                | 247              |               | 230  | 130        | 2           |          |          |           |            |            |          |            |         |                  |             |
| 8   | 0              |                         |                | 248              |               | 224  | 130        | 1           |          |          |           |            |            |          |            |         |                  |             |

Pycnocline Depth

Fluor Max Depth

|  |               |                         |           |                                   |        |   |               |                       |                       |                  |                         |                    |                   |             |      |         |                      |                 |
|--|---------------|-------------------------|-----------|-----------------------------------|--------|---|---------------|-----------------------|-----------------------|------------------|-------------------------|--------------------|-------------------|-------------|------|---------|----------------------|-----------------|
| VESSEL<br>Northwest Explorer 2012  |               | CRUISE ID (e.g. 11NW12) |           | PROJECT & LEG<br>GOA-ERP-UTL 2012 |        | If you download data after cast, fill this out<br>Filename= |               | STATION NO.<br>078    |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| CTD<br>CAST #  | LATITUDE      |                         | LONGITUDE |                                   | G M T  |   | TIME<br>(GMT) | DRY BULB<br>Temp (°C) | WET BULB<br>Temp (°C) | PRESSURE<br>(mb) | SEA STATE<br>VISIBILITY | WIND<br>DIRN (deg) | WIND<br>SPD (kts) | CLOUD (amt) | TYPE | WEATHER | BOTTO<br>M DEPTH (m) | STA.<br>NAME/ID |
| 04   | DEG           | MIN                     | DEG       | MIN                               | DAY    | MO  | YR            | HR                    | MIN                   |                  |                         |                    |                   |             |      |         | 3176                 | SEW18d          |
|  |               | 46.7                    |           | 129.07                            | 19     | Jul   | 11            | 12                    | 1156                  |                  |                         |                    |                   |             |      |         |                      |                 |
| Sensor S/N (At Start of cruise or swap)<br>Local Time (ADT)  |               |                         |           |                                   |        |   |               |                       |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1&2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transducer S/N<br>PAR S/N<br>O2 SBE43 S/N  |               |                         |           |                                   |        |   |               |                       |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing<br>O2ATOR Overcast cloudy (unclear)<br>Sea State 8-3 m waves<br>(CO2 + Salinity)<br>Could not collect samples from Station 74 (SBE430) due to termination - 2000 yd in air. Surface 20 samples were taken at SBE430 (Station 75) |               |                         |           |                                   |        |   |               |                       |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| NO DESIRED   | Rosette Notes | Hydro Sampling          |           | CHLOR Samples                     |        | Comments  |               |                       |                       |                  |                         |                    |                   |             |      |         |                      |                 |
|  |               | SALT #                  | Nut #     | OXY #                             | Bit ID | Chl Vol   | Filter        | Vial #                |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| 1  | 800           | 153                     | 819       | 105                               |        |   |               |                       |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| 2  | 100           |                         | 300       |                                   |        |   |               |                       |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| 3  | 50            |                         | 301       |                                   | 246    | 130   |               | 6                     |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| 4  | 40            |                         | 300       |                                   | 237    | 130   |               | 5                     |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| 5  | 30            |                         | 303       |                                   | 238    | 130   |               | 4                     |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| 6  | 20            |                         | 301       |                                   | 237    | 130   |               | 3                     |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| 7  | 10            |                         | 305       |                                   | 236    | 130   |               | 2                     |                       |                  |                         |                    |                   |             |      |         |                      |                 |
| 8  | 0             |                         | 306       |                                   | 225    | 130   |               | 1                     |                       |                  |                         |                    |                   |             |      |         |                      |                 |

