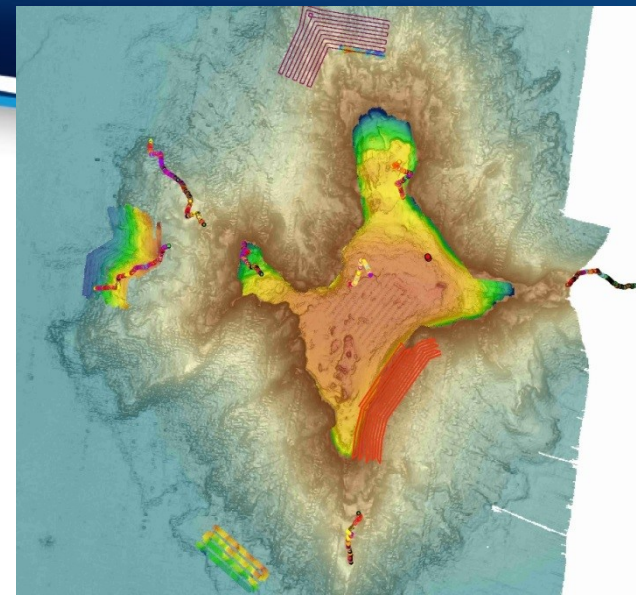




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UNDERSTANDING DEEP ATLANTIC ECOSYSTEMS



VME biodiversity and biogeography at the Tropic Seamount in the High Seas - a multidisciplinary study

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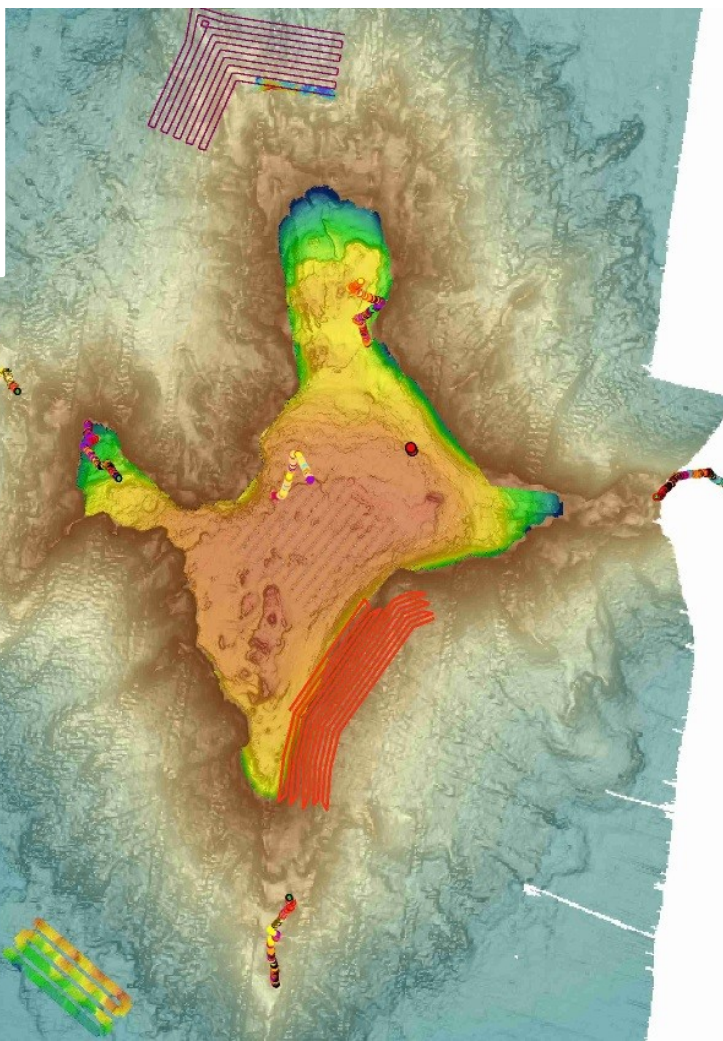
Global Open Ocean and Deep Seabed (GOODS) Biogeographic Classification

A tool to ensure rare, unique and representative biogeographic units are globally well-represented in protected areas

- Focus on areas beyond EEZs in waters >800m
- Biogeographic clusters based on physiognomic data
- Clusters are being ground-truthed data to some extent
- VME indicator taxa under-represented in deep-sea biogeography in general
- ATLAS will confront GOODS with VME indicator data and refine as needed

