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ROPOS has installed and assisted with the installation of both the Primary and Secondary infrastructure of the Cabled Observatories in the Northeast Pacific. Over this time our techniques and equipment has changed and improved. The following is a brief description of a couple of the important lessons learned during this period. The overall theme is the importance of pre-planning for every piece of equipment that is expectd to go into the water, because it will be coming out.

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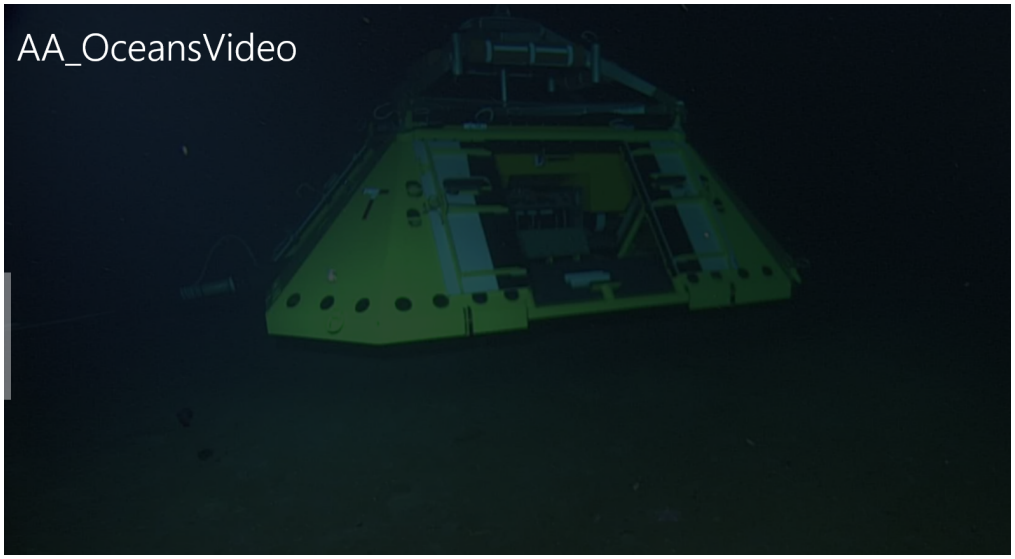
2 of the Problems

1. Sites ending up like a plate of spaghetti. Planning of extension cables and instrument deployments.
2. Extension cable laying.

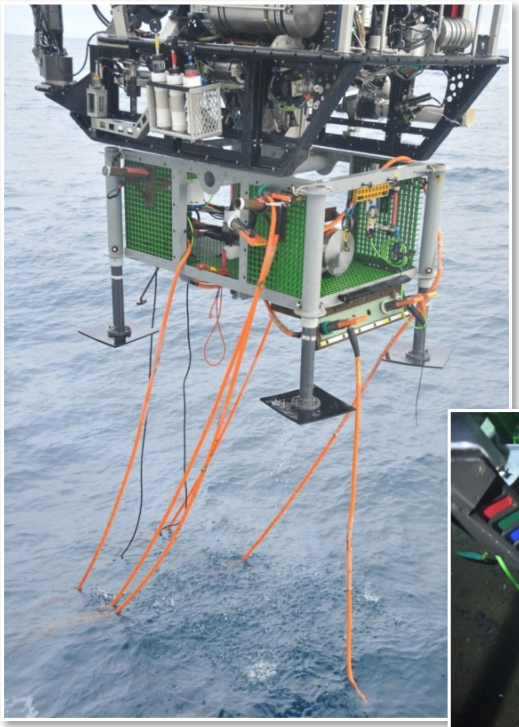
Site Plan Description

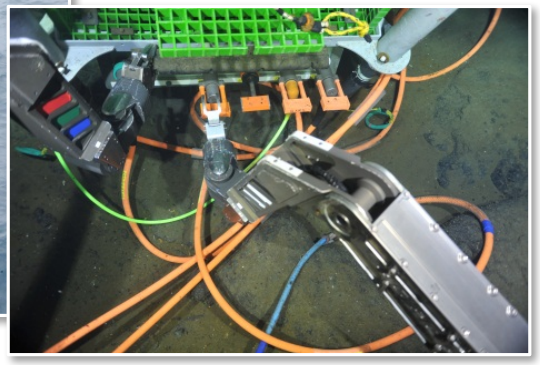


1. Sites can be very complicated with multiple instruments being deployed from the junction box, especially sensors interfering with each other or influencing the environment.
2. These sites are typically chosen for their interesting characteristics or dynamics which isn't always the best place to put an instrument let a lone a junction box. But this is where the action and science is.
3. Recovery of the instruments and junction box can be performed without extensive manipulation of surrounding cables or instruments.

Site Plan Solutions

1. Orientation of secondary node or junction box. Place the unit where it can deploy the instruments as planned but also connect to the primary node.
2. Connector bank placed on side of junction box that in correct for site.
3. Anchor points on starting/end points placed in correct quadrants for extension cables and instruments.
4. Design of bulkhead connector panel angles and location of instruments being deployed to certain locations..
5. Plan for cable excursions if getting close other sites, you never want to be working around another extension cable.
6. Survey site completely so comparisons can be made when you return in future. Check for cable hit, instrument disruption.



