

Institute of Sea Fisheries

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Cruise report FRV "Walther Herwig III" Cruise 381 05.01. – 14.01.2015

International Herring Larvae Survey in the North Sea and German Small-scale Bottom Trawl Survey

Scientist in charge: Dr. Norbert Rohlf

Summary

The cruise should survey the winter bottom fish assemblages in the German Bight and the abundance and distribution of fish larvae in the Southern North Sea.

The German Small-scale Bottom Trawl Survey (GSBTS) continued the long-term investigation of winter bottom fish assemblages through sampling of the standard area "Box A" in the German Bight. The mean catch yielded is lower compared to 2013, but in the same order of magnitude as the period 2007-2011.

Within the 10-by-10 nautical mile area in the Box, the GOV bottom trawls were accompanied by monitoring of the benthic epifauna with a 2-m beam trawl. Compared to preceding years, the epifauna in Box A was dominated by high numbers of the shrimp *Crangon crangon*, the bivalve *Nucula nitidosa* and the starfish *Asterias rubens*, while the goby *Pomatoschistus minutus* and the shrimp *Crangon allmanni* were less abundant

The international herring larvae surveys in the North Sea (IHLS) are conducted annually during the autumn and winter herring spawning activity and monitor the spatial distribution and abundance of herring larvae. Unfortunately, the storm "Elon", "Felix", "Gunther" and following depressions prevented any sampling activity on herring larvae in the area under investigation. As a consequence, no larvae abundance index can be calculated for the Southern North in the first half of January this year.

Verteiler:

TI - Institut für Seefischerei
Saßnitzer Seefischerei e. G.

per e-mail:

Bundesanstalt für Landwirtschaft und Ernährung, Hamburg
Schiffsführung FFS "Walther Herwig"
BMEL, Ref. 614
BMEL, Ref. 613
TI – Präsidialbüro (Michael Welling)
TI – Personalreferat
TI - Institut für Fischereiökologie
TI - Institut für Ostseefischerei Rostock
TI – FIZ-Fischerei
TI - PR
MRI - BFEL HH, FB Fischqualität

Dr. Rohlf, SF - Reiseplanung Forschungsschiffe
Fahrtteilnehmer
Deutsche Fischfang Union, DFFU
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.

2. Research programme

2.1 Herring larvae survey

One aim of the cruise was the German contribution to the international herring larvae surveys in the North Sea in January. Parts of ICES area IVc and VIId should be sampled by double oblique tows with the "Nackthai" (modified GULF III sampler), resulting in herring larval abundance estimates and spatial distribution. Due to a number of storms entering the area under investigation, it was impossible to cover any of the stations in the IHLS programme.

2.2 Monitoring (TI-SF)

21 GOV hauls were taken to qualitatively and quantitatively analyze the development of abundance and diversity in the bottom fish assemblages. Methods are in accordance with the International Bottom Trawl Survey, in order to allow comparison of results between the two surveys. Epibenthos sampling with a 2-m beam trawl complemented the GOV hauls in order to allow simultaneous investigations of benthic invertebrates and bottom fish (Table 2).

2.3 Epibenthos (Senckenberg Research Institute)

The 2-m beam trawl for the sampling of epibenthos had a mesh size of 20 x 20 mm in the main net and 4 x 4 mm in the cod end and was applied with 5-min 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.

2.4 Sediments and benthic infauna (Senckenberg Research Institute)

Investigations of epibenthos were accompanied by sampling of sediments using a 0.1 m² Van Veen grab for the analysis of sediment composition and total organic carbon (TOC).

3. Narrative

FRV "Walther Herwig III" left Bremerhaven on Monday afternoon, 01/05/15. The vessel steamed into the German Bight, where the fish and benthos monitoring was conducted within the next three days (01/06 – 01/08) in the area of investigation in Box A. The programme could be completed as planned, with 21 randomly assigned GOV trawl hauls and nine beam trawls and grab samples.

On Thursday evening, the vessel moved near to the Island of Helgoland, getting some shelter from the upcoming storm (forecasts wind speed up to 12 Beaufort). We decided to stay close to Helgoland for the next days, awaiting more moderate weather conditions to get the herring larvae programme started. Unfortunately, the weather conditions did not improve at all, neither in the German Bight nor in the English Channel. With the given wind speeds and waves heights, there was no chance to conduct any successful plankton sampling. On Tuesday morning (01/13/15), it became obvious that there was no good reason to await better conditions any longer. We left the position around Helgoland and streamed to Bremerhaven. The vessel was back in the port on Tuesday evening.