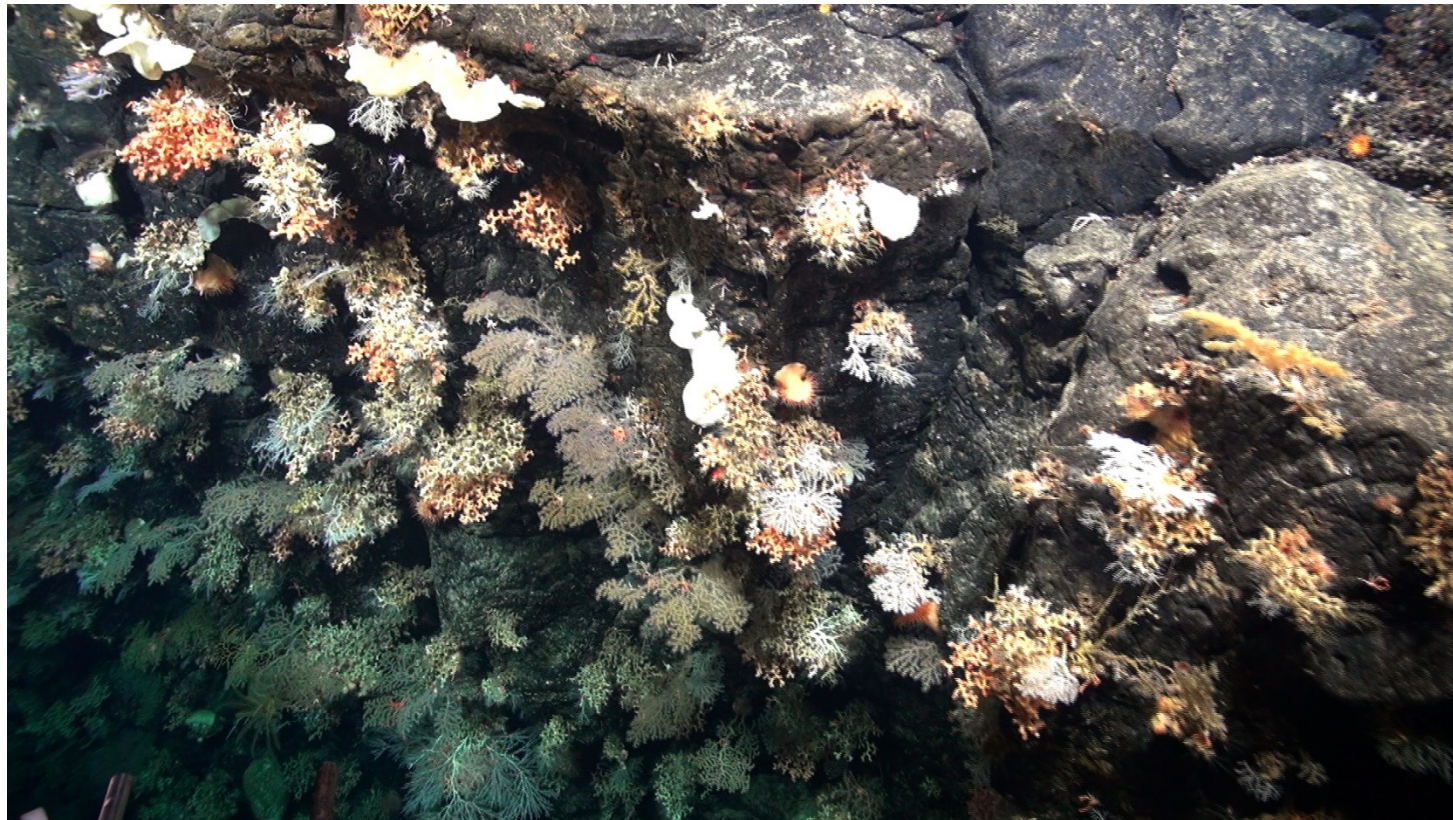


Collaboration with Marine E-Tech project



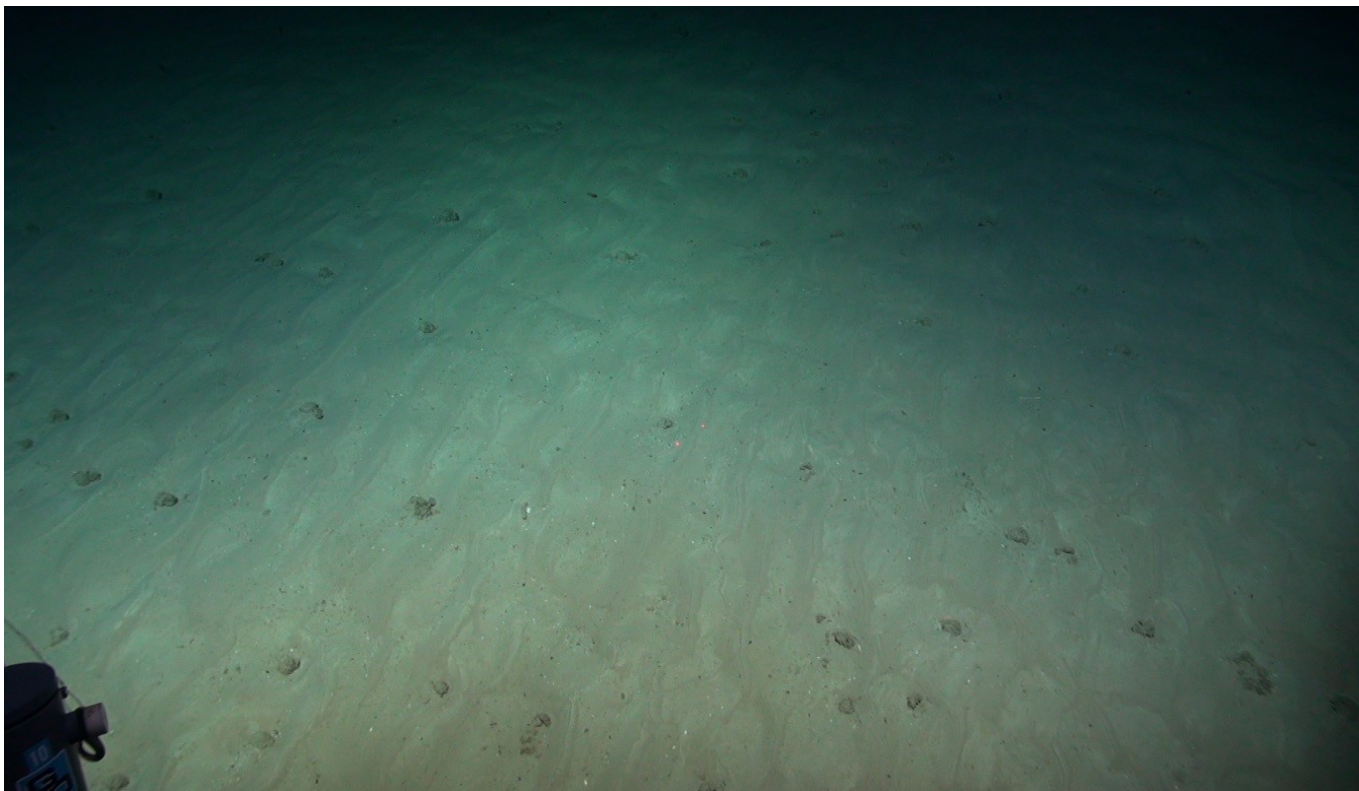
- November – December 2016
- Tropic Seamount, High Seas
- 24 ROV dives, >18,000 stills images
- CTDs
- AUV
- Hydrodynamic & plume models
- Multibeam (50m, 3m)
- Physical samples (morphological & molecular taxonomy)
- Great chance to collect new data for ATLAS (GOODS, EBSAs, VMEs, policies), forge collaborations across project
- Strong affinities to Azores & possibly subtropic western Atlantic

