Dive Plan 4893– April 26, 2017

**Port:** Stefan Sievert  \hspace{2em} **Starboard:** François Thomas  \hspace{2em} **Pilot:** Jefferson Grau

**On Bottom Target:** Sandwich site near Pvent 9 50.271; 104 17.288 W; 2508 m

Objectives: Survey area from Pvent to Teddy Bear, survey Lauren Mullineaux sandwich site, deploy colonizer at Bio9, collect chomney w/ Alvinella at Bio9, survey Tica and Crab Spa, take Riftia and majors at Crab Spa, survey Teddy Bear, deploy colonizer, take majors at Teddy Bear

Basket List

1. Large biobox w/ Crab Traps (6 lbs)
2. Small biobox w/ 2 colonizers (3 lbs)
3. Small biobox for collecting chimney w/ Alvinella
4. 5 Majors
5. T probe
6. Niskin bottle

**Locations:**

<table>
<thead>
<tr>
<th>Location</th>
<th>Lat</th>
<th>Long</th>
<th>m</th>
<th>x</th>
<th>y</th>
</tr>
</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>Sandwich site</td>
<td>9 50.271</td>
<td>104 17.288</td>
<td>2508</td>
<td>4641</td>
<td>77916</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>
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<tr>
<td>Tica</td>
<td>9 50.406</td>
<td>104 17.490</td>
<td>2505</td>
<td>4598</td>
<td>78165</td>
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<tr>
<td>Teddy Bear</td>
<td>9 50.50</td>
<td>104 17.51</td>
<td>2514</td>
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1. On bottom, transit to the Mullineaux sandwich site
2. Take photos and video
3. Make select T-measurements
4. Proceed to Bio9 and survey area for suitable collection sites for collecting chimney w/ Alvinella and deployment of colonizers
5. Proceed with deploying colonizer in Alvinella colony.
6. Measure T on top of mesh
7. Collect chimney with Alvinella and put in small biobox
8. Proceed north to Tica area and scout area
9. Proceed to ‘Crab Spa’ (Mk F)
10. Deploy Crab Traps somewhere near Crab Spa
11. Take major within Riftia colony
12. Before collecting Riftia, proceed with following:
   a. Measure T at base of Riftia clump,
   b. Make a T measurements at plume level
13. Proceed with collection and put worms in large biobox. Make sure worms fit into
    biobox and nothing sticks out.
14. Take major after collecting Riftias
15. Scout area to determine best way to deploy Vent-SID on next dive
16. Proceed to north to Teddy Bear
17. Scout area, talking video and photos
18. Identify previous LVP deployment site (look for weights)
19. Take 3 majors at warmest spot
20. Deploy colonizer
21. Go off axis and before ascending fire Niskin to get bottom seawater
Alvin Dive 4761 – AT37-12  
APR 26, 2017

Pilot: Jefferson Grau  
Port Observer: Stefan Sievert  
Starboard Observer: François Thomas  
Notes are combination of François Thomas’s and Stefan Sievert’s notes.

<table>
<thead>
<tr>
<th>GMT</th>
<th>Comments</th>
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<tbody>
<tr>
<td>14:10</td>
<td>Descending</td>
</tr>
<tr>
<td>15:45</td>
<td>On Bottom, neutrally buoyant above seafloor</td>
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<tr>
<td>16:15</td>
<td>At Pvent, found Lauren Mullineaux's sandwich site, added a map marker &quot;Sandwich site&quot; (x4628, y77907, d 2508). Mostly mussels</td>
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<tr>
<td>16:49</td>
<td>At Bio9 (x4620, y77959, d 2506)</td>
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<tr>
<td>16:58</td>
<td>Found potential site for deployment of colonizer</td>
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<tr>
<td>17:07</td>
<td>Temperature measurement with ICL probe at potential site for colonizer deployment: ~20°C</td>
</tr>
<tr>
<td>17:23</td>
<td>Deploying colonizer CV2-2017 at Bio9 (x4611, y77965, Hdg342, D 2508), on chimney with Alvinella. Temperature on top of mesh is 10°C</td>
</tr>
<tr>
<td>17:37</td>
<td>Obtain 2 chimney pieces from Bio9 with Alvinella (x4610, y77964, Hdg339, d 2508, temperature: 180°C</td>
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<tr>
<td>18:05</td>
<td>At Crab Spa (x4588, y78145, d2506)</td>
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<tr>
<td>18:11</td>
<td>Deployment of Crab Trap at the base of the Riftia pile at Crab Spa (x4588, y78145, hdg283, D 2508). It fell down later so this is not final location</td>
</tr>
<tr>
<td>18:34</td>
<td>Firing white major within Riftia colony (x4583, y78142, hdg356, d2506, Temp 24°C)</td>
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<tr>
<td>18:45</td>
<td>Temperature measurement at plume level of Riftia: 8-10°C</td>
</tr>
<tr>
<td>18:48</td>
<td>Collecting 15 Riftia from Crab Spa into the biobox (x4585, y78141, hdg355, d2506)</td>
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<tr>
<td>19:23</td>
<td>Firing green major at Crab Spa after clearing Riftia (x4585, y78141, hdg345, d2506, temp 24.6°C)</td>
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<tr>
<td>19:48</td>
<td>Green major on the basket</td>
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<tr>
<td>20:00</td>
<td>Re-deploying Crab Trap at a new location (flat shelf near Riftia colony) after it fell down (x4584, y78150, hdg189, d 2508)</td>
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<tr>
<td>20:10-21:00</td>
<td>Trying to locate Teddy Bear</td>
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<tr>
<td>21:05</td>
<td>Found another spot with &quot;furry&quot; rocks and diffuse flow, white cloud coming out and Riftia (x4535, y78388, d2519, hdg194, temp 8-10°C)</td>
</tr>
<tr>
<td>21:17</td>
<td>Firing yellow major at this spot (x4585, y78387, hdg194, d2519, temp 11-12°C)</td>
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<tr>
<td>21:24</td>
<td>Deploying colonizer CV1-2017 where yellow major was fired (x4535, y78387, hdg195, d2519)</td>
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<tr>
<td>21:25</td>
<td>Getting of axis, starting ascent</td>
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<tr>
<td>21:29</td>
<td>Trigger 5 Niskins total to obtain bottom sea water</td>
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<tr>
<td>21:30</td>
<td>End of a great dive, leaving bottom</td>
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</tbody>
</table>
AT 37-12 Sample Sheet

