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Cruise Report
FRV Walther Herwig, WH 356
07-19 – 08-16-2012

IBTS and GSBTS

Cruise Leaders: Dr. Anne Sell, Dr. Matthias Kloppmann

1. Summary

This cruise covered fisheries research representing the German contribution to the International Bottom Trawl Survey (IBTS) in quarter III, as well as one component of the two-ship operation in the German Small-scale Bottom Trawl Survey (GSBTS). Both surveys use the same principle fishing methods but at different spatial scales, applying a GOV bottom trawl, accompanied by hydrographic measurements, investigations of benthic epifauna and sediments.

A total of 144 stations were sampled in the wider German Bight, and in the central and northern North Sea. Besides the regular survey tasks, sampling was performed for stomach analyses of demersal fish species for the EU projects VECTORS and MYFISH (collaboration with Hamburg University). Benthos samples for stable isotope analyses were collected for the Thünen Institute of Fisheries Ecology.

2. Number of stations sampled during WH 356

	Hauls GOV	CTD casts (total)	CTD casts with nutrient samples	Hauls 2-m beamtrawl	Van Veen sediment grab**
IBTS	29*	29*	29*	29*	82*
Box A	20	14	9	9	25
Box B	21	15	9	9	18
Box C	21	15	9	9	18
Box D	18	14	9	9	18
Box L	20	15	9	9	18
Box M	21	15	9	9	18
total	**144**	**111**	**77**	**77**	**184**

*) IBTS: Includes 23 hauls in rectangles in the wider German Bight (incl. Box A), and one each in the remaining 5 Boxes.
**) Sediment samples from all stations, infauna for selected areas

2.1 Groundfish (TI-SF)

(Institute of Sea Fisheries, Johann Heinrich von Thünen-Institute, TI-SF)

The qualitative and quantitative composition of the bottom fish fauna was analyzed from a total of 144 GOV hauls for the IBTS and the GSBTS, respectively. 29 of the 30 ICES rectangles allocated for IBTS sampling during WH 356 could be covered (1 GOV haul and accompanying investigations, each). Within the GSBTS, six areas of investigation ('Boxes') were sampled. Generally, the target of 21 fishing hauls per Box were obtained, except for Boxes A and L (20 each), and Box D (18 hauls), were very high abundance of herring prolonged the processing and made it necessary to reduce towing time in some instances. Hauls for each Box were completed within three consecutive days (Fig. 1).

Data from the IBTS hauls taken in the wider German Bight will be combined with international data covering the entire North Sea for the assessment of groundfish stocks and for analyses on the non-commercial species. Data are uploaded to ICES DATRAS system.

In all GSBTS Boxes, specimens of cod, grey gurnard, whiting, and several flatfish species were collected for the analysis of stomach contents (TI-SF/ University of Hamburg).

From the GOV hauls, larger invertebrates were quantified as specified in the IBTS manual. For a pilot study on by-catch in the GOV, a full analysis of benthic invertebrates caught with the net was conducted for selected stations.

During all hauls, the GOV was planned to be equipped with sensors for net geometry as required for the IBTS and GSBTS surveys. Unfortunately, one of the distance sensors on the net wings was lost during a net damage on station 817 (Aug 7, Box B), and hence only distance values for the otter boards are available from that station onwards.

2.2 Hydrography (TI-SF)

A total of 111 hydrographic casts were performed with a Seabird CTD to record vertical profiles of temperature, salinity and oxygen concentration within the Boxes. At 77 of these stations, water samples for nutrient analyses were taken. Samples for calibration of the oxygen probe were taken and processed through Winkler titration for a subset of stations.

2.3 Epibenthos (Senckenberg)

Epibenthos was sampled within ICES rectangles of the wider German Bight (IBTS stations), as well as in the Boxes A, B, C, D, L and M, applying a 2 m-beam trawl. Samples were sieved over 5 mm and 2 mm mesh. The 5-mm fraction was analysed aboard, the 2-mm fraction was preserved in 4-% formaldehyde for analysis in the laboratory ashore.

2.4 Sediments, benthic infauna (Senckenberg)

Investigations of epibenthos were accompanied by sampling of sediments using a 0.1 m^2 van Veen grab. The same grab was used to sample benthic infauna from stations in the Boxes A, B, D, L and M and at IBTS stations.

