

„SOLEA“ Cruise 676

Report

24.07. – 12.08.2013

Personnel

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Objectives

1. To participate in the German Small-scale Bottom Trawl Survey (GSBTS) to monitor the fish fauna in 6 out of 12 small areas (boxes).
2. To investigate the hydrographical conditions within the boxes (vertical distribution of temperature, salinity and turbidity).
3. To monitor the zooplankton within the boxes.

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Narrative (Fig. 1)

On the 24th of July 2013 Solea left Cuxhaven and started the following day in Box N (German Bight) the scientific program. In general, the scientific program comprised three days with 7 hauls a day per box together with three CTD measurements and six plankton samples per day. Figure 1 shows the actual sequences of sampled boxes: Box N (German Bight; 3 days), Box K (Danish EEZ; 3 days), Box H (British EEZ; 3 days), Box P (German EEZ; 2 days), and Box E (Dutch EEZ; 3 days), and Box F (British EEZ; 3 days). The program ended on the 11th of August at 6 pm and the Solea docked in Cuxhaven the following day. A summary of the activities during SB676 within each box is given in Tab. 1 and a summary of the total sampling effort by box and year is presented in Tab.2.

Tab. 1: Activities (stations) during the cruise SB 676

area	KJH hauls	CTD	WP2	Bongo
Box N	22	9	9	5
Box K	21	9	8	6
Box H	21	9	9	9
Box P	18	6	4	2
Box F	21	9	9	8
Box E	21	9	9	9
total	125	51	48	39

Tab. 2: Total sampling effort by the research vessel SA and SB for each box and survey year.

Year	BOX E	BOX F	BOX H	BOX K	BOX N	BOX P	Total
1990	8	28	-	-	-	-	36
1991	28	28	27	24	-	-	107
1992	28	21	23	19	-	-	91
1993	27	23	25	27	-	-	102
1995	21	25	26	24	-	-	96
1996	28	26	17	28	-	-	99
1997	6	18	25	26	-	-	75
1998	17	20	25	23	-	-	85
1999	10	27	17	30	-	-	84
2000	-	-	-	-	8	-	8
2002	15	17	17	9	-	-	58
2003	15	24	23	24	-	24	110
2004	19	17	23	17	15	16	107
2005	14	16	20	14	20	14	98
2006	-	-	16	24	19	-	59
2007	23	22	24	12	21	16	118
2008	21	22	21	18	21	18	121
2009	24	22	21	15	22	16	120
2010	21	21	21	16	21	14	114
2011	10	-	21	7	21	21	80
2012	21	-	21	7	21	18	88
2013	21	21	21	21	23	18	125
Total	377	398	434	385	212	175	1981

Results

A total of 125 valid 30-min hauls were conducted using the cod hopper trawl equipped with the standard ground gear (20cm rubber discs in the ground rope) to monitor changes in species compositions of the 6 boxes. In addition to fishing, in each box a maximum of 9 stations were sampled with CTD, WP2 (vertical plankton net) and Bongo net (diagonal hauls).

Fig. 1 shows the area of investigation. The mean species compositions of each box and the variability within the time period are shown in Figs. 2 to 6. In Figure 7 the temporal trend in the mean diversity of a 30 min hol is shown for each box. The Shannon-Weaver-Index was calculated on the bases of annual mean cpue (kg/ 30min; (excluding crustaceans, squids and invertebrates) per box.