4. Preliminary results

4.1 Bottom Fishes (TI-SF)

The mean total catch of all bottom fishes in Box A (Figure 1) amounted to 111 kg per half hour trawl duration. This is lower as compared to 2013 (179 kg), but in the same order of magnitude as the period 2007-2011 (Figure 2). Dab (*Limanda limanda*), sprat (*Sprattus sprattus*) and herring (*Clupea harengus*) dominated the catches with on average 66, 21 and 18 kg per half hour haul, respectively (Table 3). Cod (*Gadus morhua*), plaice (*Pleuronectes platessa*) and flounder (*Platichthys flesus*) were caught with 2.2 (cod), 1.4 (plaice) and 0.7 kg (flounder), respectively. The amount of the striped red mullet (*Mullus surmuletus*) was relatively high in this year's survey (0.031 kg/30 min.).

4.2 Epibenthos (Senckenberg Research Institute)

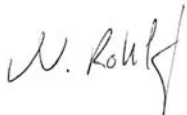
Nine beam trawl hauls and nine van Veen grab samples were undertaken in Box A. The sediment consisted of muddy fine sand. The epifauna in Box A was dominated by high numbers of the shrimp *Crangon crangon*, the bivalve *Nucula nitidosa* and the starfish *Asterias rubens*. These species occurred in remarkably higher abundances than in previous years. In contrast, high abundances of the goby *Pomatoschistus minutus* disappeared in the 2015 survey. Additionally, the shrimp *Crangon allmanni* was less abundant this year. In general, the mean biomass of the epifauna was estimated to be unusually high, most likely due to relatively high water temperatures during the winter 2014. With the tadpole fish *Raniceps raninus* we found a species, which was never observed before in any of the beam trawl hauls in Box A.

5. Participants

Name	Institution	Function
1. Norbert Rohlf	TI-SF	Cruise leader
2. Birgit Suer	TI-SF	Technician
3. Sakis Kroupis	TI-SF	Technician
4. Christine Petersen-Frey	TI-SF	Technician
5. Michael Sasse	TI-SF	Technician
6. Heike Schwermer	TI-SF	Student
7. Tim Dudeck	TI-SF	Student
8. Dr. Hermann Neumann	Senckenberg	Scientist
9. Constanze Hammerl	Senckenberg	Student

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. Norbert Rohlf)

7. Tables and Figures

Table 1: Boundaries of Box A in the German EEZ

LAT		LON		Center	
From	To	From	to		
54°17.00´ N	54°27.00´ N	006°58.00´ E	007°15.00´ E	54°22.00´ N	007°06.50´ E

Table 2: Type and amount of samples obtained in Box A

Number of stations	GOV	2-m Beam trawl	Hydrography	Sediment + Meiofauna
9	X	X	X	X
6	X		X	
6	X			
Total sets	21	9	15	9

