

# EUROFLEETS+ FINAL CONFERENCE

**Cold-Water Coral ecosystems in the Alboran Sea.  
Highlights from the Eurofleets+ OASIS Cruise.**

**Claudio Lo Iacono, OASIS cruise team**

**Bernadette Ni Chonghaile, Niamh Flavin**





Thriving Cold-Water Coral Reefs  
in the Mediterranean Sea



Spain



The Netherlands



Italy



France



Morocco



United Kingdom



United States



Canada





# OASIS



*Thriving Cold-Water Coral Reefs  
in the Mediterranean Sea*



Call OCEANS - 31 March/12 April 2023



RV Pelagia - NIOZ





## Cold Water Corals (Phylum Cnidaria):

- Biodiversity hotspots and habitat builders in the deep sea
- Provide important Ecosystem Services
- VME, vulnerable and threatened by human activities



Habitat Directive, MSFD



UNGA 2006 Res 61/105

*“...all States to take action immediately to protect marine ecosystems ...including cold water corals, from destructive human practices”*



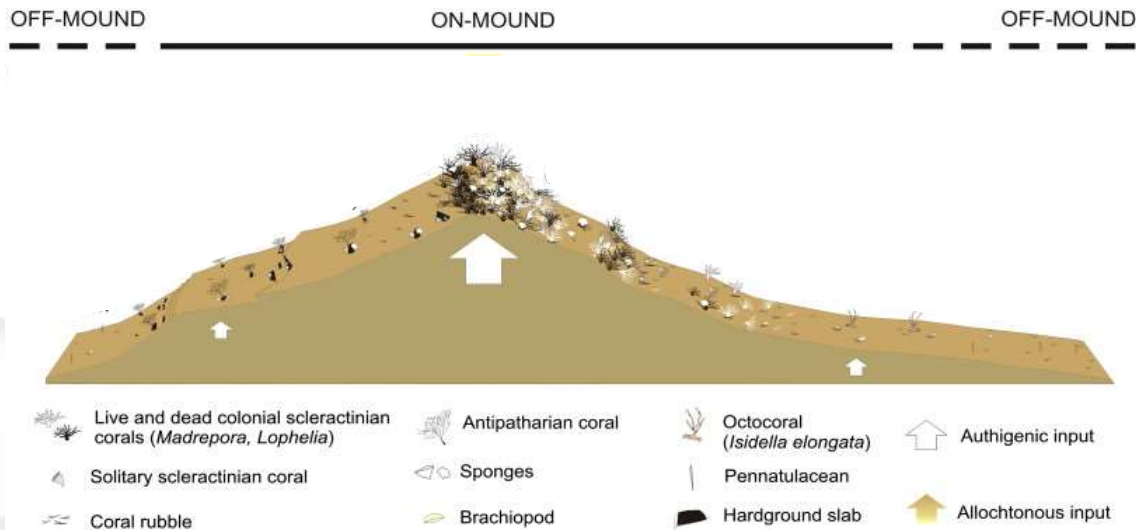




Passive feeders →

Importance of hydrodynamics in providing organic matter

*persisting suitable environmental conditions*  
Cold-water coral reefs: complex 3D expression



Buhl-Mortensen et al., 2010



*Lophelia pertusa*



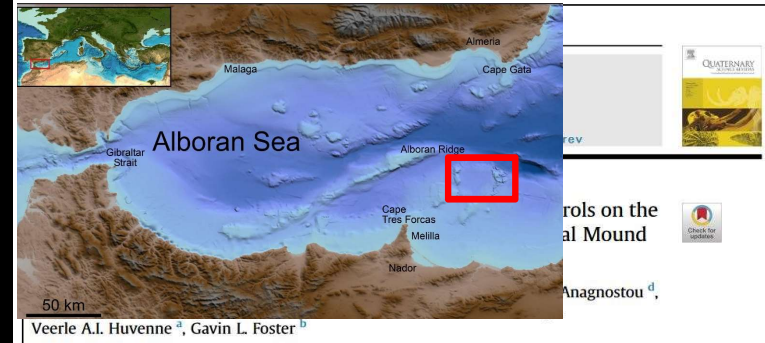
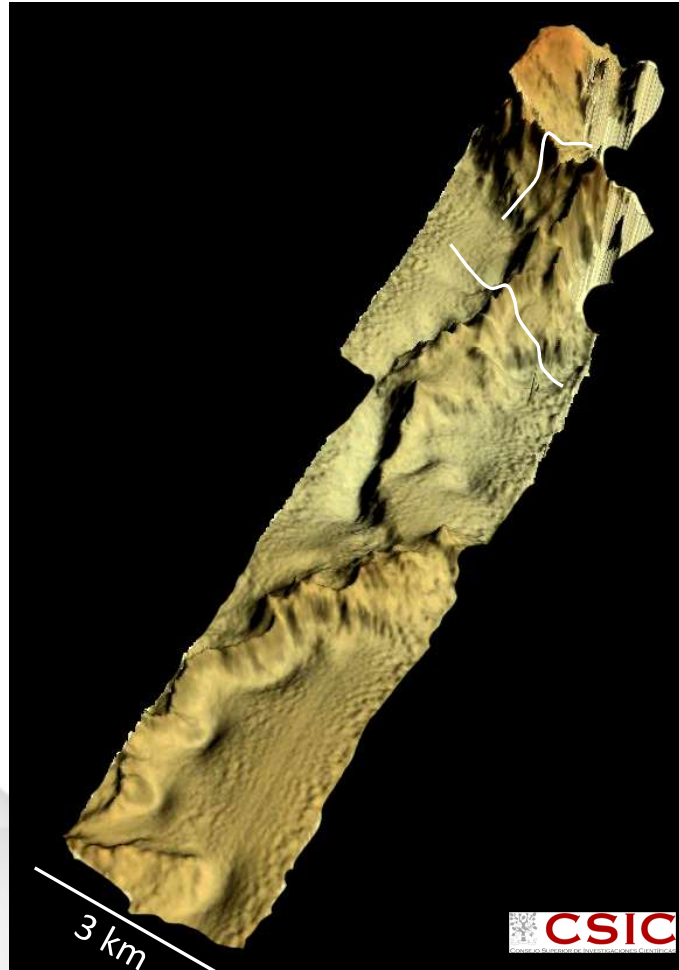
*Madrepora oculata*





