

**Johann Heinrich von Thünen Institute, Federal Research
Institute for Rural Areas Forestry and Fisheries (vTI).**

Institute of Sea Fisheries



Cruise Report

International Acoustic Survey for Pelagic Fish Stocks in the North Sea

**FRV "SOLEA"
26.06. - 16.07.2008**

Cruise No. 591

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International Acoustic Survey for Pelagic Fish Stocks in the North Sea

Cruise 591 FRV "SOLEA"

Date: 26.06. - 16.07.2008

Participants:

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Objective

The 591th survey of the FRV "Solea" was conducted in the framework of the international hydroacoustic survey on pelagic fish in the North Sea, which is co-ordinated by the ICES Planning Group for Herring Surveys (PGHERS). The main objective was to assess clupeoid resources, mainly herring and sprat, in the North Sea.

The reported acoustic survey is conducted every year to supply to ICES the most important fishery independent data (i.e. biomass estimate) for the assessment of herring and sprat stocks in the area.

Narrative

FRV "Solea" left the port of Cuxhaven on 26th June 2008. The investigation area covered the southern part of the North Sea from 52°N to 56°N. The acoustic survey was performed during day time. The acoustic equipment was an echosounder EK60 working on 38 kHz and 120 kHz. The hull mounted transducer ES38B and ES120-7c were calibrated under bad conditions in the open sea close to the Isle Helgoland at a distance between transducer and calibration sphere of between 21 and 27 m and repeated later at the same distance close the British coast when the condition were better. The echo integration, i.e. the allocation of the area backscattering strength, S_A , to the species was done by the post-processing system EchoView 4. The specific settings of the hydroacoustic equipment were used as described in the 'Manual for Herring Acoustic Surveys in ICES Divisions III, IV and VI' (ICES C.M. 2005/G:04, Annex 4).

Pelagic trawl hauls were carried out to identify the target species. From each haul sub-samples were taken to determine length and weight of fish. Further sub-samples of herring and sprat were examined for sex, maturity, and age. After each trawl haul or after about 30 NM sailed hydrographical conditions were investigated with a CTD probe. The survey ended on 16th July 2008 in Cuxhaven.

Results

The measured cruise track (Figure 1) reached in total a length of 1867 nautical miles. 34 trawl hauls were carried out and hydrographical parameters were measured on 61 stations.

Catch compositions of the conducted hauls are presented in Table 1. Abundance estimates of the pelagic fish species will be presented after further analysis of the data in combining s_A values, and species and size distribution of the fish on ICES statistical rectangle basis.



Eckhard Bethke
(cruise leader)