Dr. V. Stelzenmüller

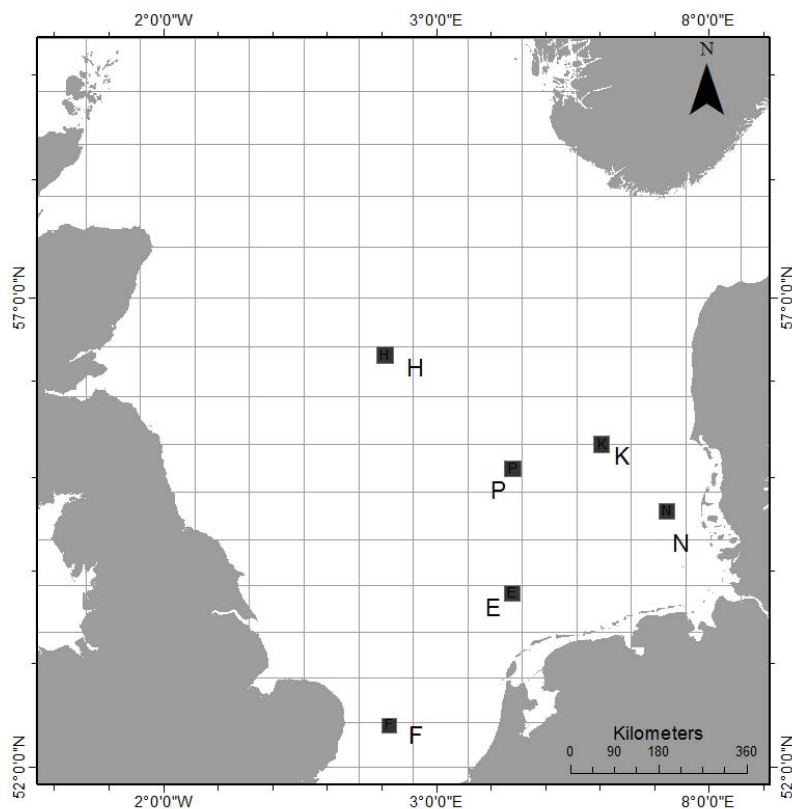


Fig. 1: Positions of German small scale bottom trawl survey "boxes" (10 x 10 nm) monitored by the research vessel „Solea“ during cruise no. 676. With ICES rectangles (30 x 30 nm).

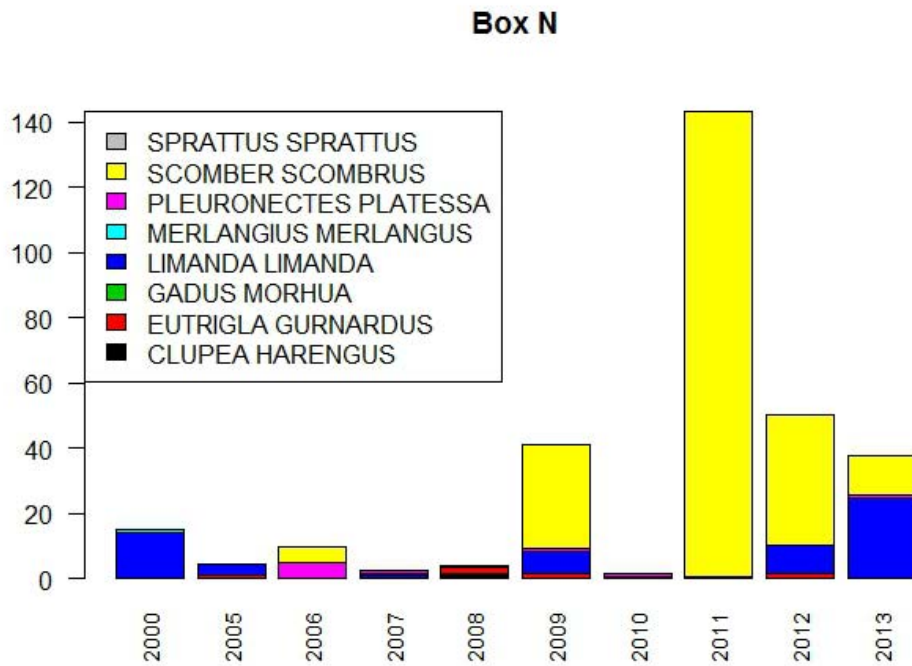


Fig. 2: Mean cpue (kg/30 min) of main species from 2000 to 2013 (summer) in Box N (German Bight).