Pycnocline Depth

Fluor Max Depth



|                                   |  |                        |  |                        |  |                  |  |  |  |                         |  |
|-----------------------------------|--|------------------------|--|------------------------|--|------------------|--|--|--|-------------------------|--|
| VESSEL<br>Northwest Explorer 2012 |  | CRUISE ID (e.g. 1NM12) |  | PROJECT & LEG<br>1NM12 |  | GOA-ERP-URL 2012 |  | If you download data after cast, fill this out<br>Filename = |  | STATION NO.<br>077      |  |
| CTD<br>CAST #                     |  | LATITUDE<br>DEG MIN    |  | LONGITUDE<br>DEG MIN   |  | GMT<br>DAY MO YR |  | TIME<br>(GMT) HR MIN   |  | DRY BULB<br>Temp (°C)   |  |
| 3415746.41 N                      |  | 13834.62 W             |  | 19501 12 2018          |  |                  |  |  |  | WET BULB<br>Temp (°C)   |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | PRESSURE<br>(mb)        |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | SEA STATE<br>VISIBILITY |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | WIND<br>DIRN (deg)      |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | WIND<br>SPD (kts)       |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | CLOUD (amt)             |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | TYPE<br>WEATHER         |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | BOTTO<br>M DEPTH (m)    |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | STA.<br>NAME/ID         |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | 010150460               |  |
|                                   |  |                        |  |                        |  |                  |  |  |  | MAX DEPTH = 201.65      |  |

Sensor S/N (At Start of cruise or swap) Local Time (ADT)

SBE Type and S/N

PRESS S/N

TEMP 1 & 2 S/Ns

COND 1&2 S/Ns

FLUOR S/N

O2 (SBE43) S/N

Transmissometer S/N

PAR S/N

O2 SBE42S/N

COMMENT: Difficult conditions, factors that may affect measurements or aid processing

W201705-0104100005  
201805-02020000

| NIS DEPTH  | Rosette Notes | Hydro Sampling | CHLOR Samples | Comments | NIS    |         |        |        |  |    |
|------------|---------------|----------------|---------------|----------|--------|---------|--------|--------|--|----|
| No DESIRED |               | SALT #         | Nut #         | OXY #    | Bit ID | Chl Vol | Filter | Vial # |  | No |
| 1          | 806           |                | 203           |          |        |         |        |        |  | 1  |
| 2          | 100           |                | 208           |          |        |         |        |        |  | 2  |
| 3          | 50            |                | 209           |          | 246    | 30      |        | 6      |  | 3  |
| 4          | 40            |                | 210           |          | 245    | 25      |        | 3      |  | 4  |
| 5          | 30            |                | 211           |          | 244    | 24      |        | 4      |  | 5  |
| 6          | 20            |                | 212           |          | 243    | 20      |        | 3      |  | 6  |
| 7          | 10            |                | 213           |          | 242    | 20      |        | 2      |  | 7  |
| 8          | 0             |                | 214           |          | 241    | 20      |        | 1      |  | 8  |

