Dive Plan 4905– May 7, 2017


On Bottom Target: LVP landing site

Objectives:

- Deploy LVP at Teddy Bear (starts pumping at 10:30/16:30)
- Fire 6 majors at Crab Spa
- Collect dead Riftia between Wedding Cake and Cup Cake
- Release LVP at 14:30 (20:30) at Teddy Bear

Basket List
1. Large biobox
2. 6 majors
3. T probe

Locations:

<table>
<thead>
<tr>
<th></th>
<th>Lat</th>
<th>Long</th>
<th>m</th>
<th>x</th>
<th>y</th>
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<tbody>
<tr>
<td>Pvent</td>
<td>9 50.276</td>
<td>104 17.474</td>
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<td>4628</td>
<td>77926</td>
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<td>104 17.476</td>
<td>2514</td>
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<td>Crab Spa MkF</td>
<td>9 50.396</td>
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<td>2505</td>
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<td>104 17.490</td>
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<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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</tbody>
</table>

1. On bottom, transit to LVP
2. Put in wand of LVP in previously used crack
3. Move to Crab Spa
4. Fire 6 majors at Crab Spa, aim at temperature of 25°C
5. Proceed to area between Wedding Cake and Cup Cake
6. There is a large clump of what appears to be dead Riftia
7. Measure T in Riftia clump
8. Collect about 6 Riftia and put in biobox
9. If time before releasing the LVP, collect small Riftia in Riftia patch near Teddy Bear and put with dead Riftia

10. Move to Teddy Bear to release LVP at 14:30 (20:30)
Pilot: Jefferson Grau
Port: Ileana Pérez-Rodríguez
Starboard: Sushmita Patwardhan
Notes are from Ileana Pérez-Rodríguez

<table>
<thead>
<tr>
<th>GMT</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:55</td>
<td>Descending</td>
</tr>
<tr>
<td>15:17</td>
<td>At sea floor</td>
</tr>
<tr>
<td>15:47</td>
<td>At LVP landing site. Picked up LVP for deployment at 'Teddy Bear'</td>
</tr>
<tr>
<td>16:29</td>
<td>Settled LVP next to 'Teddy Bear'. Removed wand from LVP, but the nozzle (wand) fell off. Re-assembled nozzle into sampling hose.</td>
</tr>
<tr>
<td>16:48</td>
<td>Placed LVP's wand into crack on 'Teddy Bear'. Temperature at site was 11.7 °C. After, we started our transit into 'Crab Spa'.</td>
</tr>
<tr>
<td>17:15</td>
<td>At 'Crab Spa' we started taking fluid samples with green major. Both chambers fired and fluid samples were taken between 24.1 and 25.6 °C.</td>
</tr>
<tr>
<td>17:20</td>
<td>Picked up yellow major for sampling. Temperature in ICL read between 19.2 to 21 °C for ambient conditions (not reliable ICL). Access to 'Crab Spa' site was difficult given the reach of major nozzle. Therefore, the pilot proceeded to clear some rocks from the area for better access.</td>
</tr>
<tr>
<td>18:11</td>
<td>Picked up blue major for sampling. Both chambers fired and fluid samples were taken at temperatures between 24 and 25.2 °C.</td>
</tr>
<tr>
<td>18:27</td>
<td>Picked up red major for sampling. We had a hard time accessing the venting source (likely due to angle in major’s nozzle), so we ended up firing both chambers and collecting fluid samples at temperatures between 17 and 19°C.</td>
</tr>
<tr>
<td>18:38</td>
<td>Picked up black major for sampling. Both chambers fired and fluid samples were taken at temperatures of 23 °C.</td>
</tr>
<tr>
<td>18:44</td>
<td>Picked up white major for sampling. Only the second chamber fired and fluid samples were taken at temperatures of 25 °C. Once the second chamber was full, we re-trieved firing the first chamber but efforts were unsuccessful.</td>
</tr>
<tr>
<td>19:10</td>
<td>Picked up yellow major for sampling. This time, temperature in ICL read 17 °C for ambient conditions (not reliable ICL). Both chambers fired and fluid samples were taken at temperatures of 35 °C. Once done we moved towards the 'Wedding Cake/Cupcake' area.</td>
</tr>
<tr>
<td>19:41</td>
<td>We moved to the bottom of the 'Wedding Cake' Alvinella structure to collect dead Riftia tubes. We measured temperature at base (2.4 °C) and on top (2.6 °C) of what seemed like a dead Riftia patch of tubeworms. We collected ~5-6 tubes and placed them in the biobox of DSV Alvin’s basket. Once we finished, we started our transit back to 'Teddy Bear'.</td>
</tr>
</tbody>
</table>
20:00  Arrived to ‘Teddy Bear’ where we parked and rested batteries while waiting for the LVP to finish its sample collection.