2.5 Seabirds (Research and Technology Centre, FTZ)

Investigations on seabirds were conducted during the fishing operations and also while the ship was steaming, using three different methods: During the fishing hauls, maxima in the numbers of ship-following birds were recorded. Secondly, discard feeding experiments were performed to document which fish species would be taken by which bird species, and at which size of prey fish. For these feeding trials, individual fish from a representative subsample of one of the two preceding GOV catches were fed while another fishing haul was being conducted. Finally, during steaming transects and at ship speeds > 8-9 kn, counts of ship-independent seabirds were obtained for the international Seabirds at Sea (SAS) monitoring program, which records species occurrence, as well as behavioural observations.

3. Cruise schedule

On July 19, 2012, the *FRV Walther Herwig* departed for cruise WH 356 from Bremerhaven, Germany. On the 20th, the scientific program started with the first haul in ICES rectangle 38F7 and continued sampling for the IBTS until July 23 with 3-4 hauls per day. The following nine days were used to sample the boxes C, L and M (Fig. 1). During a port stop in Lerwick (Shetland Islands) on August 2/3, the cruise leadership was handed over from Dr. Anne Sell to Dr. Matthias Kloppmann and the *Walther Herwig* continued the survey on August 4th with stations on the Boxes D and B (3 days each), followed by two days of IBTS sampling, three days in Box A, and a last day of IBTS work in the German Bight. The ship returned to Bremerhaven on August 15 and was disembarked the following morning.

4. Preliminary Results

Groundfish (TI_SF)

IBTS samples (ICES rectangles in the wider German Bight)
Data from the IBTS stations were transmitted to ICES, where data from all participating nations are collated and analysed with respect to groundfish stock conditions and abundance of non-commercial species.

GSBTS samples
Data from the small-scale sampling in within the GSBTS extend the existing time series of annual data and are presently being processed in detail. One of the remarkable deviations from the long-term average were the exceptionally high abundances of herring in Box D close to the Scottish coast, where average catches in 18 hauls were >4000 kg per 30-min. haul.

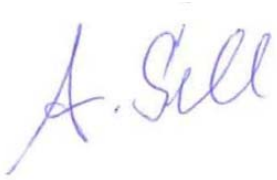
5. Cruise participants

	Name	Institution	Tasks
Leg 1			
1	Dr. Anne Sell	Thünen Institute, TI-SF	Cruise leader, hydrography
2	Dr. Ingrid Kröncke	Senckenberg	Benthos
3	Dr. Hermann Neumann	Senckenberg	Benthos
4	Gertrud Delfs	Thünen Institute, TI-SF	Fisheries biology, databases
5	Dr. Savas Kilic	Thünen Institute, TI-SF	Fisheries biology
6	Marthe Otto	Thünen Institute, TI-SF	Fisheries biology
7	Inken Rottgardt	Thünen Institute, TI-SF	Fisheries biology
8	Jens Edinger	Thünen Institute, TI-SF	Fisheries biology
9	Klaas Hauke Gerdes	Thünen Institute, TI-SF	Fisheries biology
10	Lennart Becker	Thünen Institute, TI-SF	Fisheries biology
11	Jonas Geburzi	FTZ Büsum	Seabird ecology
12	Sinikka Lennartz	FTZ Büsum	Seabird ecology
Leg 2			
1	Dr. Matthias Kloppmann	Thünen Institute, TI-SF	Cruise leader, hydrography
2	Dr. Ingrid Kröncke	Senckenberg	Benthos
3	Dr. Hermann Neumann	Senckenberg	Benthos
4	Gertrud Delfs	Thünen Institute, TI-SF	Fisheries biology, databases
5	Dr. Savas Kilic	Thünen Institute, TI-SF	Fisheries biology
6	Marthe Otto	Thünen Institute, TI-SF	Fisheries biology

7	Inken Rottgardt	Thünen Institute, TI-SF	Fisheries biology
8	Jens Edinger	Thünen Institute, TI-SF	Fisheries biology
9	Klaas Hauke Gerdes	Thünen Institute, TI-SF	Fisheries biology
10	Lennart Becker	Thünen Institute, TI-SF	Fisheries biology
11	Susanne Kühn	FTZ Büsum	Seabird ecology
12	Kai Borkenhagen	FTZ Büsum	Seabird ecology

6. Acknowledgements

We thank the ship's captain and crew for their dedicated support in fulfilling the tasks of this cruise.