Table 3: Total catch and average catch by species per 30 minutes trawl duration

STATION	1	2	3	4	5	6	7	8	9	10	11
<i>AGONUS CATAPHRACTUS</i>	0.138	0.156	0.094	0.140	0.000	0.060	0.104	0.092	0.022	0.012	0.048
<i>ALLOTEUTHIS SUBULATA</i>	0.000	0.064	0.022	0.012	0.008	0.024	0.026	0.004	0.012	0.016	0.056
<i>ALOSA FALLAX</i>	0.128	0.000	0.112	0.000	0.000	0.000	0.000	0.000	0.000	0.354	0.000
<i>AMMODYTES MARINUS</i>	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>ARNOGLOSSUS LATERNA</i>	0.000	0.030	0.008	0.001	0.000	0.000	0.001	0.044	0.020	0.016	0.012
<i>BUGLOSSIDIUM LUTEUM</i>	0.110	0.034	0.038	0.044	0.086	0.020	0.138	0.274	0.192	0.062	0.042
<i>CALLIONYMUS LYRA</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.022	0.000
<i>CALLIONYMUS RETICULATUS</i>	0.010	0.006	0.004	0.002	0.002	0.001	0.014	0.010	0.000	0.000	0.000
<i>CANCER PAGURUS</i>	0.904	2.712	0.818	0.730	1.170	0.000	0.000	0.960	0.768	0.000	1.686
<i>CILIATA MUSTELA</i>	0.000	0.000	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>CLUPEA HARENGUS</i>	17.636	20.674	13.263	34.853	14.207	25.150	25.501	38.453	23.417	13.885	26.715
<i>CRYSTALLOGOBIUS LINEARIS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000
<i>CYCLOPTERUS LUMPUS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>ECHICHTHYS VIPERA</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>ENGRAULIS ENCRASICOLUS</i>	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>ENTELURUS AEQUOREUS</i>	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.000	0.000
<i>EUTRIGLA GURNARDUS</i>	0.004	0.032	0.002	0.236	0.000	0.020	0.308	0.010	0.232	0.000	0.000
<i>GADUS MORHUA</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.170	0.000	15.400	0.300
<i>GAIDROPSARUS VULGARIS</i>	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>GASTEROSTEUS ACULEATUS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.006
<i>LABRIDAE</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
<i>LIMANDA LIMANDA</i>	60.650	91.700	57.190	58.580	75.020	39.740	80.900	91.500	72.500	45.800	32.460
<i>MERLANGIUS MERLANGUS</i>	0.098	0.536	0.388	0.326	0.182	0.734	0.010	0.336	0.348	0.170	0.328
<i>MICROSTOMUS KITT</i>	0.000	0.000	0.000	0.092	0.132	0.000	0.076	0.000	0.000	0.030	0.024
<i>MULLUS SURMULETUS</i>	0.008	0.000	0.000	0.000	0.030	0.092	0.000	0.028	0.032	0.014	0.082
<i>MYOXOCEPHALUS SCORPIUS</i>	0.000	0.270	0.000	0.000	0.064	0.184	0.048	0.000	0.034	0.000	0.396
<i>PHOLIS GUNNELLUS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>PLATICHTHYS FLESUS</i>	0.000	0.188	1.374	1.632	0.420	0.236	0.260	0.628	0.000	0.562	0.698
<i>PLEURONECTES PLATESSA</i>	3.608	1.926	0.398	0.268	1.718	0.372	1.865	1.162	1.900	0.992	2.464
<i>POMATOSCHISTUS MINUTUS</i>	0.000	0.220	0.001	0.001	0.000	0.000	0.002	0.004	0.001	0.002	0.001
<i>PSETTA MAXIMA</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>RHINONEMUS CIMBRIUS</i>	0.000	0.000	0.000	0.000	0.066	0.000	0.000	0.016	0.000	0.000	0.000
<i>SCOMBER SCOMBRUS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.076	0.000	0.000
<i>SCOPHTHALMUS RHOMBUS</i>	0.000	0.000	0.364	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>SCYLIORHINUS CANICULA</i>	0.000	0.000	0.000	0.000	0.922	0.000	0.000	0.000	0.000	0.000	0.000
<i>SEPIOLA ATLANTICA</i>	0.008	0.022	0.002	0.008	0.004	0.004	0.012	0.024	0.000	0.000	0.008
<i>SOLEA VULGARIS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>SPRATTUS SPRATTUS</i>	18.924	40.776	12.637	13.067	15.393	20.100	91.999	71.647	7.323	13.035	19.445
<i>SYNGNATHUS ROSTELLATUS</i>	0.001	0.001	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.000
<i>TRACHURUS TRACHURUS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.014	0.000	0.024
<i>TRIGLA LUCERNA</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	102.2	159.4	86.8	110.0	109.4	86.8	201.3	218.4	106.9	90.4	84.8

Table 3 continued: Total catch and average catch by species per 30 minutes trawl duration