20:31  Removed LVP’s wand from ‘Teddy Bear’ and released LVP. Next, we went north of ‘Teddy Bear’ to pick up some healthy Riftia tubeworms.

20:39  Arrived at Riftia patch. We measured temperature at base (24.5 °C) and on top (8.5 °C) of what seemed like a healthy Riftia patch of tubeworms. We collected ~4-5 tubes and placed them in the biobox of DSV Alvin’s basket (together with the dead Riftia tubes). After, we moved off-axis where we waited for the LVP to be secured on deck of R/V Atlantis.

21:54  Ascending

22:55  Alvin surfaced.
### AT 37-12 Sample Sheet

<table>
<thead>
<tr>
<th>Fluid Samples</th>
<th>Major#</th>
<th>Time</th>
<th>Temp ICL</th>
<th>Vent</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>17:15</td>
<td></td>
<td></td>
<td>Crab Spa</td>
<td>Ambient reading well</td>
</tr>
<tr>
<td>Yellow</td>
<td>17:20</td>
<td></td>
<td></td>
<td>Crab Spa</td>
<td>Ambient temperature reading between 19.5°C to 21°C</td>
</tr>
<tr>
<td>Blue</td>
<td>18:11</td>
<td></td>
<td>24-35.2°C</td>
<td>Crab Spa</td>
<td>Ambient reading at 2°C (reading well)</td>
</tr>
<tr>
<td>Red</td>
<td>18:27</td>
<td></td>
<td>17-19°C</td>
<td>Crab Spa</td>
<td>Ambient reading at 2°C (good read)</td>
</tr>
<tr>
<td>Black</td>
<td>18:38</td>
<td></td>
<td>23°C</td>
<td>Crab Spa</td>
<td>Ambient temperature at 2°C (good read)</td>
</tr>
<tr>
<td>White</td>
<td>18:44</td>
<td></td>
<td>25°C</td>
<td>Crab Spa</td>
<td>Ambient temperature at 2°C (good read)</td>
</tr>
</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>Time</th>
<th>Temp</th>
<th>Vent</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>19:41</td>
<td>2.4°C (base)</td>
<td>Wedding cake</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>19:41</td>
<td>2.6°C (top)</td>
<td>Crab Spa</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>19:41</td>
<td>2.6°C (top)</td>
<td>Crab Spa</td>
<td></td>
</tr>
</tbody>
</table>

Sample type: **Dead fish/tubes**, Basket location: **Bio Box**
Associating 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>Base</th>
<th>Vent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>20:39</td>
<td>24.5°C</td>
<td></td>
<td>Teddy Bear</td>
</tr>
</tbody>
</table>

X 4565 Y 7840 Hdg 316 Depth 2514 Alt 0 Marker 
Sample type Healthy Riftia tunicata (~5 tunicates)
Basket location Bio Box together with dead Riftia

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

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Time</th>
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<th>Base</th>
<th>Vent</th>
</tr>
</thead>
</table>

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

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<thead>
<tr>
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<th>Vent</th>
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</table>

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

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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

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<th>Vent</th>
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</table>

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

Sample type
Basket location
Assoc. water sample # ________ Assoc. biol. sample # ________ (type) ________
Descriptive comments

