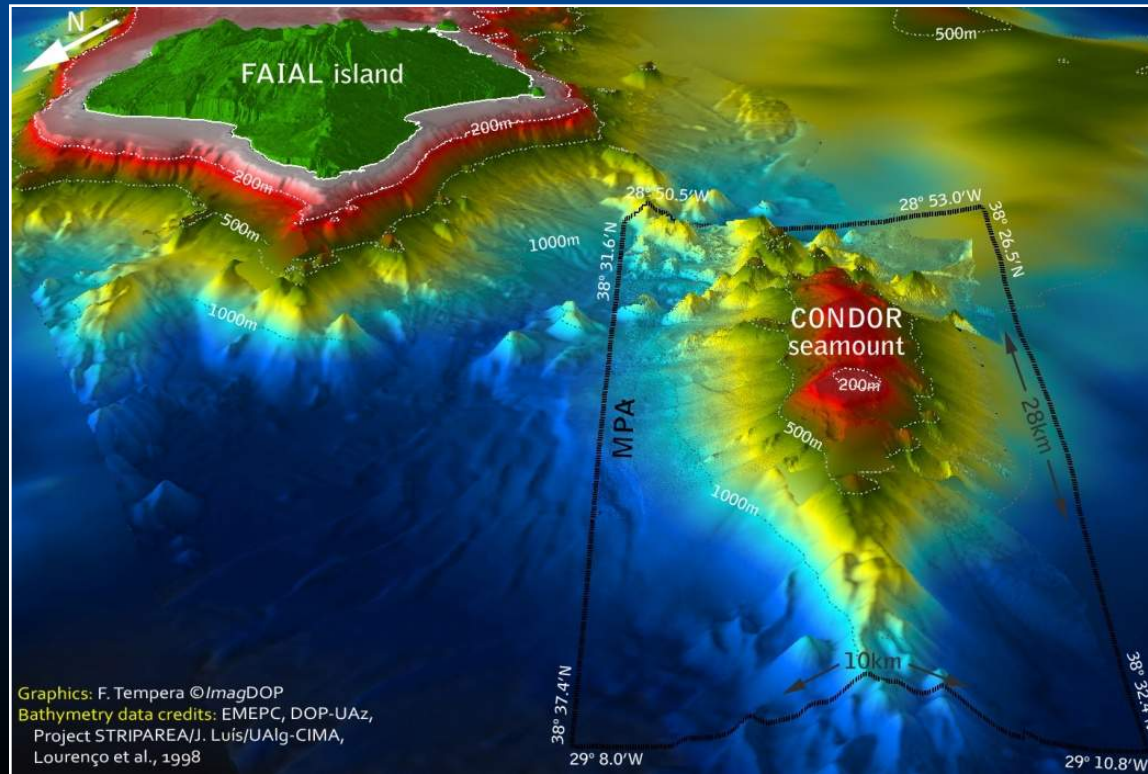
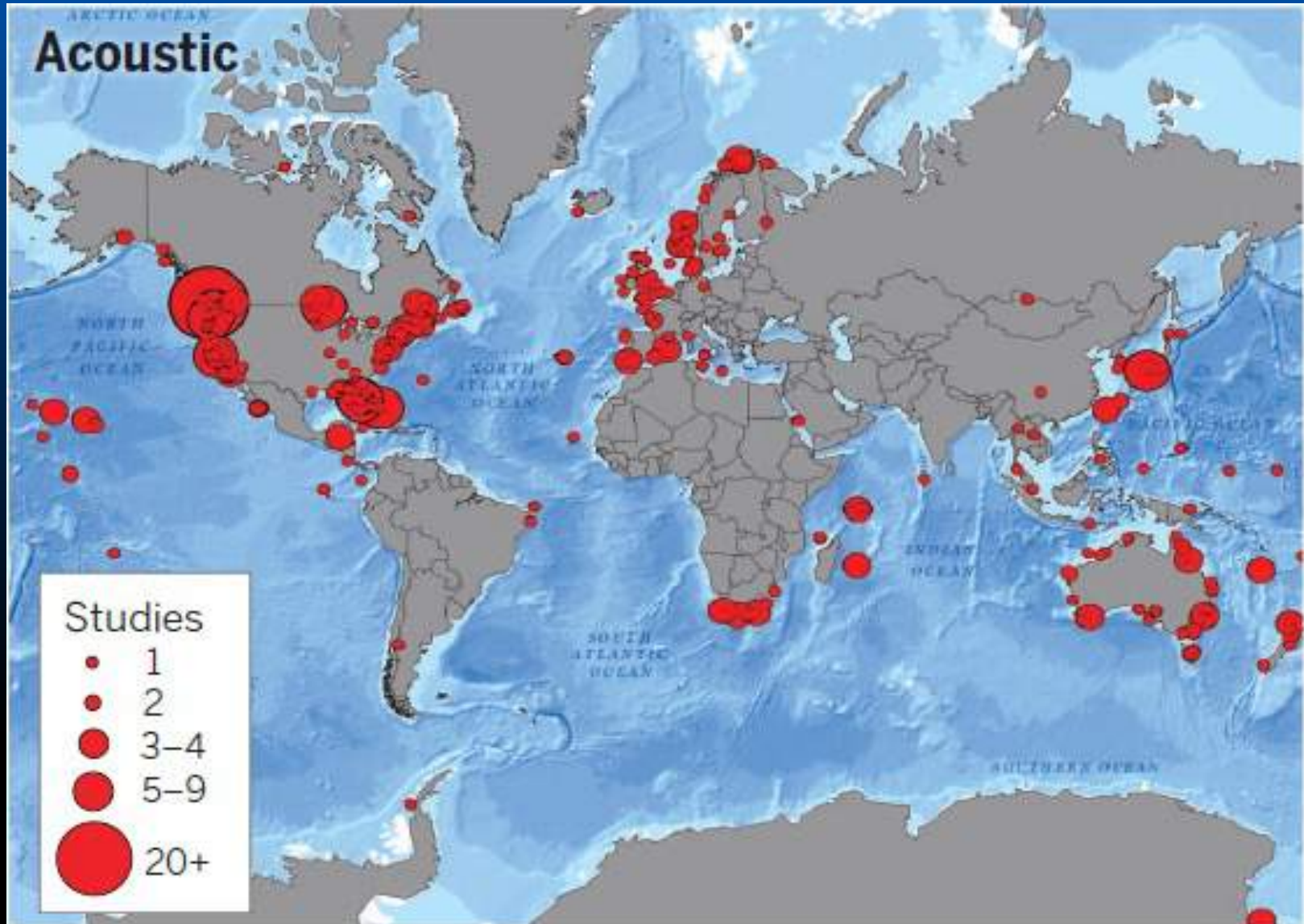