Biodiversity – Potential VMEs and data for EBSAs



Solenosmilia variabilis (CWC) patch reefs

Biodiversity – Potential VMEs and data for EBSAs



Syringammina (xenophyophore) beds

Biodiversity – Potential VMEs and data for EBSAs



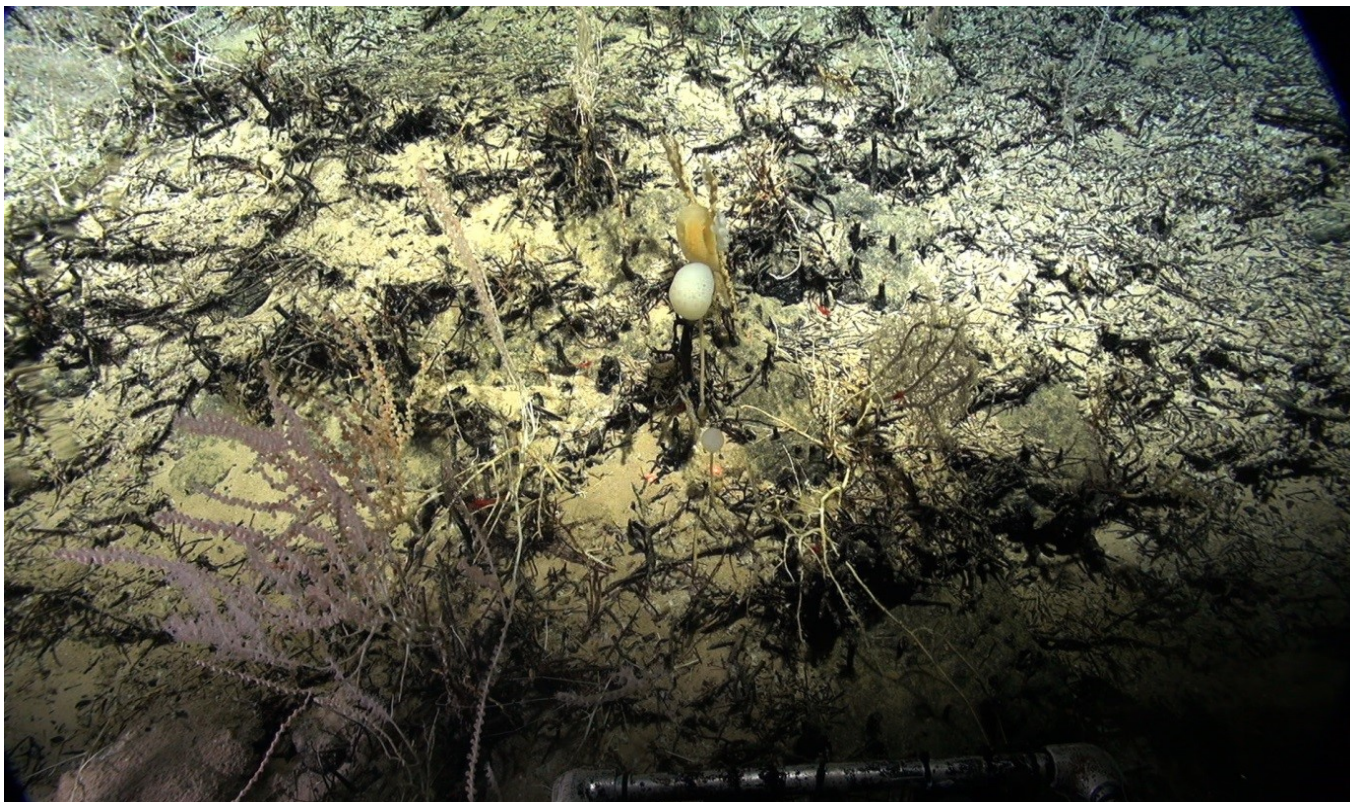
Stalked crinoid aggregations

Biodiversity – Potential VMEs and data for EBSAs



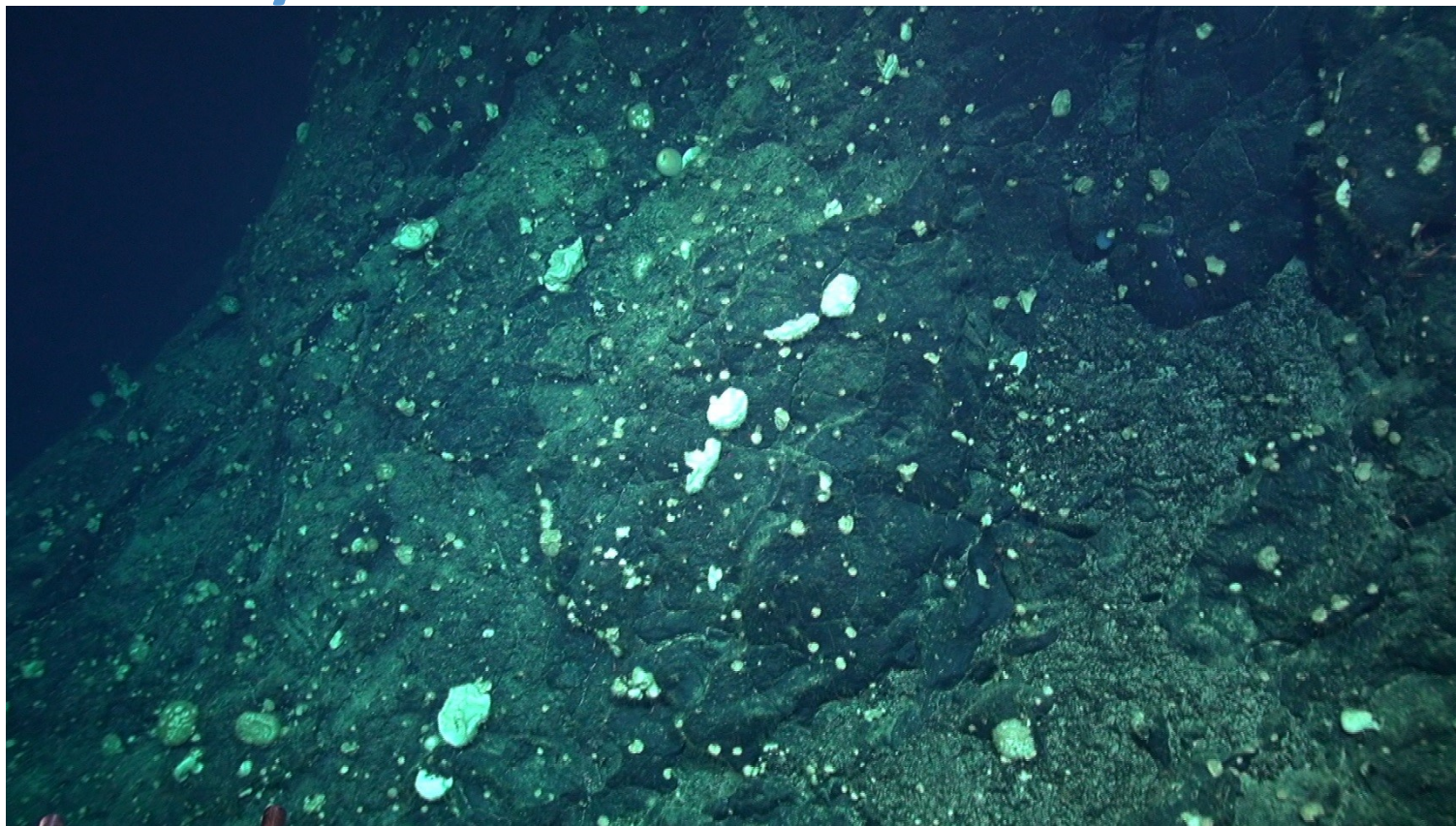
Pheronema carpenteri (bird's nest sponge) aggregations