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Time</th>
<th>Temp</th>
<th>Vent</th>
</tr>
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<tbody>
<tr>
<td>X ______ Y ______</td>
<td>Hdg ______</td>
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Basket location
Assoc. water sample # ________ Assoc. biol. sample # ________ (type) ________
Descriptive comments

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<td>Hdg ______</td>
<td>Depth ______ Alt ___</td>
<td>Marker ______ (type/#)</td>
</tr>
</tbody>
</table>

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Basket location
Assoc. water sample # ________ Assoc. biol. sample # ________ (type) ________
Descriptive comments

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<td>X ______ Y ______</td>
<td>Hdg ______</td>
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Sample type
Basket location
Assoc. water sample # ________ Assoc. biol. sample # ________ (type) ________
Descriptive comments

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

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.*

<table>
<thead>
<tr>
<th>Expt ID#/Dive</th>
<th>Time</th>
<th>Temp</th>
<th>Vent</th>
<th>X</th>
<th>Y</th>
<th>Hdg</th>
<th>Depth</th>
<th>Alt</th>
<th>Marker</th>
<th>Description of associated fauna &amp;/or type of venting</th>
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<tbody>
<tr>
<td>07-37 12</td>
<td>15:47</td>
<td></td>
<td>LVP</td>
<td>4941</td>
<td>7821</td>
<td>39</td>
<td>2504</td>
<td>0</td>
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<td>Some sea cucumbers in the area</td>
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<td></td>
<td>Picking up LVP</td>
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<tr>
<td>07-37 12</td>
<td>16:39</td>
<td>11.7°C</td>
<td>Teddy Bear</td>
<td>4557</td>
<td>7837</td>
<td>335</td>
<td>2516</td>
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<td>Deploying LVP at Teddy Bear's crack</td>
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<td>Removing LVP's wand from Teddy Bear and</td>
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<td>Released LVP</td>
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- Additional assoc. samples: type/ID
- Additional descriptive comments
### MARKERS DEPLOYED

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<tr>
<th>Time</th>
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<th>Marker #</th>
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<table>
<thead>
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<th>X</th>
<th>Y</th>
<th>Hdg</th>
<th>Depth</th>
<th>Alt</th>
<th>Marker # (type/#)</th>
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</tbody>
</table>

Reason/ assoc. sample(s) 

Comments 

### ADDITIONAL NOTES:
AT 37-12 Sample Sheet

FLUID SAMPLES

Major# Green Time 17:14 Temp ICL 25.16 Vent Crab Spa
X 4592 Y 78166 Hdg 55.6 Depth 2502 Alt 0 Marker (type/#)
Comments

Major# Yellow Time 17:20 Temp ICL 25.31 Vent Crab Spa
X 4591 Y 78166 Hdg 41.2 Depth 2505 Alt 0 Marker (type/#)
Comments Had to take the rock out; once again at 15:06

Major# Blue Time 18:00 Temp ICL 24.25 Vent Crab Spa
X 4591 Y 78166 Hdg 41.4 Depth 2505 Alt 0 Marker (type/#)
Comments Had to take some more rock out

Major# Red Time 18:21 Temp ICL 17.18 Vent Crab Spa
X 4595 Y 78166 Hdg 34.1 Depth 2506 Alt 90 Marker (type/#)
Comments

Major# Black Time 18:38 Temp ICL 22 Amb 3°C Vent Crab Spa
X 4595 Y 78166 Hdg 32 Depth 2506 Alt 0 Marker (type/#)
Comments

Major# White Time 18:44 Temp ICL 24.4 Vent Crab Spa
X 4595 Y 78166 Hdg 32 Depth 2506 Alt 0 Marker (type/#)
Comments Only W2 fixed

BILOGICAL SAMPLES

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

Sample # Dead Riftia Time 19:42 Temp 0.5 Vent
X 4584 Y 78167 Hdg 61 Depth 2515 Alt 0 Marker (type/#)
Sample type Dead Riftia
Basket location Biobox
Sample # 1111
Time 20:40
Temp 8.5
Sample type
Basket location
Assoc. water sample # 1111
Assoc. rock sample # 1111 (type) 1111
Description of associated fauna &/or type of venting

