



Alvin Upgrade Project **Science Verification Cruise**



Rationale – Science Requirements

The new vehicle should be capable of:

- 1) Direct observations of the deep ocean and seafloor
- 2) High resolution imaging/documentation of observations
- 3) Systematic exploration of new, uninvestigated regions
- 4) Sampling at the seafloor and in the overlying water column
- 5) Interaction with instrumentation at the seafloor
- 6) Transit between work areas



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Scientific Capabilities to be Verified

- 1) Navigation (DVL and USBL) & data collection
- 2) Seafloor mapping (flat topography, rough topography)
- 3) Vehicle maneuverability in tight/fragile spaces
- 4) Vehicle maneuverability under closed-loop navigation
- 5) Lighting & imaging (still & video; all cameras; photo-mosaics)
- 6) Delicate sampling (with NDSF & user-provided equipment)
- 7) *In situ* sensing (with NDSF & user-provided sensors)
- 8) Ergonomics within the sphere
- 9) Video duplication (*incl.* step-down to "hand-over" quality)