

Telepresence cruise - Objectives



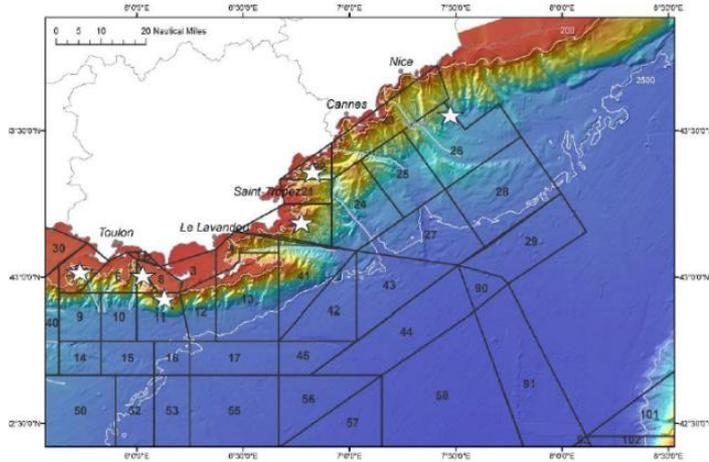
General objectives :

- Validating telepresence technologies for the French oceanographic fleet (HROV video transmission, HROV data transmission, videoconferencing, etc.).
- Applying the concept of telepresence during a coastal exploration cruise using a remotely operated underwater vehicle.
- Managing the cruise and dive operations from an onshore laboratory.
- Preparation and management of cruise operations by master-level students





Telepresence cruise



- Cruise : Telepresence
- Dates : from December 1 to 6th 2018
- Cruise leader : Olivier Soubigou – Ifremer - DFO/NSE/NE
- Ship : R/V *L'Europe*
- Underwater vehicle : HROV ARIANE
- Associated universities and institutes:
 - Ifremer
 - University of Nice, Geoazur laboratory - Geosciences
 - University of Aix-Marseille - Biology
 - IUEM Brest - Education (cancelled)



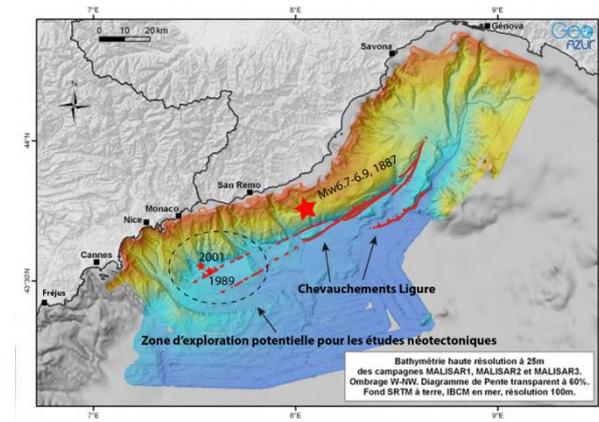
Objectives



1-GEOAZUR laboratory (CNRS) (university of Nice, France)

Scientific objective : the tectonic and sedimentary evolution of the Ligurian margin.

Education tool for Master students: definition of scientific questions, cruise preparation and management of operations, data processing and outreach.





Objectives

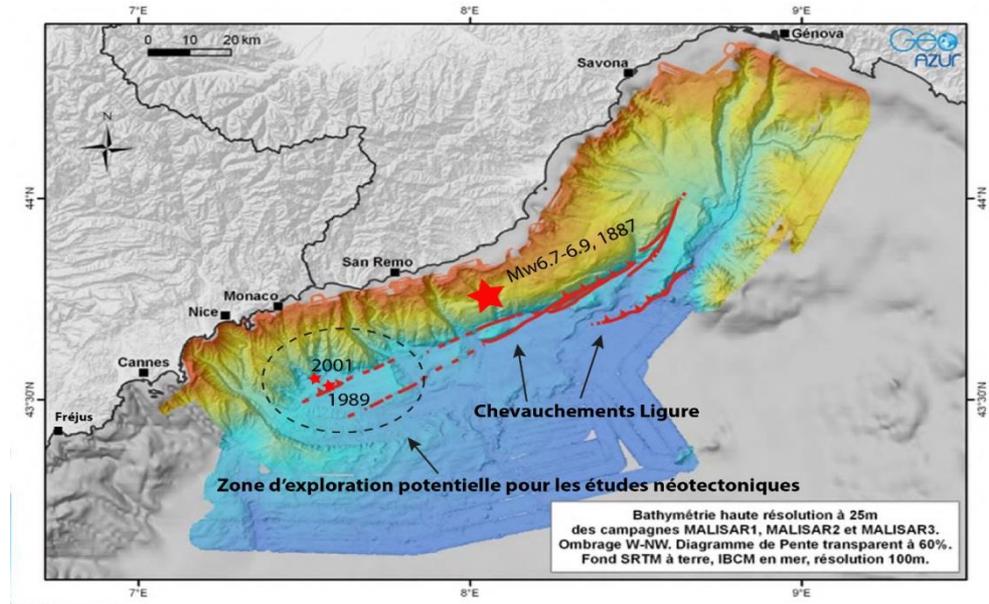


Ifremer

2-Mediterranean Institute of Biodiversity and Marine Ecology (Marseille, France)

