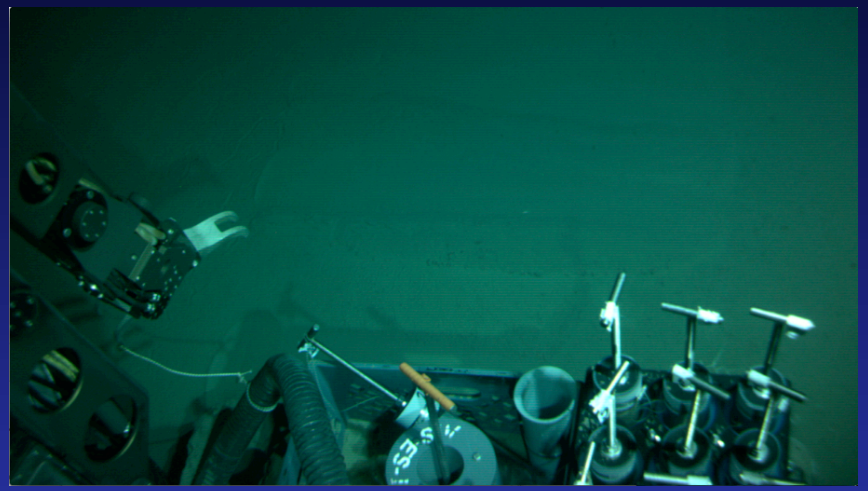
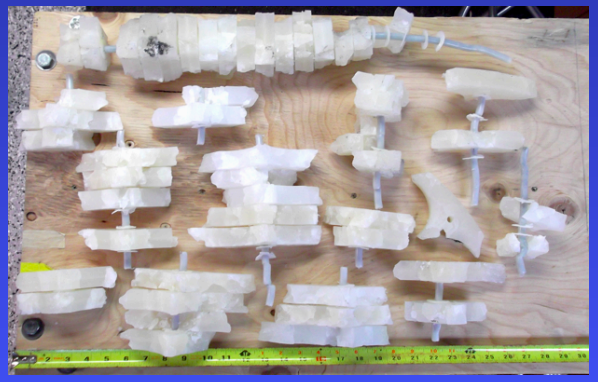
1018 GMT - Start Video Transect 2 - ~4m/min SOG , 170 COG @ 1.7-2m altitude
1110 GMT - End Video Transect 2. Attempt 2 Successfully assembled slurp nozzle, proceeding with slurp sampling for respirometer and opportunistic imaging with downward looking camera.
13:02 GMT - Sudden Loss of Communication with Nereus. Vehicle just lifting off seafloor bearing 052 to transit to elevator (Homer range - 343m),
13:02 GMT - Last Acoustic Communication uplink
13:02 GMT – (Time approximate) Nereus Team member who was below decks in the berthing area reported hearing a loud sound followed by a second loud sounds both reverberating extensively, then proceeded by a series of similar but lower magnitude sounds describe to be "popcorn popping-like". The collection of "popcorn" sounds were indistinguishable in quantity for an estimate as there were so many. Estimates of the duration of all sounds from start to finish was between 5 and 10 seconds. Time of the sounds observed corresponds to same time as the loss of communication, though no official log is recorded of the observation. It was discovered after debris was discovered.
13:02 GMT – Rest of Dive - Constant attempts to communicate with Nereus acoustically, no response, abort codes sent numerous times, attempted slight maneuvers of the ship, heading changes, securing propellors, to regain acoustic comms, no effect. No response from either LBL or standard Acomms.
1450 GMT - Depressor recovered
0146 GMT - Sighting of debris on surface from bridge
0153 GMT - Rescue boat launched and debris collected
Location: 31 deg 55.854' S - 177 deg 17.466' W
0223 GMT - Rescue boat recovered, debris verified to be pieces of Nereus structure
Location: 31 deg 56.049' S – 177 deg 17.487' W

