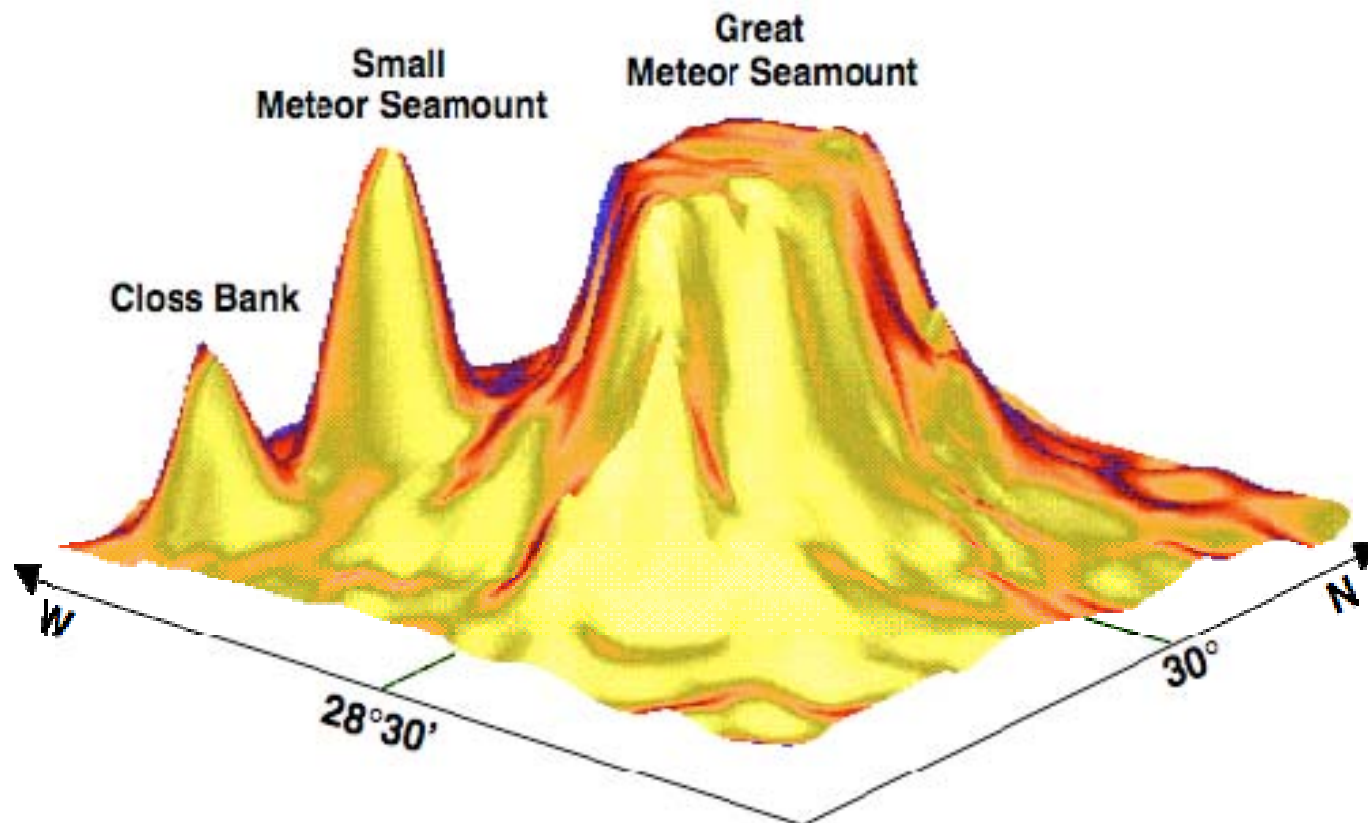


European North-East Atlantic Seamount Studies

Bernd Christiansen, Universität Hamburg, Germany



Seamounts in the NE Atlantic

- Features >1000 m
- 15°N - 90°N and 42°W - 50°E

History of European seamount research

Sources of Information

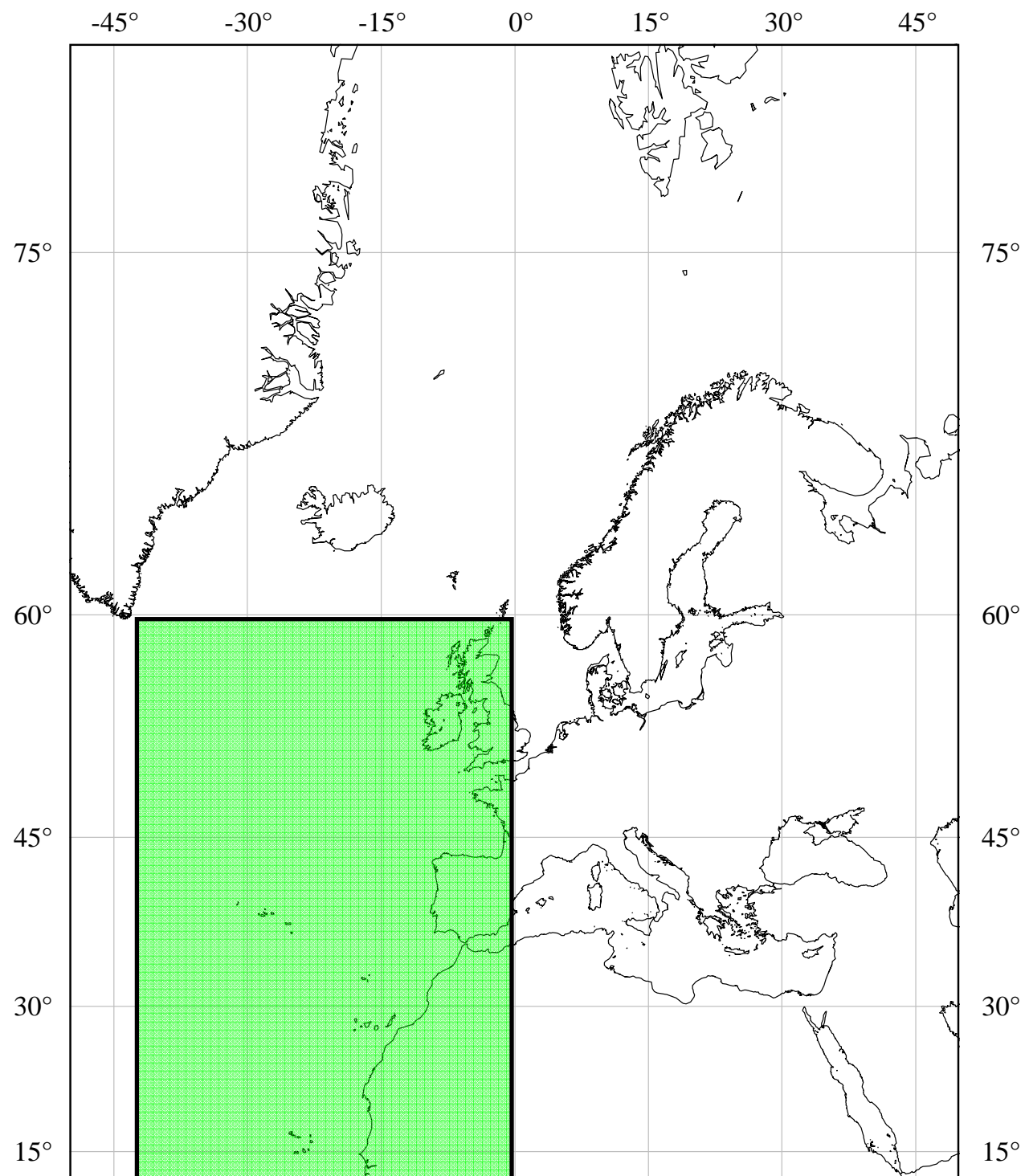
Spatial distribution of European seamount research

