

NDSF Operator's Report

NDSF Vehicle Operations Summary

NDSF NATIONAL
DEEP SUBMERGENCE
FACILITY

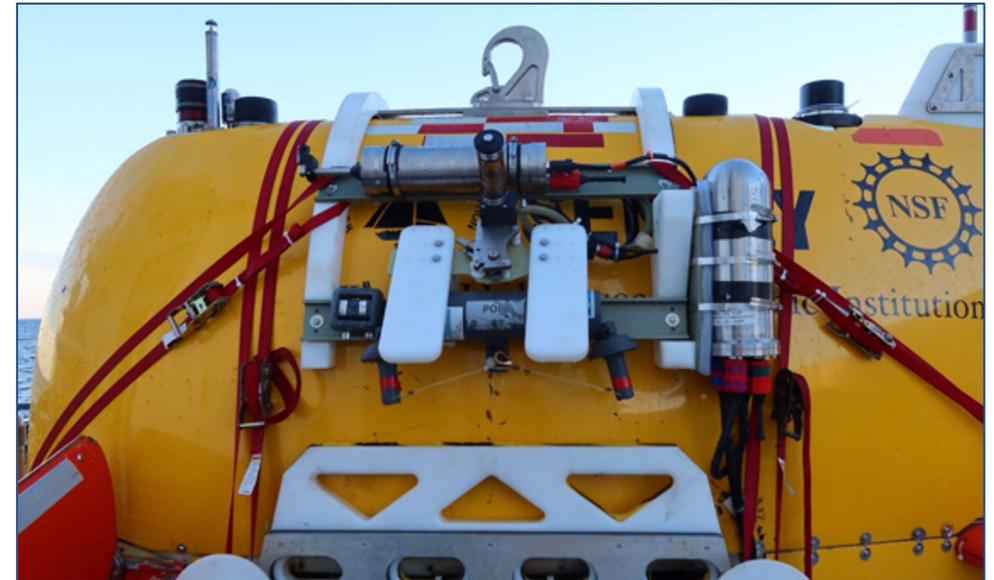


Sentry Operations Summary

- 142 operating days in 2021
- Cruises Completed
 - **Fornari - EPR**
 - **Young - GoM**
 - **Michel - Sea of Cortez**
 - **Resing - SEPR**
- **41 dives**
- Total survey time: **574 hrs**
- Total Distance: **1,364 km**
- Vessels: **R/V Roger Revelle/R/V Thompson**



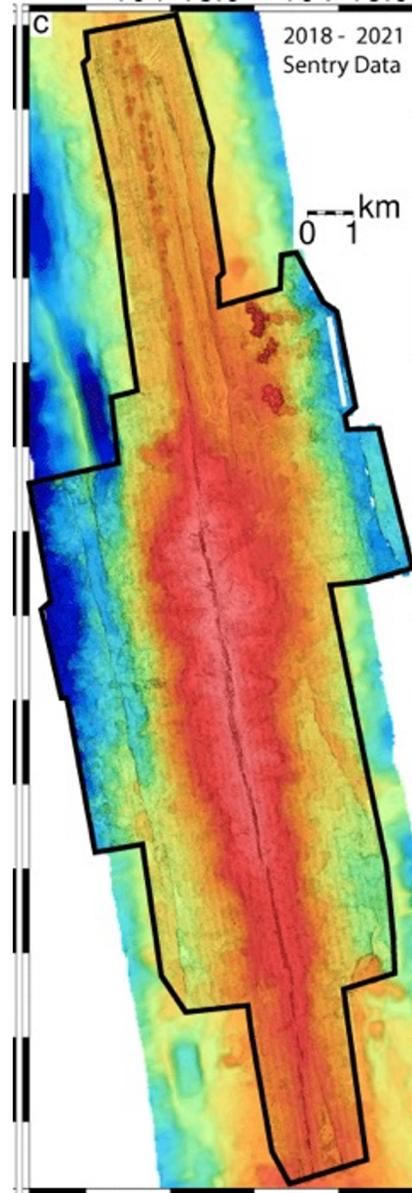
2021 Fornari cruise - March 2021



Sensors installed for Michel cruise - Guaymas Basin

Sentry Operation Highlights

- **9 Dives** on EPR extending high resolution survey.
- Survey and vent hunting at **southern EPR**
- Integration of developmental sensors for Michel cruise
- Integration of new Edgetech 2205 Sidescan Sonar (used on two cruises now)
- New survey methods for plume hunting
- Real time data feed from vehicle sensors to shore



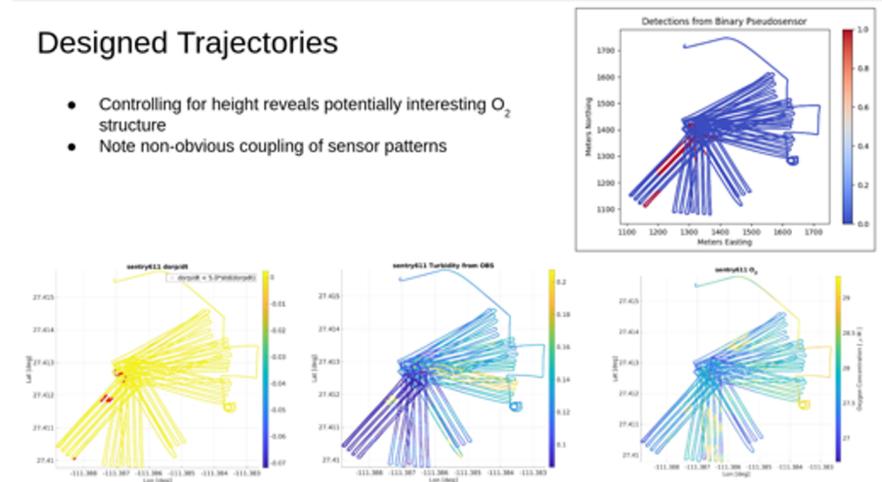
EPR Completed survey 2021.



