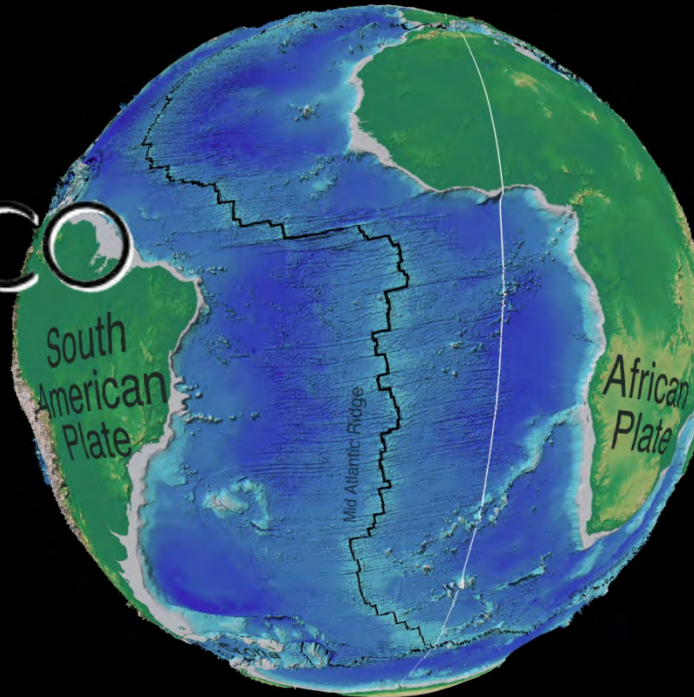




Surveying the patterns of life in the understudied depths of the South Atlantic: continuing the legacy of the MAR-ECO project (CoML) into the southern Mid-Atlantic Ridge

José Angel A. Perez¹; Andrey Gebruk²; Alexei Orlov³; Stanislav Kobylansky²; Andre Lima¹

¹Universidade do Vale do Itajaí (UNIVALI), Brazil

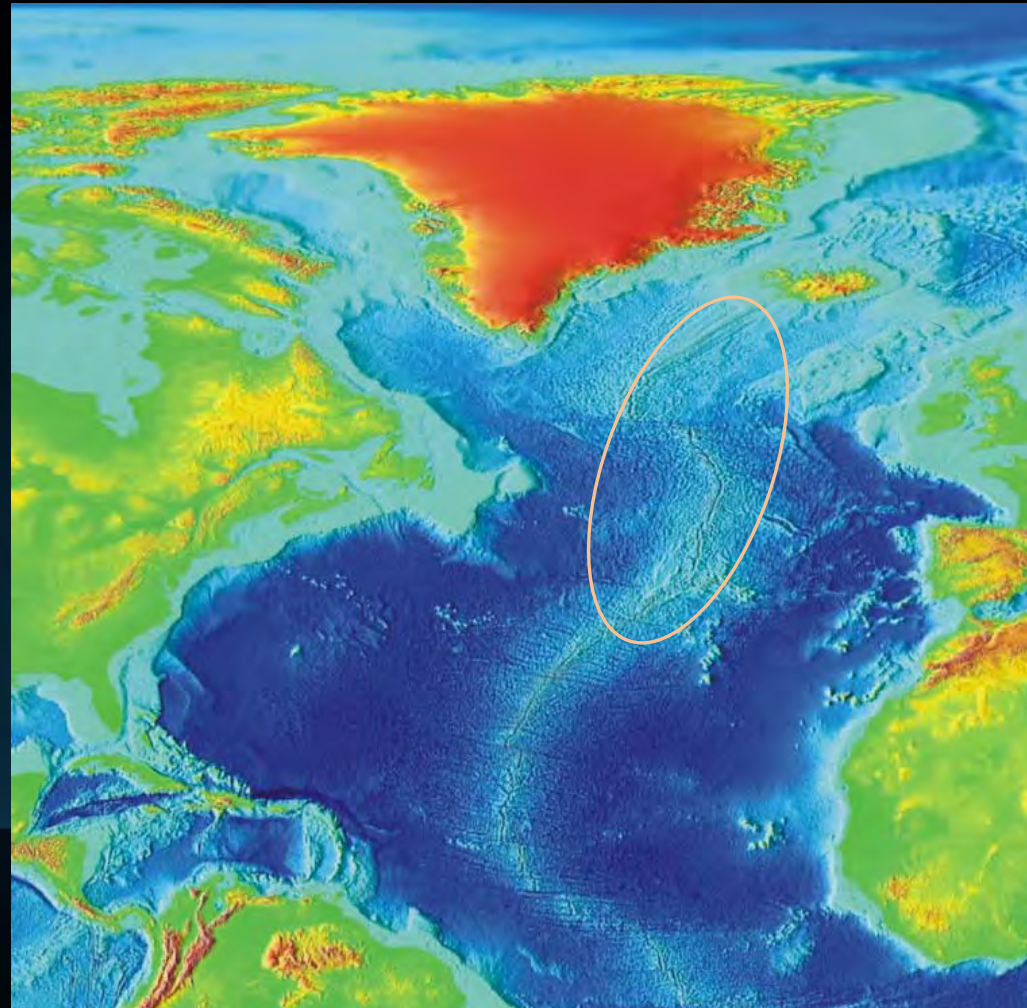
² Shirshov Institute of Oceanology, Russian Academy of Sciences (IORAS), Russia.