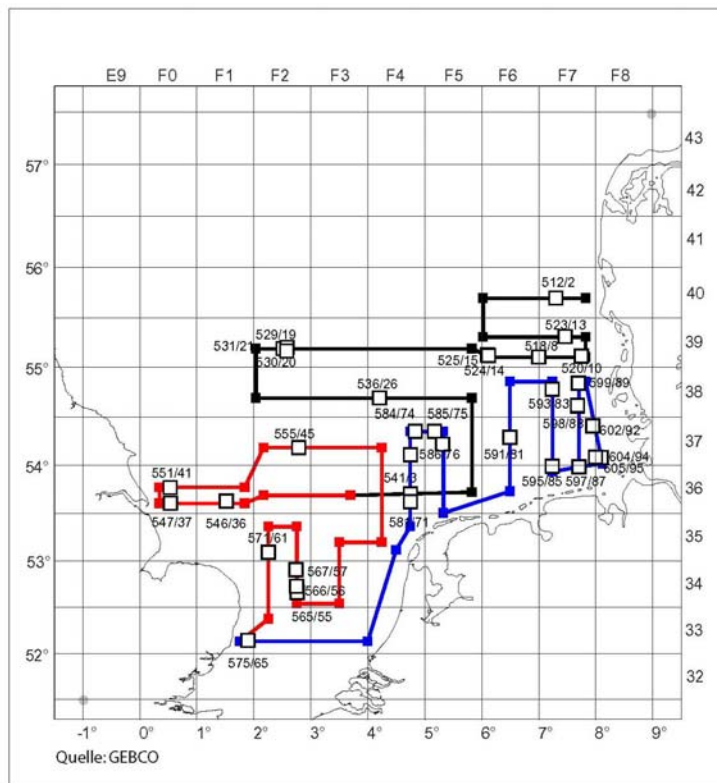


Figure 1: 591. Cruise of FRV "Solea" – cruise track and fishery stations

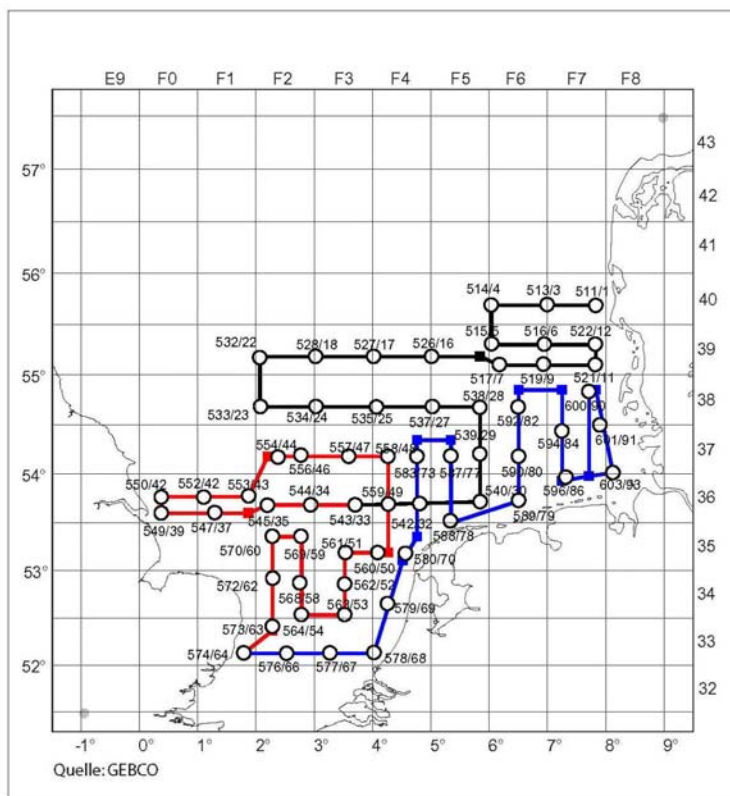


Figure 2: 591. Cruise of FRV "Solea" – Hydrographical stations.

