



atlas

UNDERSTANDING DEEP ATLANTIC ECOSYSTEMS



Influence of water masses on the biodiversity and biogeography of deep-sea benthic ecosystems in the North Atlantic at different spatial scales

ATLAS 5th General Assembly

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REVIEW effects of water masses on biodiversity and biogeography

frontiers
in Marine Science

REVIEW FORUM Corresponding Author [? Need Help? Contact us](#)

- ✓ 1. Initial Validation
- ✓ 2. Editorial Assignment
- ✓ 3. Independent Review
- ✓ 4. Interactive Review
- 5. Review Finalized**
- 6. Final Validation
- 7. Final Decision

Influence of water masses on the biodiversity and biogeography of deep-sea benthic ecosystems in the North Atlantic



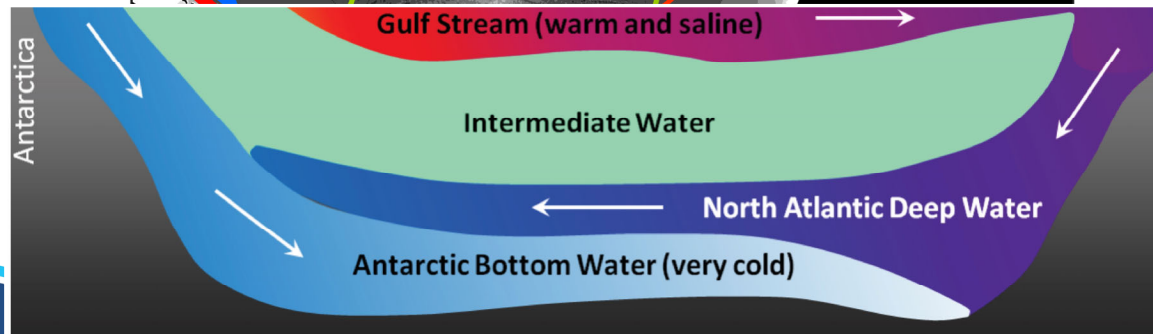
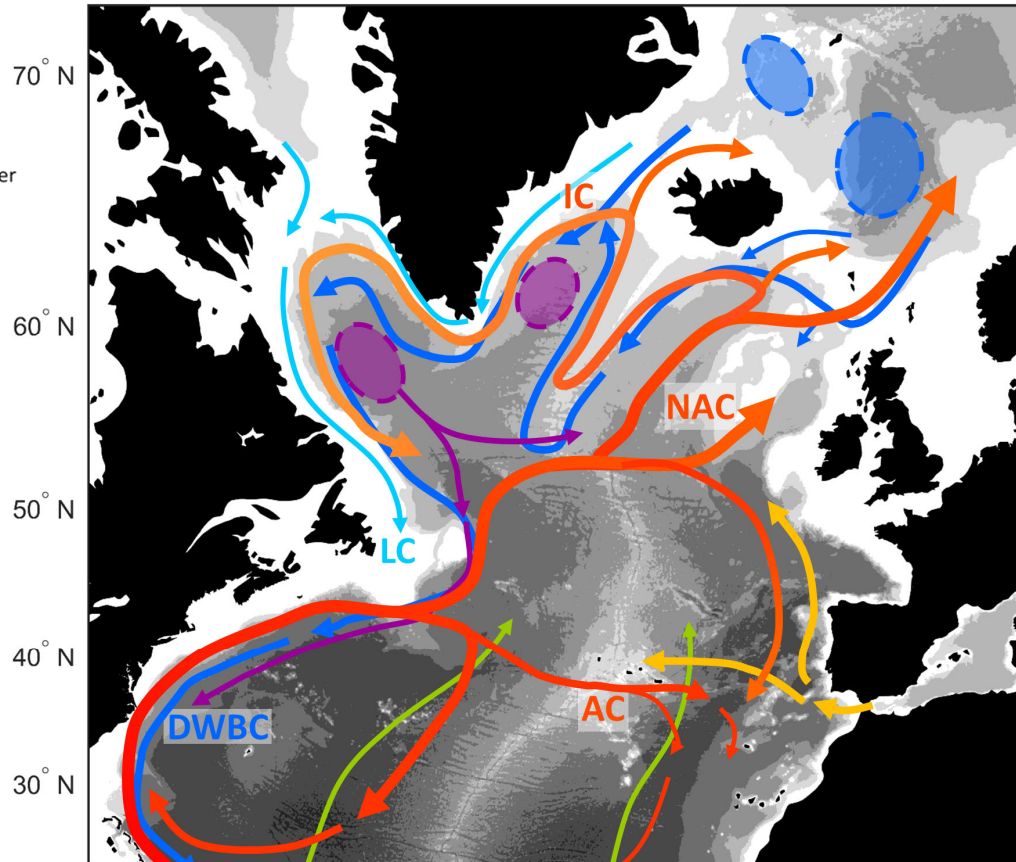
NEW SPECIES to science discovered !!!



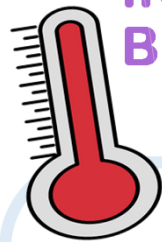
NORTH ATLANTIC CIRCULATION



- Atlantic waters
- Mediterranean Outflow Water
- overflow waters
- deep \ intermediate water formation area
- Arctic waters
- Labrador Sea Water
- Antarctic waters



CHARACTERISTICS OF WATER MASSES INFLUENCING BIODIVERSITY AND BIOGEOGRAPHY



Temperature

Distribution
Metabolic rates
Reproduction – connectivity
Mortality

**MAGNITUDE
EXPOSURE**

Hydrodynamics

Distribution
Morphology / structure
Abundance / feeding

FOOD SUPPLY

Organic matter



Distribution
Biodiversity
Abundance



Salinity

Distribution
Biodiversity (MOW)
Wide tolerance

**SCARCELY
EXPLORED**

Carbonate chemistry



Depth distribution (ASH)
Dissolution shells/skeletons
Energy cost
Long-term acclimation

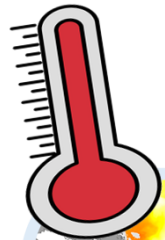
Oxygen



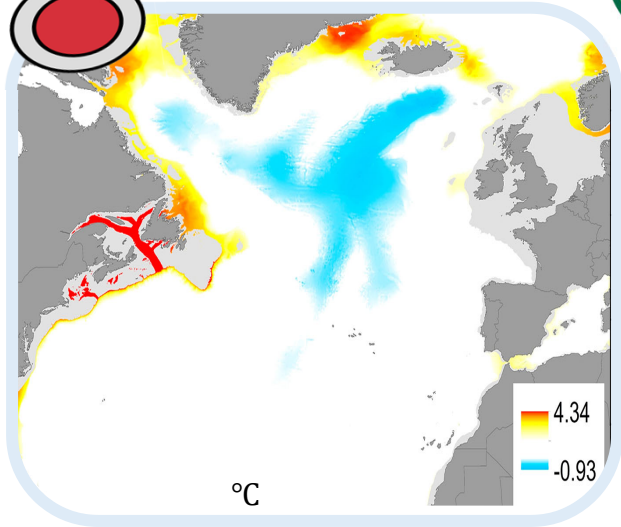
Limiting below threshold
Oxygen Minimum Zones
Species richness
Disrupted distribution
Disrupted connectivity

FUTURE CLIMATE CHANGE SCENARIOS

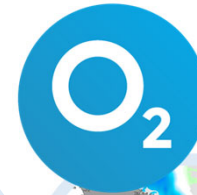
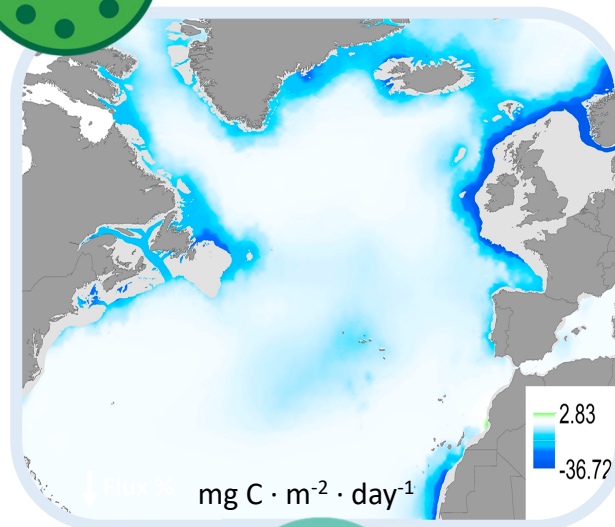
Changes
2000 - 2100



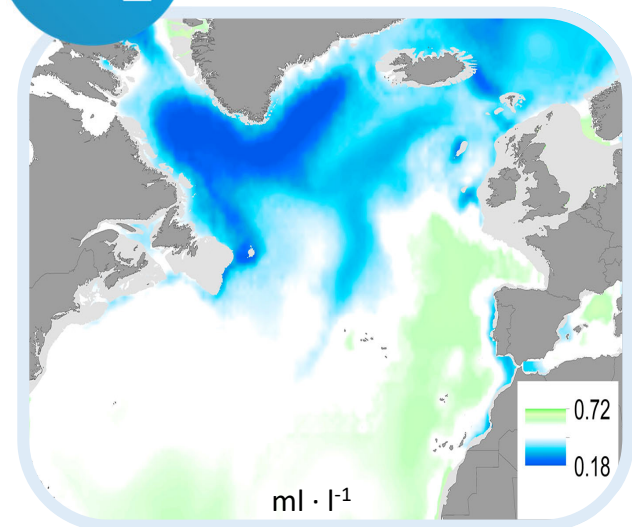
Warming



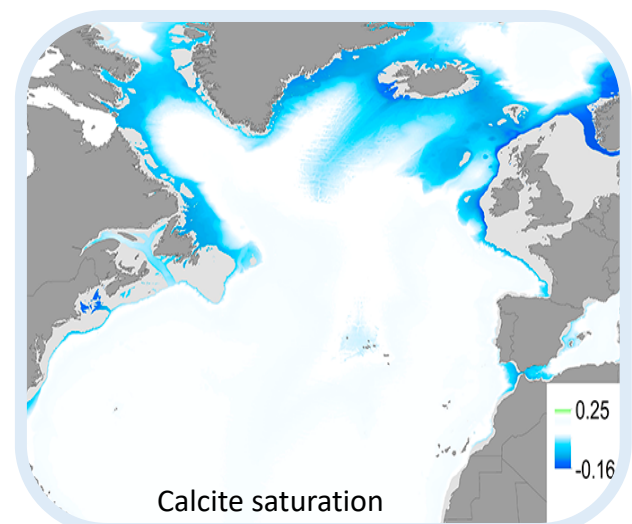
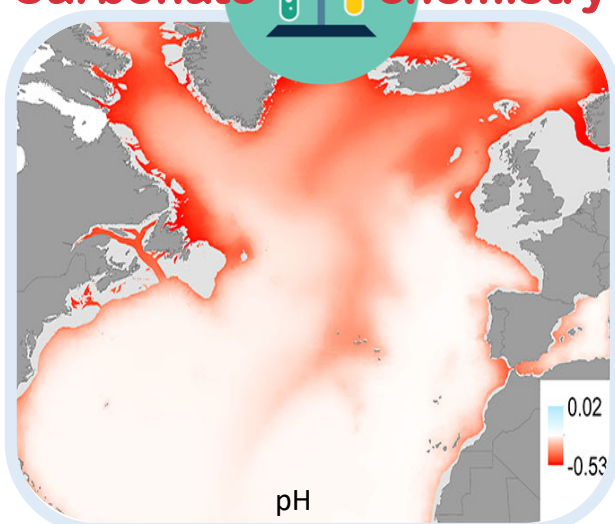
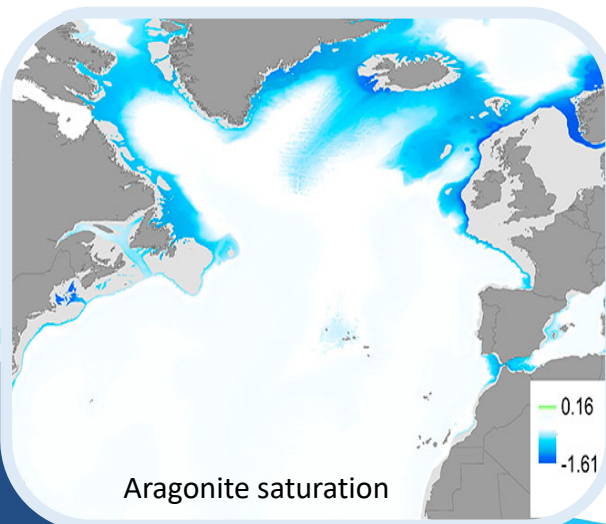
Organic matter



Deoxygenation

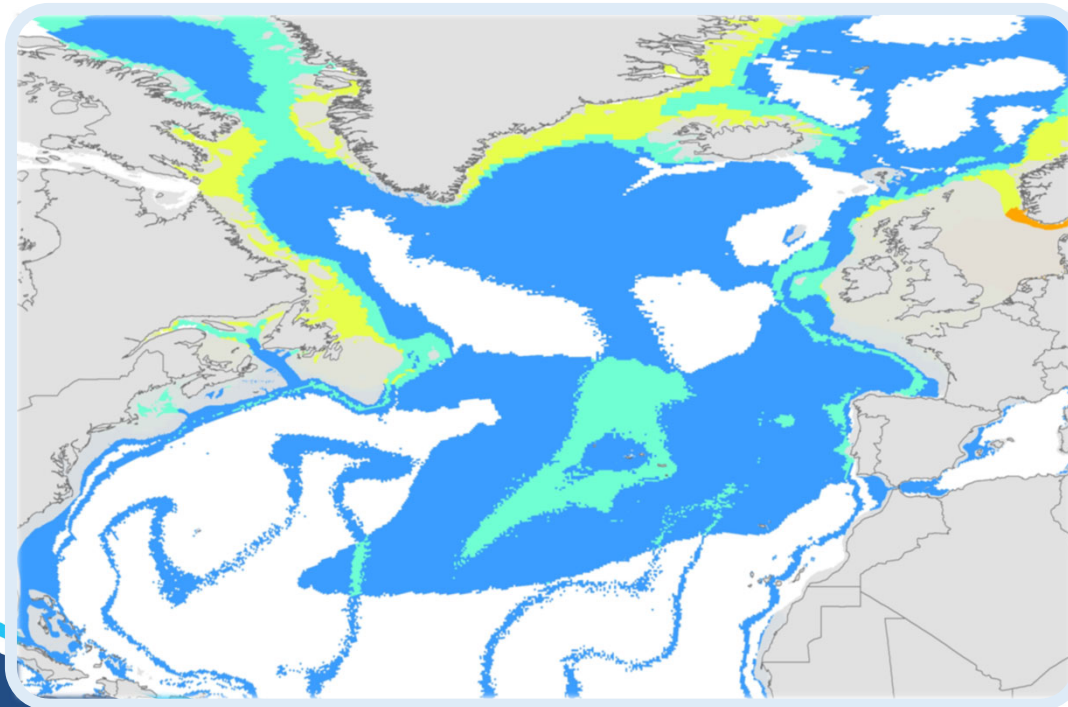
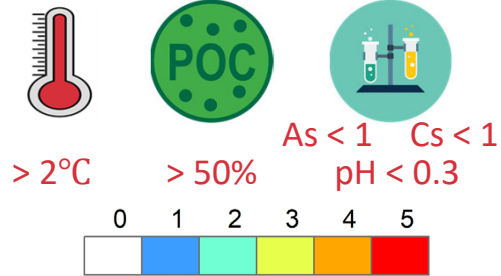


Carbonate chemistry



FUTURE IMPACTS ON BIODIVERSITY

**Cumulative
critical
changes**



IMPACTS

HIGH ENERGETIC COST

MORTALITY

DIMINISH REPRODUCTION

LOSS OF SUITABLE HABITAT

LOSS OF BIODIVERSITY

CONNECTIVITY

LOSS OF BIOMASS

ECOSYSTEM FUNCTIONING

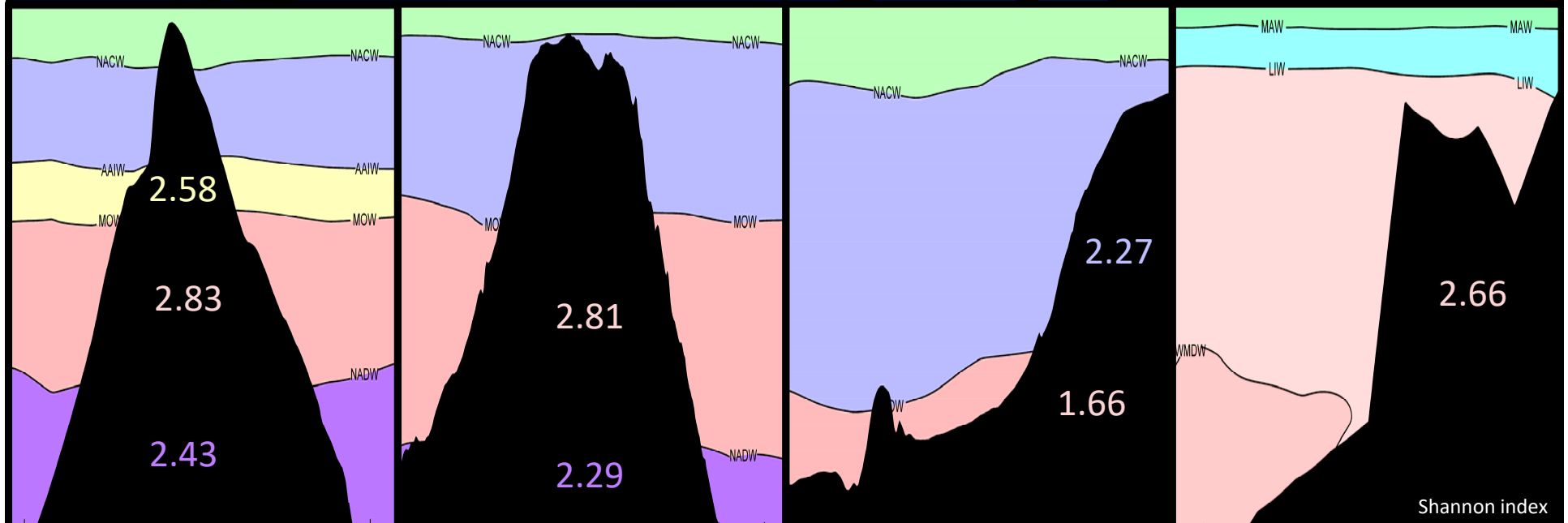
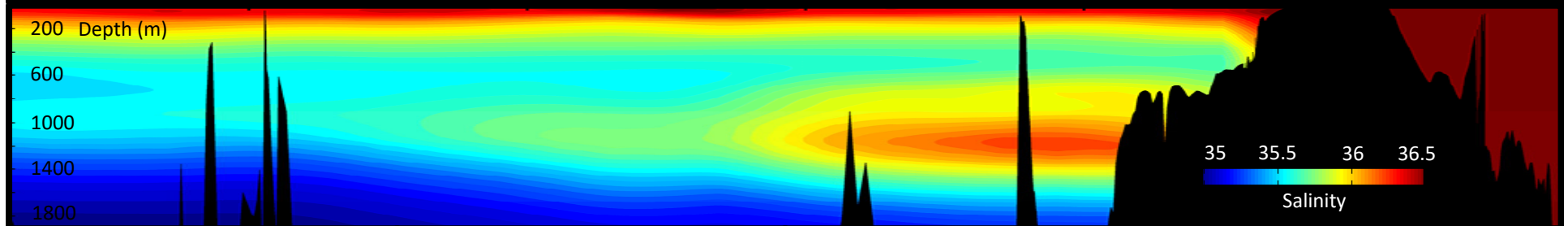
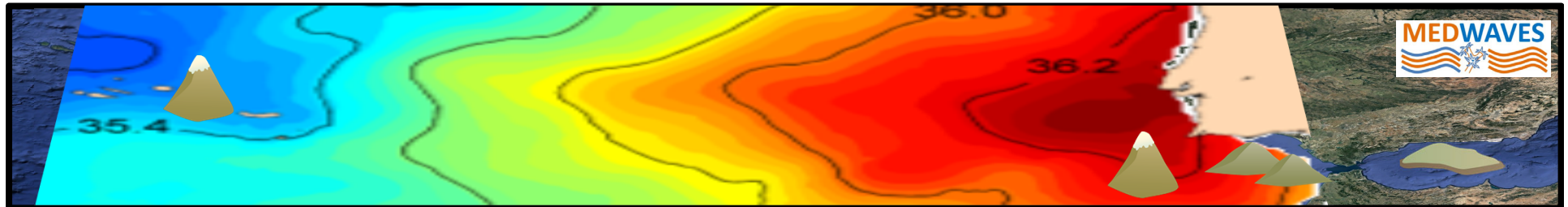
MEDITERRANEAN OUTFLOW WATER

FORMIGAS SEAMOUNT

ORMONDE SEAMOUNT

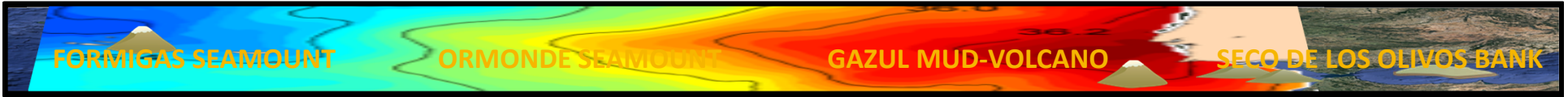
GAZUL MUD-VOLCANO

SECO DE LOS OLIVOS BANK

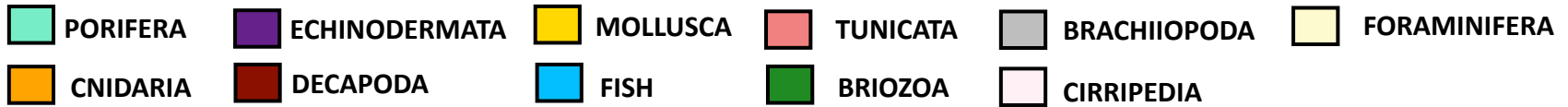
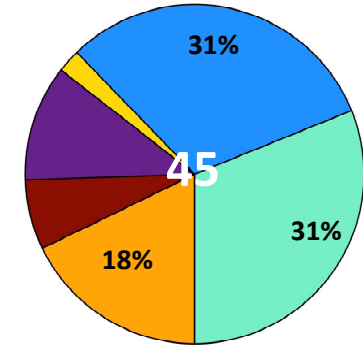
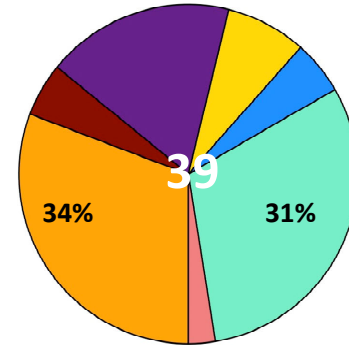
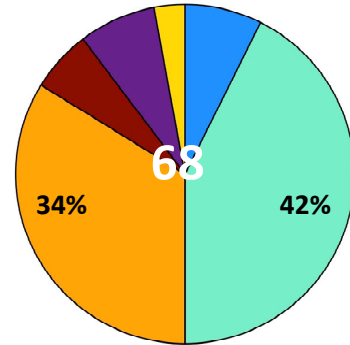
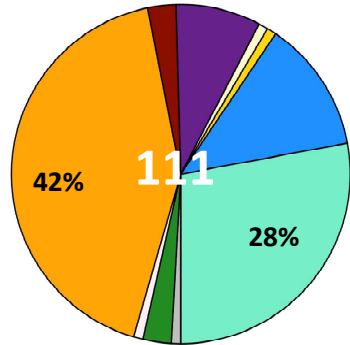


Shannon index

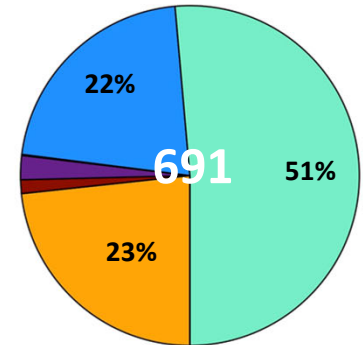
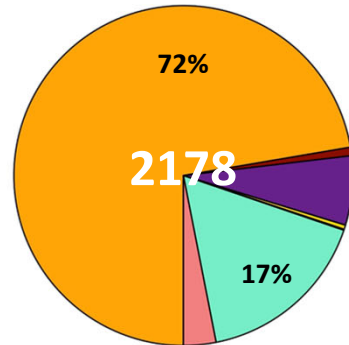
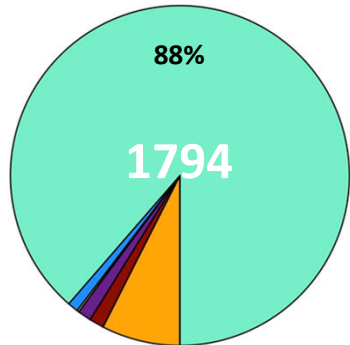
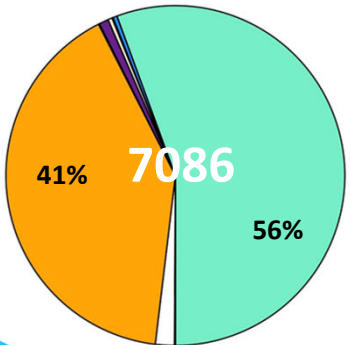
BIODIVERSITY



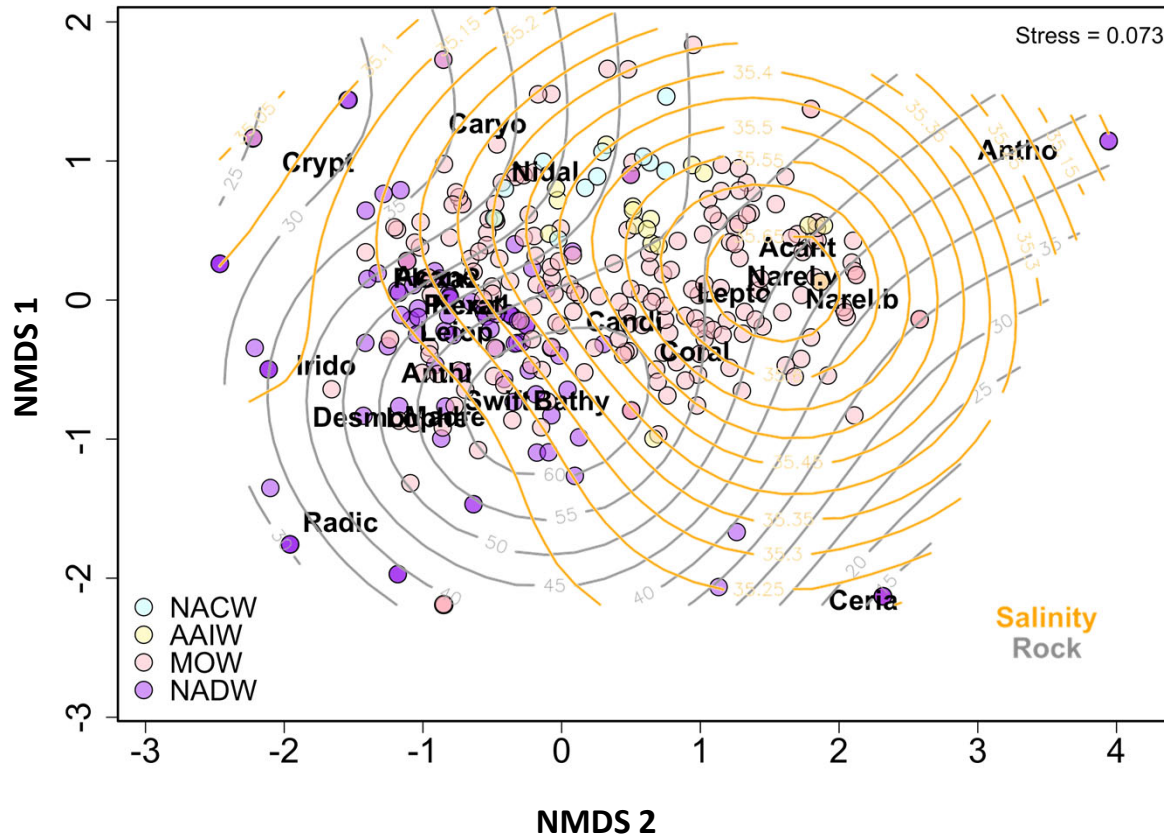
N TAXA



TOTAL ABUNDANCE



COMMUNITY STRUCTURE



Lophelia pertusa
Madrepora oculata
Desmophyllum dianthus
Leptopsammia formosa
Enallopsammia rostrata
Caryophyllia sp

SCLERACTINIA

Acanella arbuscula
Candidella imbricata
Acanthogorgia armata
Keratoisis spp
Swiftia sp
Corallium tricolor
Iridogorgia pourtalesii
Narella bellissima
Narella versluysi
Placogorgia terceira
Nidaliidae
Plexauridae sp1
Plexauridae sp2
Radicipes gracilis



ALCYONACEA

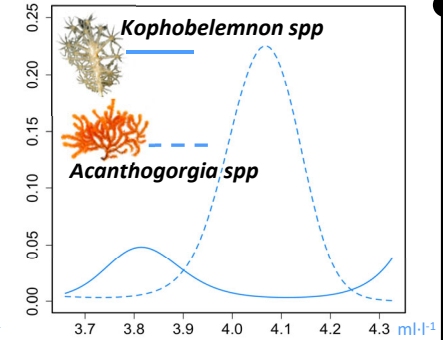
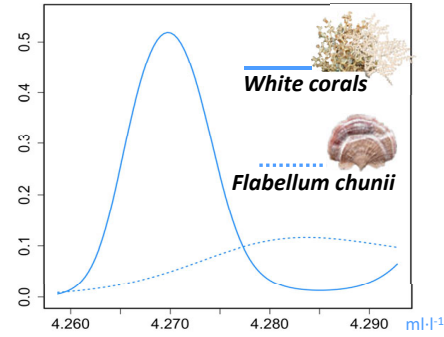
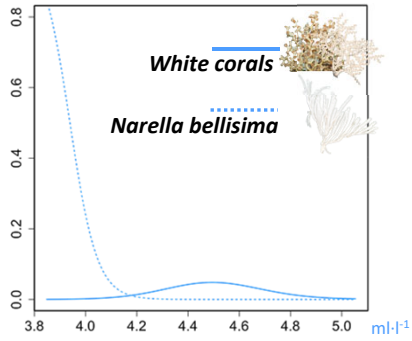
Anthipathes dichotoma
Bathypathes patula
Leiopathes glaberrima

ANTHIP

CORAL RESPONSES

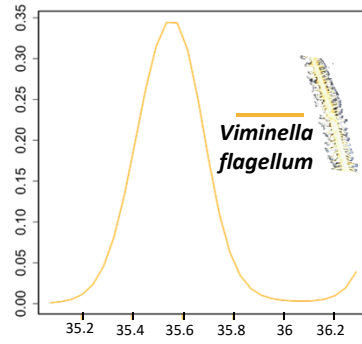
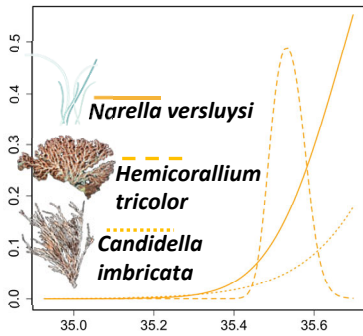


OXYGEN

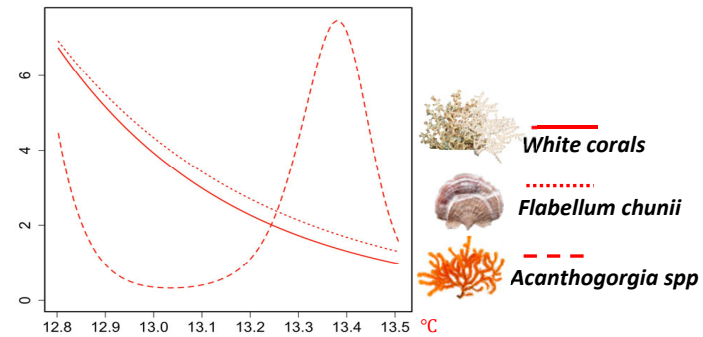
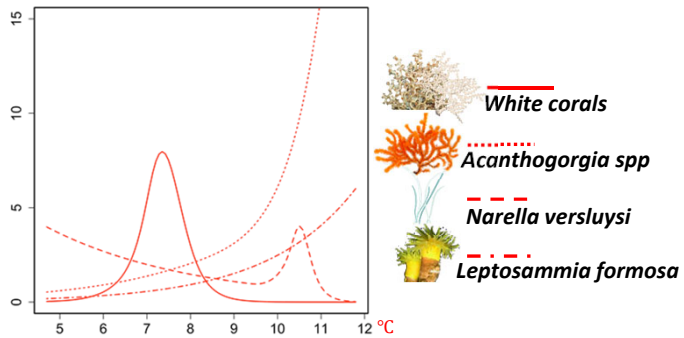


PRESENCE

SALINITY

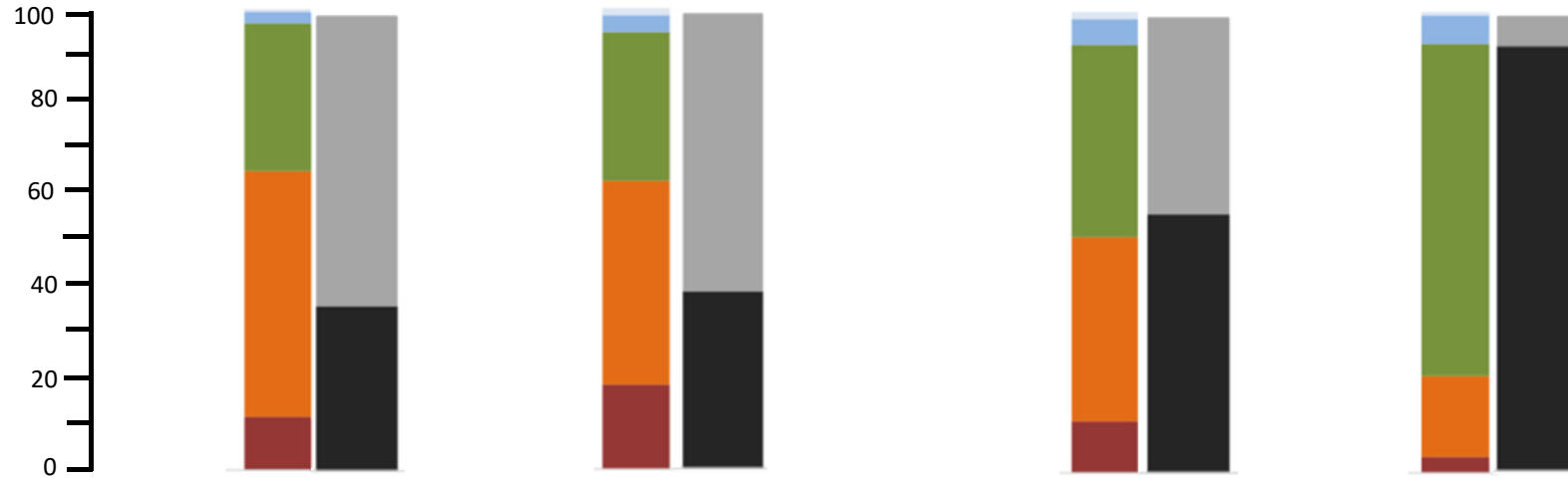
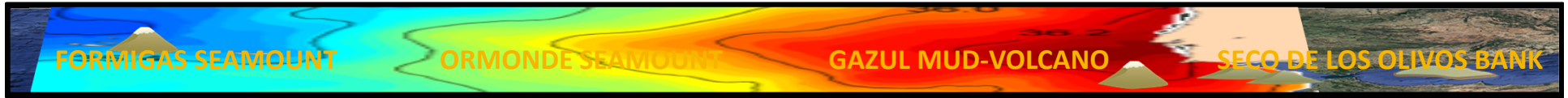


TEMPERATURE

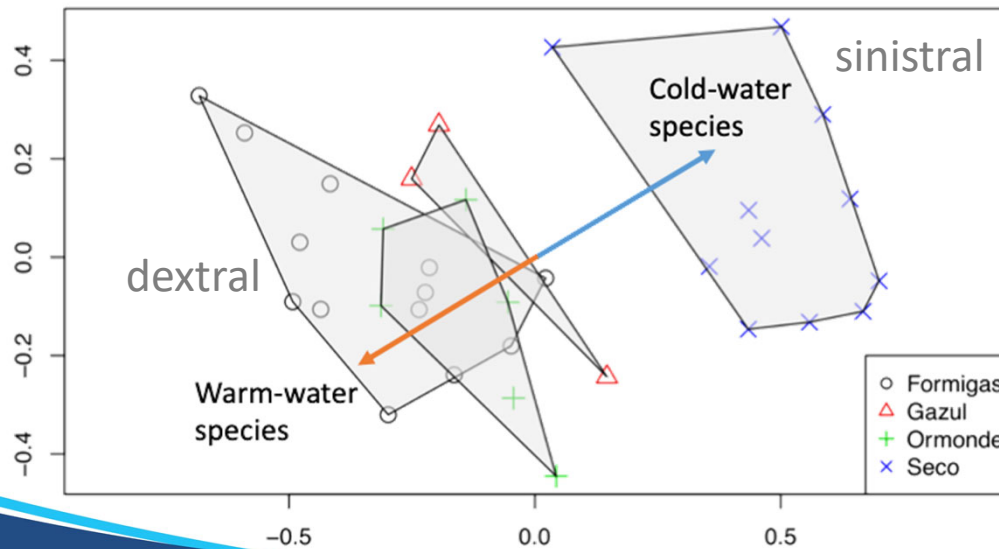


ABUNDANCE

FORAMINIFERA COMPOSITION

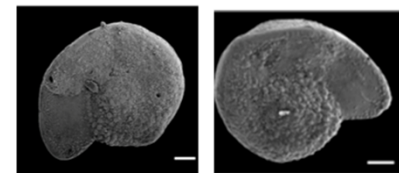


TROPICAL
SUBTROPICAL
TRANSITIONAL
SUBPOLAR
POLAR



Globotoralia truncatulinoides

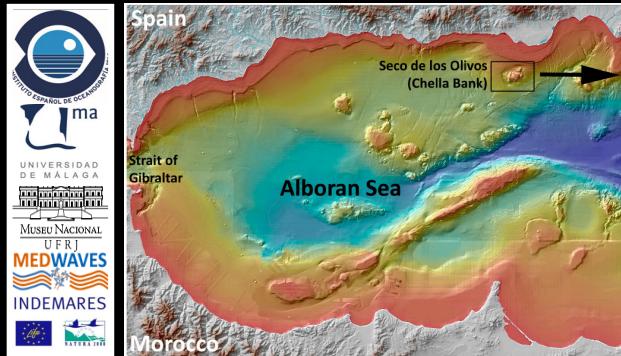
□ Dextral □ Sinistral



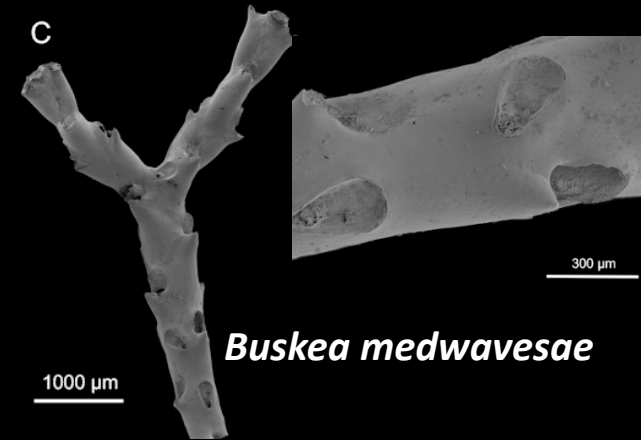
NEW RECORDS AND SPECIES



> 450 spp listed

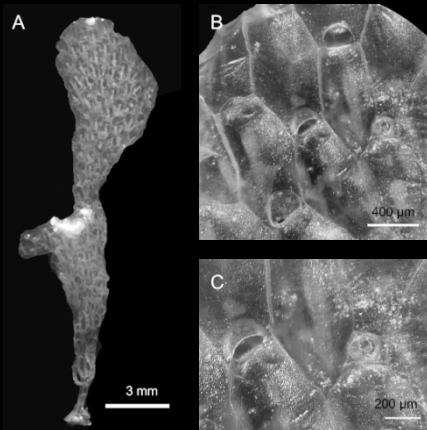


New species (ca. 4 spp.)

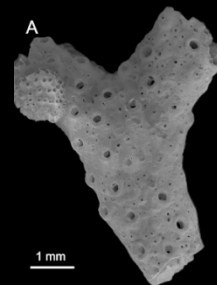


Buskea medwavesae

New records (ca. 8 spp.)



Terminoflustra barleei



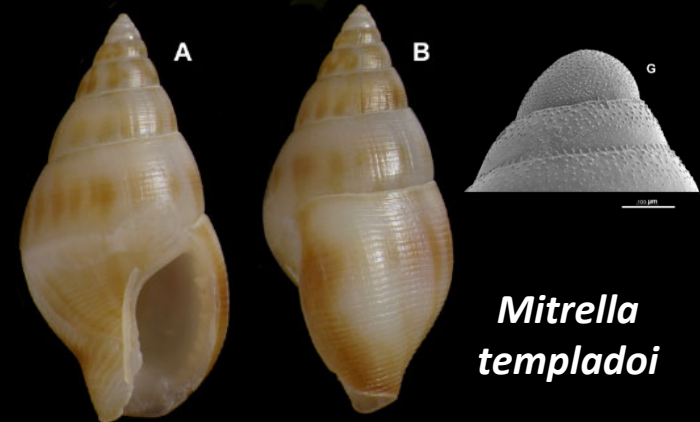
Marguetta pulchra



Veleropilina euglypta

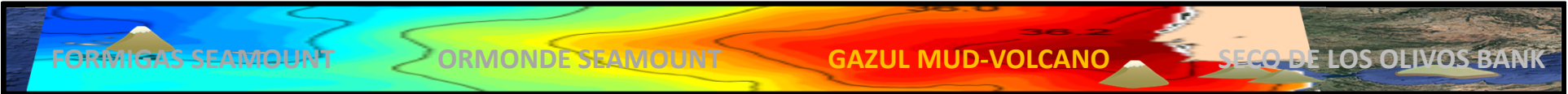


Anatoma micalii

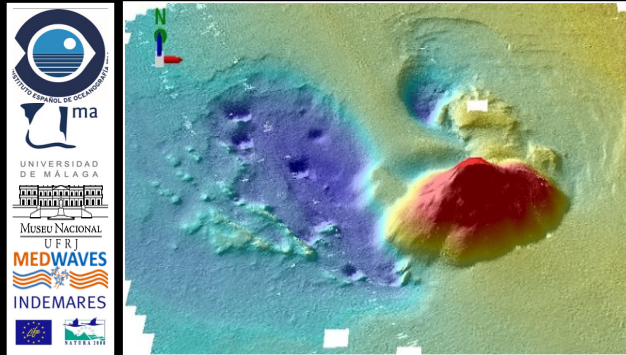


Mitrella templadoi

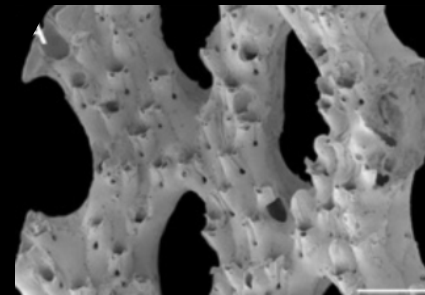
NEW RECORDS AND SPECIES



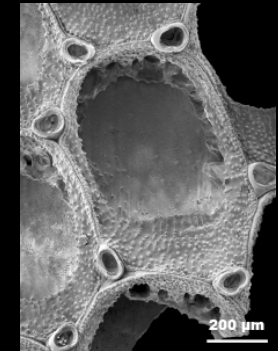
> 500 spp listed



New species (ca. 7 spp.)

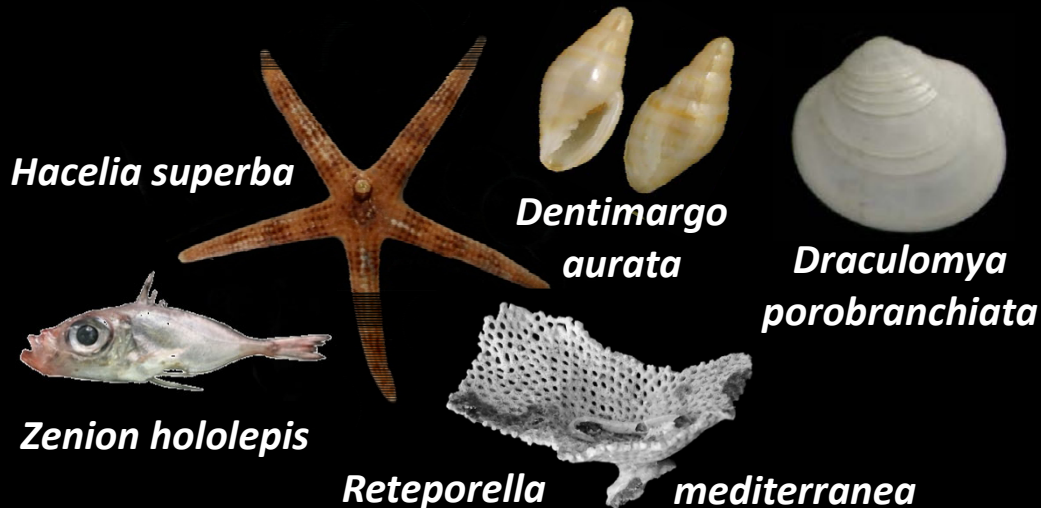


Reteporella victori



Antropora gemaritae

New records (ca. 10 spp.)



Hacelia superba

Dentimargo aurata

Draculomya porobranchiata

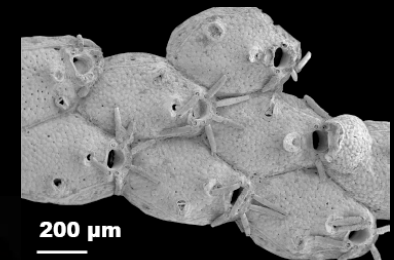
Zenion hololepis

Reteporella mediterranea



Ophiothrix sp. nov?

Microporella funbioae



Onoba goyoi



Cuspidaria atlasiana



Thank You



Special acknowledgements to

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Miguel Hernández (IEO) for managing in the kaos,
ATLAS coordination office for the moral,
institutional and economic support to get the IEO
team here!

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