## The Cabliers CWC Mound System > 400.000 years old ecosystem...and still living!

Length: 25 km  
Height: 60-110 m  
Depth: 290-710 m



National Oceanography Centre

Science Technology Facilities Business Partnerships Education About Careers

### News Archive

#### Scientists discover how the potentially oldest coral reefs in the Mediterranean developed

Posted: 21 January 2021

A new study from the Institut de Ciències del Mar (ICM-CSIC, Spain) and the National Oceanography Centre brings unprecedented insights into the environmental constraints and climatic events that controlled the formation of these reefs.

The results of this research will help understand how cold-water coral reefs can react to the effects caused by the present-day climate change.

Similar to tropical coral reefs, cold-water coral reefs are incredible hotspots of biodiversity, with the difference that they do not rely on symbiosis with microscopic algae, and therefore can be found in the dark and deep waters of our oceans. Despite their uniqueness and key functional role in the



In the present-day, the cold-water coral reefs of the Mediterranean are mainly formed by the species *Madrepora oculata* and partly *Desmophyllum pertusum* / Cabliers reef - SHAKE Cruise.





 Eurofleets 2 TNA "IRIS", 2015

*thriving reefs on the crest!*

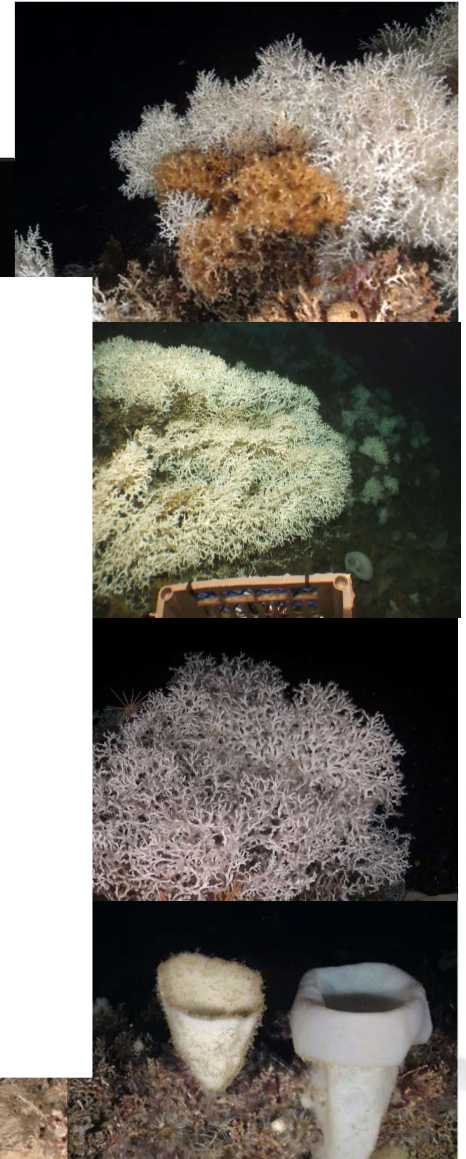
2021



Proposal for a  
Fisheries Restricted Area



FOOD AND AGRICULTURE  
ORGANIZATION  
OF THE UNITED NATIONS







 Eurofleets 2 TNA "IRIS", 2015



*thriving reefs on the crest!*

Contents lists available at ScienceDirect

 Progress in Oceanography

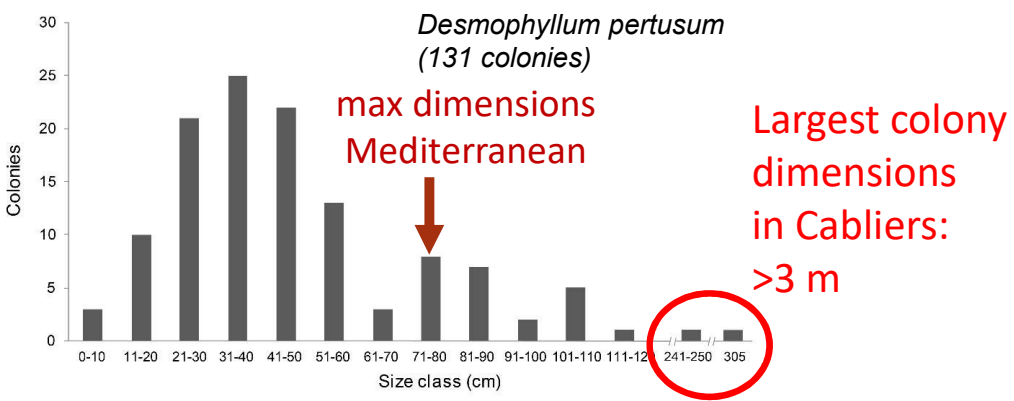
journal homepage: [www.elsevier.com/locate/pocean](http://www.elsevier.com/locate/pocean)



Ecological characterisation of a Mediterranean cold-water coral reef: Cabliers Coral Mound Province (Alboran Sea, western Mediterranean)

Guillem Corbera<sup>a,\*</sup>, Claudio Lo Iacono<sup>b</sup>, Eulàlia Gràcia<sup>b</sup>, Jordi Grinyó<sup>b,c</sup>, Martina Pierdomenico<sup>c</sup>, Veerle A.I. Huvenne<sup>a</sup>, Ricardo Aguilar<sup>d</sup>, Josep Maria Gili<sup>b</sup>





2021

**Proposal for a Fisheries Restricted Area**



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS







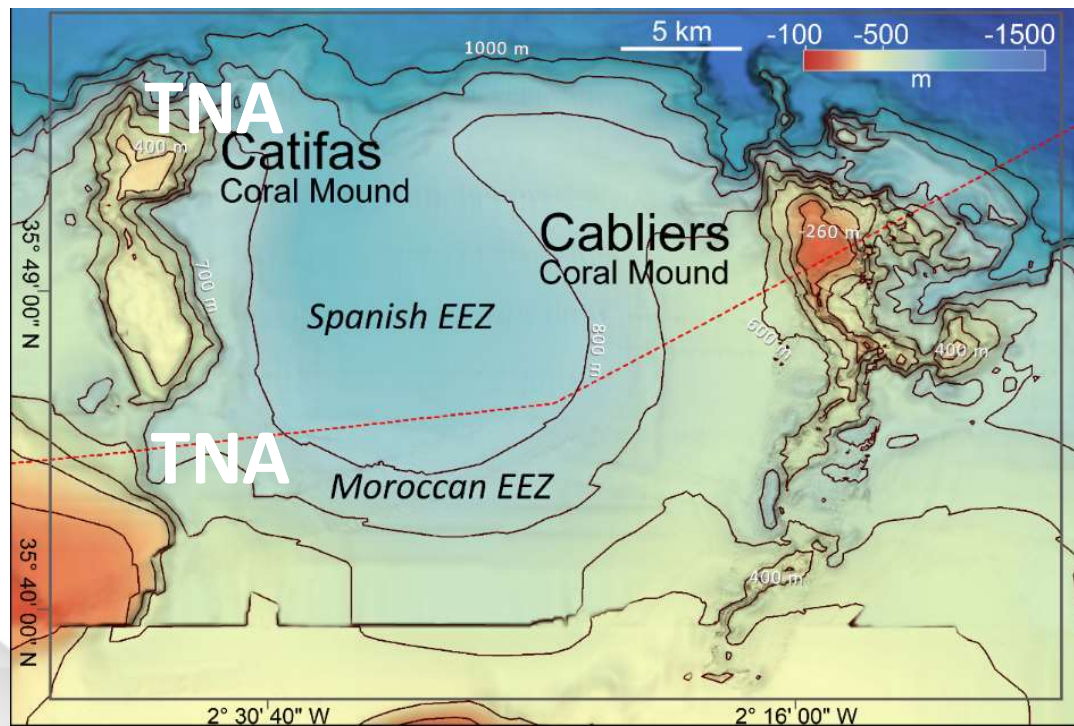
**OASIS**



*Thriving Cold-Water Coral Reefs  
in the Mediterranean Sea*

**Extension, ecology, human impact**

**Physical processes** (*how organic matter is delivered?*)





# OASIS

Thriving Cold-Water Coral Reefs  
in the Mediterranean Sea

Extension, ecology, human impact

Physical processes (*how organic matter is delivered?*)