³Russian Federal Research Institute of Fisheries and Oceanography (VNIRO), Russia

The Mid-Atlantic Ridge (MAR) is the central morphological feature of the Atlantic Ocean Basin.

In 2001 the MAR-ECO Project was set out to increase knowledge on this vast and largely unknown habitat

The northern MAR was selected as the main target area and sampling was undertaken (2004 – 2007) from Iceland to the Azores Archipelago



By 2006, as sampling activities in the North Atlantic have been concluded, scientists involved with MAR-ECO decided to support an initiative that would allow the expansion of MAR-ECO into the South Atlantic MAR:

The “SOUTH ATLANTIC MAR-ECO” Project

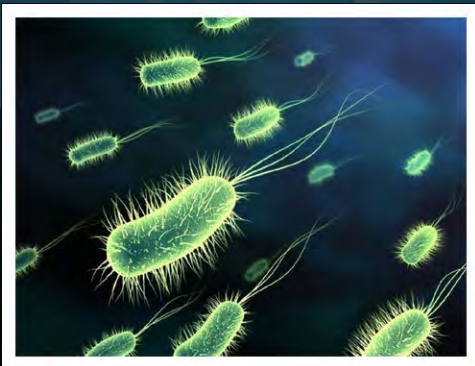


OVERRIDING GOALS



to describe and understand the patterns of distribution, abundance and trophic relationships of the organisms inhabiting the mid-oceanic South Atlantic ridge and adjacent areas

Exploring the role of the mid-oceanic South Atlantic ridge and its adjacent morphological features in dispersal processes of deep-water fauna between the coasts of Africa and South America and among the north Atlantic, Pacific, Indian and Antarctic oceans



From bacteria to whales



South Atlantic MAR-ECO target areas

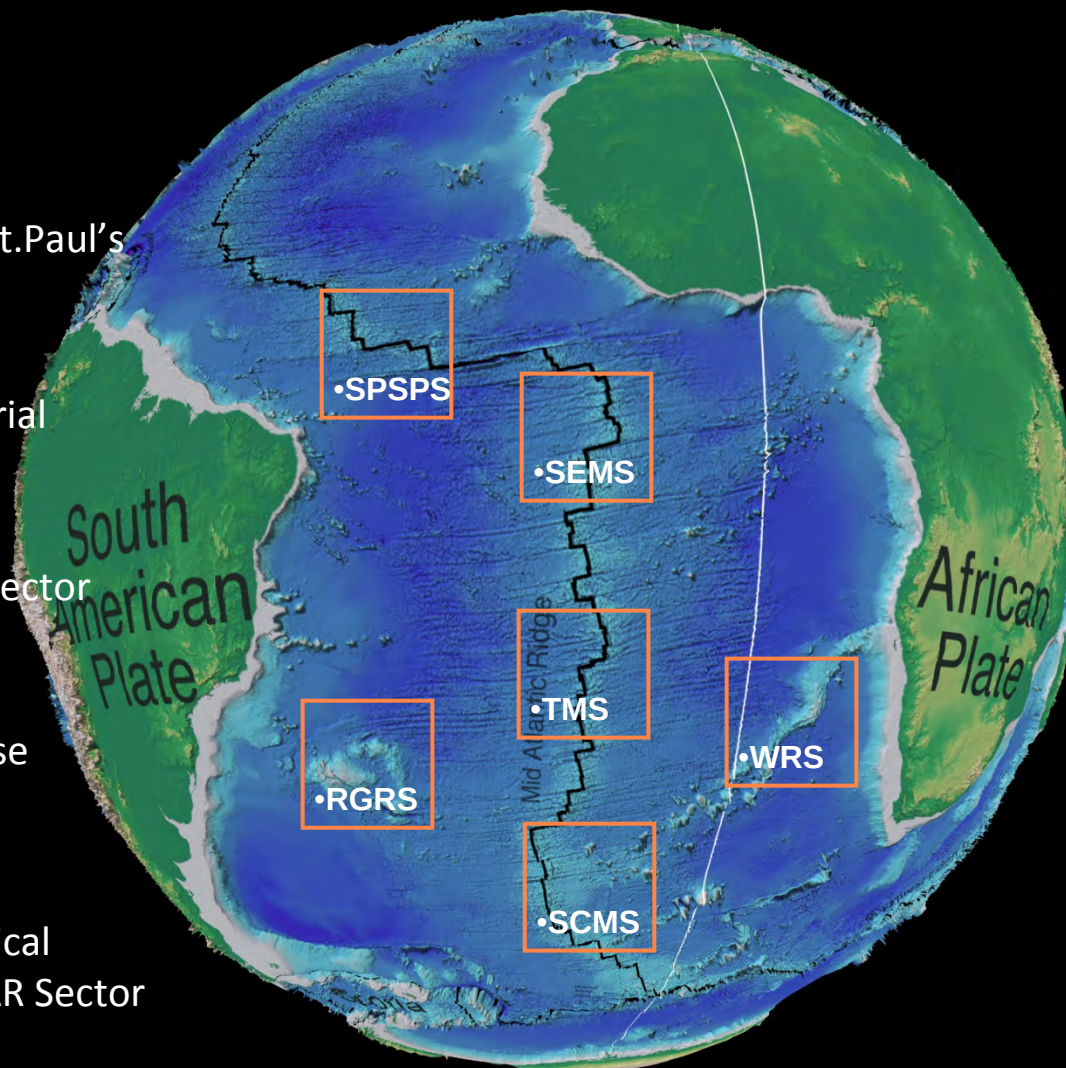
SPSPS: St. Peter's & St. Paul's
Rocks Sector

