

DTU Aqua



Cruise Report

Sand eel Dredge Survey, Sand eel Area 1, 2 and 3, 2013

Vessel: Salling

Cruise dates (planned): 22.11.2013 –
7.12.2013

Cruise number: 2013

Cruise name: Sand eel Dredge Survey, Sand
eel Area 1, 2 and 3

Port of departure:	Esbjerg	Date:	22.11.2013
Port of return:	Esbjerg	Date:	9.12.2013
Other ports:	Esbjerg	Date and justification:	4.12.2013 Due to bad weather, i.e. strong winds, the vessel went to port from 4.12 – 7.12.

Participants

Leg #: 1		
Name	Institute	Function and main tasks
Dirk Tijssen	DTU Aqua	Cruise leader

Leg #:		
Name	Institute	Function and main tasks

Objectives

The purpose of the sand eel dredge survey was to collect sand eels buried in the seabed and compare catches (number and age composition) with the previous year's collections to assess the 2013 year class strength of sand eel in the different areas adopted by ICES in 2009. Data from the dredge survey is the basis for calculating a 0-group index, which will be used in the stock assessment.

In addition, to try to validate/quality ensure each haul using bottom contact sensors mounted on the gear (dredges).

Itinerary

The vessel departed Esbjerg harbor 22.11.2013 at 14.00 hrs. and returned to Esbjerg harbor 9.12.2013 at 03.00 hrs. Sampling with the modified dredge typically started just after sunset (UTC 17.00 hrs) and the last station of the night was completed before sunrise (UTC 04.00 – 06.00 hrs) i.e. fishing was only conducted during darkness.

Achievements

Types of data collected

- GPS Positions
- Depth
- Dredge (sand eels; species, weight, length)
- Van Veen grab (sediment samples; grain size composition)

Achievements in 2013:

- 15 days at sea (planned: 15)
- 202 stations; 37 sediment grab samples and 165 dredge hauls distributed over 55 sample positions (planned 56).

Methods

On each sampling location three hauls were carried out with the modified mussel dredge according to descriptions for fishing with modified mussel dredge used since 2004. The DK II dredge was used as the primary gear and the DK IV dredge served as 'back-up'. On new sample locations sediment samples were taken with the Van Veen grab (0.2m²), for the determination of grain size composition i.e. whether the bottom could be classified as a suitable habitat for sand eel (e.g. could a very fine-grained sediment be unfit as overwintering habitat).

Time of sampling

Sand eels survive the winter by burying in the seabed, but can under some circumstances be forced to seek food in the water column. In these cases, the food search is almost exclusively carried out in darkness. In order to ensure that as large and constantly a fraction of sand eels as possible is available for the fishing gear the fishing was therefore exclusively done during darkness (i.e. optimizing the constancy of the catch ability). Sailing between sampling locations were hence, if possible, done during the light hours of the day.

Prioritization of the sampling

It was sought after, that samples should be collected from all of the planned positions. In the event of problems causing exclusion of locations, e.g. by bad weather, the highest priority was given to the locations where samples had been collected during previous sand eel surveys or where the samples were considered to provide important information for a specific area. Lowest priority was given to the positions where only a few previous sand eel cruises had taken samples or where the samples were not considered to have important information for a specific area. The organization of the sampling (sail route) was done, so time spent sailing between locations was minimized.

Processing of samples at sea

- Greater sand eel (*Hyperoplus lanceolatus*) and Smooth sand eel (*Gymnammodytessemisquamatus*) were identified at sea and discarded to separate samplebags. Small sand eel (*Ammodytes tobianus*) were not separated, and thus measured together with the lesser sand eel and first identified on land.
- Numbers of sand eels (total or sample) was recorded in a station scheme for each haul.
- At least one of the 3 hauls for each sample location was processed at sea

- All sand eels (or a sample) was length measured to the nearest half cm (scm) and the results were introduced in a graduated scheme.
- The fish were gathered in bags for each scm group, for each haul, which again were gathered for each location.

Bottom contact

In order to be able to carry out an assessment of the individual hauls validity (in addition to the skipper's assessment of the haul quality) various forms of technical means for the determination of the dredge's contact with the bottom were used. There were mechanical bottom contacts fitted on both the dredges, each connected to a log, which registered contact/no contact each second. This enabled the calculation of the part of the haul where the dredge had bottom contact. This was used to exclude hauls with a low bottom contact frequency from the later data analysis.