RV Pelagia - NIOZ



ROV Max Rover, HCMR



Landers



CTD-Rosette



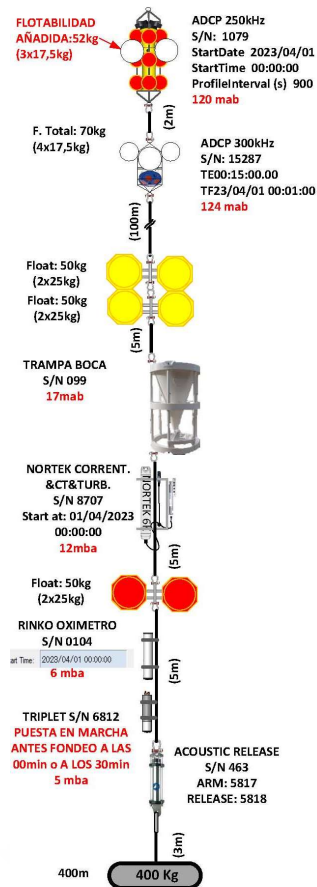
Moorings

**in-kind  
contribution**





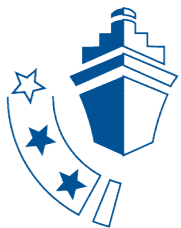
## Thriving Cold-Water Coral Reefs in the Mediterranean Sea



**2 Moorings (1 year long deployment):**  
ADCPs: entire water column  
T, S, O, turbidity, chlorophyll  
Pelagic sediment traps







# OASIS



*Thriving Cold-Water Coral Reefs  
in the Mediterranean Sea*



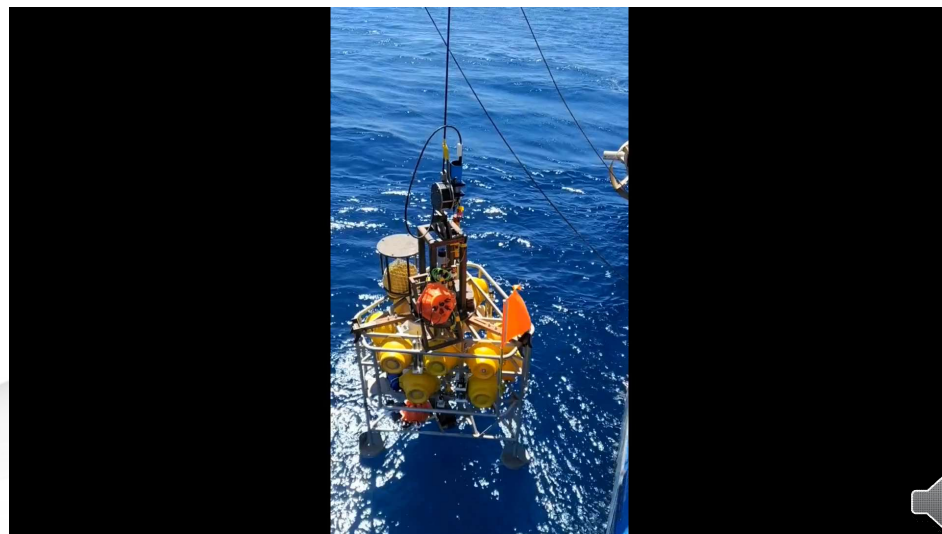
## **2 Landers (2 short deployments, 1 long):**

T, S, O, turbidity, chlorophyll, ADCPs

In situ water pumps (SPOM)

Sediment trap

Baited camera

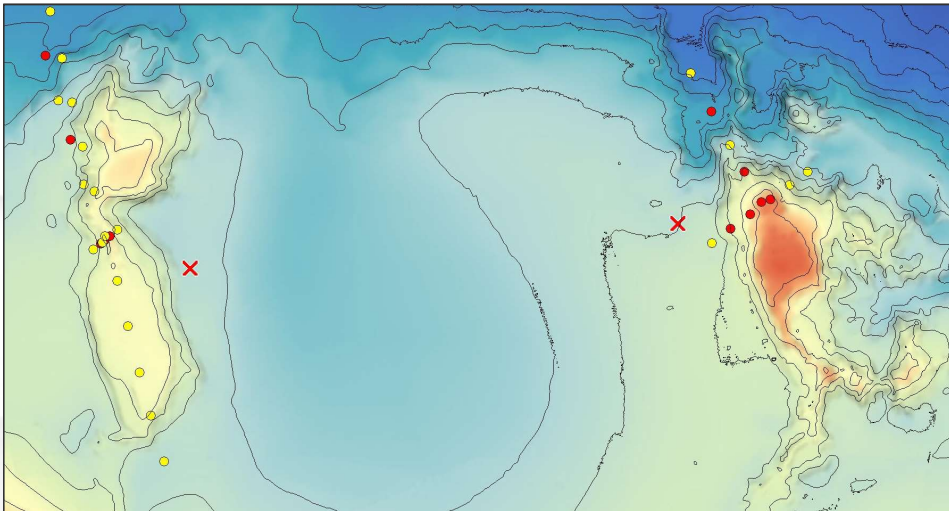




## Thriving Cold-Water Coral Reefs in the Mediterranean Sea

CTD Rosette + L-ADCP:

