

# Report

## CoML CoMarge workshop

(<http://www.ifremer.fr/comarge/>)



## Large scale patterns in bathyal free-living nematodes

**Organisation**  
Marine Biology Research group  
Ghent University  
Coordinator Ann Vanreusel  
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**28th January -1st February 2008**



## Participant list

### Financed by Comarge

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### UGent group (email :name.surname@ugent.be)

Ann Vanreusel  
Jan Vanaverbeke  
Saskia Van Gaever  
Maarten Raes  
Jeroen Ingels  
Tania Bezerra  
Ellen Pape  
Bea Merckx (data manager)  
Giovanni Santos

### Not financed by Comarge

Virag Venekey → virag\_venekey@yahoo.com.br  
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### Not attending dataproviders

Baban Ingole → [baban@nio.org](mailto:baban@nio.org)  
Daria Portnova → [dp81@yandex.ru](mailto:dp81@yandex.ru)



## Database and research topics

The database contained in total 60 datasets. An overview is given at the end of the report. Most databases were at genus level. Only two provided species data. They were all organized in an access database. This database is only accessible by the data Task force (see data policy document) on <http://intramar.ugent.be/comarge>.

Based on the available datasets and the general objectives of the CoMarge CoMI project we identified the following research questions grouped within 5 different topics. Each topic was dealt with by a working group identified during the workshop, based on the interest of the participants

### **Geographical patterns**

Is there any geographical trend in community composition and biodiversity?  
Is this trend related to surface primary production?

Workgroup participants: Cristina Gambi, Gustova Fonseca, Sergio Netto, Tania Bezerra, André Esteves, Daniella Zeppeli

### **Bathymetric gradients**

Is there a mid slope maximum in biodiversity at different taxonomic levels over all data and for different ocean basins, areas ?

Is there a bathymetric zonation ? Shift in dominant genera similar for different regions

Can we predict dominant genera for different depths?

Can we relate the importance of particular genera to particular environmental gradients, such as depth, productivity or oxygen?

Are differences in community composition along slope explained by differences in vertical profiles over wide areas (within and between ocean basins?)

Workgroup participants :Jan Vanaverbeke, Virag Venekey , Agnes Muthumbi and Maria Cristina da Silva

### **Habitat heterogeneity**

Does regional diversity increases with habitat heterogeneity?

To what extent differs hotspots from 'normal' slope communities,

How many species (taxa) are obligate associated with these hotspots?

Are differences between regions larger than differences between habitats (canyons vs slopes)?

Workgroup participants : Tim Ferrero, Gunnar Gad, Maarten Raes, Jeroen Ingels, Saskia Van Gaever, Nikos Lampadariou, Giovanni Santos

### **Abyssal Plains**

How similar are abyssal plains within and between ocean basins?

Does similarity decreases with mutual distance?

Can we relate differences in biodiversity and community composition to surface primary production?

Workgroup participants: Alexey Tchesunov, Valentina Galtsova, Teresa Radziejewska, Maria Miljutina, Dmitry Miljutin

**Biodiversity**

Does species diversity changes consistently on a global scale in relation to  
nr of individuals identified  
sample size  
area sampled  
bathymetric coverage

Work group participants: Ellen Pape, Ann Vanreusel

**Cosmopolitanism**

How much evidence is there for cosmopolitan morphospecies? Examples

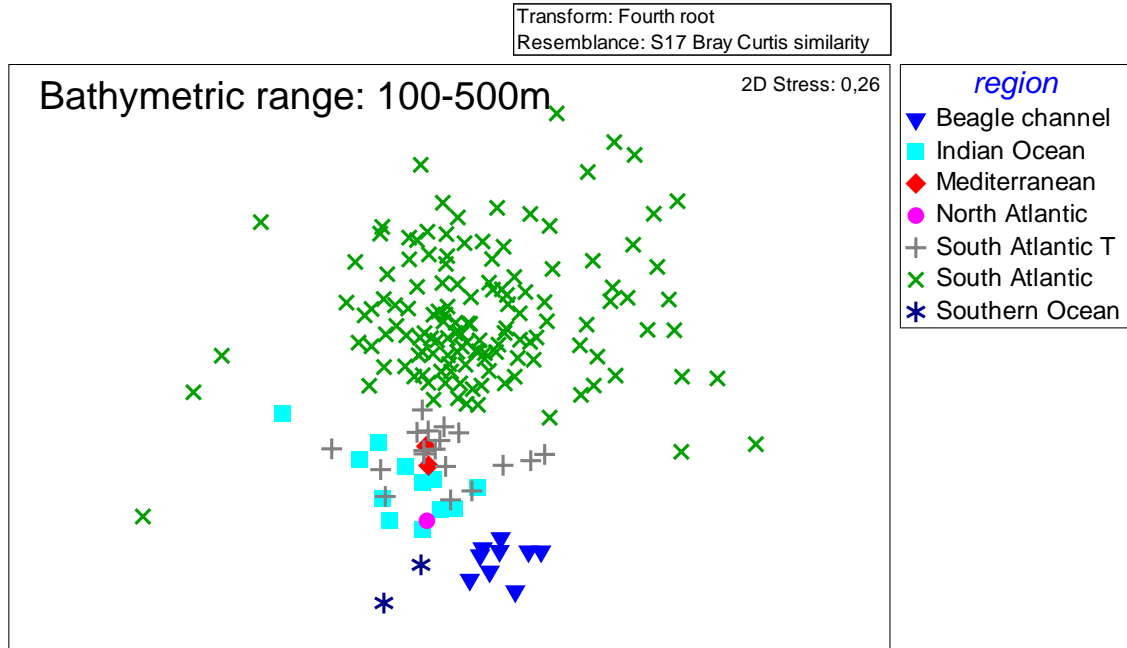
Work group participants: Tim Ferrero, Dmitry Miljutin