SEMS: South Equatorial
MAR Sector

TMS: Tropical MAR Sector

RGRS: Rio Grande Rise
Sector

SCMS: Subtropical
Confluence MAR Sector

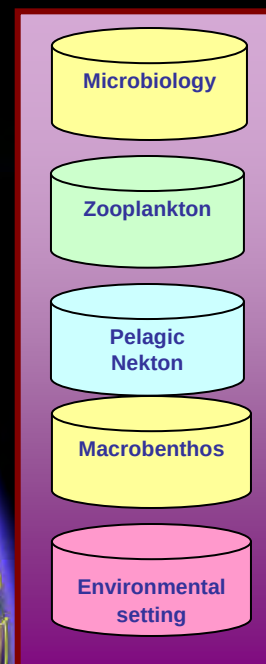


WRS: Walvis
Ridge Sector



OCEAN.RU

Russian Academy of Sciences
P.P. Shirshov Institute
of Oceanology



Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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elev 0 m



- 10 pre-defined “Superstations”

- 2 SS (1 – 2) SEMS North
(North of Romanche Fracture) – 0° S

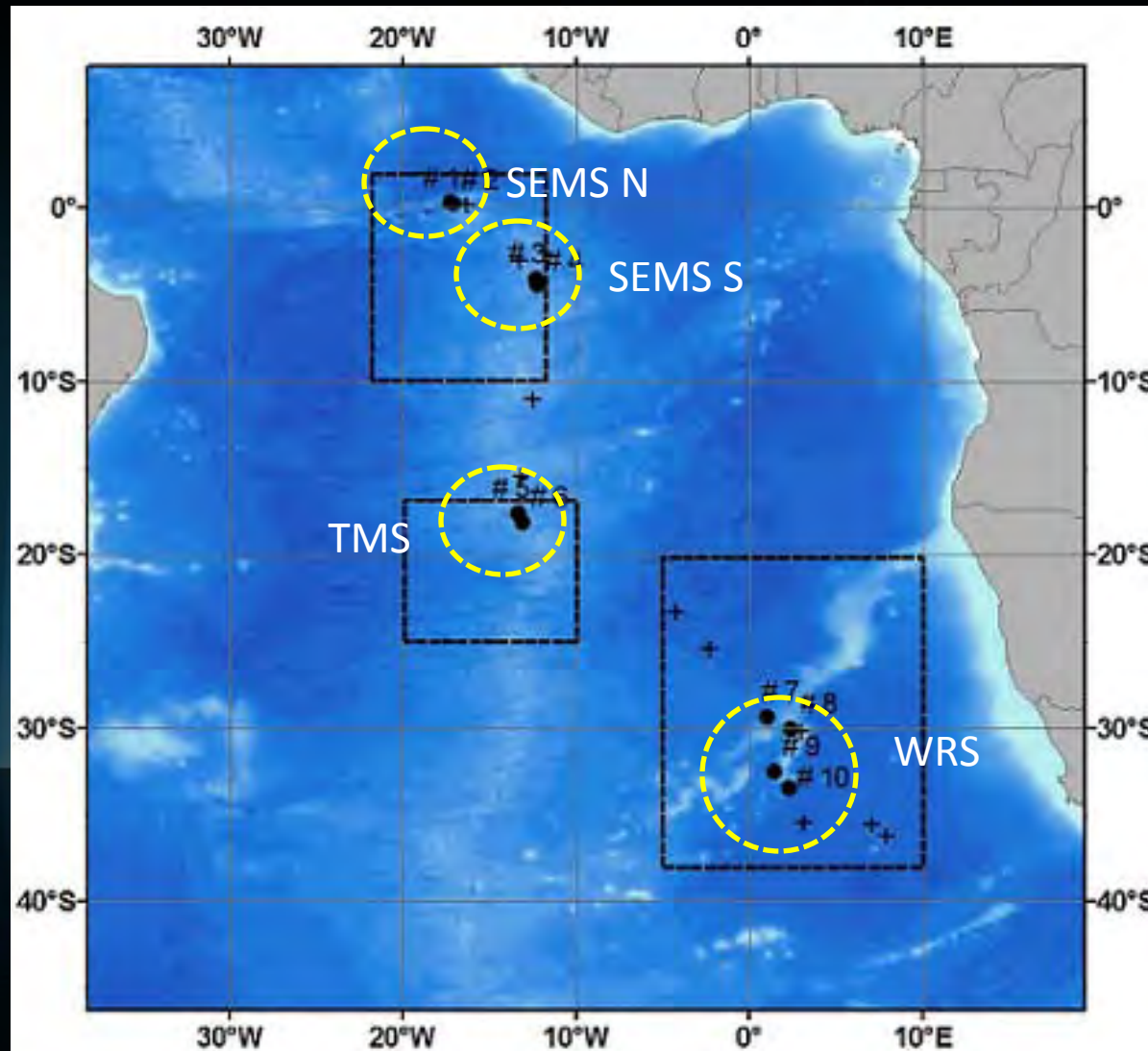
- 2SS (3 – 4) SEMS South
(South of Romanche Fracture Zone) - 4° S

