100 No DESIRED Nis DEPTH Rosette Notes 1 10 CONSC CAST# 9 ω G 4 ယ 7 O 2 USF&W Tiglax SBE 9+ 40 SEC COND SN 3/772 PRICOND SN 042251 SEC TEMP SN PRI TEMP SN PRESS SN SO (V 00 60 2 0 0 29 4 1 65 SST= DEG 8540 LATITUDE 63503 42272 MΝ SALT Z کر US F&W Ticlax 4 DEG SSSal= SBE43-Oxy (prime) Hydro Team-PMEL PAR S/N FLUOR S/N Transmissometer Nut.Btl ADT Date and Time = 1:0147 LONGITUDE 00 6 W <u>₹</u> O2-Btl.No **L6** HH ₹ 2 8 W 5 N 5 6 Frac Chloro Prim. Pro Phyto DAY MPS GOA-IERP-LTL Spring 2011 PROJECT & LEG N O DATE (UTC) Strom/Frederickson \_\_ \_\_ ¥ REMARKS HR MIN U TIME (UTC) 2 Micro Zoops DRY BULB WET BULB (°C) Position (°C) PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) WIN D SPD. (kts) CLOUD (amt  $\propto$ TYPE WEATHER STATION NO. or alt. name BOTTO
M
DEPTH STA. NAME/ID 2 MAX. DEPTH = 3 5 -Zis 10 8 12  $\vec{\exists}$ 9 ω 7 O Ç 4 ω 2

VESSEL 12 11 10 No. DESIRED Nis DEPTH Rosette Notes 9 თ CONSC CAST# ω S ω N USF&W Tiglax 0 SBE 9+ 0 PRI COND SN SEC TEMP SN PRESS SN SEC COND SN PRI TEMP SN 20 0 7 100 60 -50 75 27 051 رع SST= DEG 53 59 dr.40 N LATITUDE 00 MΝ SALT Z CRUISE ID US F&W Tiglax DEG SBE43-Oxy (prime) FLUOR S/N Hydro Team-PMEL PAR S/N SSSal= Transmissometer 154 Nut.Btl 1990 ADT Date and Time = F 1 2 0 0 5 0 00 LONGITUDE 59,82 W M O2-Btl.No WZSAPT 1 6 6 Frac Chloro Prim. Prd Phyto DAY GOA-IERP-LTL Spring 2011 ŏ O DATE (UTC) Strom/Frederickson \_ ¥ 1633 REMARKS HR MIN TIME (UTC) Micro Zoops DRY BULB WET BULB (°C) (°C) PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) Ω (kts) WIN D SPD. CLOUD (amt TYPE WEATHER STATION NO. or alt. name DEPTH STA. NAME/ID 67 MAX. DEPTH = Œ GPQ 10 \_ 8 Nis. 12 9 Φ თ တ ယ 7 4 N

10 No.DESIRED Nis DEPTH Rosette Notes CONSC CAST# 9 ∞ တ Ŋ 4 ယ N USF&W Tiglax 003 58.958 PRI COND SN \$ SEC COND SN SEC TEMP SN PRI TEMP SN PRESS SN 20 W 08/ 40 50 75 100 125 SST= DEG 00 LATITUDE 57. 48 N SALT 816.051 CRUISE ID US F&W Tiglax DEG Transmissometer
PAR S/N SSSal= SBE43-Oxy (prime) 150 Hydro Team-PMEL FLUOR S/N Nut.Btl O2-Btl.No 25 29 24 ADT Date and Time = 23 22 20 7 LONGITUDE 55.48 D W 25 R P R 1 1 W 5 1 0 Frac Chloro Prim. Pro Phyto DAY PROJECT & LEG GOA-IERP-LTL Spring 2011 ĕ DATE (UTC) Strom/Frederickson ¥ 1843 REMARKS 품 TIME (UTC) MZ Micro Zoops 11-6PP-34A DRY BULB WET BULB (၁) (၁) **PRESSURE** SEA STATE VISIBILITY Comments WIND DIRN. (deg) SPD. CLOUD (amt TYPE WEATHER STATION NO. or alt. name BOTTO GP-3

M
DEPTH STA. NAME/ID 186 MAX. DEPTH = 10 o Nis 12 9 O S ω 4 ယ N

1 10 No. DESIRED CAST# 12 9 ω USF&W Tiglax 7 တ S ω 40 SBE 9+ DEPTH Rosette Notes PRI COND SN SEC TEMP SN PRI TEMP SN PRESS SN SEC COND SN C 40 100 125 W 50 150 0 O DEG 4.28.85 58 49.62 N LATITUDE SALT Z 18 CRUISE ID 150.883 US F&W Tiglax Transmissometer
PAR S/N 15¢ 52,98 W SSSal= SBE43-Oxy (prime) FLUOR S/N Hydro Team-PMEL Nut.Btl ADT Date and Time = 3/ LONGITUDE 2 J. W. W 37 8 32 38 30 5 O2-Btl.No W 7 S 5 5 All Prints Fig. Chloro Prim. Pro Phyto DAY APR PROJECT & LEG GOA-IERP-LTL Spring 2011 Mo DATE (UTC) Strom/Frederickson \_ ¥ REMARKS 픘 5 TIME (UTC) MIN Micro Zoops DRY BULB WET BULB (°C) <u>ී</u> PRESSURE SEA STATE VISIBILITY Comments WIND DIRN. (deg) WIN D SPD. CLOUD (amt TYPE WEATHER STATION NO. or alt. name BOTTO ( ) ( ) 7 200 MAX. DEPTH = 3 GP-4 N<sub>O</sub> 6 Nis 12 ဖ ω 6 S 4 ယ N

10 No.DESIRED Nis DEPTH Rosette Notes 12 005 CONSC CAST# 9 ω USF&W Tiglax 125 150 SBE 9+ SEC COND SN PRI COND SN PRI TEMP SN PRESS SN 00) SEC TEMP SN 5 50 20 WO  $\overline{\infty}$ 175 0 0 SST= 16.85 DEG 58 LATITUDE 40,26 N SALT N 150,834 CRUISE ID US F&W Tiglax Transmissometer
PAR S/N Hydro Team-PMEL SBE43-Oxy (prime) FLUOR S/N SSSal= 154 56,440 Nut.Btl O2-Btl.No ADT Date and Time = 67 3 S 8 3 45 9 44 LONGITUDE 7 WZGAPR W ~ Frac Chloro Prim. Pro Phyto DAY PROJECT & LEG GOA-IERP-LTL Spring 2011 MO DATE (UTC) Strom/Frederickson \_\_ ¥ 1 REMARKS 픘 TIME (UTC) 42 ΜN Micro Zoops y miles awith Tream DRY BULB ိ 11-6PP-36A WET BULB (ငိ PRESSURE SEA STATE VISIBILITY Comments deployment WIND DIRN. (deg) WIN D SPD. CLOUD (amt TYPE WEATHER STATION NO. or alt. name DEPTH STA. NAME/ID -9 W MAX. DEPTH = (E) 60.6 No  $\vec{z}$ 10 9 ω O S 4 2 ω

11 No. DESIRED Nis DEPTH Rosette Notes 10 0 CONSC CAST# 12 9 ω O ယ USF&W Tiglax SBE 9+ 45 100 SEC COND SN PRI COND SN PRI TEMP SN PRESS SN SEC TEMP SN 40 50 -0 20 No W 25 5 0 SST= DEG 50 9h5 85 LATITUDE 32,76 MΝ 2 SALT N - 20 CRUISE ID US F&W Tiglax 15¢ 46.62 W DEG PAR S/N SSSal= Hydro Team-PMEL SBE43-Oxy (prime) FLUOR S/N Transmissometer Nut.Btl 8 2 57 75 5 ADT Date and Time = S 5 60 LONGITUDE 62 177 6 <u>Z</u> O2-Btl.No w 26 5 Frac Chloro Prim. Pro Phyto DAY PROJECT & LEG GOA-IERP-LTL Spring 2011 <u>N</u> DATE (UTC) Strom/Frederickson 놨 N REMARKS 풌 W TIME (UTC) w <u>M</u> Micro Zoops DRY BULB WET BULB (၁) ြင္ပ PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) WIN D SPD. (kts) CLOUD (amt TYPE WEATHER STATION NO. or alt. name BOTTO GP-7
DEPTH STA. NAME/ID 4 MAX. DEPTH = (m) No. \_ 12 10 9 ∞ တ Ŋ 4 ယ N

1 10 No DESIRED Nis DEPTH Rosette Notes 12 9 CAST# ω 6 G 4 ယ 7 2 USF&W Tiglax 0 SBE 9+ 25  $\infty$ SEC COND SN PRI COND SN SEC TEMP SN PRESS SN 67 PRI TEMP SN 184.8540 5 0 75 0 0 0 SST= DEG 9 LATITUDE 28,86 Z Z Z SALT 299 Z 154 150,756 CRUISE ID US F&W Tiglax DEG SSSal= PAR S/N SBE43-Oxy (prime) Hydro Team-PMEL FLUOR S/N Transmissometer Nut.Btl O2-Btl.No 8 99 65 69 64 8 ADT Date and Time = 70 LONGITUDE 45.36 ĭ Z ε W 2 7 N \_\_\_\_ 5 W Frac Chloro Prim. Pro Phyto DAY APR 1 1 PROJECT & LEG GOA-IERP-LTL Spring 2011 **M** DATE (UTC) Strom/Frederickson ¥ 0027 REMARKS HR MIN TIME (UTC) START Micro Zoops DRY BULB WET BULB (၁) AP Line (၁) (mb) PRESSURE SEA STATE VISIBILITY MISSED Comments DIRN. (deg) SPD. (kts) CLOUD (amt TYPE WEATHER STATION NO. or alt. name DEPTH STA. NAME/ID 00 MAX. DEPTH = 3 10 N<sub>O</sub> Nis 12 9 Ŋ  $\infty$ တ ω N

No. DESIRED CONSC CAST# Nis DEPTH Rosette Notes 10 9 ω 0 G N JSF&W Tiglax SEC TEMP SN SBE 9+ 98 SEC COND SN PRI TEMP SN PRESS SN 50 30 40 5 0 DEG SST= 9 58.469 N LATITUDE 28.14 N SALT CRUISE ID US F&W Tiglax -5A 150.943 Transmissometer PAR S/N SSSal= Hydro Team-PMEL SBE43-Oxy (prime) FLUOR S/N Nut.Btl 77 ADT Date and Time = 76 LONGITUDE アソ 56.58 W O2-Btl.No w 27 \_ 0 Frac Chloro Prim. Pro Phyto DAY PROJECT & LEG AP GOA-IERP-LTL Spring 2011 ĕ Ö DATE (UTC) Strom/Frederickson ¥ 0 REMARKS 茮 TIME (UTC) 122 <u>≤</u> Micro Zoops DRY BULB WET BULB (ငိ ြင္ပ PRESSURE SEA STATE VISIBILITY Comments WIND DIRN. (deg) WIN D SPD. (kts) CLOUD (amt TYPE WEATHER STATION NO. or alt. name DEPTH STA. NAME/ID 75 MAX. DEPTH = (E) No. ㅎ 12  $\stackrel{\rightharpoonup}{=}$ 9 ω თ Q ယ 7 4 N