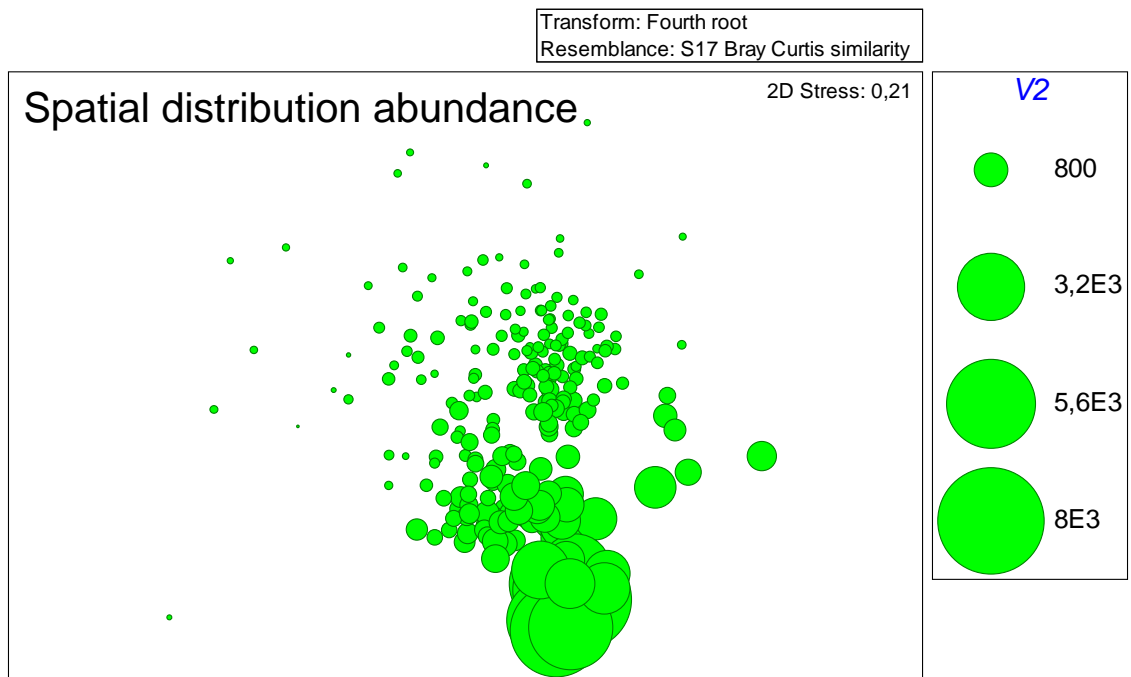
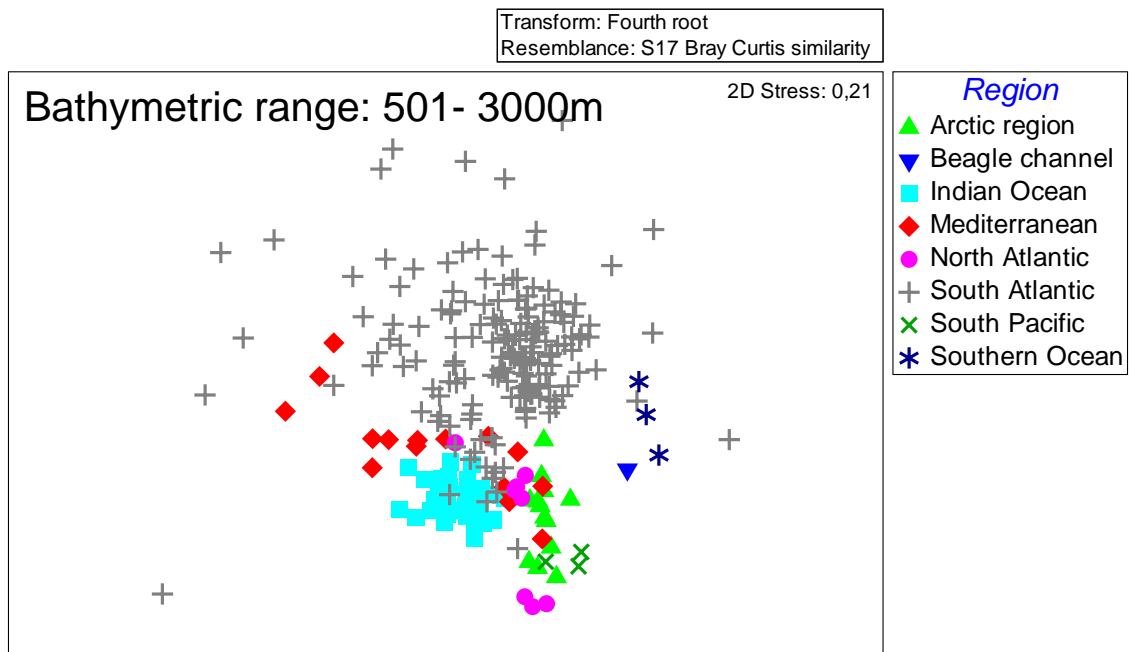
## Results