Results

The sand eel dredge survey in sand eel areas 1, 2 and 3 was carried out in accordance with the survey protocol in the period from November 22 - December 9. 55 positions were sampled; 33 in area 1 and 19 in area 3. Catches of sand eel were generally larger in area 1 than in area 3 though the catch rates in the Norwegian EZ were very high.

Table 1. Station list. VV refers to Van Veen grab (sediment samples) and DK 2 are dredges (hauls).

Date	Position	Station	Sandeel_area	Gear	Start_UTC	End_UTC	Start_lat_dec	Start_lon_dec	End_lat_dec	End_lon_dec	Depth_m
22-11-2013	4165.16	1	1	VVNY	21:03	21:05	56.2972	5.5860	56.2972	5.5860	35
22-11-2013	4165.16	2	1	DK2	21:30	21:40	56.2963	5.5935	56.2979	5.5814	35
22-11-2013	4165.16	3	1	DK2	22:00	22:10	56.2958	5.5858	56.3005	5.5938	35

22-11-2013	4165.16	4 (Invalid)	1	DK2	22:32	22:42	56.3004	5.5868	56.2942	5.5874	35
22-11-2013	4165.16	5	1	DK2	22:57	23:07	56.2929	5.5896	56.2988	5.5861	35
23-11-2013	4165.02	6	1	VVNY	00:55	01:05	56.0626	5.2881	56.0613	5.2880	38
23-11-2013	4165.02	7	1	DK2	01:13	01:23	56.0610	5.2796	56.0634	5.2915	38
23-11-2013	4165.02	8	1	DK2	01:38	01:48	56.0661	5.2865	56.0661	5.2860	38
23-11-2013	4165.02	9	1	DK2	02:06	02:16	56.0589	5.2910	56.0650	5.2820	38
23-11-2013	4165.01	10	1	VVNY	02:50	02:53	56.0293	5.2584	56.0280	5.2583	36
23-11-2013	4165.01	11	1	DK2	03:08	03:18	56.0240	5.2525	56.0293	5.2602	37
23-11-2013	4165.01	12	1	DK2	03:33	03:43	56.0314	5.2542	56.0254	5.2615	37
23-11-2013	4165.01	13	1	DK2	03:56	04:06	56.0280	5.2652	56.0284	5.2512	37
23-11-2013	4065.03	14	1	VVNY	16:06	16:09	55.9660	5.2484	55.9660	5.2486	42
23-11-2013	4065.03	15	1	DK2	16:24	16:34	55.9660	5.2558	55.9660	5.2451	43
23-11-2013	4065.03	16	1	DK2	16:50	17:00	55.9622	5.2405	55.9671	5.2516	43
23-11-2013	4065.03	17	1	DK2	17:16	17:26	55.9699	5.2478	55.9627	5.2491	43
23-11-2013	4065.02	18	1	VVNY	18:12	18:15	55.8911	5.1487	55.8903	5.1476	34
23-11-2013	4065.02	19	1	DK2	18:26	18:36	55.8899	5.1399	55.8909	5.1527	33
23-11-2013	4065.02	20	1	DK2	18:55	19:05	55.8869	5.1517	55.8933	5.1453	33
23-11-2013	4065.02	21	1	DK2	19:23	19:33	55.8943	5.1509	55.8872	5.1463	33