Species diversity, distribution and biogeography

Mediterranean Seamounts

Conclusions

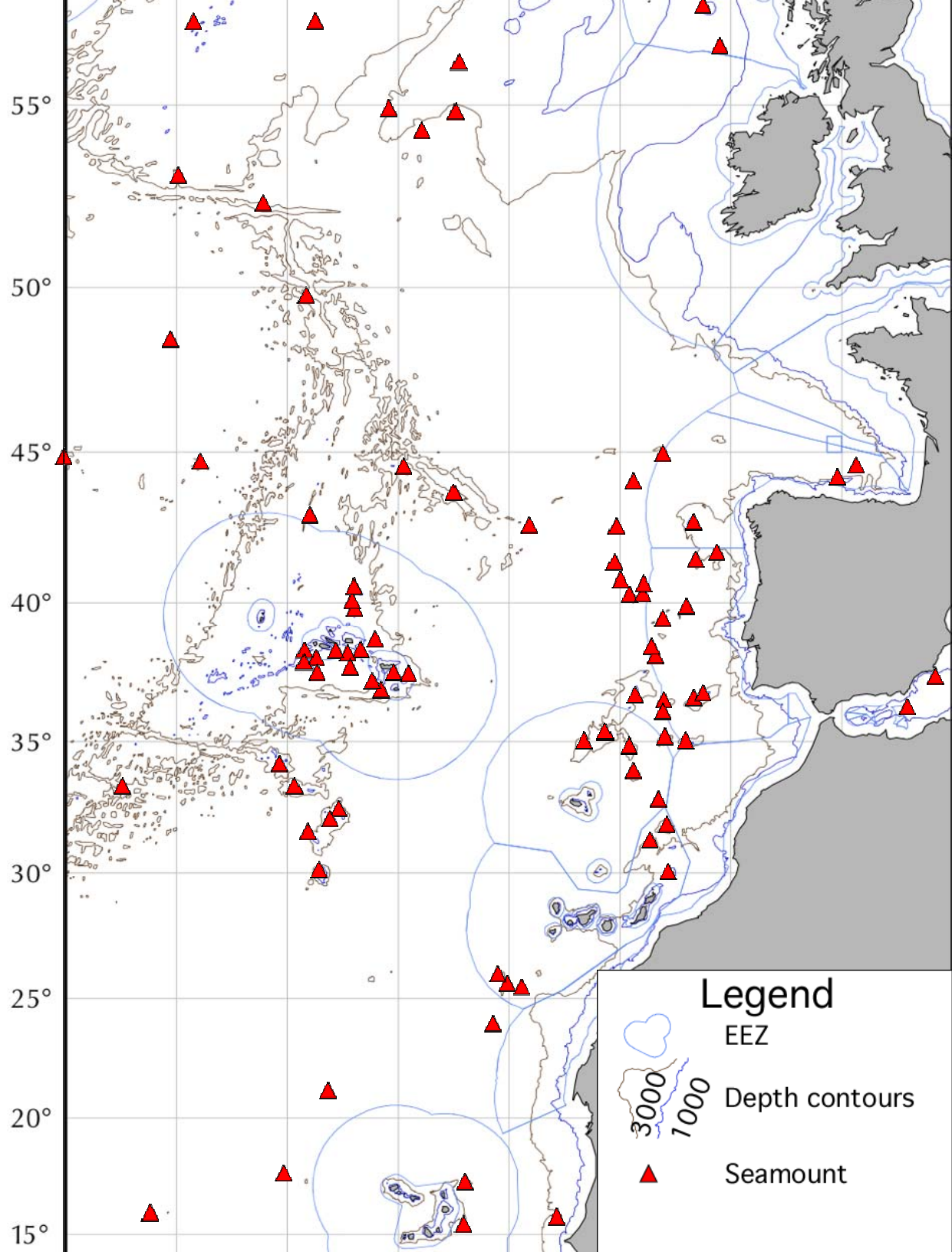
Seamounts in the NE Atlantic



Seamounts in the NE Atlantic

According to GEBCO

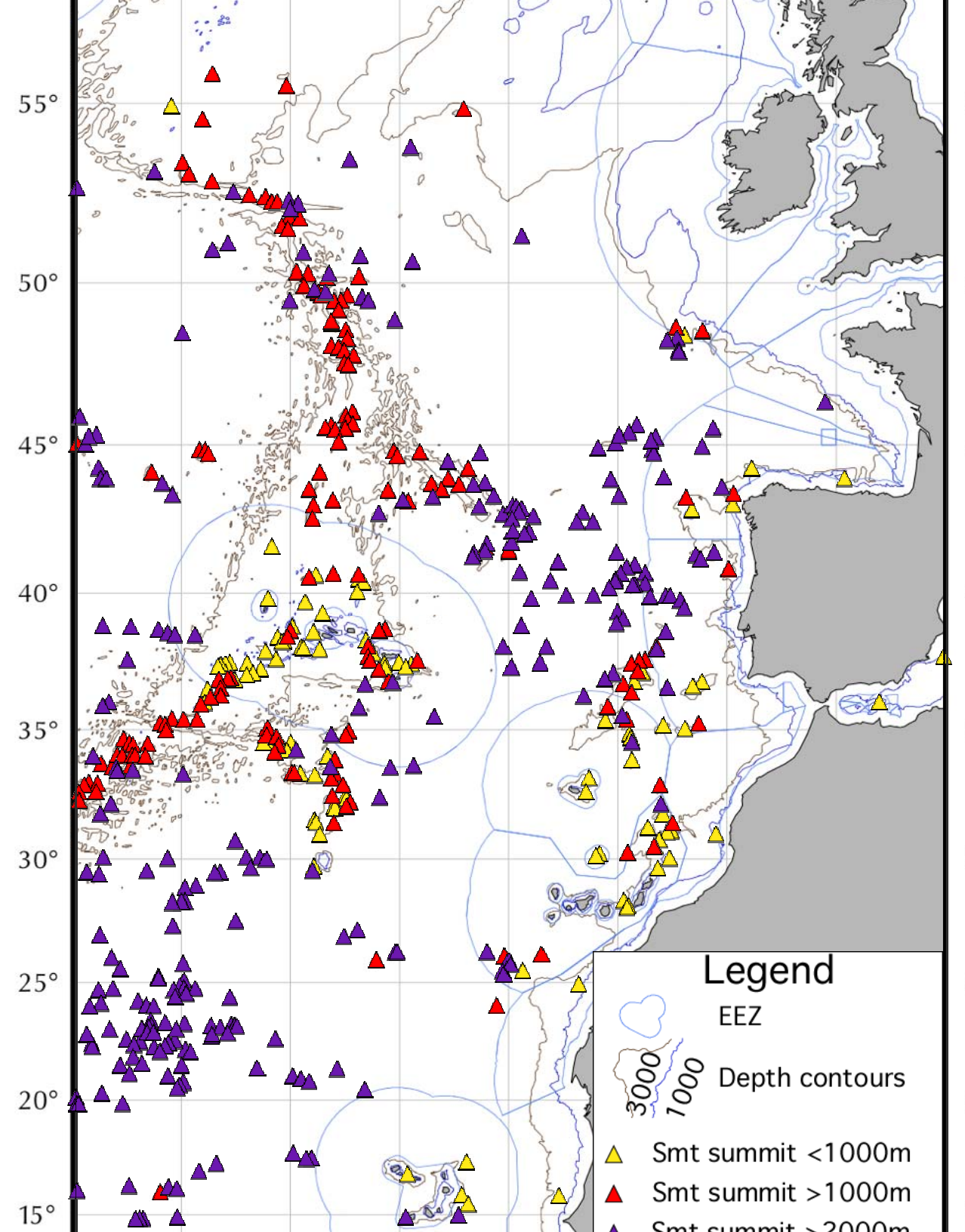
Seamounts
outside 200 nm
deeper 1000 m



Seamounts in the NE Atlantic

According to satellite gravimetry data (Whitingman and Lai 2004)

Seamounts deeper than 1000 m

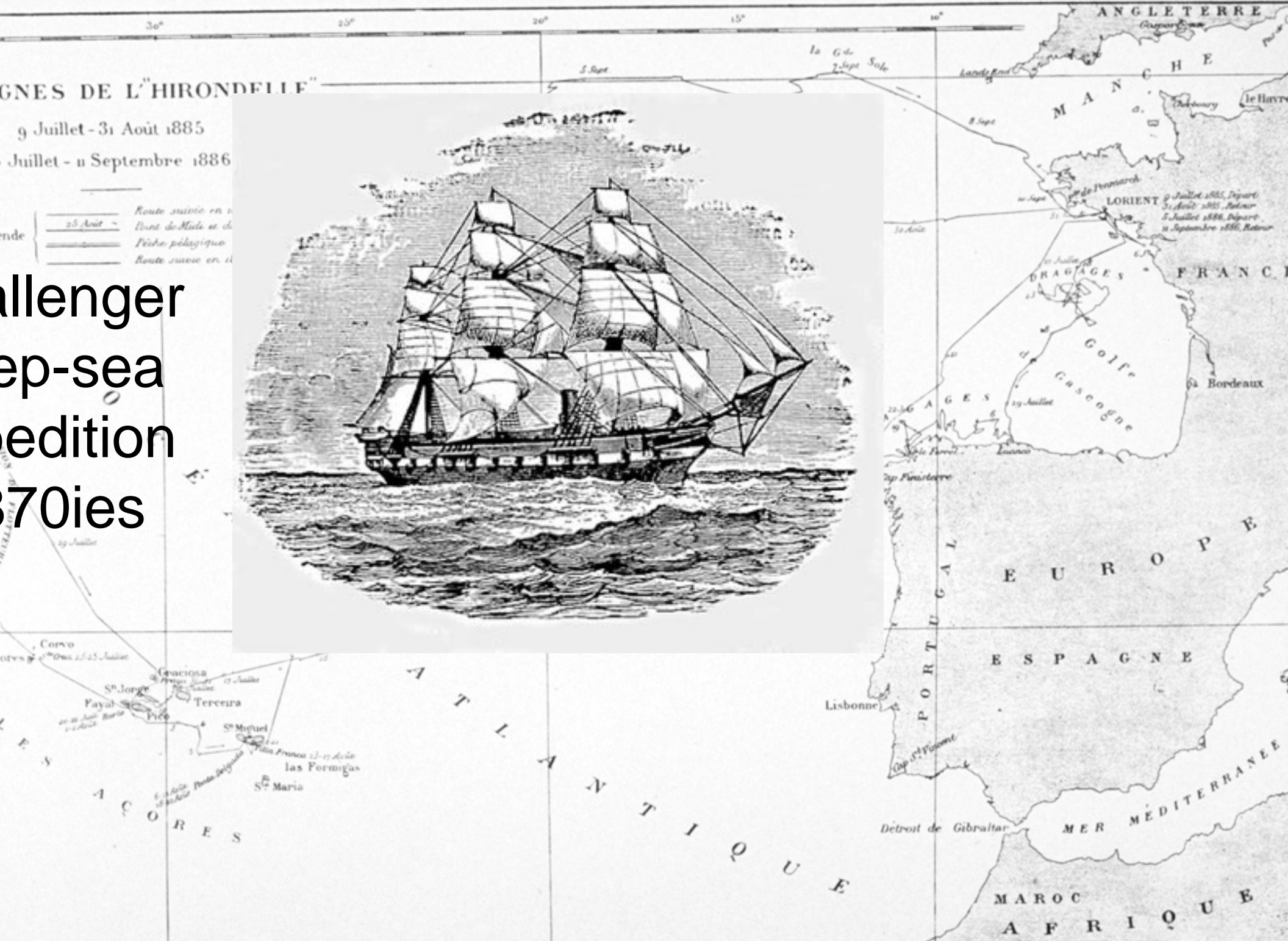
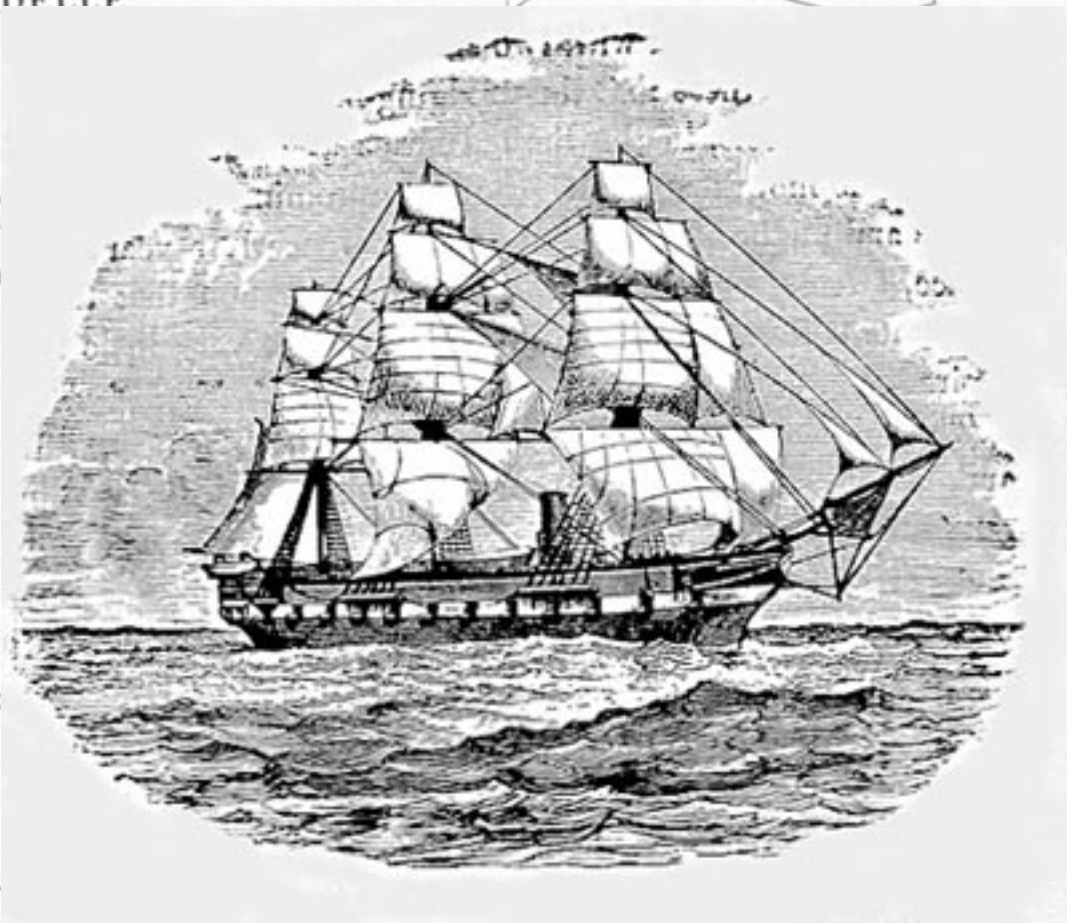