Alvin Dive# 4893 Date 26 APR 2017 Logged by FRANCOIS THOMAS
Port Obs. STEFEN SIENIT Starboard Obs. FRANCOIS THOMAS Pilot JEFFERSON GREEN

FLUID SAMPLES

Major# White Time 18:34 Temp ICL 24°C Vent Grab Spat
X 45°3 Y 78°14 Depth 2506 Alt Marker (type/#
Comments Before removal of Riffia

Major# Yellow Time 19:43 Temp ICL 23.7°C Vent Grab Spat
X 45°35 Y 78°14 Depth 2506 Alt Marker (type/#
Comments After cleaning of Riffia

Major# Yellow Time 21:17 Temp ICL 11°C Vent
X 45°35 Y 78°38 Depth 2519 Alt Marker (type/#
Comments

Major# Time Temp ICL Vent
X Y Hdg Depth Alt Marker (type/#
Comments

Major# Time Temp ICL Vent
X Y Hdg Depth Alt Marker (type/#
Comments

Major# Time Temp ICL Vent
X Y Hdg Depth Alt Marker (type/#
Comments

BIOLOGICAL SAMPLES

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

Sample # 4 Time 13:37:03 Temp 18°C (max recorded 182°C) Vent 5°C
X 46°3 Y 77°49 Hdg 339 Depth 8508 Alt Marker (type/#
Sample type 2 big pieces of chimney with Alvinella
Basket location Front small biofox
Assoc. water sample # Assoc. rock sample # 4 (type)
Basket location

Assoc. water sample # ______ Assoc. rock sample # ______ (type) ______

Description of associated fauna &/or type of venting

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**ROCK SAMPLES**

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

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Time</th>
<th>Temp</th>
<th>Vent</th>
</tr>
</thead>
<tbody>
<tr>
<td>X ______ Y ______</td>
<td>Hdg ______</td>
<td>Depth ______</td>
<td>Alt ______ Marker ______ (type/#)</td>
</tr>
</tbody>
</table>

Sample type __________________ Basket location __________________

Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______

Descriptive comments __________________

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Sample # ______ Time ______ Temp ______ ______ ______ Vent ______

X ______ Y ______ | Hdg ______ | Depth ______ | Alt ______ Marker ______ (type/#) |

Sample type __________________ Basket location __________________

Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______

Descriptive comments __________________

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Sample # ______ Time ______ Temp ______ ______ ______ Vent ______

X ______ Y ______ | Hdg ______ | Depth ______ | Alt ______ Marker ______ (type/#) |

Sample type __________________ Basket location __________________

Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______

Descriptive comments __________________

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Sample # ______ Time ______ Temp ______ ______ ______ Vent ______

X ______ Y ______ | Hdg ______ | Depth ______ | Alt ______ Marker ______ (type/#) |

Sample type __________________ Basket location __________________

Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______

Descriptive comments __________________

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Sample # ______ Time ______ Temp ______ ______ ______ Vent ______

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.