- 32 cast (280 – 900 m) along 4 transects
- 11 water sampling (3 depths)  
*SPOM, C and N isotopes, chlorophyll- $\alpha$  concentrations, microplastics*
- 2 yo-yo 12 hours





# OASIS



Thriving Cold-Water Coral Reefs  
in the Mediterranean Sea

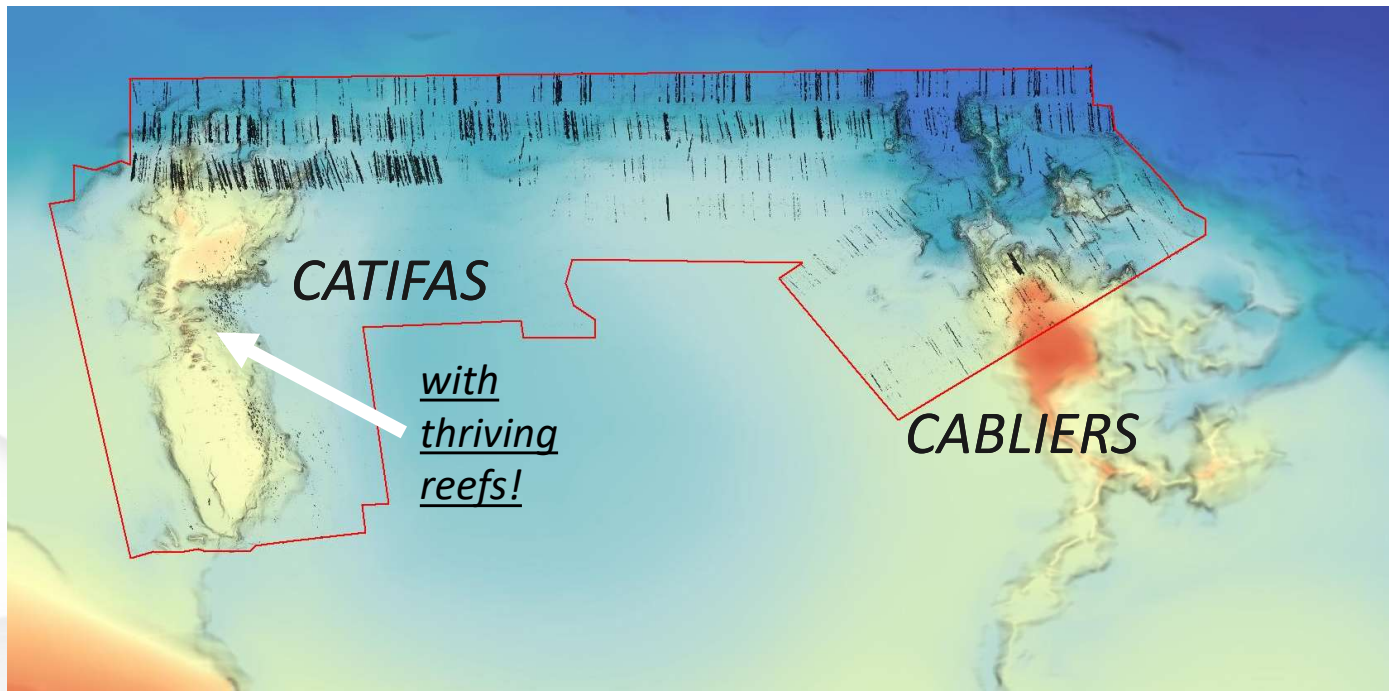


EMODnet

European Marine  
Observation and  
Data Network

Seafloor mapping:

- new MB covering around 450 km<sup>2</sup> (350 km acquisition)
- new discovery of CATIFAS MOUND SYSTEM