History of European Maritime Research

IGNES DE L'HIRONDELLE"
9 Juillet - 31 Août 1885
Juillet - 11 Septembre 1886

Route suivie en 1885
25 Août - Port de Mada et de
Pêche pélagique
Route suivie en 1886

challenge
ep-sea
edition
70ies



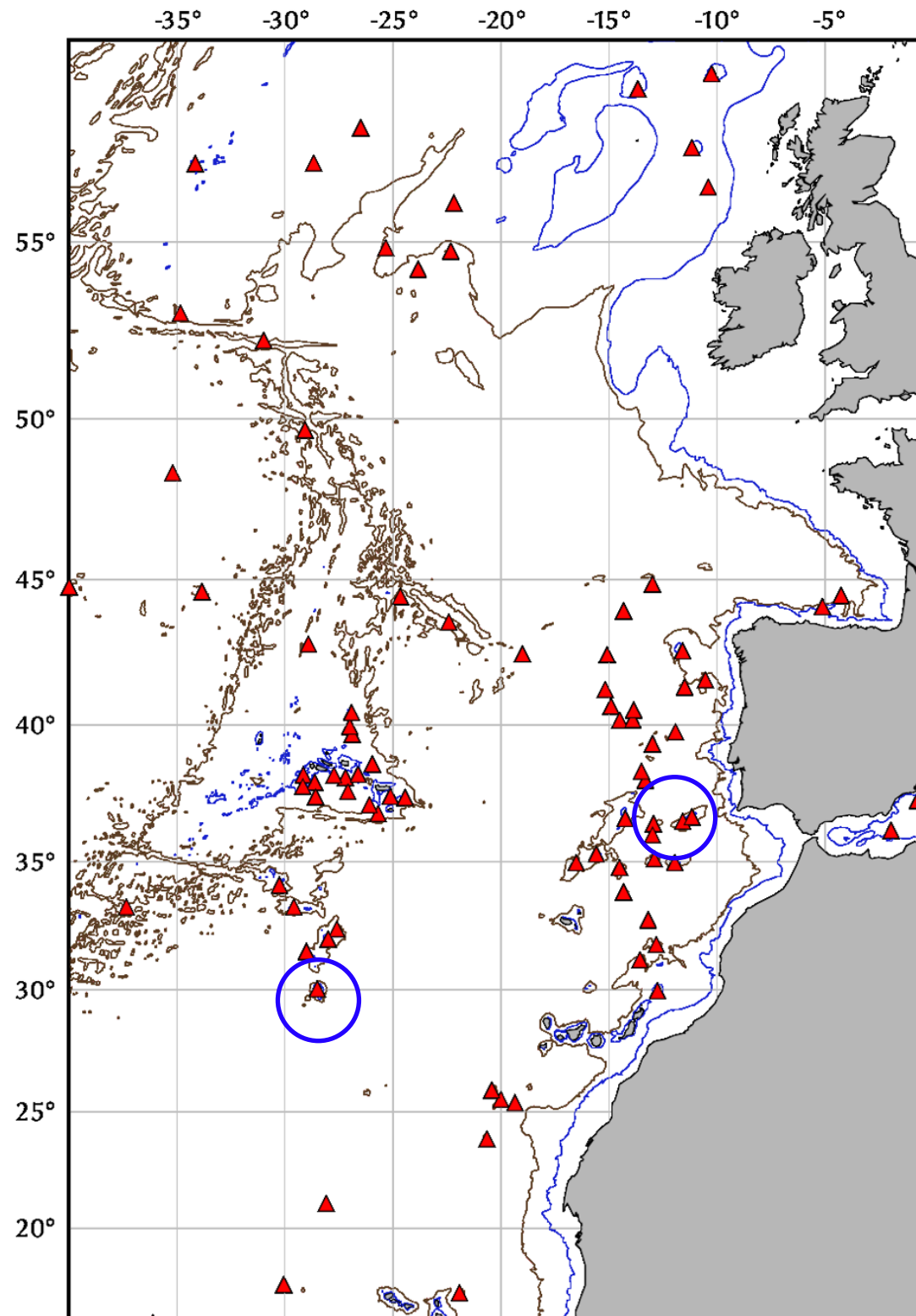
History of European shelf research

Nordatlantische
Expeditionen 1967, 1970 +
1998

R/V Meteor



Great Meteor



History of European Seamount Research

Seamount 1 1987

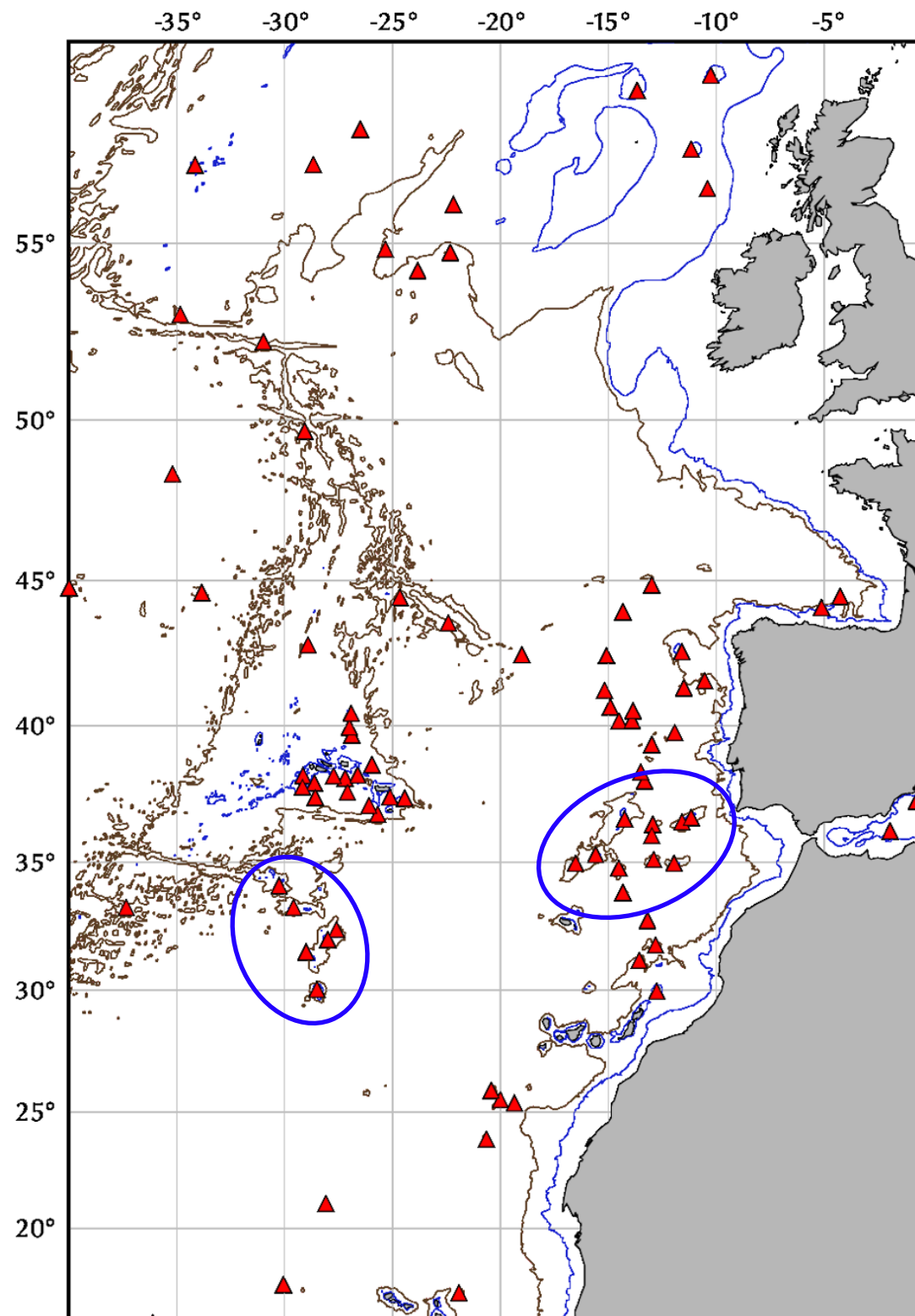
R.V. *Le Noroit*

Antipaterian seamounts

Seamount 2 1993

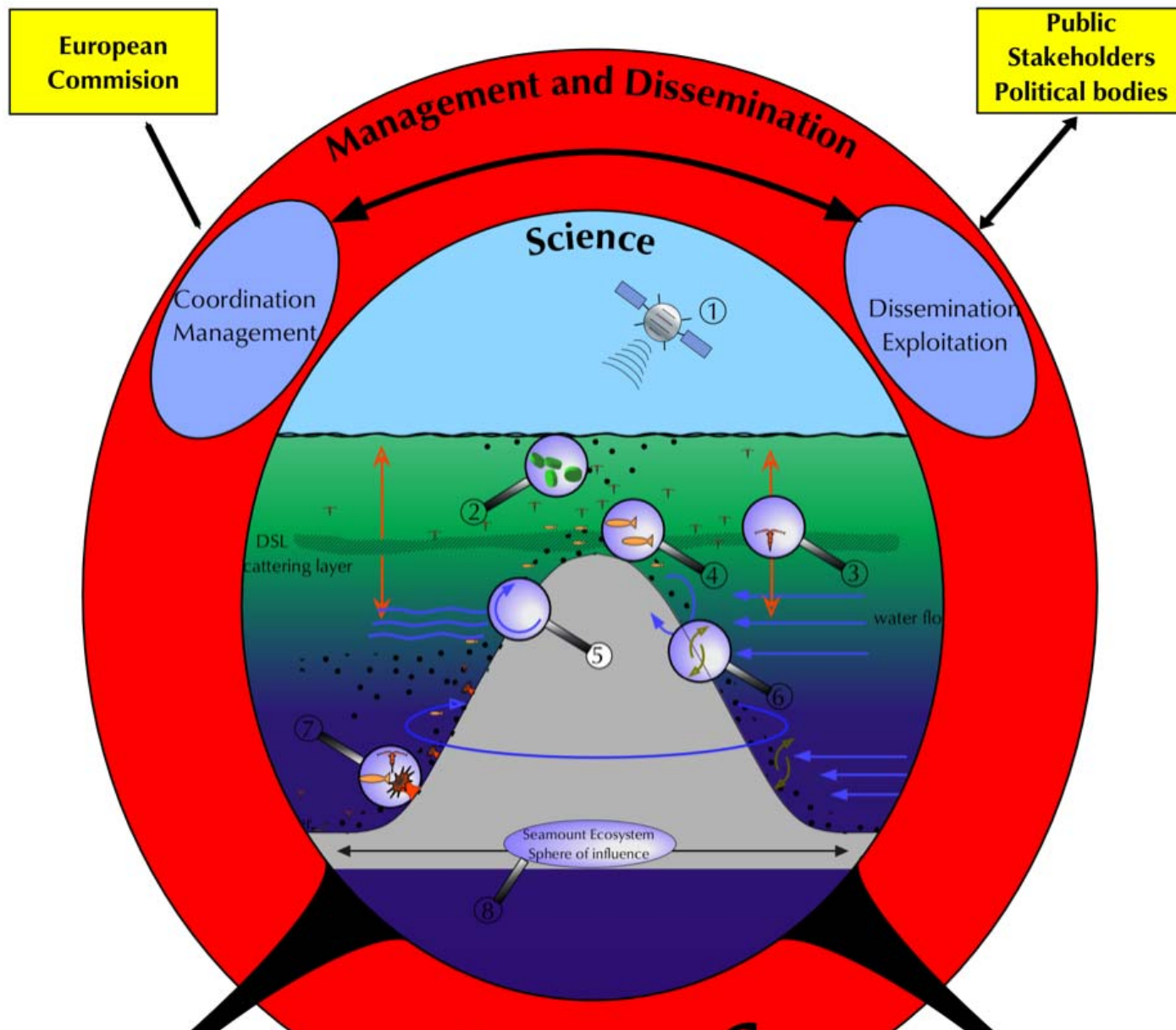
R.V. *Suroit*

Antipaterian - Great Meteor



OASIS

Oceanic Seamounts: an Integrated Study



3-OASIS

Universität Hamburg

Galway, Gaillimh

Centro de Biotecnología



The OASIS project

Project OASIS aims at describing the functioning characteristics of seamount ecosystems.

Objective 1: Physical oceanography

Identify and describe the physical forcing mechanisms effecting seamount systems

Objective 2: Biogeochemistry

Assess the origin, quality and dynamics of particulate organic material within the water column and surface sediment at seamounts.