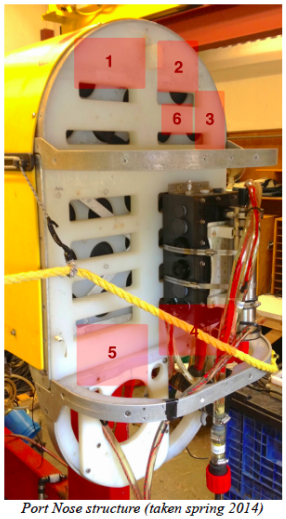
Nereus Loss



Last recorded image from HD "Gobi" Camera on pan & tilt, brow cam



Port Nose Debris Reconstruction



Port Nose structure (taken spring 2014)

Nereus Failure Analysis Report Outline

Objectives of Report: Determine the most likely root-cause leading to loss of the vehicle

Review method – outline methodology of report to meet objectives

- Understanding the circumstances surrounding the loss (overview the system)
- Examine technical causes of the loss
- Review of design process and risk assessment procedures for future.

The loss event – description of event itself, micro-scale timeline

Circumstances surrounding the loss

Long Term Vehicle history

Failure Analysis Procedure for the investigation

- Description of Failure Cause Tree
- Event Likelihoods

Event cause categories: Design, Manufacture, Maintenance, Operation, external

Analysis of Potential Failure Scenarios

Conclusions

- Summarize top 10 highest percentage failure modes table.
- What would it take to mitigate these? Time? Resources?