 $\stackrel{\rightharpoonup}{=}$ 10 No. DESIRED Nis DEPTH Rosette Notes **TESSEL** 12 CAST# 9 ω თ 5 4 7 ω 2 JSF&W Tiglax 0 SBE 9+ SEC COND SN PRI COND SN SEC TEMP SN PRI TEMP SN PRESS SN 35 05 K 00 20 30 ۵ SST= DEG 00 (7) 00 LATITUDE MΝ 27.00 N 7 Z SALT 151 CRUISE ID US F&W Tiglax DEG SSSal= Hydro Team-PMEL PAR S/N Transmissometer SBE43-Oxy (prime) FLUOR S/N Nut.Btl O2-Btl.No ADT Date and Time = 25 CA 2 90 LONGITUDE 00 2 00 00 51.15w27AP P9. A4 Frac Chloro Prim. Pro Phyto DAY 4 6 5 PROJECT & LEG GOA-IERP-LTL Spring 2011 Mo DATE (UTC) R 1 1 Strom/Frederickson ¥ 2220 REMARKS Ø222 퓨 TIME (UTC) M N Micro Zoops DRY BULB WET BULB ြင္ပ <u>ြိ</u> **PRESSURE** SEA STATE VISIBILITY Comments WIND DIRN. (deg) WIN D SPD. (kts) . CLOUD (amt TYPE STATION NO. or alt. name WEATHER BOTTO AP-4 M DEPTH STA. NAME/ID MAX. DEPTH = 3 00 No Nis 12 \_ 70 ဖ ω 7 တ G 4 ယ N

1 10 No DESIRED CONSC CAST# 12 Nis DEPTH Rosette Notes 9 8 6 Ç ယ N ∪SF&W Tiglax PRI TEMP SN SBE 9+ SEC COND SN PRI COND SN SEC TEMP SN PRESS SN 20 50 00 0 ص ص 5 25 200 J SST= DEG 58 26.40 LATITUDE 00 . KK Z M SALT 30b CRUISE ID US F&W Tiglax 151 19.98 Transmissometer\_PAR S/N DEG SSSal= Hydro Team-PMEL SBE43-Oxy (prime) FLUOR S/N Nut.Btl ADT Date and Time = *₽* 2 90 60 20 00 200 LONGITUDE 00 51 33 3w 27 APR 11 O2-Btl.No Frac Chloro Prim. Prd Phyto DAY CV 4 5 PROJECT & LEG GOA-IERP-LTL Spring 2011 MO DATE (UTC) Strom/Frederickson \_ 줐 0442 REMARKS HR MIN TIME (UTC) Micro Zoops DRY BULB WET BULB KSI AKI SM (၀) Both ြင္ပ t with PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) SP □ ≦ CLOUD (amt TYPE WEATHER (kts) STATION NO. or alt. name BOTTO AP-3
M
DEPTH STA. NAME/ID 132 MAX. DEPTH = 3 N<sub>O</sub> 7 10 9 ω 0 ယ Ŋ N

11 No. DESIRED Nis DEPTH Rosette Notes 10 CONSC CAST# 12 9 ω ∪SF&W Tiglax SBE 9+ SEC COND SN PRI COND SN SEC TEMP SN PRI TEMP SN PRESS SN 165 125 150 50 75 Gal 20 30 4 b 0 DEG SST= 57 LATITUDE 25.24 ĭ 2 N 7 SALT US F&W Tiglax CRUISE ID 151 31.84 0 DEG PAR S/N Hydro Team-PMEL SBE43-Oxy (prime) Transmissometer FLUOR S/N 151.5 Nut.Btl ADT Date and Time = 20] 20 2 9 200 2 100 LONGITUDE 3 07 100 Ö Z Z O2-Btl.No حی -4 6 3 w 2 7 Frac Chloro Prim. Pro Phyto DAY PROJECT & LEG APR GOA-IERP-LTL Spring 2011 Mo DATE (UTC) Strom/Frederickson \_ \_ 놨 REMARKS 풌 535 TIME (UTC) Z Z Micro Zoops DRY BULB WET BULB (°C) <u>ල</u> (mb) PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) SPD. (kts) CLOUD (amt TYPE WEATHER STATION NO. or alt. name BOTTO AP\_2 M DEPTH STA. NAME/ID MAX. DEPTH = 16940 3 2 Nis No.  $\Rightarrow$ 10 12 9 ω 6 Ŋ ω N

SSSal=

No DESIRED Nis DEPTH Rosette Notes CONSC CAST# 1 **USF&W Tiglax** 10 9 ω 7 6 G 4 ω N VESSEL 01258 SEC TEMP SN\_\_\_\_PRI COND SN\_\_\_ SBE 9+ SEC COND SN PRESS SN PRI TEMP SN 00 3 125 250 162 8 35 F) 50 9 SST= DEG <u>۔</u> LATITUDE Ž 1 رو SALT - × CRUISE ID US F&W Tiglax Transmissometer
PAR S/N DEG SBE43-Oxy (prime) FLUOR S/N SSSal= Hydro Team-PMEL Nut.Btl ADT Date and Time = 107 三 108 20 115 13 109 LONGITUDE 9 72.3 Σ O2-Btl.No Frac Chloro Prim. Prd Phyto 6 ح دي 4 2W27 DAY APR PROJECT & LEG GOA-IERP-LTL Spring 2011 Mo DATE (UTC) Strom/Frederickson \_ ¥ 0633 REMARKS 퓨 TIME MN Micro Zoops DRY BULB WET BULB ြင္ပ Bottle င္ပိ didn't **PRESSURE** Close SEA STATE VISIBILITY Comments DIRN. (deg) SPD. (kts) CLOUD (amt TYPE WEATHER STATION NO. or alt. name BOTTO #-/
M
DEPTH STA. NAME/ID MAX. DEPTH = 75491 (E) N<sub>O</sub> Zi.s 그 10 9 ω 6 4 7 Ŋ ω N

10 9 œ 6 5 ω 2 CAST # 7 JSF&W Tiglax <u>ل</u> SEC COND SN SBE 9+ DESIRED PRI TEMP SN PRESS SN SEC TEMP SN DEPTH PRI COND SN 4 20 30 50 GH GH = 0 SST= DEG Rosette Notes LATITUDE 50.65 z SALT US F&W Tiglax DEG PAR S/N SBE43-Oxy (prime) Hydro Team-PMEL Transmissometer FLUOR S/N Nut.Btl ADT Date and Time = 123 # 77 70 7 2 2 LONGITUDE 00 02-Btl.No ٤ 27 ى Frac Chloro DAY # 4 2 5 GOA-IERP-LTL Spring 2011 PROJECT & LEG APR ₹ DATE (UTC) Prim. Prod Phyto Strom/Frederickson ⋨ REMARKS 푯 2 TIME 7 MIN Micro Zoops DRY BULB (၁) WET BULB (°C) (mb) PRESSURE CHOSE SEA STATE VISIBILITY Comments DIRN. (deg) (kts) WIND SPD. CLOUD (amt) TYPE STATION NO. or alt. name WEATHER BOTTOM DEPTH MAX. DEPTH = 3 <u>~</u> \$€ SES STA. NAME/ID 12 N S 10 9 No. œ 7 6 ഗ 4 ω 2

SSSal=

9 6 ω 2 CAST # 8 7 S JSF&W Tiglax 0 SBE 9+ PRI COND SN SEC TEMP SN PRESS SN DEPTH PRI TEMP SN DESIRED SEC COND SN 100 141 125 弘 况 20 0 30 40 50 0 r SST= DEG 58 Rosette Notes LATITUDE ₹ SALT 301 US F&W Tiglax DEG 152.3893 . PAR S/N SBE43-0xy (prime) Hydro Team-PMEL SSSal= Transmissometer Nut.Btl ADT Date and Time = 125 13 33 128 127 124 126 132 )3 130 129 LONGITUDE M 02-Btl.No Frac Chloro 27 DAY 5 کی ہک + 6 GOA-IERP-LTL Spring 2011 PROJECT & LEG De M DATE (UTC) Prim. Prod Phyto Strom/Frederickson ⋨ REMARKS 丟 O TIME ₹ Ž r Micro Zoops DRY BULB (ငိ) did not close & forgot backup - not needed WET BULB (°C) (mb) PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) SP NO CLOUD (amt) (kts) TYPE STATION NO. or alt. name WEATHER BOTTOM DEPTH MAX. DEPTH = 3 2 5 S STA. NAME/ID SE4 n T 12 = 10 No. N S 9 œ 6 5 ω 2

| USF&W Tiglax          | US F&W Tiglax GOA-IERP-LTL              | GOA-IERP-LTL Spring 2011     |
|-----------------------|---|------------------------------|
| CONSC CAST # LATITUDE | LONGITUDE . DATE                        | E TIME C) DRY BULB           |
| DEG                   | DAY N                                   | YR HR MIN                    |
| 01 5 58 44.66         | N 152" 22.65" W 27 APR                  | 1 1 1 0 5 5                  |
|                       | ADT Date and Time =                     |                              |
| SBE 9+                | FLUOR S/N                               | REMARKS                      |
| PRESS SN              | SBE43-Oxy (prime)                       |                              |
| PRI TEMP SN           | Transmissometer                         |                              |
| PRI COND SN           | PAR S/N                                 |                              |
| SEC COND              |   |                              |
| No. DESIRED           | SALT Nut.Btl O2-Btl.No Frac Chloro Prin | Prim. Prod Phyto Micro Zoops |
| 1 1/5                 | 13.4                                    | 25                           |
| 2 100                 | 135                                     |                              |
| 3 75                  | 136                                     |                              |
| 4 50                  | 134                                     |                              |
| 5 50                  |   |                              |
| 6 40                  | 134 5                                   |                              |
| 7 36                  | +                                       | 2                            |
| 8 3                   | V39 H                                   |                              |
| 9 26                  | 1 <b>40</b> 3.                          |                              |
| 10 10                 | 141 2                                   |                              |
| 11 0                  | lu <sub>2</sub>                         |                              |
| 12                    |   |                              |