Tracking in to the deep III: Multiscale acoustic telemetry of seamount fishes



**Pedro Afonso,
Niall McGinty, Gonçalo Graça, Jorge Fontes, Gui Menezes**

The coastal domination

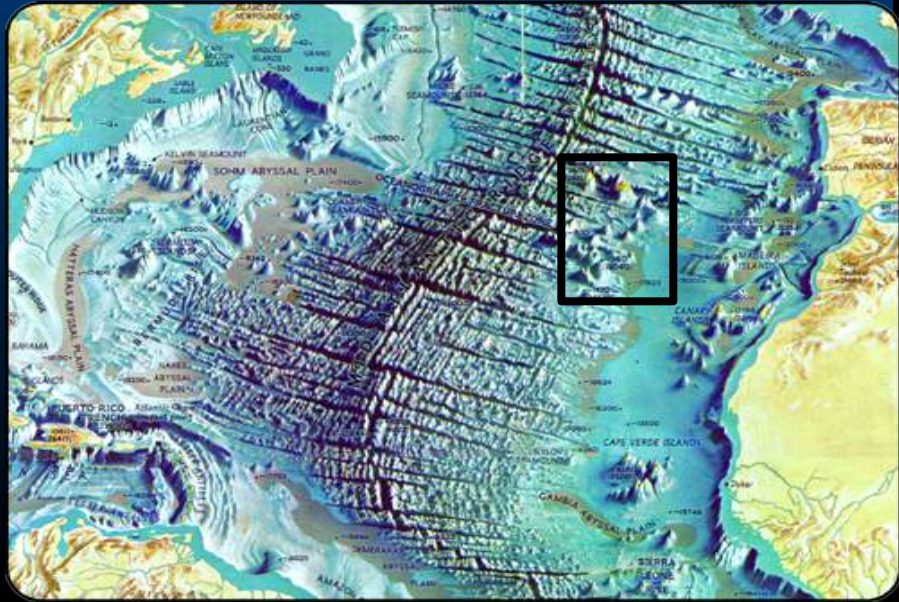




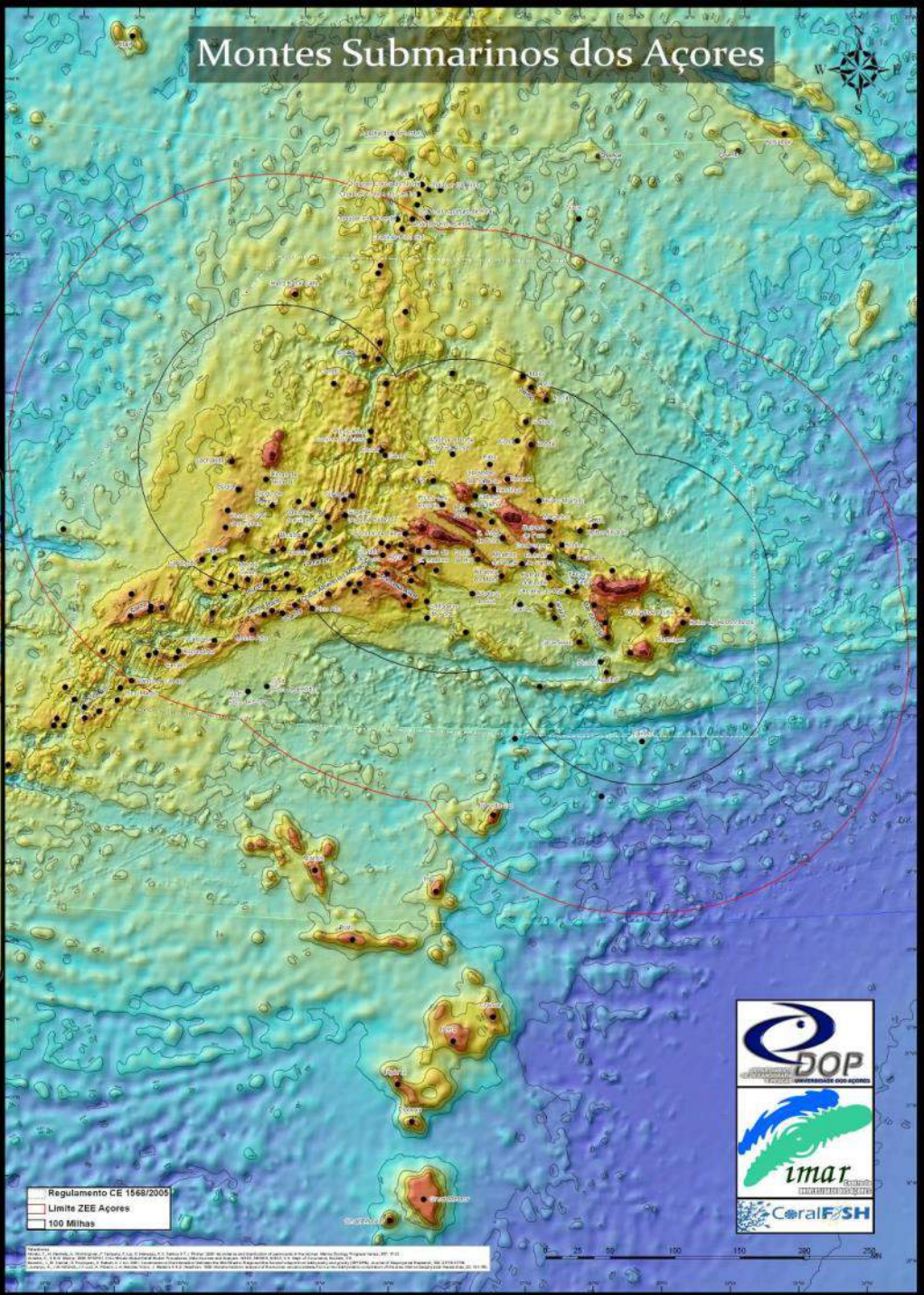
*"I don't know why I don't care about the bottom
of the ocean, but I don't."*