Not all the formulated questions were answered during the workshop. The most important results from during the workshop are shown below.

### Geographical patterns

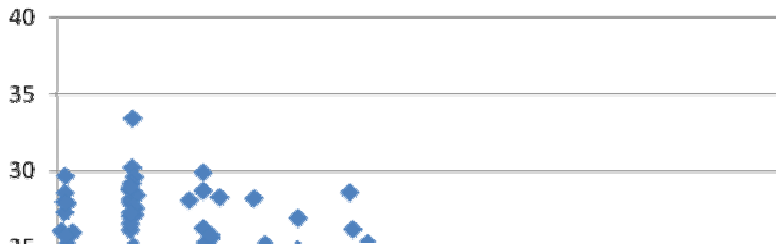
The analysis of the global geographical patterns were performed on all data subdivided in two depth zones (100 to 500m and 500 to 3000m). An MDS was applied on genera densities. The graphs show that the mean pattern was geographical and not depth related within these depth ranges. The pattern was largely explained by densities. A gradient in community composition from low to high surface productivity could be recognized, especially for the deeper areas





### Bathymetric gradients

There was no bathymetric trend in genera diversity for all data pooled nor within regions (not shown)



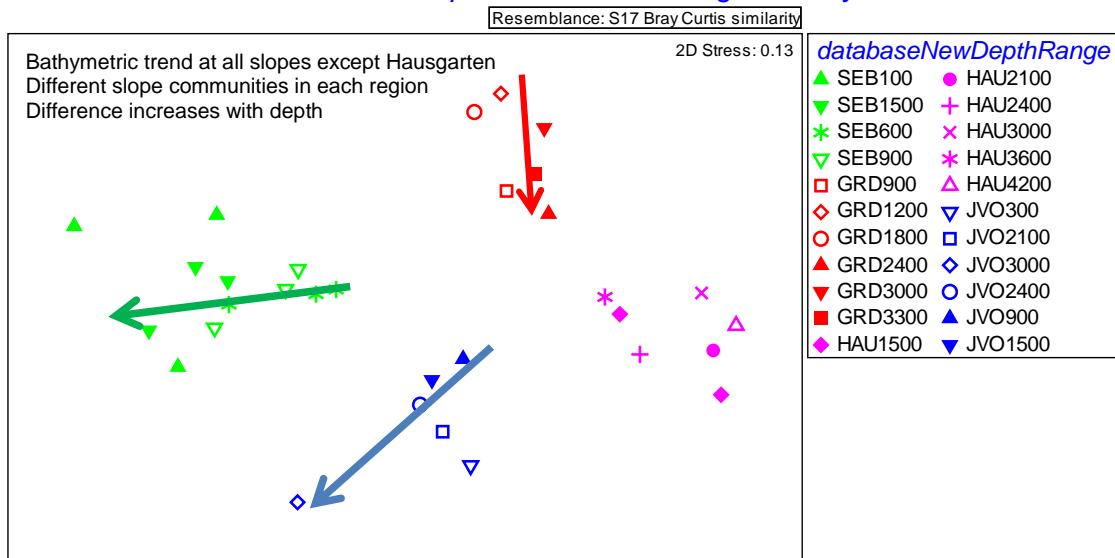
A multivariate analysis (MDS) on 4 data sets from the Atlantic for which a bathymetric transect was sampled showed that areas separated, rather than depths. In each area however except the Nordic Ice margin at the Hausgarten showed a bathymetric trend.