9 ω 2 CAST # 8 7 ნ ഗ JSF&W Tiglax PRESS SN SBE 9+ DESIRED SEC TEMP SN PRI TEMP SN DEPTH SEC COND SN PRI COND SN 36 40 77 10 20 28 30 F 50 0 SST= DEG **₹** Rosette Notes т Г LATITUDE ₹ SALT z US F&W Tiglax 15 DEG PAR S/N SBE43-0xy (prime) SSSal= Hydro Team-PMEL Transmissometer FLUOR S/N Nut.Btl ADT Date and Time = 143 14 144 九ト 149 니 % 941 1 150 LONGITUDE 20 - 810 02-Btl.No 4 ـ س Ç 6 ٤ 27 Frac Chloro DAY APR GOA-IERP-LTL Spring 2011 ĕ DATE (UTC) Prim. Prod Phyto Strom/Frederickson ¥ REMARKS 픘 TIME (UTC) ĭ Z L Micro Zoops DRY BULB (°C) extra didn't close WET BULB <u>Ĉ</u> ( Wica (mb) PRESSURE SEA STATE VISIBILITY Comments (deg) WIND DIRN. (kts) SPD. Will CLOUD (amt) TYPE STATION NO. or alt. name WEATHER BOTTOM DEPTH MAX. DEPTH = 3 99 STA. NAME/ID 35 T 12 \_ 10 8 O Nis. 9 ω 6 5 ω 2

3 CONSC CAST # 9 œ 6 4 USF&W Tiglax SBE 9+ DESIRED PRESS SN PRI COND SN SEC TEMP SN DEPTH Rosette Notes SEC COND SN PRI TEMP SN 20 ££ 30 0 3 0 30 50 ah DEG SST= 58 LATITUDE ĭ Z . 95 SALT US F&W Tiglax 152° DEG SSSal= PAR S/N SBE43-Oxy (prime) Hydro Team-PMEL Transmissometer FLUOR S/N Nut.Btl ADT Date and Time = 50 15 157 136 521 153 52 15% LONGITUDE 17.710 W X Z 02-Btl.No S Frac Chloro 27 DAY GOA-IERP-LTL Spring 2011  $\mu\rho$ R 8 DATE (UTC) Prim. Prod Phyto Strom/Frederickson ⋨ REMARKS 돗 ~ TIME (UTC) <u>X</u> 00 Micro Zoops DRY BULB ී Bockup WET BULB ී (amb) PRESSURE SEA STATE VISIBILITY Comments (deg) DIRN. (kts) SP NO CLOUD (amt) TYPE WEATHER STATION NO. or alt. name BOTTOM DEPTH 83人元 MAX. DEPTH = (m) STA. NAME/ID 系 T 47 12 = 10 8 O Z. 9 œ ω 6 ъ

| 12  | 11   | 10   | 9 | 8        | 7    | 6     | 5                                       | 4   | ω   | 2   | _                                       | Z                | Zis                |             |                 |             |                   |              |                   | Ī        | Π        | 8 8                  | S                        | 7 |
|-----|--|------|---|----------|------|-------|---|-----|-----|-----|---|------------------|--------------------|-------------|-----------------|-------------|-------------------|--------------|-------------------|----------|----------|----------------------|--------------------------|---|
|     |  | 0    | 0 | 20       | 30   | 0,1   | 50                                      | 75  | 100 | 125 | 15                                      | DESIRED          | DEPTH              | SEC COND SN | SEC TEMP SN     | PRI TEMP SN | PRESS SN          | SBE 9+       |                   | 18       |          | CONSC<br>CAST #      | USF&W Tiglax             |   |
|     |  |      |   |          |      |       |   |     |     |     | 7                                       | 0                | ·                  | D SN        | NS.             | SN<br>N     |                   | ı            | ***               | . 5      | DEG      |                      | iglax                    |   |
|     |  |      |   |          |      |       |   |     |     |     |   |                  | Rosette Notes      |             |                 |             |                   |              |                   | 59.      | <u>₹</u> | LATITUDE             |                          |   |
|     |  |      |   | A        |      | H var |   | 8   |     |     |   |                  |                    |             |                 |             |                   |              |                   | 10       |          | m                    |                          |   |
|     |  | 302  |   |          |      |       |   |     |     |     |   | SALT             | Ĥ                  |             | <br>            |             | BS .              |              |                   | Z        | DEG      |                      | US F                     |   |
|     |  | 1.67 | 5 | 591      | 1.64 | 163   | 162                                     | 161 | 160 | 50  | 85                                      | Nut.Btl          | Hydro Team-PMEL    | FAR J/N     | Transmissometer |             | SBE43-Oxy (prime) | FLUOR S/N    | ADT D             | 152      | <u></u>  | LON                  | US F&W Tiglax            |   |
|     |  |      |   |          | n e  | 00    | /~                                      |     |     |     |   | 02-Btl.No        | m-PMEL             |             | neter<br>—      | ı           | (prime)           | ı            | ADT Date and Time |          | <u>≼</u> | LONGITUDE            | glax                     |   |
|     | <u>                                       </u> |      | 2 | <u>ω</u> |      | い     | -                                       |     |     |     | !<br>!                                  |                  |                    |             |                 |             |                   |              | Time =            | 6 w      |          |                      |                          |   |
|     |  |      |   |          |      |       | 6                                       |     |     |     | *************************************** | Frac Chloro      |                    |             |                 |             |                   |              |                   | 27 /     | DAY      |                      | G                        | 1 |
|     |  |      |   |          |      |       |   |     |     |     | 1                                       | [[               | Stro               |             |                 |             |                   |              |                   | APR      | ₹        | DATE<br>(UTC)        | GOA-IERP-LTL Spring 2011 |   |
|     |  |      |   |          |      |       |   |     |     |     |   | Prim. Prod Phyto | Strom/Frederickson |             |                 |             |                   | æ.           | -                 | 1        | ∌        | O III                | -LTL Sp                  |   |
|     |  |      |   |          |      |       |   |     |     |     |   | туto             | rickson            |             |                 |             |                   | REMARKS      |                   | 432      | HR MIN   | TIME<br>(UTC)        | ring 201                 |   |
|     |  |      |   |          |      |       |   |     | 1   |     |   | Micro Zoops      |                    |             |                 |             |                   |              |                   | 2        |          | R)                   |                          | ١ |
| 12  |  |      |   |          |      |       |   |     |     |     |   | ops              |                    |             |                 |             |                   |              |                   |          | C        | DRY BULB             |                          |   |
|     |  |      |   |          | Pid  |       |   |     |     |     |   |                  |                    |             |                 |             |                   |              |                   | _        | (°C)     | WET BULB             |                          |   |
|     |  |      |   |          | 4 m  |       |   | =   |     |     | ;<br>;<br>;<br>;                        |                  |                    |             |                 |             |                   |              |                   |          | (mb)     | PRESSURE             |                          |   |
|     |  |      |   |          | 1    |       |   | !   |     |     |   |                  |                    |             |                 |             |                   |              |                   |          | *        | SEA STATE VISIBILITY |                          |   |
|     |  |      |   |          | ESE  |       | 1                                       |     |     |     |   |                  | Comments           |             |                 |             |                   |              |                   |          | (deg)    | DIRN.                |                          |   |
|     |  |      |   |          |      |       | 1                                       | 2:  |     |     |   |                  | its                |             |                 |             |                   |              |                   | $\vdash$ | (kts)    | WIND.                |                          |   |
| 120 |  |      |   |          |      |       | 1                                       |     |     |     |   |                  |                    |             |                 |             | ×                 |              |                   |          | *        | CLOUD (amt)          |                          | - |
|     |  |      |   |          |      |       | *************************************** |     |     |     |   |                  |                    |             |                 |             |                   | ~            |                   |          | *        | WEATHER              |                          |   |
|     |  |      |   | e;—      |      |       | 1                                       |     |     |     |   |                  |                    |             |                 |             |                   | MAX. DEPTH = |                   | 59       | (E)      | BOTTOM<br>DEPTH S    |                          |   |
|     | 234  |      |   |          |      |       | 4 |     |     |     |   |                  |                    |             |                 |             |                   | <b>H</b>     |                   | KE       |          | RE 4<br>STA. NAME/ID |                          |   |
| 12  | -1   | 10   | 9 | 8        | 7    | 6     | 5                                       | 4   | ω   | 2   | j-                                      | N <sub>O</sub> . | N.S.               |             |                 |             |                   | a a          |                   | -E       |          | ¥E/ID                |                          |   |

10 9 8 6 ω 2 CONSC CAST # USF&W Tiglax SBE 9+ PRI TEMP SN 40 Q V DESIRED SEC COND SN PRI COND SN SEC TEMP SN PRESS SN 50 77 20 DEPTH Rosette Notes 0 9 5 DEG SST= 737 LATITUDE SALT US F&W Tiglax DEG PAR S/N SBE43-Oxy (prime) Hydro Team-PMEL Transmissometer FLUOR S/N 92.036 Nut.Btl ADT Date and Time = 172 169 171 170 83/ LONGITUDE 74 02-Btl.No ٤ £ 6 7 Frac Chloro DAY APR GOA-IERP-LTL Spring 2011 MO DATE (UTC) Prim. Prod Phyto Strom/Frederickson ⋨ REMARKS 풎 539 TIME (UTC) MZ Micro Zoops DRY BULB (°C) WET BULB (°C) PRESSURE SEA STATE VISIBILITY Comments (deg) DIRN. SP WIND CLOUD (amt) (kts) TYPE WEATHER STATION NO. or alt. name BOTTOM DEPTH 8 MAX. DEPTH = I XE 1 STA. NAME/ID 10 N<sub>o</sub> = Nis. 9 ω 7 6 5 4 ω 2

SSSal=

9 ω Ö 02057 CAST # JSF&W Tiglax SBE 9+ DESIRED SEC COND SN SEC TEMP SN PRI TEMP SN PRESS SN 142 PRI COND SN St. DEPTH Rosette Notes 5 50 125 0 20 30 00 30 <u>-</u> 0 DEG LATITUDE 3 <u>≼</u> 760'N 151" SALT 303 US F&W Tiglax DEG PAR S/N Hydro Team-PMEL Transmissometer SBE43-Oxy (prime) Nut.Btl ADT Date and Time = 178 73 したり 176 182 85 183 20 180 189 LONGITUDE 27.560' w 28 <u>₹</u> 02-Btl.No Frac Chloro DAY ~ Apr GOA-IERP-LTL Spring 2011 8 DATE (UTC) Prim. Prod Phyto Strom/Frederickson ⋨ 0 6 0 REMARKS 픘 TIME (UTC) Post Deplay at 11 CBP-3A ₹ Ž Micro Zoops DRY BULB <u>C</u> WET BULB (0) (mb) PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) SPD. WIND CLOUD (amt) (kts) TYPE WEATHER STATION NO. or alt. name 1 C 6 8 -BOTTOM DEPTH 146 3 MAX. DEPTH = STA. NAME/ID P S O = Nis 12 10 9 ω 6 ω 7 S 2