Image from integrated Fornari Camera at EPR

Designed Trajectories

- Controlling for height reveals potentially interesting O₂ structure
- Note non-obvious coupling of sensor patterns



survey patterns from Anna Michel cruise

JASON Operations Summary

- Four cruises completed in 2021
- **Fornari/Arellano/Mullineaux**
 - Revelle EPR-950 Hydrothermal/Larnae-Biofilms/Functional diversity
 - 19 dives, 312+ hrs in water; Max depth 2570m
- **Young et al. (2021) not reviewed**
 - Thompson, Single body, 24 hour ops
 - 15 dives, 120 hrs in water; Max depth 3303 m
- **Kelley et al. (2021) – OOI, PNW Coast**
 - Thompson, Single body, 24 hour ops, 2 legs
 - 44 dives, 252 hrs in water; Max depth 2904 m
- **Michel et al. (2021)**
 - Revelle, Single body, 24 hour ops
 - 13 dives, 168 hrs in water; Max depth 1855 m

JASON Highlights

- Telemetry replacement complete and fully successful
- Propulsion upgrade proceeding
 - Motor design complete, controller design proceeding
- Hydraulic control upgrade complete
 - New board eliminates pc 104 stack
- PHINs IMU integration underway
 - enables closed loop off bottom
- Sulis 4 k camera interface improved
- Sentry Kongsberg EM 2040 tested successfully on Jason
- Sea-log being used extensively, mostly positive feedback
 - Recognize concerns and developing transition from VV to Sealog **pcar 2020**
- New North Quissett Storage Facility

Alvin 2022 Team Update

New Alvin Team members 2021

- Randy Holt – Expedition Leader
- John Dymek – Mechanical Engineer
- Kaityln Beadshear – Electrical Technician
- Nick Ellis – Mechanical Engineer

Personnel Promotions

- Nick Osadcia – Engineer II
- Rose Wall – Engineer II
- Danik Forsman – Training Coordinator
- Rick Sanger – Pilot (August 2022)

Pilot Qualifications

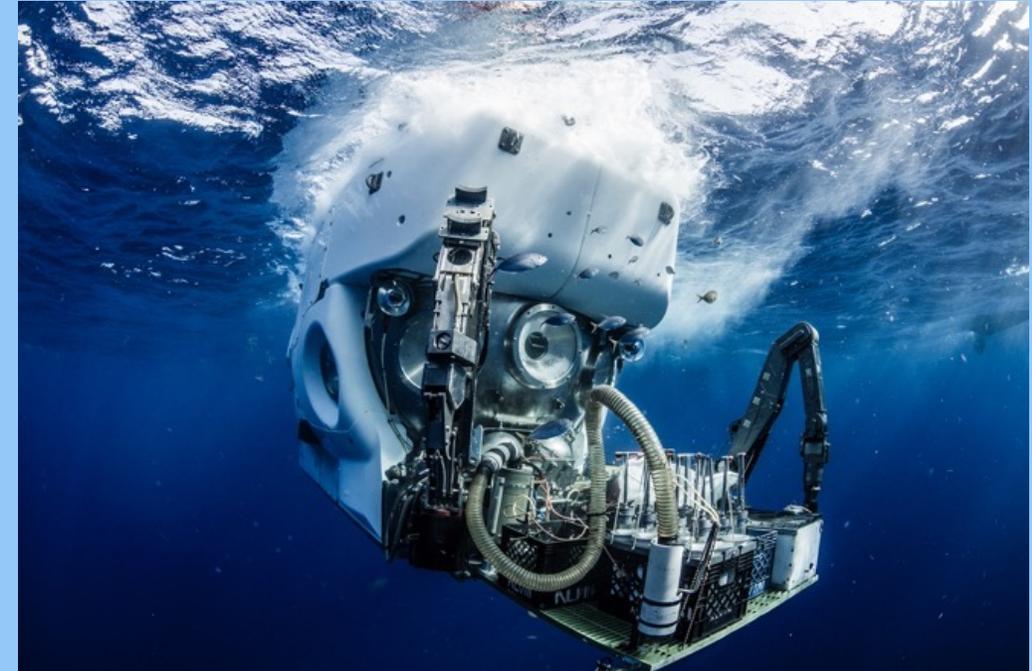
- Rick Sanger – September 2022
- Nick Osadcia – End of 2022



Alvin 2022 Team Update

Personnel Recruiting

- **Alvin Certification Coordinator**
 - completing offer to final candidate
 - new ACC joins as soon as possible
- **Ops Electrical Engineer – 2 positions**
 - completing offer to 1st candidate
 - continuing selection of 2nd candidate
- **Ops Mechanical Engineer - 2 positions**
 - completing initial interviews



New Ops team members aboard for Sea Trials