Dive Plan 4894– April 27, 2017

*Port:* Jeremy Rich    *Starboard:* Sean O’Neill     *Pilot:* Phil Forte

**On Bottom Target:** Crab Spa, 9 50.396 104 17.489  2505, x 4583, y 7814, hdg 355

Objectives: Deploy Vent-SID at Crab Spa, take majors, pick up Crab Trap, collect Riftia

Basket List
1. Large biobox w/ Crab Trap
2. 5 Majors
3. T probe

### Locations:

<table>
<thead>
<tr>
<th>Location</th>
<th>Lat</th>
<th>Long</th>
<th>m</th>
<th>x</th>
<th>y</th>
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</thead>
<tbody>
<tr>
<td>Pvent</td>
<td>9 50.276</td>
<td>104 17.474</td>
<td>2511</td>
<td>4628</td>
<td>77926</td>
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<tr>
<td>Bio9</td>
<td>9 50.296</td>
<td>104 17.476</td>
<td>2514</td>
<td>4624</td>
<td>77962</td>
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<tr>
<td>Crab Spa MkF</td>
<td>9 50.396</td>
<td>104 17.489</td>
<td>2505</td>
<td>4600</td>
<td>78147</td>
</tr>
<tr>
<td>Tica</td>
<td>9 50.406</td>
<td>104 17.490</td>
<td>2505</td>
<td>4598</td>
<td>78165</td>
</tr>
<tr>
<td>Teddy Bear</td>
<td>9 50.50</td>
<td>104 17.51</td>
<td>2514</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. On bottom, transit to Crab Spa
2. At Crab Spa, take 4 majors at warmest spot, should be around 23-25°C, there is an opening to access to the fluids that we cleared today
3. Check on Crab Trap (x 4584, y 7814, z 2508m).
4. Swap Trap with new one in the biobox regardless if crabs are inside
5. Move to Riftia site near Crab Spa, there is chimney forming just below Crab Spa.
6. Measure T and take major at hottest spot
7. Collect Riftia in colony around chimney
8. Before collecting Riftia, proceed with following:
   a. Measure T at base of Riftia clump,
   b. Make a T measurements at plume level
9. Proceed with collection and put worms in large biobox. Make sure worms fit into biobox and nothing sticks out. Don’t fold them!
10. If time permits, move north to find Teddy Bear.
**Pilot**: Phil Forte  
**Port Observer**: Jeremy Rich  
**Starboard Observer**: Sean O’Neill  
**Notes are from Jeremy Rich and Sean O’Neill**

<table>
<thead>
<tr>
<th>GMT</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>14:00</td>
<td>Descending</td>
</tr>
<tr>
<td>15:30</td>
<td>At sea floor</td>
</tr>
<tr>
<td>15:35</td>
<td>Surveying microbial biofilm site (x4600 y78143 d2505) near Crab Spa</td>
</tr>
<tr>
<td>15:40</td>
<td>Taking temperature in small chimney with riftia and mussels at biofilm site; T=14-15˚C</td>
</tr>
<tr>
<td>15:45</td>
<td>Continuing to survey biofilm site.</td>
</tr>
<tr>
<td>15:57</td>
<td>At Crab spa for major sampling; Initial temperatures were reading 20˚C with basket probe. This probe was underestimating temperature by 4-5˚C. Used ICL temperature probe, and it was reading 23-24˚C</td>
</tr>
<tr>
<td>16:25</td>
<td>First major (blue) at Crab Spa; ICL T=22˚C</td>
</tr>
<tr>
<td>16:33</td>
<td>Second major (green) at Crab Spa; ICL T=25˚C</td>
</tr>
<tr>
<td>16:44</td>
<td>Third major (red) at Crab Spa; ICL T bad thermocouple</td>
</tr>
<tr>
<td>16:49</td>
<td>Fourth major (white) at Crab Spa; ICL T=23˚C, second chamber did not fill, appeared jammed.</td>
</tr>
<tr>
<td>16:55</td>
<td>Fifth major (black) at Crab Spa; ICL T reading 15˚C in ambient seawater, bad readings</td>
</tr>
<tr>
<td>17:05</td>
<td>Just below Crab Spa, exchanging crab trap with crab in it with empty crab trap.</td>
</tr>
<tr>
<td>17:15</td>
<td>Measuring temperature at Alvinella mound (x4572 y78130 d2512) near Crab Spa. T=150˚C in mound; T=30-45˚C in alvinella.</td>
</tr>
<tr>
<td>17:40</td>
<td>Sampling riftia (x4568 y78137 d2515); T=0˚C at top of riftia, T=24˚C at riftia base (T measured with basket probe, which was underestimating T by 4-5˚C).</td>
</tr>
<tr>
<td>18:09</td>
<td>Heading to Teddy Bear Site</td>
</tr>
<tr>
<td>18:19</td>
<td>Starting to survey area south of Teddy Bear</td>
</tr>
<tr>
<td>19:13</td>
<td>Teddy Bear site located based on sighting of large volume pump weights</td>
</tr>
<tr>
<td>19:26</td>
<td>Taking T at riftia patch near Teddy Bear (x4541 y7835 d2516) using ICL probe, T=7-11˚C</td>
</tr>
<tr>
<td>19:37</td>
<td>Taking T at riftia crack at Teddy Bear (x4545 y7836 d2516) using ICL probe, T=5-10˚C</td>
</tr>
<tr>
<td>19:50</td>
<td>Going off axis to drop weights</td>
</tr>
<tr>
<td>19:53</td>
<td>Ascending</td>
</tr>
<tr>
<td>21:00</td>
<td>At surface</td>
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</table>
AT 37-12 Sample Sheet