SSSal

SST=

| VESSEL                  | CRUISE ID              | PROJECT & LEG                            | STATION NO. or alt. name   |          |
|-------------------------|------------------------|--|--|----------|
| USF&W Tiglax            | US F&W Tiglax          | GOA-IERP-LTL Spring 2011                 |  |          |
| CONSC                   | LONGITUDE              | DATE TIME (UTC) (UTC) DRY BULB           | WET BULB  PRESSURE  SEA STATE VISIBILITY  DIRN. SPD. CLOUD (amt)  TYPE WEATHER  DEPTH STA. NAME/ID |          |
| DEG MIN                 | DEG MIN                | DAY MO YR HR MIN (°C)                    | (°C) (mb) * * (deg) (kts) * * * (m)  |          |
|                         | ADT Date               | -  |  |          |
| SBE 9+                  | FLUOR S/N              | REMARKS                                  | MAX. DEPTH =   | ٦        |
| PRESS SN                | SBE43-Oxy (prime)      | This cast o                              | following ones correspond ul the CTD files   | V*       |
| SEC TEMP SN             | Transmissometer        |  |  |          |
| PRI COND SN             | PAR S/N                | W.53 & Q                                 | Bottom Botile Trip   |          |
| Nis DEPTH Rosette Notes | Hydro Team-PMEL        | Strom/Frederickson                       | Comments   | Zi<br>Si |
| No. DESIRED             | SALT Nut.Bti 02-Btl.No | Frac Chloro Prim. Prod Phyto Micro Zoops | 2  | No.      |
| 1 150                   | 8                      |  |  |          |
| 2 125                   | 9                      |  |  | 2        |
| 3 100                   | 10                     |  |  | ω        |
| 4 75                    | 11                     |  |  | 4        |
| 5 50                    | 12                     |  |  | <b>У</b> |
| 6 70                    | (a                     |  |  | ნ        |
| 7 46                    | 1                      |  | Paker  | 7        |
| 8 36                    | 14                     |  |  | 8        |
| 9                       | 15                     |  |  | 9        |
| 10 PO                   | 6                      |  |  | 10       |
| 111 0                   | 17                     |  |  | 11       |
| 12                      |                        |  |  | 12       |
| SST=                    | SSSal=                 |  |  |          |
|                         |                        |  |  |          |
| 1                       |                        |  |  |          |

| 12   | 11 | 0  | 9  | ω  | 7  | 9       | ις.      | 4  | ω                                       | 2/1 | 1 1/   | No.                 | Nis                | SE          | § %         | I<br>B      |                   | SB           |                   | 23           |             | CONSC<br>CAST #           | USF8                     | VESSEL                    |
|------|----|----|----|----|----|---------|----------|----|---|-----|--------|---------------------|--------------------|-------------|-------------|-------------|-------------------|--------------|-------------------|--------------|-------------|---------------------------|--------------------------|---------------------------|
|      |    |    | 0  | 0  | 20 | 20      | 30       | 40 | 01                                      | 52  | 105    | DESIRED             | DEPTH              | SEC COND SN | SEC TEMP SN | PRI TEMP SN | PRESS SN          | SBE 9+       |                   | 38           | DEG         | SC **                     | USF&W Tiglax             |                           |
|      |    |    |    |    |    |         |          |    |   |     |        |                     | Rosette Notes      | SZ -        |             |             |                   |              |                   | 6.583        | MIN         | LATITUDE                  | lax                      |                           |
| 1010 |    |    | 25 | 24 |    |         | 22       | 2) | 20                                      | -0  | 304 18 | SALT Nut.Btl        | Hydro Team-PMEL    |             | PAR S/N     |             | SBE43-Oxy (prime) | FLUOR S/N    | ADT Date          | N /S2.0      | DEG         | LONGITUDE                 | US F&W Tiglax            | CRUISE ID                 |
|      |    |    |    |    |    |         |          |    |   |     |        | 02-Btl.No           | PMEL               |             | e           |             | ime)              |              | ADT Date and Time | 510          | MZ          | UDE .                     | ax                       |                           |
|      |    |    |    |    |    |         |          |    |   |     |        | Frac Chloro         |                    |             |             | G           |                   |              |                   | ۳<br>92<br>9 | DAY         |                           | <u>କ</u>                 | PR                        |
|      |    |    |    |    |    |         |          |    |   |     |        | ro Prim. Prod Phyto | Strom/F            |             | 1           | 1           |                   |              |                   | Apr 1 1      | MO YR       | DATE<br>(UTC)             | )A-IERP-LTL              | PROJECT & LEG             |
|      |    |    |    |    |    |         |          |    |   |     |        | od Phyto            | Strom/Frederickson |             |             |             |                   | REMARKS      |                   | 252          | HR MIN      | TIME<br>(UTC)             | GOA-IERP-LTL Spring 2011 |                           |
|      |    |    |    |    |    |         |          |    |   |     |        | Micro Zoops         |                    |             |             |             |                   | MAK          |                   | Ω.           | (°C)        | DRY BULB                  |                          | -                         |
|      |    |    |    |    |    | 2000    |          |    |   |     |        |                     |                    |             |             |             |                   | Denta        |                   |              | (0)         | B WET BULB                |                          |                           |
|      |    |    |    |    |    | not.    |          |    |   |     |        |                     |                    |             |             |             |                   | * CTO        | f                 |              | (mb)        | PRESSURE                  |                          |                           |
|      |    |    |    |    |    | tion of |          |    |   |     |        |                     | Comments           |             |             |             |                   |              |                   |              | *           | SEA STATE VISIBILITY  □ ≤ |                          |                           |
|      |    |    | Ī  |    |    |         |          | ē. | 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |     |        |                     | ents               |             |             |             |                   |              |                   |              | (deg) (kts) | WIND WIND DIRN. SPD.      |                          |                           |
|      |    |    |    |    |    |         |          |    |   |     |        |                     |                    |             |             |             |                   |              |                   |              | * *         | CLOUD (amt) TYPE WEATHER  |                          | OIAII                     |
|      |    |    |    |    |    |         |          |    |   |     |        |                     |                    |             |             |             |                   | MAX. DEPTH = |                   | 6            | (m)         | ВОТТОМ                    | 7-                       | STATION NO. OF AIR, HAIRE |
|      | 17 |    |    |    |    |         |          | -  |   |     |        |                     |                    |             |             |             |                   | 30 /=HTC     |                   |              |             | STA. NAME/ID              | oQ.                      | C Marine                  |
| 12   | =  | 10 | 9  | ω  | 7  | 6       | <u>м</u> | 4  | ω                                       | 2   |        | Ş<br>Ö              | 꺙                  |             |             |             |                   | ] = "        | _                 |              | L           | <del>∂</del>              |                          |                           |

No. DESIRED CAST # USF&W Tiglax 250 SEC COND SN PRI TEMP SN PRESS SN SBE 9+ 200 PRI COND SN SEC TEMP SN 100 DEPTH y 30 18 3 150 0 お 0 SST= Rosette Notes 20 LATITUDE 2 Calvins Sut's 20/ 202 g 196 200 195 199 194 460'N SALT US F&W Tiglax 121 DEG PAR S/N SBE43-Oxy (prime) Hydro Team-PMEL Transmissometer FLUOR S/N Nut.Btl W 200 ADT Date and Time = 29 1/3 YW 2 27 26 W LONGITUDE 37.200 5 02-Btl.Nc 81 9 5 Frac Chloro DAY G ُو PROJECT & LEG APR GOA-IERP-LTL Spring 2011 ₹ DATE (UTC) Prim. Prod Phyto Strom/Frederickson 0 REMARKS 픗 W TIME 0 <u>₹</u> Micro Zoops  $\overline{\Omega}$ DRY BULB (°C) WET BULB (°C) (mb) PRESSURE SEA STATE VISIBILITY Comments WIND DIRN. (deg) SPD. WIND CLOUD (amt) (kts) TYPE STATION NO. or alt. name HX/8 WEATHER BOTTOM DEPTH 500 MAX. DEPTH = (m HX (8) STA. NAME/ID N S 12 ⇉ 7 <u>N</u>0. ω თ ω

SSSal=

10 CONSC CAST # JSF&W Tiglax SBE 9+ PRESS SN PRI COND SN SEC TEMP SN PRI TEMP SN DESIRED DEPTH 50 500 250 20 30 94 50 100 150 0 K 0 DEG SST= Rosette Notes S LATITUDE <u>₹</u> 450 SALT z 305 /5] 。 US F&W Tiglax DEG PAR S/N SSSal= Hydro Team-PMEL Transmissometer SBE43-Oxy (prime) FLUOR S/N Nut.Btl ADT Date and Time = LONGITUDE . 440 w <u>⊀</u> 02-Btl.No UAF Nuts 30 402 43 Frac Chloro DAY イア 7 Oh O 至 PS 36 35 APR GOA-IERP-LTL Spring 2011 MO DATE (UTC) Prim. Prod Phyto Strom/Frederickson ⋨ 05 풎 TIME X Z 1 Micro Zoops DRY BULB (°C) WET BULB (°C) (mb) PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) (kts) WIND SPD. CLOUD (amt) TYPE WEATHER STATION NO. or alt. name BOTTOM DEPTH 500 HX 1/85 MAX. DEPTH = 3 STA. NAME/ID Hx 185 8 Nis 10 12 9  $\infty$ 7 6 S 4 ω N

No. DESIRED 10 CONSC CAST # ∪SF&W Tiglax PRESS SN PRI TEMP SN SBE 9+ 성 PRI COND SN SEC TEMP SN SEC COND SN 401 150 유 50 250 500 DEPTH Rosette Notes 50 20 30 2 0 156 DEG 49.680 LATITUDE ₹ z SALT 151 US F&W Tiglax DEG SBE43-0xy (prime) SSSal= Hydro Team-PMEL Transmissometer Nut.Btl ADT Date and Time = LONGITUDE ĭ 02-Btl.No 930' W Strom/Frederickson ろと 60 30 いい S DAY APR GOA-IERP-LTL Spring 2011 PROJECT & LEG 8 DATE (UTC) Prim. Prod Phyto ⋨ 9 REMARKS HR MIN TIME (UTC) 1 Micro Zoops enter file + court sheet the DRY BULB Ma ow (0) WET BULB mater will (°C) (mb) PRESSURE SEA STATE VISIBILITY Comments WIND DIRN. (deg) SPD. WIND CLOUD (amt) (kts) TYPE STATION NO. or alt. name WEATHER BOTTOM DEPTH 500  $\mathbb{E}$ MAX. DEPTH = # STA. NAME/ID 185 No. Nis. <del>1</del>0 9 6 ω 12 ω

