

Thünen Institute of Baltic Sea Fisheries

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Cruise report

FRV „Solea“ Cruise 748
30.05. - 11.06.2018

Investigation of the demersal fish fauna in the German Baltic Sea (BaltBox)

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Andrés Velasco, Paco Rodriguez-Tress, Thomas Hogh

1 In a nutshell

The purpose of this survey is the qualitative and quantitative recording of changes in distribution and composition of the demersal fish fauna in the German EEZ of the Baltic Sea. The survey is undertaken annually since 2003 by the Thünen Institute of Baltic Sea Fisheries in fixed reference areas. The sampling areas are located in ecologically characteristic areas ranging from Kiel Bay and Fehmarn Belt in the west via the deep Arkona Basin through to Adlergrund and Oderbank in the east. Since 2018 only the most characteristic areas concerning spatio-temporal distribution of fish species are investigated: "West", "Deep" and "East". The exact location of the sampling areas can be inferred from the map in the annex (Fig.1). In summary 68 fishery hauls and hydrographic stations were conducted in 2018. Overall 28 different fish species were identified. Highest biodiversity with 20 fish species was found in the area "West". Highest number of individuals as well as largest biomasses in the catch, referring to towed distance, also occurred here due to the high occurrence of dab. Sum of catch biomasses per nautical mile from all areas and all fish species except clupeids was dominated to 90% by the four demersal fish species cod (*Gadus morhua*), flounder (*Platichthys flesus*), dab (*Limanda limanda*) and plaice (*Pleuronectes platessa*).

Distribution list:

BLE, Hamburg
Schiffsführung FFS „Solea“
BMEL, Ref. 614
Thünen Institut - Präsidialbüro
Thünen Institut - Pressestelle, Dr. Welling
Thünen Institut - Institut für Fischereiökologie
Thünen Institut - Institut für Seefischerei
Thünen Institut - Institut für Ostseefischerei
Thünen - FZ-Fischerei
Max Rubner-Institut - FB Fischqualität, Hamburg
Bundesamt für Seeschifffahrt und Hydrographie, Hamburg
Reiseplanung Forschungsschiffe, Herr Dr. Rohlf
Fahrteilnehmer
Deutsche Fischfang-Union

Mecklenburger Hochseefischerei Sassnitz
Sassnitzer Seefischerei e. G.
Landesverband der Kutter- u. Küstenfischer MV
Landesfischereiverband SH
DFFU Cuxhaven
Mecklenburger Hochseefischerei Sassnitz
Doggerbank Seefischerei GmbH, Bremerhaven
Deutscher Fischerei-Verband e. V., Hamburg
Helmholtz-Zentrum für Ozeanforschung GEOMAR
Leibniz-Institut für Ostseeforschung Warnemünde
Institut für Fischerei der Landesforschungsanstalt
LfA für Landwirtschaft und Fischerei MV
Euro-Baltic Mukran

2 Cruise objectives

During the survey fixed ecologically characteristic reference areas of the German Baltic Sea are explored (Fig. 1) with regard to composition of and changes in the occurring demersal fish fauna. Investigations take place in areas differing in their hydrographic characteristics ranging from saline Bays in the Belt Sea to the Arkona Basin of 50m depth to shallow brackish water areas east of the island Rügen.

During the survey FRV "Solea" fished with a TV-3#520 bottom trawl. Fishing and processing of the catch were realized according to BITS standard (ICES 2007). Hydrographical CTD measurements were conducted after each haul to examine how fish distribution depends on temperature, salinity and oxygen contents.

Between 2010 and 2012 the BaltBox Survey was part of the Fehmarn Belt-project thereby providing data on spatio-temporal dynamics of commercially important fish species in this area. Since 2013 the BaltBox Survey is conducted in the frame of the European Marine Strategy Framework Directive (MSFD) for the assessment of variability of the demersal fish fauna in the western Baltic Sea. Furthermore all bycaught litter is monitored and documented.

Since 2018 the survey program was modified by specifically focusing on those areas significantly differing from each other in terms of spatio-temporal distribution of fish species.

3 Cruise narrative and preliminary results

FRV "Solea" left port Rostock-Marienehe on 30.05.2018 about 09:30 a.m. Survey operations started in the Fehmarn Belt.

On 04.06.2018 an exchange of scientific cruise members was made on schedule at port Saßnitz. The survey ended on 11.06.2018 in Rostock-Marienehe.