- 2 SS (5 – 6) TMS – 18°S

- 4 SS – WRS (7 – 10) - 30° - 34°S (1 northern slope, 2 summit, 1 southern slope)

- Extra stations

- Continuous Sampling



Sampling gear

Micronekton



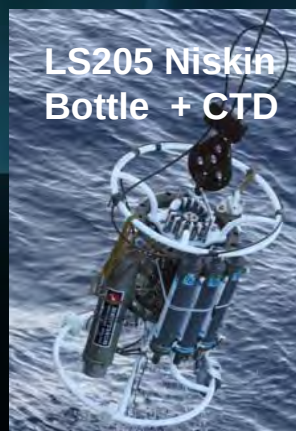
Macrobenthos



Plankton



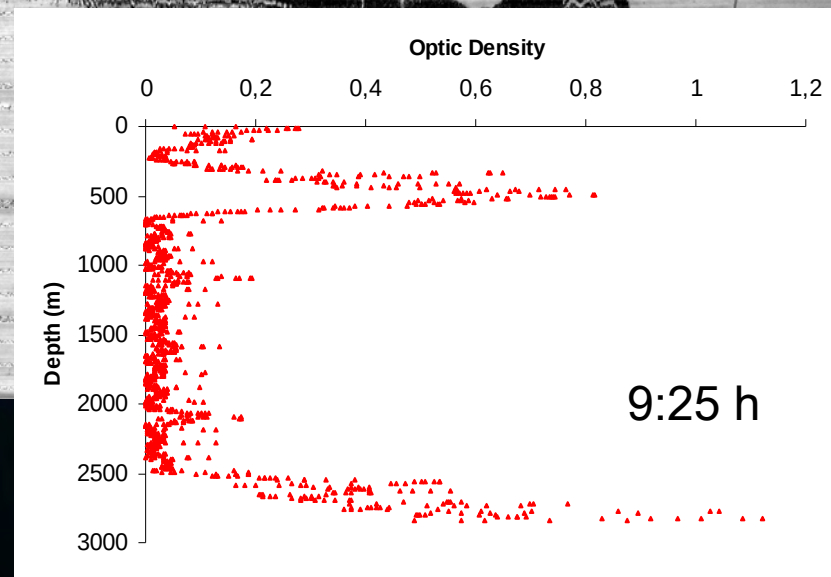
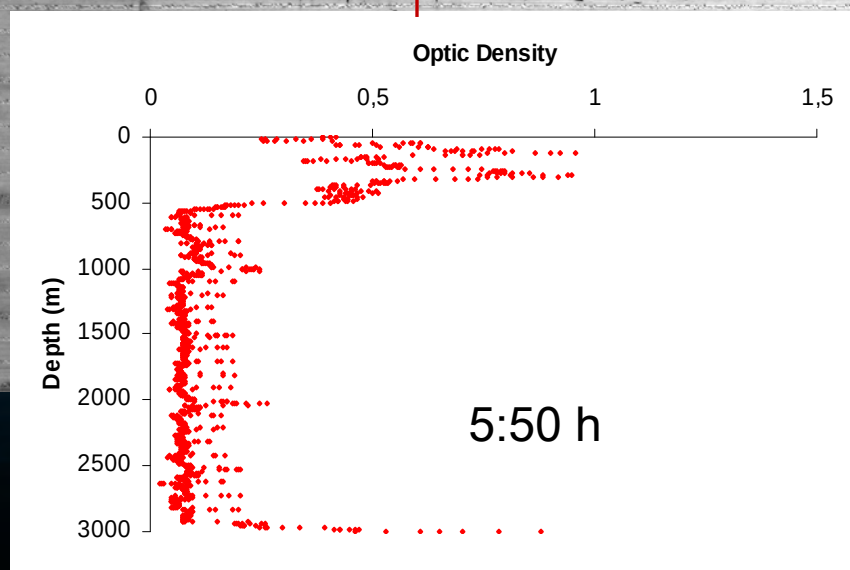
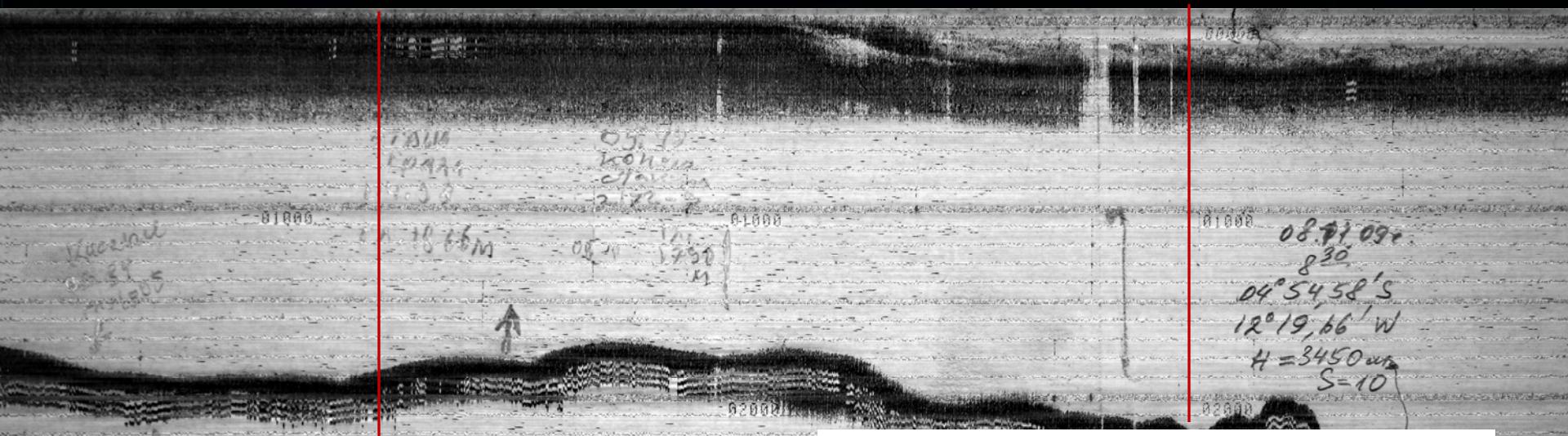
Microbiology