Scientific objective : deep hexacoralliaires and octocoralliaires species, level of vertical connectivity at different depths.

Corporate communication:
live streaming of 2 dives on Intranet Ifremer
1 800 connections / 6 hours live streaming





R/V l'Europe

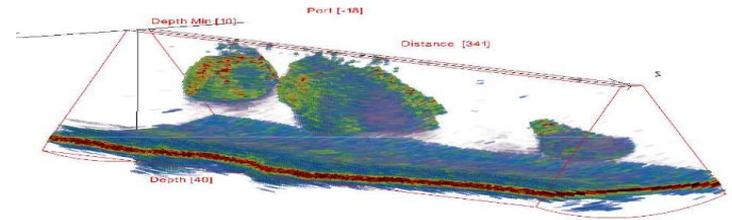


Twin-hull built in 1993 by OCEA shipyard

- Length : 29,60 m
- Width : 10,60 m
- Displacement : 264 t
- Transit speed : 9 knts
- Autonomy : 8 days
- Crew + scientists : 8 + 8

Multipurpose missions :

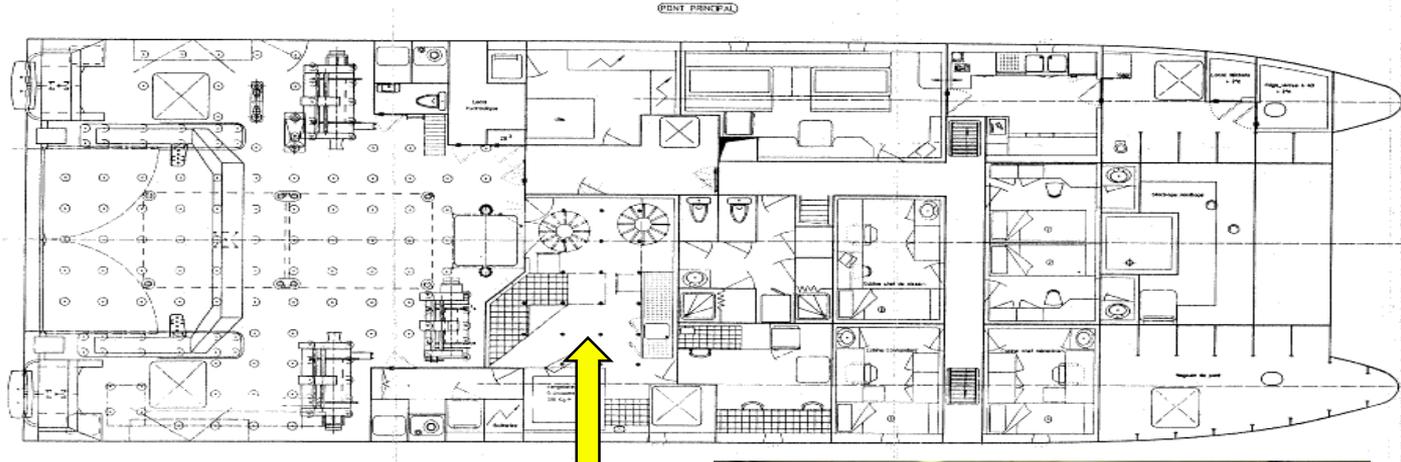
- Fish stock assessment (ME70, SBES, trawls)
- Oceanography-hydrology (CTD, mobile EM 2040)
- UW vehicle support (AUV, HROV)