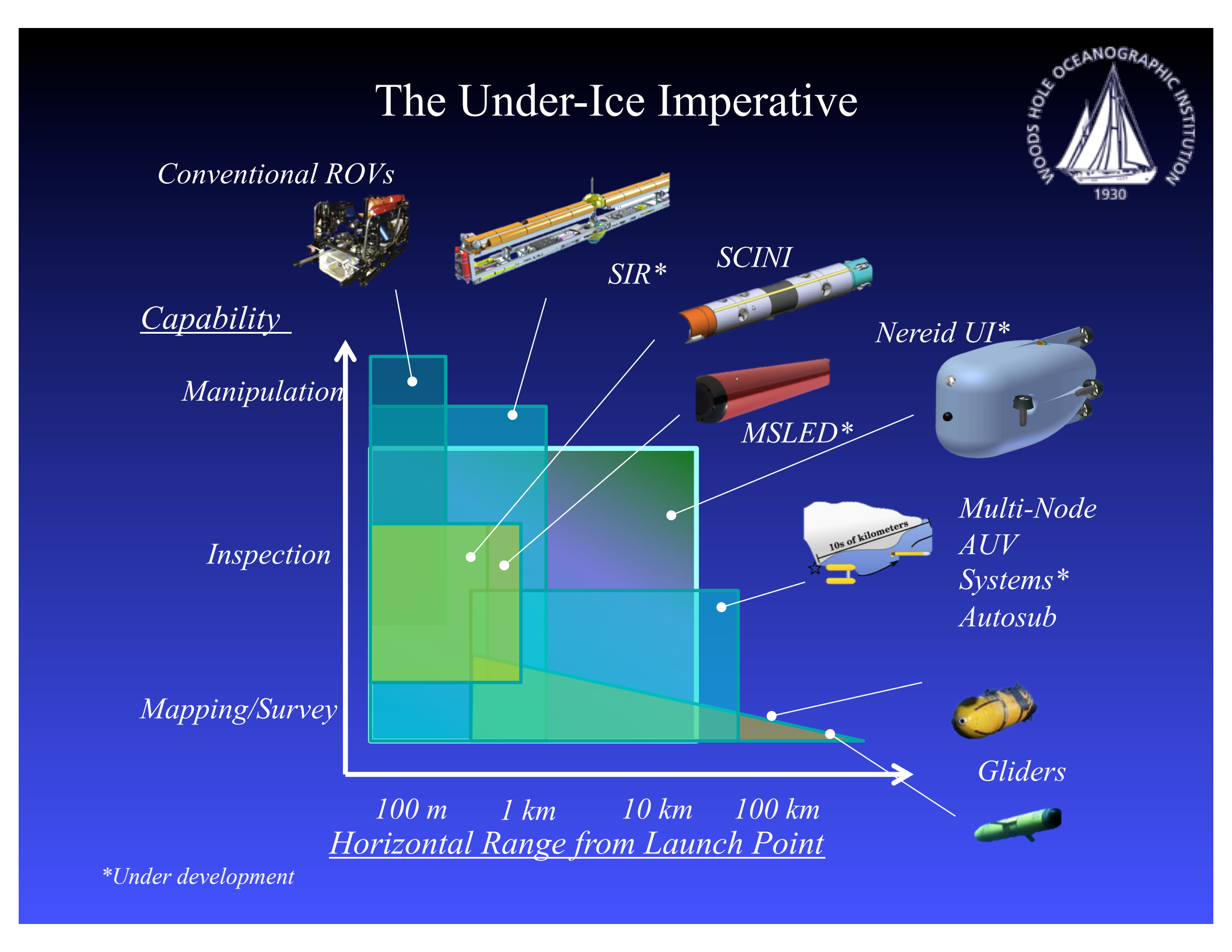
Recommendations

Risk management recommendations

Technical design change recommendations

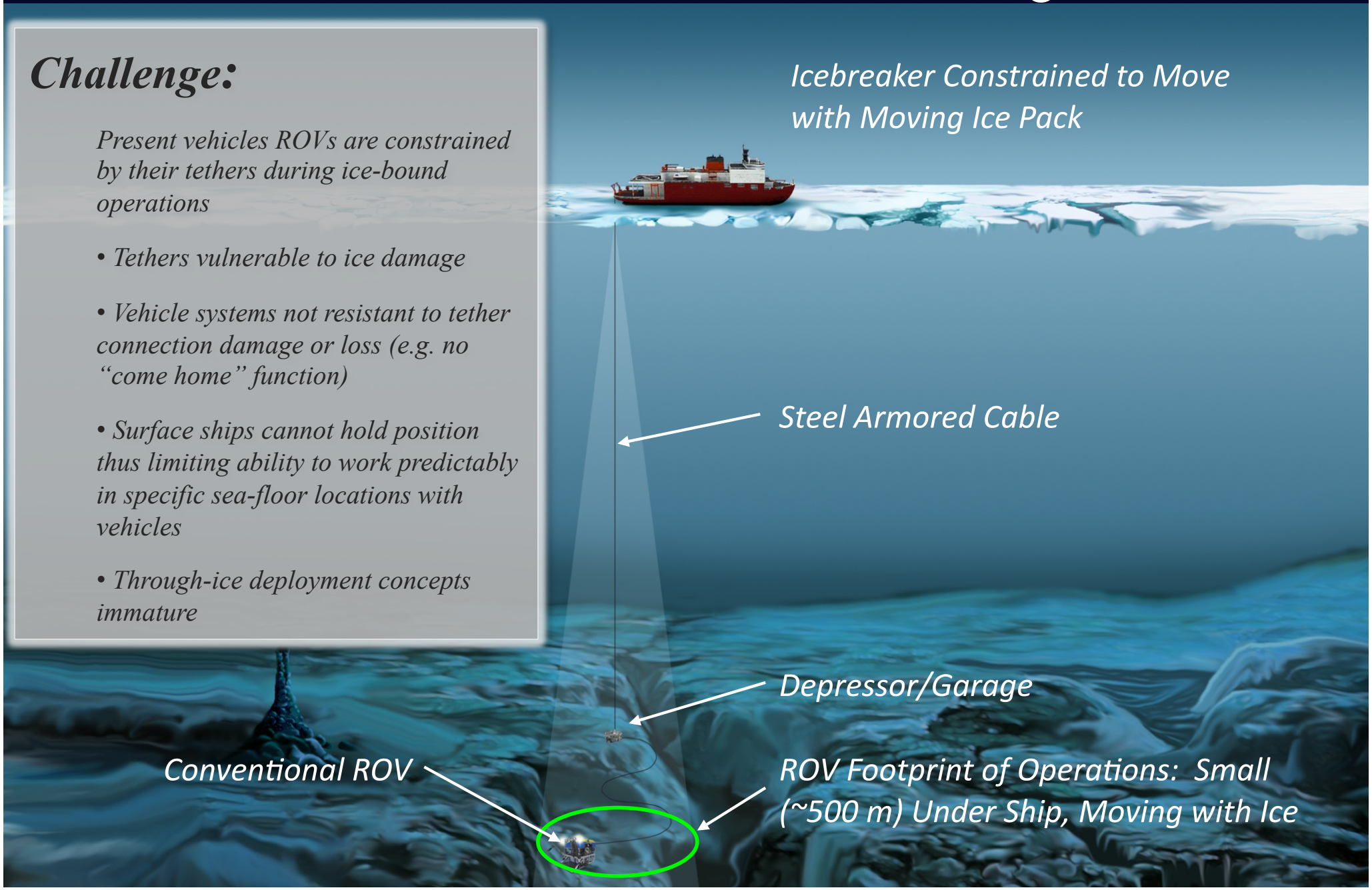
Procedure recommendations for ceramic housings