Alvin Dive# 4894  Date 4/27/17  Logged by Jeremy Rich
Start: 14:00 GMT  At Seafloor 15:30  End 21:00

FLUID SAMPLES

Major# 1  Blue  Time 16:25  Temp ICL 23.0  Vent Crab Spn
X 4590 Y 78128  Hdg 5  Depth 3506  Alt 0  Marker (type/#)
Comments

Major# Green  Time 16:33  Temp ICL 22.7  Vent Crab Spn
X 4590 Y 78127  Hdg 5  Depth 3506  Alt 0  Marker (type/#)
Comments

Major# Red  Time 16:44  Temp ICL NA  Vent Crab Spn
X 4586 Y 78125  Hdg 6  Depth 3506  Alt 0  Marker (type/#)
Comments

Major# White  Time 16:49  Temp ICL 19.5  Vent Crab Spn
X 4586 Y 78124  Hdg 5  Depth 3506  Alt 0  Marker (type/#)
Comments

Major# Black  Time 16:55  Temp ICL NA  Vent Crab Spn
X 4583 Y 78123  Hdg 6  Depth 3506  Alt 0  Marker (type/#)
Comments

BIOLOGICAL SAMPLES

Take photos before collection, in the claw (if possible), and after collection.
If needed, make sketches with scales.

Sample # 1  Time 17:40  Temp top 2°C base (24°C)  Vent Tica
X 4569 Y 7813  Hdg 61  Depth 2515  Alt 0  Marker (type/#)
Sample type Riftia
Basket location Biobox

Temp taken with basket probe, which is underestimating temp by 2-5°C
Assoc. water sample # ________ Assoc. rock sample # ________ (type) ________
Description of associated fauna &/or type of venting

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Time</th>
<th>Temp</th>
<th>Vent</th>
</tr>
</thead>
<tbody>
<tr>
<td>X ______</td>
<td>Y ______</td>
<td>Hdg ______</td>
<td>Depth ______</td>
</tr>
</tbody>
</table>

Sample type
Basket location

Assoc. water sample # ________ Assoc. rock sample # ________ (type) ________
Description of associated fauna &/or type of venting

Sample # ________ Time ________ Temp ________ Vent ________
X ______ | Y ______ | Hdg ______ | Depth ______ | Alt ______ | Marker ______ | (type/#) |

Sample type
Basket location

Assoc. water sample # ________ Assoc. rock sample # ________ (type) ________
Description of associated fauna &/or type of venting

Sample # ________ Time ________ Temp ________ Vent ________
X ______ | Y ______ | Hdg ______ | Depth ______ | Alt ______ | Marker ______ | (type/#) |

Sample type
Basket location

Assoc. water sample # ________ Assoc. rock sample # ________ (type) ________
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Sample # ________ Time ________ Temp ________ Vent ________
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Sample type
Basket location

Assoc. water sample # ________ Assoc. rock sample # ________ (type) ________
Description of associated fauna &/or type of venting

Sample # ________ Time ________ Temp ________ Vent ________
X ______ | Y ______ | Hdg ______ | Depth ______ | Alt ______ | Marker ______ | (type/#) |

Sample type
Basket location

Assoc. water sample # ________ Assoc. rock sample # ________ (type) ________
Description of associated fauna &/or type of venting