During the BaltBox Survey 70701 fish were caught with an overall weight of 12074 kg (~ 12 tons). Largest biomasses in the catch, referring to towed distance, occurred in the area "West" (140.6 kg/nm), followed by the areas "Deep" (118.8 kg/nm) and "East" (105.3 kg/nm). In the area "Deep" (Arkona Basin) markedly lower cod biomasses were caught compared to the years before (2018: 64.36 kg/nm; 2016: 225.9 kg/nm; 2015: 154.6 kg/nm; 2014: 127.9 kg/nm; 2013: 101.5 kg/nm; 2012: 76 kg/nm). In 2018 cod constituted only 54.2 % of the catch in the Arkona Basin.

Overall 98.6% of the total cod catches during the survey occurred in SD24.

For the purpose of age determination 692 otoliths in SD 22 and 1794 otoliths in SD 24 were taken in total from cod (*Gadus morhua*), dab (*Limanda limanda*), flounder (*Platichthys flesus*), plaice (*Pleuronectes platessa*), and turbot (*Scophthalmus maximus*).

The weight and number per distance of the main fish species caught are presented in table 1. For the assessment of the demersal fish fauna herring and sprat are not considered.

Preliminary results show highest fish abundances in the area "West" (1606.2 Ind./nm) which are more than three times higher than abundances in the other areas, respectively ("Deep": 505.5 Ind./nm, "East": 441.4 Ind./nm). In the west these numbers are mainly referring to the large amount of dab in the catch (1189.7 Ind./nm). In the area "Deep" the catch is dominated by cod (173.8 Ind./nm), followed by flounder (122.7 Ind./nm) and whiting (105.1 Ind./nm) and in the area "East" plaice is dominating (207.8 Ind./nm).

Overall 28 different fish species were identified. Highest biodiversity was found in the area "West" (20 fish species), lowest diversity in the area "East" (14 fish species). Largest biomasses of demersal fish species accounted for cod (36.8 %), followed by plaice (18.9 %), dab (17.7 %) and flounder (17.0 %); 8.7 % of total biomasses refer to whiting, the rest (0.9 %) to other species.

4 Cruise Participants

Andrés Velasco	Co-Cruise leader	TI-OF
Paco Rodriguez-Tress	Co-Cruise leader	TI-OF
Thomas Hogh	Co-Cruise leader	TI-OF
Sven Dressler	Biological-technical assistant	TI-OF
Nakula Plantener	IT expert	TI-OF
Rainer Stechert	Biological-technical assistant	TI-OF
Florian Lüskow	Guist scientist	Univ. of Southern Denmark
Felix Zundel	Student assistant	Univ. Oldenburg & Groningen

5 Acknowledgments

I'm grateful to the captain V.Koops and his crew for their cooperation and commitment. In addition I thank the scientific team for its qualified work, flexibility, effort and the nice working atmosphere.

sgd. A. Rau
(Scientist in charge)

Table 1: Main fish species caught in the demersal fish boxes during cruise 748 with FRV „Solea“, referring to towed nautical mile (sm).

Box	West				Deep				East				Summe			
Towed nautical mile (nm)	19.4				52.0				30.1							
Number of hauls	13.0				35.0				20.0							
Fish species	Weight		Number		Weight		Number		Weight		Number		Weight		Number	
	kg	kg/sm	n	n/sm	kg	kg/sm	n	n/sm	kg	kg/sm	n	n/sm	kg	kg/sm	n	n/sm
<i>Gadus morhua</i>	27.7	1.4	134	7	3348.6	64.4	9044	174	1034.9	34.4	2413	80	4411.2	43.5	11591	114
<i>Merlangius merlangus</i>	150.4	7.8	1997	103	891.5	17.1	5466	105	0.4	0.0	2	0	1042.2	10.3	7465	74
<i>Platichthys flesus</i>	54.6	2.8	206	11	1206.7	23.2	6384	123	774.8	25.7	3969	132	2036.1	20.1	10559	104
<i>Limanda limanda</i>	2050.0	105.8	23046	1190	65.1	1.3	549	11	2.3	0.1	16	1	2117.4	20.9	23611	233
<i>Pleuronectes platessa</i>	360.7	18.6	2292	118	624.4	12.0	3115	60	1279.3	42.5	6255	208	2264.4	22.3	11662	115
<i>Scophthalmus maximus</i>	1.3	0.1	4	0	3.7	0.1	5	0	17.2	0.6	43	1	22.2	0.2	52	1
<i>Clupea harengus</i>	9.7	0.5	184	9	11.7	0.2	190	4	3.5	0.1	50	2	24.9	0.2	424	4
<i>Sprattus sprattus</i>	46.6	2.4	2796	144	21.4	0.4	1499	29	4.6	0.2	193	6	72.6	0.7	4488	44
<i>Others</i>	21.6	1.1	454	23	9.0	0.2	50	1	52.4	1.7	345	11	83.0	0.8	849	8
Sum	2722.6	140.6	31113	1606	6182.0	118.8	26302	505	3169.5	105.3	13286	441	12074.0	119.0	70701	697
Sum without Clupeids	2666.3	137.6	28133	1452	6149.0	118.2	24613	473	3161.3	105.0	13043	433	11976.6	118.0	65789	648