Biodiversity – Potential VMEs and data for EBSAs



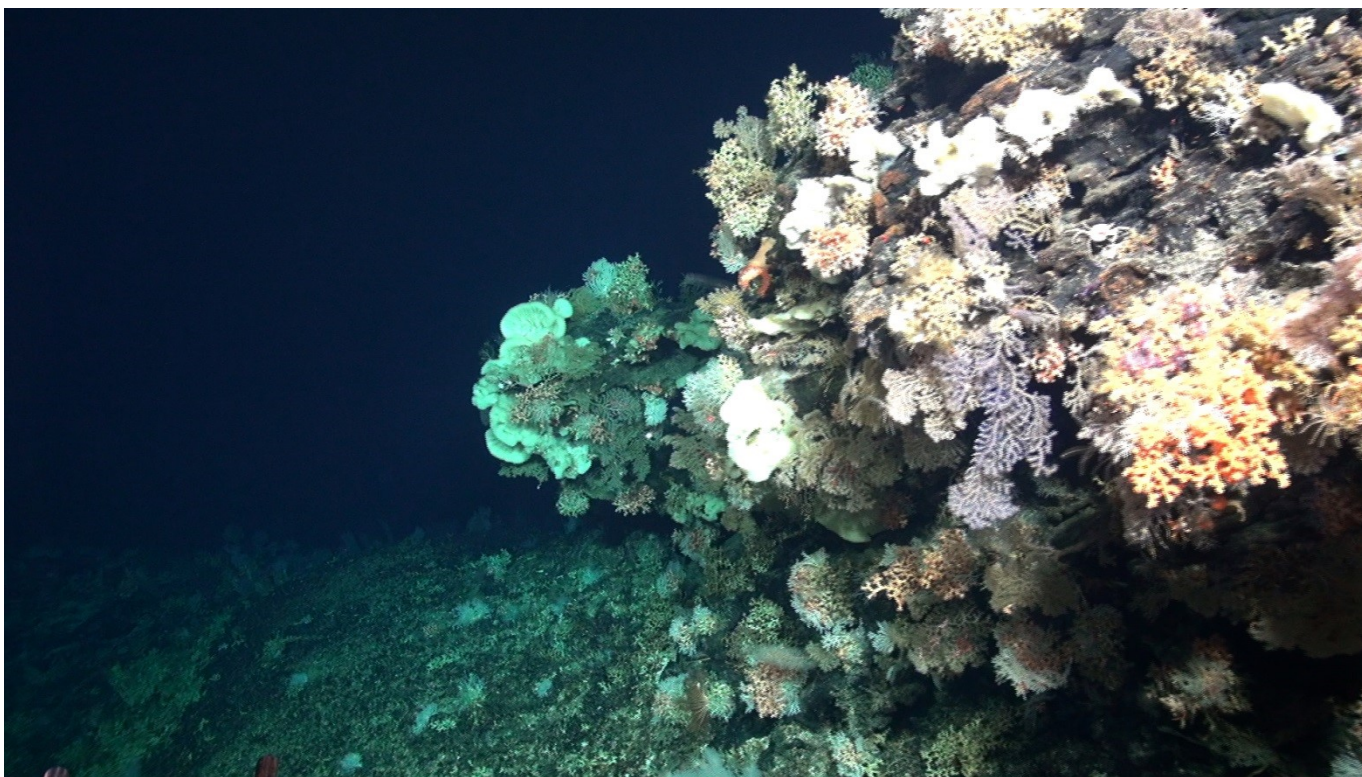
Stylocordyla pellita (lollipop sponge) aggregations

Biodiversity – Potential VMEs and data for EBSAs



Unidentified sponge aggregations

Biodiversity – Potential VMEs and data for EBSAs



Various coral gardens (octocorals, antipatharians, CWC mixed)