23-11-2013	4065.01	22	1	VVNY	20:55	20:58	55.7820	5.0646	55.7820	5.0646	31
23-11-2013	4065.01	23	1	DK2	21:10	21:20	55.7820	5.0585	55.7803	5.0717	31
23-11-2013	4065.01	24	1	DK2	21:38	21:48	55.7835	5.0700	55.7796	5.0582	31
23-11-2013	4065.01	25	1	DK2	22:03	22:13	55.7767	5.0637	55.7840	5.0648	32
24-11-2013	3964.03	26	1	VVNY	01:43	01:46	55.4823	4.4101	55.4819	4.4098	28
24-11-2013	3964.03	27	1	DK2	01:59	02:09	55.4835	4.4874	55.4834	4.4170	28
24-11-2013	3964.03	28	1	DK2	02:25	02:35	55.4874	4.4123	55.4794	4.4075	27
24-11-2013	3964.03	29	1	DK2	02:49	02:59	55.4788	4.4129	55.4856	1.4092	28
24-11-2013	3964.02	30	1	DK2	16:19	16:29	55.4205	4.3135	55.4132	4.3196	30
24-11-2013	3964.02	31	1	DK2	16:43	16:53	55.4155	4.3248	55.4132	4.3126	32
24-11-2013	3964.02	32	1	DK2	17:08	17:18	55.4122	4.3137	55.4183	4.3185	30
24-11-2013	3964.01	33	1	DK2	18:21	18:31	55.4185	4.0717	55.4180	4.0585	25
24-11-2013	3964.01	34	1	DK2	18:42	18:52	55.4133	4.0620	55.4200	4.0662	26
24-11-2013	3964.01	35	1	DK2	19:04	19:14	55.4217	4.0625	55.4142	4.0683	26
24-11-2013	3963.04	36	1	DK2	21:00	21:10	55.2651	3.7341	55.2629	3.7210	30
24-11-2013	3963.04	37	1	DK2	21:23	21:33	55.2595	3.7235	55.2669	3.7280	31
24-11-2013	3963.04	38	1	DK2	21:45	21:55	55.2667	3.7222	55.2601	3.7290	30
24-11-2013	3963.01	39	1	DK2	23:30	23:40	55.0884	3.4814	55.0848	3.4707	39
24-11-2013	3963.01	40	1	DK2	23:53	00:03	55.0811	3.4760	55.0889	3.4759	29
25-11-2013	3963.01	41	1	DK2	00:15	00:25	55.0878	3.4724	55.0843	3.4828	29
25-11-2013	3862.01	42	1	VVNY	16:10	16:13	54.5812	2.1474	54.5812	2.1474	16
25-11-2013	3862.01	43	1	DK2	16:20	16:30	54.5827	2.1474	54.5797	2.1413	15
25-11-2013	3862.01	44	1	DK2	16:43	16:53	54.5771	2.1454	54.5841	2.1487	14
25-11-2013	3862.01	45	1	DK2	17:04	17:14	54.5840	2.1424	54.5782	2.1517	15
25-11-2013	3761.04	46	1	VVNY	18:15	18:17	54.4679	1.9999	54.4678	1.9831	14
25-11-2013	3761.04	47	1	DK2	18:26	18:36	54.4689	1.9777	54.4669	1.9912	15
25-11-2013	3761.04	48	1	DK2	18:49	18:59	54.4633	1.9865	54.4695	1.9825	15
25-11-2013	3761.04	49	1	DK2	19:13	19:23	54.4699	1.9860	54.4631	1.9802	15