A deeper view of the sea

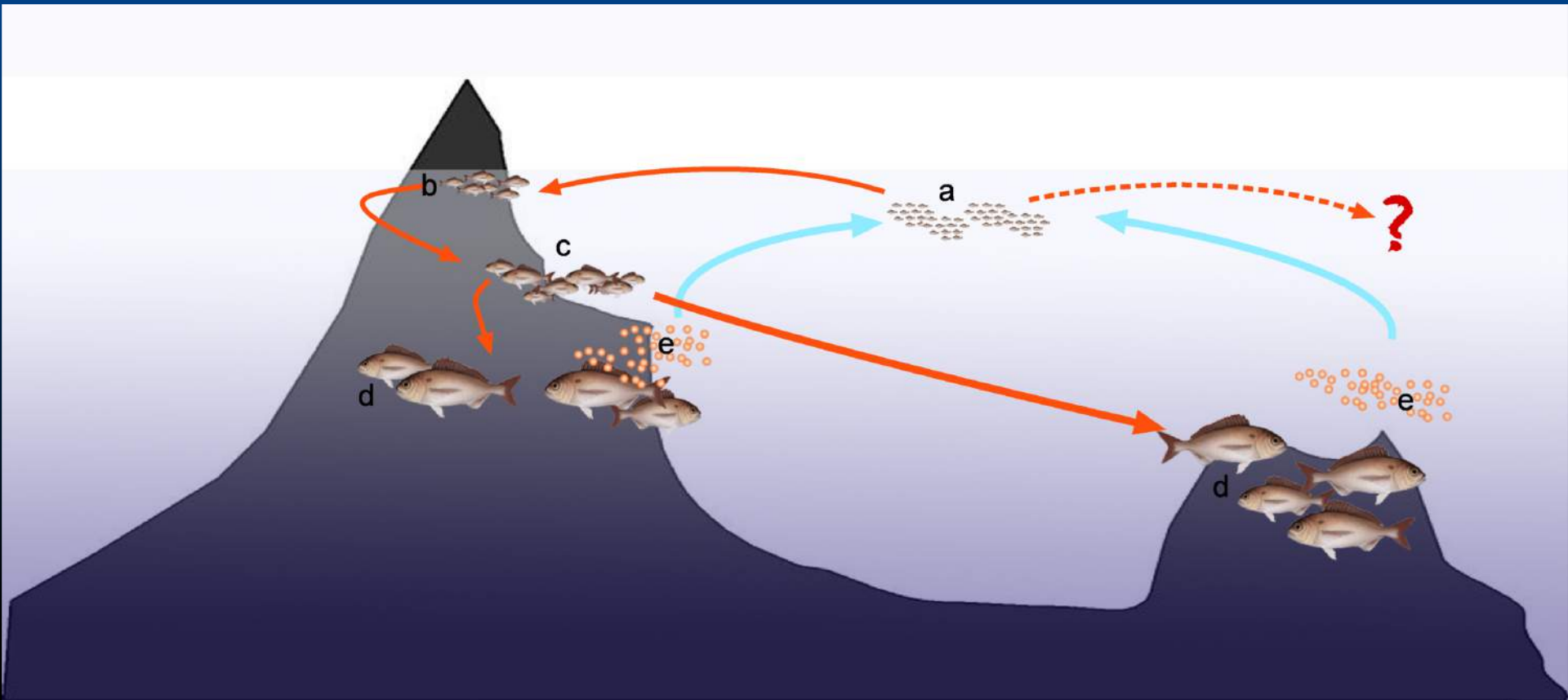
Mid Atlantic seamounts



ca. 434 large seamounts
in the Azores region alone

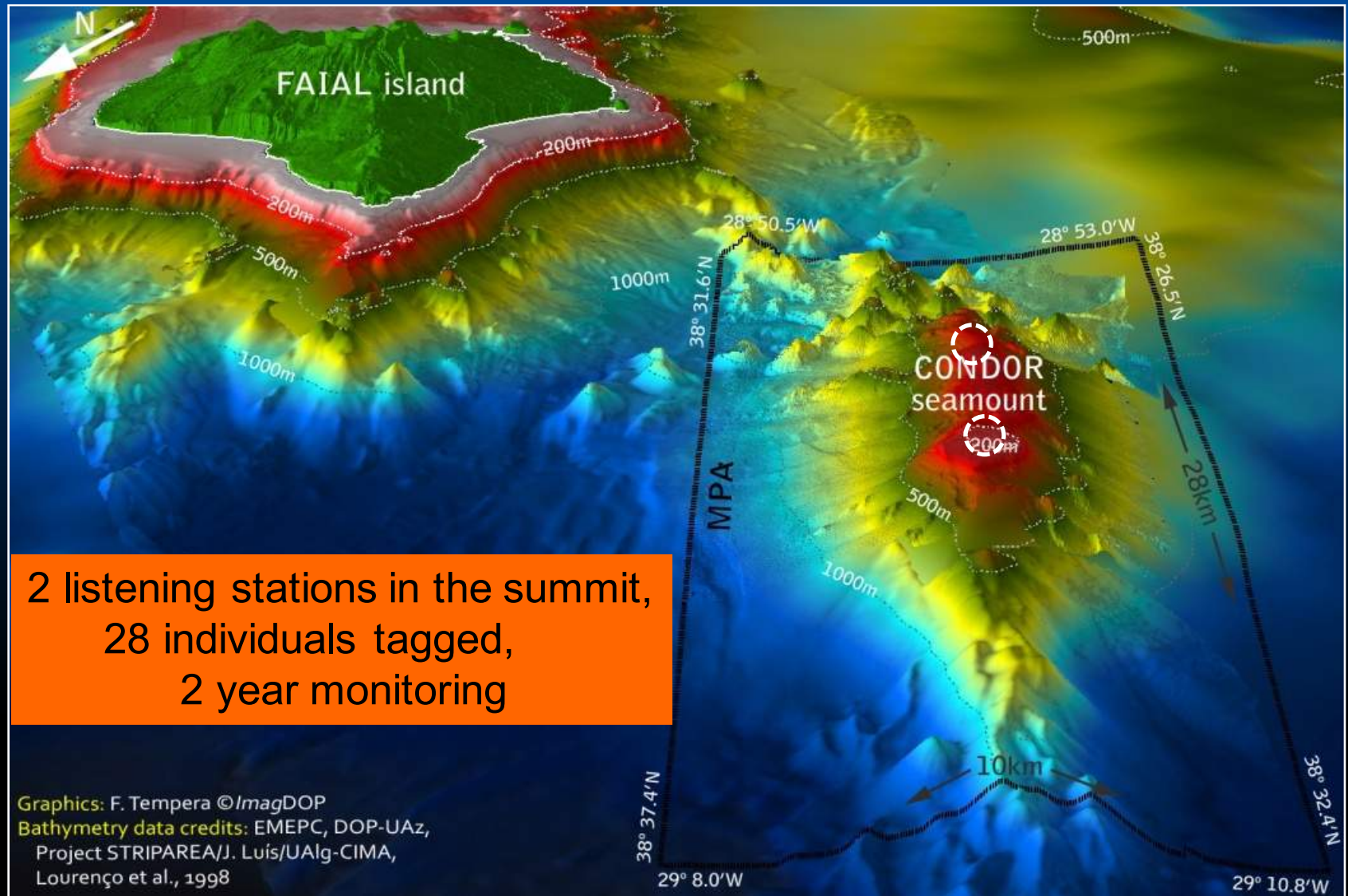


Ecological hypothesis testing and decision support: Essential habitat and connectivity of blackspot seabream



(deep) acoustic telemetry...or deep troubles?

Phase 1: experimental telemetry at the Condor seamount MPA



Phase 1: Experimental Passive acoustic telemetry at Condor



Can we use acoustic telemetry to study deepwater demersal species?

Yes, we can

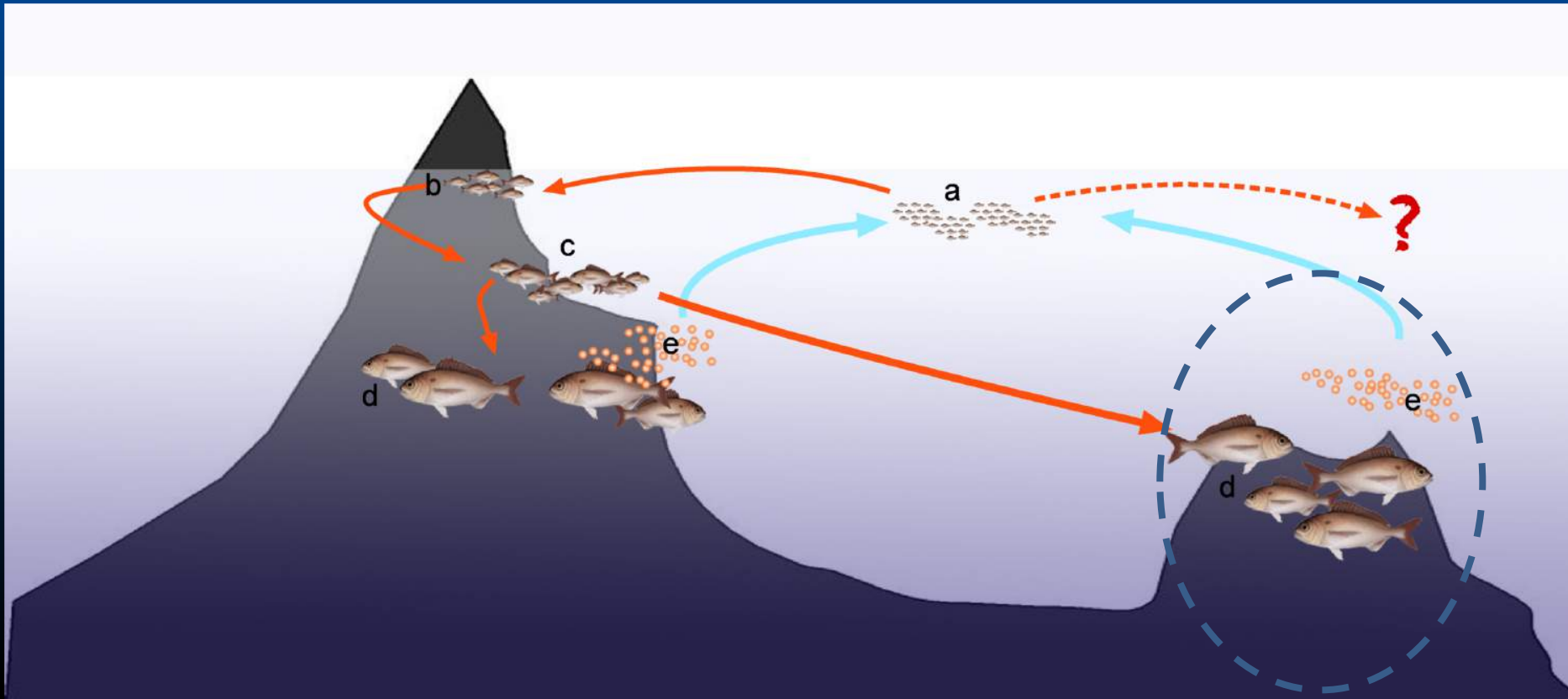
But need improvements to reduce (potential) mortality and deepgoing 3D tags to study their fine-scale behaviour

Do adult goraz reside at seamounts or visit them seasonally?

Large individual variation, but higher residency than expected (up to 2 yr)

But need wider and deeper receiver coverage + larger sample & sizes

Ecological hypothesis testing and decision support: Essential habitat and connectivity of blackspot seabream



Can local resources explain their fine-scale behaviour?

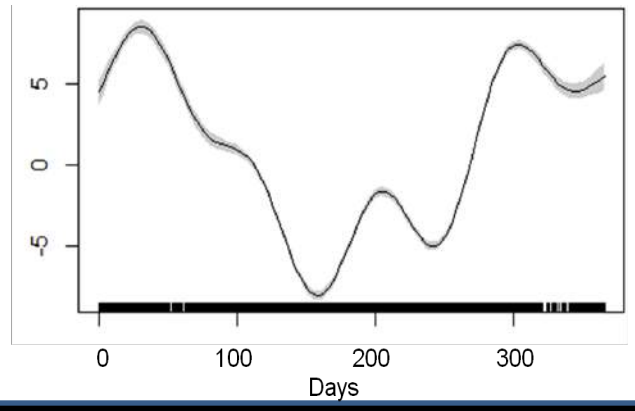
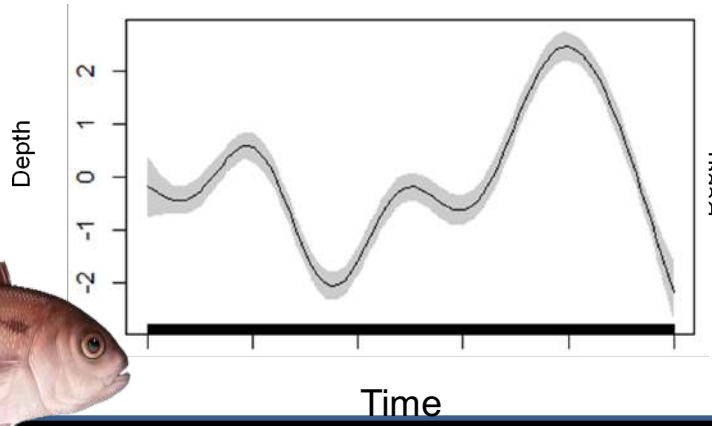
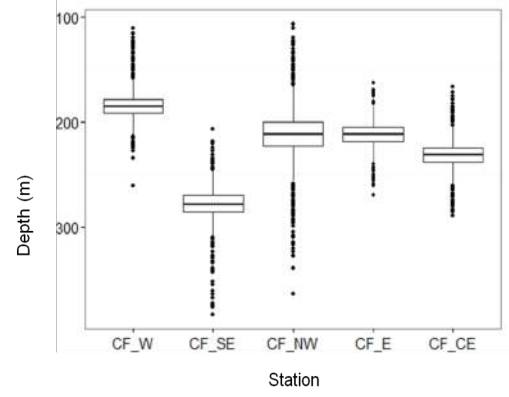
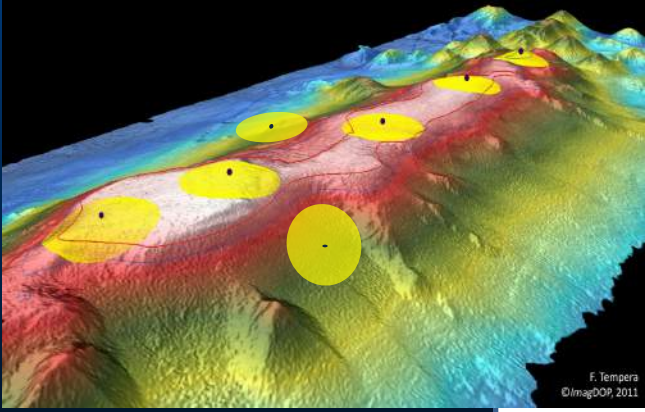
Increased productivity on seamounts → increased residency?