ĕ 10 9 ω 7 6 5 4 ω 2 CAST # JSF&W Tiglax SBE 9+ PRI COND SN SEC TEMP SN PRI TEMP SN DESIRED PRESS SN 27 DEPTH Rosette Notes 20 W. 10 45 30 5 65 0 5 57 DEG SST= LATITUDE <u>≼</u> .280 N SALT US F&W Tiglax 152 DEG SBE43-Oxy (prime) FLUOR S/N PAR S/N SSSal= Hydro Team-PMEL Transmissometer Nut.Btl ADT Date and Time = LONGITUDE ĭ Z 02-Btl.No 180' W30 UAF Notes Prim. Prod Phyto 95 28 2 DAY 93) 8 6 GOA-IERP-LTL Spring 2011 APR 8 DATE (UTC) Strom/Frederickson ⋨ REMARKS 돗 TIME (UTC) ME Micro Zoops DRY BULB c WET BULB (°C) (d (d PRESSURE SEA STATE VISIBILITY Comments WIND DIRN. (deg) SPD. WIND CLOUD (amt) (kts) TYPE STATION NO. or alt. name WEATHER BOTTOM DEPTH MAX. DEPTH = (m) 741410 STA. NAME/ID 185 No. N Sis 12 70 9 œ 7 6 5 4 ω 2

|                                       | 12   | 11 | 10 | 9 10 | 8 29 | 730 | (d) | 4  | 4 30   | 3 7 | 2 50 | フノ     | No. DESIRED                  | Nis DEPTH          | SEC COND SN | SEC TEMP SN             | PRI TEMP SN | PRESS SN          | con o   |  | 200        | 1             | CONSC<br>CAST #   | USF&W Tiglax             | VESSEL                   |
|---------------------------------------|------|----|----|------|------|-----|-----|----|--|-----|------|--------|------------------------------|--------------------|-------------|-------------------------|-------------|-------------------|---|--|------------|---------------|---|--------------------------|--------------------------|
| S 31                                  | SCT. |    |    |      |      |     |     |    |  |     |      |        | D CLAFF NITE                 | Rosette Notes      | ND SN       | P SN                    | PSN         | z                 |   |  | 295. 73    | DEG MIN       | LATITUDE  | Tiglax                   |                          |
| S S S S S S S S S S S S S S S S S S S | 0000 |    |    | 8    | 66   | 65  | 49  |    | The state of the s | 64  | 63   | 306 62 | SALT Nut.Btl 02-Btl.No       | Hydro Team-PMEL    |             | Transmissometer PAR S/N |             | SBE43-Oxy (prime) | EL HOD CAN  | ADT Date and Time                        | 014.451x   | DEG MIN       | LONGITUDE   | US F&W Tiglax            | CRUISE ID                |
|                                       |      |    |    |      |      |     |     |    |  |     |      |        | Frac Chloro                  | Strom/             |             | =                       |             |                   | S. COURSE AND | ime #                                    | w 30 Apr 1 | DAY MO YR     | . DATE (UTC)  | GOA-IERP-LT              | PROJECT & LEG            |
|                                       |      |    |    |      |      |     |     |    |  |     |      |        | Prim. Prod Phyto Micro Zoops | Strom/Frederickson | ed id wa    | ロベンナの                   |             |                   | - 1   | # 100 mm m m m m m m m m m m m m m m m m | 1600       | R HR MIN (°C) | TIME (UTC) DRY BULB   | GOA-IERP-LTL Spring 2011 | G                        |
|                                       |      |    |    |      |      |     |     | (  | N. L.  |     |      |        | 18.                          |                    | doed of     | ack down                |             |                   |   |  |            | (°C) (mb) *   | E PRESSURE  | 740                      |                          |
|                                       |      |    |    |      |      |     |     | (  | the later  |     |      |        |                              | Comments           |             | to cated o              | 7           |                   |   |  |            | (deg) (kts)   | VISIBILITY  DIR. WIND  SP. WIND  CLOUD (amt)  TYPE  WEATHER |                          | STAT                     |
|                                       | 12   | 11 | 10 | 9    | 00   | 7   | o   | U. | 4  | ω   | 2    |        | No.                          | Nis                |             | ones tehn               | F           |                   | MAX DEPTH = 74                                    |  | S14185     | (m)           | BOTTOM STA. NAME/ID   |                          | STATION NO. or alt. name |

.

| 12      | 11   | ÷:                                      | 10            | 9  | ω     | 7   | 6    | S   | 4   | ω        | 2        |      | N <sub>O</sub>   | N<br>is            | S           | ٦           | <u>ک</u> ار     | Ţ                 | S            |                     | 20   |          | CAS                     | USF                      |
|---------|------|---|---------------|----|-------|-----|------|-----|-----|----------|----------|------|------------------|--------------------|-------------|-------------|-----------------|-------------------|--------------|---------------------|------|----------|-------------------------|--------------------------|
| 4, 50   |      |   |               |    | /     | 0   | 10   | 20  | BC  | 40       | 50       | 63   | DESIRED          | DEPTH              | SEC COND SN | PRI COND SN | SEC TEMP SN     | PRESS SN          | SBE 9+       |                     |      |          | CONSC<br>CAST #         | USF&W Tiglax             |
| 14 = 10 | 11/2 |   | enni<br>Evili |    | HIII. |     |      |     |     |          |          | 31/2 | 444              | Rose               | SN I        | S<br>S      | NS N            | ī                 | ı            |                     | 57   | DEG      | ě                       | iglax                    |
|         |      |   |               |    |       |     |      |     |     |          |          |      |                  | Rosette Notes      |             |             |                 |                   |              |                     | 532  | ĭ<br>Ž   | LATITUDE                |                          |
|         |      |   |               |    |       | SK  | YK   | SE  | SX  | 7/       | 70       | 69   | WAF              | SS                 |             |             |                 |                   |              |                     | کا   |          | Ē                       |                          |
|         |      |   |               |    |       |     | 3610 |     |     | 6.07.657 | 0        |      | SALT             |                    | Ц           | 4           |                 | +                 |              |                     | z    | F        |                         | le<br>E                  |
|         | -    | 1                                       |               |    |       | 2   | 77   | 2   | 2   | 2        | 7        | 2    |                  | Hydro              |             | PAR S/N     | Transm          | SBE43-            | FLUOR S/N    | 8                   | 151  | DEG      | _                       | US F&W Tiglax            |
|         |      |   |               |    |       | 712 | =    | 210 | 209 | 208      | 207      | 206  | Nut.Btl          | Hydro Team-PMEL    |             | Z           | Transmissometer | SBE43-Oxy (prime) | N/S          | T Date              | 14   | _        | LONGITUDE               | Tigla                    |
|         |      | *************************************** |               | 21 |       |     |      |     |     |          |          |      | 02-Bti.No        | MEL                |             | 1           | 4               | ne)               |              | ADT Date and Time = | 037  | ₹<br>Z   | DE .                    | <b> </b> *               |
|         | 1    |   |               |    |       |     |      |     |     |          |          |      |                  | eks.               |             |             |                 |                   |              | me =                | ×    |          |                         |                          |
|         |      |   |               |    |       |     |      |     |     |          |          |      | Frac Chloro      | =                  |             |             |                 |                   |              |                     | 30 A | DAY      |                         | 8                        |
|         | -    | +                                       |               |    |       |     |      | 1   |     |          |          |      |                  | Stro               |             | ١           | ١               |                   | 3            |                     | Z    | Mo       | DATE<br>(UTC)           | GOA-IERP-LTL Spring 2011 |
|         |      |   |               |    |       | -   |      | 1   |     |          |          |      | Prim. Prod Phyto | m/Fred             |             |             | _               |                   | 70           |                     | 1    | ∌        |                         | -   S                    |
|         |      |   |               |    |       |     |      |     |     |          |          | 1    | hyto             | Strom/Frederickson |             |             |                 |                   | REMARKS      |                     | 3    | 景        | TIME<br>(UTC)           | ring 20                  |
| 0.00    | İ    |   |               |    |       |     |      |     |     |          | <u> </u> |      | Micro Zoops      |                    |             |             |                 |                   |              |                     | W    | ₹<br>Z   |                         | =                        |
|         |      |   |               |    |       |     |      |     |     |          |          |      | Zoops            |                    |             |             |                 |                   |              |                     |      | Ĉ        | DRY BULB                | F                        |
|         |      |   |               |    |       |     |      |     |     |          |          |      |                  |                    |             |             |                 |                   |              |                     |      | -        | -                       |                          |
|         |      |   |               |    |       | 11  |      |     |     |          |          |      |                  | _                  |             |             |                 |                   |              |                     |      | (°C)     | WET BULB                |                          |
|         |      |   |               |    |       | ļ   |      |     | 000 |          |          |      |                  |                    |             |             |                 |                   |              |                     |      | (mb)     | PRESSURE                |                          |
|         |      |   |               |    |       |     |      |     |     |          |          |      |                  | 0                  |             |             |                 |                   |              |                     |      | *        | SEA STATE<br>VISIBILITY |                          |
|         |      | 1                                       |               |    |       |     |      |     |     |          |          |      |                  | Comments           |             |             |                 |                   |              |                     |      | (deg)    | WIND<br>DIRN.           |                          |
|         |      |   |               |    |       |     |      | 1   | -   |          |          |      |                  | S                  |             |             |                 |                   |              |                     |      | (kts)    | WIND<br>SPD.            | 1                        |
|         |      |   |               |    |       |     |      |     |     |          |          |      |                  |                    |             |             |                 |                   |              |                     |      | *        | CLOUD (amt)             | 1                        |
|         |      |   |               |    |       |     |      |     |     | 1        |          |      |                  |                    |             |             |                 |                   |              |                     |      | *        | WEATHER                 |                          |
|         |      |   |               |    |       |     |      |     |     |          |          |      |                  |                    |             |             |                 |                   | MAX. DEPTH = |                     | 69   | <u>a</u> | ВОТТОМ<br>DEPTH         |                          |
|         |      |   |               |    |       |     |      |     | 8   |          |          |      |                  |                    |             |             |                 |                   |              |                     |      | -        | HL-189<br>STA. NAME/ID  |                          |
| 1       |      |   |               |    |       |     |      |     |     |          |          |      |                  |                    |             |             |                 |                   | 63           |                     |      |          | NAME                    |                          |