Objective 3: Biology

Describe aspects of the biodiversity and the ecology of seamount biota, to assess their dynamics and the maintenance of their production.

Objective 4: Modelling

Modelling the trophic ecology of seamount ecosystems.

SIS 2003-2005

V. Poseidon (3)

V. Meteor (1)

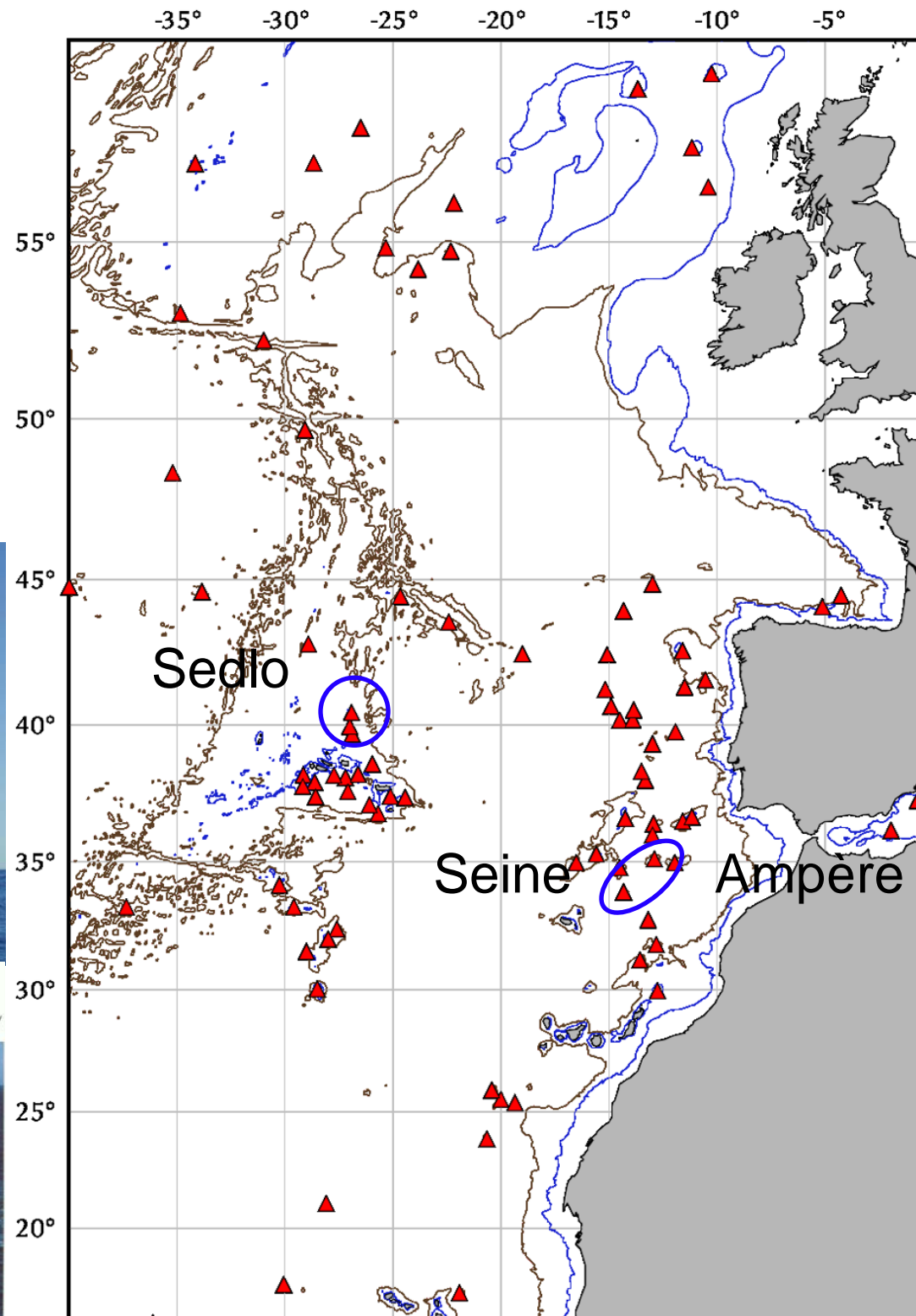
V. Arquipelago (3)

R.S. Discovery (1)