Vertical migrations DSL → vertical migrations of goraz?

Phase 2: Expanded 3D passive monitoring at Condor

Vertical Migrations of a Deep-Sea Fish and Its Prey

Pedro Afonso^{1,2*}, Niall McGinty^{1,3}, Gonçalo Graça^{1,2}, Jorge Fontes^{1,2}, Mónica Inácio^{1,2}, Atle Totland⁴, Gui Menezes^{1,2}



seasonal and diel depth range changes

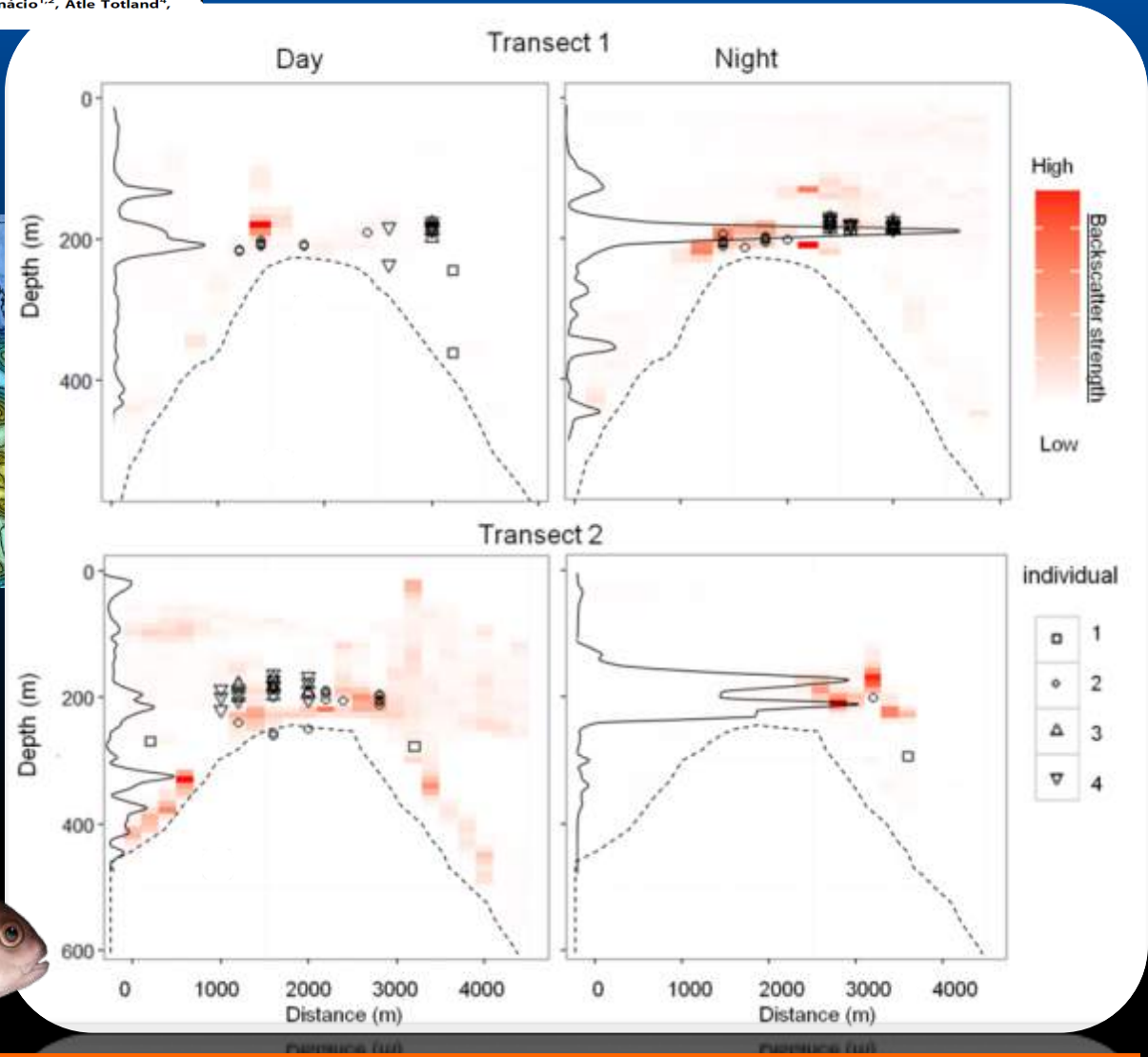
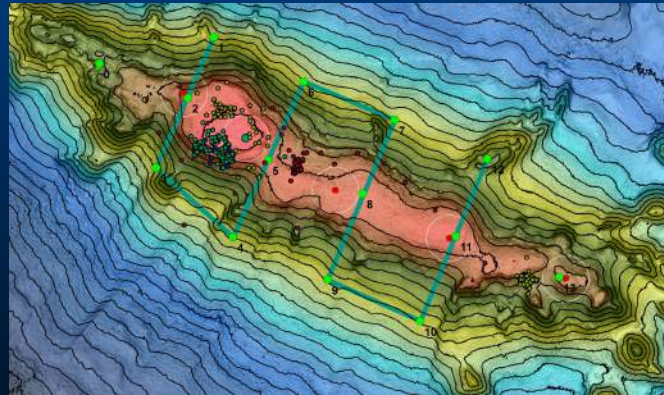
Phase 3 - Active 3D acoustic tracking & synoptic observations

OPEN ACCESS Freely available online

PLOS ONE

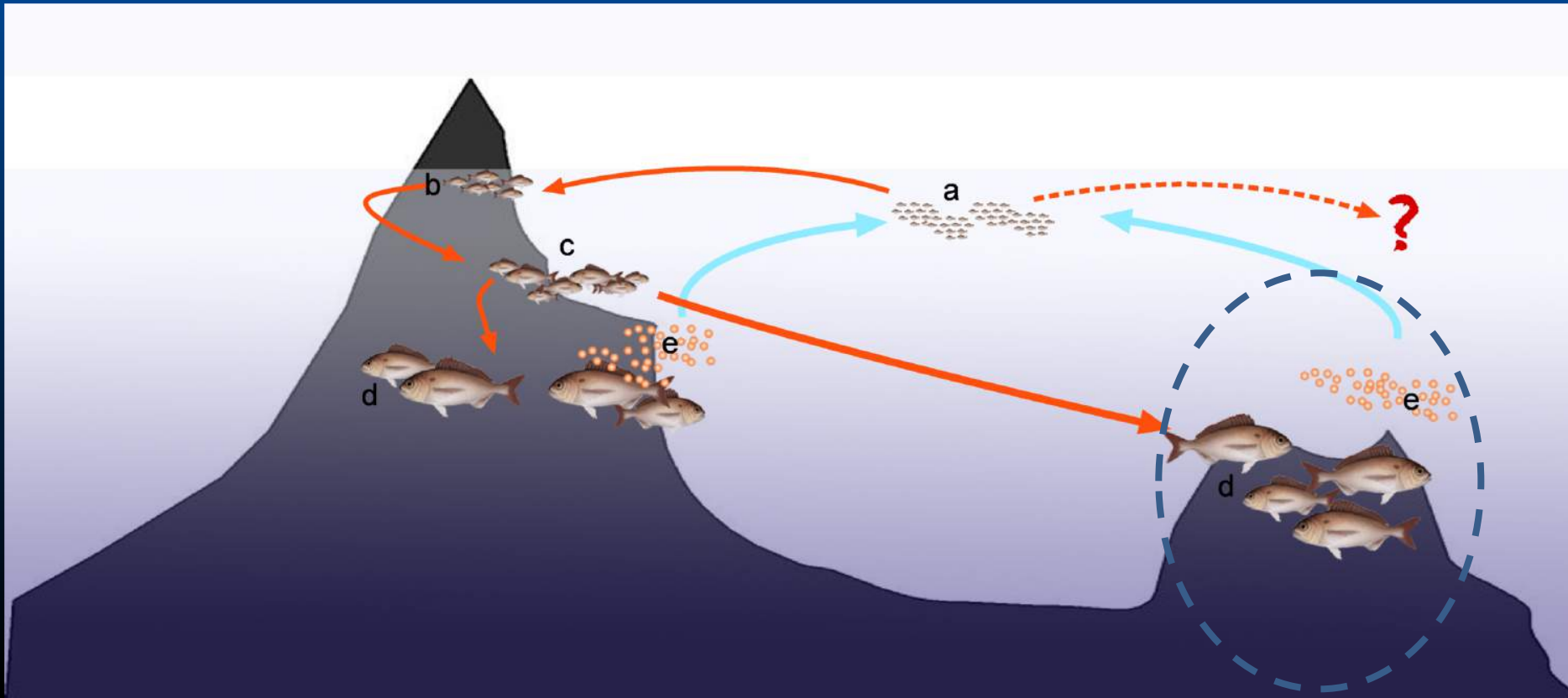
Vertical Migrations of a Deep-Sea Fish and Its Prey