Biodiversity – Potential VMEs and data for EBSAs



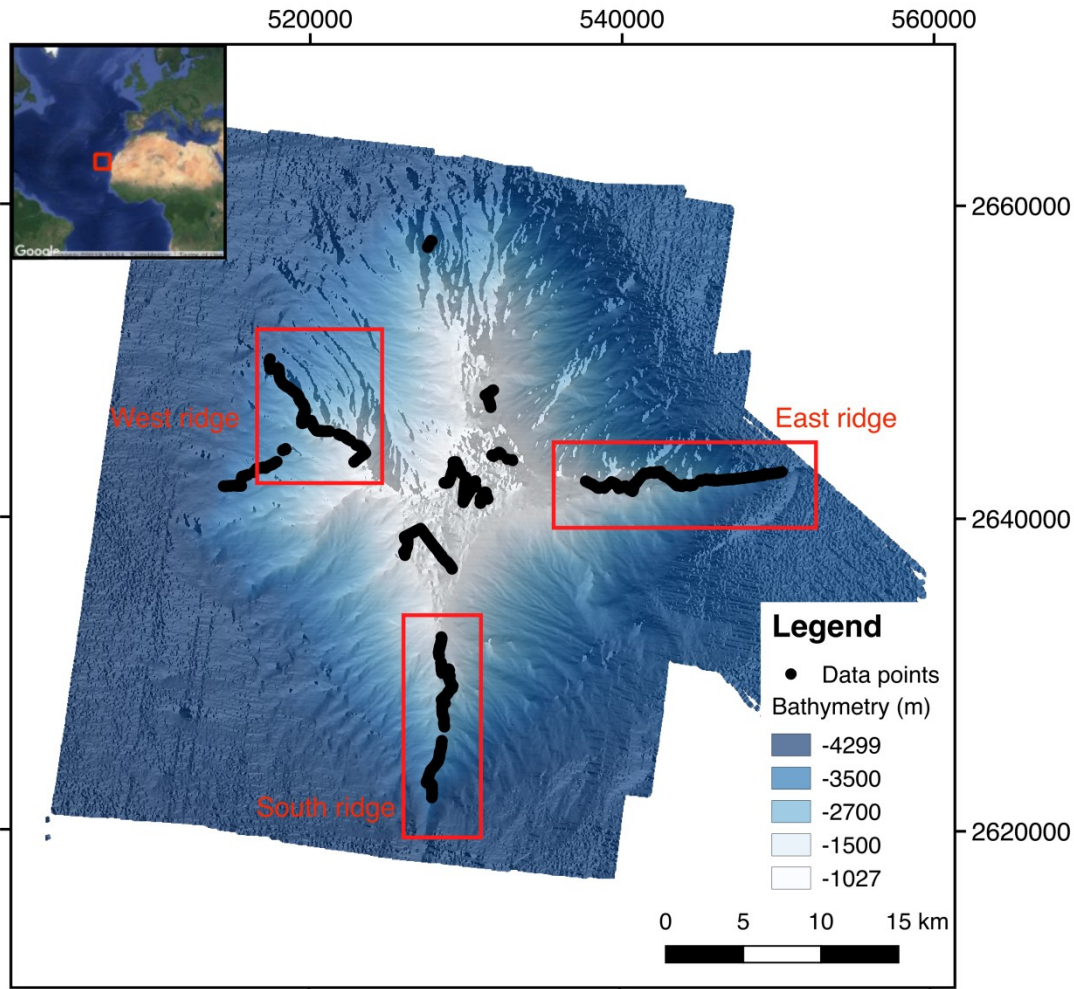
Deep-sea squid nursery on coral gardens

Biodiversity – Potential VMEs and data for EBSAs

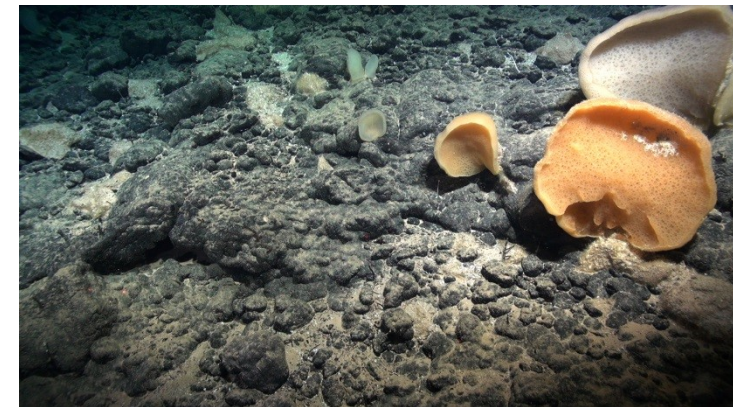


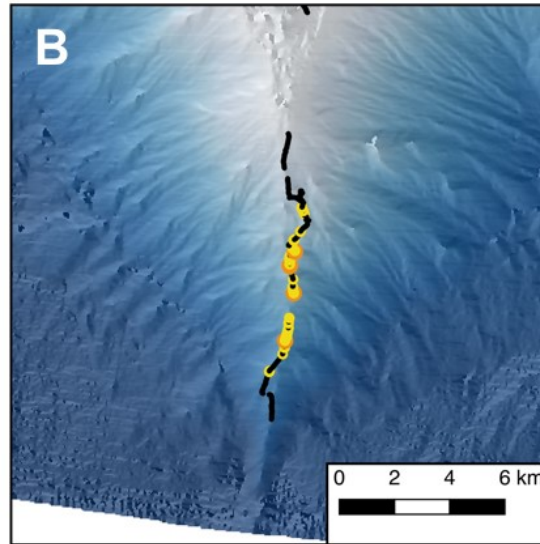
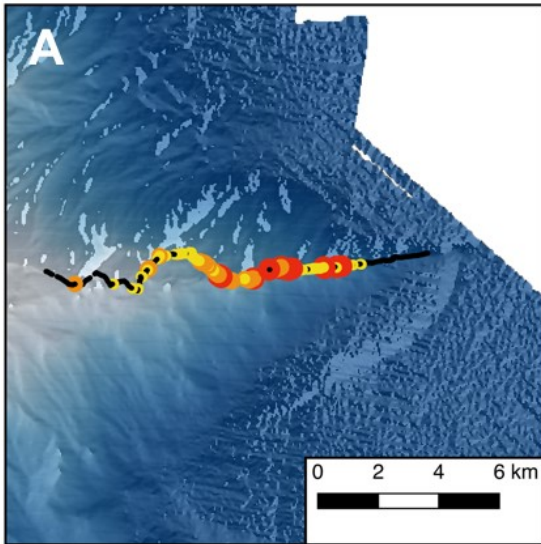
Poliopogon amadou sponge aggregations