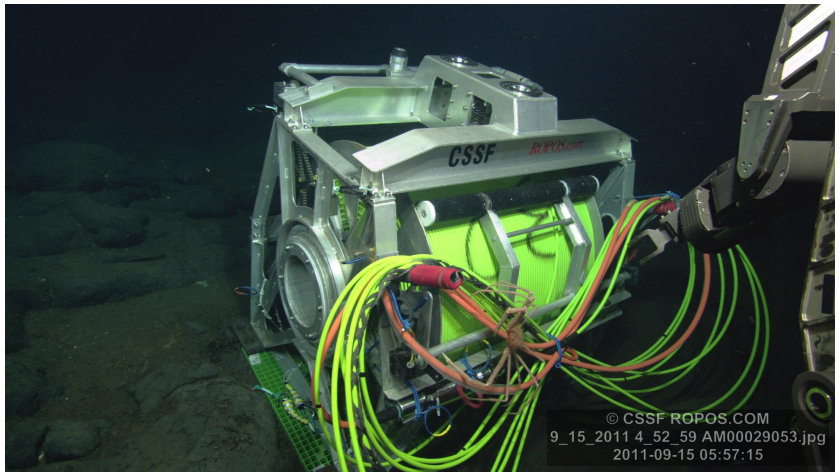


Extension Cable Laying

1. Plan, Plan, Plan.
2. Spooling of cable onto turn, sheet for every drum with every meter defined from ODI on starting position, amount of cable free on the horns to the end where the fact can box is deployed from ROCLS.
3. Marking of the cable so you always know how much cable is paid out, to correlate to cable lay plan.
4. Speed of lay to allow for correct amount of slack paid out and also keep it taught on the drum.
5. Anchor points for starting cable lay
6. Direction of lay from Node to Junction Box or vice versa.

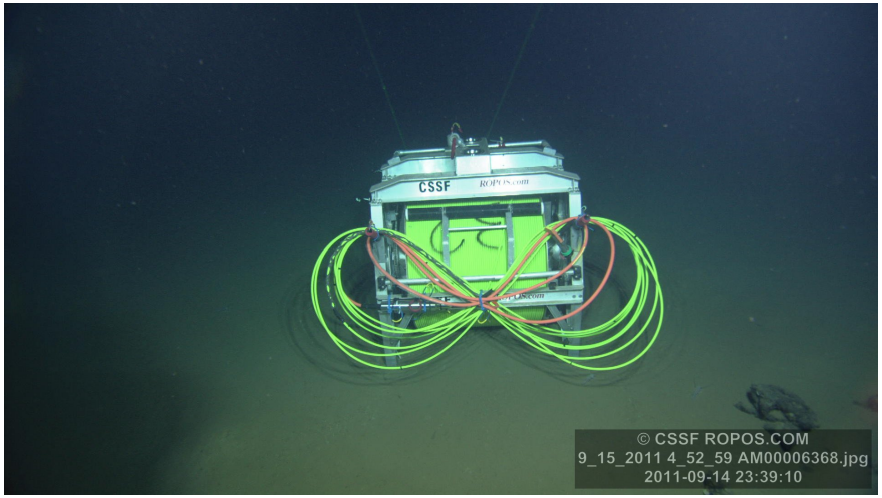
Extension Cable Solutions

1. Speed of the vessel eventually dictates speed of lay to some point.
2. Vessel Positioning for take-off, turns and landing.
3. Orientation of Node decides which corner to anchor too.
4. Orientation of secondary node or junction box.
5. Anchor points on starting/end points
6. Complete bathymetry of cable lay.
7. Cable marking for known payout.
8. Amount of adhesive used between layers enough to keep in on spool put not enough to allow it to pay out.
9. Accurate navigation for distance travelled.
10. Height off bottom to allow for correct slack %.
11. End termination box and dropping it off.
12. Starting/Ending anchor point.
13. Amount of cable free on frame to start Lay.



Extension Cable Solutions

1. Direction of lay.
2. Avoidance of poor bottom conditions.
3. Cable spooling practices.
4. Landing zones along cable for emergency set downs.
5. End Point landing area, sometimes very specific.
6. This should be a joint effort between contractor and cable owner.