STATION	12	13	14	15	16	17	18	19	20	21	Mean
<i>AGONUS CATAPHRACTUS</i>	0.018	0.104	0.138	0.296	0.038	0.144	0.108	0.094	0.058	0.128	0.079
<i>ALLOTEUTHIS SUBULATA</i>	0.000	0.016	0.008	0.010	0.002	0.000	0.006	0.000	0.004	0.032	0.022
<i>ALOSA FALLAX</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054
<i>AMMODYTES MARINUS</i>	0.000	0.000	0.000	0.000	0.010	0.012	0.000	0.000	0.000	0.000	0.001
<i>ARNOGLOSSUS LATERNA</i>	0.000	0.000	0.000	0.056	0.000	0.001	0.001	0.030	0.014	0.002	0.012
<i>BUGLOSSIDIUM LUTEUM</i>	0.084	0.090	0.058	0.196	0.066	0.172	0.073	0.116	0.080	0.192	0.095
<i>CALLIONYMUS LYRA</i>	0.088	0.018	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.002
<i>CALLIONYMUS RETICULATUS</i>	0.002	0.000	0.000	0.000	0.000	0.026	0.028	0.000	0.000	0.002	0.004
<i>CANCER PAGURUS</i>	0.000	3.146	0.000	1.000	0.408	1.364	0.506	0.564	0.000	0.728	0.886
<i>CILIATA MUSTELA</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044	0.000	0.003
<i>CLUPEA HARENGUS</i>	20.245	21.846	21.765	22.410	15.160	3.205	6.322	4.319	3.321	7.383	23.069
<i>CRYSTALLOGOBIUS LINEARIS</i>	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
<i>CYCLOPTERUS LUMPUS</i>	0.000	0.000	3.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>ECHIICHTHYS VIPERA</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000
<i>ENGRAULIS ENCRASICOLUS</i>	0.000	0.000	0.000	0.000	0.002	0.004	0.000	0.000	0.000	0.000	0.001
<i>ENTELURUS AEQUOREUS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
<i>EUTRIGLA GURNARDUS</i>	0.000	0.012	0.600	0.006	0.000	0.362	0.048	0.000	0.110	0.238	0.077
<i>GADUS MORHUA</i>	0.000	0.000	0.000	0.000	0.000	8.360	0.000	5.564	0.000	2.834	2.625
<i>GAIDROPSARUS VULGARIS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
<i>GASTROSTEUS ACULEATUS</i>	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.001
<i>LABRIDAE</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>LIMANDA LIMANDA</i>	57.000	61.100	34.700	52.700	57.500	60.400	72.100	72.800	88.200	113.300	64.185
<i>MERLANGIUS MERLANGUS</i>	0.892	0.360	0.104	0.224	0.594	0.046	0.236	0.528	0.328	0.000	0.314
<i>MICROSTOMUS KITT</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.226	0.032
<i>MULLUS SURMULETUS</i>	0.216	0.046	0.000	0.058	0.000	0.026	0.000	0.028	0.000	0.000	0.026
<i>MYOXOCEPHALUS SCORPIUS</i>	0.054	0.182	0.000	0.066	0.140	0.094	0.000	0.000	0.174	0.118	0.091
<i>PHOLIS GUNNELLUS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.000	0.000	0.000
<i>PLATICHTHYS FLESUS</i>	1.256	1.200	0.286	0.568	0.184	0.776	2.300	0.362	1.192	0.000	0.545
<i>PLEURONECTES PLATESSA</i>	0.340	3.228	1.066	0.282	0.342	0.498	0.858	2.374	0.300	2.944	1.516
<i>POMATOSCHISTUS MINUTUS</i>	0.001	0.000	0.002	0.001	0.000	0.002	0.001	0.001	0.000	0.002	0.021
<i>PSETTA MAXIMA</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.704	0.000	0.000	0.000	0.000
<i>RHINONEMUS CIMBRIUS</i>	0.000	0.000	0.000	0.042	0.000	0.014	0.036	0.000	0.020	0.064	0.007
<i>SCOMBER SCOMBRUS</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
<i>SCOPHTHALMUS RHOMBUS</i>	0.000	0.000	0.284	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033
<i>SCYLIORHINUS CANICULA</i>	0.000	0.000	0.000	0.000	0.000	0.772	0.000	0.000	0.000	0.000	0.084
<i>SEPIOLA ATLANTICA</i>	0.002	0.016	0.018	0.038	0.016	0.012	0.045	0.014	0.004	0.000	0.008
<i>SOLEA VULGARIS</i>	0.000	0.000	0.000	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>SPRATTUS SPRATTUS</i>	6.415	9.954	15.575	12.990	4.320	12.395	16.318	5.621	8.579	29.557	29.486
<i>SYNGNATHUS ROSTELLATUS</i>	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001
<i>TRACHURUS TRACHURUS</i>	0.000	0.034	0.000	0.004	0.000	0.008	0.000	0.004	0.000	0.000	0.005
<i>TRIGLA LUCERNA</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.000
Total	86.6	101.4	78.0	91.0	78.8	88.7	99.7	92.4	102.5	157.8	123.3