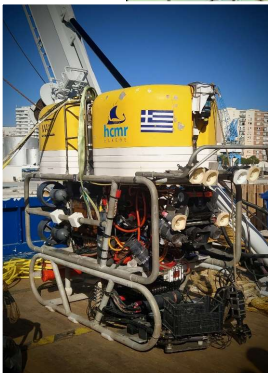
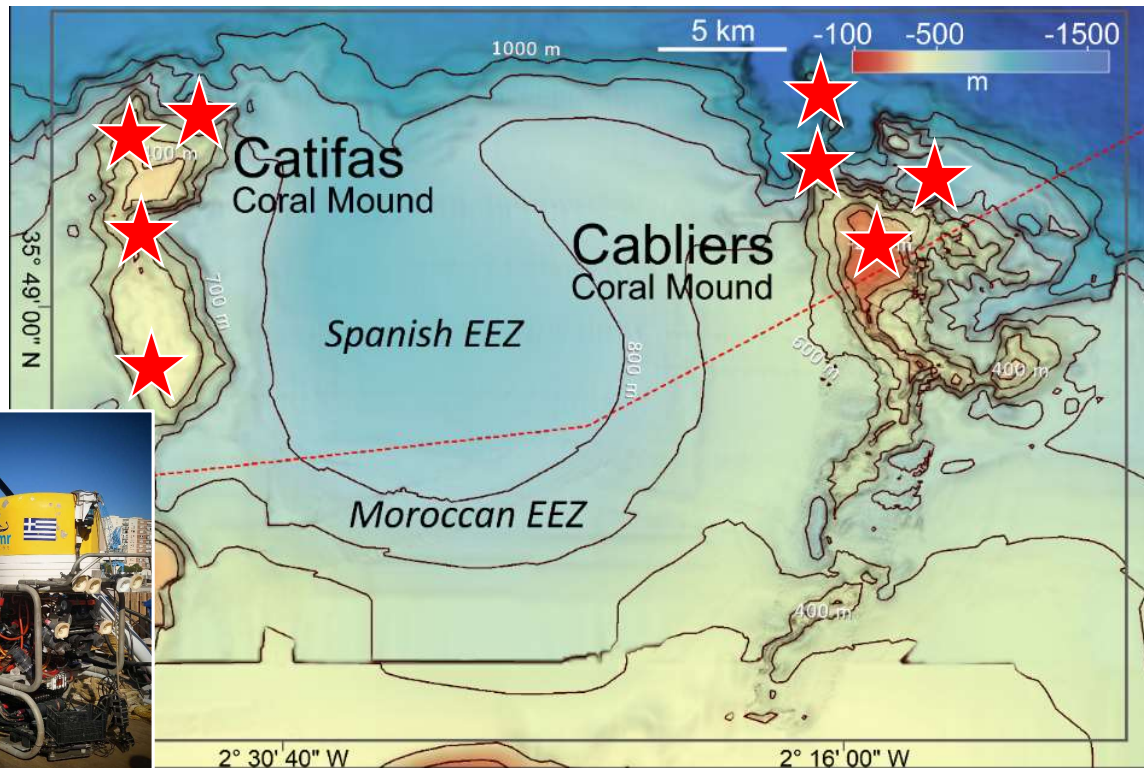


# OASIS

## Thriving Cold-Water Coral Reefs in the Mediterranean Sea

ROV dives:

15 dives, 19 hours of HR Video footage, CTD and oximeter, 19 samples

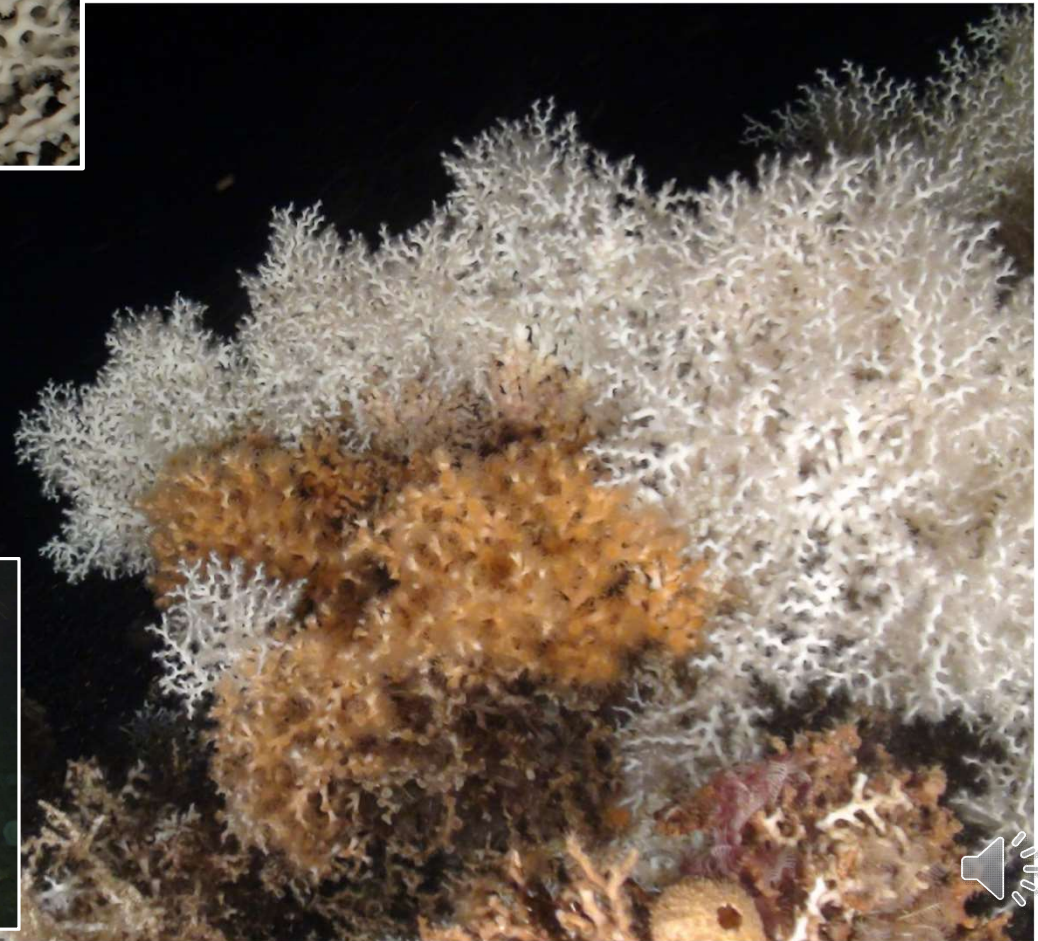
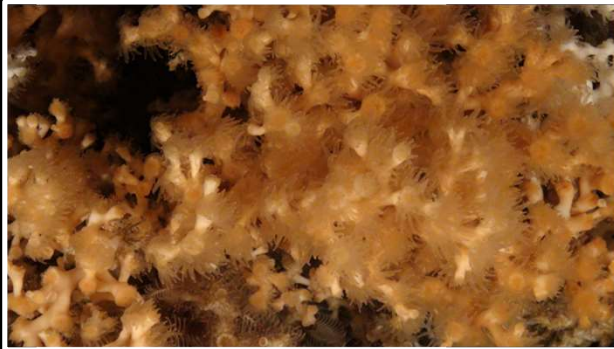