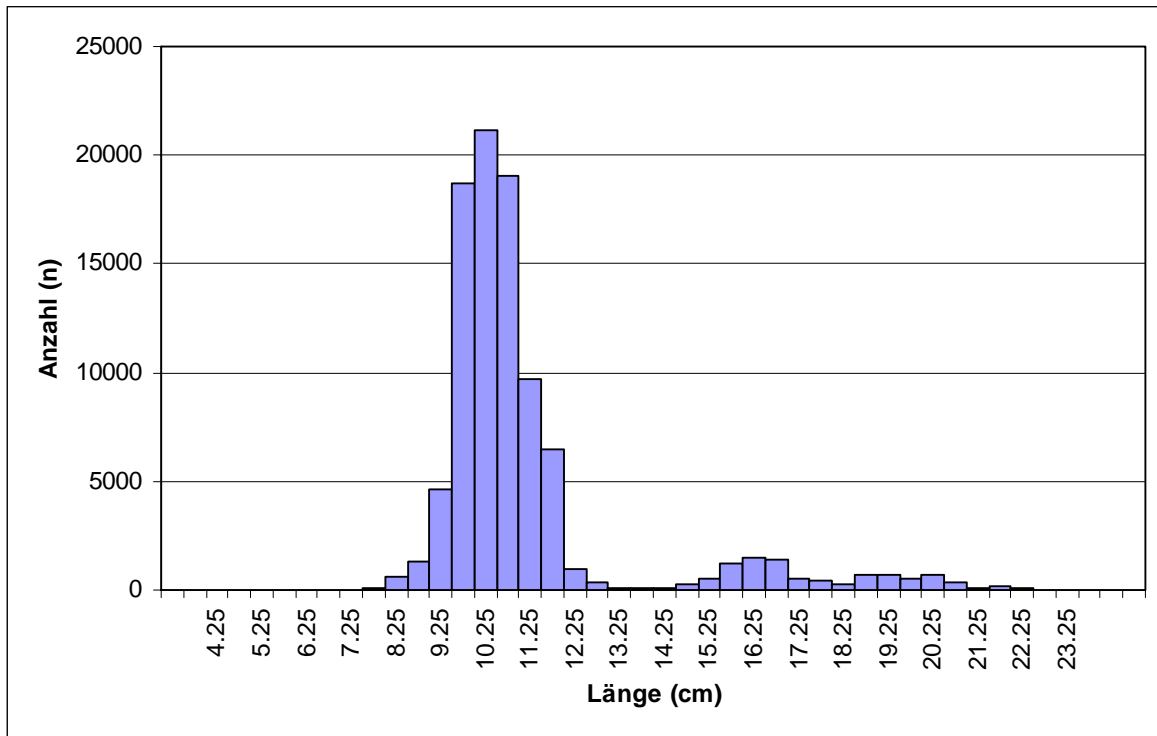


Figure 3: 591. Cruise of FRV "Solea" – Herring – total length distribution.

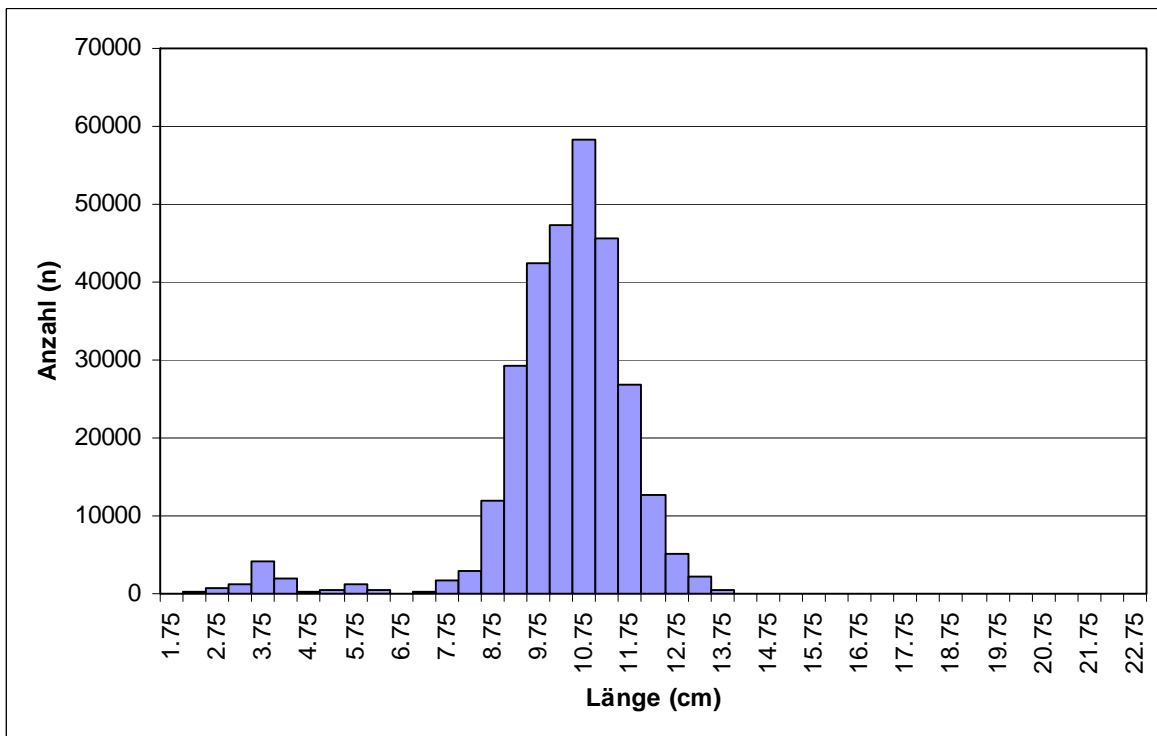


Figure 4: 591. Cruise of FRV "Solea" – Spratt – total length distribution.

Table 1: Catch compositions of the conducted hauls - 591. Cruise of FRV "Solea" (all results normalized on 30 min.)