Pycnocline Depth

Fluor Max Depth

| VESSEL<br>Northwest Explorer 2012  |       | CRUISE ID (e.g. 1NW12) |                | PROJECT & LEG<br>1NW12 |                | GOA-IERP-UTL 2012  |          | If you download data after cast, fill this out<br>Filename= |         | STATION NO<br>079 |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
|--|-------|------------------------|----------------|------------------------|----------------|--------------------|----------|---|---------|-------------------|--|----|-------|---------------|----------------|--|----------------|--|----------|----|--------|-------|-------|--------|---------|---------------|---|-----|--|--|-----|--|--|--|---|---|-----|--|--|-----|--|--|--|---|---|----|--|--|-----|--|-----|----|---|---|----|--|--|-----|--|-----|----|---|---|----|--|--|-----|--|-----|----|---|---|----|--|--|-----|--|-----|----|---|---|----|--|--|-----|--|-----|----|---|---|---|--|--|-----|--|-----|----|---|
| CTD<br>CAST #  |       | LATITUDE<br>DEG MIN    |                | LONGITUDE<br>DEG MIN   |                | G M T<br>DAY MO YR |          | TIME<br>(GMT) HR MIN  |         | DRY BULB WET BULB |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| DEG MIN  |       | DEG MIN                |                | DEG MIN                |                | DAY MO YR          |          | HR MIN  |         | Temp (C) Temp (C) |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 04 25.90 N   |       | 138 01.91 W            |                | 2011                   |                | 12                 |          | 0153  |         | x x               |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| Sensor S/N (At Start of cruise or swap on local time (ADT))  |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| SSE type and S/N   |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| PRESS S/N  |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| TEMP 1 & 2 S/Ns  |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| COND 1 & 2 S/Ns  |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| FLUOR S/N  |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| O2 (SBE43) S/N   |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| Transmissometer S/N  |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| PAR S/N  |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| O2 SBE42 S/N   |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing  |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 120414<br>20080405   |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| MAX DEPTH = 500 m  |       |                        |                |                        |                |                    |          |   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| <table border="1"> <thead> <tr> <th rowspan="2">No</th> <th rowspan="2">DEPTH</th> <th rowspan="2">ROSETTE NOTES</th> <th colspan="2">HYDRO SAMPLING</th> <th colspan="2">CHLOR SAMPLING</th> <th rowspan="2">Comments</th> <th rowspan="2">No</th> </tr> <tr> <th>SALT #</th> <th>Nut #</th> <th>OXY #</th> <th>Btl ID</th> <th>Chl Vol</th> <th>Filter Vial #</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>200</td> <td></td> <td></td> <td>215</td> <td></td> <td></td> <td></td> <td>1</td> </tr> <tr> <td>2</td> <td>100</td> <td></td> <td></td> <td>216</td> <td></td> <td></td> <td></td> <td>2</td> </tr> <tr> <td>3</td> <td>80</td> <td></td> <td></td> <td>217</td> <td></td> <td>180</td> <td>20</td> <td>6</td> </tr> <tr> <td>4</td> <td>60</td> <td></td> <td></td> <td>218</td> <td></td> <td>251</td> <td>25</td> <td>5</td> </tr> <tr> <td>5</td> <td>40</td> <td></td> <td></td> <td>219</td> <td></td> <td>250</td> <td>20</td> <td>4</td> </tr> <tr> <td>6</td> <td>20</td> <td></td> <td></td> <td>220</td> <td></td> <td>249</td> <td>20</td> <td>3</td> </tr> <tr> <td>7</td> <td>10</td> <td></td> <td></td> <td>221</td> <td></td> <td>248</td> <td>20</td> <td>2</td> </tr> <tr> <td>8</td> <td>0</td> <td></td> <td></td> <td>222</td> <td></td> <td>247</td> <td>20</td> <td>1</td> </tr> </tbody> </table> |       |                        |                |                        |                |                    |          |   |         |                   |  | No | DEPTH | ROSETTE NOTES | HYDRO SAMPLING |  | CHLOR SAMPLING |  | Comments | No | SALT # | Nut # | OXY # | Btl ID | Chl Vol | Filter Vial # | 1 | 200 |  |  | 215 |  |  |  | 1 | 2 | 100 |  |  | 216 |  |  |  | 2 | 3 | 80 |  |  | 217 |  | 180 | 20 | 6 | 4 | 60 |  |  | 218 |  | 251 | 25 | 5 | 5 | 40 |  |  | 219 |  | 250 | 20 | 4 | 6 | 20 |  |  | 220 |  | 249 | 20 | 3 | 7 | 10 |  |  | 221 |  | 248 | 20 | 2 | 8 | 0 |  |  | 222 |  | 247 | 20 | 1 |
| No   | DEPTH | ROSETTE NOTES          | HYDRO SAMPLING |                        | CHLOR SAMPLING |                    | Comments | No  |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
|  |       |                        | SALT #         | Nut #                  | OXY #          | Btl ID             |          |   | Chl Vol | Filter Vial #     |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 1  | 200   |                        |                | 215                    |                |                    |          | 1   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 2  | 100   |                        |                | 216                    |                |                    |          | 2   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 3  | 80    |                        |                | 217                    |                | 180                | 20       | 6   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 4  | 60    |                        |                | 218                    |                | 251                | 25       | 5   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 5  | 40    |                        |                | 219                    |                | 250                | 20       | 4   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 6  | 20    |                        |                | 220                    |                | 249                | 20       | 3   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 7  | 10    |                        |                | 221                    |                | 248                | 20       | 2   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |
| 8  | 0     |                        |                | 222                    |                | 247                | 20       | 1   |         |                   |  |    |       |               |                |  |                |  |          |    |        |       |       |        |         |               |   |     |  |  |     |  |  |  |   |   |     |  |  |     |  |  |  |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |    |  |  |     |  |     |    |   |   |   |  |  |     |  |     |    |   |

