

Cruise Report
FRV Walther Herwig III, WH 436
06/05 to 06/10/2020
EEZ Survey North Sea – Natura 2000 site “Sylt Outer Reef”

Cruise Leaders: Dr. Hermann Neumann

Summary

The cruise was part of the national DAM pilot project "Exclusion of mobile bottom fishing in marine protected areas of the German EEZ of the North Sea". Thirty-seven stations were sampled in the Natura 2000 site "Sylt Outer Reef" with a 2m beam trawl in order to assess the current status and distribution of demersal fish and epifauna against the background of a future exclusion of ground fishing activities in some parts of the Sylt Outer Reef. The beam trawl hauls were supplemented by plankton (AWI) and microbiology (University Oldenburg) sampling. In total, 82 fish and epifauna species were found in the Sylter Outer Reef area. Multivariate community analyses revealed five distinct communities reflecting a spatial gradient from east to south-west in the study area (Fig. 1). Species numbers were high in coastal and northwestern areas of the Sylter Outer Reef and low in the southwestern part. Summed biomass was exceptional low in the northwestern areas, while summed abundance largely follows a decreasing trend from the coast to offshore areas. The results of the plankton and microbiology analyses are still pending.

Verteiler:

TI - Seefischerei

per E-Mail:

BMEL, Ref. 614
BMEL, Ref. 613
Bundesanstalt für Landwirtschaft und Ernährung, Hamburg
Schiffsführung FFS "
Präsidialbüro (Michael Welling)
Personalreferat Braunschweig
TI - Fischereiökologie
TI - Ostseefischerei Rostock
FIZ-Fischerei

TI - PR

MRI - BFEL HH, FB Fischqualität
Dr. Rohlf/SF - Reiseplanung Forschungsschiffe
Fahrtteilnehmer
Bundesamt für Seeschifffahrt und Hydrographie, Hamburg
Mecklenburger Hochseefischerei GmbH, Rostock
Doggerbank Seefischerei GmbH, Bremerhaven
Deutscher Fischerei - Verband e. V., Hamburg
Leibniz-Institut für Meereswissenschaften IFM-GEOMAR
H. Cammann-Oehne, BSH
Deutscher Hochseefischerei-Verband e.V.
DFFU

2. Research programme and methods

2.1 Fish and epibenthos sampling (TI-SF)

Sampling of fish and epibenthos was conducted at every station. The 2-m beam trawl for the sampling had a mesh size of 10 x 10 mm in the main net and 4 x 4 mm in the cod end and was applied with five minutes towing duration at 1.5 knots. Samples were sieved over 5 mm and 2 mm mesh. The 5 mm fraction was analysed aboard, the 2 mm fraction was preserved in 70% alcohol for analysis in the laboratory ashore. Sampling was accompanied by physical measurements (e.g. temperature, salinity and conductivity) via a CTD mounted directly onto the CTD-rosette system. Thirty-seven stations were sampled in the Sylt Outer Reef (Fig. 1)

2.2 Plankton sampling (AWI)

A hand-towing net equipped with a flowmeter and 250 µm mesh size was used for plankton sampling at every station. Sampling depth was approximately 6 meters. The samples were preserved in formalin for analysis in the laboratory ashore. Additionally, 250 ml water samples were taken at every station from the CTD water sampler. At every station a sample from the water surface and from approximately 1m above the sea floor were taken. Water samples were preserved in Lugol solution for analysis in the laboratory ashore.

2.3 Microbiology (C.v.O. University Oldenburg)

Three sediment and bottom water samples were taken at 12 stations randomly distributed over the study area. Sediment (5g) were scratched from the surface of van Veen grab samples and frozen afterwards. The water samples were taken from the CTD rosette and filtered before being frozen as well.

3. Cruise schedule

FRV "Walther Herwig III" was embarked and prepared for the cruise on Friday, 06/05/20, and left Bremerhaven at the same day. Trawling started on Saturday morning (06/06/20) at station 303 (Fig. 1). Weather conditions were good and activities could be finished within four days. **In total, 37 beam trawl hauls, 37 CTD profiles, 75 plankton water samples, 25 plankton hand-hauled plankton net samples, 36 sediment and water samples for microbiology.** Without any technical or meteorological disturbances, the programme was finished in the morning of 06/09/20. The vessel was back in Bremerhaven at evening on Tuesday, 06/09/20, two days earlier than expected.

