



NAUTILUSLIVE.ORG
OCEAN EXPLORATION TRUST

UNOLS 2020 DESSC FALL MEETING

2020 E/V Nautilus Field Season

8 expeditions (August - December)

110 operational days (ROV & mapping)

>65% reduction in at-sea participants

Emphasis on telepresence for science/outreach

270 registered Scientists Ashore

24/7 live stream & virtual event series for
outreach



COVID-19 IMPACTS

- **DELAYED START TO FIELD SEASON** // postponed June start to August.
- **REDUCED PERSONNEL ABOARD** // sailed with >65% reduction of expedition teams and decreased the number of ship crew; on some expeditions, the entire science party participated from shore and only the operational teams sailed; OET deferred all 2020 education program participants (18 interns & 27 educators) to a later date.
- **COVID-19 PROTOCOLS** // for the entirety of the 2020 field season, OET required all at-sea participants to complete a 14-day quarantine in the port of departure and receive a negative COVID-19 diagnostic test prior to boarding the ship; personnel transfers and crew changes were minimized to the extent possible, resulting in many individuals sailing for longer durations than is typical for E/V Nautilus; strict mitigation measures were put in place aboard the vessel and in port; protocols were put in place for responding to suspected cases onboard.

Thank you, **UNOLS**, for your leadership this spring in providing excellent guidance for safely mounting expeditions during the pandemic!



At-Sea Expedition Team



Scientists Ashore

INCREASED EMPHASIS ON TELEPRESENCE

- Utilized 12 years of experience and infrastructure for telepresence-enabled science and outreach from E/V Nautilus to involve shore-based teams during 54 ROV dives;
- Many dives were led by geographically dispersed teams onshore that were tapped into the live audio stream as if they were aboard the ship guiding the ROV team; OET saw increased participation from OET's Scientist Ashore community, including participation by local experts, educators, and tribal representatives in outreach and dive narration;
- All 2020 outreach was conducted without dedicated outreach personnel aboard, including moderated Q&A during the live stream with viewers around the world;
- OET gained high levels of viewership and engagement across our live stream and social media platforms, including 20M+ views of the live streams and highlight videos on the Nautilus Live YouTube channel.
- **Future improvements** will enhance the shoreside experience by (1) continuing to invite shoreside participation in science and outreach, including those that are not capable of going to sea, (2) refining tools, including improvements of situational awareness through interactive navigation displays, and (3) modernizing a "best practices" guide for home telepresence operations and centralizing information.
- OET's aims to utilize this telepresence model for future cruises aboard the new UNOLS RGRVs to enable 24/7 ROV operations with limited berthing.

SHIP & TECHNOLOGY IMPROVEMENTS

COMPLETED IN 2020

- Commissioned new main engine
- Commissioned new DP system
- Redesigned funnel; expanded & upgraded gray water system; overhauled sewage treatment
- Completed building and testing new 3-van ROV control room, including a dedicated outreach studio

PLANNED FOR DEC 2020 - spring 2021

- Stern extension (4 meters)
- Integration of new crane for deployment of ASVs, AUVs, and other technologies in tandem with ROV deployments
- Addition of a new 2-cabin suite, increasing potential science party berths to 33 from 31





ANTICIPATED 2021 FIELD SEASON

- ~200 operational days planned for 2021 with NOAA OER, NOAA Ocean Exploration Cooperative Institute (OECI) partners, NOAA Office of National Marine Sanctuaries, and Ocean Networks Canada.
- The OECI technology demonstrations will kick off the 2021 field program and include multiple technology demonstrations with tandem operations of UNH's DriX ASV and WHOI's Mesobot AUV as well as tandem operations with WHOI's hybrid vehicle NUI, optical modem capabilities, and OET's ROVs.
- Nautilus will end the field season with ~80 days mapping and characterizing the Papahānaumokuākea MNM and winter in HI.
- OET, in collaboration with UNH, will also deploy mobile assets for mapping within Lake Huron with Thunder Bay National Marine Sanctuary.