In further analysis the vertical profiles into the sediment will be considered.



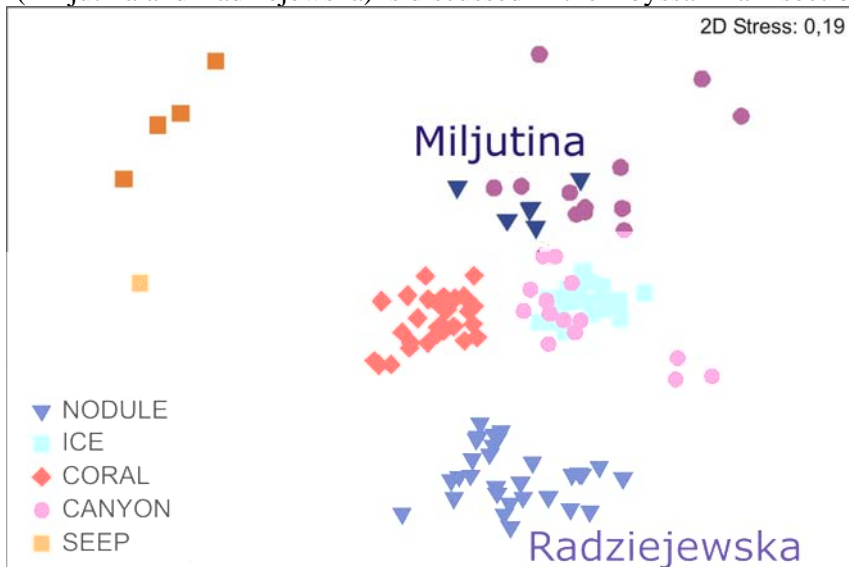
# Atlantic and Arctic

"CombineSample""new\_taxon""AvgOfdensity"