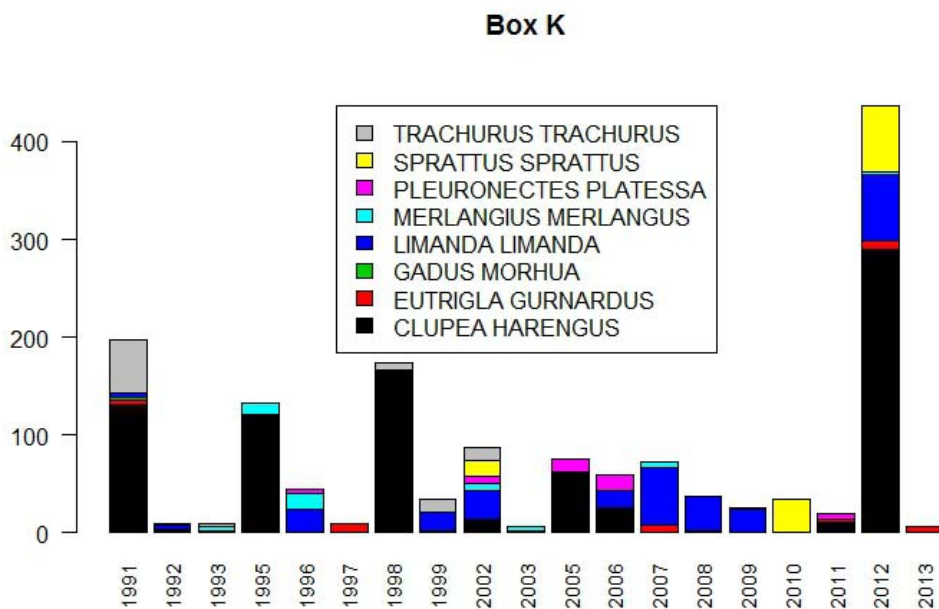


Fig. 3: Mean cpue (kg/30 min) of main species from 1991 to 2013 (summer) in Box K (Danish EEZ).

Box P

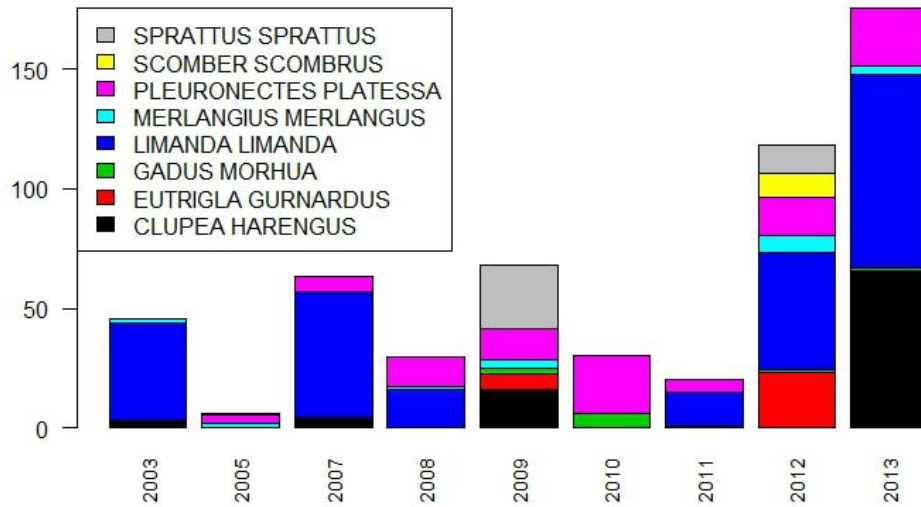


Fig. 4: Mean cpue (kg/30 min) of main species from 2003 to 2013 (summer) in Box P (German EEZ).

Box F

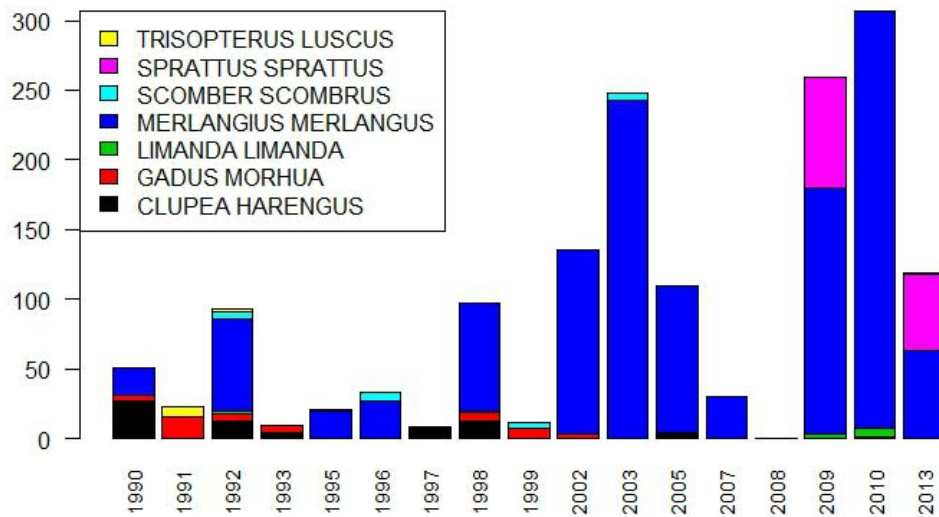


Fig. 5: Mean cpue (kg/30 min) of main species from 1990 to 2013 (summer) in Box F (British EEZ; English Channel).