Sample # 2222
Time 8:5
Temp 24.5
Sample type
Basket location
Assoc. water sample # 2222
Assoc. rock sample # 2222 (type) 2222
Description of associated fauna &/or type of venting

Sample # 3333
Time 3:3
Temp 3.3
Sample type
Basket location
Assoc. water sample # 3333
Assoc. rock sample # 3333 (type) 3333
Description of associated fauna &/or type of venting

Sample # 4444
Time 4:4
Temp 4.4
Sample type
Basket location
Assoc. water sample # 4444
Assoc. rock sample # 4444 (type) 4444
Description of associated fauna &/or type of venting

Sample # 5555
Time 5:5
Temp 5.5
Sample type
Basket location
Assoc. water sample # 5555
Assoc. rock sample # 5555 (type) 5555
Description of associated fauna &/or type of venting
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>
<th>Time</th>
<th>Temp</th>
<th>Vent</th>
<th>Sample type</th>
<th>Basket location</th>
<th>Assoc. water sample #</th>
<th>Assoc. biol. sample #</th>
<th>(type)</th>
<th>Descriptive comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>X ______</td>
<td>Y ______</td>
<td>Hdg</td>
<td>Depth</td>
<td>Alt ___</td>
<td>Marker ______ (type/#)</td>
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<tr>
<td>Sample type</td>
<td>Basket location</td>
<td>Assoc. water sample #</td>
<td>Assoc. biol. sample #</td>
<td>(type)</td>
<td>Descriptive comments</td>
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<td>X ______</td>
<td>Y ______</td>
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<td>Marker ______ (type/#)</td>
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<td>Assoc. water sample #</td>
<td>Assoc. biol. sample #</td>
<td>(type)</td>
<td>Descriptive comments</td>
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<td>Assoc. biol. sample #</td>
<td>(type)</td>
<td>Descriptive comments</td>
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</tbody>
</table>
EXPERIMENT DEPLOYMENTS/RECOVERIES

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

Expt ID/# \[LV\]
Time 15:47 Temp \[\text{ missing}\] Vent \[\text{ missing}\]
X 4442 Y -7822 Hdg 58 Depth 2514 Alt 0 Marker (type/#)
Description of associated fauna &/or type of venting

Saw an octopus

Additional assoc. samples: type/ID
Additional descriptive comments

Expt ID/# \[LV\] Deployed LV
Time 16:38 Temp 10 Vent Teddy Bear
X 4556 Y -7837 Hdg 334 Depth 2515 Alt 168 Marker (type/#)
Description of associated fauna &/or type of venting

Saw lots of crabs & 2 octopus mating

Additional assoc. samples: type/ID
Additional descriptive comments

Expt ID/# \[LV\] Released LV
Time 20:39 Temp \[\text{ missing}\] Vent \[\text{ missing}\]
X 4564 Y -7837 Hdg 168 Depth 2514 Alt 0 Marker (type/#)
Description of associated fauna &/or type of venting

Additional assoc. samples: type/ID
Additional descriptive comments

Expt ID/# \[LV\]
Time \[\text{ missing}\] Temp \[\text{ missing}\] Vent \[\text{ missing}\]
X \[\text{ missing}\] Y \[\text{ missing}\] Hdg \[\text{ missing}\] Depth \[\text{ missing}\] Alt \[\text{ missing}\] Marker (type/#)
Description of associated fauna &/or type of venting

Additional assoc. samples: type/ID
Additional descriptive comments

Expt ID/# \[LV\]
Time \[\text{ missing}\] Temp \[\text{ missing}\] Vent \[\text{ missing}\]
X \[\text{ missing}\] Y \[\text{ missing}\] Hdg \[\text{ missing}\] Depth \[\text{ missing}\] Alt \[\text{ missing}\] 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: