LIFE BaĦAR for N2K – Interpretation of data & results

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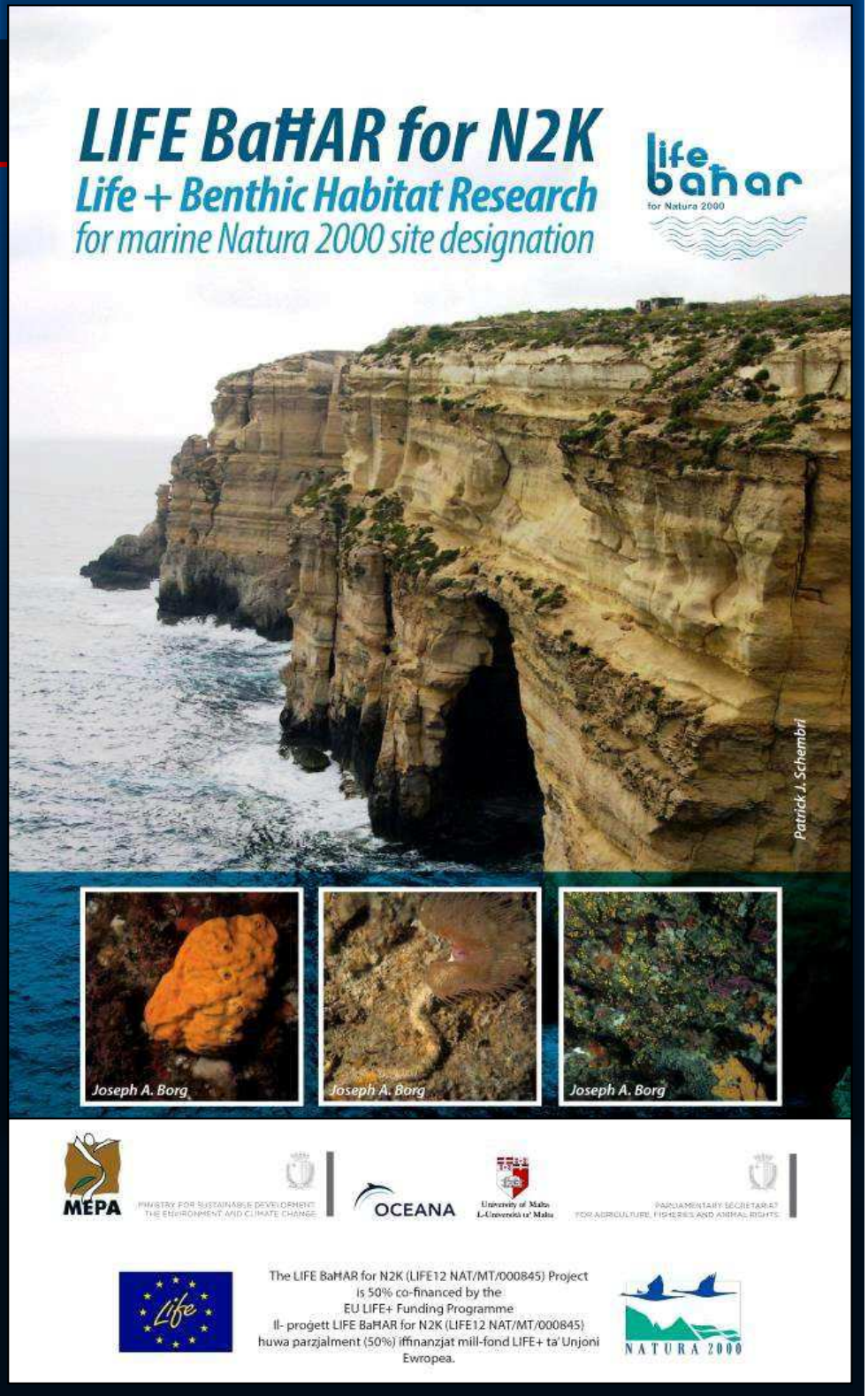
NATURA 2000

LIFE BaĦAR for N2K

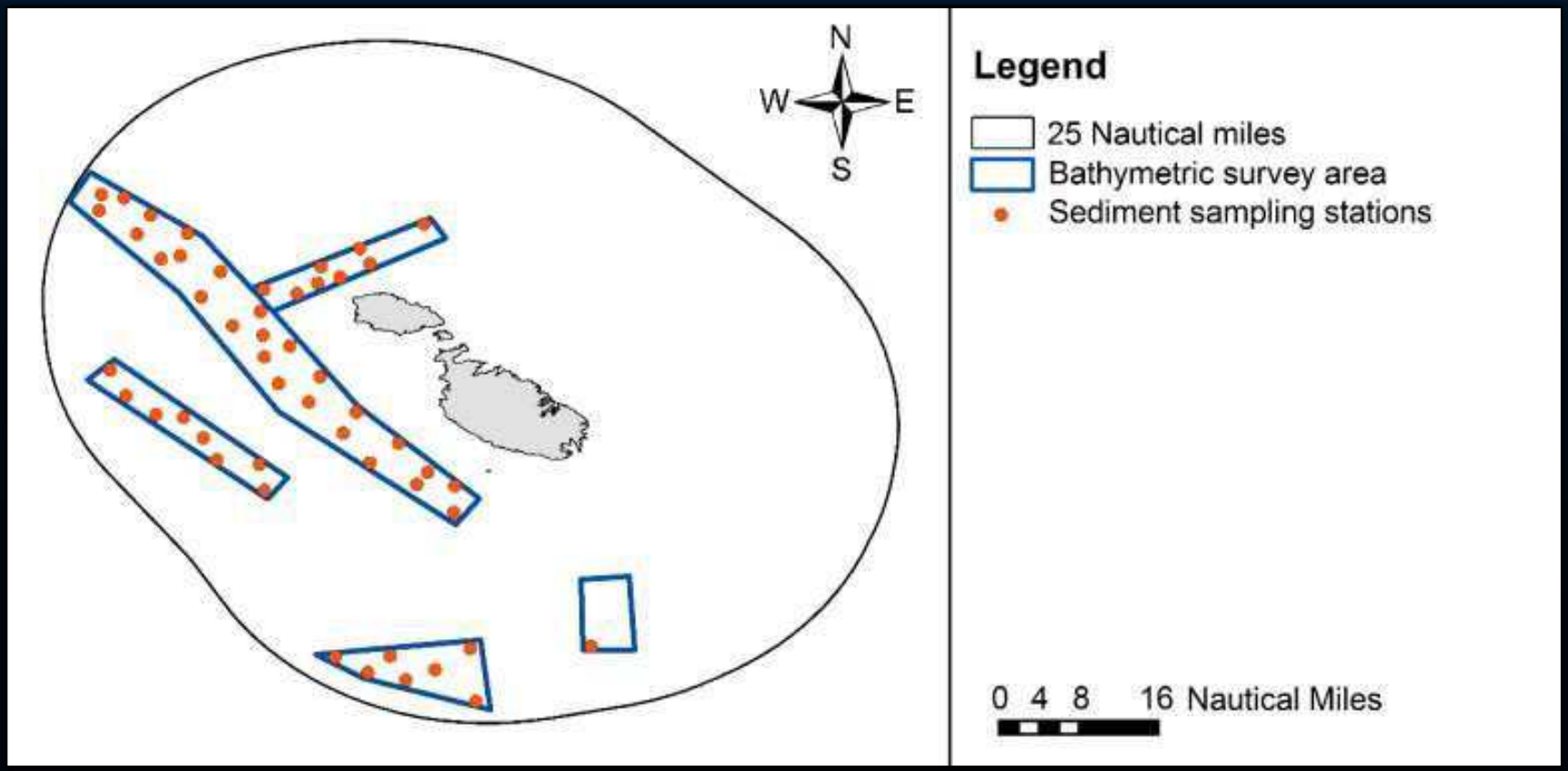
- Aims to support designation of marine NATURA 2000 sites
- Research focus:
  - Sandbanks
  - Marine caves
  - Reefs
- Three phases:
  - Initial data collection
  - 2015 marine surveys
  - 2016 marine surveys



LIFE BaĦAR for N2K poster

LIFE BaHAR Surveys: 2015 & 2016

- 206 ROV dives (197 offshore; 9 coastal)
- 42 SCUBA dives
- Multibeam Echosounder and Sediments Survey



Sandbanks

- "*elevated, elongated, rounded or irregular topographic features, permanently submerged and predominantly surrounded by deeper water… above a sandbank the water depth is seldom more than 20 m*" [EU Habitat Interpretation Manual]

Sandbanks

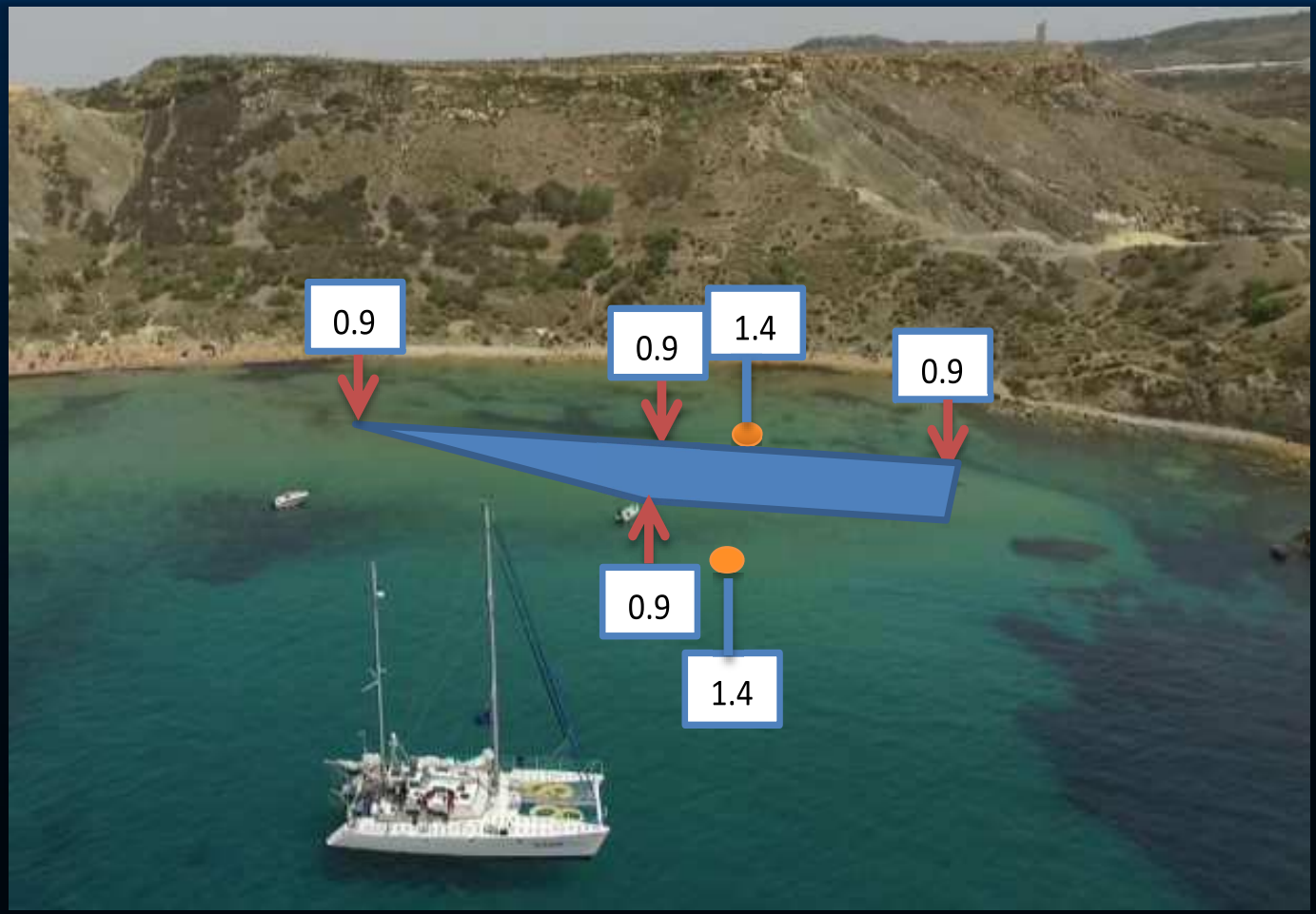
- Elevated sandy features are rare in Maltese Islands
- Three sandy elevations were documented and measured
- All present in very shallow waters and only had small elevations compared to the surrounding seabed:
  - Mellieħa Bay: 0.2 – 0.7 m depth
  - Blue Lagoon: 0.9 – 1.0 m depth
  - Għajn Tuffieħa: 0.9 – 1.4 m depth
- Elevations took the form of a ridge of sand raised above the adjacent sandy bottom, parallel to the beach shoreline

Sandbanks

- Example: Għajn Tuffieħa Bay

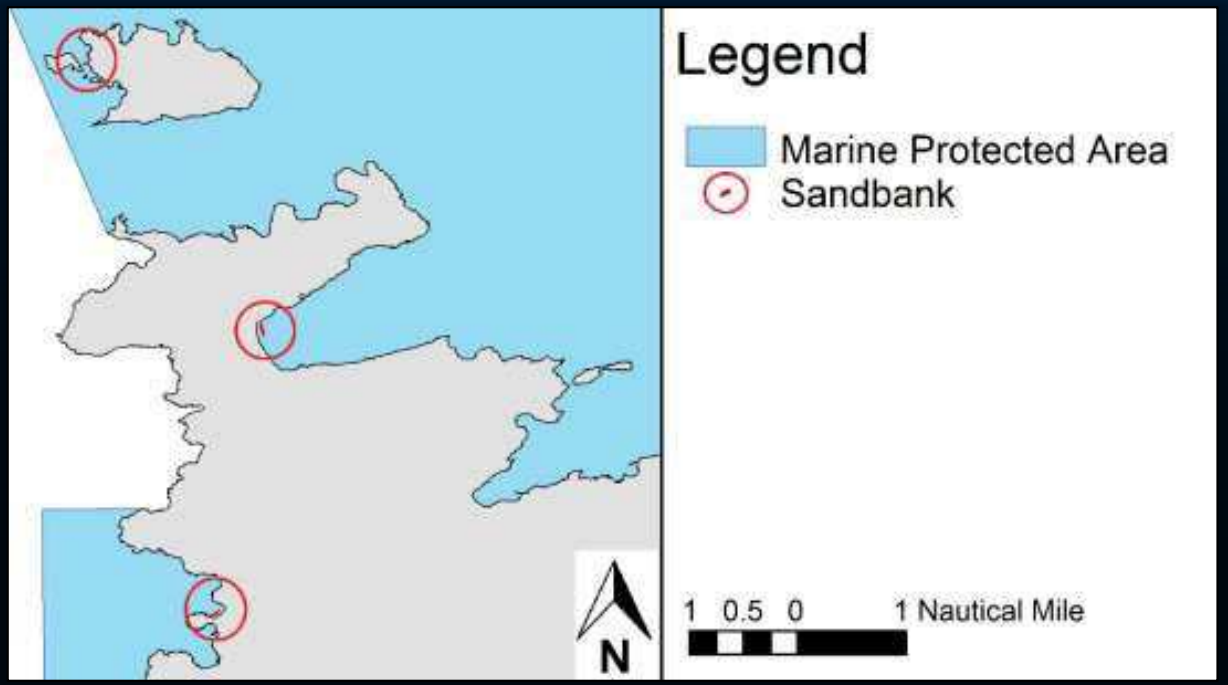
Measurements

- Depth: 0.9 - 1.4 m
- Length: 90 m
- Width: 7.5 m



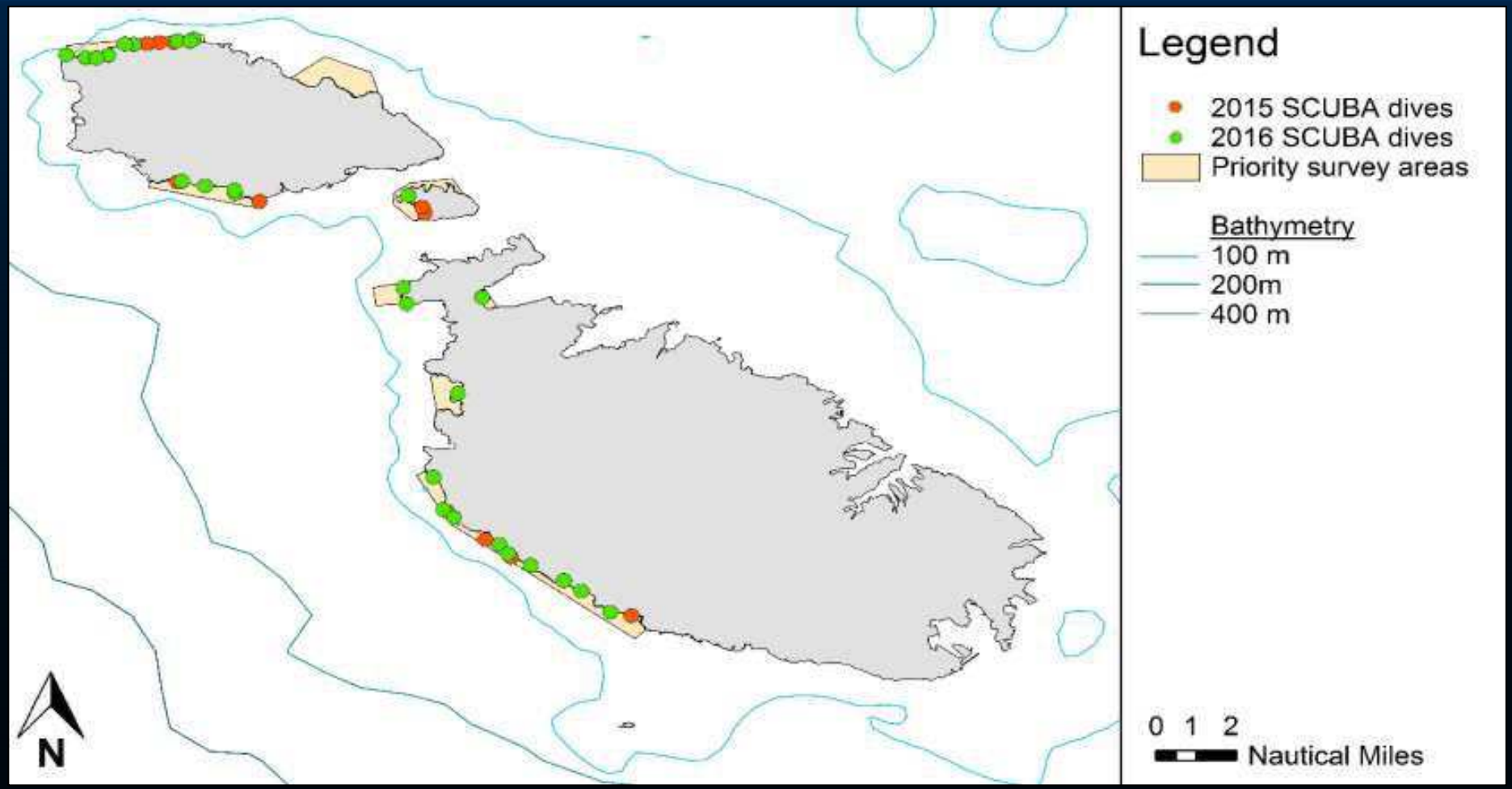
Sandbanks

- No submerged vegetation present, confirming that "*on many sandbanks macrophytes do not occur*" [EU Habitat Interpretation Manual]
- No data on the processes forming and maintaining the sandy elevations available, so it is not possible to conclude if these are 'sandbanks' in the geomorphological sense
- Areas where sandy elevations were present were all located in existing MPAs



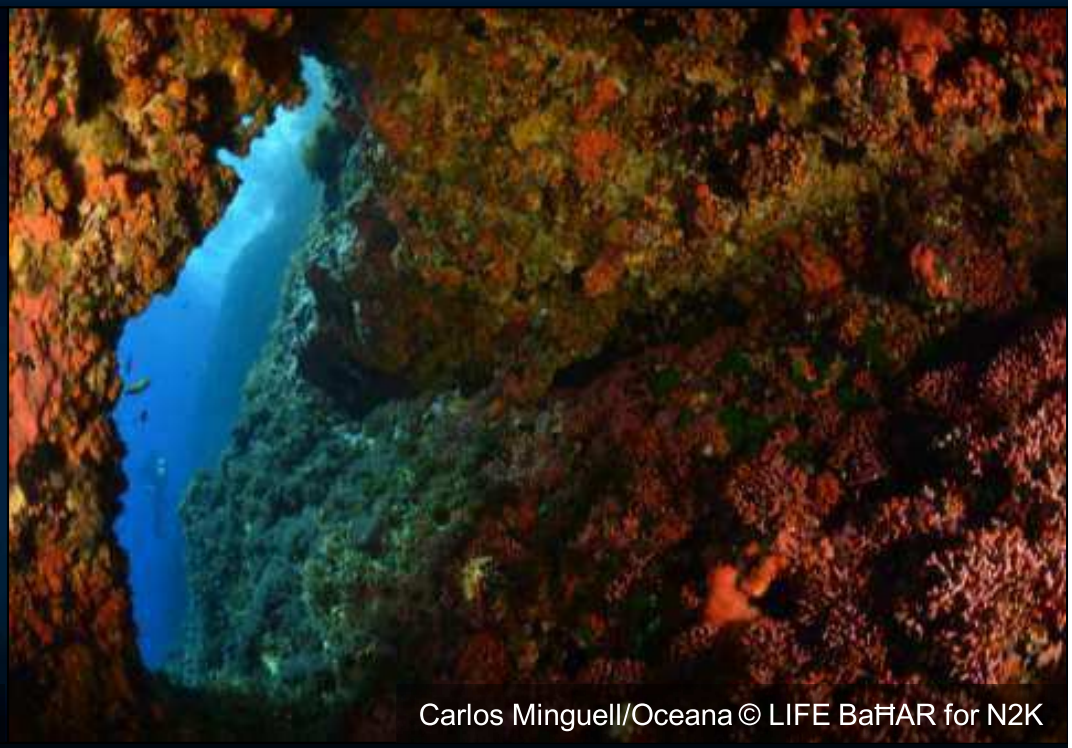
Coastal Marine Caves

- 37 SCUBA dives in 2015 & 2016, plus stakeholder involvement



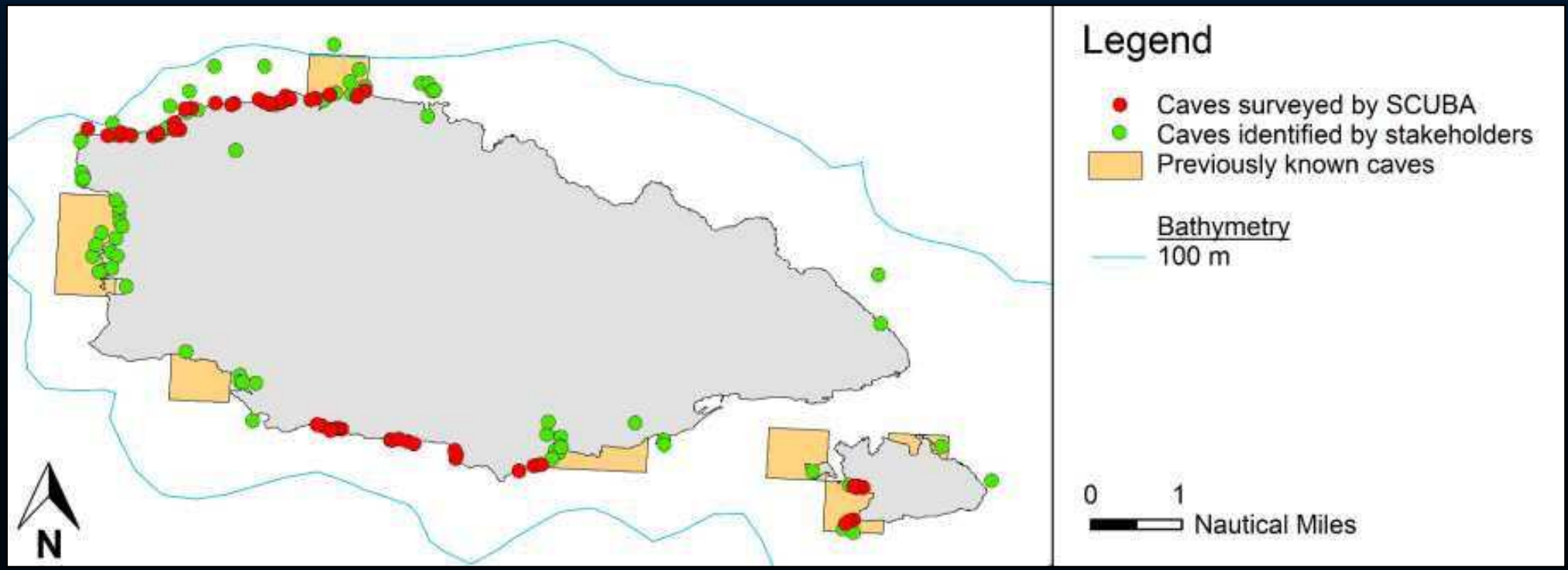
Coastal Marine Caves

- A total of 89 caves were surveyed (36 in 2015 / 53 in 2016)
- Of the surveyed caves 37 were ‘emergent’ caves
- Depths where caves were located varied from 0 to 40 m
- Caves of various morphologies and dimensions were recorded



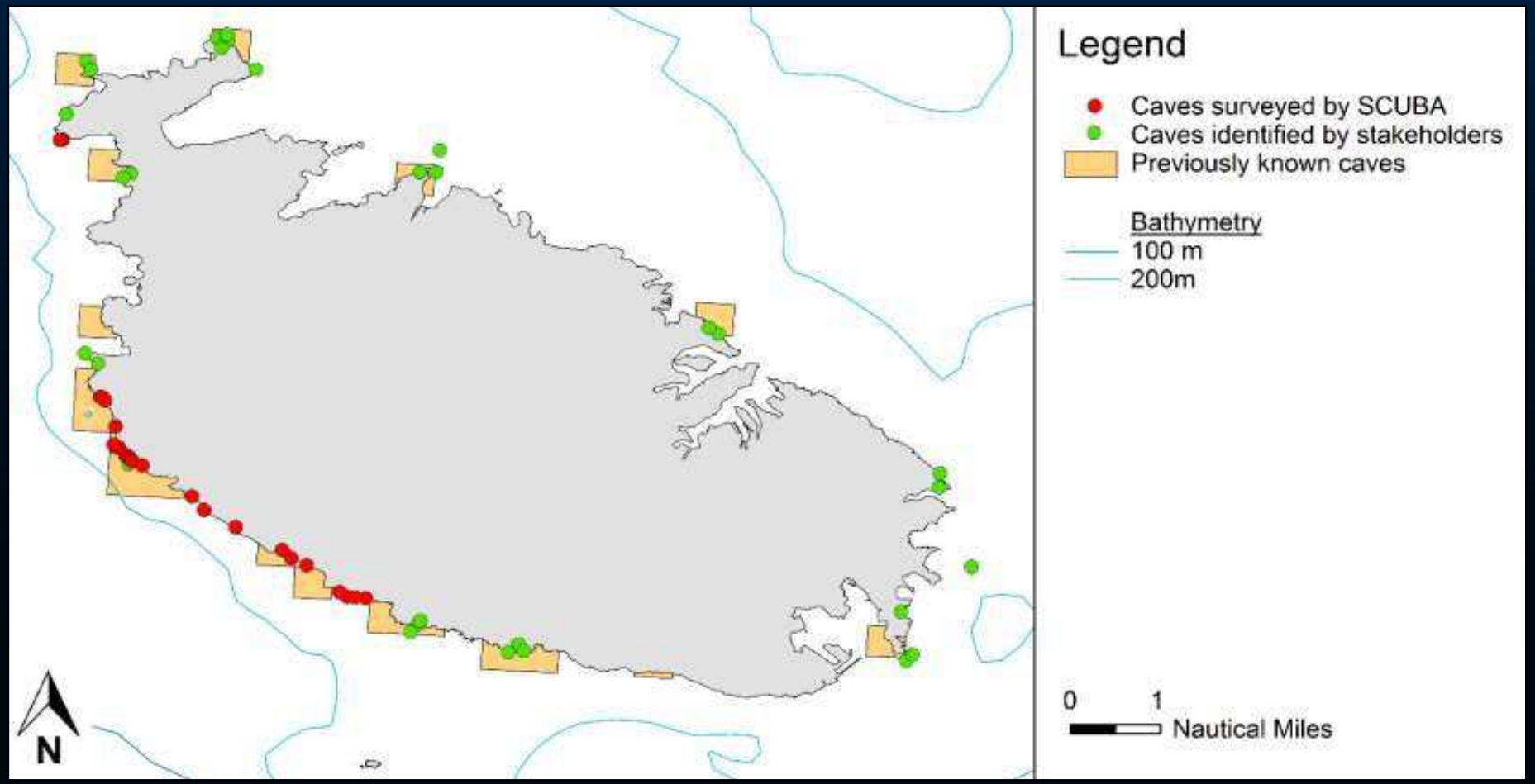
Coastal Marine Caves – Gozo & Comino

- Highest densities of caves were recorded off north-west and southern coast of Gozo
- Small, inaccessible fissures as well as very large caves
- Stakeholder surveys revealed high density of caves at Dwejra



Coastal Marine Caves – Malta

- Steep escarpment to app. 40 m depth along south-western coast
- Small, inaccessible as well as large caves located in escarpment



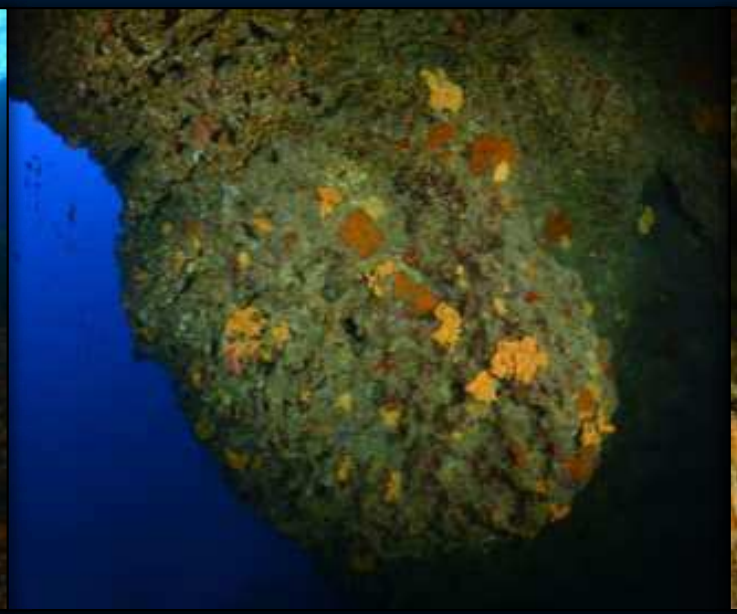
Coastal Marine Caves – Biota

- Biotic communities varied depending on:
  - Size and structure of caves
  - Exposure to waves, currents, sediment scour

Coastal Marine Caves – Biota

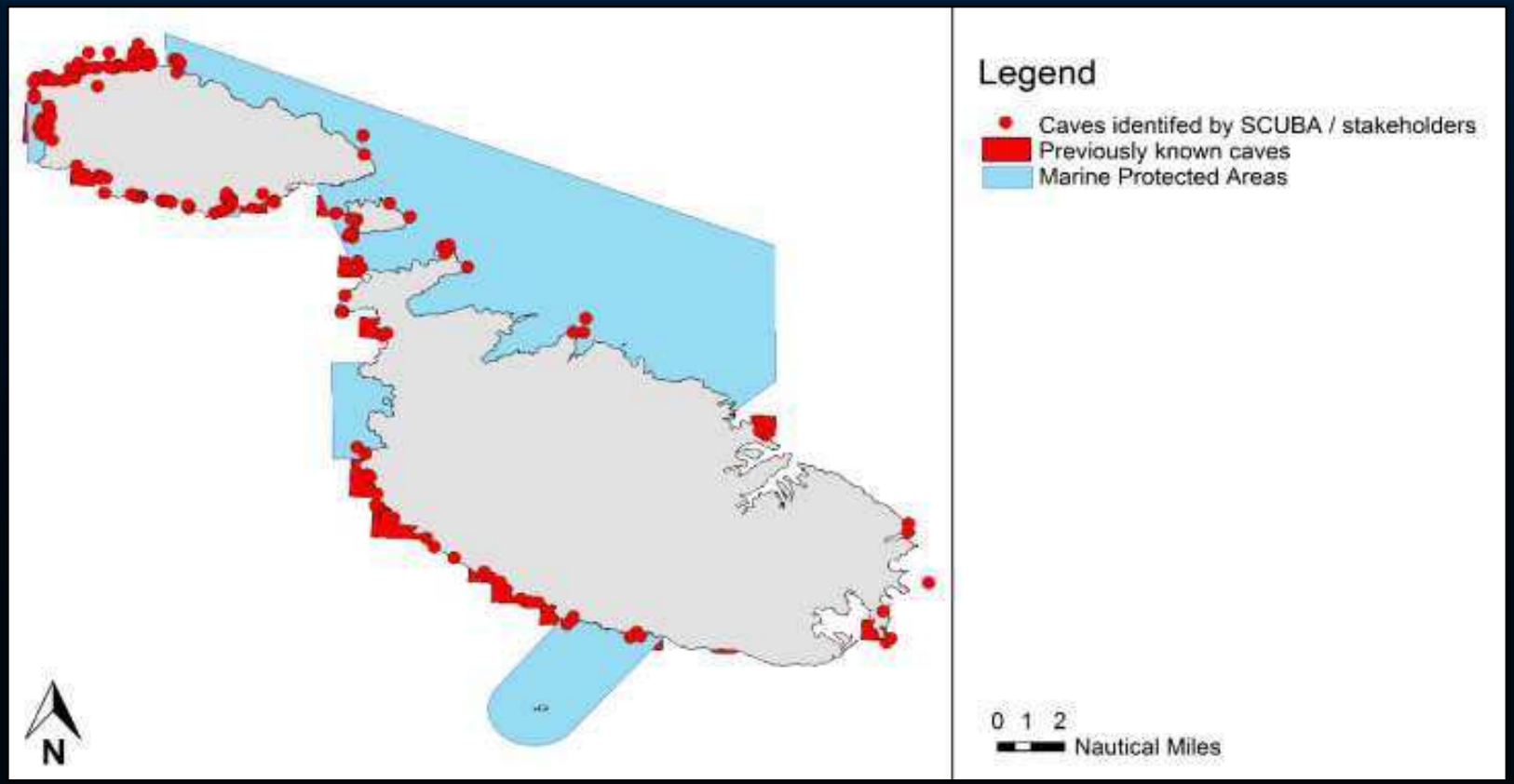
- Three main zones found in larger caves:

1. Outer section where light penetrates - growth of photophilic algae at the mouth / progressively more sciaphilic inwards
2. Middle section - sessile invertebrates
3. Dark inner section largely devoid of sessile organisms.



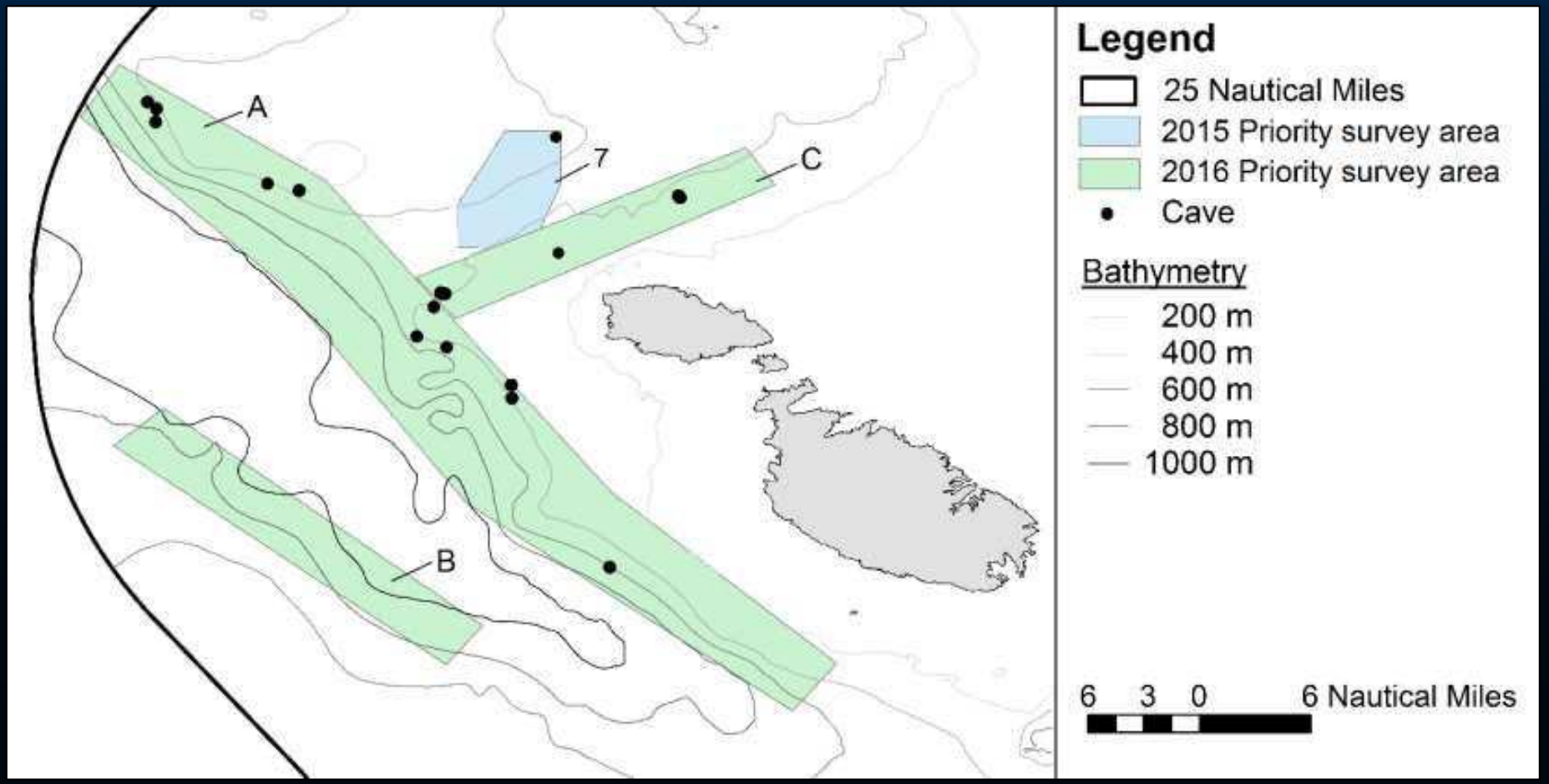
Marine Caves – Location of MPAs

- Several caves were new discoveries and previously unknown
- In particular no records exist of the smaller caves which are less accessible to SCUBA divers
- Many marine caves lie outside existing MPAs



Deep-Water Caves

- During ROV dives deep-water caves were located to the W & NW of the Maltese Islands



Deep-Water Caves

- Most caves located at depths of 250-450 m
- Caves varied in shape and size, overhangs often found nearby
- Largest deep-water cave was found at 438 m
- Deepest record was 795 m
- Caves possibly date back to the Messinian period

Deep-Water Caves – Biota

- Caves were found to harbour diverse communities of sessile & mobile invertebrates, as well as several species of fish

Reefs in Coastal Areas

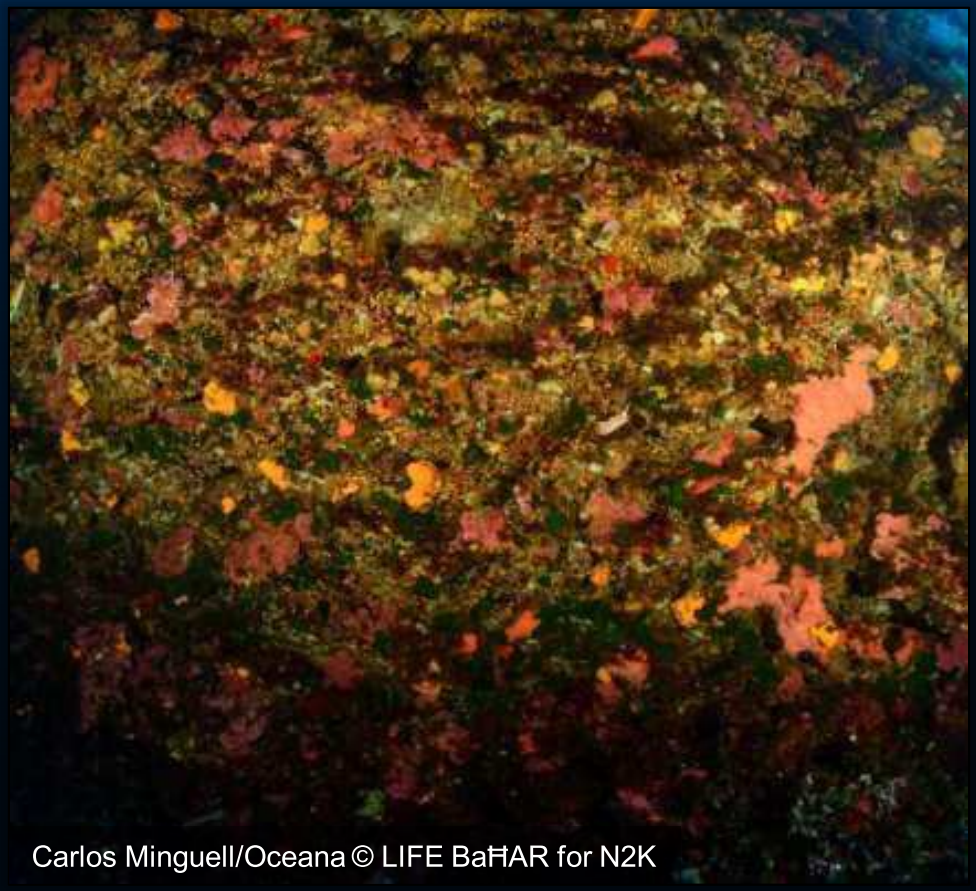
- Underwater cliff faces & escarpments surveyed via SCUBA diving
- Locations of reefs in coastal areas are well known, so surveying inshore reefs was not a priority

Carlos Minguell/Oceana © LIFE BaĦAR for N2K

Carlos Minguell/Oceana © LIFE BaĦAR for N2K

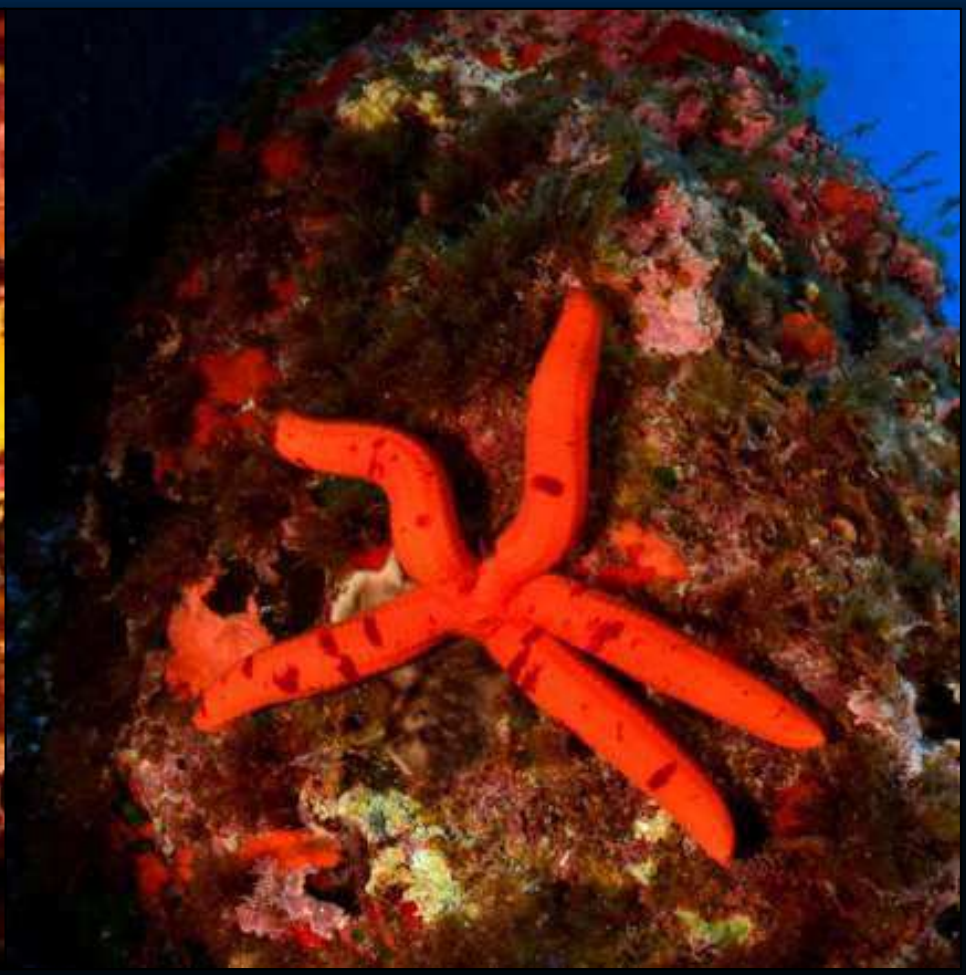
Reefs in Coastal Areas – Biota

- Well-lit upper areas: Photophilic (‘light-loving’) brown algae
- Deeper areas & under overhangs: Sciaphilic (‘shade-loving’) green & red algae and corals, bryozoans, serpulids & sponges



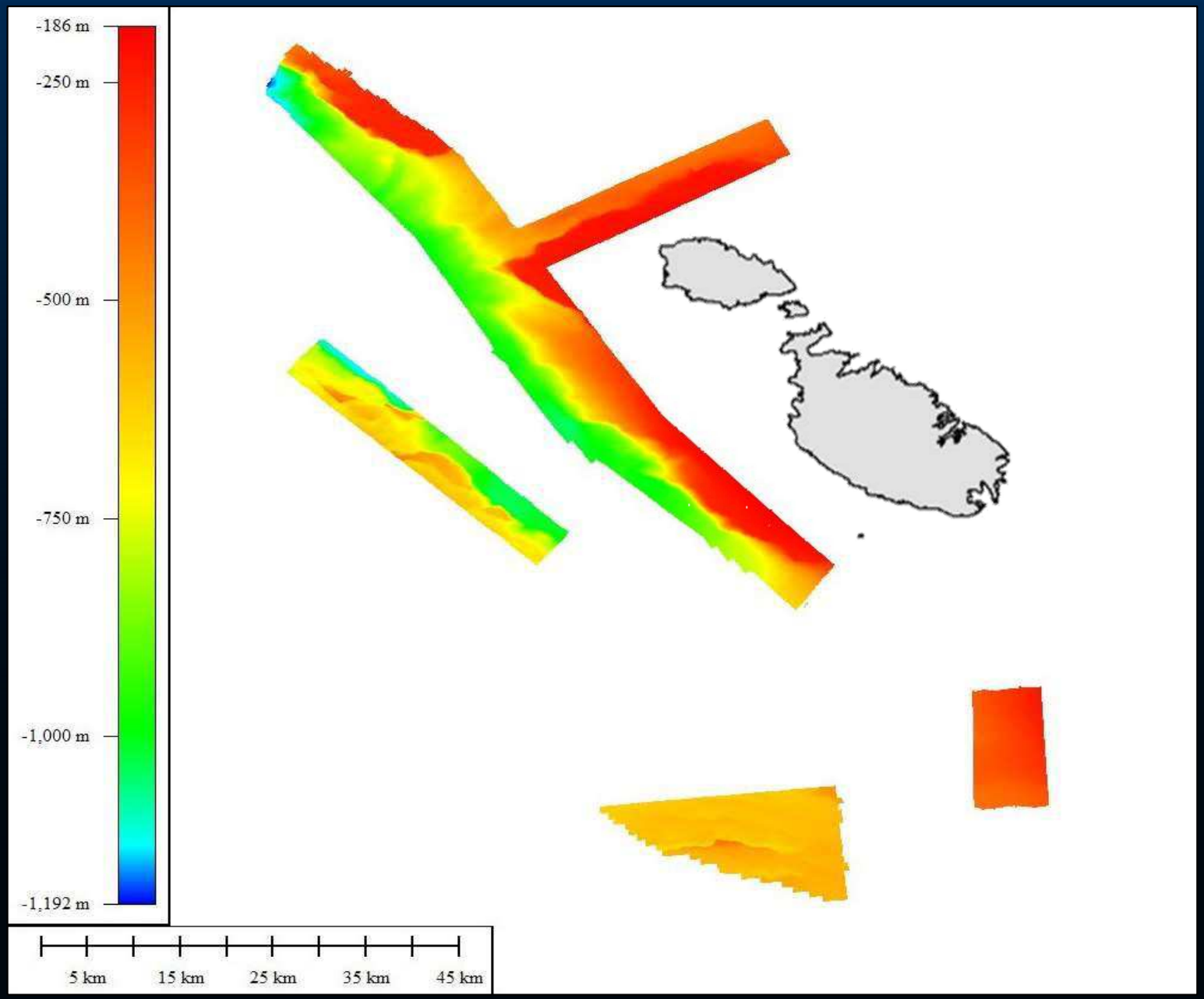
Reefs in Coastal Areas – Biota

- Typical shallow-water rocky bottom assemblages
- Include species of conservation interest

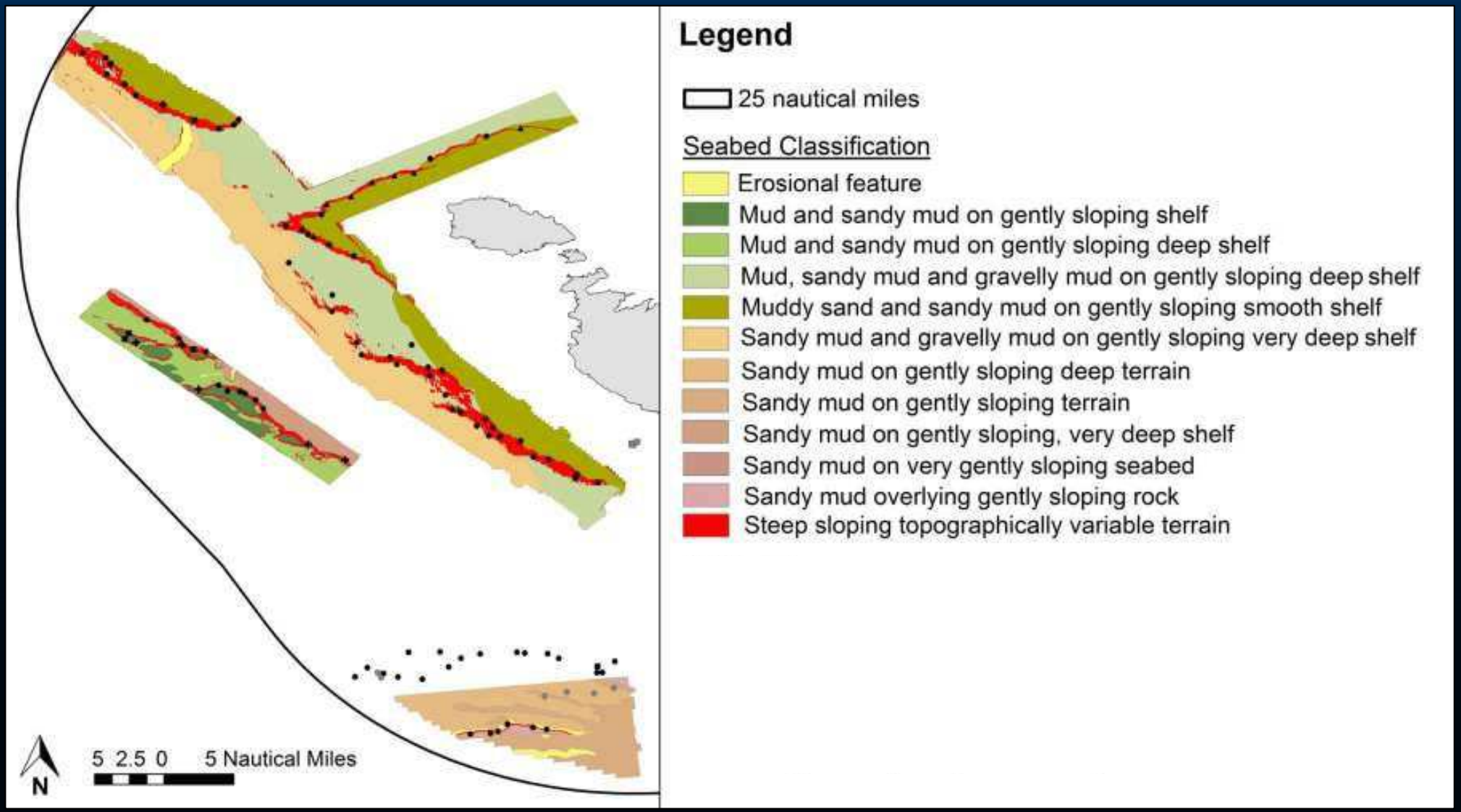


Carlos Minguell/Oceana © LIFE BaHAR for N2K

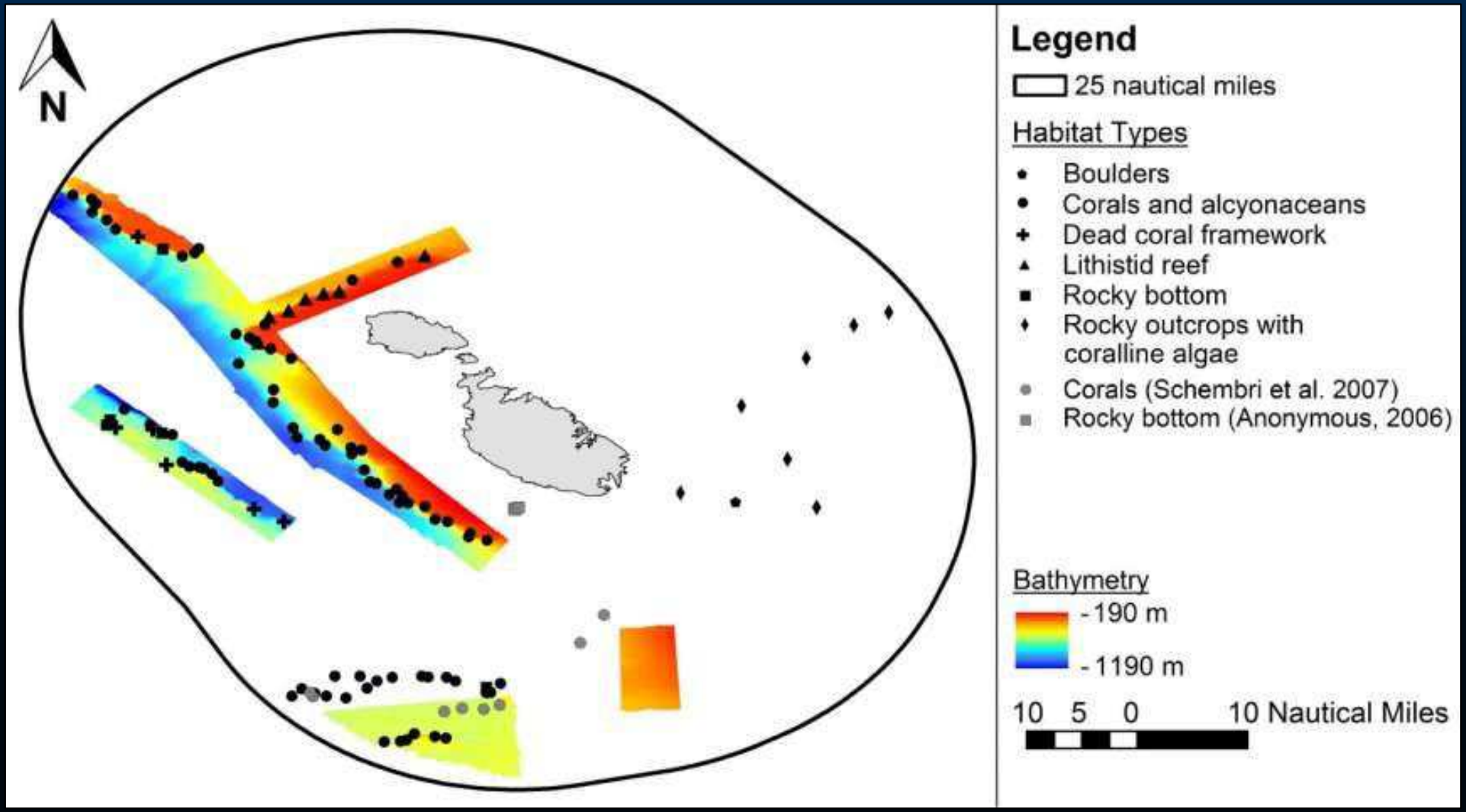
Offshore Reefs – Multibeam Survey



Offshore Reefs – Multibeam Survey

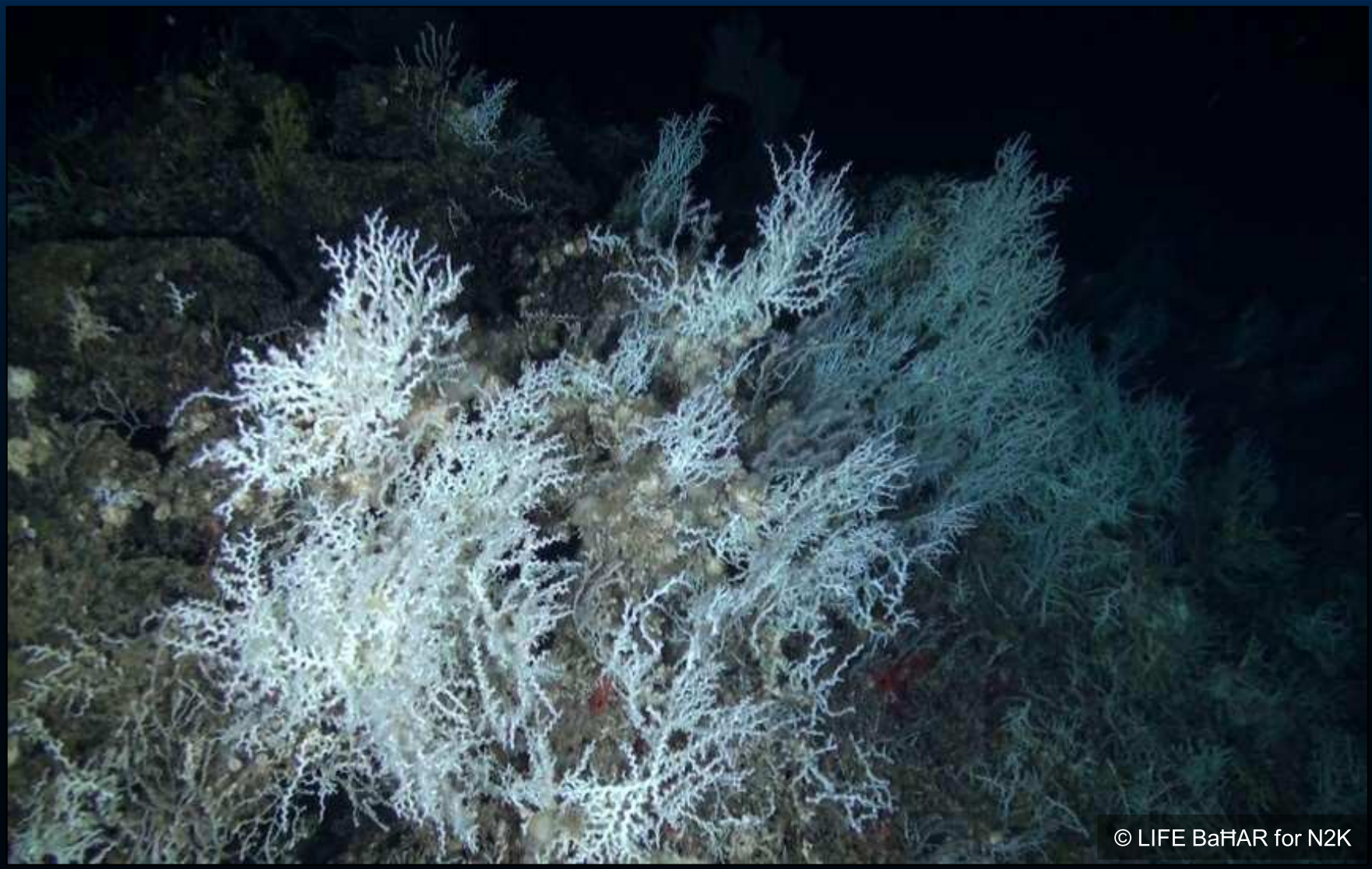


Offshore Reefs – Types of Reefs Located



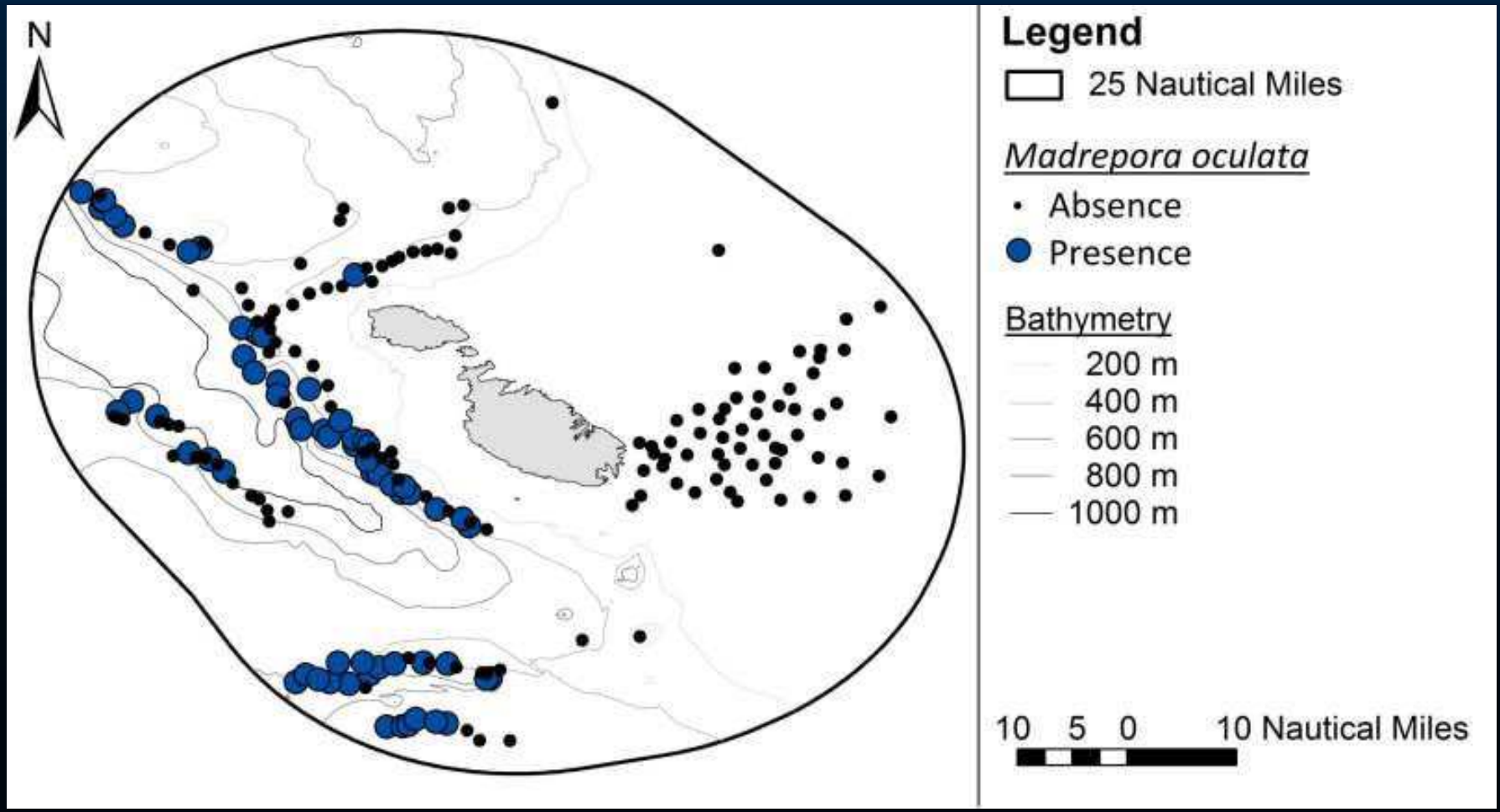
Cnidarian Reefs – Habitat Forming Species

- *Madrepora oculata*



Cnidarian Reefs – Habitat Forming Species

- *Madrepora oculata*
  - Location of sightings



Cnidarian Reefs – Habitat Forming Species

- *Leiopathes glaberrima*

Cnidarian Reefs – Habitat Forming Species

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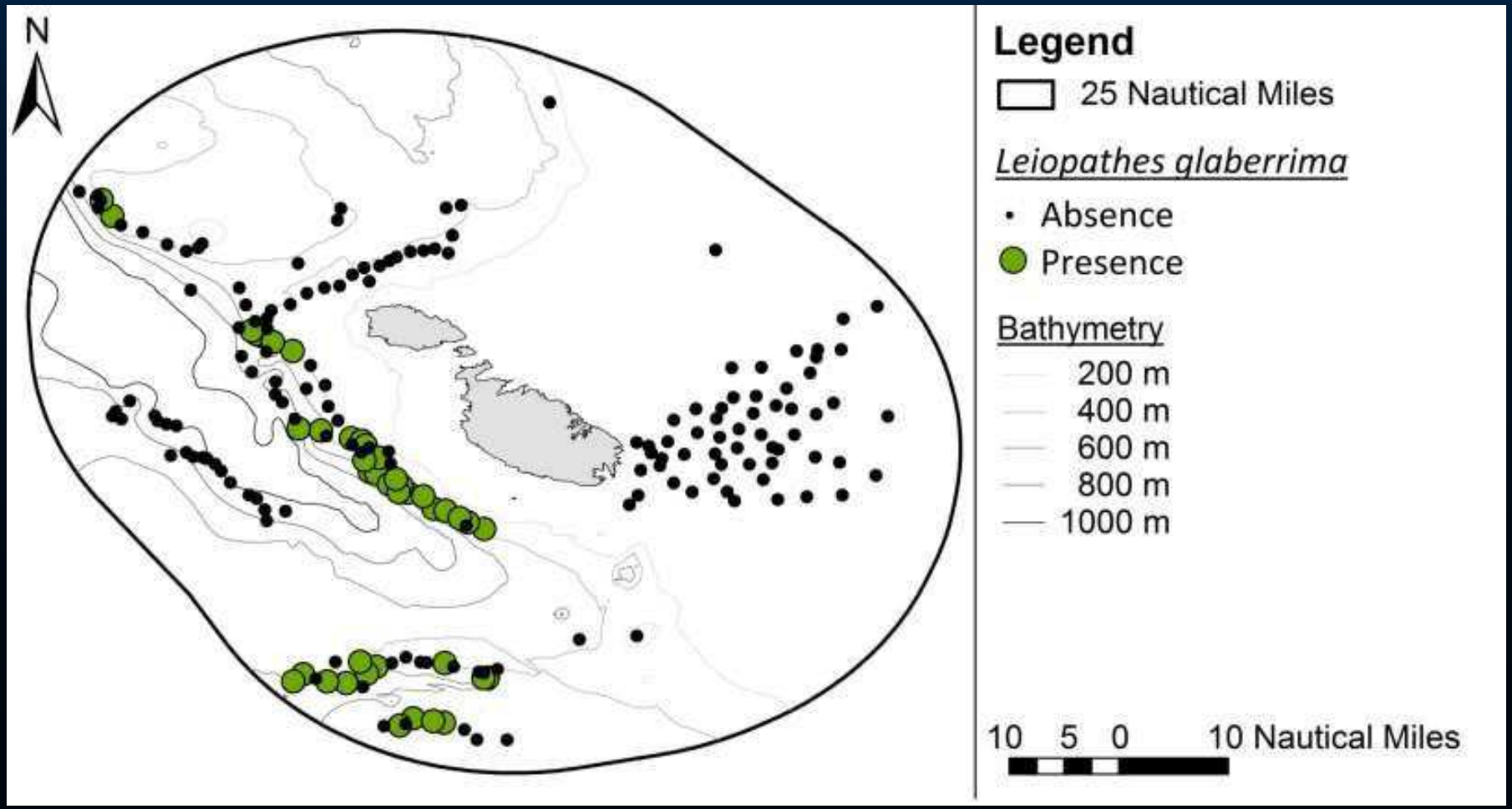
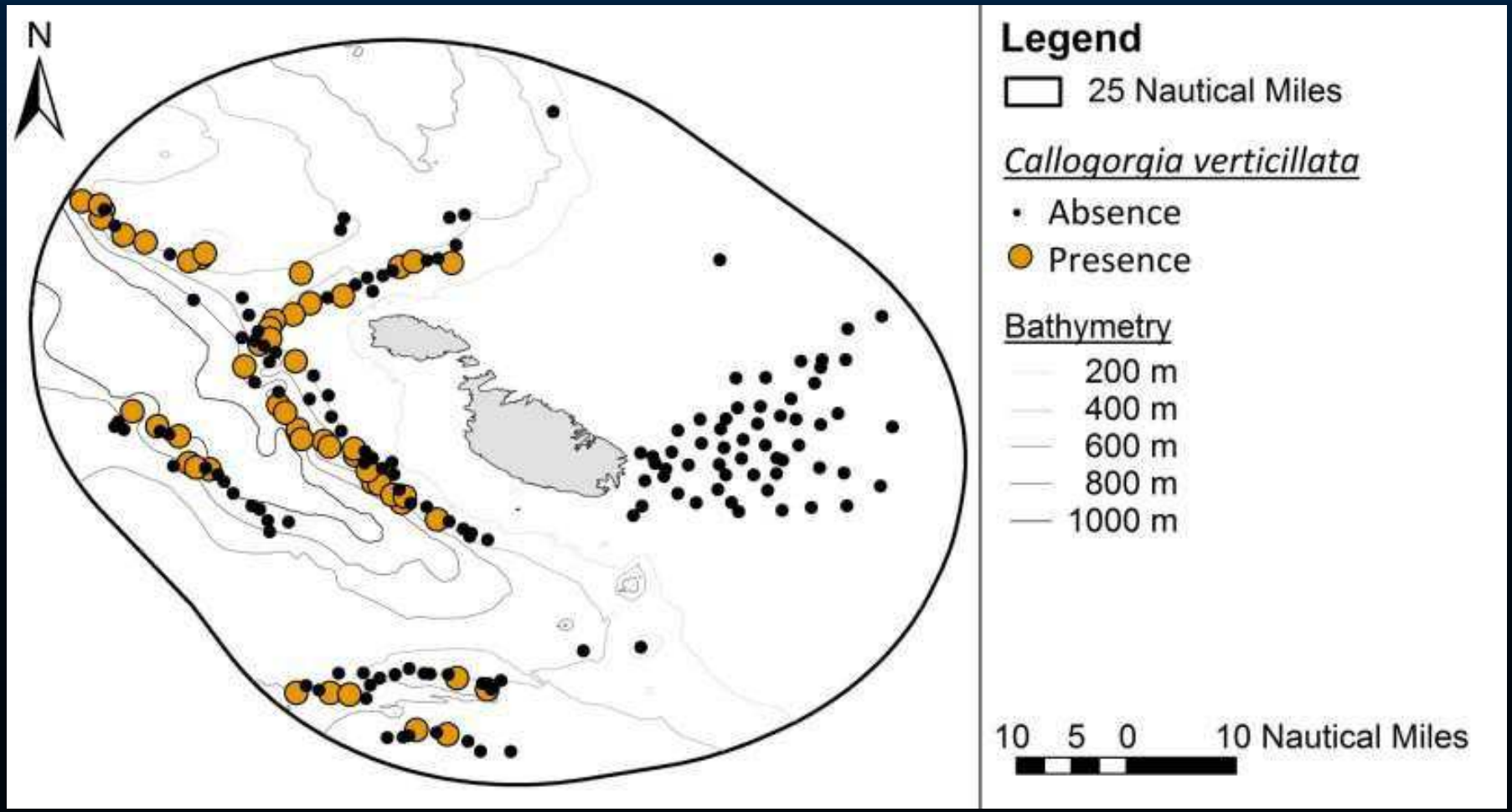


Cnidarian Reefs – Habitat Forming Species

- *Callogorgia verticiallata*

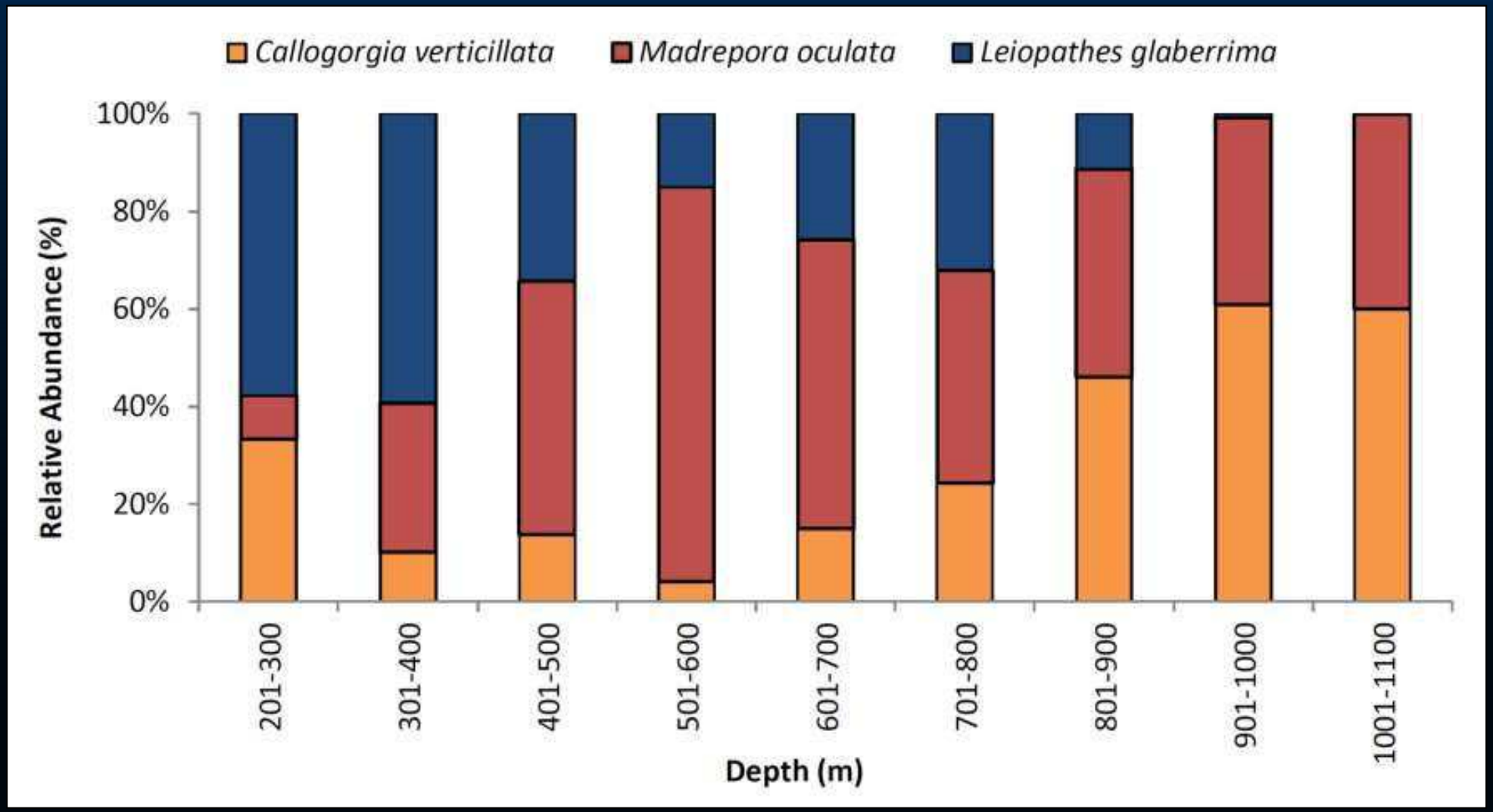
Cnidarian Reefs – Habitat Forming Species