25-11-2013	3762.01	50	1	VVNY	20:42	20:44	54.4573	2.1405	54.4573	2.1407	14
25-11-2013	3762.01	51	1	DK2	20:53	21:03	54.4567	2.1456	54.4580	2.1344	15
25-11-2013	3762.01	52	1	DK2	21:14	21:24	54.4546	2.1366	54.4605	2.1434	15
25-11-2013	3762.01	53	1	DK2	21:34	21:44	54.4602	2.1384	54.4531	2.1446	15
25-11-2013	3762.02	54	1	VVNY	23:51	23:53	54.1493	2.0609	54.1492	2.0610	24
26-11-2013	3762.02	55	1	DK2	00:03	00:13	54.1493	2.0544	54.1502	2.0672	24
26-11-2013	3762.02	56	1	DK2	00:23	00:33	54.1528	2.0621	54.1463	2.0571	56
26-11-2013	3762.02	57	1	DK2	00:45	00:55	54.1459	2.0630	54.1518	2.0577	22
26-11-2013	3761.08	58	1	VVNY	02:51	02:53	54.1897	1.5795	54.1898	1.5793	25
26-11-2013	3761.08	59	1	DK2	03:03	03:13	54.1907	1.5738	54.1886	1.5857	25
26-11-2013	3761.08	60	1	DK2	03:24	03:34	54.1919	1.5825	54.1870	1.5739	27
26-11-2013	3761.08	61	1	DK2	03:45	03:55	54.1856	1.5799	54.1925	1.5779	24
26-11-2013	3760.03	62	1	VVNY	16:31	16:33	54.2061	0.8385	54.2061	0.8386	35
26-11-2013	3760.03	63	1	DK2	16:44	16:54	54.2049	0.8383	54.2049	0.8326	39
03-12-2013	3760.03	64	1	DK2	07:48	07:48	54.2087	0.8360	54.2029	0.8423	38
26-11-2013	3760.03	65	1	DK2	17:41	17:51	54.2034	0.8340	54.2078	0.8435	37
26-11-2013	3760.04	66	1	VVNY	18:09	18:12	54.2622	0.7994	54.2625	0.7999	54
26-11-2013	3760.04	67	1	DK2	18:23	18:33	54.2592	0.8022	54.2655	0.7953	39
26-11-2013	3760.04	68	1	DK2	18:44	18:54	54.2622	0.7910	54.2622	0.8091	49
26-11-2013	3760.04	69	1	DK2	19:07	19:17	54.2641	0.8019	54.2596	0.7936	45
26-11-2013	3760.05	70	1	VVNY	20:31	20:34	54.3159	0.9273	54.3158	0.9291	46
26-11-2013	3760.05	71	1	DK2	20:45	20:55	54.3172	0.9242	54.3140	0.9358	47
26-11-2013	3760.05	72	1	DK2	21:08	21:18	54.3176	0.9306	54.3118	0.9217	43
26-11-2013	3760.05	73	1	DK2	21:29	21:39	54.3123	0.9293	54.3189	0.9275	43
26-11-2013	3861.19	74	1	VVNY	23:48	23:51	54.5672	1.2636	54.5673	1.2642	22
27-11-2013	3861.19	75	1	DK2	00:00	00:10	54.5686	1.2570	54.5667	1.2689	22
27-11-2013	3861.19	76	1	DK2	00:21	00:31	54.5702	1.2675	54.5646	1.2600	23
27-11-2013	3861.19	77	1	DK2	00:41	00:51	54.5645	1.2652	54.5713	1.2618	23
27-11-2013	3861.34	78	1	VVNY	01:25	01:27	54.5292	1.3625	54.5291	1.3629	26
27-11-2013	3861.34	79	1	DK2	01:37	01:47	54.5271	1.3683	54.5311	1.3587	26
27-11-2013	3861.34	80	1	DK2	01:58	02:08	54.5275	1.3595	54.5318	1.3704	26
27-11-2013	3861.34	81	1	DK2	02:21	02:31	54.5321	1.3634	54.5321	1.3630	26
27-11-2013	3861.22	82	1	VVNY	16:35	16:37	54.5390	1.5715	54.5390	1.5716	21
27-11-2013	3861.22	83	1	DK2	16:47	16:57	54.5345	1.5736	54.5413	1.5704	21
27-11-2013	3861.22	84	1	DK2	17:07	17:17	54.5392	1.5500	54.5375	1.5788	21
27-11-2013	3861.22	85	1	DK2	17:28	17:38	54.5409	1.5757	54.5352	1.5658	21
27-11-2013	3861.23	86	1	VVNY	18:02	18:04	54.5454	1.6229	54.5455	1.6229	16
27-11-2013	3861.23	87	1	DK2	18:13	18:23	54.5479	1.6179	54.5434	1.6277	16
27-11-2013	3861.23	88	1	DK2	18:33	18:43	54.5469	1.6297	54.5447	1.6175	16
27-11-2013	3861.23	89	1	DK2	18:53	19:03	54.5418	1.6215	54.5491	1.6237	16
27-11-2013	3861.35	90	1	VVNY	20:38	20:40	54.6390	1.6644	54.6389	1.6647	16
27-11-2013	3861.35	91	1	DK2	20:49	20:59	54.6436	1.6670	54.6368	1.6635	16
27-11-2013	3861.35	92	1	DK2	21:08	21:18	54.6356	1.6687	54.6409	1.6616	16
27-11-2013	3861.35	93	1	DK2	21:28	21:38	54.6385	1.6581	54.6390	1.6541	16
28-11-2013	3861.17	94	1	VVNY	00:21	00:23	54.8398	1.9958	54.8398	1.9958	20
28-11-2013	3861.17	95	1	DK2	00:32	00:42	54.8400	1.9927	54.8368	2.0038	20