The Under-Ice Imperative

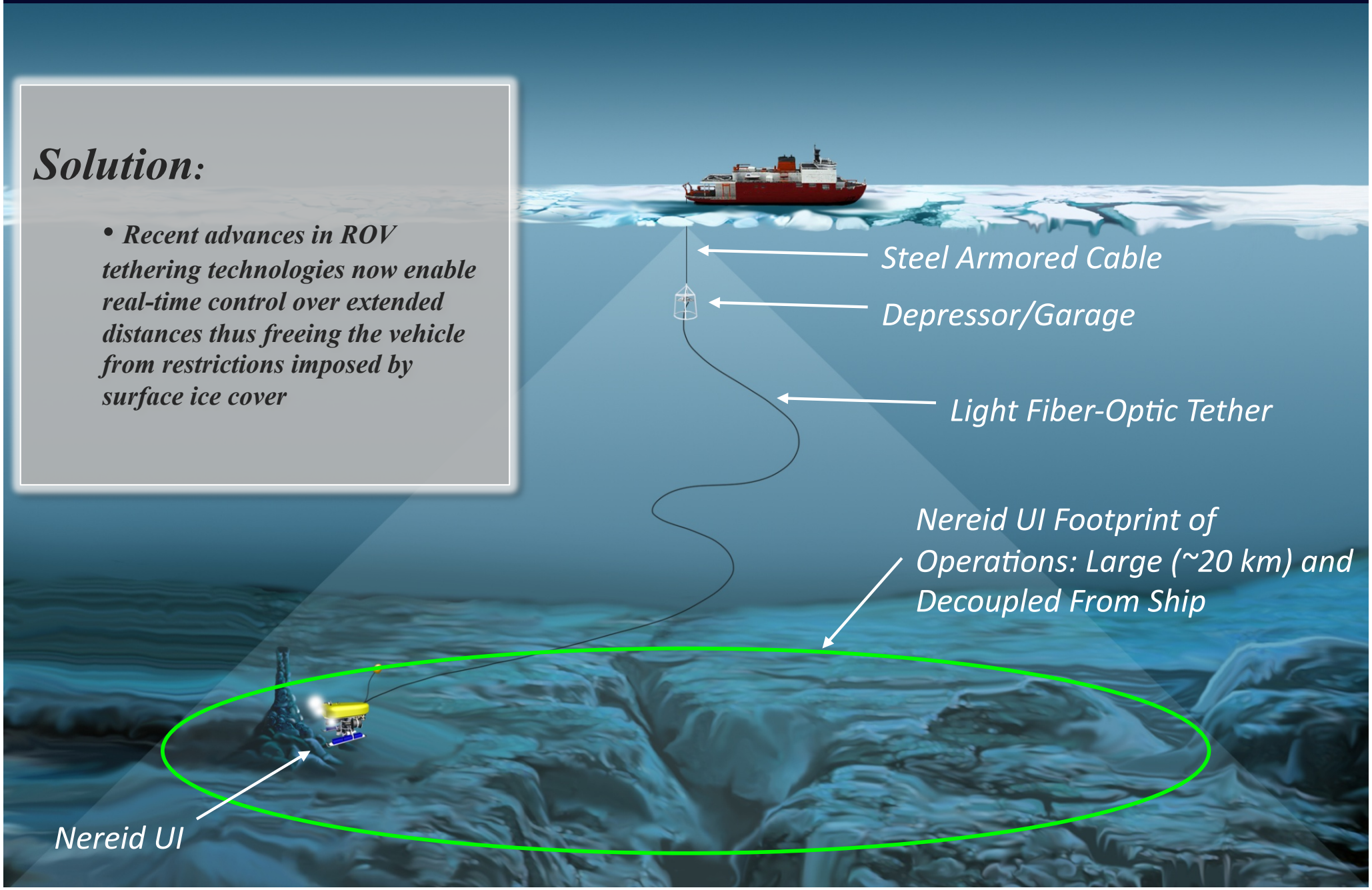


*Under development

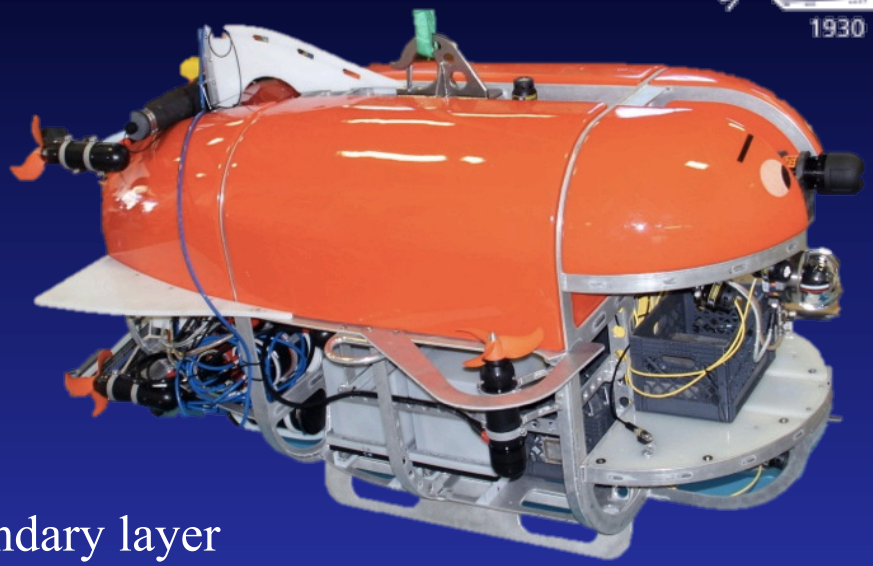
Conventionally Tethered ROV Operations