- *Callogorgia verticiallata*
  - Location of sightings

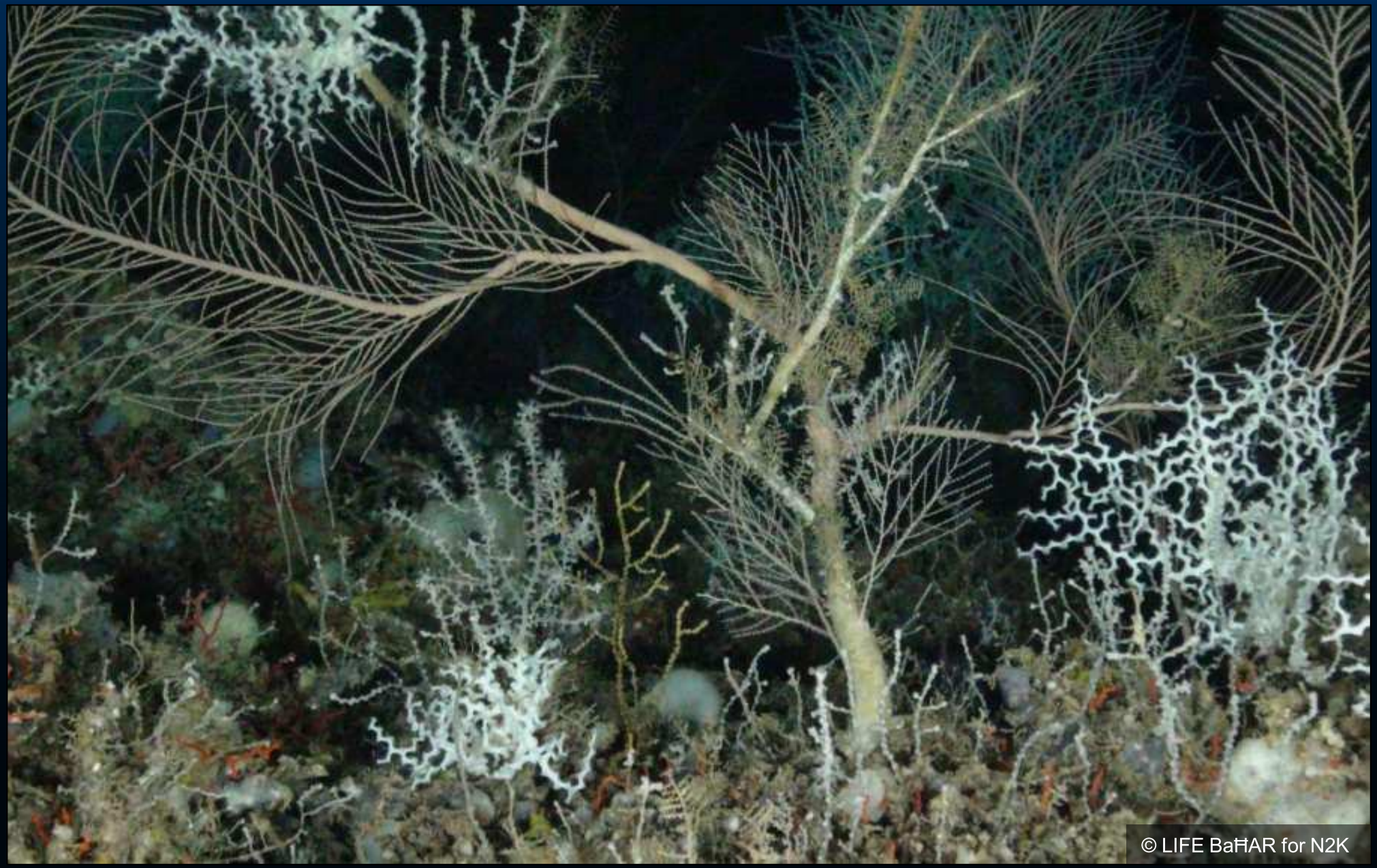


Cnidarian Reefs – Habitat Forming Species

- Vertical stratification identified for main habitat-forming species



Cnidarian Reefs – Other Habitat Formers

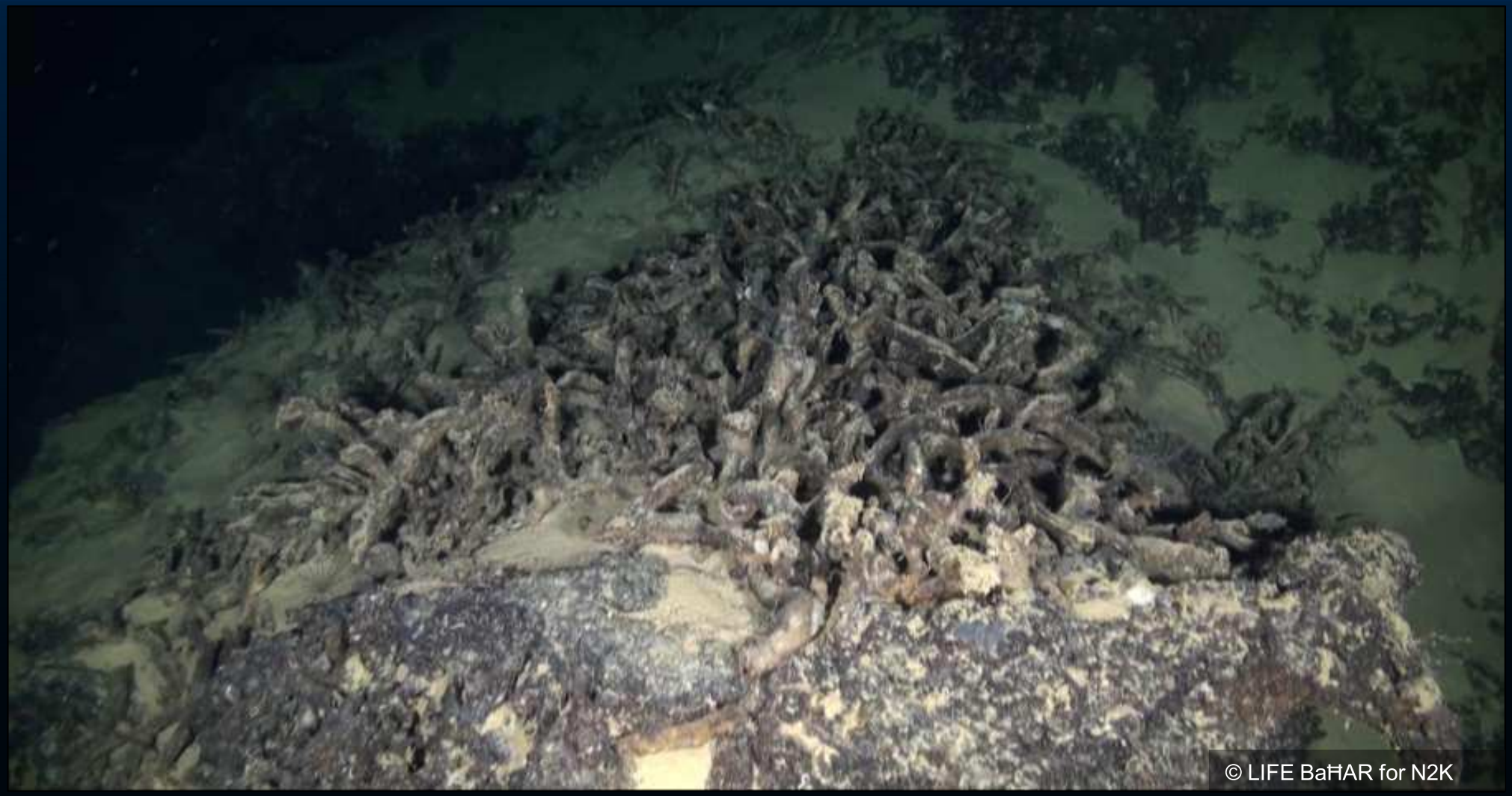


Cnidarian Reefs – Associated Biota

- High diversity of associated fauna: over 200 species observed

Dead Coral Frameworks

- Areas with extensive dead coral frameworks also discovered west of Gozo and on west side of the Malta Graben



Lithistid Sponge Reef

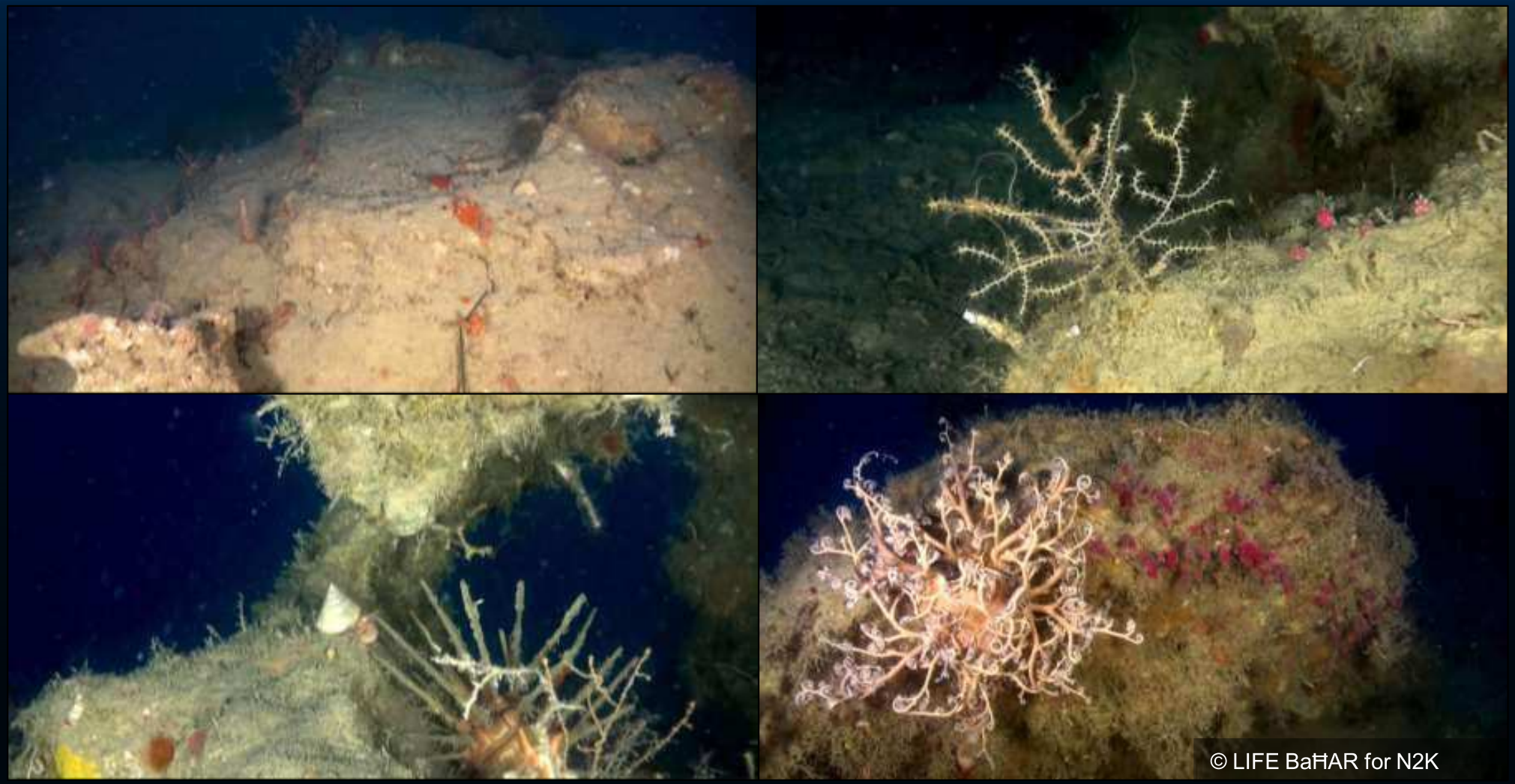
- Dead (fossilised) stony sponge reef found north of Gozo

Lithistid Sponge Reef – Biota

- Fossil reef provides habitat for several species

Offshore Reefs in Shallow water (< 150m)

- Shallow areas southeast of Malta included a few areas with rocky outcrops forming small reefs