RECTANGLE	STATION	kg total	BELONE BELONE	CALLIONYMUS LYRA	CLUPEA HARENGUS	DICENTRARCHUS LABRAX	ECHIICHTHYS VIPERA	ENGRAULIS ENCRASICOLUS	ENTELURUS AEQUOREUS	EUTRIGLA GURNARDUS	HYPEROPLUS LANCEOLATUS	LIMANDA LIMANDA	MERLANGIUS MERLANGUS	SCOMBER SCOMBRUS	SPRATTUS SPRATTUS	TRACHURUS TRACHURUS	TRIGLA LUCERNA	Number of Species
40F7	512	76.0			26.3					0.5	0.1	0.5	0.0	16.3	32.4			7
39F6	518	104.9			101.3					0.4	0.0		0.0	0.2	3.0			6
39F7	520	53.8			0.0					0.5	0.1				53.2			4
39F7	523	174.0			75.6					0.0				2.4	95.9			4
39F6	524	3.2								3.1	0.0		0.0		0.0			4
39F6	525	32.8			25.0					6.6					1.2			3
39F2	530	0.2							0.0	0.2								2
39F2	531	0.1					0.0		0.0	0.0	0.0							4
38F4	536	2.4								2.4			0.0					2
36F4	541	207.7			1.4			0.0		1.5			0.0	16.1	188.5	0.1		7
36F1	546	13.6					0.1						0.0	0.3	13.1			4
36F0	548	133.0			0.2		1.0		1.1	0.1	0.9		0.0		129.7			7
36F0	551	272.9			264.0		3.0		0.0	0.1	1.0			4.9	0.1			7
37F2	555	0.8								0.8								1
34F2	565	71.0					0.6			0.1			1.2	1.0	68.1			5
34F2	566	227.4			0.0		0.4		0.0				0.2	0.2	226.6			6
34F2	567	2.7				0.3	0.1						0.0		2.2			4
35F2	571	141.6	0.2				6.6	0.0	0.0	1.1	5.5			0.8	126.5		0.8	9
33F1	575	27.6			0.0		0.3				0.1		0.0	2.6	24.5			6
36F4	581	140.7			0.0			0.0	0.0					1.0	139.6			5
37F4	582	139.5		0.0	26.5					0.1			0.9	2.4	109.6			6
37F4	584	1.7								0.4			0.0	0.8			0.5	4
37F5	585	295.2			1.2					0.6			0.0	0.9	292.5			5
37F5	586	222.7	0.2		1.4					0.2			0.1	7.4	213.4			6
37F6	591	22.1			5.5								0.1	4.5	12.1			4
38F7	593	0.2								0.2			0.0			0.0		3
37F7	595	373.9			93.2			0.8						0.3	279.6			4
37F7	597	497.3			312.2					0.1			0.0	3.2	181.8			5
38F7	598	2.3												2.3		0.0		2
38F7	599	1.0											0.0	1.0		0.0		3
37F7	602	26.8						1.8						16.8	5.3	2.9		4
37F8	604	196.2			69.8			0.1						2.4	123.9			4
37F8	605	926.5			117.6			0.2						0.4	808.2			4
total		4391.8	0.4	0.0	1121.2	0.3	12.2	2.9	1.1	19.2	7.7	0.5	2.6	88.2	3131.1	3.0	1.3	15
proportion (%)			0.0	0.0	25.5	0.0	0.3	0.1	0.0	0.4	0.2	0.0	0.1	2.0	71.3	0.1	0.0	
number of catches			2	1	19	1	9	7	7	21	9	1	19	23	25	5	2	
presence (%)			6.1	3.0	57.6	3.0	27.3	21.2	21.2	63.6	27.3	3.0	57.6	69.7	75.8	15.2	6.1	

Table.2: Table 2: Frequency, mass, mean length and percentage of herring or sprat of the total catch. 591. Cruise of FRV "Solea" (all results normalized on 30 min.)