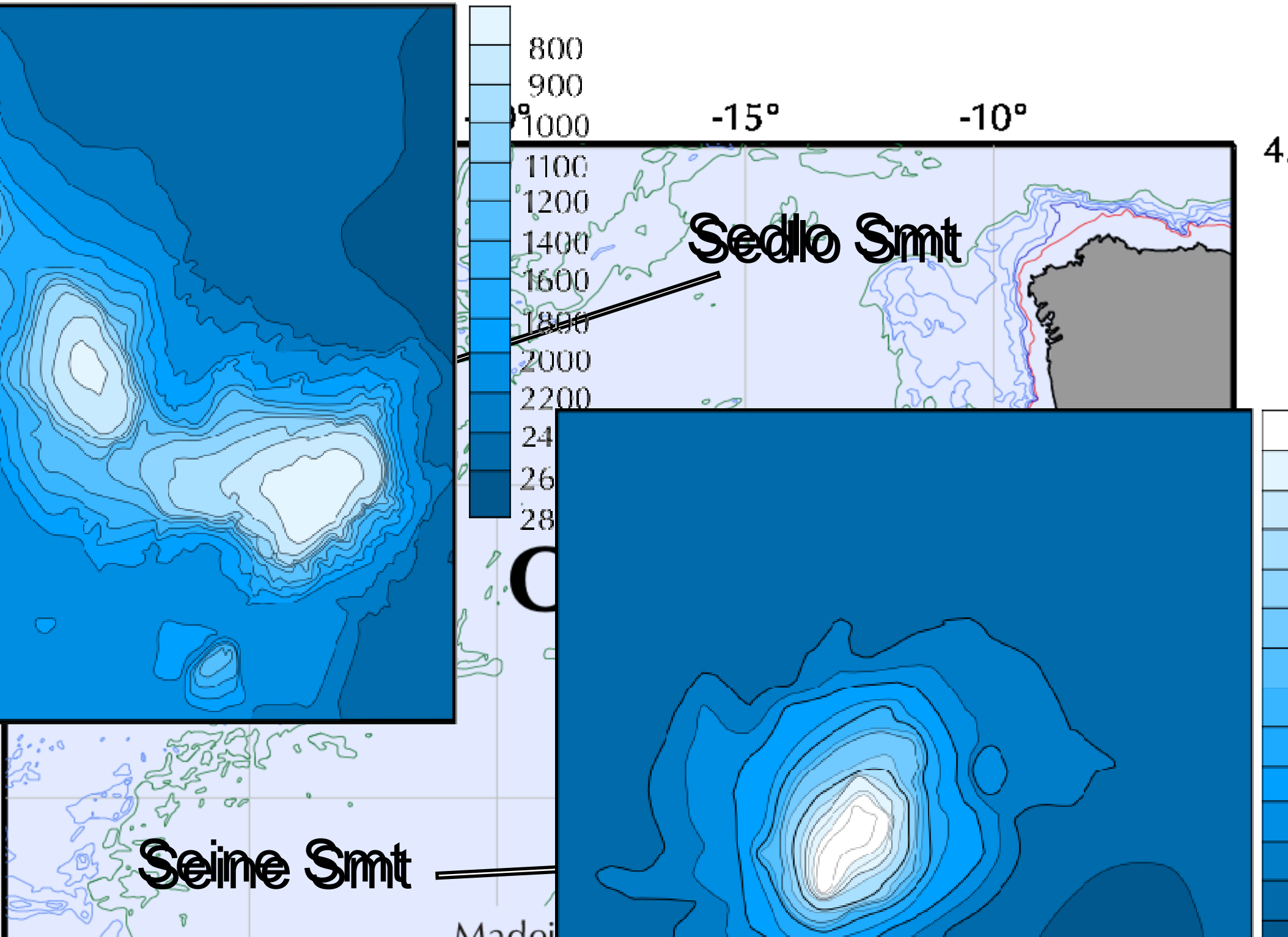


NATURAL ENVIRONMENT RESEARCH COUNCIL
NERC Research Ship Unit

RRS Discovery

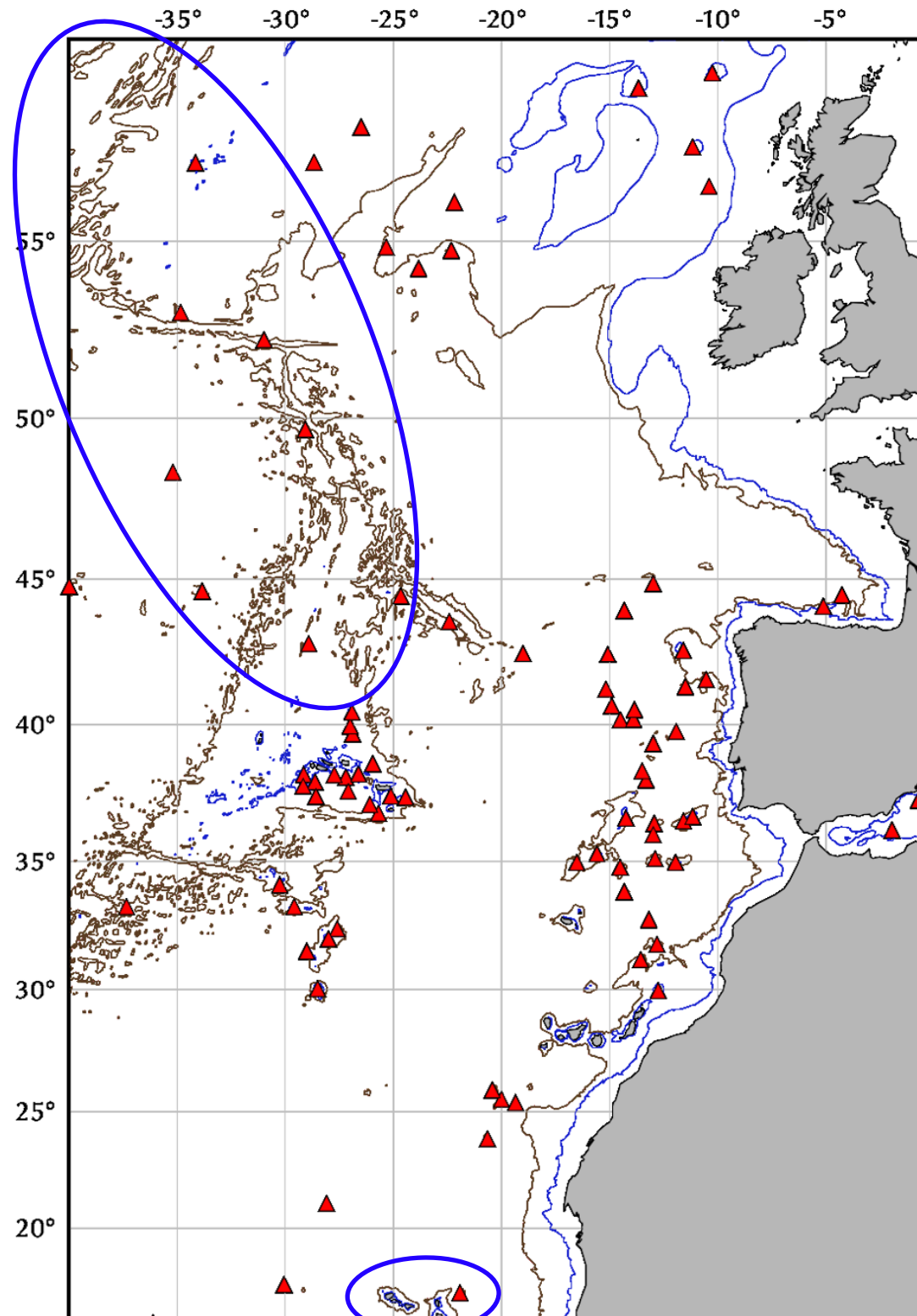


The OASIS project: research sites



MAR-ECO 2004
R.V. *G.O Sars*
Midatlantic Ridge

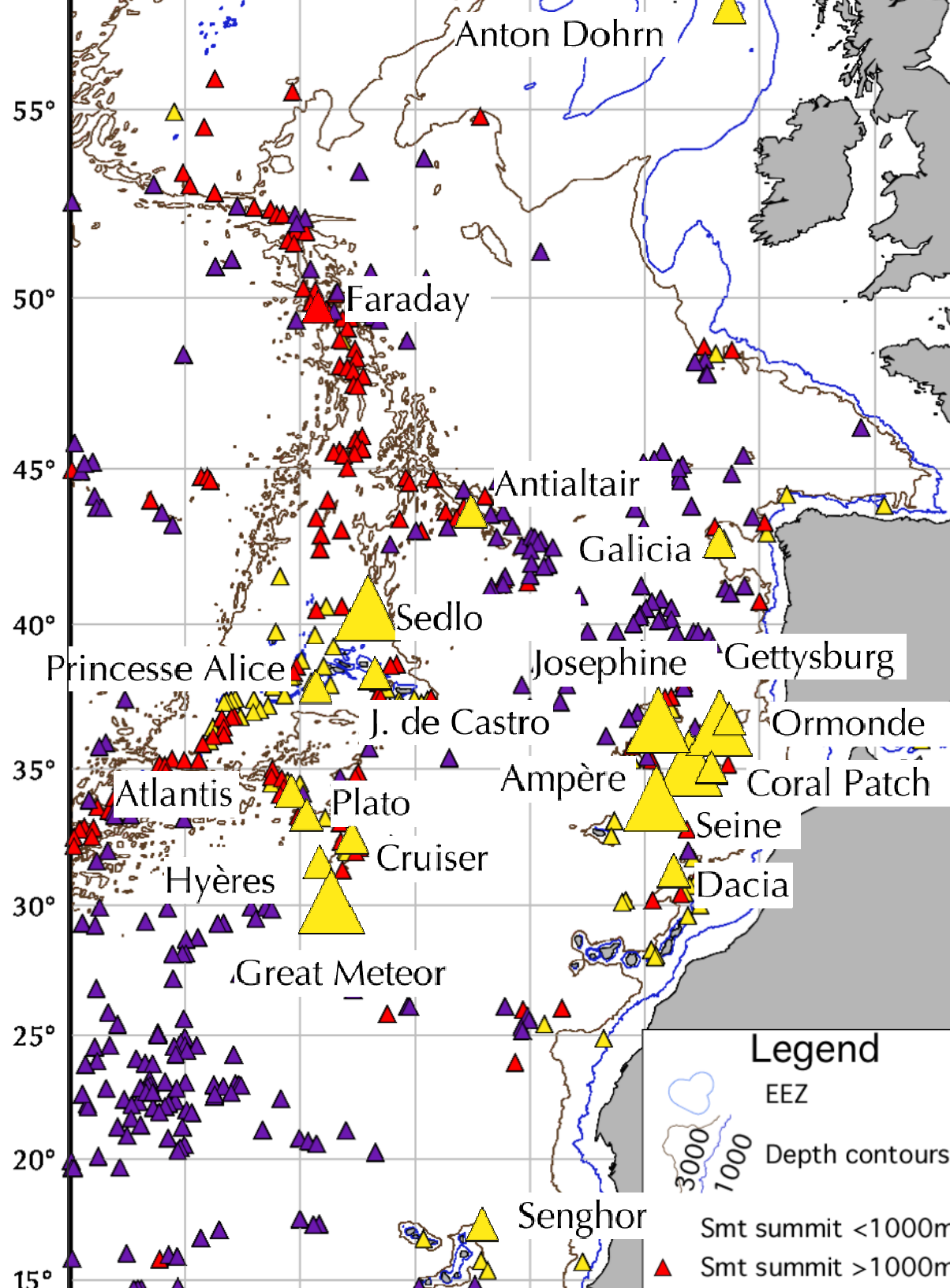
at cruises 2005, 2006
R.V. *Poseidon*
proposal for 2008
R.V. *Meteor*
e Verde seamounts:
Senghor
Noroeste



- Kaufmann and Wilson (1991)
- WWF/Rogers (2001)
- Fock and von Westernhagen (2004)
- Gubbay/OASIS 2003
- Beck et al./OASIS (2005)
- Seamounts Online

European smt research

points which
been
ed
ically:
(out of more
600)
y only
it and upper
regions



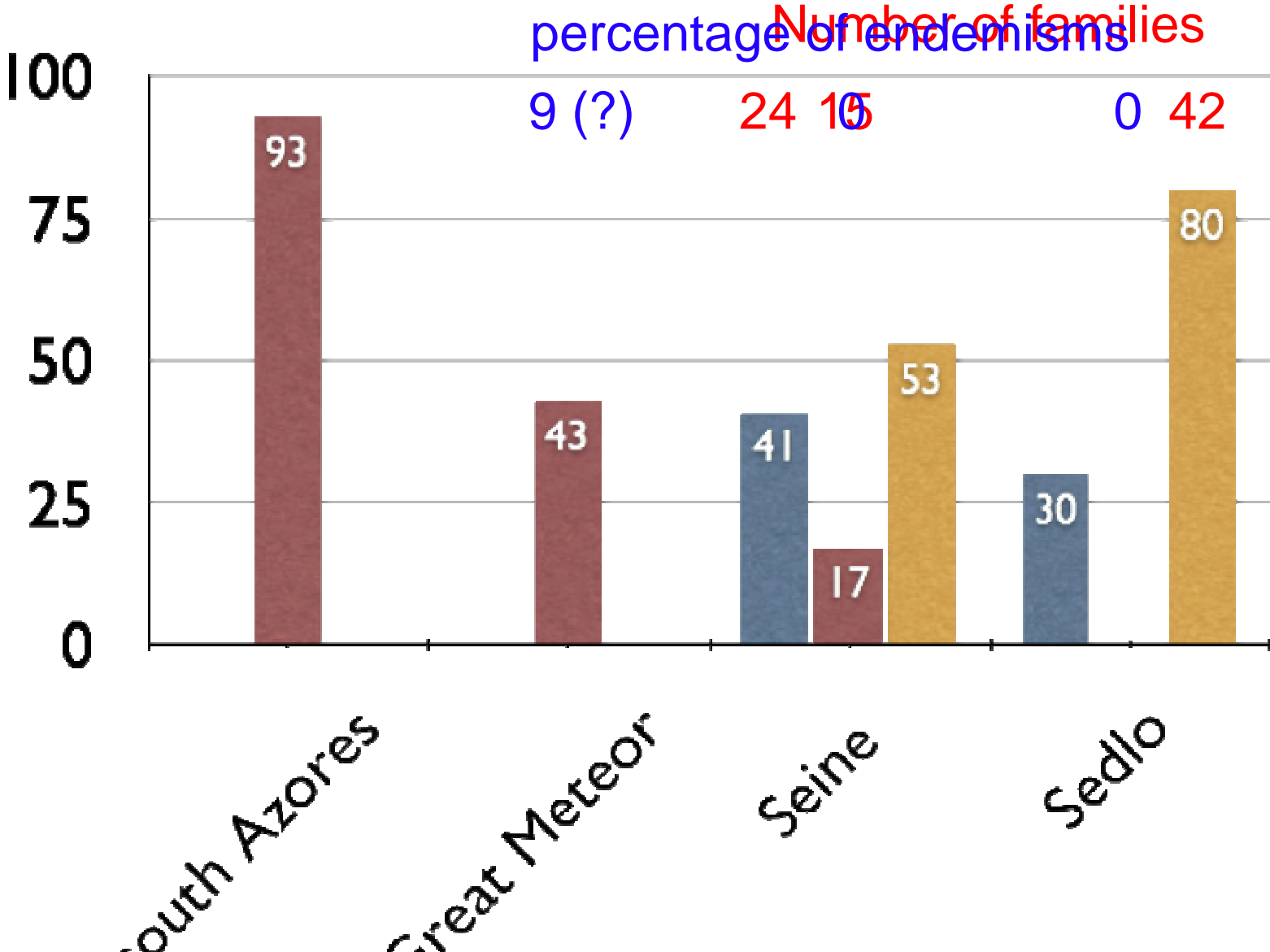
Taxonomic groups

- Fish: several seamounts
- Molluscs: Lusitanian seamounts, Azores
- Cnidarians and other macrobenthos: several seamounts in the region
- Meiofauna groups (nematodes, harpacticoids): Gt. Meteor, Seine, Sedlo
- Zooplankton, incl. ichthyoplankton: several seamounts