| 12 | 1 | 10 | 9 | ω | 7  | 6 | СЛ                                      | 4  | ω  | 2  |       | 8                | Z<br>S             |             |             |                 | يار               |              |                     | 30    |                                       | CA CO                   | ISU                      | VESSEL     |
|----|---|----|---|---|----|---|---|----|----|----|-------|------------------|--------------------|-------------|-------------|-----------------|-------------------|--------------|---------------------|-------|---------------------------------------|-------------------------|--------------------------|------------|
|    |   |    |   |   | 0  | 0 | 20                                      | 30 | 40 | 50 | 5     | DESIRED          | DEPTH              | SEC COND SN | PRI COND SN | SEC TEMP SN     | PRESS SN          | SBE 9+       |                     |       | $\perp$                               | CONSC<br>CAST #         | USF&W Tiglax             | NET.       |
| NE |   |    |   |   |    |   |   |    |    |    | I SEV |                  |                    | D SN        | S S         | S X             | 1                 |              | :                   | 62    | DEG                                   |                         | iglax                    |            |
|    |   |    |   |   |    |   |   |    |    |    |       |                  | Rosette Notes      |             |             |                 |                   |              |                     | .364  | Z<br>Z                                | LATITUDE                |                          |            |
|    |   |    |   |   | 28 | 8 | 80                                      | 70 | 78 | 77 | 34    | マッチ<br>マッチ       | Š                  |             |             |                 |                   |              |                     | 4     |                                       | DE .                    |                          |            |
|    |   |    |   |   |    |   |   |    |    |    |       | SALT             |                    |             |             |                 |                   |              |                     | z     |                                       |                         | Lis.                     | 5          |
|    |   | -  | - | - |    |   |   |    |    |    |       | Nut.Btl          | Hydro              |             | PAR S/N     | Transmi         | SBE43-Oxy (prime) | FLUOR S/N    | AD.                 | 151   | DEG                                   |                         | US F&W Tiglax            | כאטוטר וני |
|    |   |    |   |   |    |   | П                                       |    |    |    |       |                  | Hydro Team-PMEL    |             | _           | Transmissometer | )xy (prim         | ž            | T Date              | .610  | 3                                     | LONGITUDE               | Tigla                    |            |
|    |   |    |   |   |    |   |   |    |    | Ь. |       | 02-Btl.No        | ÆL.                |             |             |                 | <u>ē</u>          |              | ADT Date and Time = | 0     | ₹<br>Z                                | DE                      |                          |            |
|    |   |    |   |   |    |   |   |    |    |    |       |                  | HEENG              |             |             |                 |                   |              | ne =                | w 30  | p                                     | -                       |                          |            |
|    |   |    |   |   |    |   |   |    |    |    |       | Frac Chloro      |                    |             | 12          |                 |                   |              |                     | +     | DAY                                   |                         | 60,                      | +          |
|    |   |    |   |   |    |   |   |    |    |    |       |                  | Stror              |             | ľ           |                 |                   | l            |                     | Apr 1 | ₹                                     | DATE<br>(UTC)           | A-IERP-I                 |            |
|    |   |    |   |   |    |   |   |    |    |    |       | Prim. Prod Phyto | Strom/Frederickson |             |             |                 |                   | æ            |                     | -     | ∌                                     |                         | TL Spr                   |            |
|    |   |    |   |   |    |   |   |    |    |    |       | yto              | rickson            |             |             |                 |                   | REMARKS      |                     | 2143  | · · · · · · · · · · · · · · · · · · · | TIME<br>(UTC)           | GOA-IERP-LTL Spring 2011 |            |
|    |   |    |   |   |    |   |   |    |    |    |       | Micro Zoops      |                    |             |             |                 |                   |              | 1616                | W     | Z                                     |                         | =                        |            |
|    |   |    |   |   |    |   |   |    |    |    |       | oops             |                    |             |             |                 |                   |              |                     |       | (°C)                                  | DRY BULB                |                          | 1          |
|    |   |    |   |   |    |   |   |    |    |    |       |                  |                    |             |             |                 |                   |              |                     |       |                                       | WET                     |                          | ١          |
|    |   |    |   |   |    |   |   |    |    |    |       |                  |                    |             |             |                 |                   |              |                     | •     | င္ပ                                   | WET BULB                |                          |            |
|    |   |    |   |   | -  |   |   |    |    |    |       |                  | F                  |             |             |                 |                   |              |                     |       |                                       | PRESSURE                | /earvi                   |            |
|    |   |    |   |   |    |   |   |    |    |    |       |                  | Cor                |             |             |                 |                   |              |                     |       | *                                     | SEA STATE<br>VISIBILITY | 1                        |            |
|    |   |    |   |   |    |   | •<br>•<br>•                             |    |    |    |       |                  | Comments           |             |             |                 |                   |              |                     |       | (deg)                                 | DIRN.                   |                          |            |
|    |   |    |   |   |    |   |   |    |    |    |       |                  |                    |             |             |                 |                   |              |                     |       | (kts)                                 | WIND<br>SPD.            |                          |            |
|    |   |    |   |   |    |   | 1<br>5<br>1<br>1<br>1                   |    |    |    |       |                  |                    |             |             |                 |                   |              |                     |       | *                                     | CLOUD (amt)<br>TYPE     | _                        |            |
|    |   |    |   |   |    |   |   |    |    |    |       |                  |                    |             |             |                 |                   | Š            | -                   | 6     | *                                     | WEATHER<br>R 명          | 10                       |            |
|    |   |    |   |   |    |   | 1 |    |    |    |       |                  |                    |             |             |                 |                   | MAX. DEPTH = |                     | 67    | (m)                                   | BOTTOM<br>DEPTH S       | 000                      |            |
|    |   |    |   |   |    |   |   | 60 |    |    |       |                  |                    |             |             |                 |                   | H.           |                     |       |                                       | STA. NAME/ID            | ٥                        | ,          |
| 12 | = | 10 | 9 | ω | 7  | 6 | 01                                      | 4  | ω  | 2  |       | N <sub>o</sub> . | Nis.               |             |             | 05              |                   | ٦            |                     |       |                                       | ME/ID                   |                          |            |

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1:WE 0044 6 W

| F      |    | -  | T=-                                     | I,,  | I <sub>a-</sub> | T_ ·  | T <sub>e</sub> | Ī, s                                    | I s  | 111   | D.   | T :   | Z                                | Z                  |             | -           |                 | 7                 | 7            | <u> </u>          | <u> </u>   | Ι.              | ráe                                     |                          |                          |
|--------|----|----|---|------|-----------------|-------|----------------|---|------|-------|--|-------|----------------------------------|--------------------|-------------|-------------|-----------------|-------------------|--------------|-------------------|------------|-----------------|---|--------------------------|--------------------------|
|        | 12 | 17 | 10 25                                   | 9 30 | 8 40            | 4.5 2 | 6 75           | 5                                       | 150  | 3 200 | 2 250  | 1 4/6 | lo. DESIRED                      |                    | SEC COND SN | PRI COND SN | PRI TEMP SN     | PRESS SN          | SBE 9+       |                   | 3/2        | D               | CONSC<br>CAST #                         | USF&W Tiglax             | VESSEL                   |
| CT_    | hs | 93 | 26                                      | 12   | 90              | 8     | 88             | 48                                      | * 86 | 85    | 18   | 83    | Nats<br>Nats                     | osette Note        | SN          | SS :        | SX              |                   |              |                   | 57 4 .52   | DEG MIN         | LATITUDE                                | iglax                    |                          |
| 2 2223 |    |    |   |      |                 |       | * .            | A                                       |      |       |  |       | SALT Nut.Btl 02-Btl.No           | Hydro Team-PMEL    |             | PAR S/N     | Transmissometer | SBE43-Oxy (prime) | FLUOR S/N    | ADT Date and Time | N (5°11.35 | DEG MIN         | LONGITUDE                               | US F&W Tiglax            | CRUISE ID                |
|        |    |    | 5                                       |      |                 |       |                |   |      | ÷     |  |       | .No Frac Chloro Prim. Prod Phyto | Strom/Frederickson |             |             |                 |                   |              | lime = 1 1 1      | wolmay 1 1 | DAY MO YR       | DATE (UTC)                              | GOA-IERP-LTL Spring 2011 | PROJECT & LEG            |
|        |    |    | 1 |      |                 |       |                | 1 |      |       |  |       | Phyto Micro Zoops                | derickson          |             |             |                 |                   | REMARKS      |                   | 0004 .     | HR MIN (°C)     | TIME (UTC) DRY BULB                     | pring 2011               |                          |
|        |    |    |   |      |                 |       |                |   |      |       | n de la companya de l |       |                                  | Comments           |             |             |                 |                   |              |                   |            | (mb) * * (deg)  | PRESSURE SEA STATE VISIBILITY DIRN.     |                          |                          |
|        |    |    |   |      |                 |       |                |   |      |       |  |       |                                  |                    |             |             | CART S          |                   | MAX. DEPTH = |                   | 420        | (kts) * * * (m) | SPD. CLOUD (amt) TYPE WEATHER DEPTH STA | 12-189                   | STATION NO. or alt. name |
|        | 12 | 11 | 10                                      | 9    | 8               | 7     | 6              | 5                                       | 4    | ω     | 2  |       | N <sub>o</sub> .                 | N.S.               |             |             |                 |                   | 4/6 "        |                   |            |                 | STA. NAME/ID                            |                          | me                       |

N<sub>O</sub> CAST # USF&W Tiglax 10 9 8 7 6 5 4 ω 2 SBE 9+ PRESS SN 1250 PRI COND SN SEC TEMP SN PRI TEMP SN 300 SEC COND SN 150 DESIRED 50 DEPTH 50 77 5 40 20 Š DEG SST=Rosette Notes LATITUDE 50.460'N ₹ SALT 307 US F&W Tiglax 1500 DEG SBE43-Oxy (prime) PAR S/N Hydro Team-PMEL FLUOR S/N Transmissometer Nut.Btl ADT Date and Time = 215 214 224 217 225 222 22 220 218 216 223 219 LONGITUDE 46 . 420' WOI 02-Bti.No Frac Chloro 601 101 102 77 401 001 42 26 DAY 26 MAY GOA-IERP-LTL Spring 2011 MO DATE (UTC) Prim. Prod Phyto Strom/Frederickson ⋨ 0 REMARKS 풌 3 TIME (UTC) X Z 2 Micro Zoops DRY BULB (၁) WET BULB (°C) (dm) PRESSURE SEA STATE VISIBILITY Comments WIND DIRN. (deg) SPD. SIND CLOUD (amt) (kts) TYPE STATION NO. or alt. name WEATHER 181-189 BOTTOM DEPTH 500 MAX. DEPTH = (m) STA. NAME/ID ĕ N Sis 12 <u>-1</u> 7 9 5 2 œ 7 ნ ω

|              | Did not close                       |   |                        | 12 0                    |
|--------------|-------------------------------------|---|------------------------|-------------------------|
|              |                                     | 34                                      |                        |                         |
|              |                                     | 15                                      | 1112                   | 5                       |
|              |                                     | 12                                      |                        | 10 26                   |
| :            |                                     |   |                        | 9<br>130                |
| 35           |                                     | 10                                      |                        | 8 40                    |
|              |                                     |   |                        | 7 50                    |
|              |                                     | O.                                      |                        | 6 50                    |
|              | leaked                              | 10                                      |                        | 5 75                    |
| 5.           | did not close                       | 1987                                    |                        | 4 (10)                  |
|              |                                     | 80                                      |                        | 3 (50                   |
| 数            |                                     | 107                                     |                        | 2 250                   |
|              |                                     | m01                                     |                        | 1 500                   |
|              | )S                                  | Frac Choro Prim. Prod Phyto Micro Zoops | SALT Nut.Btl 02-Btl.No | No DESIRED              |
| its          | Comments                            | Strom/Frederickson                      | Hydro Team-PMEL        | Nis DEPTH Rosette Notes |
|              |                                     |   |                        | SEC COND SN             |
|              |                                     |   | PAR S/N                | PRI COND SN             |
|              |                                     |   |                        | PRI TEMP SN             |
|              |                                     |   | SBE43-Oxy (prime)      | PRESS SN                |
| MAX. DEPTH = |                                     | REMARKS                                 | FLUOR S/N              | SBE 9+                  |
|              |                                     | -                                       | ADT Date and Time =    |                         |
| 2000H        | •                                   | 1 May 1 1 06 3 0                        | ' N 150° 21 . 590° W   | 3 3 57 4.250            |
| (kts) * *    | (°C) (mb) * *                       | DAY MO YR HR MIN (°C)                   | DEG MIN                | DEG                     |
| l            | PRESSURE SEA STATE VISIBILITY DIRN. | DATE TIME (UTC) (UTC) DRY BULB          | LONGITUDE              | CONSC LATITUDE          |
| HX-193       |                                     | GOA-IERP-LTL Spring 2011                | US F&W Tiglax          | USF&W Tiglax            |
|              |                                     | _                                       |                        |                         |