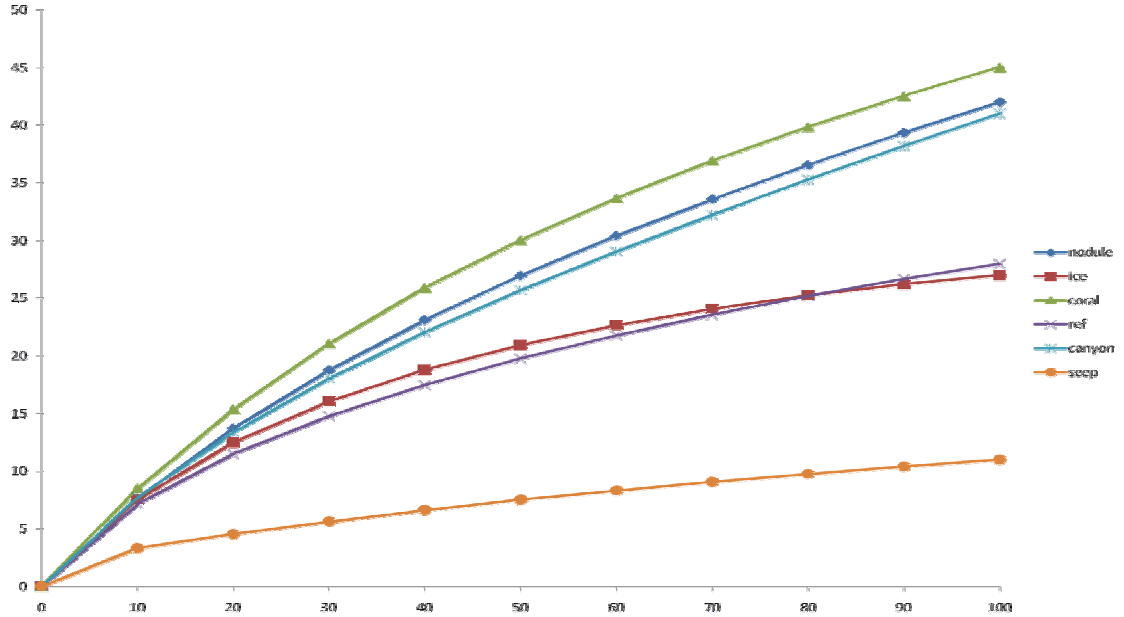


## Habitat heterogeneity

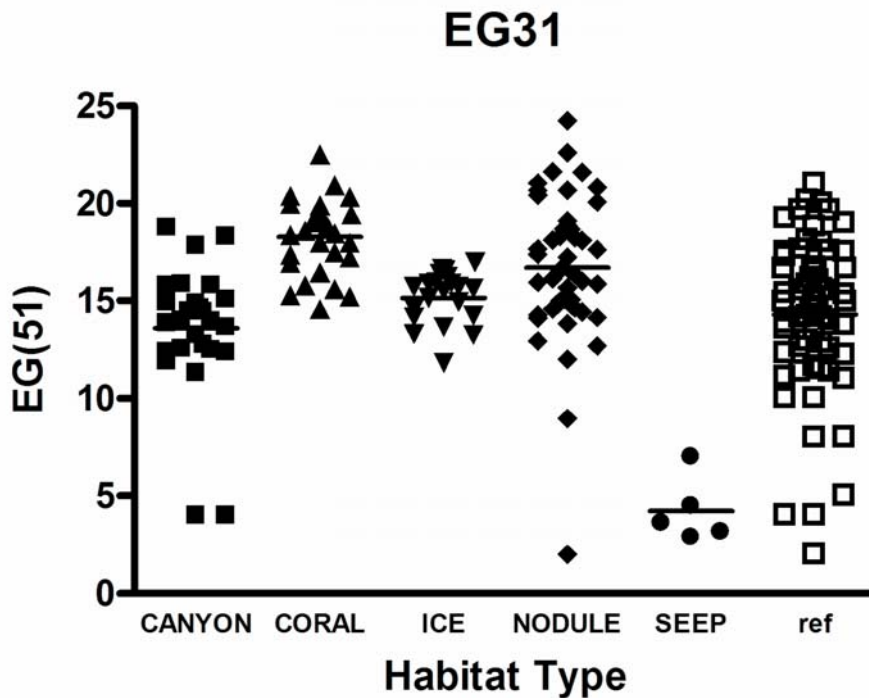
An Mds on all data from different possible 'hotspot' habitats excluding soft sediment from slopes and abyssal plains showed different communities for different habitats. The presence of different communities in both nodule areas from the Clarion Clipperton Fracture Zone (Miljutina and Radziejewska) is discussed in the Abyssal Plain section



Rarefaction for different habitats pooled showed the highest curves in corals, followed by nodules and canyons, while the seeps showed the lowest diversity



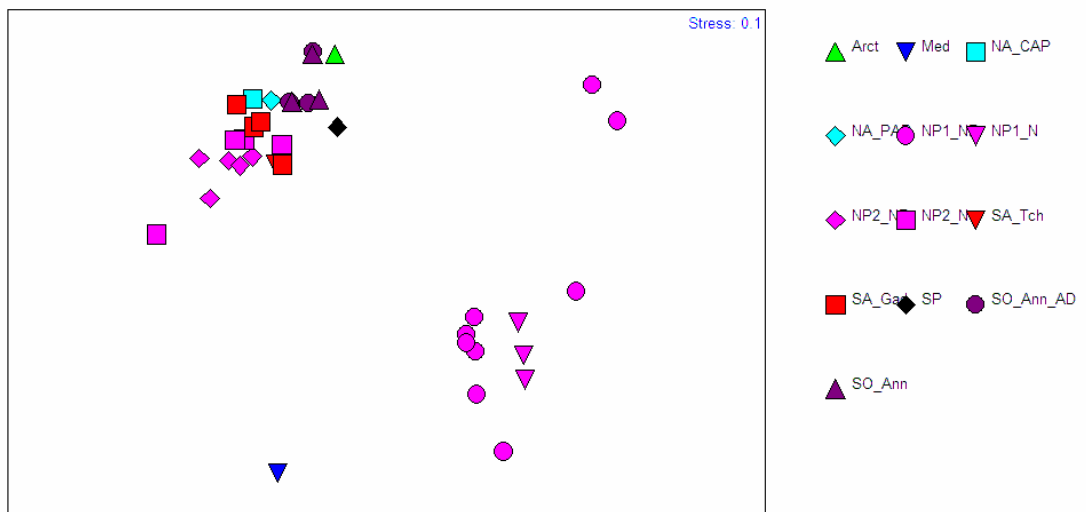
The graph below shows the variation in diversity between samples from different habitats. It confirms that the highest diversity is found in corals and nodules and the lowest in seeps.