4. Preliminary results

4.1 Fish and Epibenthos (TI-SF)

In total, 82 species were found in the Sylter Outer Reef area. Multivariate community analyses revealed five distinct fish and epibenthos communities reflecting a spatial gradient from east to south-west in the study area (Fig. 1). The easternmost coastal community was characterized by high abundances of the brown shrimp *Crangon crangon* and the shrimp *Philocheiras trispinosus*. Species numbers and summed abundances of species in that shallow habitats were generally high (exception station 307), while summed biomass was rather low (Fig. 2-4). The transitional "coast-central" community occupies the largest area (15 samples) with the solenette *Buglossidium luteum* and the sea star *Asterias rubens* as characteristic species. Summed biomass and abundance revealed a decreasing trend from the coast to the more offshore stations. Species numbers ranged

from 15 to 19 species and were neither particularly high nor particularly low. The both “north-west” communities were similar with respect to dominant species such as the solenette *Buglossidium luteum*, the scaldfish *Arnoglossus laterna* and the dab *Limanda limanda*. However, the both stations 325 and 329 (northwest1) differed from the other northwestern stations by the presence of the masked crab *Corystes cassivelaunus*, the hermit crab *Pagurus bernhardus* and the hooknose *Agonus cataphractus*. Species numbers were high in the northwestern part of the Sylter Outer Reef, while in contrast summed abundance and biomass were very low. The southwestern community was situated in the deeper parts of the Sylter Outer Reef and was characterized by the occurrence of the sea urchin *Echinocardium cordatum* and the sea star *Astropecten irregularis*. With exception of station 331, species number and summed abundance were very low in that area.

4.2 Plankton (AWI)

No preliminary results. Analyses has not finished yet. Results will be expected in a few months.

4.3 Microbiology (C.v.O. University Oldenburg)

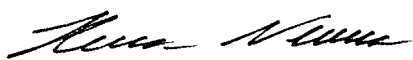
No preliminary results. Analyses has not finished yet. Results will be expected in a few months.

5. Participants

Name	Institution	Function
1. Dr. Hermann Neumann	TI-SF	Cruise leader
2. Philip Schweizer	TI-SF	Technician
3. Jana Bäger	TI-SF	Technician
4. Karin Krüger	TI-SF	Technician
5. Laura Lehnhoff	TI-SF	Scientist

6. Acknowledgement

Thanks to Captain Hans-Otto Janßen and FRV “Walther Herwig III” crew members for their great support and hospitality and to all participants for their reliable and responsible teamwork.



(Dr. H. Neumann)