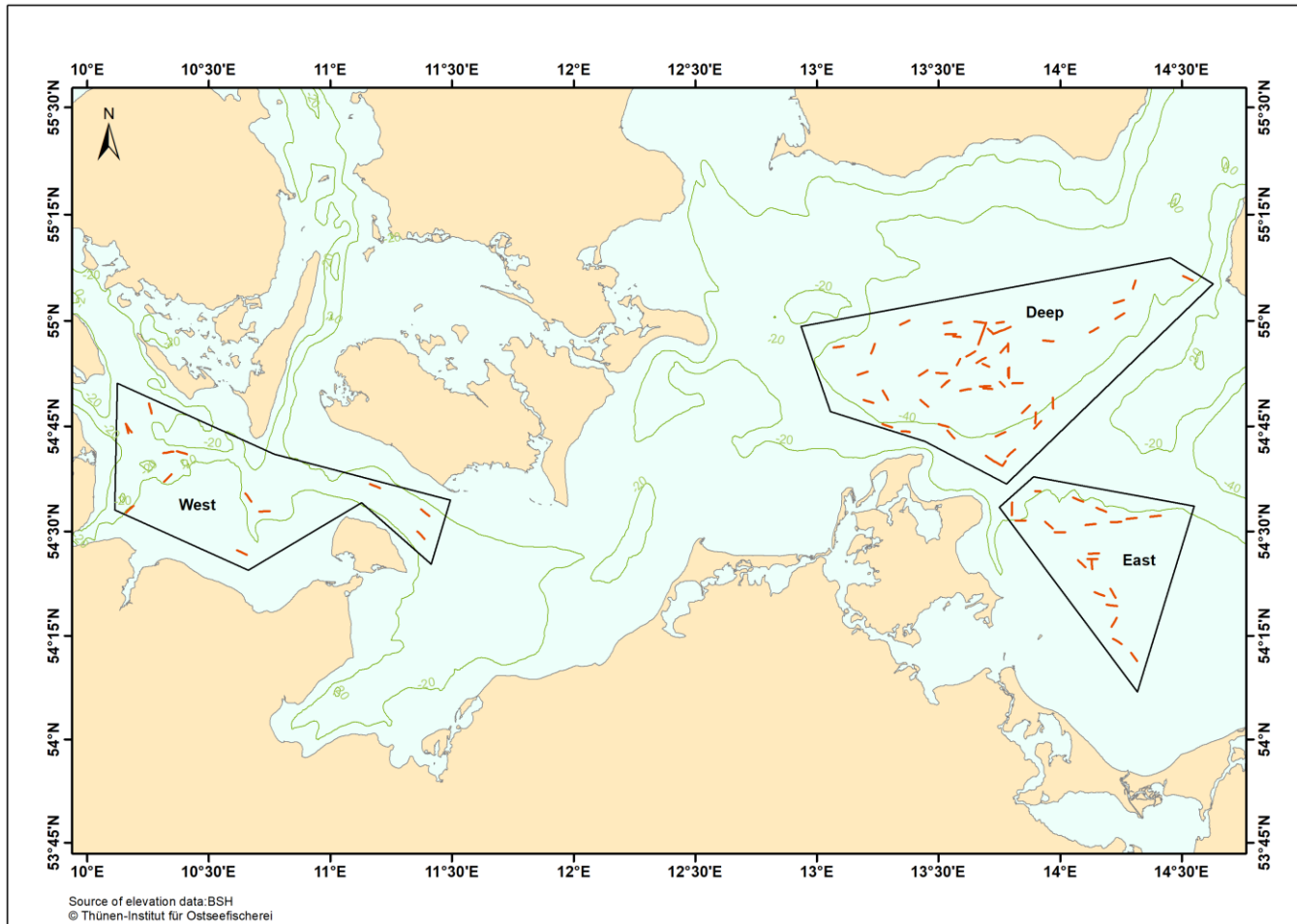


Figure 1: Location of fixed sampling areas of the BaltBox-Survey for investigation of the demersal fish fauna in the German EEZ of the Baltic Sea.