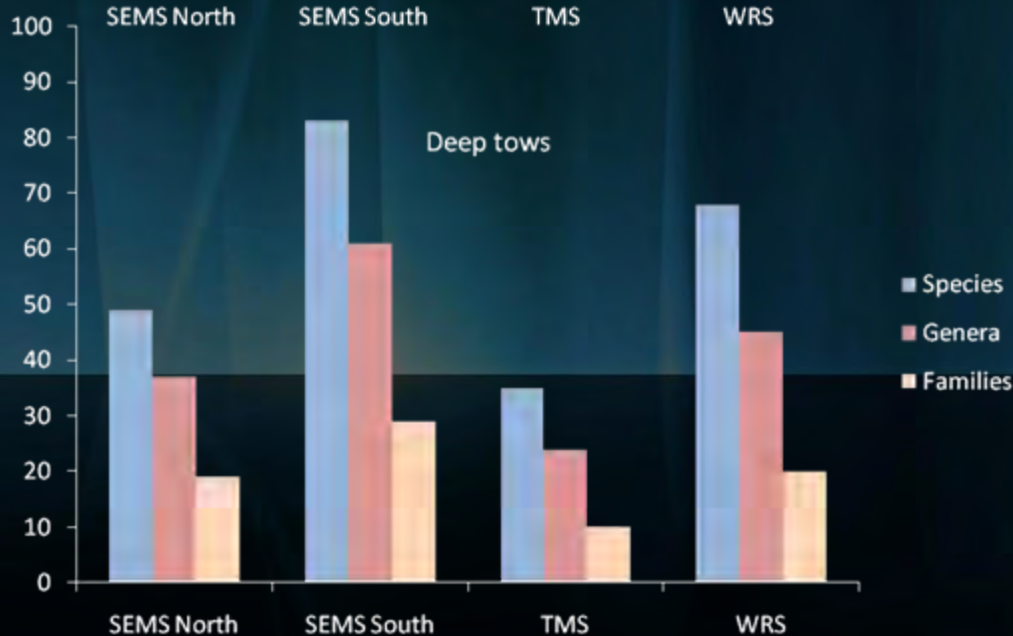
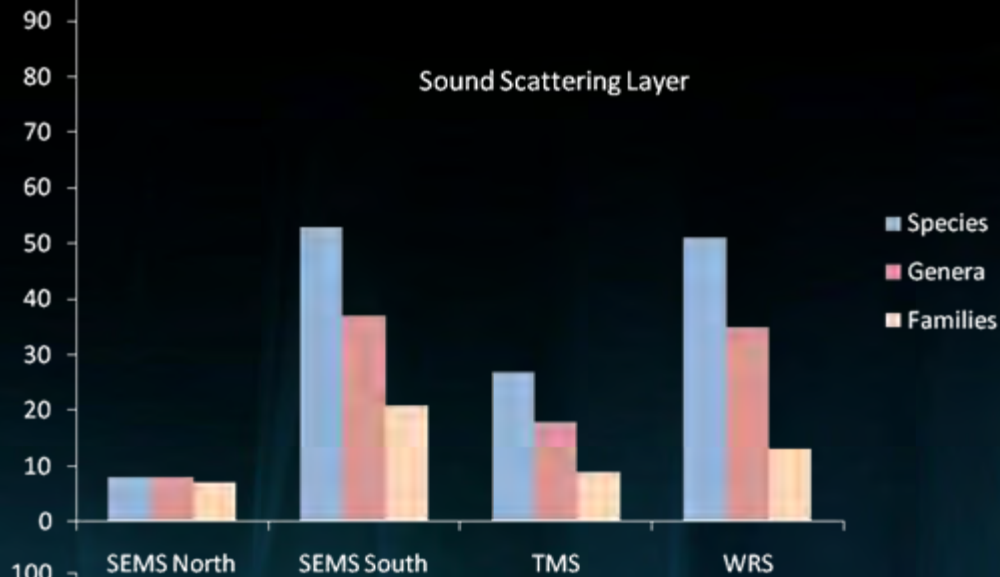