Haul	Stat.	Rec-tangle	total catch (kg)	clupeid catch (kg)	clupeid portion (%)	Herring					Sprat					Herring	Sprat
						catch (kg)	count (n)	range (cm)			catch (kg)	count (n)	range (cm)			(% clups)	(% clups)
								min	max	mean			min	max	mean		
1	512	40F7	76.0	58.6	77	26.3	841	12.75	19.25	16.00	32.4	2408	9.75	13.75	11.67	45	55
2	518	39F6	104.9	104.3	99	101.3	3176	13.75	18.25	16.09	3.0	183	10.75	13.75	12.16	97	3
3	520	39F7	53.8	53.2	99	0	2	11.25	11.75	11.50	53.2	4659	9.75	12.25	11.06	0	100
4	523	39F7	174.0	171.5	99	75.6	8018	8.75	15.25	10.96	95.9	8377	9.25	12.25	10.92	44	56
5	524	39F6	3.2	0	0	0	0	0	0	0	0	1	9.75	9.75	9.75	0	100
6	525	39F6	32.8	26.2	80	25.0	684	15.25	19.25	16.57	1.2	107	9.75	13.75	11.09	95	5
8	530	39F2	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	531	39F2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	536	38F4	2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	541	36F4	207.7	189.9	91	1.4	49	7.25	17.75	14.33	188.5	24482	7.75	11.25	9.50	1	99
12	546	36F1	13.6	13.1	97	0	0	0	0	0.00	13.1	1258	9.25	13.25	10.92	0	100
13	548	36F0	133.0	129.9	98	0.2	5	14.75	19.25	16.15	129.7	8643	10.75	13.75	12.15	0	100
14	551	36F0	272.9	264.1	97	264.0	3862	15.75	23.25	19.53	0.1	3	12.75	13.25	12.92	100	0
15	555	37F2	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	565	34F2	71.0	68.1	96	0	0	0	0	0.00	68.1	6635	9.25	13.25	10.69	0	100
17	566	34F2	227.4	226.6	100	0.0	1	16.75	16.75	16.75	226.6	33536	8.25	12.25	9.54	0	100
18	567	34F2	2.7	2.2	84	0	0	0	0	0	2.2	6303	1.75	5.75	3.57	0	100
19	571	35F2	141.6	126.5	89	0	0	0	0	0	126.5	17396	3.25	13.25	9.18	0	100
20	575	33F1	27.6	24.5	89	0	3	7.25	15.75	10.42	24.5	6074	5.25	10.75	7.57	0	100
21	581	36F4	140.7	139.7	99	0	1	15.75	15.75	15.75	139.6	11480	9.25	14.25	11.51	0	100
22	582	37F4	139.5	136.1	98	26.5	692	14.25	18.75	16.89	109.6	9681	9.25	13.25	11.06	19	81
23	584	37F4	1.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	585	37F5	295.2	293.7	99	1.2	69	7.75	16.75	12.73	292.5	30651	9.25	13.25	10.70	0	100
25	586	37F5	222.7	214.8	96	1.4	85	8.75	18.25	12.57	213.4	22931	8.75	12.75	10.42	1	99
26	591	37F6	22.1	17.6	79	5.5	255	11.75	17.25	13.51	12.1	673	11.25	14.25	12.86	31	69
27	593	38F7	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	595	37F7	373.9	373.6	100	93.2	8918	9.75	14.25	11.46	279.6	20627	10.25	13.75	11.81	25	75
29	597	37F7	497.3	494.0	99	312.2	43074	9.25	11.75	10.47	181.8	16667	9.25	12.75	10.93	63	37
30	598	38F7	2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	599	38F7	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	602	37F7	26.8	7.1	26	0	0	0	0	0	5.3	425	10.25	13.25	11.43	0	75
33	604	37F8	196.2	193.8	99	69.8	12193	7.75	10.75	9.54	123.9	13696	8.25	11.75	10.24	36	64
34	605	37F8	926.5	926.1	100	117.6	17735	8.25	11.75	10.01	808.2	90816	9.25	12.75	10.45	13	87