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Plastic benthic vs pelagic behaviour depending on prey (DSL) availability

Ecological hypothesis testing and decision support:
Essential habitat and connectivity of blackspot seabream

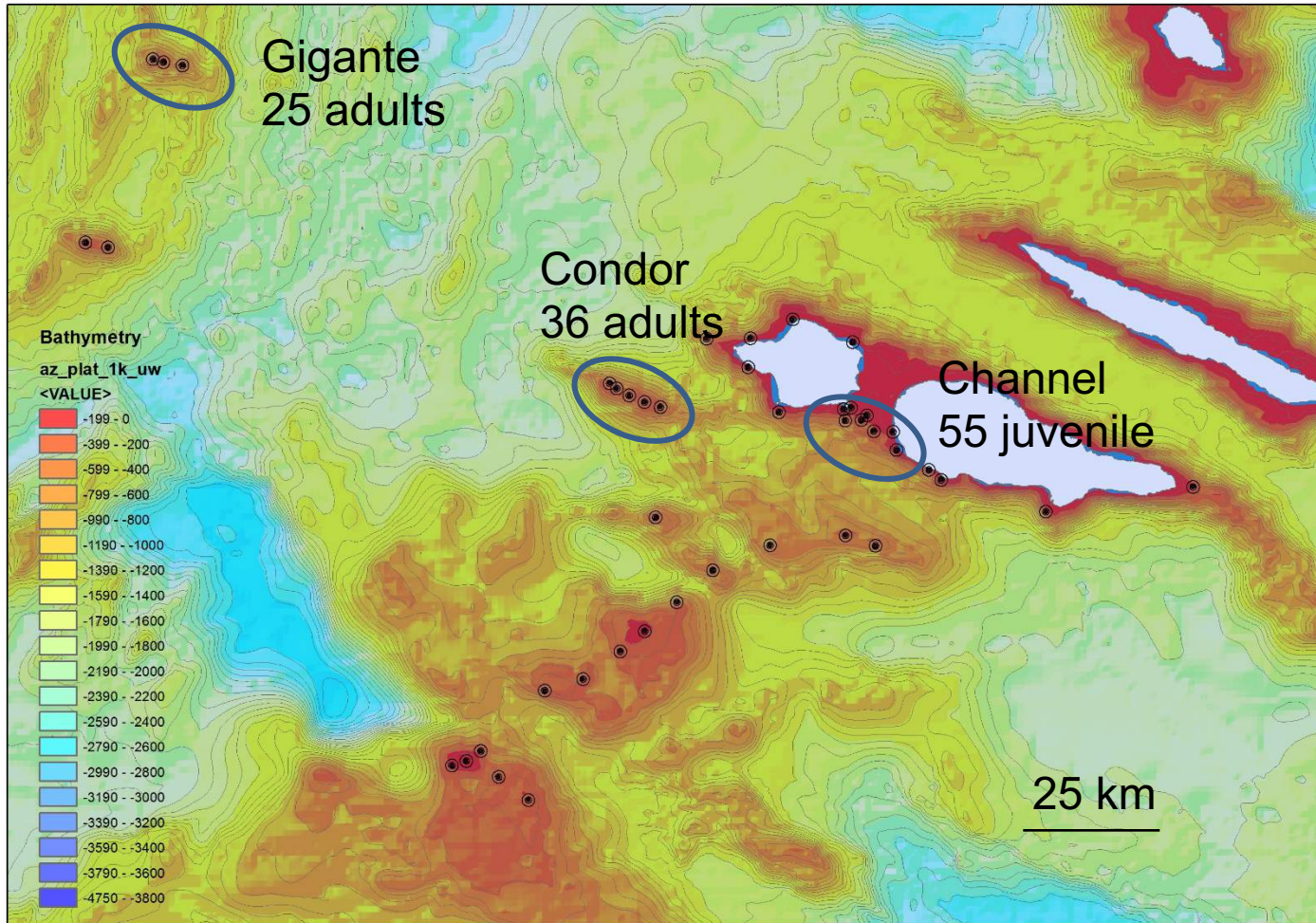


Ontogenetic migration hypothesis

Adult connectivity among seamounts / island slopes

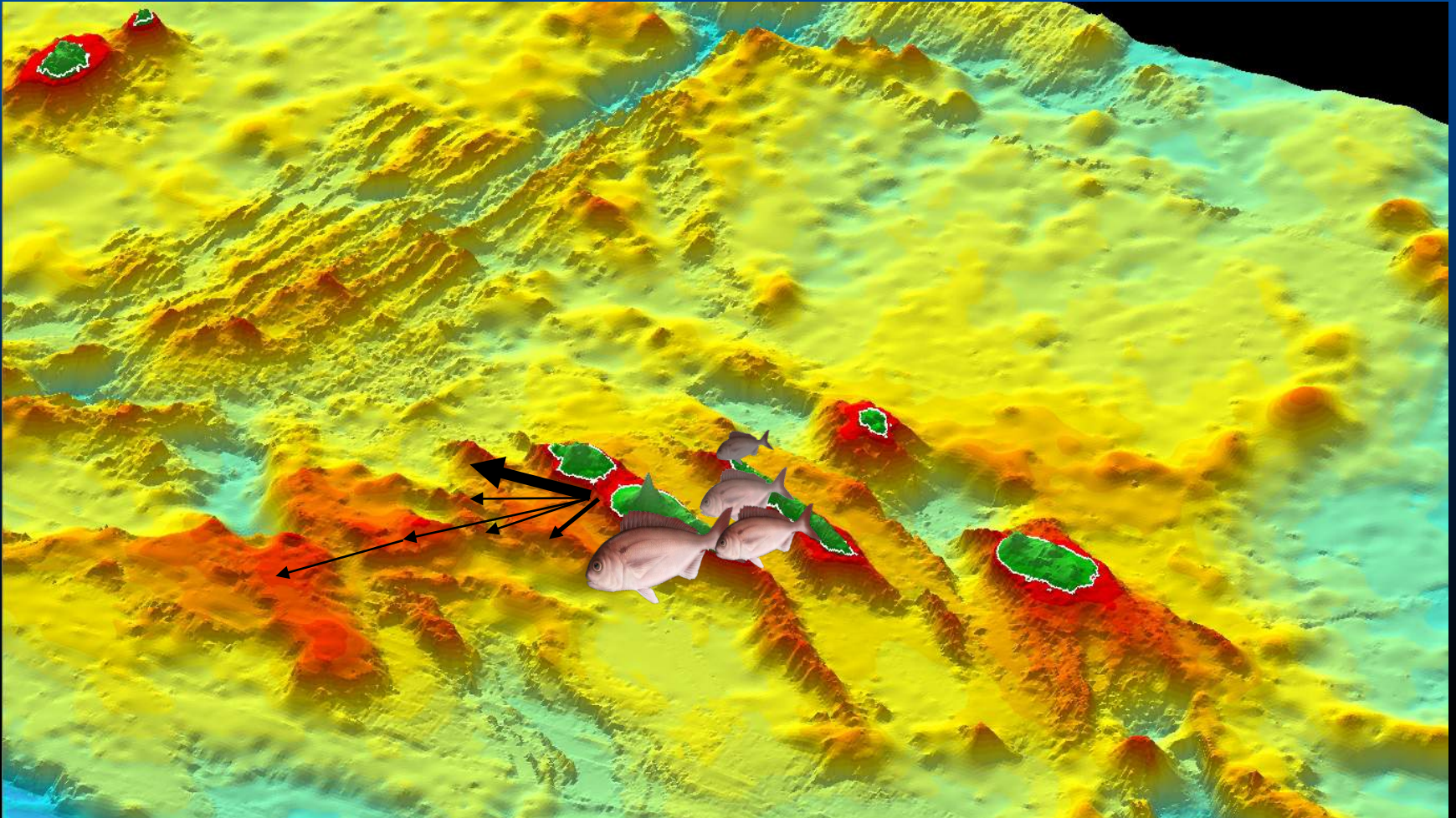
Spawning aggregations

Phase 4: Multi-habitat long-term acoustic monitoring



Phase 4: Multi-habitat long-term acoustic monitoring