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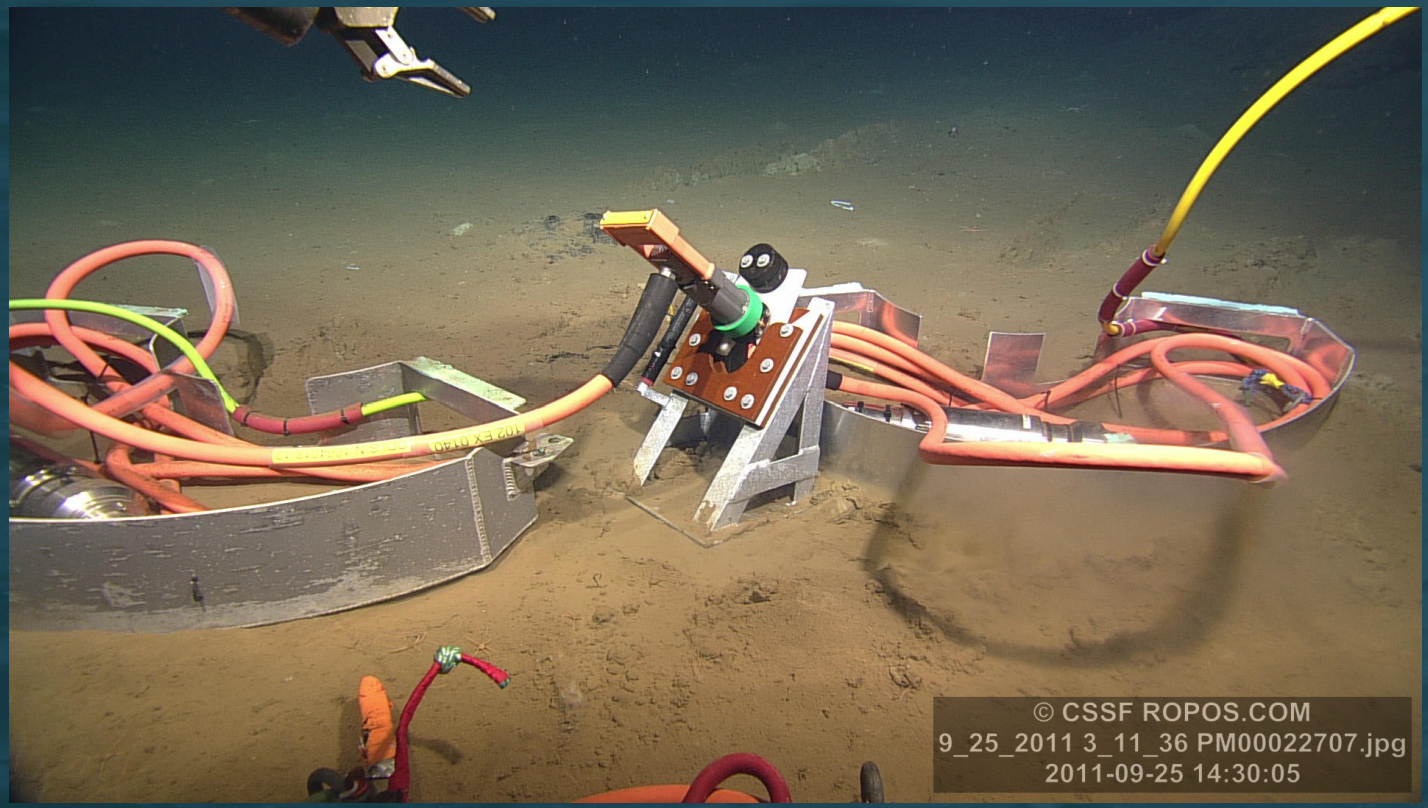
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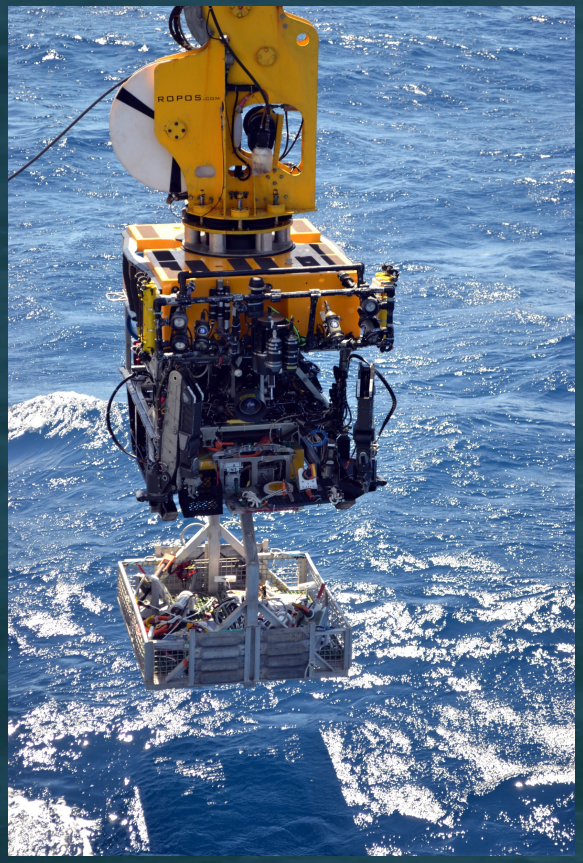

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Other Considerations

1. Is this a good place to put a cable?
2. Always consider Recovery and re-deployment criteria in initial design, including option for ROV intervention.
3. As before - planning, planning and planning. Survey, options and understanding of process. Hire contractors and experts in the field for advice but be involved in the solution.
4. Weather - You thought your last recovery was rough.

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