Pycnocline Depth

Fluor Max Depth

| VESSEL  |     | CRUISE ID (e.g. 1NW12) |     | PROJECT & LEG    |    | STATION NO |    |
|---|-----|------------------------|-----|------------------|----|------------|----|
| Northwest Explorer 2012   |     | 1NW12                  |     | GOA-ERP-UTL 2012 |    | 081        |    |
| CTD CAST #  |     | LATITUDE               |     | LONGITUDE        |    | GMT        |    |
| DEG   | MIN | DEG                    | MIN | DAY              | MO | YR         | HR |
| 14  | 35  | 05                     | 52  | 20               | 06 | 12         | 17 |
|   |     | N                      |     | W                |    | 1735       |    |
| Sensor S/N (At Start of cruise or swap)   |     |                        |     |                  |    |            |    |
| SBE type and S/N  |     |                        |     |                  |    |            |    |
| PRESS S/N   |     |                        |     |                  |    |            |    |
| TEMP 1 & 2 S/Ns   |     |                        |     |                  |    |            |    |
| COND 1 & 2 S/Ns   |     |                        |     |                  |    |            |    |
| FLUOR S/N   |     |                        |     |                  |    |            |    |
| O2 (SBE43) S/N  |     |                        |     |                  |    |            |    |
| Transducer S/N  |     |                        |     |                  |    |            |    |
| PAR S/N   |     |                        |     |                  |    |            |    |
| O2 SBE42 S/N  |     |                        |     |                  |    |            |    |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing |     |                        |     |                  |    |            |    |
| LOCAL TIME (ADT)  |     |                        |     |                  |    |            |    |
| 1 2   |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| 13351220  |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |
| MAX DEPTH =   |     |                        |     |                  |    |            |    |
| 100.47  |     |                        |     |                  |    |            |    |

| VESSEL   |               | CRUISE ID (e.g. 1NW12) |               | PROJECT & LEG    |            | If you download data after cast- fill this out |               | STATION NO. |           |            |            |                |             |      |         |                   |             |         |
|--|---------------|------------------------|---------------|------------------|------------|--|---------------|-------------|-----------|------------|------------|----------------|-------------|------|---------|-------------------|-------------|---------|
| Northwest Explorer 2012                                  |               | 1NW12                  |               | GOA-ERP-UTL 2012 |            | Filename=                                      |               | 6182        |           |            |            |                |             |      |         |                   |             |         |
| CTD CAST #   | LATITUDE      | LONGITUDE              | G M T         |                  | TIME (GMT) | DRY BULB                                       | WET BULB      | PRESSURE    | SEA STATE | VISIBILITY | WIND DIRN. | WIND SPD (kts) | CLOUD (amt) | TYPE | WEATHER | BOTTO M DEPTH (m) | STA NAME/ID |         |
| 644  | 58 05.14 N    | 137 08.43 W            | 20            | 56               | 12         | 11   | 43            |             |           |            |            |                |             |      |         | 1185 Fm 10180     | 6           |         |
| Sensor S/N (At Start of cruise or swap) Local Time (ADT) |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| SBE type and S/N   |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| PRESS S/N  |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| TEMP 1 & 2 S/Ns  |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| COND 1&2 S/Ns  |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| FLUOR S/N  |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| O2 (SBE43) S/N   |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| Transducer S/N   |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| PAR S/N  |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| O2 SBE43 S/N   |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| LIST DEPTH   | Rosette Nodes | Hydro Sampling         | CHLOR Samples | Comments         |            |  |               |             |           |            |            |                |             |      |         |                   |             |         |
| No   | DESIRED       | SALT #                 | Nut. #        | OXY #            | BI ID      | CH VOL   | Filter Vial # |             |           |            |            |                |             |      |         |                   |             | NIS No. |
| 1  | 100           |                        | 990           |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             | 1       |
| 2  | 60            |                        | 991           |                  |            |  | 6             |             |           |            |            |                |             |      |         |                   |             | 2       |
| 3  | 40            |                        | 998           |                  |            |  | 5             |             |           |            |            |                |             |      |         |                   |             | 3       |
| 4  | 30            |                        | 999           |                  |            |  | 4             |             |           |            |            |                |             |      |         |                   |             | 4       |
| 5  | 20            |                        | 994           |                  |            |  | 3             |             |           |            |            |                |             |      |         |                   |             | 5       |
| 6  | 10            |                        | 935           |                  |            |  | 2             |             |           |            |            |                |             |      |         |                   |             | 6       |
| 7  | 0             |                        | 930           |                  |            |  | 1             |             |           |            |            |                |             |      |         |                   |             | 7       |
| 8  |               |                        |               |                  |            |  |               |             |           |            |            |                |             |      |         |                   |             | 8       |