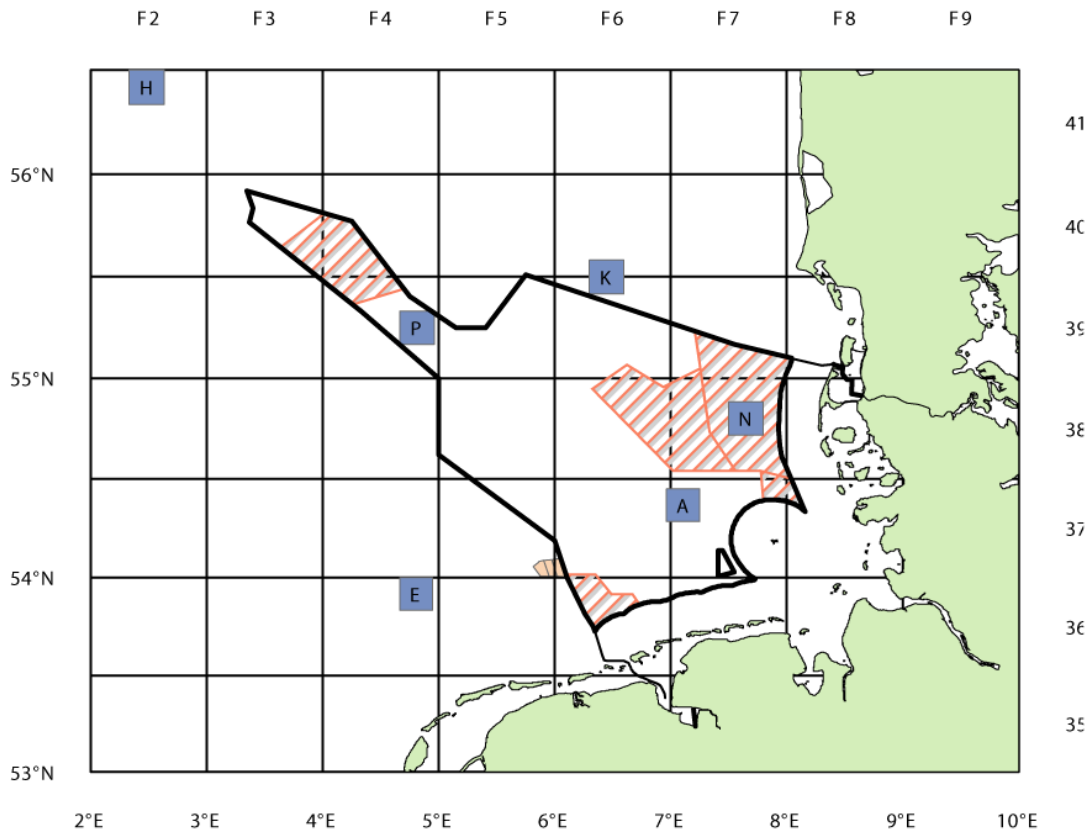


Figure 1: Location of Box A in the German EEZ

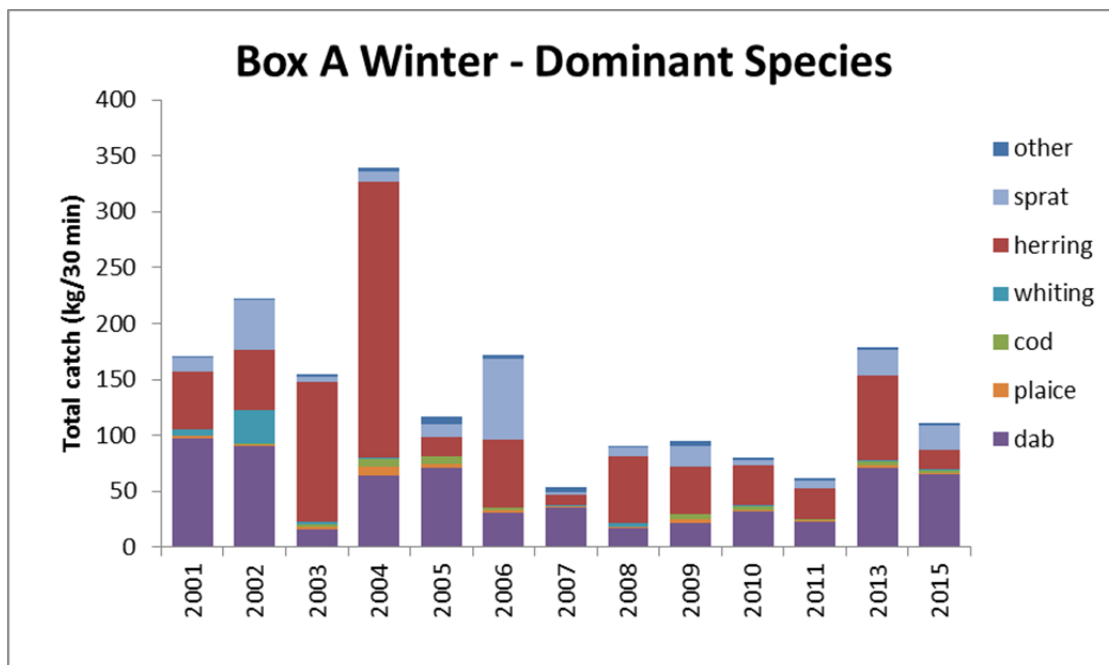


Figure 2: Catch ratios (kg/30min) in Box A in the German Bight from January 2001 to January 2015.