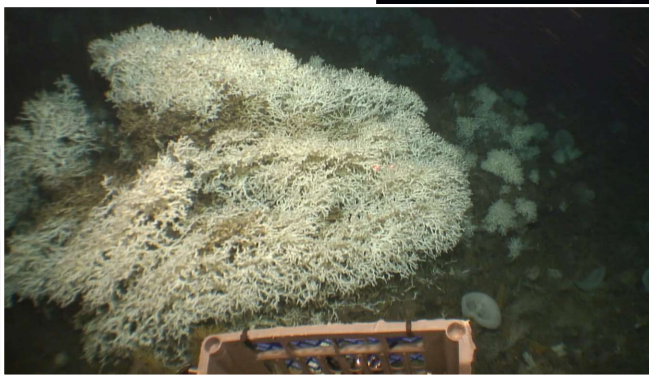
# Habitats VMEs



*Desmophyllum pertusum* (= *Lophelia pertusum*)  
*Madrepora oculata* reefs

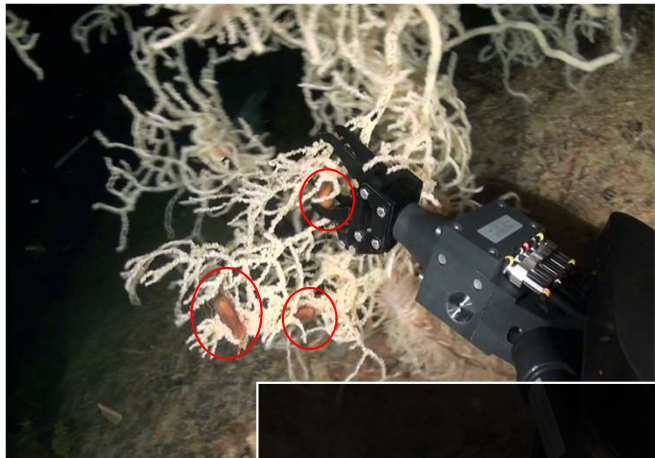


**OASIS** 

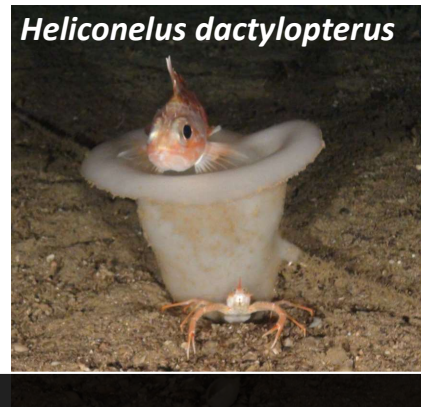




# Essential Fish Habitats

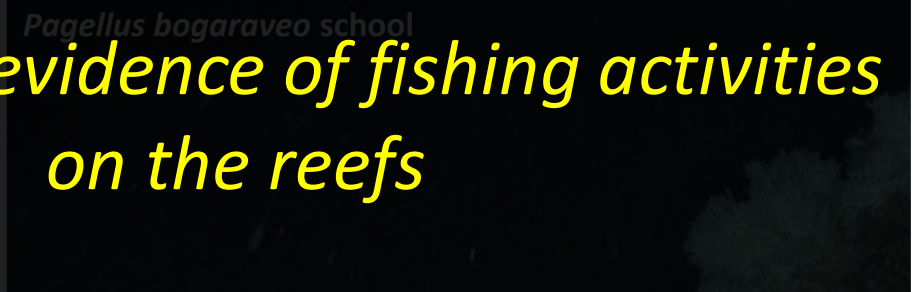


Egg cases on black corals (Diploria)



*Heliconelus dactylopterus*

**No litters or evidence of fishing activities on the reefs**



*Pagellus bogaraveo* school







## Thriving Cold-Water Coral Reefs in the Mediterranean Sea



Home > News > New OASIS in the deep!