|   |  |                         |  |                         |  |                  |  |   |  |                    |  |
|---|--|-------------------------|--|-------------------------|--|------------------|--|---|--|--------------------|--|
| VESSEL<br>Northwest Explorer 2012   |  | CRUISE ID (e.g. 11NW12) |  | PROJECT & LEG<br>11NW12 |  | GOA-ERP-UTL 2012 |  | If you download data after cast, fill this out<br>Filename= |  | STATION NO.<br>083 |  |
| CTD<br>CAST #   |  | LATITUDE                |  | LONGITUDE               |  | G M T            |  | TIME<br>(GMT)   |  | DRY BULB           |  |
| DEG MIN   |  | DEG MIN                 |  | DAY MO YR               |  | HR MIN           |  | Temp (°C)   |  | Temp (°C)          |  |
| 1645  |  | 28.12.54 N              |  | 137.04.98 W             |  | 21 01 12 01 10   |  |   |  |                    |  |
| Sensor S/N (At Start of cruise or swap)   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| SBE type and S/N  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| PRESS S/N   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| TEMP 1 & 2 S/Ns   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| COND 1 & 2 S/Ns   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| FLUOR S/N   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| O2 (SBE43) S/N  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| Transmittometer S/N   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| PAR S/N   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| O2 SBE42S/N   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing |  |                         |  |                         |  |                  |  |   |  |                    |  |
| Local Time (ADT)  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 1 2   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| WET BULB  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| PRESSURE  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| SEA STATE   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| VISIBILITY  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| WIND DIRN   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| WIND SPD  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| CLOUD (amt)   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| TYPE  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| WEATHER   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| BOTTO M DEPTH   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 195.5m  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| MAX DEPTH   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 101.39  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| STA NAME/ID   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 11NW12  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| Route Notes   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| Hydro Sampling  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| SALT #  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| Nut #   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| OXY #   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| Btl ID  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| Chl VOL   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| Filter Vol #  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| Comments  |  |                         |  |                         |  |                  |  |   |  |                    |  |
| NIS   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| No.   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 1   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 2   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 3   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 4   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 5   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 6   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 7   |  |                         |  |                         |  |                  |  |   |  |                    |  |
| 8   |  |                         |  |                         |  |                  |  |   |  |                    |  |

Pycnocline Depth

Fluor Max Depth

|   |                       |                                   |  |                                    |  |   |  |                       |                       |                         |                    |                   |                     |               |                         |                 |  |
|---|-----------------------|-----------------------------------|--|------------------------------------|--|---|--|-----------------------|-----------------------|-------------------------|--------------------|-------------------|---------------------|---------------|-------------------------|-----------------|--|
| VESSEL<br>Northwest Explorer 2012   |                       | CRUISE ID (e.g. 11NM12)<br>11NM12 |  | PROJECT & LEG<br>GOA-IERP-UTL 2012 |  | If you download data after cast- fill this out<br>Filename= |  | STATION NO.<br>084    |                       |                         |                    |                   |                     |               |                         |                 |  |
| CTD<br>CAST #<br>046  | LATITUDE<br>DEG MIN N | LONGITUDE<br>DEG MIN W            |  | G M T<br>DAY MO YR                 |  | TIME<br>(GMT) HR MIN  |  | DRY BULB<br>Temp (°C) | WET BULB<br>Temp (°C) | SEA STATE<br>VISIBILITY | WIND<br>DIRN (deg) | WIND<br>SPD (kts) | CLOUD (amt)<br>TYPE | WEATHER       | BOTTO<br>M DEPTH<br>(m) | STA.<br>NAME/ID |  |
| Sensor S/N (At Start of cruise or swap out Local Time (ADT))<br>SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1 & 2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Transmissometer S/N<br>PAR S/N<br>O2 SBE42S/N |                       |                                   |  |                                    |  |   |  |                       |                       |                         |                    |                   |                     |               |                         |                 |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing   |                       |                                   |  |                                    |  |   |  |                       |                       |                         |                    |                   |                     |               |                         |                 |  |
| NIS DEPTH   |                       | Rosette Notes                     |  | Hydro Sampling                     |  | CHLOR Sampling  |  | Comments              |                       |                         |                    |                   |                     |               |                         |                 |  |
| NO DESIRED  |                       |                                   |  | SALT #                             |  | NUT #   |  | OXY #                 |                       | Btl ID                  |                    | Chl Vial          |                     | Filter Vial # |                         |                 |  |
| 1   |                       |                                   |  | 155                                |  | 344   |  | 139                   |                       |                         |                    |                   |                     |               |                         |                 |  |
| 2   |                       |                                   |  | 345                                |  | 346   |  | 347                   |                       |                         |                    |                   |                     |               |                         |                 |  |
| 3   |                       |                                   |  | 348                                |  | 349   |  | 350                   |                       |                         |                    |                   |                     |               |                         |                 |  |
| 4   |                       |                                   |  | 351                                |  | 352   |  | 353                   |                       |                         |                    |                   |                     |               |                         |                 |  |
| 5   |                       |                                   |  | 354                                |  | 355   |  | 356                   |                       |                         |                    |                   |                     |               |                         |                 |  |
| 6   |                       |                                   |  | 357                                |  | 358   |  | 359                   |                       |                         |                    |                   |                     |               |                         |                 |  |
| 7   |                       |                                   |  | 360                                |  | 361   |  | 362                   |                       |                         |                    |                   |                     |               |                         |                 |  |
| 8   |                       |                                   |  | 363                                |  | 364   |  | 365                   |                       |                         |                    |                   |                     |               |                         |                 |  |