Other Habitats – Soft Muddy Bottoms

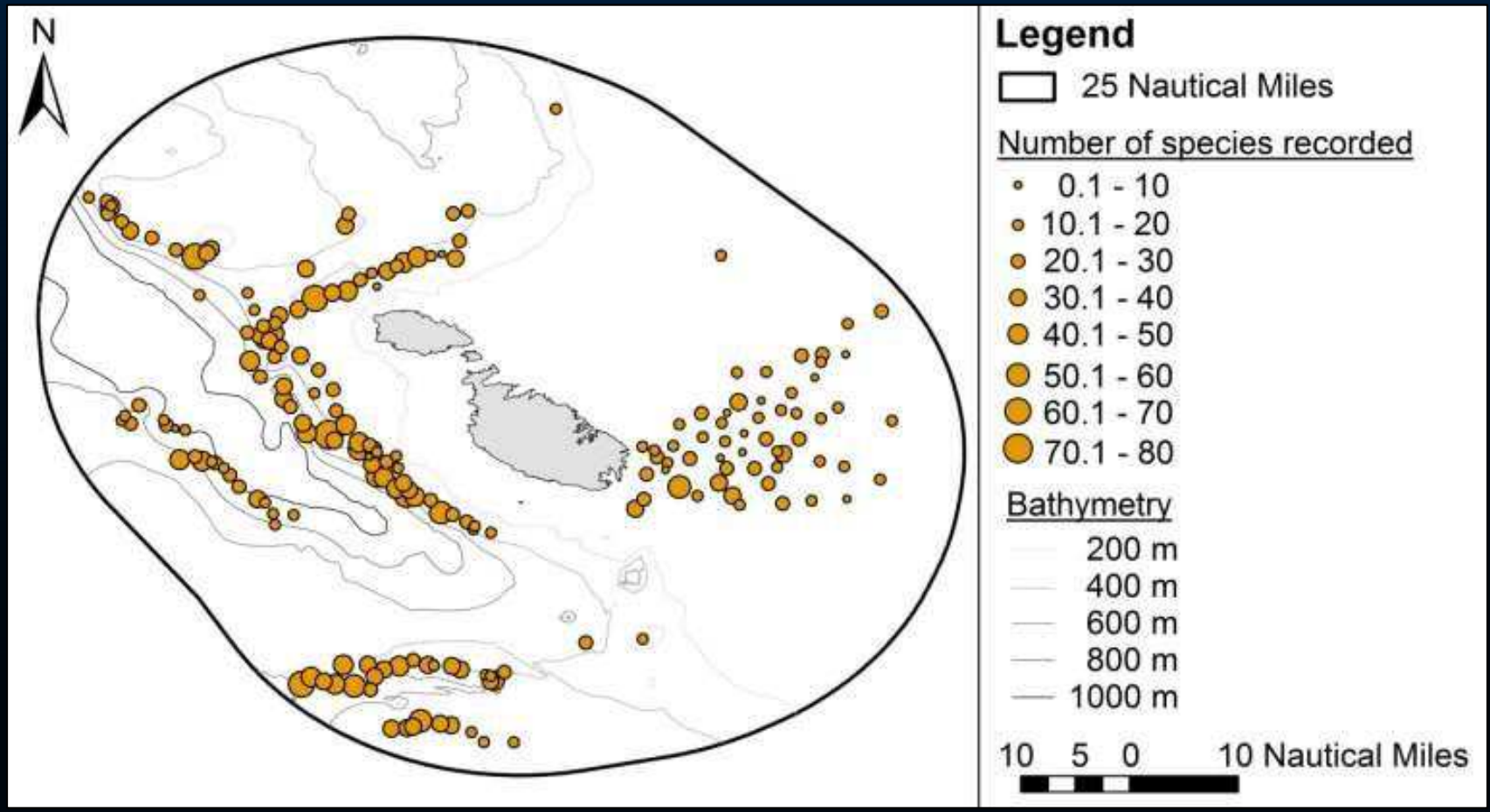
- Some areas lacked reefs, were characterized by muddy bottoms
- Included bamboo coral, sea pens, sea urchins and lobsters

Other habitats – Rhodolith beds

- Shallow areas southeast of Malta also included rhodolith beds

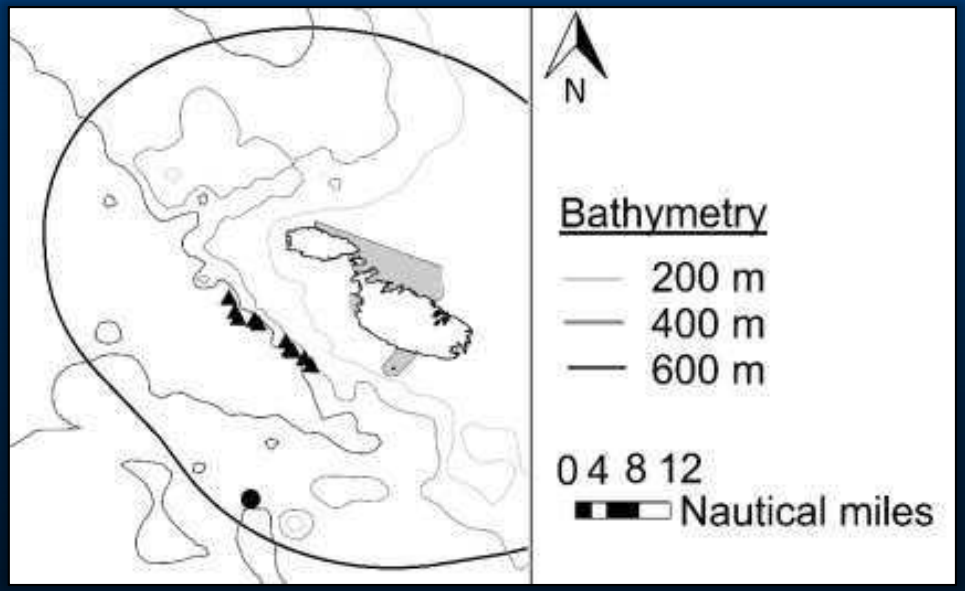
Offshore Habitats – Number of Species

- Cnidarian-dominated communities on escarpments and lithistid reef had most diverse faunal assemblages
- Lower diversity on dead coral frameworks and soft bottoms



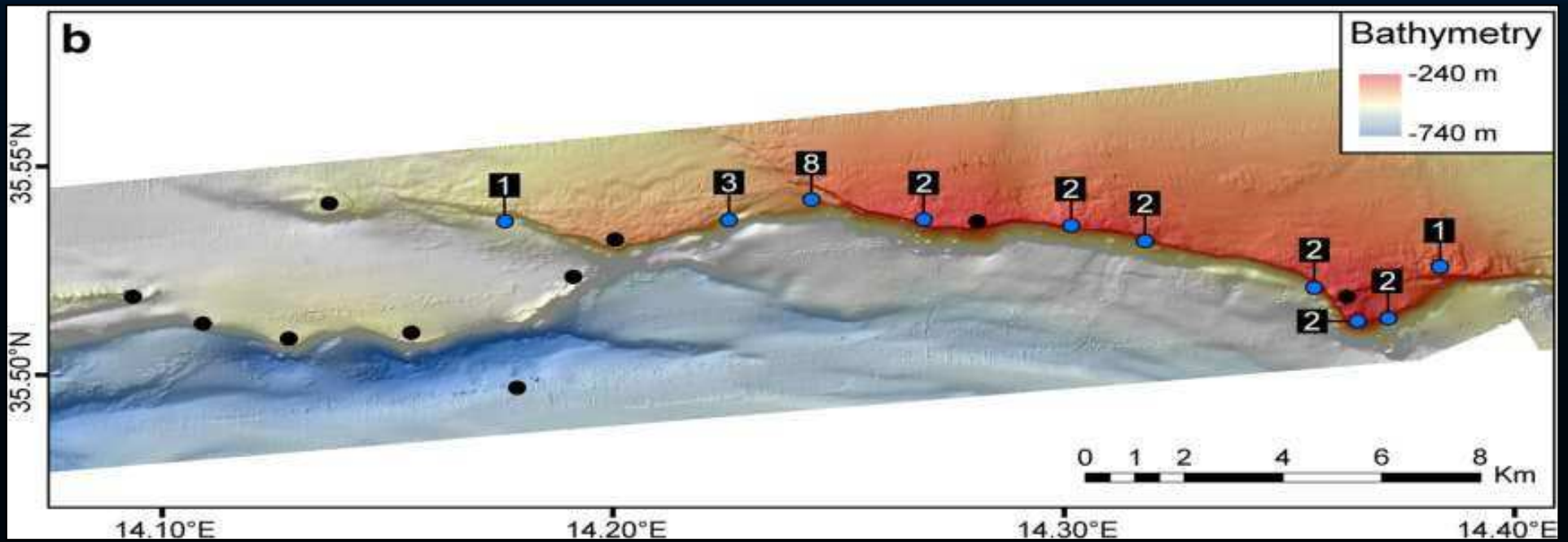
Red Coral Depth Record

- Numerous colonies growing deeper than 800 m recorded
- Maximum observed depth was 1016 m
- Colonies were part of diverse community

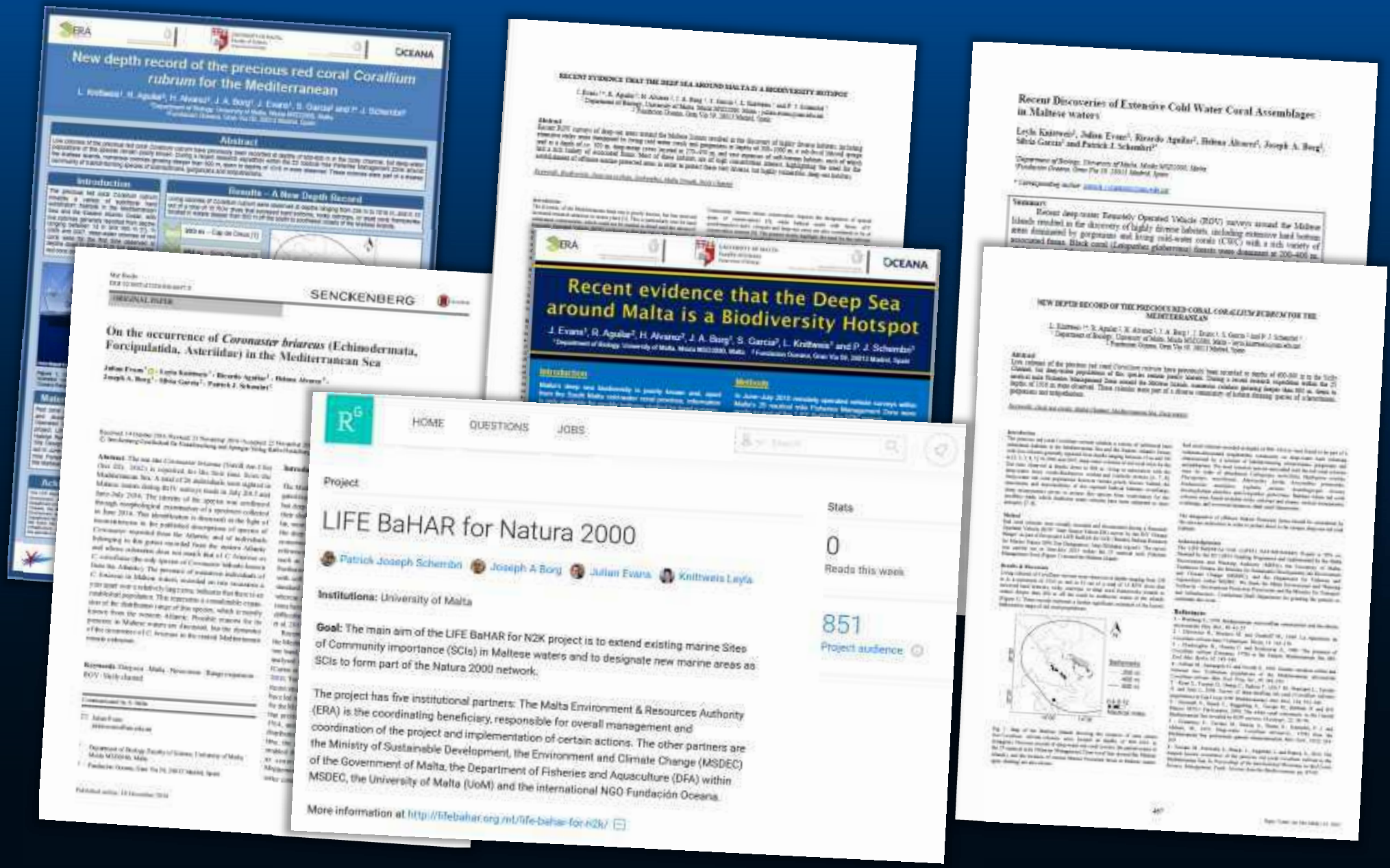


Coronaster briareus in the Mediterranean

- First record in Mediterranean Sea
- Total of 26 individuals sighted, 25 at edge of same escarpment
- Identity confirmed by collecting specimen in June 2016



Dissemination of Findings



Thank you for your attention!