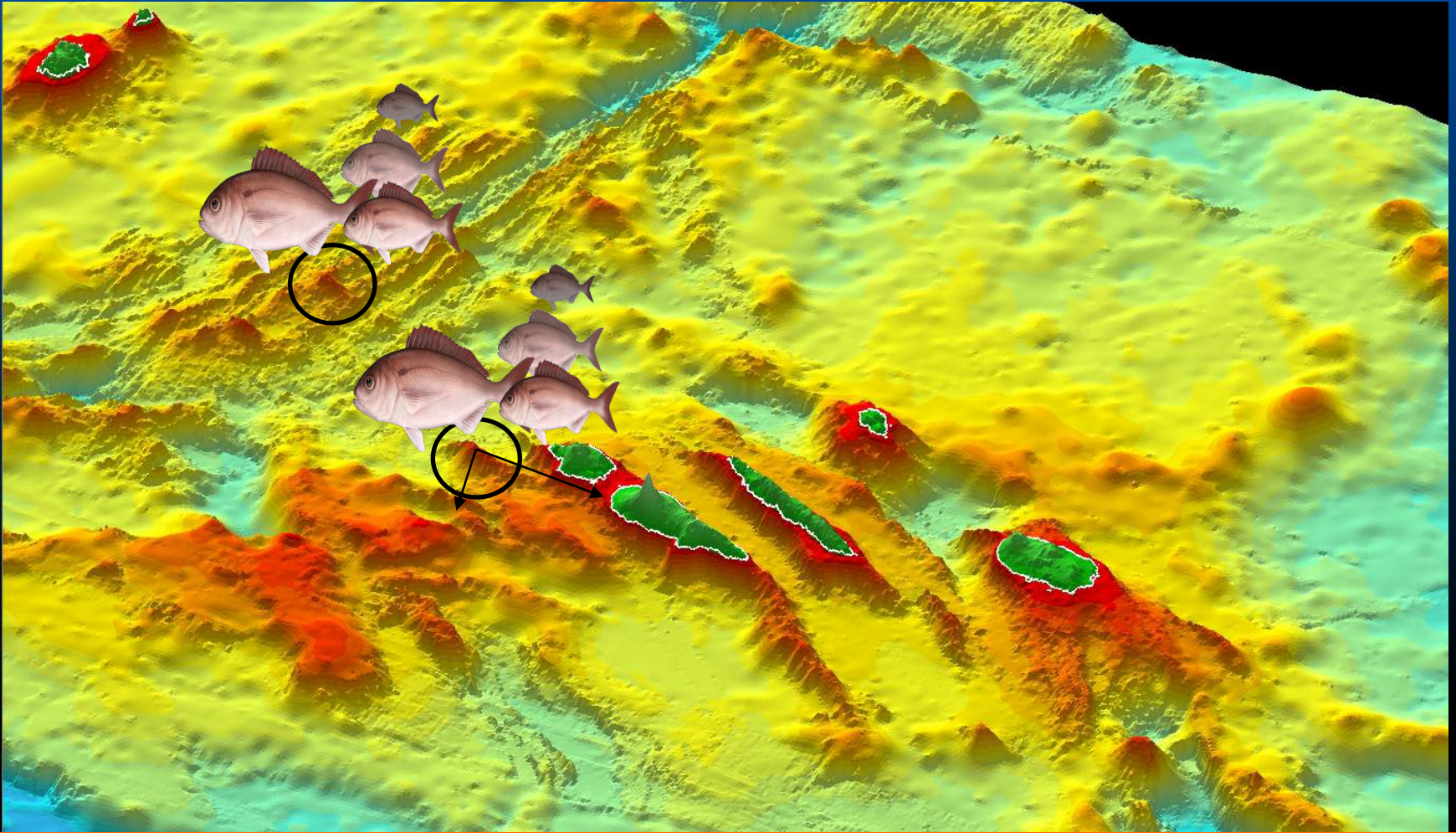
Connectivity among habitat boxes through ontogenetic migration



Pre-adults migrate to seamounts (20% tagged fish) and don't come back
Little residency

Phase 4: Multi-habitat long-term acoustic monitoring

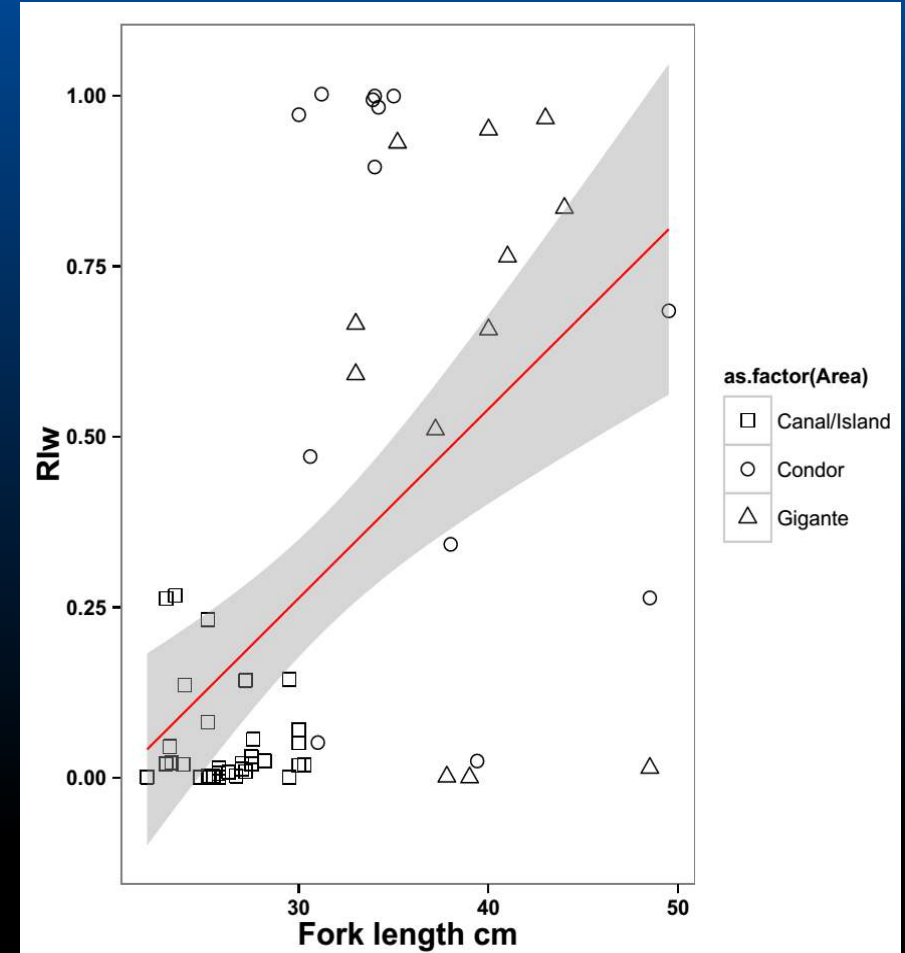
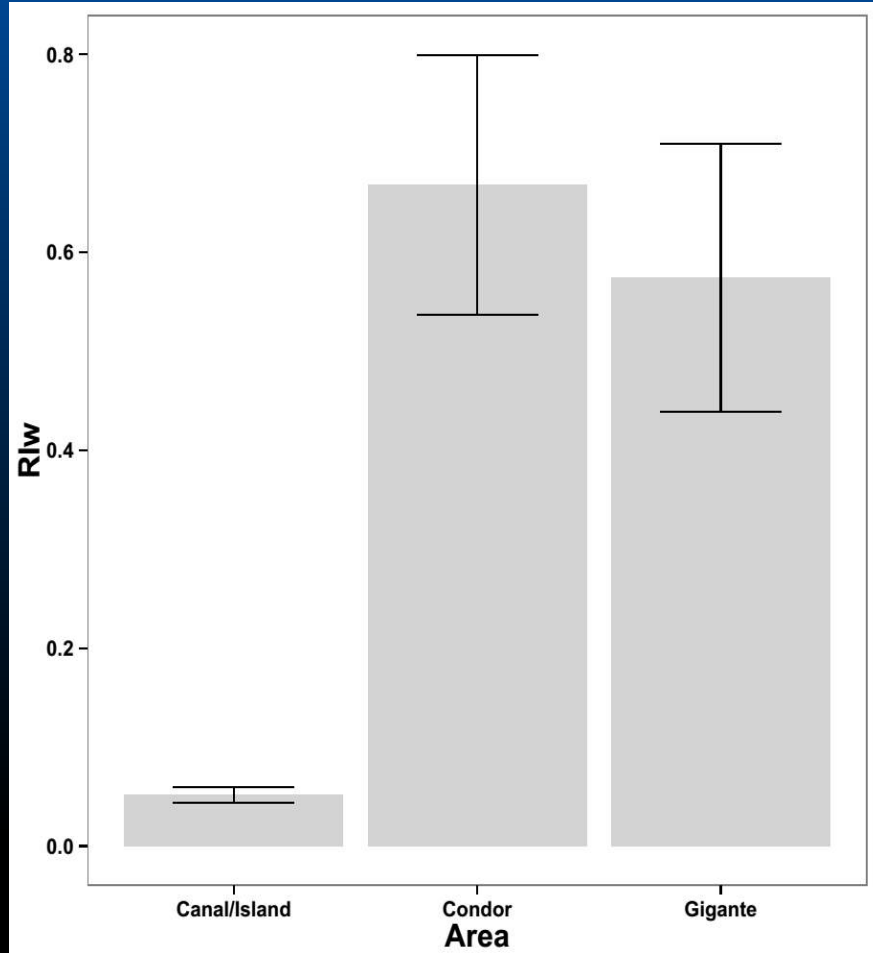
Connectivity among habitat boxes through adult migration



Adults reside at seamounts up to years (2/3 of tagged fish)
Very little movement between boxes detected