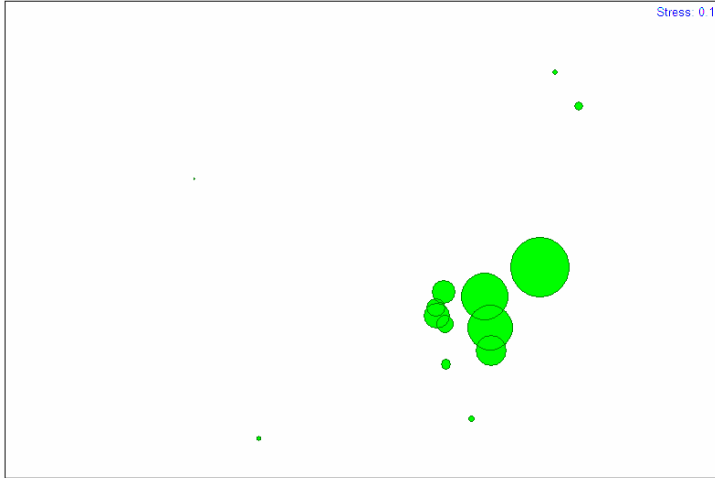
## Abyssal Plains

An MDS on relative abundances of genera on abyssal plains and trenches (4000 m or deeper) showed the separation of one area in the CCFZ. The other areas show a slight productivity related trend which will be further explored by excluding the deviating stations from the CCFZ.

The separation of this CCFZ area is based on the genus *Terschellingia* and some other genera normally rare at those depths



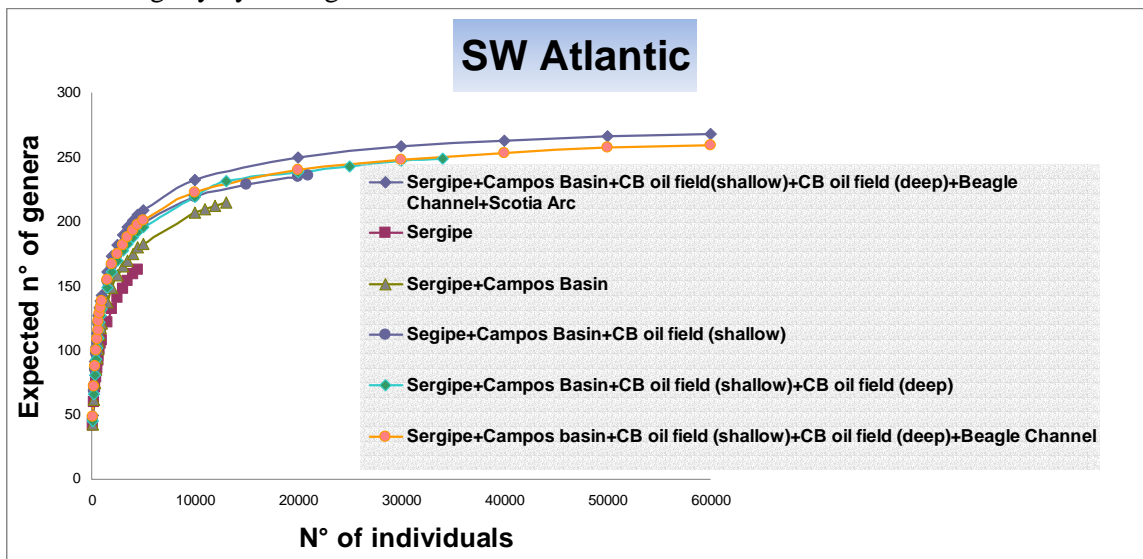
The bubble plot of the genus *Terschellingia* (see graph below) shows the higher abundance in one area of the CCFZ. It will be explored if this difference is possibly evidence for hydrothermalism in this area. This genus is often associated with reduced sediments from seeps or shallow water anoxic sediments