from Icebreaker in Permanent Moving Ice



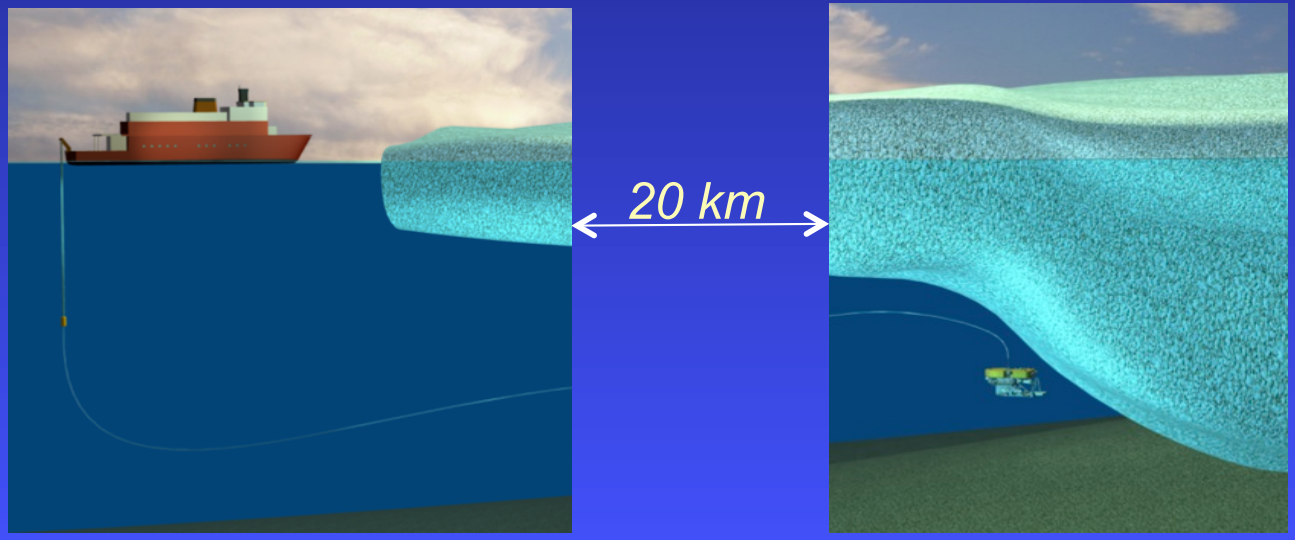
Light-Tethered Nereid UI Operations from Icebreaker In Permanent Moving Ice