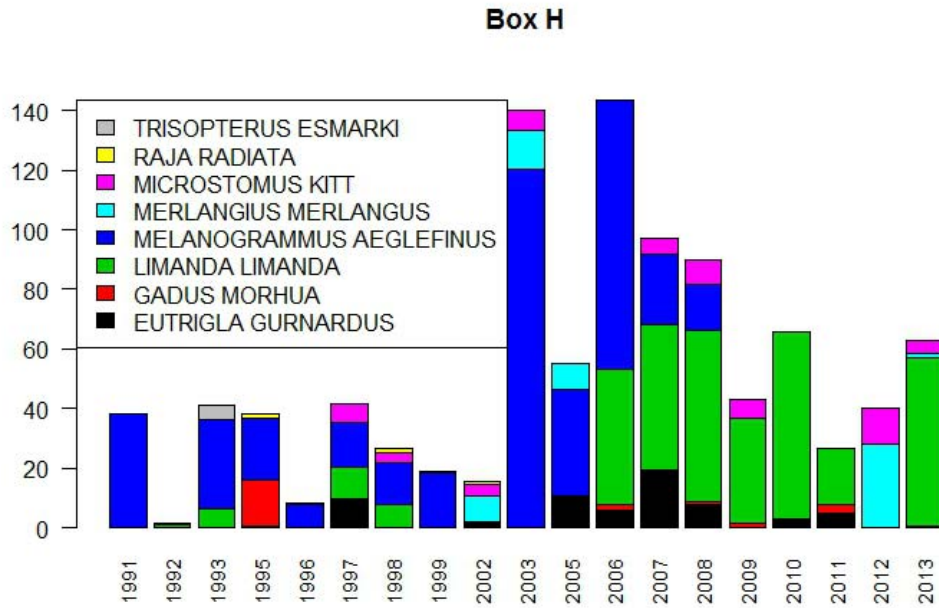


Fig. 6: Mean cpue (kg/30 min) of main species from 1991 to 2013 (summer) in Box H (British EEZ; central North Sea).

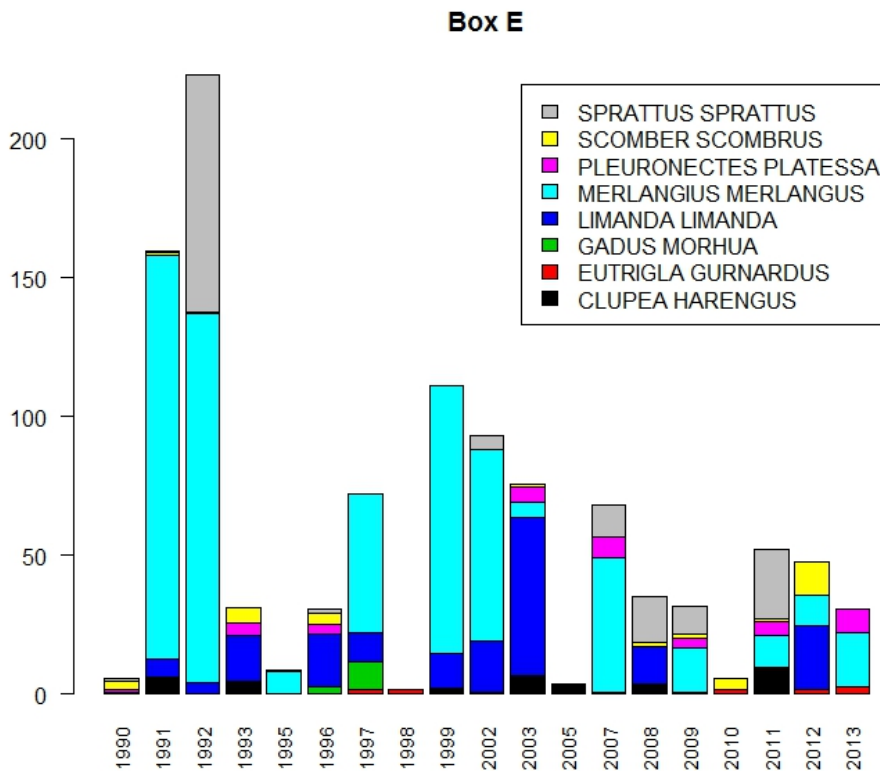


Fig. 7: Mean cpue (kg/30 min) of main species from 1990 to 2013 (summer) in Box E (Dutch EEZ).