28-11-2013	3861.17	96	1	DK2	00:52	01:02	54.8409	2.0010	54.8374	1.9888	20
28-11-2013	3861.17	97	1	DK2	01:13	01:23	54.8338	1.9937	54.8421	1.9972	21
28-11-2013	3861.32	98	1	VVNY	02:32	02:35	54.9881	1.8469	54.9881	1.8469	23
28-11-2013	3861.32	99	1	DK2	02:43	02:53	54.9920	1.8461	54.9847	1.8482	23
28-11-2013	3861.32	100	1	DK2	03:04	03:14	54.9883	1.8521	54.9895	1.8397	23
28-11-2013	3861.32	101	1	DK2	03:24	03:34	54.9843	1.8409	54.9904	1.8518	23
28-11-2013	3861.14	102	1	VVNY	16:33	16:35	54.8498	1.4500	54.8500	1.4333	21
28-11-2013	3861.14	103	1	DK2	16:44	16:54	54.8536	1.4310	54.8466	1.4353	21
28-11-2013	3861.14	104	1	DK2	17:05	17:15	54.8491	1.4396	54.8501	1.4275	21
28-11-2013	3861.14	105	1	DK2	17:25	17:35	54.8456	1.4283	54.8520	1.4366	21
28-11-2013	3861.29	106	1	VVNY	18:05	18:08	55.0173	1.3515	55.0175	1.3514	28
28-11-2013	3861.29	107	1	DK2	19:00	19:10	55.0207	1.3494	55.0138	1.3543	28
28-11-2013	3861.29	108	1	DK2	19:21	19:31	55.0172	1.3559	55.0174	1.3431	30
28-11-2013	3861.29	109	1	DK2	19:43	19:53	55.0143	1.3475	55.0193	1.3553	28
28-11-2013	3861.28	110	1	VVNY	21:23	21:26	55.0750	1.3821	55.0750	1.3823	31
28-11-2013	3861.28	111	1	DK2	21:34	21:44	55.0785	1.3809	55.0712	1.3821	32
28-11-2013	3861.28	112	1	DK2	21:56	22:06	55.0736	1.3862	55.0769	1.3755	32
28-11-2013	3861.28	113	1	DK2	22:19	22:29	55.0729	1.3764	55.0772	1.3866	34
28-11-2013	3861.42	114	1	VVNY	23:36	23:39	55.2119	1.5321	55.2121	1.5335	33
28-11-2013	3861.42	115	1	DK2	23:47	23:57	55.2047	1.5381	55.2135	1.5267	33
29-11-2013	3861.42	116	1	DK2	00:08	00:18	55.2094	1.5261	55.2159	1.5374	33
29-11-2013	3861.42	117	1	DK2	00:31	00:41	55.2167	1.5320	55.2097	1.5315	33
29-11-2013	4263.02	118	3	DK2	21:28	21:38	56.8162	3.7165	56.8106	3.7080	56
29-11-2013	4263.02	119	3	DK2	22:04	22:14	56.8085	3.7148	56.8146	3.7107	53
29-11-2013	4263.02	120	3	DK2	22:42	22:52	56.8030	3.7026	56.8030	3.7141	55
30-11-2013	4264.03	121	3	DK2	01:21	01:31	56.6694	4.1426	56.6660	4.1521	48
30-11-2013	4264.03	122	3	DK2	01:47	01:57	56.6700	4.1570	56.6659	4.1482	47
30-11-2013	4264.03	123	3	DK2	02:12	02:22	56.6634	4.1500	56.6706	4.1503	46
30-11-2013	4365.08	124	3	DK2	16:17	16:27	57.1304	5.2240	57.1333	5.2129	49
30-11-2013	4365.08	125	3	DK2	16:40	16:50	57.1307	5.2168	57.1345	5.2284	49
30-11-2013	4365.08	126	3	DK2	17:07	17:17	57.1354	5.2208	57.1291	5.2159	49
30-11-2013	4365.04	127	3	DK2	18:17	18:27	57.1410	5.4697	57.1421	5.1421	43
30-11-2013	4365.04	128	3	DK2	18:43	18:53	57.1448	5.4799	57.1379	5.4726	45
30-11-2013	4365.04	129	3	DK2	19:06	19:16	57.1385	5.4798	57.1450	5.4736	43
30-11-2013	4365.01	130	3	DK2	20:40	20:50	57.2514	5.5275	57.2579	5.5254	55
30-11-2013	4365.01	131	3	DK2	21:06	21:16	57.2577	5.5213	57.2516	5.5323	55
30-11-2013	4365.01	132	3	DK2	21:30	21:40	57.2558	5.5225	57.2548	5.5195	55
01-12-2013	4366.06	133	3	DK2	00:03	00:13	57.1001	6.1177	57.1028	6.1328	46
01-12-2013	4366.06	134	3	DK2	00:29	00:39	57.1054	6.1276	57.0984	6.1234	47
01-12-2013	4366.06	135	3	DK2	00:52	01:02	57.0981	6.1300	57.1035	6.1217	45
01-12-2013	4367.02	136	3	DK2	21:10	21:20	57.0390	7.0096	57.0437	7.0012	34
01-12-2013	4367.02	137	3	DK2	21:34	21:44	57.0415	7.0005	57.0440	7.0131	37
01-12-2013	4367.02	138	3	DK2	22:00	22:10	57.0482	7.0087	57.0379	7.0001	38
01-12-2013	4367.06	139	3	DK2	22:41	22:51	57.0500	7.0965	57.0527	7.1095	25
01-12-2013	4367.06	140	3	DK2	23:04	23:14	57.0492	7.1106	57.0534	7.0998	22
01-12-2013	4367.06	141	3	DK2	23:27	23:37	57.0553	7.1032	57.0546	7.1038	25