Sampling effort

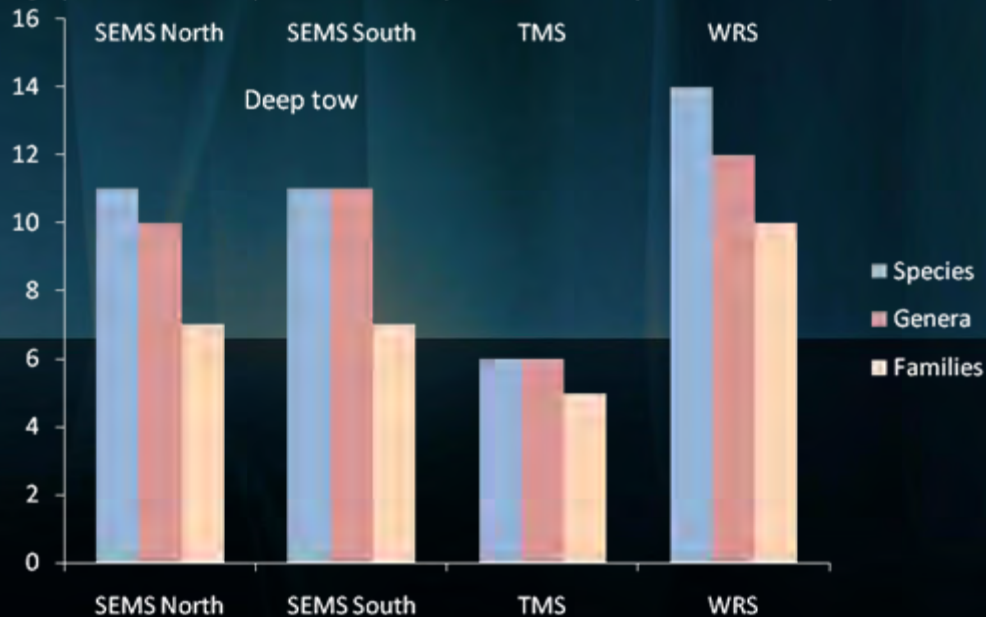
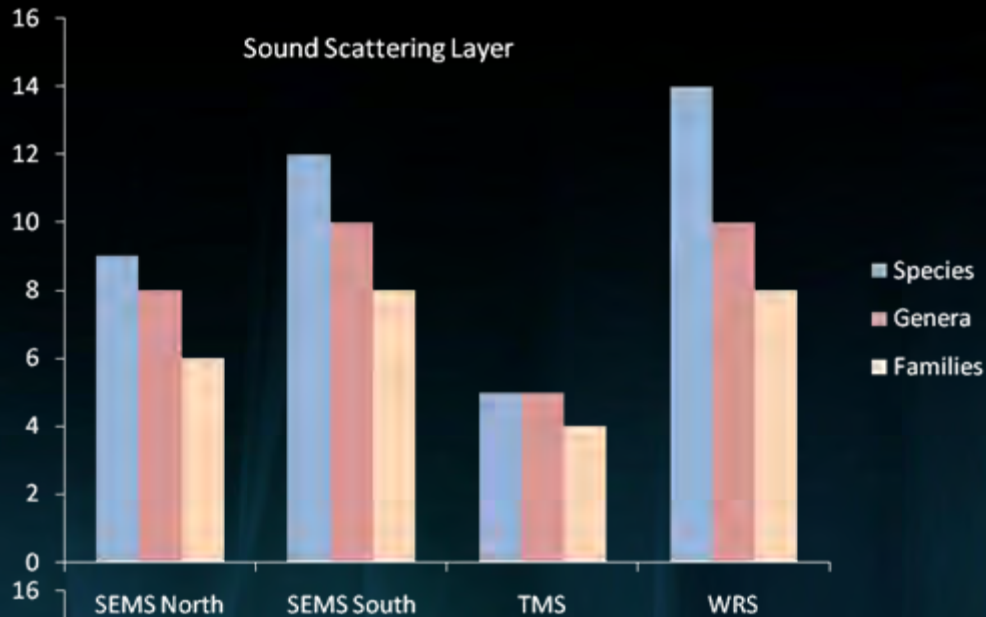
	Benthos	Micronekton	Plankton	Microbiology	CTD	Total
SEMS North	2	4	2	0	1	9
SEMS South	2	4	2	3	1	12
TMS	1	3	2	3	1	10
WRS	4	9	4	3	1	21
Extras	3	6	0	6	0	15
Total	12	26	10	15	4	63