Ship based in Mediterranean sea



Laboratory at the work deck

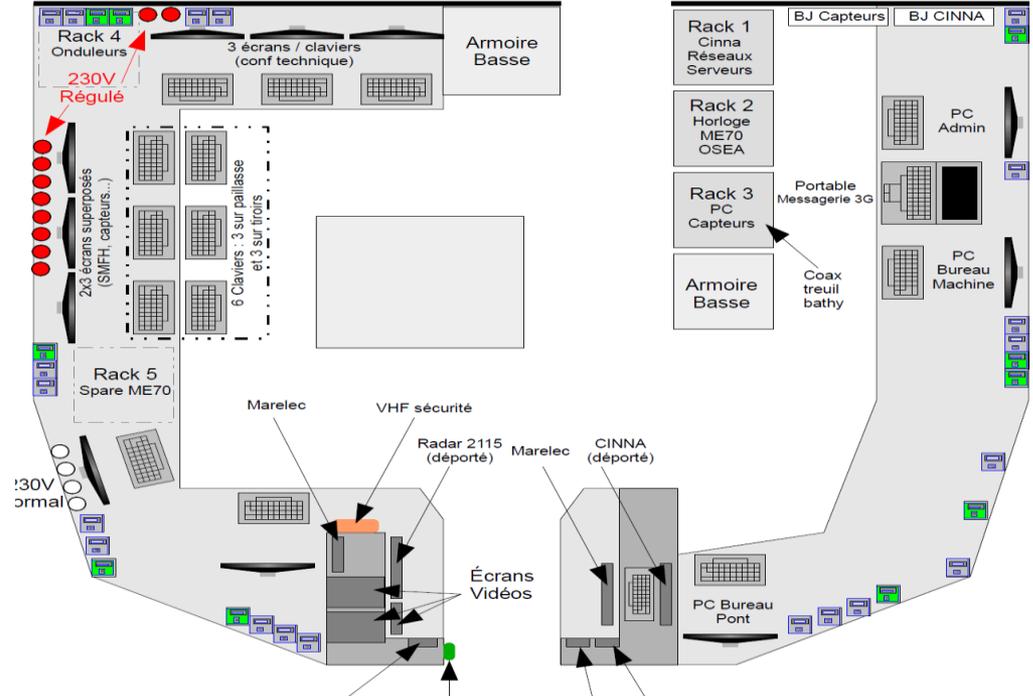


- UW vehicle operation room



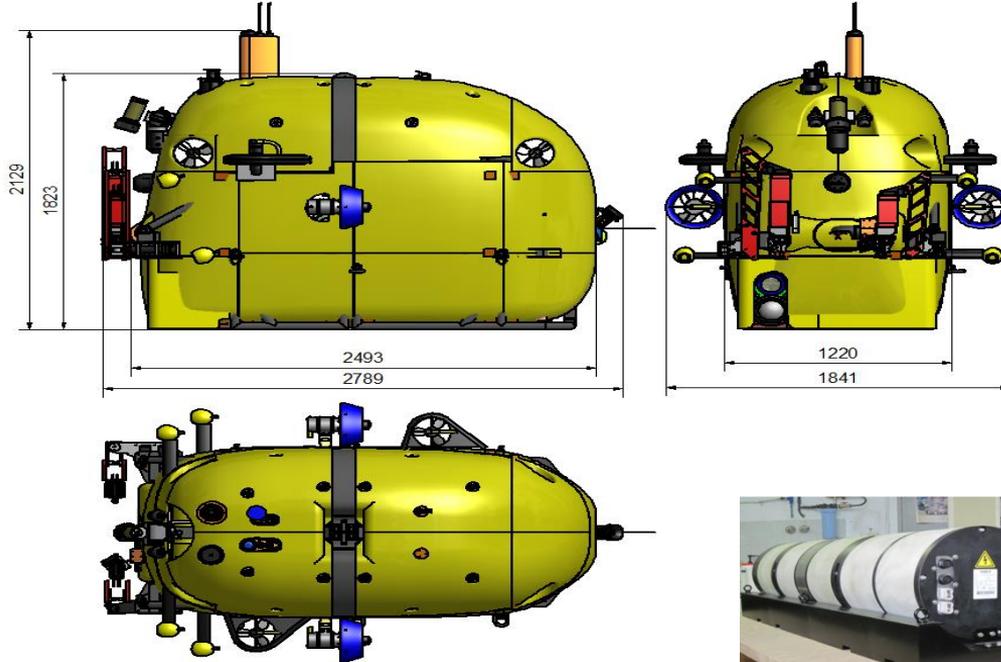


Scientific PC at the bridge level





Hybrid ROV ARIANE



- ROV with batteries + long and thin optical tether between depressor and vehicle
- Or AUV
- Mass 1,7t
- Autonomy max 12h
- 3 modules Li-on 2 kWh@48V
- 1 battery 20kWh Li-ion 13kWh@150Vdc