biogeography

Fish

Engines
awl
combined

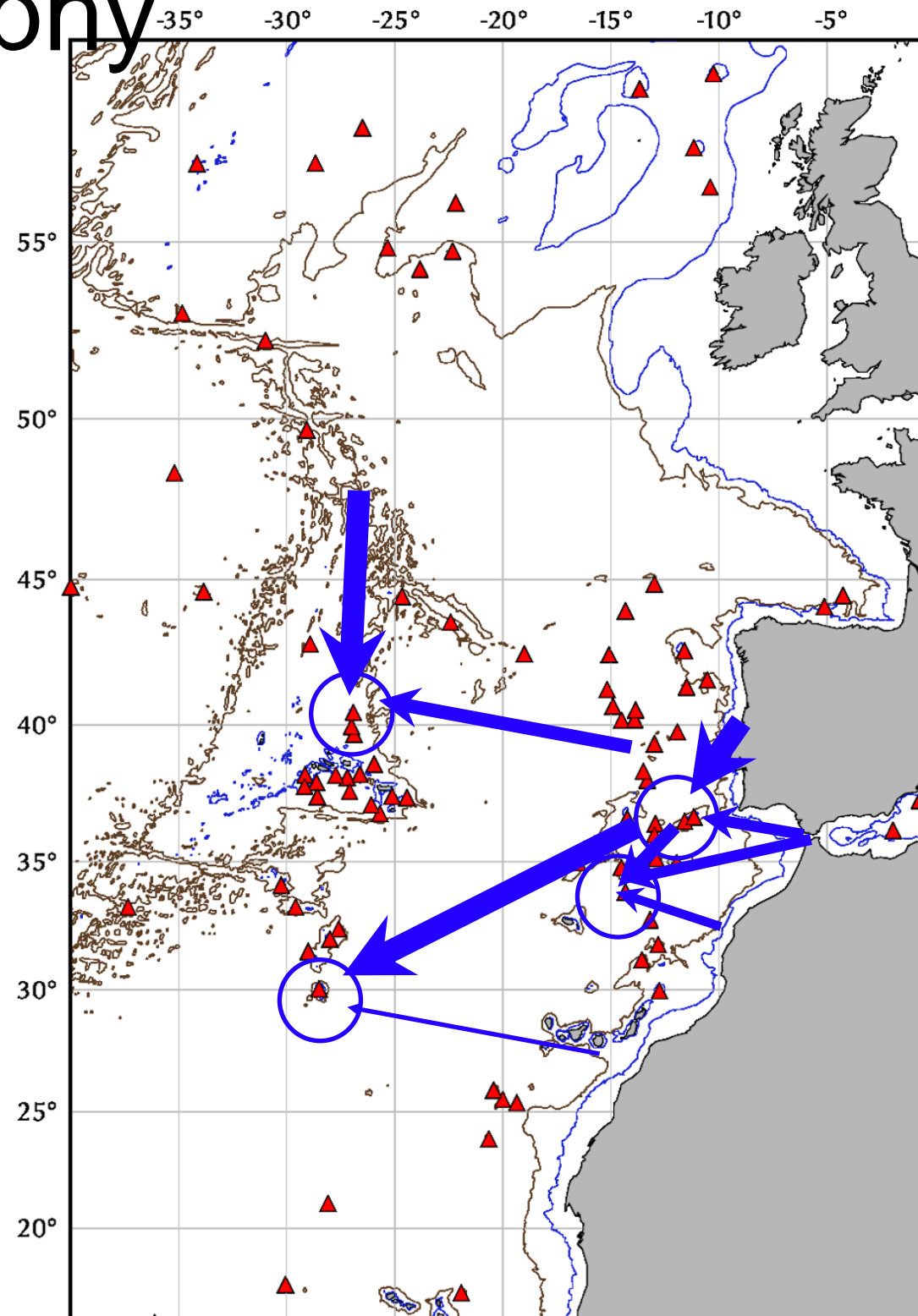


Distribution, biogeography

Fish

Area: NE- Atlantic,
MAR

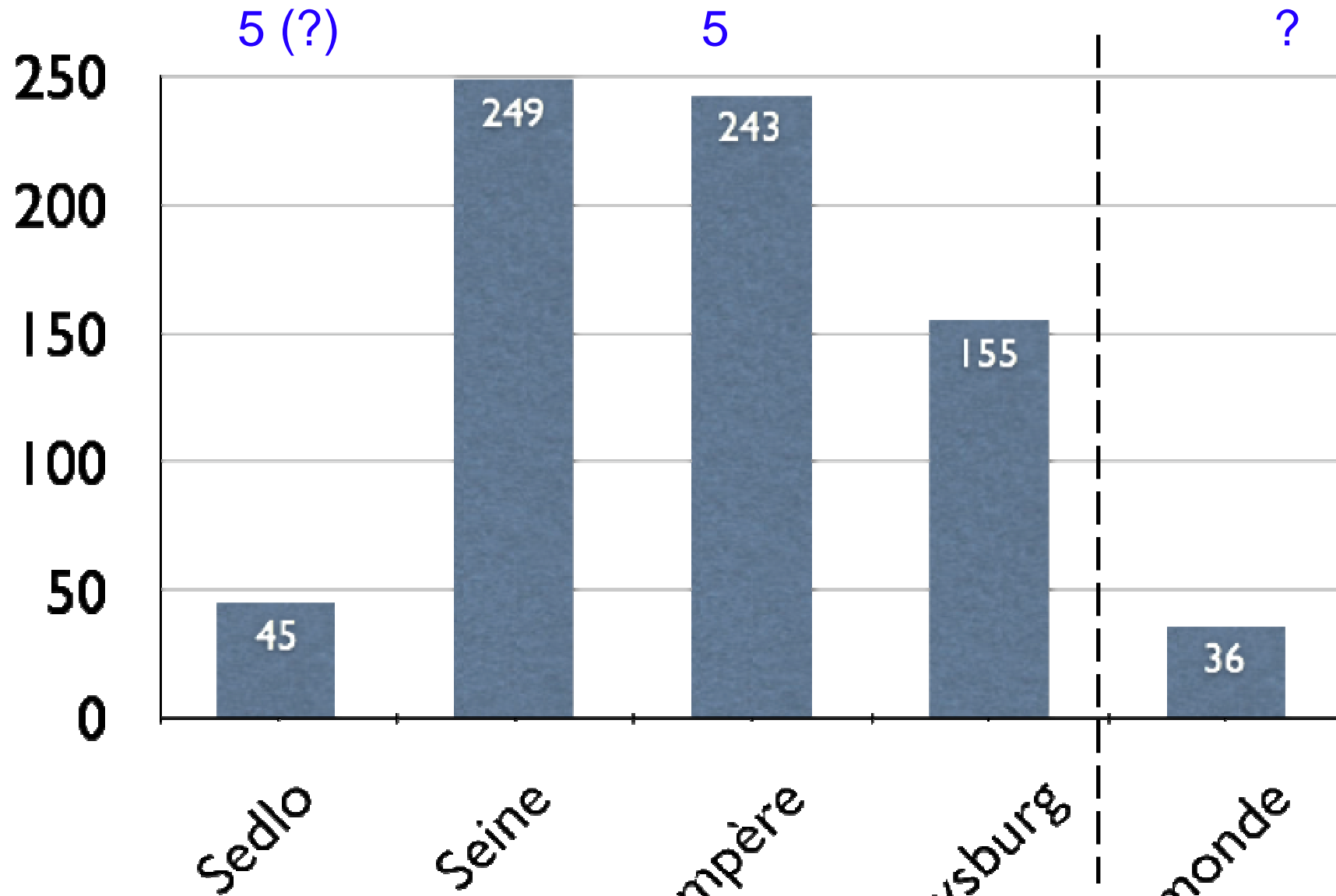
Basins: Rhine, Seine, Great
Oceans: SE-European
Mediterranean, W-
African shelf