Pycnocline Depth

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|   |  |                                   |  |                                      |  |   |  |                      |  |
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| VESSEL<br>Northwest Explorer 2012   |  | CRUISE ID (e.g. 11NW12)<br>11NW12 |  | PROJECT & LEG<br>GOA-IERP-JUL 2012   |  | If you download data after cast- fill this out<br>Filename= |  | STATION NO.<br>486   |  |
| CTD<br>CAST #   |  | LATITUDE<br>DEG MIN               |  | LONGITUDE<br>DEG MIN                 |  | G M T<br>DAY MO YR  |  | TIME<br>(GMT) HR MIN |  |
| 1475356.60 N  |  | 118720.41 W                       |  | 21 JUL 12                            |  | 1745  |  |                      |  |
| Sensor S/N (At Start of cruise or swap)   |  | Local Time (ADT)                  |  | 1                                    |  | 2   |  |                      |  |
| SBE type and S/N<br>PRESS S/N<br>TEMP 1 & 2 S/Ns<br>COND 1&2 S/Ns<br>FLUOR S/N<br>O2 (SBE43) S/N<br>Translucometer S/N<br>PAR S/N<br>O2 SBE43 S/N |  |                                   |  |                                      |  |   |  |                      |  |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing   |  |                                   |  |                                      |  |   |  |                      |  |
| No DESIRED  |  | Rosette Notes                     |  | Hydro Sampling<br>SALT # Nut # OXY # |  | CHLOR Samples<br>Btl ID Chl VOL Filter Vial #               |  | Comments             |  |
| 1 150   |  |                                   |  | 251                                  |  |   |  |                      |  |
| 2 100   |  |                                   |  | 258                                  |  |   |  |                      |  |
| 3 50  |  |                                   |  | 250                                  |  | 200 20  |  | 6                    |  |
| 4 40  |  |                                   |  | 254                                  |  | 201 20  |  | 5                    |  |
| 5 30  |  |                                   |  | 255                                  |  | 200 100   |  | 4                    |  |
| 6 20  |  |                                   |  | 256                                  |  | 219 100   |  | 3                    |  |
| 7 10  |  |                                   |  | 257                                  |  | 218 20  |  | 2                    |  |
| 8 0   |  |                                   |  | 258                                  |  | 211 130   |  | 1                    |  |
| Pycnocline Depth<br>Fluor Max Depth   |  |                                   |  |                                      |  |   |  |                      |  |