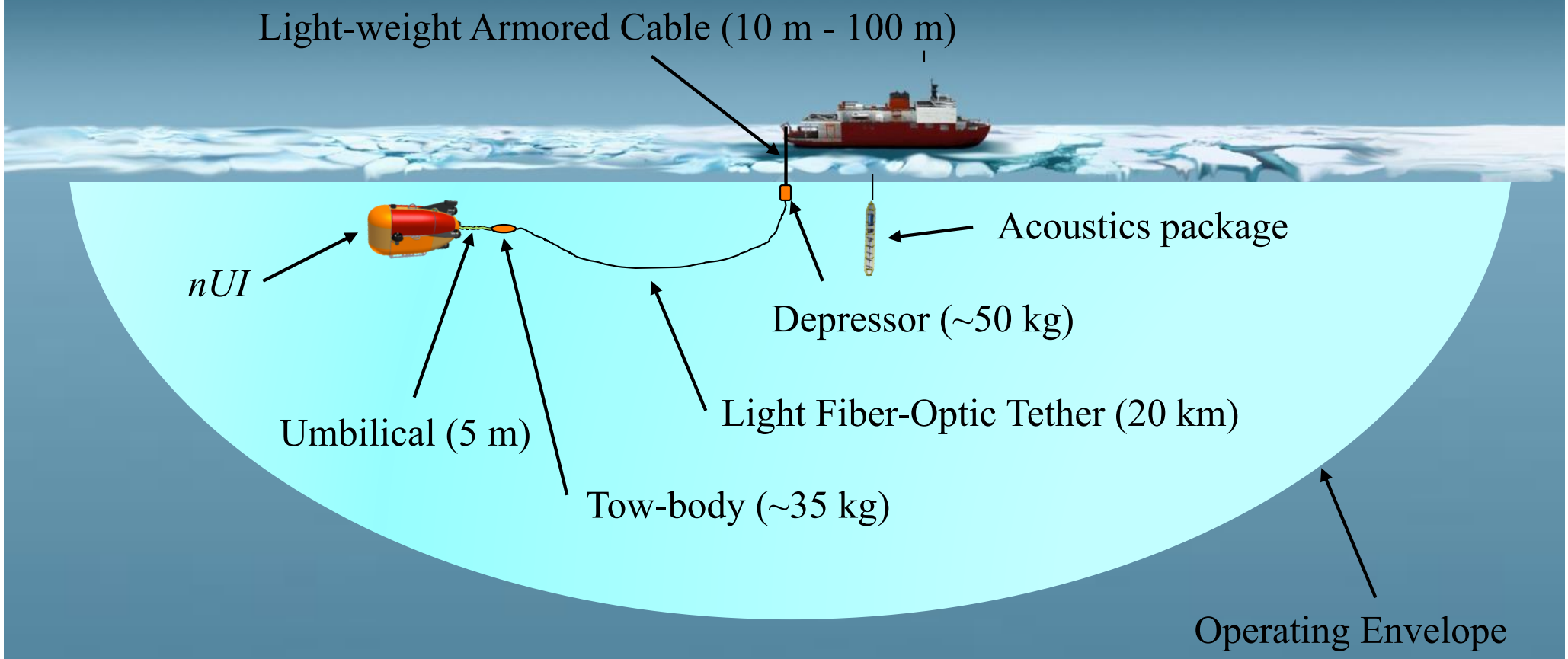
Nereid UI Capabilities



- Exploration
  - Real time visualization
  - Immediate Re-tasking
  - 20 km standoff
- Maneuverability
  - Close inspection
  - Precision access to under-ice boundary layer
- Future manipulation and sample retrieval capability



nUI Sea-Ice Concept of Operations: Deployed



Two-body launch like *Nereus,* **but**:

- No descent/ascent weights---Pilot has control.
- Short descent (10-20 m)
- Light-weight depressor/tow-body system, ~85kg, 2 m tall