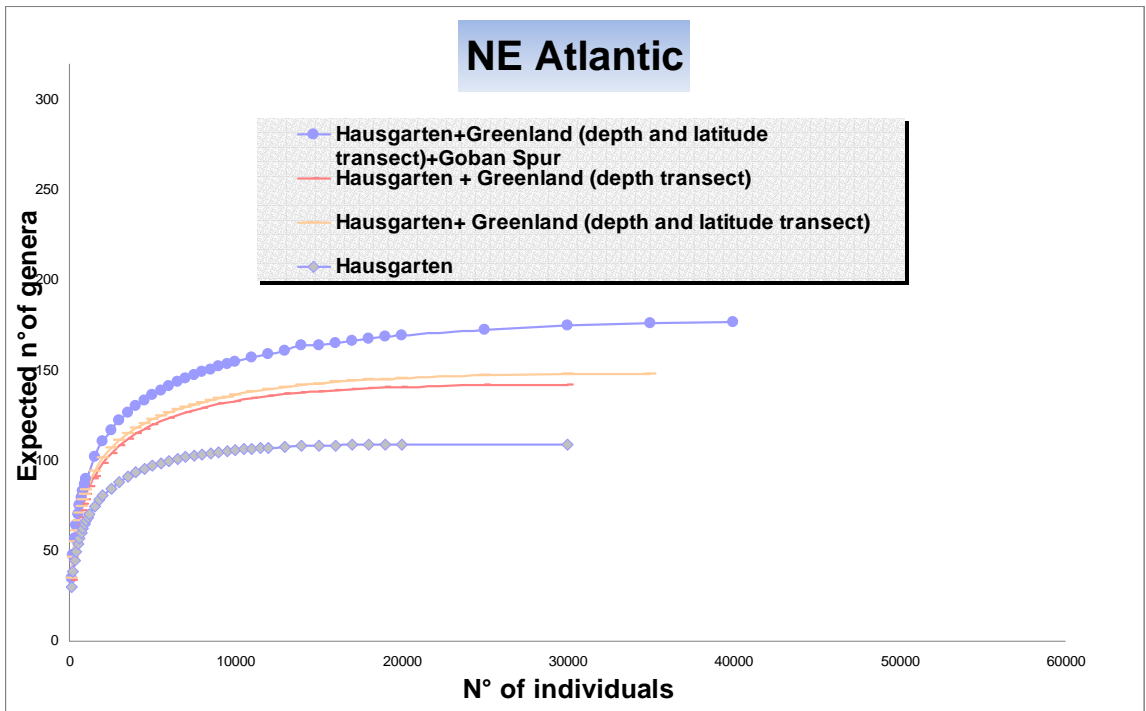
## Biodiversity

Here we analysed rare fraction curves for the NE and SW Atlantic respectively. Each time we started from one data set (the most northern one) and added the most adjacent one towards the south in order to see to what extent the curves increased (the higher the curve, the higher the diversity)

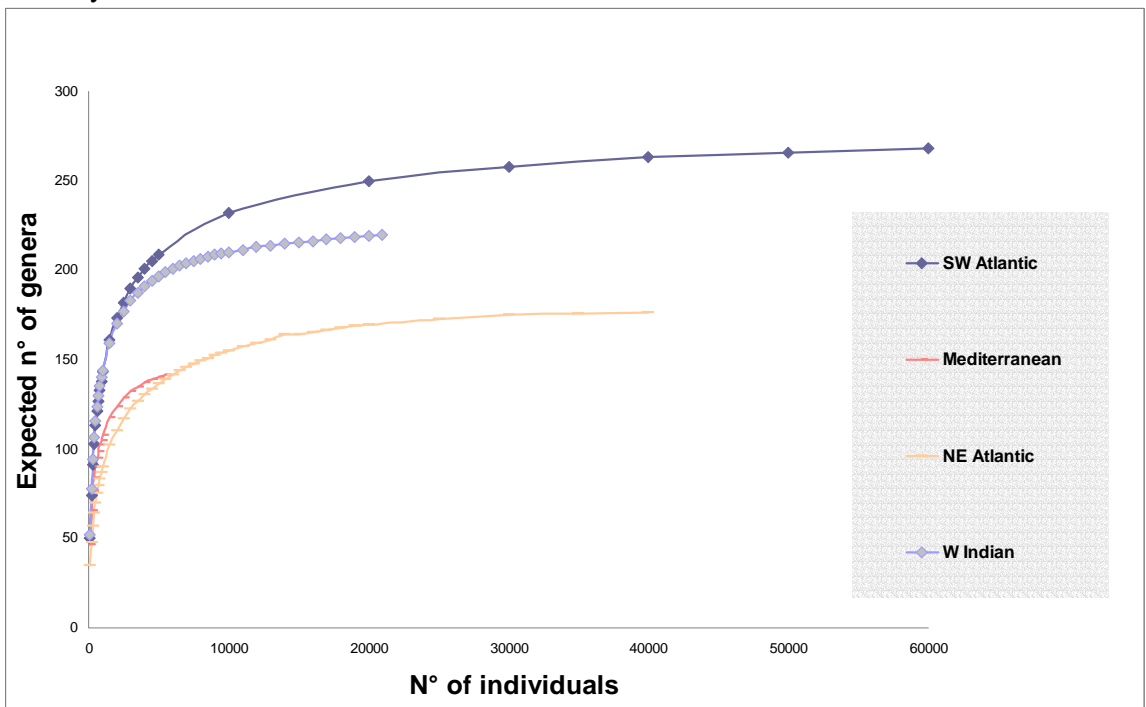
For the SW Atlantic it was noticed that diversity was already high in the Sergipe area and increased slightly by adding more datasets from the South.