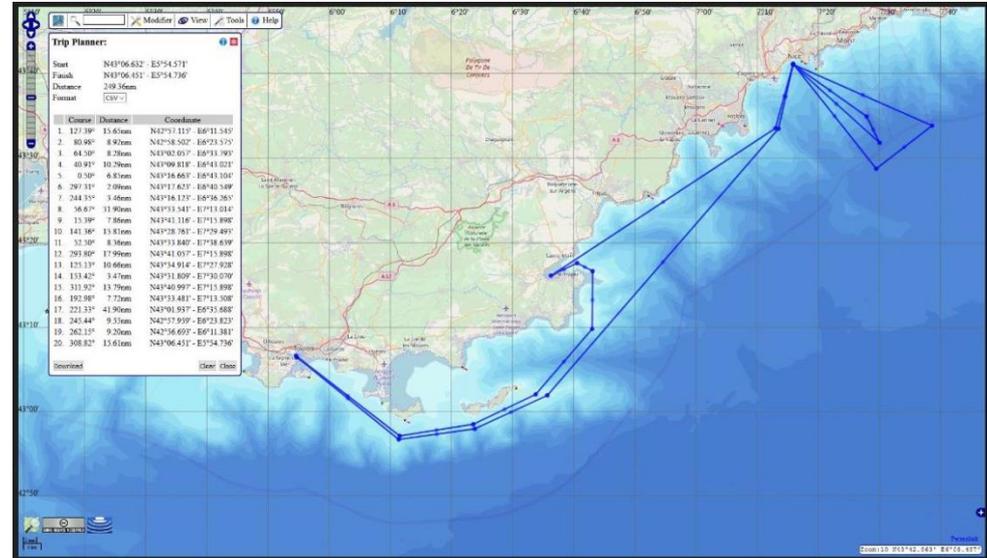


Daily course



Ifremer

- Day 1 : Mobilization in Toulon
- Day 2 and 3 : Biology dives n°1 and n°2
- Days 3 : ARIANE failure (optical fiber) – Geosciences dive n°3 cancelled
- Day 4 : Geoscience dive n°4
- Day 5 : MBS calibration performed by engineers on shore – Brest center

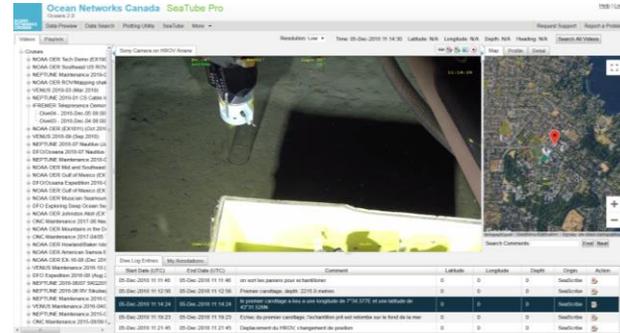
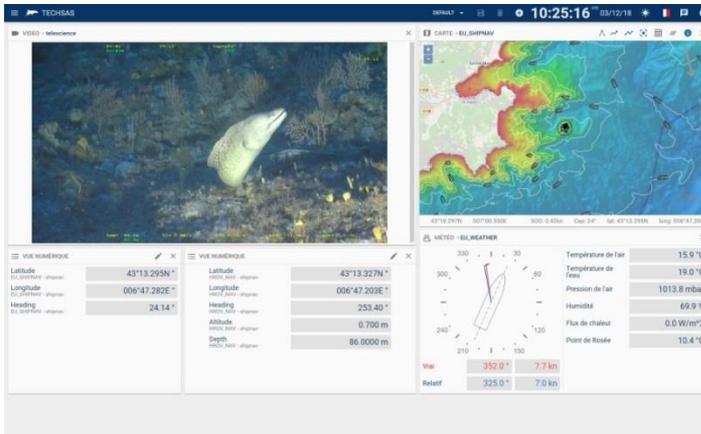




Operations in GEOZUR conf. room



- GEOAZUR conference room :
 - 1 scientific PI + 20 students and scientists
 - Visio conference with RV *L'Europe*
 - ARIANE video display + general data on TECHSAS software
- On *L'Europe* :
 - 1 scientific PI + technical team (2) + ARIANE operators (3)
 - Visio conference with GEOAZUR





Conclusions



- Telepresence technologies fully validated
- Shore based team reported a strong immersive feeling during operations
- Management of the cruise and dive operations from an onshore laboratory validated
- Sea/shore coordination is the key point and has been validated : dive preparation, animation, extensive exchanges between sea and shore (briefing, debriefing, real time description of operations)
- Opportunity for shore based scientists to participate actively to a cruise operated on coastal vessel
- Flexibility in case of on-board breakdowns (equipment failure, weather conditions...)
- Preparation and management of cruise operations by master-level students validated

PERSECTIVES : ANOTHER TELEPRESENCE CRUISE IS PLANNED IN 2020 (ROV 3G) ON RV L'EUROPE WITH HROV ARIANE