7. Tables and Figures

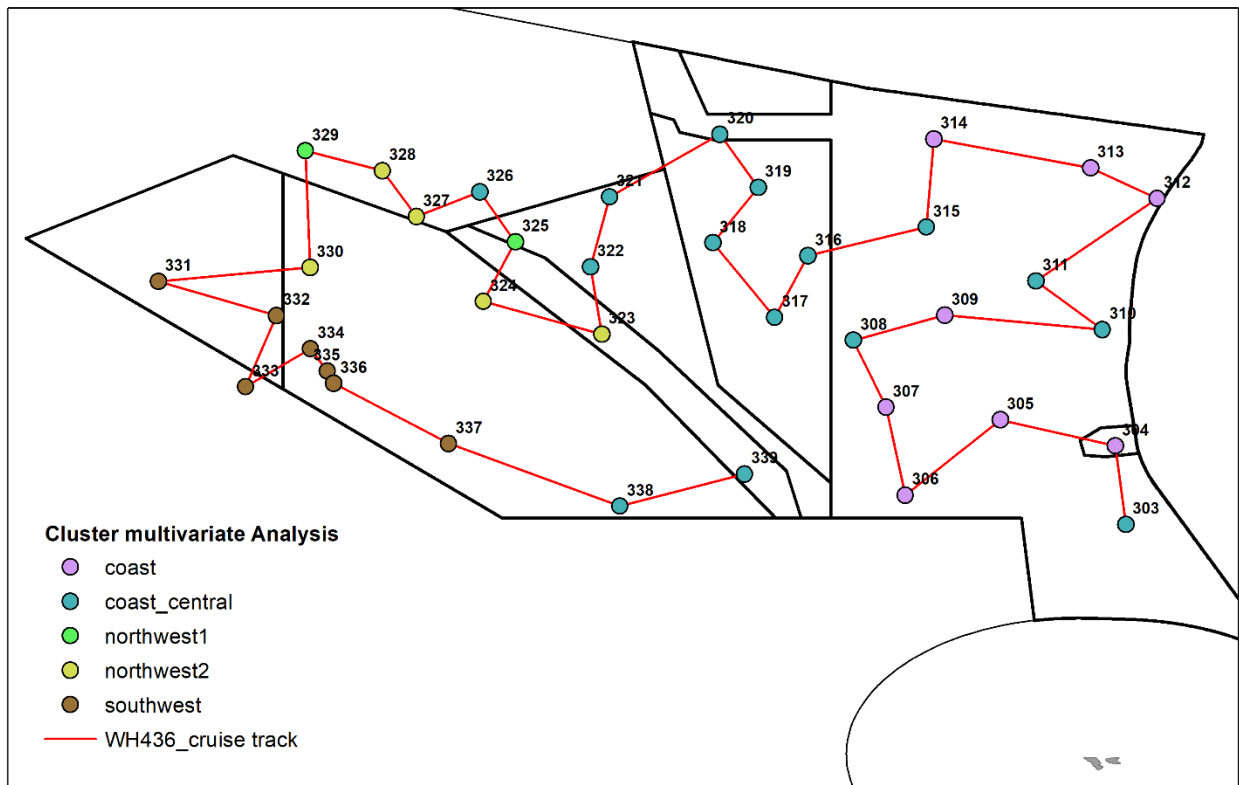


Fig. 1: WH436 cruise track with sampling stations in the Sylt Outer Reef. Color of circles represent clustering in multivariate analysis (nMDS and Clusteranalysis; not shown)

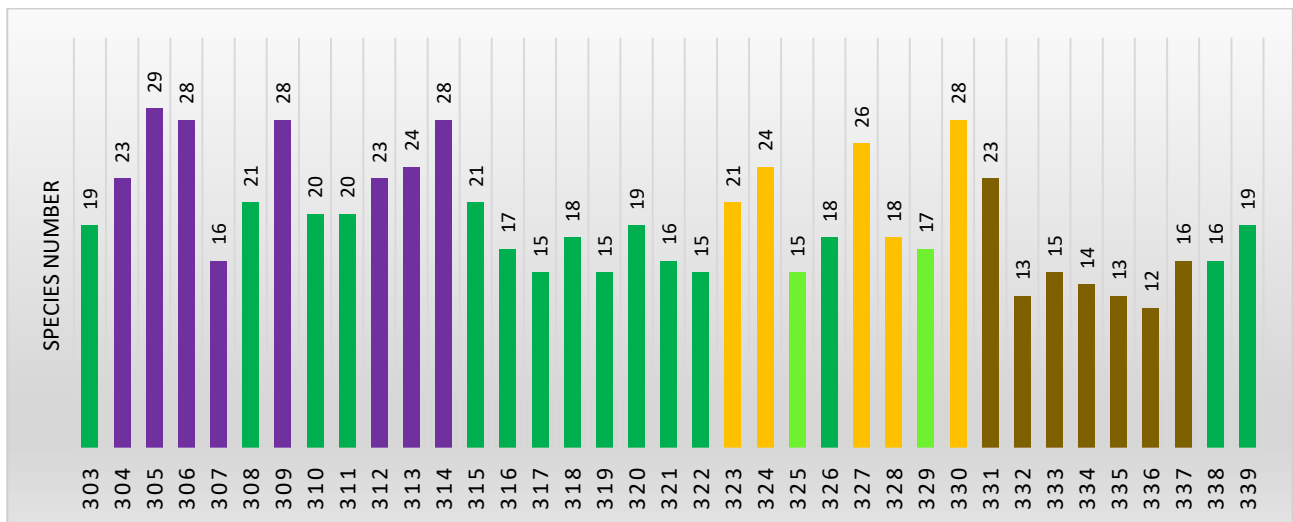


Fig. 2: Number of species at each station. Colors correspond to clusters in figure 1.