Pelagic sampling: Sound Scattering Layer – Deep pelagic layer



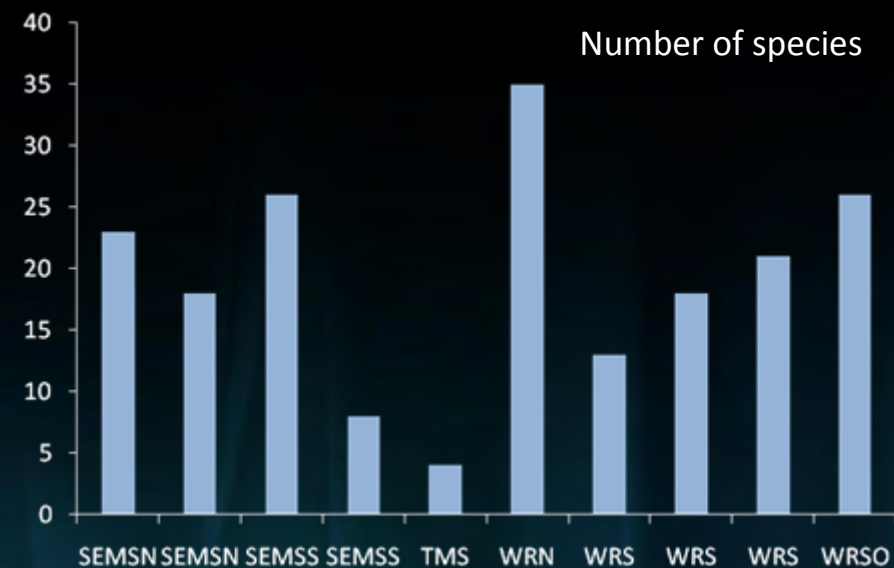


- ~7,000 specimens
- 170 species
- 50 families
- Higher number of taxa at southern SEMS and WRS