X 4611 Y 77965 Hdg 242° Depth 250m Alt  Marker (type/#)
Description of associated fauna &/or type of venting Aluninellids + 1 crab

Additional assoc. samples: type/ID
Additional descriptive comments

Expt ID#/ Trap 1 Time 18:11 Temp 9°C Vent Crab Spa
X 4588 Y 78145 Hdg 283° Depth 250m Alt  Marker (type/#)
Description of associated fauna &/or type of venting

Additional assoc. samples: type/ID
Additional descriptive comments Fell down, put back at new location

Expt ID#/ Trap 1 Time 20:00 Temp 9°C Vent Crab Spa
X 4584 Y 78150 Hdg 189° Depth 250m Alt  Marker (type/#)
Description of associated fauna &/or type of venting

Additional assoc. samples: type/ID
Additional descriptive comments On a flat shelf below Crab Spa near Riftia

Expt ID#/ CVA 2014 Time 21:24 Temp 10°C Vent
X 4135 Y 78387 Hdg 195° Depth 2519m Alt  Marker (type/#)
Description of associated fauna &/or type of venting

Additional assoc. samples: type/ID
Additional descriptive comments Where many yellow worms fired

Expt ID#/ Time Temp Vent
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:
AT 37-12 Sample Sheet

Alvin Dive# 4893  Date  Apr 26 20___  Logged by  Sievert
Port Obs.  Sievert  Starboard Obs.  Thomas  Pilot  Gray

FLUID SAMPLES

<table>
<thead>
<tr>
<th>Major#</th>
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<th>Time</th>
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<th>Temp ICL</th>
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<th>Vent</th>
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<th>Temp ICL</th>
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<th>Vent</th>
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<th>Major#</th>
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</tbody>
</table>

BIOLOGICAL SAMPLES

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

<table>
<thead>
<tr>
<th>Sample #</th>
<th></th>
<th>Time</th>
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<th>Temp</th>
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<th>Vent</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
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<td>180° C</td>
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<table>
<thead>
<tr>
<th>Sample type</th>
<th></th>
<th>Basket location</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>chimneys with Alvina</td>
<td></td>
<td>Front small bio box</td>
<td></td>
</tr>
</tbody>
</table>

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

Sample # 2 Time 18:48 Temp 10°C Vent Cab Spn
X 4584 Y 1814 Hdg 55° Depth 2506 Alt Marker (type/#)
Sample type Bifida
Basket location box box
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

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
ROCK SAMPLES

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

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Time</th>
<th>Temp</th>
<th>X</th>
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<th>Hdg</th>
<th>Depth</th>
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</table>

Sample type __________________________ Basket location_____________________

Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______

Descriptive comments ____________________________

Sample # _______ Time _______ Temp __________________________ Vent _______

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Time</th>
<th>Temp</th>
<th>X</th>
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Sample type __________________________ Basket location_____________________

Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______

Descriptive comments ____________________________

Sample # _______ Time _______ Temp __________________________ Vent _______

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Sample type __________________________ Basket location_____________________

Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______

Descriptive comments ____________________________

Sample # _______ Time _______ Temp __________________________ Vent _______

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<tr>
<th>Sample #</th>
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Sample type __________________________ Basket location_____________________

Assoc. water sample # ______ Assoc. biol. sample # ______ (type) ______

Descriptive comments ____________________________

Sample # _______ Time _______ Temp __________________________ Vent _______

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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/# Sandwell Time 16:14 Temp _______ Vent _______
X 4614 Y 7791 Hdg 87 Depth 2510 Alt ______ Marker ______ (type/#)
Description of associated fauna &/or type of venting

Addtional assoc. samples: type/ID
Addtional descriptive comments

Expt ID/# Colonizer Time 17:01 Temp ~20°C Vent Bio 9
X 4611 Y 7796 Hdg 242 Depth 2508 Alt ______ Marker ______ (type/#)
Description of associated fauna &/or type of venting

Alvinella colon

Additional assoc. samples: type/ID
Additional descriptive comments

Expt ID/# Crab Trap Time 18:30 Temp _______ Vent Crab Spac
X 4588 Y 7814 Hdg 283 Depth 2506 Alt ______ Marker ______ (type/#)
Description of associated fauna &/or type of venting

diffuse flow

Additional assoc. samples: type/ID
Additional descriptive comments fell down in crevice

Expt ID/# Crab Trap Time 20:00 Temp _______ Vent near Crab Spac
X 4584 Y 7815 Hdg 189.6 Depth 2506 Alt ______ Marker ______ (type/#)
Description of associated fauna &/or type of venting

placed on flat rock next to butterfly colony

Additional assoc. samples: type/ID
Additional descriptive comments Redeployment

Expt ID/# CVI Time 21:25 Temp _______ Vent _______
X 4535 Y 7638 Hdg 194 Depth 2511 Alt ______ Marker Old MKA (type/#)
Description of associated fauna &/or type of venting

cf. thin, diffuse flow

Additional assoc. samples: type/ID
Additional descriptive comments