### New OASIS in the deep!



The Eurofleets+ OASIS expedition, onboard the Dutch RV "Pelagia", headed last week the Alboran Sea, western Mediterranean. Unexpected large and thriving reefs of cold water coral deep-sea ecosystems were unveiled on the Cabliers and Catifas Banks.

The cruise is led by Claudio Lo Iacono from ICM-CSIC, the Marine Science Institute of the Spanish National Research Council, and partnered by several international institutions of mar



### OASIS cruise | Exploring the Alboran Sea

Publication date: Tuesday 11 April 2023

Category: NIOZ@Sea

During the OASIS cruise, awarded to ICM CSIC by Eurofleets+, we are exploring a little part of this wilderness in the Alboran sea in the westernmost part of Mediterranean Sea.

Thursday 6 April 2023 - Discoverv of a new oasis in the deep!



Cold-water coral reefs form habitats for a diverse faunal community





# OASIS



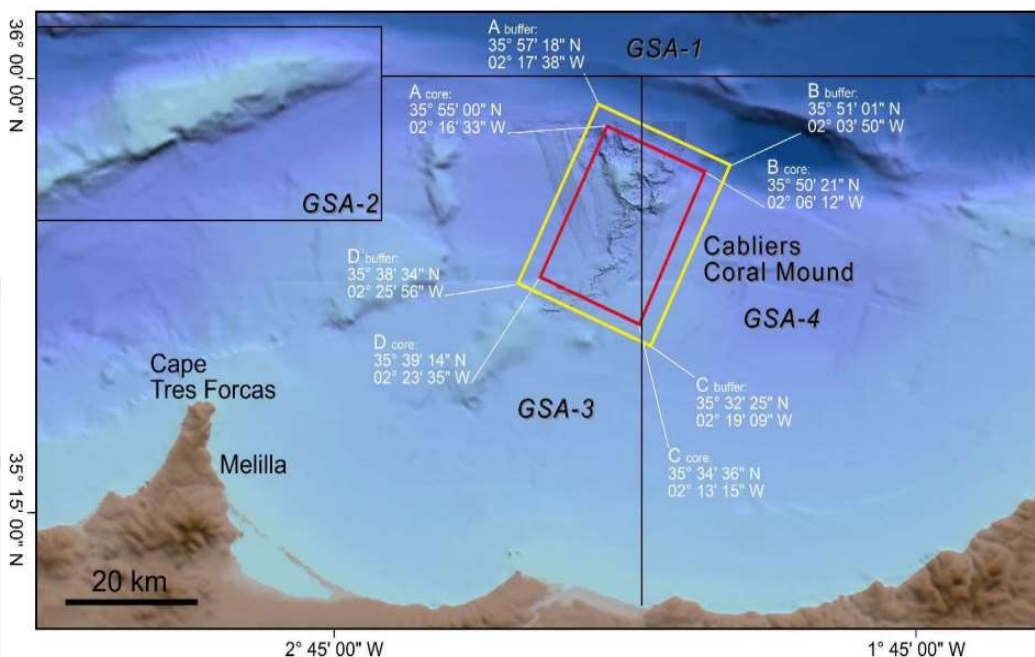
## Thriving Cold-Water Coral Reefs in the Mediterranean Sea



General Fisheries Commission  
for the Mediterranean  
Commission générale des pêches  
pour la Méditerranée

OASIS results presented to the Subregional Committee for the West. Mediterranean  
Malaga, 13 April 2023

### Cabliers will be a FRA in 2024



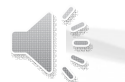
Home > Press corner > Fisheries joint multiannual management plans in MED

Available languages: English

Press release | 12 November 2022 | Brussels

### Fisheries: EU and neighbouring countries agree first-ever joint multiannual management plans in the Mediterranean

Furthermore, the EU, Morocco and Algeria agreed on a **roadmap for the establishment of the first shared fisheries restricted area (FRA)**. The future FRA will cover the waters of Spain, Morocco and Algeria in the Cablier Mound area of the Alboran Sea. It will complement the new Alboran MAP measures for the protection of the blackspot seabream stock, which is in a critical state.







Thriving Cold-Water Coral Reefs  
in the Mediterranean Sea



Thank  
you!