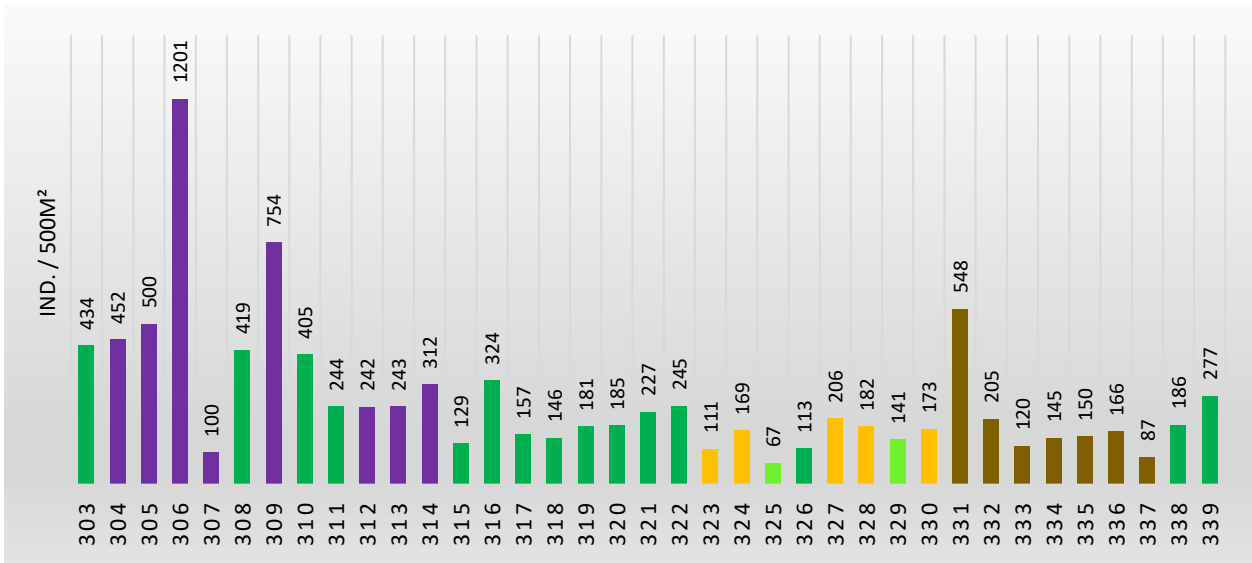


Fig. 3: Summed abundance of species (ind. / 500 m²) at each station. Colors correspond to clusters in figure 1.

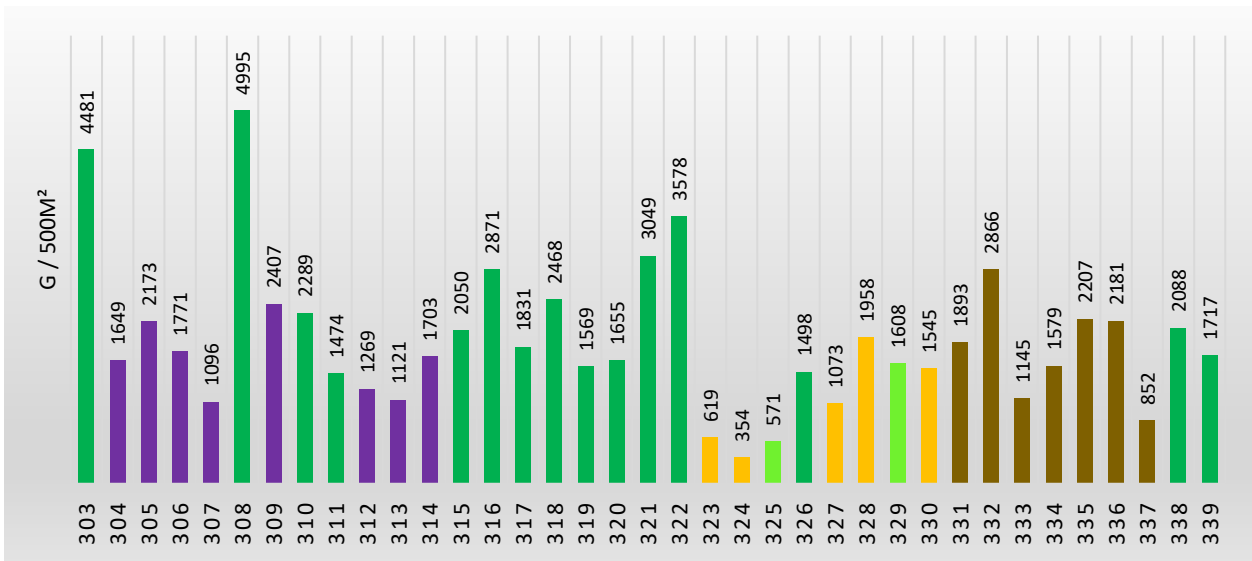


Fig. 4: Summed biomass of species (g / 500 m²) at each station. Colors correspond to clusters in figure 1.