N<sub>O</sub> З CONSC CAST # USF&W Tiglax 10 9 œ 7 6 2 PRESS SN SBE 9+ PRI TEMP SN PRI COND SN SEC TEMP SN 74 SEC COND SN 30 DESIRED 5 100 150 9 2 40 7 DEPTH Rosette Notes 0 \_\_ 42 DEG SST=LATITUDE 2 ₹ .790 N SALT 150 US F&W Tiglax DEG FLUOR S/N SBE43-Oxy (prime) Hydro Team-PMEL PAR S/N Transmissometer Nut.Btl ADT Date and Time = LONGITUDE 45 .510' ĭ Z 02-Btl.No \$ Saccine's 12 ح = DAY 23 18 二十 5 2 7 GOA-IERP-LTL Spring 2011 12 증 DATE (UTC) Prim. Prod Phyto Strom/Frederickson ⋨ REMARKS 돗 0 TIME (UTC) ĭ Z Micro Zoops 4 DRY BULB **ී** WET BULB (°C) (mb) PRESSURE SEA STATE VISIBILITY Comments WIND DIRN. (deg) SP NO CLOUD (amt) (kts) TYPE STATION NO. or alt. name HT-193 WEATHER BOTTOM DEPTH MAX. DEPTH = Œ 8947 STA. NAME/ID 193 õ Nis 10 12 ဖ œ თ 5 4 ω 2

SSSal=

Nis. No 9 ω CAST # USF&W Tiglax œ 7 6 S 4 2 PRI TEMP SN SBE 9+ PRI COND SN SEC TEMP SN PRESS SN SEC COND SN GP. DESIRED 30 7 DEPTH Rosette Notes 10 س D S. J 5 DEG SST= 57 LATITUDE 32.160 ĭ Z SALT z 308 US F&W Tiglax 151 DEG SBE43-Oxy (prime) PAR S/N SSSal= Hydro Team-PMEL FLUOR S/N Transmissometer Nut.Btl ADT Date and Time = LONGITUDE 10 . 060 <u>₹</u> 02-Bti.No \$ Strom/Frederickson
Frac Chloro Prim. Prod Phyto DAY 17/9 12 124 Z & 20 GOA-IERP-LTL Spring 2011 PROJECT & LEG 8 DATE (UTC) ¥ REMARKS 픘 V TIME (UTC) 5 MIN Micro Zoops DRY BULB ೦ WET BULB (°C) (mb) PRESSURE SEA STATE VISIBILITY Comments WIND DIRN. (deg) SP WIND
CLOUD (amt) (kts) TYPE STATION NO. or alt. name HP-193 WEATHER BOTTOM DEPTH MAX. DEPTH = 3 77 HP-193 STA. NAME/ID 8 O Nis 70 12 = 9 ω 2 œ 7 6 S 4

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| SBE 9+   | VESSEL USF&W Tiglax CONSC CAST # DEG | 5             |          | V Tiglax LONGITUDE | ·   |                     |                  | GOA-IERP-LTL Spring 2  GOATE  DATE  (UTC)  (UTC)  HR | GOA-IERP-LTL Spring 2011  DATE TIME (UTC) (UTC) DR' | GOA-IERP-LTL Spring 2011  DATE  TIME (UTC)  (UTC)  MIN  (°C)  (°C) | GOA-IERP-LTL Spring 2011  DATE  TIME (UTC)  (UTC)  MIN  (°C)  (°C) | PROJECT & LEG                   | GOA-IERP-LTL Spring 2011                  | PROJECT & LEG                                 |
|--|--------------------------------------|---------------|----------|--------------------|-----|---------------------|------------------|--|---|--|--|---------------------------------|---|---|
| ADT Date and Time =  | S                                    |               |          | 611.               | DAY | May 1               | _   <sup>m</sup> | 1 HR MIN   | HR W  | HR MIN (°C) (°C)   | HR MIN (°C) (°C) (mb) *  | HR MIN (°C) (°C) (mb) * * (deg) | HR MIN (°C) (°C) (mb) * * (deg) (kts) * * | HR MIN (°C) (°C) (mb) * * (deg) (kts) * * * 4 |
| PRESS SN         SEC TEMP SN         SEC TEMP SN         PRI COND SN         DEPTH Rosette Notes       Hydro Team-PMEL         DESIRED         LO       J 3 J    | SBF 9+                               |               | AD AD    | T Date and Tir     | 1   | -                   | 20.00            | REMARKS  | A   | A  | A  | A                               | A   | A   |
| PRI TEMP SN         Intransmissometer           SEC TEMP SN         ITRANSMISSOMETER           PAR S/N         ITRANSMISSOMETER           DEPTH         Rosette Notes         Hydro Team-PMEL           DESIRED         SALT         ICAFE         02-BtI.No         Frac Chloro           LO         1 3 2         1 3 3         1 3 3         1 3 4         1 3 4         1 3 4         I 3 4  | PRESS SN                             |               | SBE43-I  | Oxy (prime)        |     |                     |                  |  |   |  |  |                                 |   |   |
| PRI COND SN  | PRI TEMP SN                          |               |          |                    |     | ļ                   |                  |  |   |  |  |                                 |   |   |
| DEPTH   Rosette Notes  | PRI COND SN                          |               | PAR S/I  | 7                  |     |                     |                  |  |   |  |  |                                 |   |   |
| DESIRED SALT NUT.Bit 02-Bit.No Frac Chloro  45   130   130    20   132   133    10   133   134    134   134   134    134   134   134    134   134   134    134   134   134    137   134   134    138   139   139    139   139   139    130   130   139    131   131   131    131   132   133    132   133   134    133   134   135    134   135   135    135   136   136    137   138   138    138   138   138    139   139   139    130   131   131    131   131   131    131   131   131    131   131   131    131   131   131    132   133   131    133   134   135    134   135   135    135   135   135    136   137   135    137   138   135    138   138   138    139   139   138    130   131   131    131   131   131    131   131   131    131   131   131    132   133   135    133   135   135    134   135   135    135   135   135    137   135   135    138   138   138    139   139   135    130   130   135    131   131   135    131   131   135    131   131   135    131   131   135    132   133   135    133   135   135    134   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135    135   135   135 | DEPTH                                | Rosette Notes | Hydro    | Team-PMEL          |     | Strom/Fr            |                  | Strom/Frederickson                                   | ederickson  | ederickson   |  | ederickson Comments             |   |   |
| 45   13<br>20   13<br>10   13<br>0   13<br>13  |                                      |               |          |                    |     | ro Prim. Prod Phyto |                  |  | Phyto Micro Zoops                                   |  |  |                                 |   |   |
| 30   13<br>20   13<br>10   13<br>0   13  |                                      |               |          | 30                 |     | -                   | $\overline{}$    |  |   |  |  |                                 |   |   |
| 20   13<br>  10   13<br>  0   13   | 2 30                                 |               | /        | 3/                 |     |                     |                  |  |   |  |  |                                 |   |   |
| 10 13  | 3 20                                 |               | 13       |                    |     |                     |                  |  |   |  |  |                                 |   |   |
| 0 1  | 4 10                                 |               | 1.       | 33                 |     |                     |                  |  |   | *  | *  |                                 |   |   |
|  | 5 (0                                 |               |          | )                  |     |                     | <del>:</del>     | 1<br>1<br>1<br>1<br>1                                |   |  |  |                                 |   |   |
| 7<br>8<br>8<br>9<br>1  | 6                                    |               | 1.3      | 48                 |     |                     | _                |  |   |  |  |                                 |   |   |
| 8  | 7                                    |               |          |                    |     |                     |                  |  |   |  |  |                                 |   |   |
| 2  | 8                                    |               | <u> </u> |                    |     |                     | _                |  |   |  |  |                                 |   |   |
| 1 0  | 9                                    |               |          |                    |     |                     | _                |  |   |  |  |                                 |   |   |
| 2  | 10                                   |               |          |                    |     |                     | _                |  |   |  |  |                                 |   |   |
| 2  | 11                                   |               | Diagram  |                    |     |                     |                  |  |   |  |  |                                 |   |   |
|  | 12                                   |               |          |                    |     |                     |                  |  |   |  |  |                                 |   |   |

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|          |   |                              |               | SSSal=            | v               | 100             |        |
|----------|---|------------------------------|---------------|-------------------|-----------------|-----------------|--------|
| 12       |   |                              |               |                   |                 |                 |        |
| =        |   |                              |               |                   |                 |                 | 12     |
| 2        |   |                              |               |                   |                 |                 | 1=     |
| 5        |   |                              | 153           |                   |                 | C               | lä     |
| ω        |   |                              | 152           |                   |                 | , 5             | 9      |
| œ        |   |                              | 3             |                   |                 | 3 5             | ∞      |
| 7.       |   |                              |               |                   |                 | 300             | 7      |
| 6        |   |                              | 150           | 23/               |                 |                 | 6      |
| ۍ        |   |                              |               | 30                |                 |                 | 57     |
| 4        |   |                              | 747           | 279               | ,               | _               | 4      |
| ω        |   |                              | 871           | 228 182           |                 | +               | ω      |
| 2        |   |                              | 471           | 727               |                 | 1               | 2      |
| <u> </u> |   |                              | lyle          | 226               |                 | 10.             |        |
| No.      | ps  | Prim. Prod Phyto Micro Zoops | 10            | Nut.Btl O2-Btl.No | SALT            | DESIRED         | Š      |
| Nis      | Comments  | Strom/Frederickson           |               | Hydro Team-PMEL   | Rosette Notes + | HTGGO           | Z<br>Z |
|          |   |                              |               |                   |                 | SEC COND        |        |
|          |   |                              |               | PAR S/N           |                 | PRI COND SN     |        |
|          |   |                              |               | Transmissometer   |                 | SEC TEMP SN     |        |
|          |   |                              |               |                   |                 | PRI TEMP SN     |        |
| ] ,      | MAX, CEFT H =   |                              | ::.           | SBE43-Oxy (prime) |                 | PRESS SN        |        |
|          | S NAV DIDITI  | REMARKS                      |               | FLUOR S/N         |                 | SBE 9+          |        |
|          |   |                              |               | ADT Date and Time |                 |                 |        |
|          | 9   |                              | 1 KVW         | 2.009             | 31 N 699471     | 3858            | Ī.     |
|          | (°C) (mb) * * (deg) (kts) * * * (m)   | Z                            | DAY MO        | DEG MIN           | MIN             | DEG             | Т      |
|          | DRY BULB WET BULB PRE SEA STATE  SEA SIBILITY  DIRN. SPD. 2-12 YE WE DEPTH STA. NAME/ID  DRY BULB WET BULB PRE SEA STATE   TIME (UTC)                   | DATE<br>(UTC) | LONGITUDE         | LATITUDE        | CONSC<br>CAST # | 20     |
|          |   | GOA-IERP-LTL Spring 2011     | GOA-IERP-I    | US F&W Tiglax     | SN              | USF&W Tiglax    | E      |
|          | STATION NO. or alt, name  | _EG                          | PROJECT & LEG | CRUISE ID         | CRU             | VESSEL          | ٦      |
|          |   |                              |               |                   |                 | CCC             |        |