02-12-2013	4367.16	142	3	DK2	01:00	01:10	57.0869	7.4284	57.0918	7.4381	24
02-12-2013	4367.16	143	3	DK2	01:24	01:34	57.0944	7.4347	57.0865	7.4397	23
02-12-2013	4367.16	144	3	DK2	01:46	01:56	57.0889	7.4439	57.0921	7.4317	25
02-12-2013	4469.02	145	3	VVNY	16:02	16:05	57.5723	9.5341	57.5724	9.5344	15
02-12-2013	4469.02	146	3	DK2	16:14	16:24	57.5769	9.5327	57.5693	9.5355	15
02-12-2013	4469.02	147	3	DK2	16:34	16:44	57.5702	9.5410	57.5738	9.5288	15
02-12-2013	4469.02	148	3	DK2	16:53	17:03	57.5706	9.5270	57.5734	9.5399	17
02-12-2013	4368.06	149	3	VVNY	20:39	20:49	57.4052	8.6368	57.4052	8.6370	20
02-12-2013	4368.06	150	3	DK2	20:52	21:02	57.4098	8.6378	57.4025	8.6348	20
02-12-2013	4368.06	151	3	DK2	21:11	21:21	57.4029	8.6403	57.4083	8.6311	21
02-12-2013	4368.06	152	3	DK2	21:32	21:42	57.4046	8.6291	57.4057	8.6445	22
02-12-2013	4368.05	153	3	DK2	22:17	22:27	57.3719	8.5532	57.3676	8.5414	26
02-12-2013	4368.05	154	3	DK2	22:40	22:50	57.3643	8.5445	57.3713	8.5420	26
02-12-2013	4368.05	155	3	DK2	23:03	23:13	57.3702	8.5389	57.3661	8.5506	26
03-12-2013	4367.23	156	3	DK2	00:24	00:34	57.2028	8.5244	57.2039	8.5187	17
03-12-2013	4367.23	157	3	DK2	00:46	00:56	57.2019	8.5247	57.2082	8.5185	17
03-12-2013	4367.23	158	3	DK2	01:06	01:16	57.2065	8.5146	57.2059	8.5279	17
03-12-2013	4367.23	159	3	VVNY	16:02	16:05	57.0817	7.6744	57.0815	7.6744	25
03-12-2013	4367.23	160	3	DK2	16:15	16:25	57.0778	7.6743	57.0845	7.6682	25
03-12-2013	4367.23	161	3	DK2	16:38	16:48	57.0815	7.6650	57.0812	7.6790	26
03-12-2013	4367.23	162	3	DK2	17:00	17:10	57.0845	7.6766	57.0793	7.6680	24
03-12-2013	4267.25	163	3	VVNY	17:54	17:56	56.9826	7.6965	56.9826	7.6967	18
03-12-2013	4267.25	164	3	DK2	18:05	18:15	56.9845	7.6907	56.9812	7.7029	18
03-12-2013	4267.25	165	3	DK2	18:26	18:36	56.9685	7.7038	56.9818	7.6933	18
03-12-2013	4267.25	166	3	DK2	18:47	18:57	56.9791	7.6964	56.9871	7.6963	18
03-12-2013	4267.12	167	3	VVNY	20:31	20:35	56.9427	7.4311	56.9431	7.4319	24
03-12-2013	4267.12	168	3	DK2	20:43	20:53	56.9451	7.4354	56.9401	7.4255	26
03-12-2013	4267.12	169	3	DK2	21:04	21:14	56.9399	7.4326	56.9458	7.4253	25
03-12-2013	4267.12	170	3	DK2	21:23	21:33	56.9436	7.4243	56.9403	7.4368	25
03-12-2013	4267.27	171	3	VVNY	22:12	22:14	56.9124	7.6044	56.9124	7.6056	20
03-12-2013	4267.27	172	3	DK2	22:26	22:36	56.9124	7.5975	56.9160	7.6082	20
03-12-2013	4367.27	173	3	DK2	22:47	22:57	56.9158	7.6023	56.9090	7.6066	20
03-12-2013	4267.27	174	3	DK2	23:08	23:18	56.9120	7.6112	56.9120	7.5990	21
07-12-2013	3967.06	175	2	VVNY	15:51	15:53	55.1298	7.5240	55.1298	7.5238	20
07-12-2013	3967.06	176	2	DK2	16:02	16:12	55.1295	7.5192	55.1318	7.5306	18
07-12-2013	3967.06	177	2	DK2	16:21	16:31	55.1342	7.5257	55.1273	7.5227	19
07-12-2013	3967.06	178	2	DK2	16:39	16:49	55.1285	7.5265	55.1344	7.5205	19
07-12-2013	3967.02	179	2	VVNY	17:42	17:45	55.1239	7.2952	55.1239	7.2948	19
07-12-2013	3967.02	180	2	DK2	17:51	18:01	55.1244	7.2890	55.1237	7.3012	19
07-12-2013	3967.02	181	2	DK2	18:10	18:20	55.1272	7.2992	55.1212	7.2922	19
07-12-2013	3967.02	182	2	DK2	18:28	18:38	55.1208	7.2963	55.1272	7.2952	19
07-12-2013	3966.03	183	2	VVNY	21:01	21:03	55.3011	6.8207	55.3010	6.8200	21
07-12-2013	3966.03	184	2	DK2	21:10	21:20	55.3028	6.8165	55.2991	6.8268	21
07-12-2013	3966.03	185	2	DK2	21:29	21:39	55.3021	6.8281	55.3003	6.8162	21
07-12-2013	3966.03	186	2	DK2	22:29	22:39	55.3056	6.8223	55.2988	6.8206	22
07-12-2013	3966.04	187	2	VVNY	23:28	23:31	55.1803	6.8713	55.1802	6.8719	27