Phase 4: Multi-habitat long-term acoustic monitoring

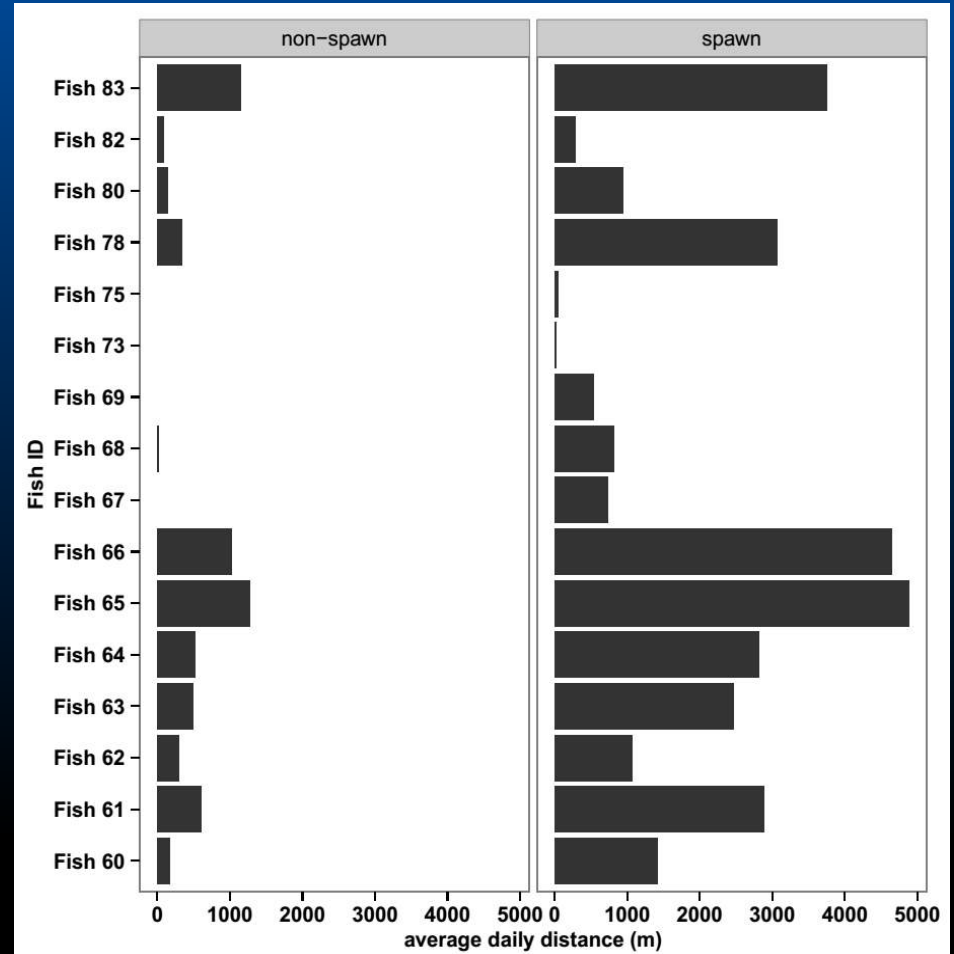
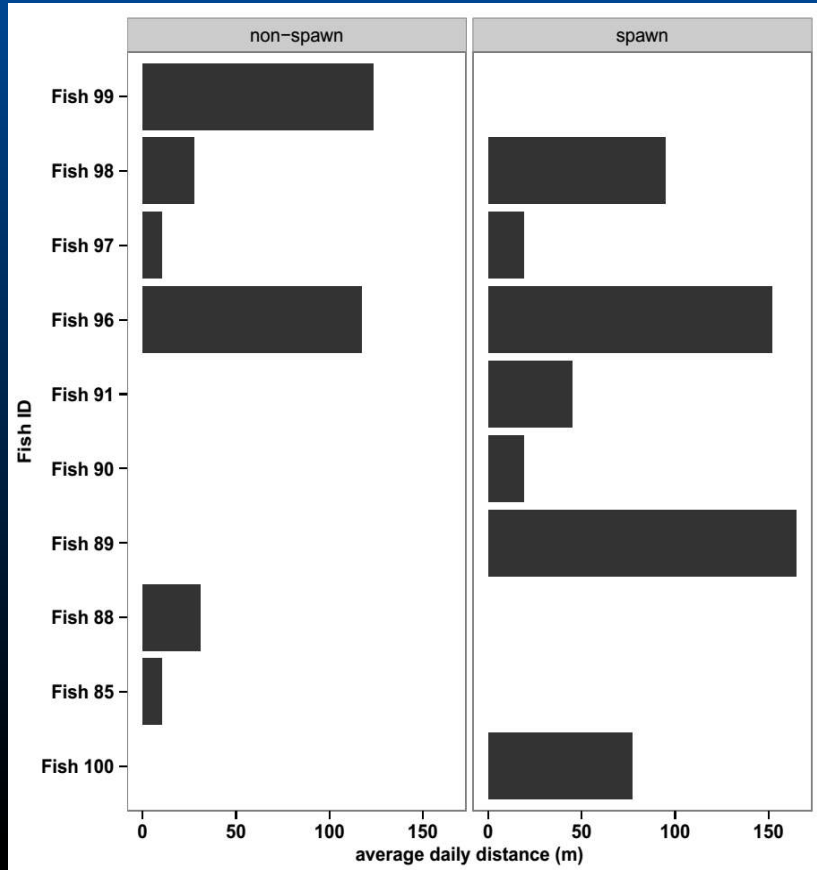
Ontogenetically/habitat dependent habitat use



Adults much more resident than juveniles

Phase 4: Multi-habitat long-term acoustic monitoring

Seasonal trends in seamount use



No clear spawning aggregations but reproductive increase in movement
Spawning related or feeding related?

Acoustic telemetry of goraz at Condor

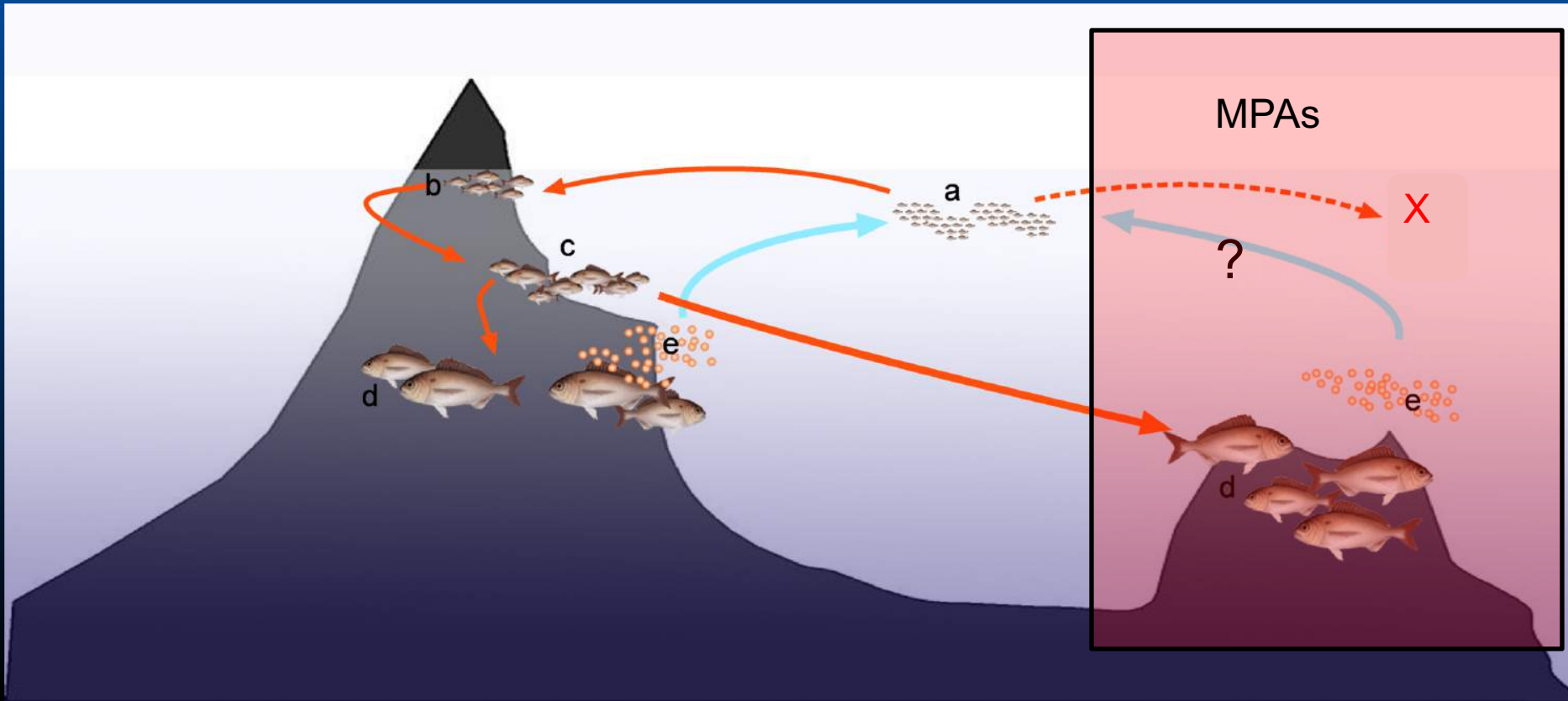
Can we use acoustic telemetry to study deepwater demersal fishes?