For the NE Atlantic curves were lower but increased significantly. It was striking that adding a latitudinal transect at 200m to the bathymetric transect at the Greenland margin did not increase the biodiversity significantly



Comparing different ocean basins confirmed the high biodiversity at the SW Atlantic followed by the WIO. Remark that for the WIO ocean the geographical area covered is much smaller. Younger basins such as the NE Atlantic and the mediterranean showed a much lower genus diversity



## Conclusions

The above graphs are just a selection of the most important results. Full presentations can be seen on the intramar website only accessible for workshop participants

All the results are preliminary and more analysis will be performed per working group/topic. It was decided at the workshop to compile all results in one large manuscript on the condition we find a journal willing to publish. It is aimed to finalize a draft paper by the end of the summer (October 2008) in order to finish the manuscript by the end of 2008

The following strict deadlines are proposed

15 february 2008 Finalization of the database : no new data or corrections can be added

30 April 2008 : Finalization of the analysis per working group. Working group participants submit all data analysis results with interpretation on the [intramar.ugent.be/comarge](http://intramar.ugent.be/comarge) website

31 May 2008 Results compiled and suggestions for structure of paper distributed

31th June 2008 Identification of responsible for writing different parts of paper

database	data_provider	institute		
OMB	Baban Ingole	National Institute of Oceanography (NIO)	genus	Westcoast of India
LHI	Baban Ingole	National Institute of Oceanography (NIO)	genus	Antarctica
JVO	Jan Vanaverbeke	Ghent University	genus	OMEX transect in the Goba
DGM	Cristina Gambi	Polytechnic University of Marche	species	Mediterranean Sea
DGA	Cristina Gambi	Polytechnic University of Marche	species	South Pacific
ANG	Saskia Van Gaever	Marine Biology, Ugent	genus	Zaire canyon, REGAB area
GRD	Gustavo Fonseca	Alfred-Wegener-Institut	species	Greenland depth transect: ic
GRL	Gustavo Fonseca	Alfred-Wegener-Institut	species	Greenland latitudinal transect
IOM	Teresa radziejewska & Valentina Galtsova	University of Szczecin	genus	Project IOM BIE; Pacific, C
WIO	Agnes Muthumbi	University of Nairobi	genus	Western Indian Ocean - KA
AEG	Nikos Lampadariou	Hellenic Centre for Marine Research	genus	Hermes Southcrete - MATE
Mag	Magda Vincx	Ghent University	genus	Beagle Channel
HAU	Ann Vanreusel	Ghent University	species	Arctic deep-sea station HAU
TrM	Nikos Lampadariou	Hellenic Centre for Marine Research	genus	Trans-Mediterranean cruise
MIL	Maria Miljutina & Dmitry Miljutin	Shirshov Institute of Oceanology, Russian Academy of Sciences (Moscow, Russia)	species	Dataset NODINAUT cruise
COR	Maarten Raes	Ghent University	genus	Cold-water coral degradation
CAB	André Morgado Esteves & Maria Cristina da Silva	Universidade Federal de Pernambuco - UFPE	genus	Brazil - Campos Basin
ABP	Ann Vanreusel	Ghent University	genus	North, mid & South Atlantic
SEB	André Morgado Esteves & Maria Cristina da Silva	Universidade Federal de Pernambuco - UFPE	genus	Brazil - Sergipe
SND	Sergio Netto	Unisul	genus	Brazil - Campos Basin oil field
SNS	Sergio Netto	Unisul	genus	Brazil - Campos Basin oil field
AAE	Maarten Raes	Ghent University	genus	ANDEEP program - Weddell Sea
ADI	Alexey Chesunov	Yandex	species	DIVA-1 program - Angola I
GGD	Gunnar Gad	Oldenburger Universität	genus	DIVA-1 program - Angola I
SCA	Jeroen Ingels	Ghent University	genus	Scotia Arc
NAS	Jeroen Ingels	Ghent University	genus	Nazare slope & canyon data



TAN	Hannah Flint (NOCS), John Copley (NOCS), Tim Ferrero (NHM)	NOCS/NHM (National Oceanography Centre Southampton/Natural History Museum)	genus	Black ridge (Hydrothermal v
EPR	Hannah Flint (NOCS), John Copley (NOCS), Tim Ferrero (NHM)	NOCS/NHM (National Oceanography Centre Southampton/Natural History Museum)	species	EPR: Hydrothermal vent sy:
HSN	Nikos Lampadariou	Hellenic Centre for Marine Research	genus	HERMES program: Two ca