Environmental controls of *P. amadou* distribution

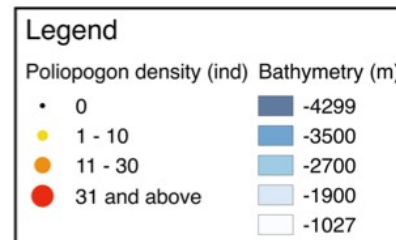
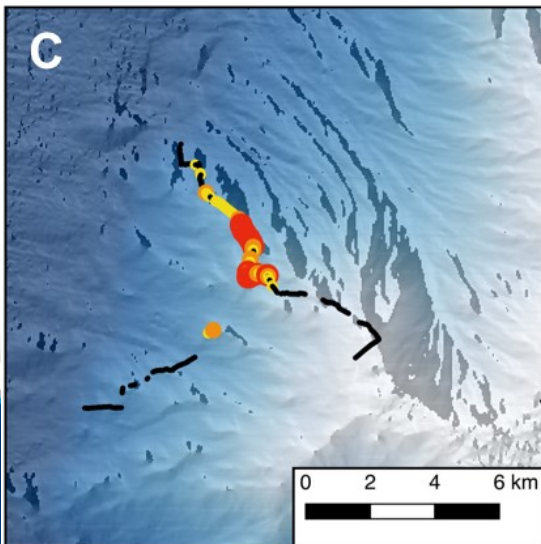


- Sponge abundance
- Generalised Linear Modelling (binary data, weighted)
- Terrain analysis on multibeam data





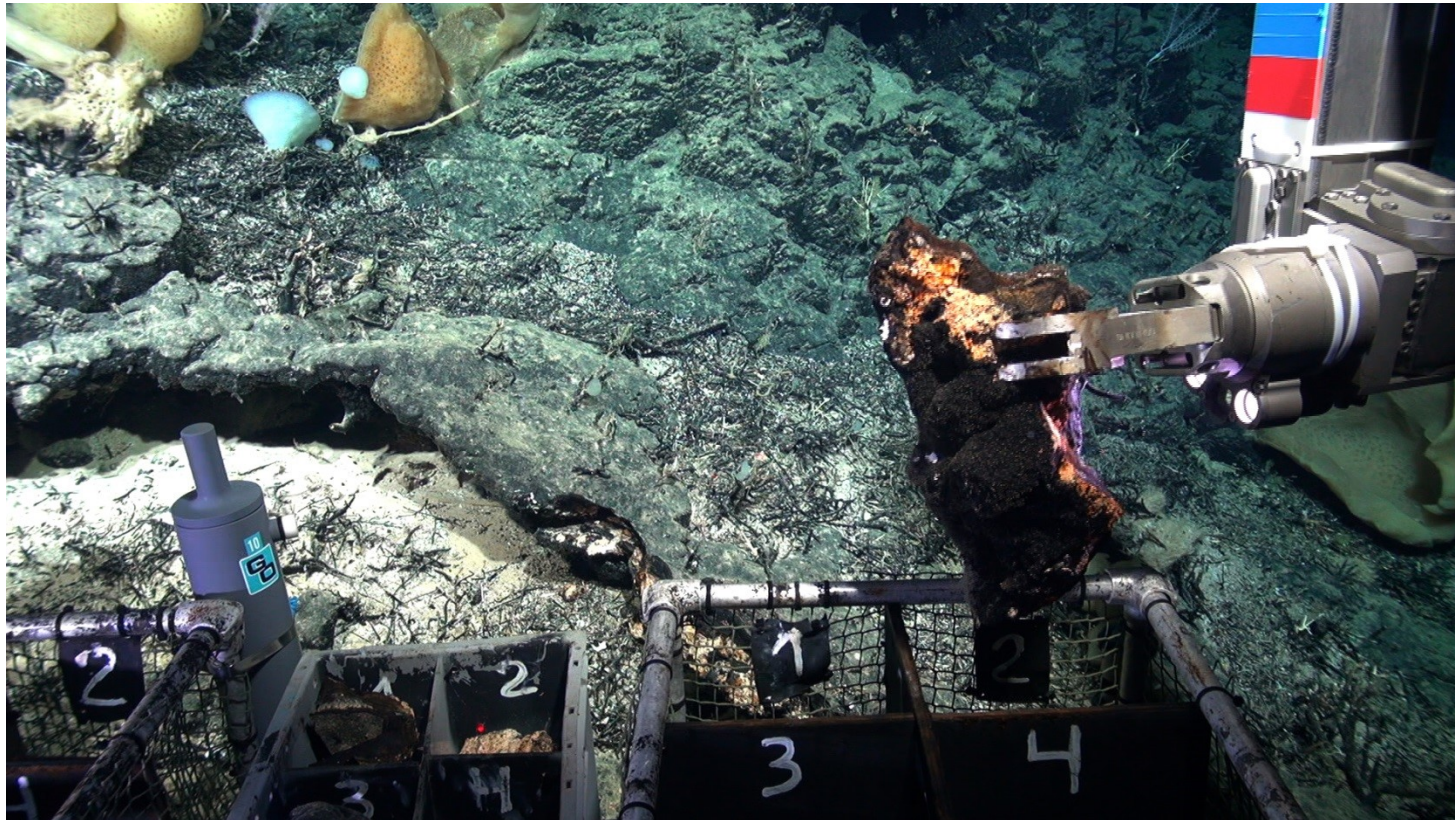
- Depth, slope, eastness (aspect) control distribution
- 2,600 – 3,600 m depth
- Upper NADW (2.5°C, 34.5ppt, O₂ 210-220 umol/kg)
- Definite preference for steeply sloped spurs