distribution, biogeography

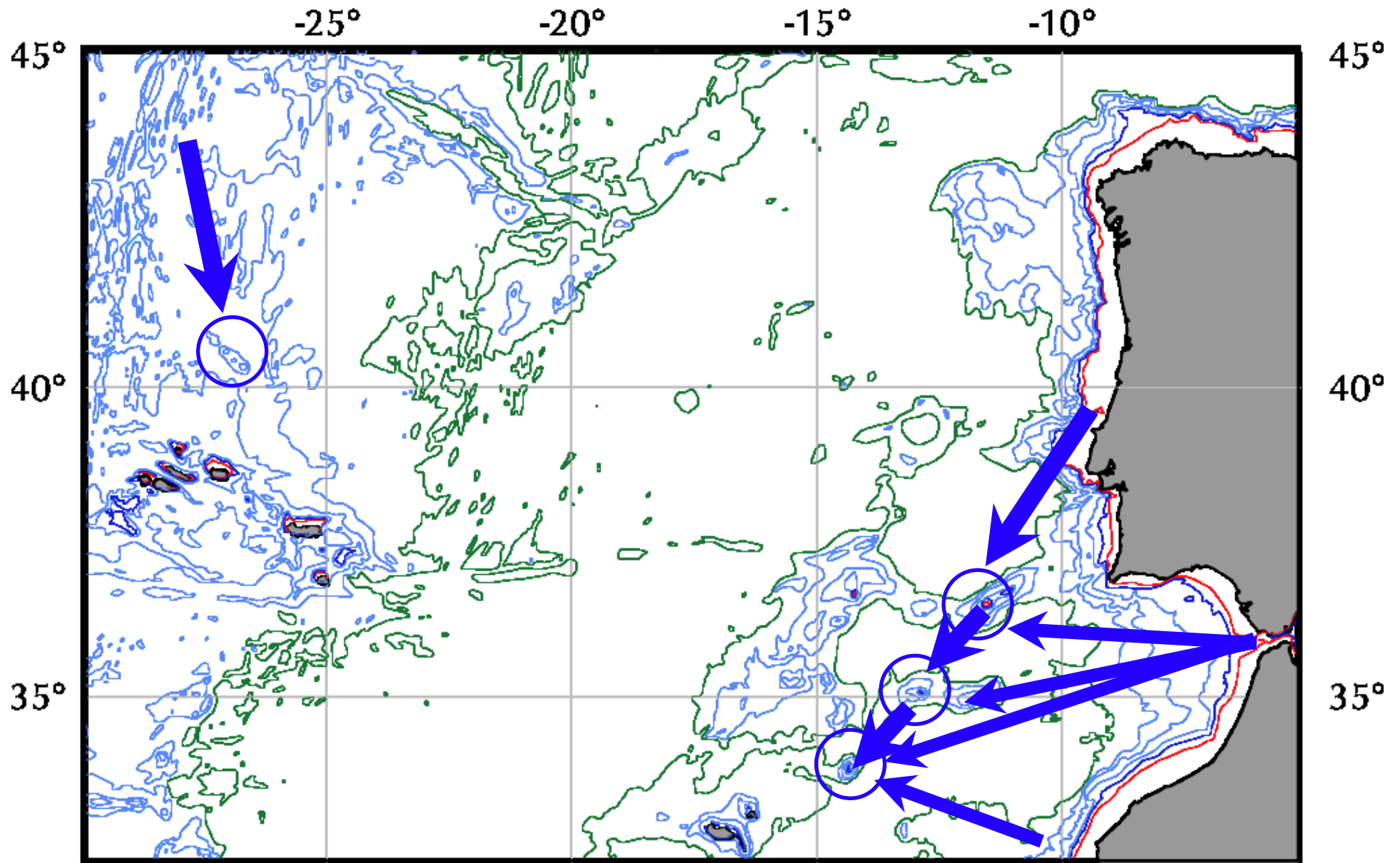
Macrofauna: Mollusca

percentage of endemisms



distribution, biogeography

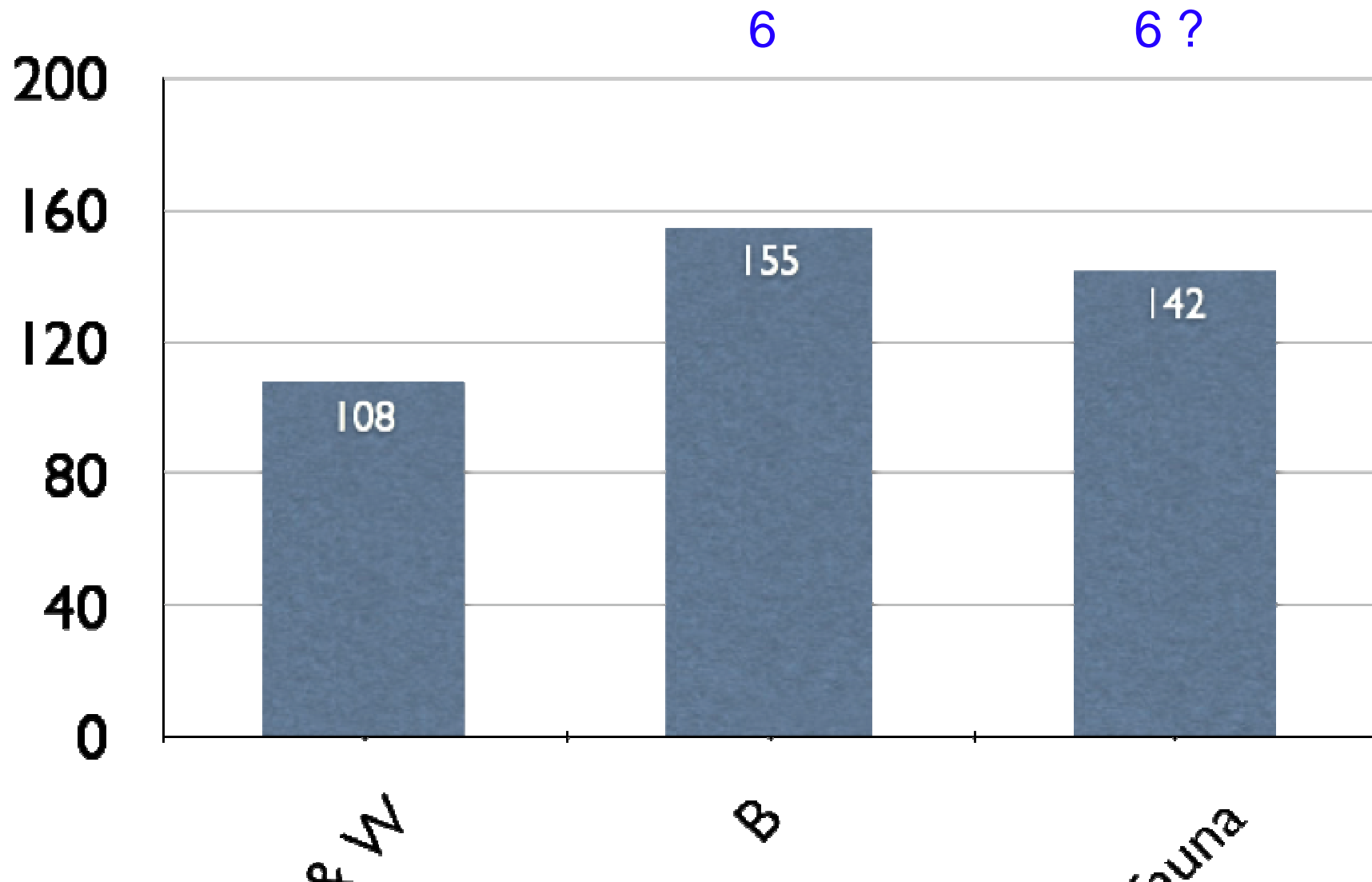
Macrofauna: Mollusca



distribution, biogeography

Great Meteor: invertebrates

percentage of endemisms

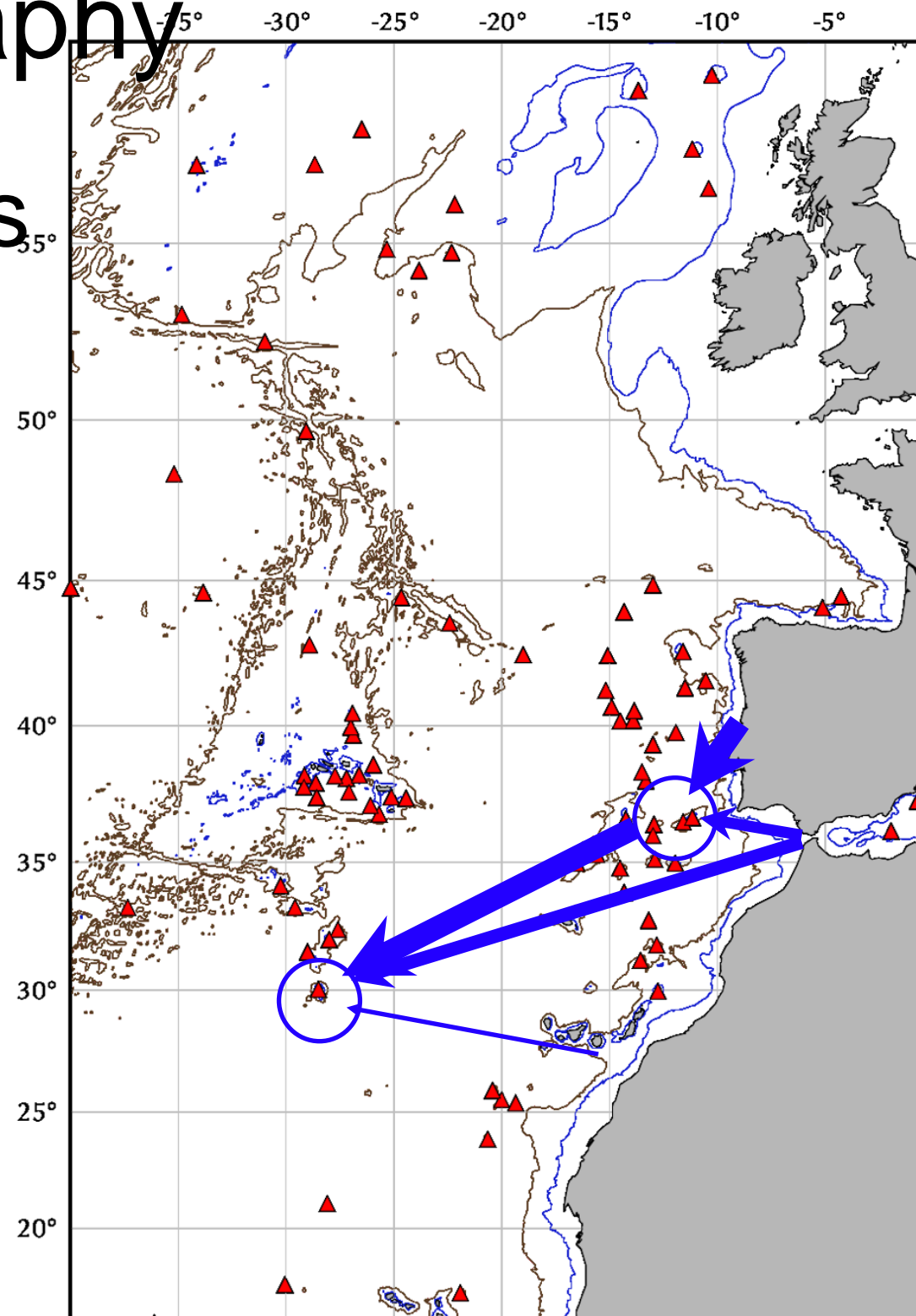


tribution, biogeography

Meteor: invertebrates

do: NE- Atlantic,
MAR

hine, Seine, Great
or: SE-European
Mediterranean, W-
African shelf



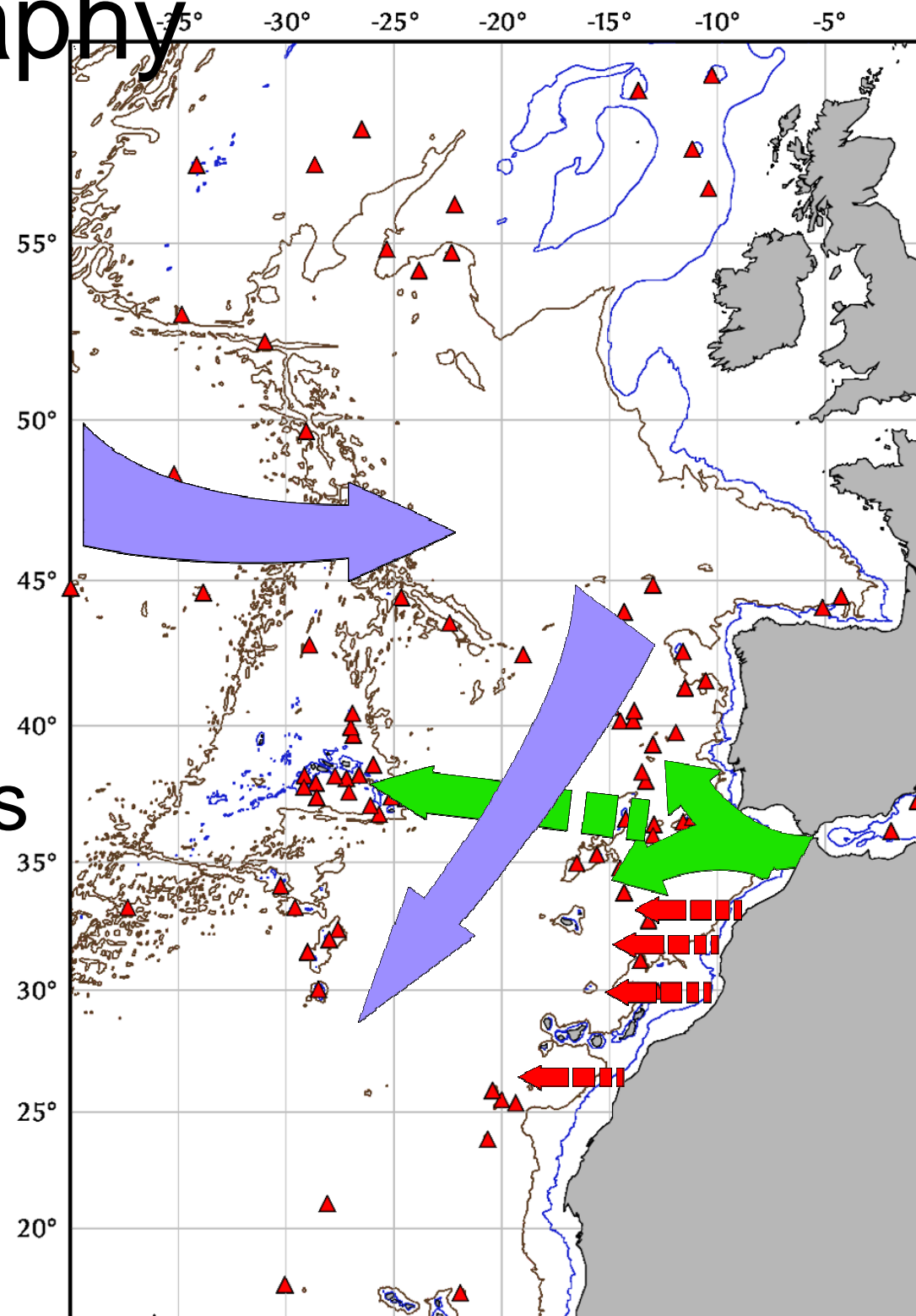
tribution, biogeography

water masses

antic gyre

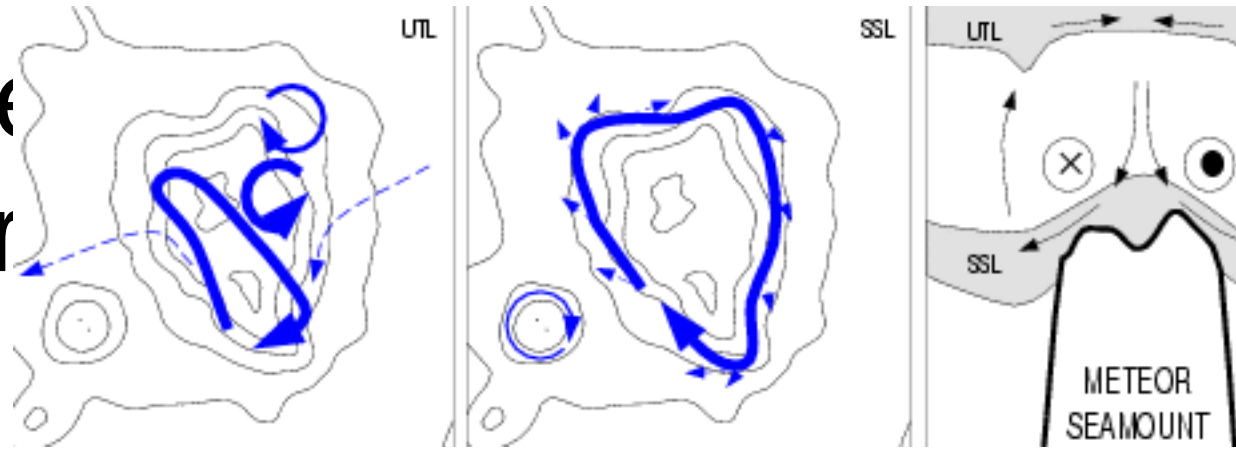
erranean outflow

frican upwelling filaments



distribution, biogeography

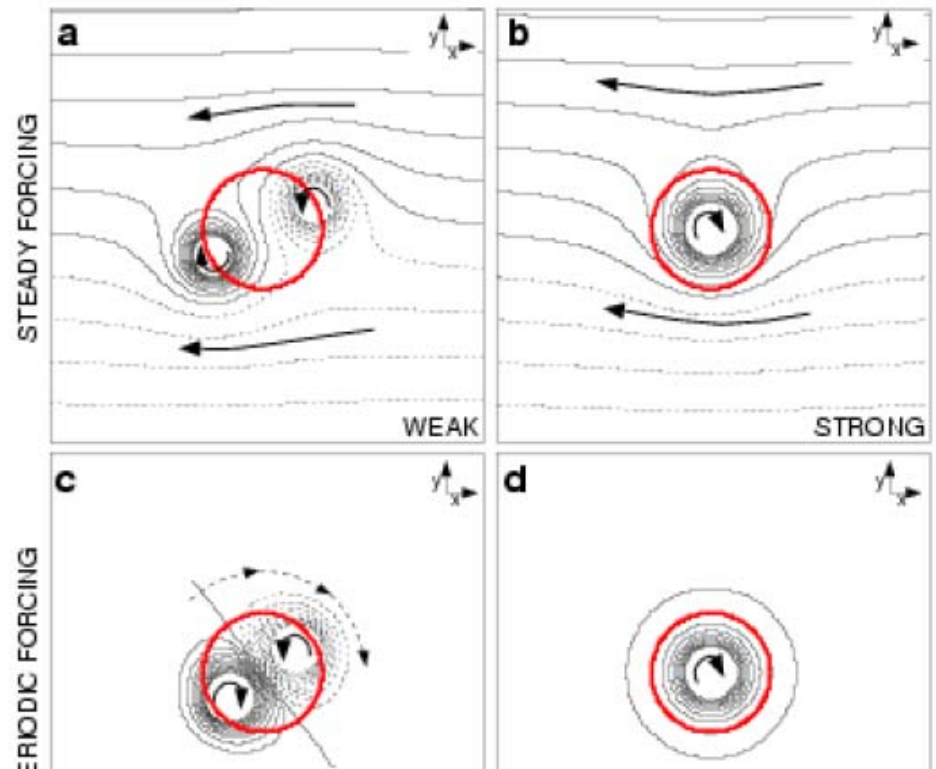
influence of small scale circulation, e.g. Taylor columns