|   |     |                        |    |                  |    |  |    |             |    |
|---|-----|------------------------|----|------------------|----|--|----|-------------|----|
| VESSEL<br>Northwest Explorer 2012   |     | CRUISE ID (e.g. 1NW12) |    | PROJECT & LEG    |    | If you download data after cast- fill this out |    | STATION NO. |    |
|   |     | 1NW12                  |    | GOA-ERP-UTL 2012 |    | Filename=                                      |    | 087         |    |
| CTD CAST #  |     | LATITUDE               |    | LONGITUDE        |    | G M T  |    | TIME (GMT)  |    |
| 048   | 01  | 34                     | N  | 127              | 04 | W  | 8  | 13          | 01 |
| 1   | 2   | 30                     | 40 | 1                | 2  | 20   | 40 |             |    |
| Sensor S/N (At Start of cruise or swap; local time (AOT))                             |     |                        |    |                  |    |  |    |             |    |
| COMMENT: Difficult conditions, factors that may affect measurements or aid processing |     |                        |    |                  |    |  |    |             |    |
| SBE type and S/N  |     |                        |    |                  |    |  |    |             |    |
| PRESS S/N   |     |                        |    |                  |    |  |    |             |    |
| TEMP 1 S2 S/N   |     |                        |    |                  |    |  |    |             |    |
| COND 1A2 S/N  |     |                        |    |                  |    |  |    |             |    |
| FLUOR S/N   |     |                        |    |                  |    |  |    |             |    |
| O2 (SBE43) S/N  |     |                        |    |                  |    |  |    |             |    |
| Transmissometer S/N   |     |                        |    |                  |    |  |    |             |    |
| PAR S/N   |     |                        |    |                  |    |  |    |             |    |
| O2 SBE 42S/N  |     |                        |    |                  |    |  |    |             |    |
| O2 SBE 42S/N  |     |                        |    |                  |    |  |    |             |    |
| N/A DEPTH Rosette Notes   |     |                        |    |                  |    |  |    |             |    |
| Hydro Sampling  |     |                        |    |                  |    |  |    |             |    |
| SALT #  |     |                        |    |                  |    |  |    |             |    |
| Nut #   |     |                        |    |                  |    |  |    |             |    |
| OXY #   |     |                        |    |                  |    |  |    |             |    |
| CHLOR Samples   |     |                        |    |                  |    |  |    |             |    |
| Btl ID  |     |                        |    |                  |    |  |    |             |    |
| Ch VOL  |     |                        |    |                  |    |  |    |             |    |
| Filter Vial #   |     |                        |    |                  |    |  |    |             |    |
| Comments  |     |                        |    |                  |    |  |    |             |    |
| N/A   |     |                        |    |                  |    |  |    |             |    |
| No. DESIRED   |     |                        |    |                  |    |  |    |             |    |
| 1   | 200 |                        |    |                  |    |  |    |             |    |
| 2   | 100 |                        |    |                  |    |  |    |             |    |
| 3   | 50  |                        |    |                  |    |  |    |             |    |
| 4   | 10  |                        |    |                  |    |  |    |             |    |
| 5   | 30  |                        |    |                  |    |  |    |             |    |
| 6   | 20  |                        |    |                  |    |  |    |             |    |
| 7   | 10  |                        |    |                  |    |  |    |             |    |
| 8   | 0   |                        |    |                  |    |  |    |             |    |

Pycnocline Depth

Fluor Max Depth

|   |  |   |  |                                    |  |  |  |                    |  |
|---|--|---|--|------------------------------------|--|--|--|--------------------|--|
| VESSEL<br>Northwest Explorer 2012       |  | CRUISE ID (e.g. 1NW12)  |  | PROJECT & LEG<br>GOA-IEEP-UTL 2012 |  | if you download data after cast- fill this out<br>Filename = |  | STATION NO.<br>988 |  |
| CTD<br>CAST #                           |  | LATITUDE  |  | LONGITUDE                          |  | GMT  |  | TIME (GMT)         |  |
| DEG MIN                                 |  | DEG MIN   |  | DAY MO YR                          |  | HR MIN   |  | Temp (°C)          |  |
| 4495863.76N                             |  | 13656.17W   |  | 21 24 12                           |  | 2300   |  | Temp (°C)          |  |
| Sensor S/N (At Start of cruise or swap) |  | Local Time (ADT)  |  | 1                                  |  | 2  |  | MAX DEPTH =        |  |
| SBE type and S/N                        |  | COMMENT: Difficult conditions, factors that may affect measurements or aid processing |  | 20103                              |  | SEV05  |  |                    |  |
| PRESS S/N                               |  |   |  |                                    |  |  |  |                    |  |
| TEMP 1 & 2 S/Ns                         |  |   |  |                                    |  |  |  |                    |  |
| COND 1&2 S/Ns                           |  |   |  |                                    |  |  |  |                    |  |
| FLUOR S/N                               |  |   |  |                                    |  |  |  |                    |  |
| O2 (SBE43) S/N                          |  |   |  |                                    |  |  |  |                    |  |
| Transmissometer S/N                     |  |   |  |                                    |  |  |  |                    |  |
| PAR S/N                                 |  |   |  |                                    |  |  |  |                    |  |
| O2 SBE42S/N                             |  |   |  |                                    |  |  |  |                    |  |