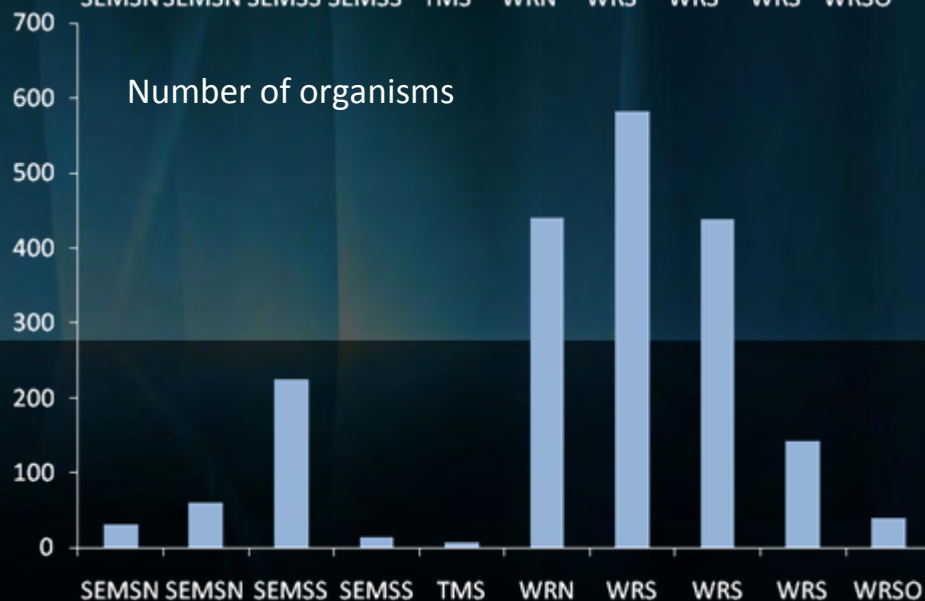


- 258 specimens
- 44 species
- 22 families
- Low number of taxa at TMS

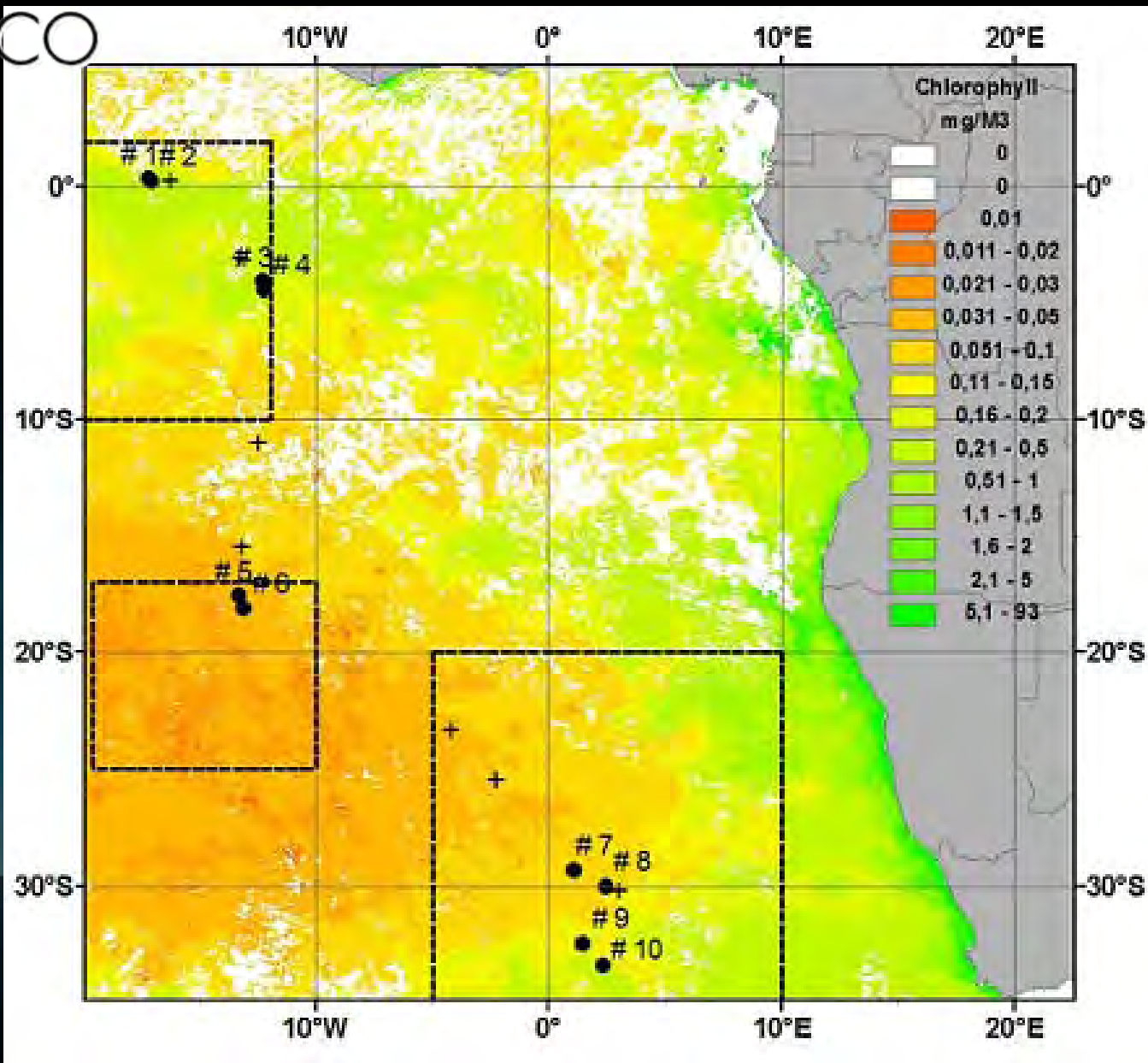
Macrobenthos sampling



- 1980 specimens
- 180-190 species
- 20,647 g wet weight
- SEMS and WRS – higher number of species
- WRS – higher abundance



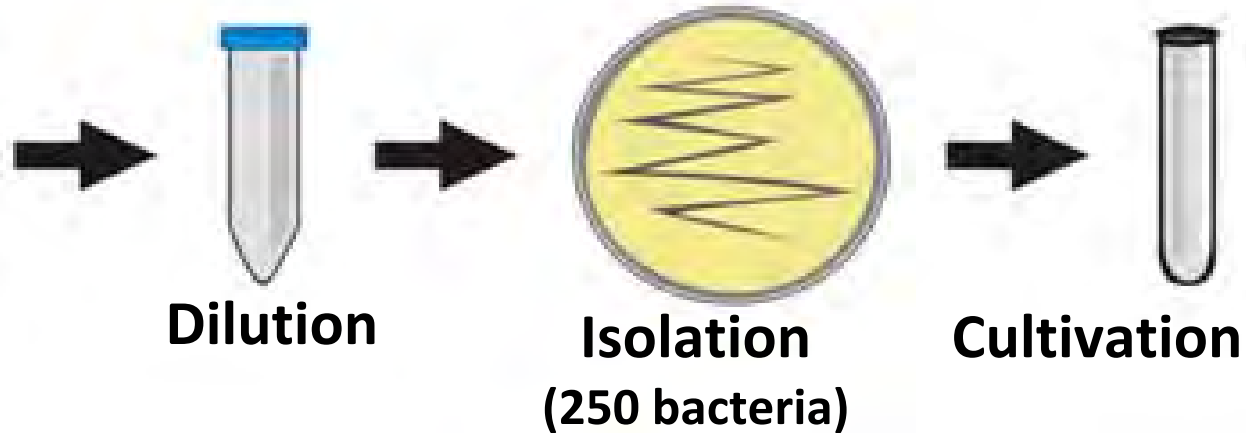
Primary productivity at surface



Biodiversity and bioprospection of deep-sea bacteria

Deep Sea
Sediments

Sample Collection



Cellulases

Lipase

**Bioplastic
(PHA)**

**Evaluation
And
Identification**

16SrDNA
(cultivated bacteria)

Metagenomics
(non cultivated bacteria)

Concluding remarks

- The 2009 MAR-ECO cruise to the Southern Mid-Atlantic Ridge was the MAR-ECO Project first attempt of systematically sampling this remote and understudied area.
- Most biological samples are currently being examined by many specialists in Brazil, Russia, South Africa, Norway and the USA.
- Preliminary results reported by these groups suggest the area is highly diverse and with likely detectable latitudinal gradients.
- Nearly 250 bacteria were identified, 50 of them have shown potential for biotechnological uses.
- The South Atlantic MAR-ECO project will continue the MAR-ECO legacy beyond CoML and search for new opportunities to sample more and better the overlooked depths of the South Atlantic Ocean

THANK YOU FOR YOUR ATTENTION