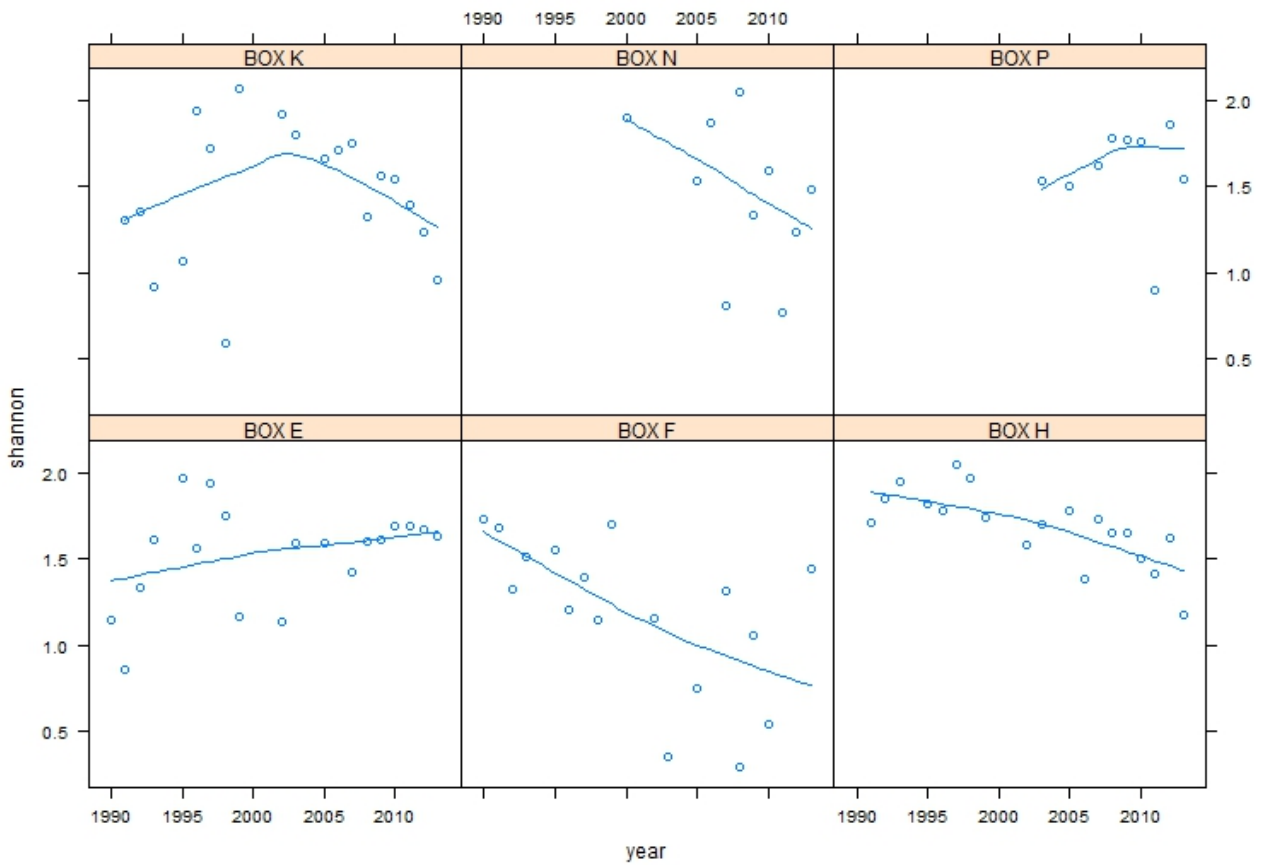


Fig 8: Temporal trends of the Shannon-Weaver-Index of biodiversity calculated on the basis of mean catch (kg/30 min) per species (excluding crustaceans, squids and invertebrates) per year and GSBTS box.