  

| No | DEPTH<br>DESIRED | Relative Notes | Hydro Sampling |       | CHLOR Samples |       | Comments | No |
|----|------------------|----------------|----------------|-------|---------------|-------|----------|----|
|    |                  |                | SALT #         | Nut # | OXY #         | BI ID |          |    |
| 1  | 100              |                |                | 267   |               |       |          | 1  |
| 2  | 100              |                |                | 268   |               |       |          | 2  |
| 3  | 20               |                |                | 269   |               | 294   | 130      | 6  |
| 4  | 40               |                |                | 270   |               | 293   | 130      | 5  |
| 5  | 30               |                |                | 271   |               | 292   | 130      | 4  |
| 6  | 20               |                |                | 272   |               | 291   | 130      | 3  |
| 7  | 10               |                |                | 273   |               | 290   | 130      | 2  |
| 8  | 0                |                |                | 274   |               | 289   | 130      | 1  |

Pycnocline Depth

Fluor Max Depth

|   |  |   |  |                                      |  |   |  |                      |  |
|---|--|---|--|--------------------------------------|--|---|--|----------------------|--|
| VESSEL<br>Northwest Explorer 2012       |  | CRUISE ID (e.g. 11NW12)<br>11NW12   |  | PROJECT & LEG<br>GOA-IEEP-JTL 2012   |  | If you download data after cast- fill this out<br>Filename= |  | STATION NO.<br>089   |  |
| CTD<br>CAST #                           |  | LATITUDE<br>DEG MIN   |  | LONGITUDE<br>DEG MIN                 |  | GMT<br>DAY MO YR  |  | TIME<br>(GMT) HR MIN |  |
| 05058                                   |  | 06.22 N   |  | 13647.93 W                           |  | 21011   |  | 121351               |  |
| Sensor S/N (At Start of cruise or swap) |  | Local Time (ADT)  |  |                                      |  |   |  |                      |  |
| SBE type and S/N                        |  | COMMENT: Difficult conditions, factors that may affect measurements or aid processing |  |                                      |  |   |  |                      |  |
| PRESS S/N                               |  |   |  |                                      |  |   |  |                      |  |
| TEMP 1 & 2 S/Ns                         |  |   |  |                                      |  |   |  |                      |  |
| COND 1&2 S/Ns                           |  |   |  |                                      |  |   |  |                      |  |
| FLUOR S/N                               |  |   |  |                                      |  |   |  |                      |  |
| O2 (SBE43) S/N                          |  |   |  |                                      |  |   |  |                      |  |
| Transmissometer S/N                     |  |   |  |                                      |  |   |  |                      |  |
| PAR S/N                                 |  |   |  |                                      |  |   |  |                      |  |
| O2 SBE42S/N                             |  |   |  |                                      |  |   |  |                      |  |
| No. DEPT#                               |  | Resete Notes  |  | Hydro Sampling<br>SALT # Nut # OXY # |  | CHLOR Samples<br>Btl ID Chl VOL Filter Vial #               |  | Comments             |  |
| 1 80                                    |  |   |  | 375                                  |  |   |  |                      |  |
| 2 100                                   |  |   |  | 374                                  |  |   |  |                      |  |
| 3 50                                    |  |   |  | 377                                  |  | 400   |  |                      |  |
| 4 40                                    |  |   |  | 378                                  |  | 299   |  | 130 5                |  |
| 5 30                                    |  |   |  | 379                                  |  | 298   |  | 130 4                |  |
| 6 20                                    |  |   |  | 380                                  |  | 297   |  | 130 3                |  |
| 7 10                                    |  |   |  | 381                                  |  | 296   |  | 130 2                |  |
| 8 0                                     |  |   |  | 382                                  |  | 295   |  | 130 1                |  |
|   |  |   |  | 147                                  |  | 95  |  |                      |  |

Pycnocline Depth

Fluor Max Depth

MAX DEPTH = 180.71