- Yes we can
- V13Ps proved efficient, high potential for VPS studies
- Improvements/adaptations will make the difference
- Adequate monitoring coverage
- Multi-scale protocols and techniques
- Deep-going telemetric gear!!!
- Technical improvements in tagging (deep tagging, recompression)

Behavioral ecology of goraz at seamounts

- ontogenetic migration -> seamount residency while adult picture
- highly specialized benthopelagic behaviour related to prey availability
- Finer scale concurrent telemetry + synoptic data experiments are much needed to understand the ecology of (seamounts) fishes
- Severe management implications

Basis for spatial management



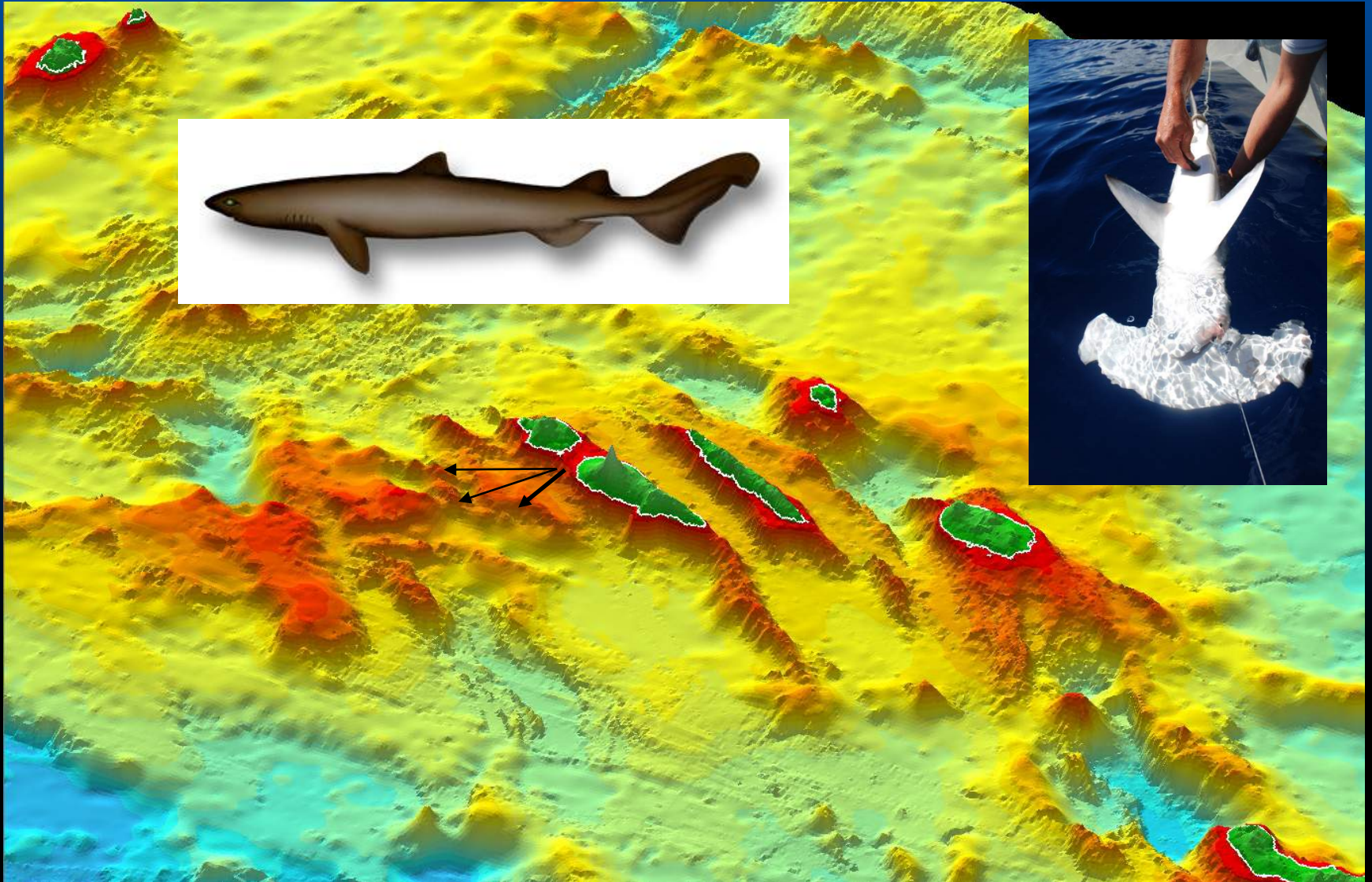
• reserve effect ✓

• larval dispersal ✓?

• spillover X ...but need to consider juvenile spillover!

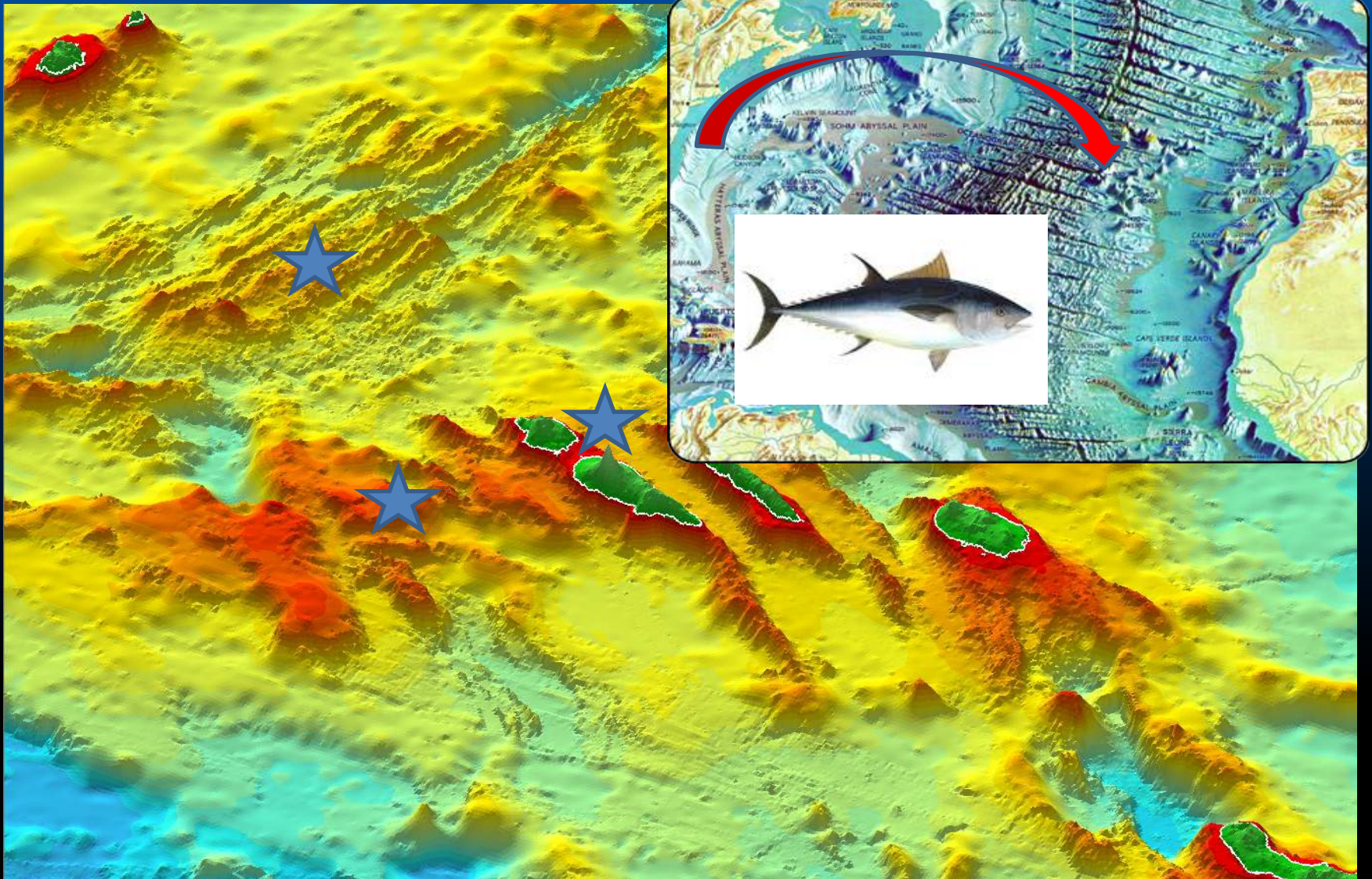
Other species from here and there

The value of a deep sea array for multispecies ecosystem analysis



Other species from here and there

The value of a mid-oceanic listening outpost



Additional questions: afonso@uac.pt

Fieldwork voluntaries, Crews RVs ('Águas Vivas' & 'Arquipélago') and fishing boats, J. Santos (database), D. Bates (OTN), D. King and T. Stone (Vemco), A. Totland (IMR/Norway, acoustics)