Sample # ________ Time ________ Temp ________ Vent ________
X ______ | Y ______ | Hdg ______ | Depth ______ | Alt ______ | Marker ______ | (type/#) |
Sample type __________________________________________________________
Basket location ______________________________________________________
Assoc. water sample # ______ Assoc. rock sample # ______ (type) ______
Description of associated fauna &/or type of venting______________________

**ROCK SAMPLES**

*Take photos before collection and in the claw. If needed, make sketches w/ scales.*

<table>
<thead>
<tr>
<th>Sample #</th>
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<th>Vent</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

X ______ Y ______ Hdg ______ Depth ______ Alt ___ Marker ______(type/#)
Sample type ___________________________ Basket location __________________
Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______
Descriptive comments ____________________________

<table>
<thead>
<tr>
<th>Sample #</th>
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</tr>
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X ______ Y ______ Hdg ______ Depth ______ Alt ___ Marker ______(type/#)
Sample type ___________________________ Basket location __________________
Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______
Descriptive comments ____________________________

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X ______ Y ______ Hdg ______ Depth ______ Alt ___ Marker ______(type/#)
Sample type ___________________________ Basket location __________________
Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______
Descriptive comments ____________________________

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X ______ Y ______ Hdg ______ Depth ______ Alt ___ Marker ______(type/#)
Sample type ___________________________ Basket location __________________
Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______
Descriptive comments ____________________________

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</table>

X ______ Y ______ Hdg ______ Depth ______ Alt ___ Marker ______(type/#)
Sample type ___________________________ Basket location __________________
Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______
Descriptive comments ____________________________
EXPERIMENT DEPLOYMENTS/RECOVERIES

Take photos before and after deployment or recovery. Make sketches with scales.

Expt ID/#  trap 1  Time 17:05  Temp  /  Vent /  Base of Crab Spa
X 45.78  Y 78.17  Hdg 89.614  Depth 2508  Alt 8.5  Marker (type/#)

Description of associated fauna &/or type of venting: There was 1 crab in
the trap. This trap was collected and new trap deployed.

Expt ID/#  
X  
Y  
Hdg  
Depth  
Alt  
Marker (type/#)

Description of associated fauna &/or type of venting:

Additional assoc. samples: type/ID
Additional descriptive comments

Expt ID/#  
X  
Y  
Hdg  
Depth  
Alt  
Marker (type/#)

Description of associated fauna &/or type of venting:

Additional assoc. samples: type/ID
Additional descriptive comments

Expt ID/#  
X  
Y  
Hdg  
Depth  
Alt  
Marker (type/#)

Description of associated fauna &/or type of venting:

Additional assoc. samples: type/ID
Additional descriptive comments

Expt ID/#  
X  
Y  
Hdg  
Depth  
Alt  
Marker (type/#)

Description of associated fauna &/or type of venting:

Additional assoc. samples: type/ID
Additional descriptive comments
MARKERS DEPLOYED

Time ___________ Marker type ___________ Marker # ___________
X _______ Y _______ Hdg _______ Depth _______ Alt ___ Marker _______(type/#)
Reason/ assoc. sample(s) _____________________________________________
Comments ________________________________________________________

Time ___________ Marker type ___________ Marker # ___________
X _______ Y _______ Hdg _______ Depth _______ Alt ___ Marker _______(type/#)
Reason/ assoc. sample(s) _____________________________________________
Comments ________________________________________________________

Time ___________ Marker type ___________ Marker # ___________
X _______ Y _______ Hdg _______ Depth _______ Alt ___ Marker _______(type/#)
Reason/ assoc. sample(s) _____________________________________________
Comments ________________________________________________________

ADDITIONAL NOTES:

1610 → Basket @ 20° ± 2 ± 3° offset from window
a basket, basket 3° cooler

1615 → utilizing 2nd temp probe → 23.5

Alt plan
All 5 majors @ CrabsPa
Temp @ higher temp vent

Alvinella Pillar near Tiga
1718, 4572 x 78130y, 2512dop, q=0
h = 95 / Temp = 150 C approx
1722 → Temp @ 30-45°C in alvinella

(see one more page)
4/27/17 Dive 4894 Exploring sites

9:30 am x 4607 y 78151 - south of crab site
diffuse flow microbial mats

1530 14°C, top stack with riftia +
      15°C mussels

Difficult terrain for
vent sid

- 20 m east of Tica
  20 m northeast of crab site

x 4541 y = 7835 d = 2516 a = 0 h = 174

1926 Near teddy bear site, riftia patch
  1CL probe:
  7°C, 10°C, 11°C Good for vent sid

1937 x 4545 x 7836 d 2516 h = 263 a = 0
  Riftia crack next to LVP weights

5°F - 10°C Good flat terrain for vent - SD