(Dr. Anne Sell, Cruise leader)

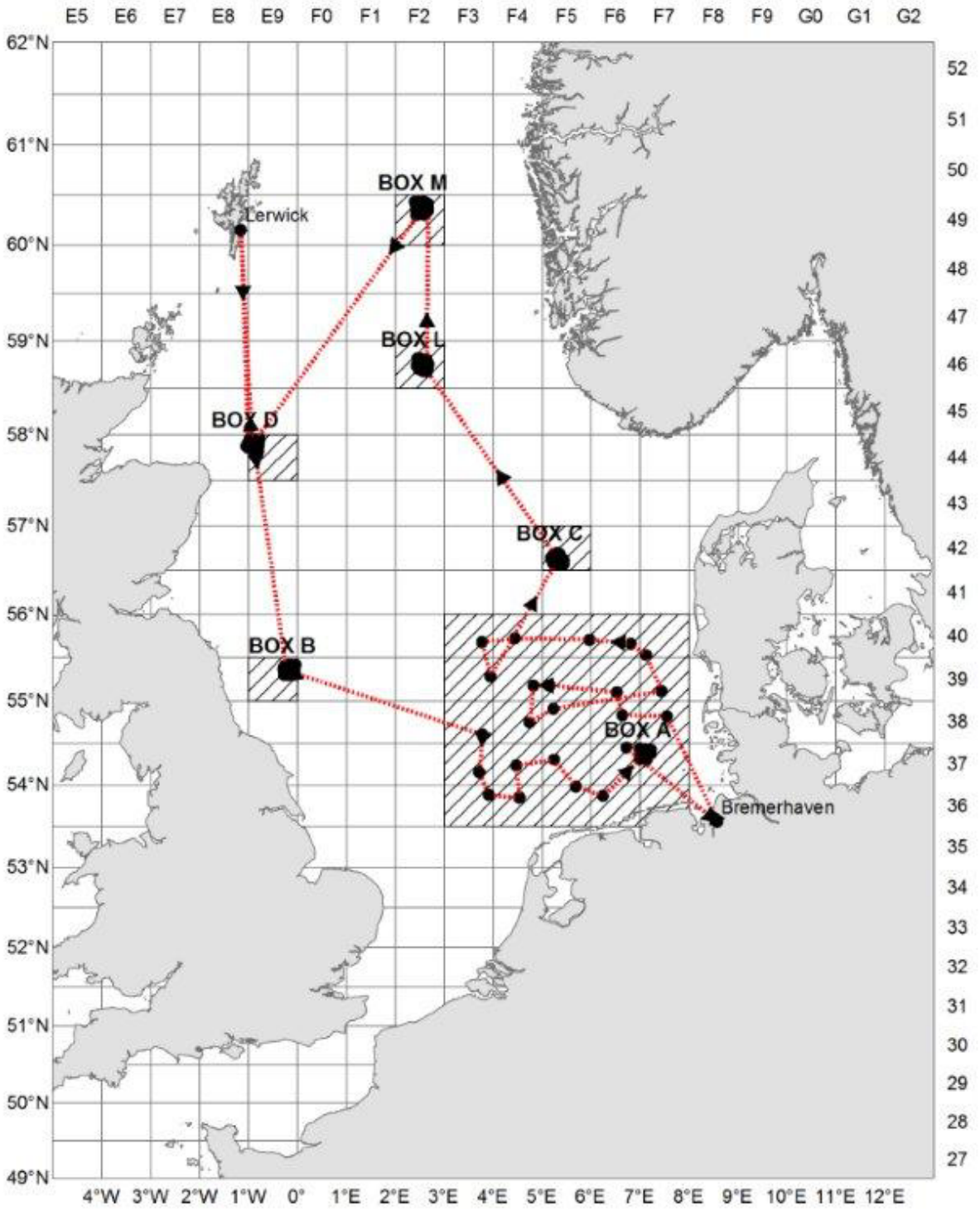


Fig. 1: Cruise track of WH 356, GSBTS and IBTS, 07/19-08/16/2012. Hatched area: ICES rectangles sampled within the IBTS, letters: areas of investigation (Boxes) within the GSBTS.