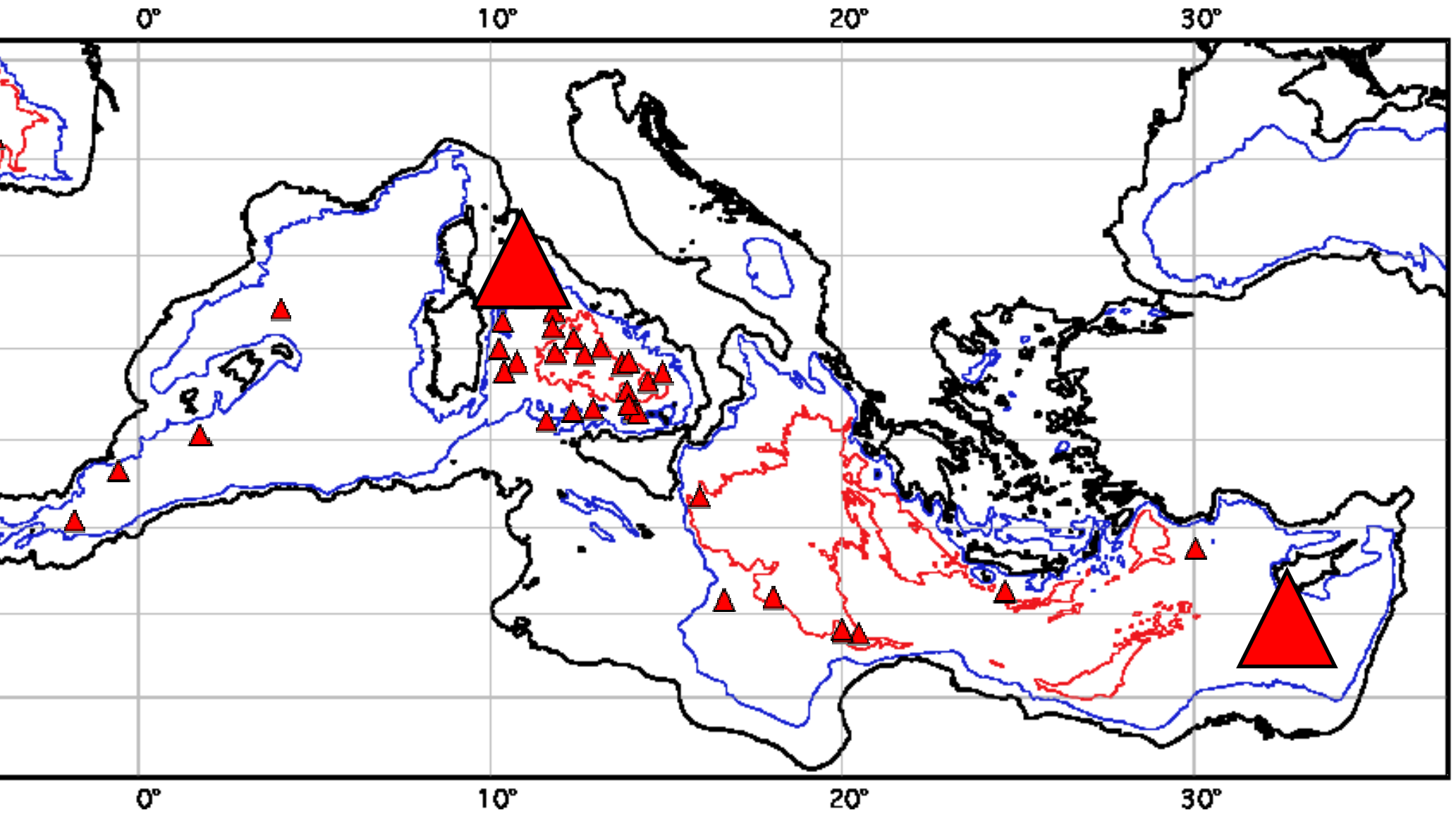
Mohn & Beckmann

plankton distribution

asymmetric distribution of biogeochemical sediment parameters - benthic



Mediterranean seamounts



36 seamounts

knowledge

Biological seamounts research in the NE Atlantic has concentrated on only a few sites

In a few exceptions, only the shallower parts (<1000m) have been considered

Deep seamounts have been sampled biologically

Biodiversity at seamounts is probably enhanced, but certainly different, but only basic approaches to analyzing interactions between fauna and habitat have been made

Biogeographical connections to the European and African shelves and to the Mediterranean have been

Recommendations for further

systematic inventory (and analysis!) of seamount species, and a biogeographic assessment, based on existing information and probably supplemented by genetic studies

• Sample more seamounts, including comprehensive sampling of hardsubstrate fauna

• Deep seamounts

• Deeper regions of shallow seamounts

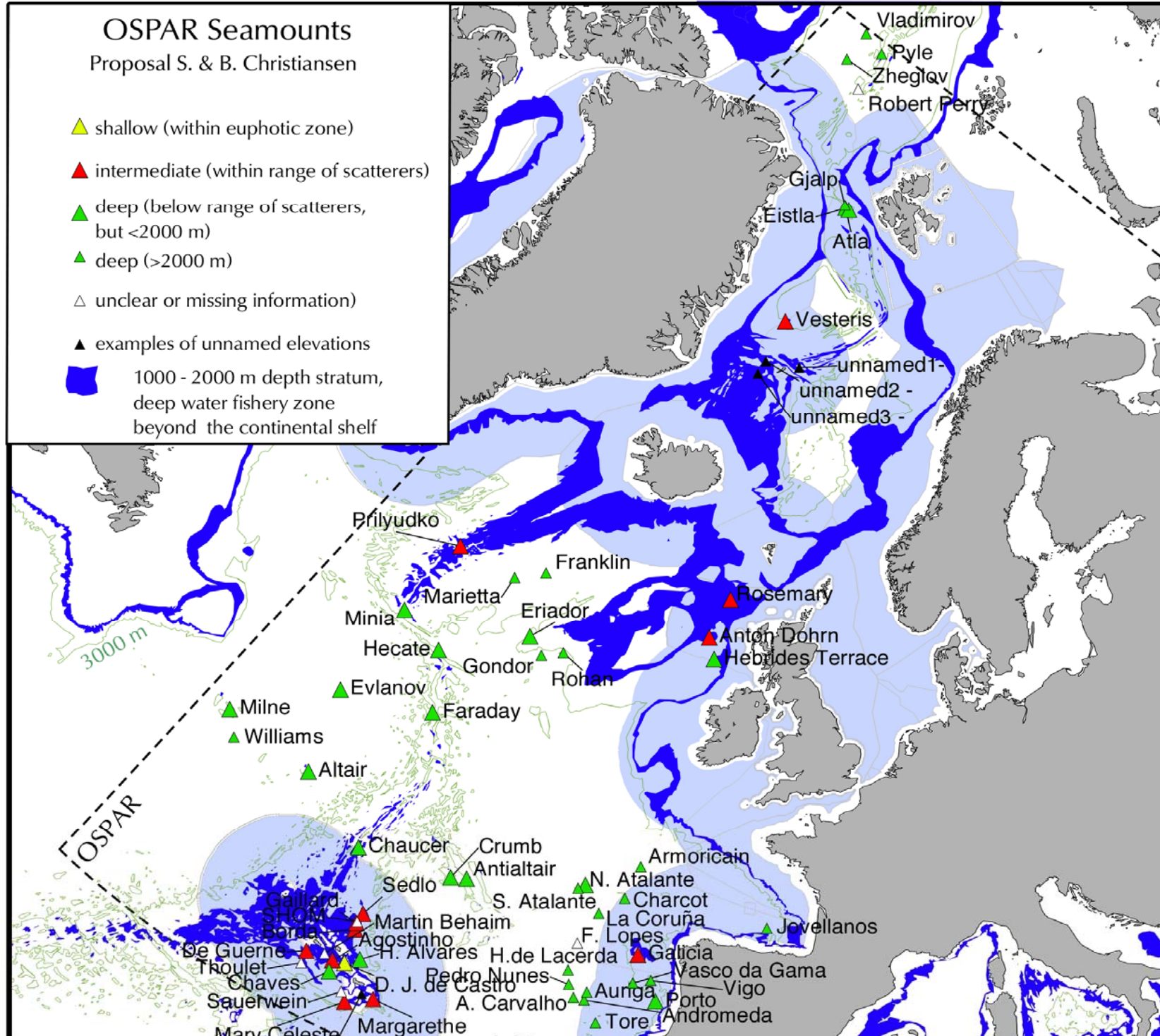
• Seamounts from undersampled areas

•

• Include oceanographic and biogeochemical information

OSPAR, EU and NEAFC

Convention: 40
national



OSPAR, EU and NEAFC

OSPAR list of threatened and declining species and habitats

- OSPAR adopted binding criteria for the selection of species and habitats and the initial list of threatened and/or declining species and habitats (2003)
- The list includes a number of commercial fish species, e.g. Orange Roughy, and many offshore features such as coral reefs, hydrothermal vents and seamounts.
- Features on this list are of priority concern for the implementation of management measures, including the designation of marine protected areas (MPA) in the future.

OSPAR, EU and NEAFC

OSPAR network of Marine Protected Areas (MPA)

- OSPAR adopted the goal to implement an "ecologically coherent network of well-managed MPAs (2003)
- This will include a representative selection of seamounts inside and outside national jurisdiction.



OSPAR, EU and NEAFC

Habitats Directive

- All European Member States have to implement the EU Habitats Directive up to the outer boundary of their 200 nm zone
- The hard substrate habitats of seamounts (“reefs”) are then subject to conservation measures such as protected areas – 30 to 60 % of the total habitat will have to figure in an EU-wide so-called Natura 2000 network of protected sites..
- Currently, only 2 NEA seamounts are protected as MPAs both in the Azores where another seamount will be designated as a nature reserve soon

OSPAR, EU and NEAFC

- European Council (EC) Regulation No 1568/2005 In implementing the objective of an ecosystem approach to fisheries management of the reformed Common Fisheries Policy, in September 2005 a regulation was adopted for the protection of deep-water coral reefs from the effects of fishing in large sea areas including all seamounts around the Azores, Madeira and Canary Islands
- NEAFC decided to close 5 seamounts and a section of the Reykjanes Ridge to bottom touching gear for 3 years, when a revision would take place