Next steps –

- COI & 18S sequencing to confirm sponge ID
- Integrate hydrographic model outputs into the GLM next time

Potential conflict: Deep seabed mining and sponge aggregations



- Sponge habitat frequently co-occurs on volcanic basaltic rock in areas with dense ferromanganese deposits; Tropic Seamount also predicted to hold 12% of the world's tellurium content



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Biodiversity/biogeography
analyses relevant to fisheries
councils (CECAF) and EBSA

COSS

- Limited studies on VMEs in the CECAF area
- Some VMEs on Tropic Seamount too deep to fish, but vulnerable to deeper water exploitation



Food and Agriculture Organization
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Fisheries and
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Rapport sur les
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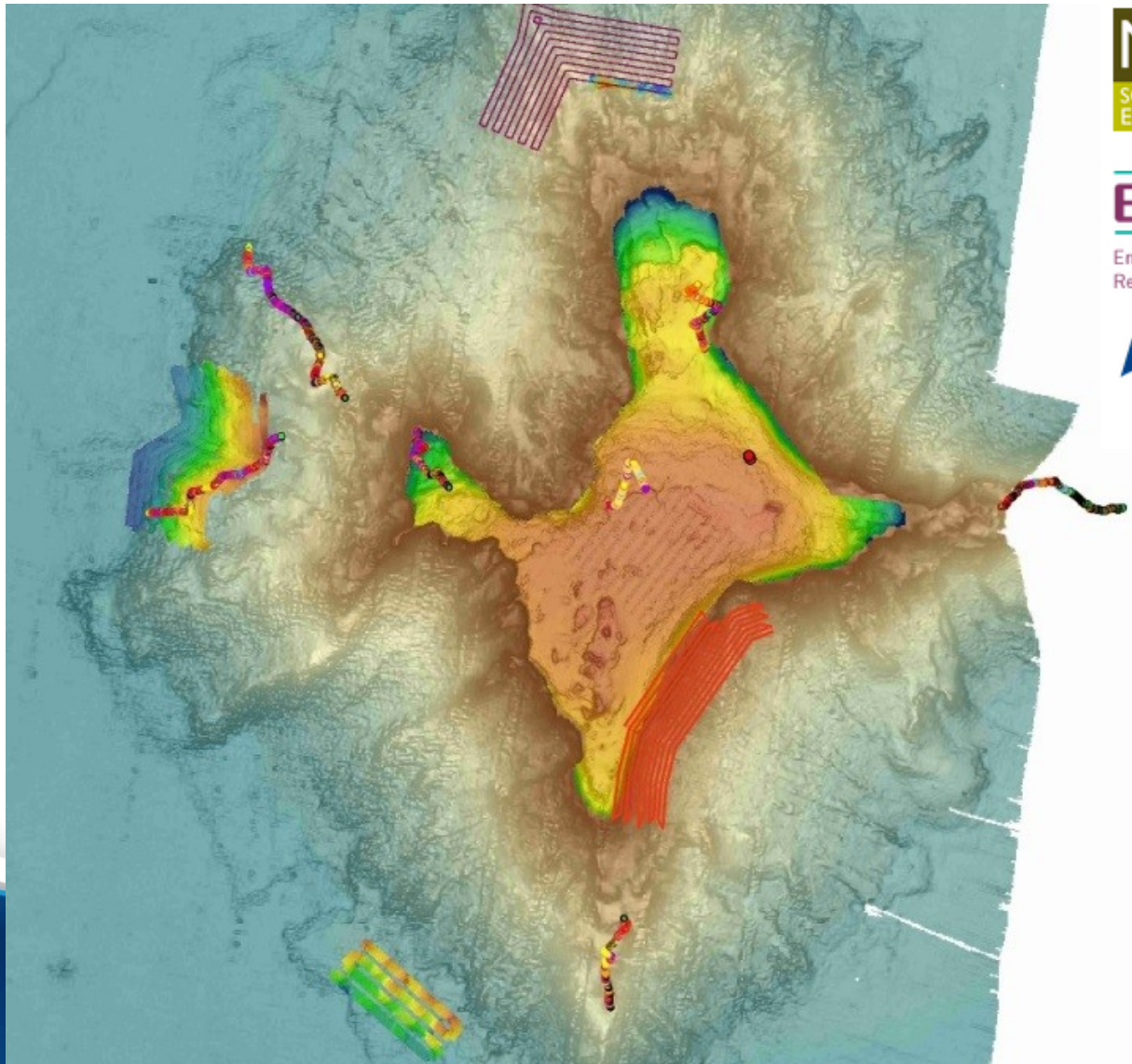
**FAO/CECAF TECHNICAL WORKSHOP ON DEEP-SEA FISHERIES
AND VULNERABLE MARINE ECOSYSTEMS IN THE EASTERN
CENTRAL ATLANTIC**

Dakar, Senegal, 8–10 November 2016

Rapport de

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Thank You