07-12-2013	3966.04	188	2	DK2	23:36	23:46	55.1802	6.8775	55.1800	6.8655	27
07-12-2013	3966.04	189	2	DK2	23:57	00:07	55.1779	6.8687	55.1846	6.8751	27
08-12-2013	3966.04	190	2	DK2	00:17	00:27	55.1834	6.8697	55.1764	6.8721	26
08-12-2013	3966.05	191	2	VVNY	01:00	01:02	55.0980	6.9113	55.0979	6.9032	25
08-12-2013	3966.05	192	2	DK2	01:10	01:20	55.1477	6.8948	55.0982	6.9109	24
08-12-2013	3966.05	193	2	DK2	01:32	01:42	55.1007	6.9080	55.0961	6.8979	25
08-12-2013	3966.05	194	2	DK2	01:52	02:02	55.0944	6.9032	55.1015	6.9013	25
08-12-2013	3868.01	195	2	DK2	16:04	16:14	54.9625	6.9316	54.9670	6.9226	28
08-12-2013	3868.01	196	2	DK2	16:27	16:37	54.9689	6.9260	54.9618	6.9290	28
08-12-2013	3868.01	197	2	DK2	16:49	16:59	54.9661	6.9319	54.9647	6.9207	28
08-12-2013	3867.02	198	2	DK2	19:31	19:41	54.6998	7.2937	54.6945	7.3021	20
08-12-2013	3867.02	199	2	DK2	19:52	20:02	54.6981	7.3035	54.6952	7.2926	20
08-12-2013	3867.02	200	2	DK2	20:10	20:20	54.6932	7.2956	54.6998	7.3017	20
08-12-2013	3867.06	201	2	DK2	22:06	22:16	54.6005	7.5026	54.5934	7.5086	20
08-12-2013	3867.06	202	2	DK2	22:26	22:36	54.5961	7.5123	54.5964	7.5010	20
08-12-2013	3867.06	203	2	DK2	22:46	22:56	54.5938	7.5043	54.6004	7.5090	20

Others

A cruise summary report will be delivered online to

http://seadata.bsh.de/csr/online/V1_index.html.