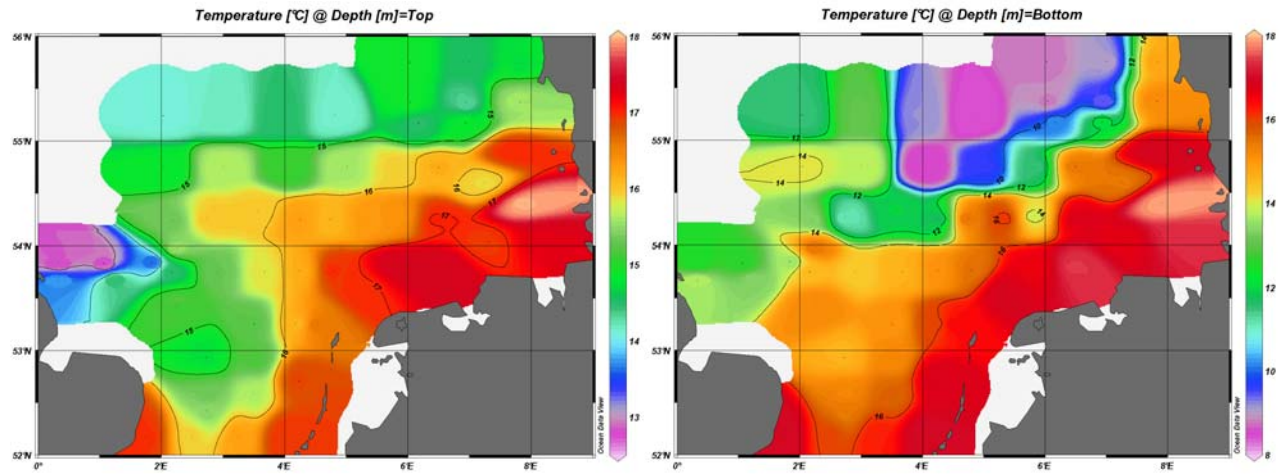
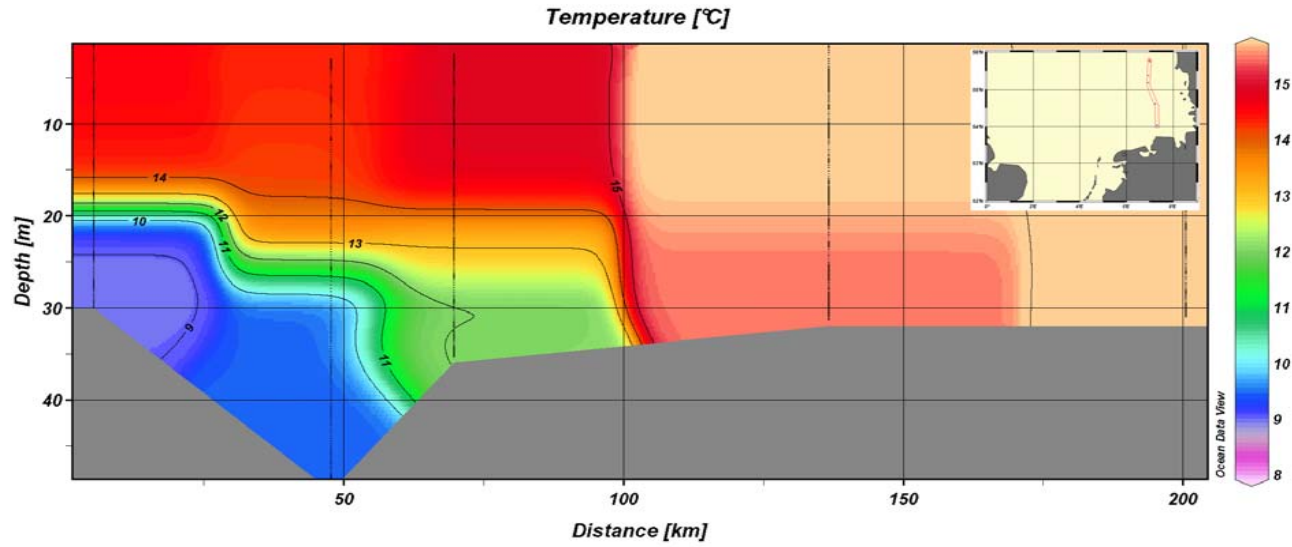


Figure 6: 591. Cruise of FRV "Solea" – temperature at a transect at 7° E , at the surface and the bottom (presented with ODV).