| 12             |   |                  |                          |        |                     | SSSal=            |  | SST=         |                 |
|----------------|---|------------------|--------------------------|--------|---------------------|-------------------|--|--------------|-----------------|
|                | Lottle missing, would silled @ Swiface.               |                  |                          | 243    |                     | 197               |  |              | 12 8            |
| :              |   |                  |                          | 242    |                     | 196               |  |              | 11 10           |
| 5 (            |   |                  |                          | 241    |                     | 195               |  |              | 10 26           |
| 0 0            |   |                  |                          | 240    |                     | 194               |  |              | 9               |
| 20 -           |   |                  |                          | 239    |                     | 193               |  |              | 8               |
| 7 0            |   |                  |                          | 238    |                     | 192               |  |              | 7               |
| ח ני           |   |                  |                          | 237    |                     | 191               |  |              | 6 75            |
| v 1            | 02 bottle # 153 has mislabled stopped (#154)          |                  |                          | 236    | 153                 | 190               |  |              | 5 100           |
| <u> </u>       |   |                  |                          | 235    |                     | 1891              | ,  | 1            | 4 12            |
| ω              |   |                  |                          | 734    |                     | 188               |  | 7            | 3 15            |
| 2              |   |                  |                          | 233    |                     | 107               | The state of the s |              | 2 300           |
| -3             |   |                  |                          | 232    | 7                   | 186               | on the little state of the stat | 0            | 500             |
| N <sub>o</sub> |   | hyto Micro Zoops | Prim. Prod Phyto         |        | 02-Bti.No           | SALT ( Nursel of  | (0   | Ð            | No. DESIRED     |
| Z<br>S         | Comments  | erickson         | Strom/Frederickson       | CALVIN | PMEL                | Hydro Team-PMEL   | Rosette Notes  | HRose        | Nis DEPTH       |
|                |   |                  |                          |        |                     |                   |  | ND SN        | SEC COND SN     |
|                |   |                  |                          |        |                     | PAR S/N           |  | ND SN        | PRI COND SN     |
|                |   |                  | 1                        |        | ter                 | Transmissometer   |  | MP SN .      | SEC TEMP SN     |
|                | 1444 7-3m.  | MITTON           | -                        |        | rime)               | SBE43-0xy (prime) |  | AP SN .      | PRI TEMP SN     |
| a              | MAX. DEPTH =  | REMARKS          | 20                       |        |                     | FLUOR S/N         |  |              | SBE 9+          |
|                |   |                  | 1 1                      | 0 11   | ADT Date and Time = | ADT Dat           |  |              |                 |
|                |   | 2009             | 1 - 1                    | N Ch   | 9292                | N 149.97          | 31967  | 57           | et i            |
| ME/ID          | (*C) (mb) * * (deg) (kts) * * *                       | Z                | ∌                        | DAY    | <u>X</u>            | DEG               | MIN  | DEG          | -               |
| th             | RESSURE EA STATE ISIBILITY WIND COUD (amt) YPE EATHER | TIME   DBY BLILB | DATE                     | •      | TUDE                | LONGITUDE         | LATITUDE   |              | CONSC<br>CAST # |
|                | 64  | oring 2011       | GOA-IERP-LTL Spring 2011 | 60.    | lax                 | US F&W Tiglax     |  | USF&W Tiglax | ISF&W           |
|                | STATION NO. or alt. name                              |                  | PROJECT & LEG            | PRO    |                     | CRUISE ID         |  |              | VESSEL          |

|  |                                   | SSI                     |
|--|-----------------------------------|-------------------------|
| Strom/Frederickson Comments  To Prim. Prod Phyto Micro Zoops  Micro Zo | _                                 |                         |
| Strom/Frederickson Comments  TO Prim. Prod Phytro Micro Zoops   | 753 766                           |                         |
| Strom/Frederickson Comments  Type Prim. Prod Phyto Micro Zoops  Micro  |                                   | 7.0 -                   |
| Strom/Frederickson Comments  Prim. Prod Phyto Micro Zoops  Micro Zoops  Micro Zoops  Micro Zoops  Micro Zoops  Micro Zoops   |                                   | 10 70 4                 |
| Strom/Frederickson Comments    Prim. Prod   Phytro   Micro Zoops   |                                   | AX /                    |
| Strom/Frederickson Comments  Prim. Prod Phyto Micro Zoops  Micro Zoops  Micro Zoops  Micro Zoops  Micro Zoops  Micro Zoops   | 250 767                           | 900                     |
| Strom/Frederickson Comments  Prim. Prod Phyto Micro Zoops  | 249 261                           | 8 50 4                  |
| Strom/Frederickson Comments    Prim. Prod   Phyto   Micro Zoops  | 248 260                           | 7 /5/                   |
| Strom/Frederickson Comments  Prim. Prod Phyto Micro Zoops  Micro Zoops  Micro Zoops  Micro Zoops   |                                   | of the                  |
| Strom/Frederickson Comments  Prim. Prod Phyto Micro Zoops  Micro Zoops  Micro Zoops  | 247 259                           | 5 / Me                  |
| Strom/Frederickson Comments  Prim. Prod Phyto Micro Zoops  |                                   | 4 100 %                 |
| Strom/Frederickson Comments  Prim. Prod Phyto Micro Zoops  | WU 258                            | 3 125 4                 |
| Strom/Frederickson Comments Prim. Prod Phyto Micro Zoops   |                                   | 2 /50 4                 |
| Strom/Frederickson Comments Prim. Prod Phyto Micro Zoops   |                                   | 1/1/1                   |
| Strom/Frederickson Comments  | SALT Nut.Btl 02-Btl.No FracChloro | No. DESIRED             |
| l i .  | Hydro Team-PMEL                   | Nis DEPTH Rosette Notes |
|  |                                   | SEC COND                |
|  | PAR S/N                           | PRI COND SN             |
| •  | Transmissometer                   | SEC TEMP SN             |
| SURFACE DINE BY PAI  | SBE43-Oxy (prime)                 | PRI TEMP SN             |
| REMARKS MAX. DEPTH = 17  | FLUOR S/N                         | SBE 9+                  |
|  | ADT Date and Time =               |                         |
|  | N 151,1188 W Z                    | 51 58 95867             |
| YR HR MIN (*C) (*C) (mb) * * (deg) (kts) * * * (m)   | DAY                               | DEG MIN                 |
| DATE TIME  (UTC) (UTC) DRY BULB WET BULB PRE SS STATE  (SS DIRN. SPD. LL YPE THER  DEPTH STA NAME/ID   | LONGITUDE                         | CONSC LATITUDE          |
| GOA-IERP-LTL Spring 2011   | US F&W Tiglax GOA                 | USF&W Tiglax            |
| PROJECT & LEG STATION NO. or alt. name   | CRUISE ID PRO                     | VESSEL                  |

17-10 dr. 56

No DESIRED Nis DEPTH Rosette Notes 70 VESSEL 강 9 œ S CONSC CAST# G G USF&W Tiglax SBE 9+ SEC COND SN PRI COND SN SEC TEMP SN PRI TEMP SN PRESS SN シケ 203 20 ر 10 500 M 5 5 303 9 0 DEG 3/08t 1 0438 09P14280 LATITUDE 2251 1772 1771 X N 2272 SALT z ~ US F&W Tiglax CRUISE ID DEG So. The PAR S/N SBE43-Oxy (prime) Hydro Team-PMEL Transmissometer FLUOR S/N Nut.Btl 205 267 192 26 265 756 723 ADT Date and Time = 260 757 285 225 852 LONGITUDE <u>S</u> O2-Btl.No 4497 2460 WOHMAY 431876 0 17 (7) 5106 たっと 20% V/IC Wind Prim. Pro Phyto DAY GOA-IERP-LTL Spring 2011 PROJECT & LEG M O DATE (UTC) Strom/Frederickson 쏬 C REMARKS HR MIN Cx TIME Micro Zoops 0 DRY BULB WET BULB ೦ (°C) (dm) PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) © □ ≦ CLOUD (amt) TYPE (Kts) STATION NO. or alt. name Bongo WEATHER マテク вотто M DEPTH STA. NAME/ID MAX. DEPTH = 3 ストゴ 0 10 Ö Zis ユ 12 ဖ œ o S 4 ω N

SSSal=

No.DESIRED Nis DEPTH Rosette Notes CONSC CAST # <del></del> œ 6 ယ VESSEL  $\vec{\Box}$ 9 7 S 4 N **USF&W Tiglax** 500 SBE 9+ 8 5 127 SEC COND SN PRI COND SN SEC TEMP SN PRI TEMP SN PRESS SN 0 3 15/ ない 9 201 DEG SST= 58.299.84 09P14280 0438 LATITUDE 1771 1772 2272 2251 Z Z N148-1832 SALT CRUISE ID US F&W Tiglax DEG SBE43-Oxy (prime) PAR S/N FLUOR S/N SSSal= Hydro Team-PMEL Transmissometer 286 Nut.Btl 285 282 280 279 278 2.76 215 ADT Date and Time = 781 784 283 LONGITUDE <u>≤</u> O2-Btl.No 880 4497 2460 W OSMA 431876 429 427 432 A30 437 433 127 ME H 428 Erae Chloro Prim. Pro Phyto 95 F 58.4 426 DAY GOA-IERP-LTL Spring 2011 MO DATE (UTC) Strom/Frederickson --> \_ 뇄 <u>مر</u> REMARKS HR MIN TIME (UTC) 5 Micro Zoops DRY BULB WET BULB <u>ල</u> <u>ိ</u>င် PRESSURE SEA STATE VISIBILITY Comments DIRN. (deg) WIN SPD. (kts) CLOUD (amt)
TYPE
WEATHER STATION NO. or alt. name Bongo вотто M DEPTH STA. NAME/ID RF) 3 MAX. DEPTH = かも 72/ No 10 Nis 2 ဖ ထ G ഗ 4 ယ N