

7.3 Geochemistry of particulate organic matter in the water column and sediments of the Ob and Yenisei estuaries and the inner Kara Sea

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Introduction

Major objectives are the characterization and quantification of particulate organic matter accumulated in the Ob and Yenisei estuaries and the adjacent Kara Sea. Information on the quantitative amounts of organic carbon derived from the respective sources (i.e. terrestrial/freshwater vs. marine) can be deduced from detailed organic-geochemical investigations of the suspended matter in the water column and the sedimentary organic carbon fraction. Both, bulk data (TOC, C/N-ratios, hydrogen index) as well as quantitative and qualitative biomarker distributions (*n*-alkanes, fatty acids, sterols, hopanoids, etc.) and $\delta^{13}\text{C}$ of biomarkers will be used to characterise and identify the different sources of the particulate and sedimentary organic carbon pool. The studies of sediments will include surface sediments as well as samples from selected sediment cores.

Sampling of particulate organic matter and surface sediments

123 water samples 48 stations were obtained either by use of a Niskin rosette water sampler, large volume sampler (Bathomat, 200 L) or a water bucket. Sample locations were selected according to the salinity gradient recorded by the CTD-system. Water sampling stations, depth of the subsamples and the respective salinity are given in Table 7.3. In general, three water depths were sampled at each of the selected stations: surface water, the pycnoclyne (mixed-water) layer and near-bottom water. The water samples were filtered through precombusted glas-fiber filters (Whatman GF/F, 47mm diameter). The particulate organic matter collected on these filters was pre-extracted onboard with a mixture of 10ml Dichlormethane/Methanol (1:1) and stored under light-protection at -20°C. The quantitative and qualitative distribution of individual biomarkers (*n*-alkanes, fatty acids, sterols, hopanoids) will be used to investigate the biological sources (marine vs. terrestrial) and the conversion of the particulate organic matter prior to sedimentation.

In addition to the water samples, at GKG and MUC stations (see station list, Annex 10.1) surface samples were taken for future organic-geochemical investigations. The sediment samples were stored frozen (-20°C) and under light-protection in precleaned 100 ml glass-bottles.

Table 7.3: Stations used for sampling of particulate organic matter of the water column.

Station	sample-depth(m)	salinity	volume(l)	sampler
BP01-01	0	26.6	22.4	bucket
	18	29.7	21.25	CTD/RS
	35	33.4	20.0	BAT
BP01-03	0	4.4	18.0	bucket
BP01-04	0	0.0	15.0	bucket
	5	0.0	15.0	BAT
BP01-05	0	0.0	18.0	bucket
	11	0.0	18.0	BAT
BP01-06	0	0.0	18.0	bucket
BP01-08	0	0.0	18.0	bucket
	28	0.0	18.0	BAT
BP01-11	0	0.0	8.5	bucket
	3	0.0	8.5	BAT
	7	0.8	7.6	CTD/RS
	8	9.6	8.5	BAT
BP01-14	0	0.0	12.0	bucket
	15	0.0	12.0	BAT
BP01-16	0	0.0	18.0	bucket
	22	0.0	18.0	BAT
BP01-19	0	6.0	18.0	bucket
	10	31.3	12.0	BAT
	18	32.5	9.0	BAT
BP01-23	0	4.8	19.0	bucket
	7	17.7	19.5	CTD/RS
	15	33.0	19.0	BAT
BP01-26	0	12.3	19.5	bucket
	15	28.8	41.0	BAT
	28	33.5	18.0	BAT
BP01-28	0	22.7	22.3	bucket
	17		21.0	CTD/RS
	30	33.4	19.4	BAT
BP01-29	0	25.8	21.7	bucket
BP01-30	0	27.2	22.2	bucket
	12		21.6	CTD/RS
	30	33.9	20.7	BAT
BP01-31	0	28.9	22.5	bucket
	15		21.6	CTD/RS
	80	34.1	20.1	BAT
BP01-32	0	29.8	22.6	bucket

BP01-34	0	28,9	21,5	bucket
	19		18,0	CTD/RS
	60	34,3	20,8	BAT
BP01-35	0	28,8	21,6	Bucket
	17	32,4	21,7	CTD/RS
	100	34,5	20,6	BAT
BP01-37	0	28,3	21,7	bucket
	15	31,3	21,95	CTD/RS
	100	33,9	20,5	BAT
BP01-38	0	29,0	22,0	bucket
	14,5	30,6	25,6	CTD/RS
	60	34,1	20,7	BAT
BP01-40	0	23,3	22,1	bucket
	9	28,8	22,3	CTD/RS
	30	32,9	21,2	BAT
BP01-41	0	23,5	21,6	bucket
	10	26,6	21,8	CTD/RS
	28	32,9	20,9	BAT
BP01-43	0	20,6	21,0	bucket
	10	23,9	21,1	CTD/RS
	27	33,4	21,2	BAT
BP01-45	0	29,0	22,5	bucket
	18	31,4	21,0	CTD/RS
	50	33,9	19,6	BAT
BP01-46	0	25,0	21,2	bucket
	20	34,1	22,0	CTD/RS
	140	34,9	55,3	BAT
BP01-48	0	25,7	21,7	bucket
	15		22,0	CTD/RS
	100		40,1	BAT
BP01-51	0	23,5	21,9	bucket
	10	29,6	21,0	CTD/RS
	100	29,6	41,3	BAT
BP01-52	0	25,1	21,8	bucket
	12	29,4	22,8	CTD/RS
	40	33,6	41,1	BAT
BP01-55	0	25,9	22,0	bucket
	16	28,4	21,1	CTD/RS
	42	32,9	40,4	BAT
BP01-56	0	21,5	22,6	bucket
	16	31,9	22,4	CTD/RS
	100	34,4	40,8	BAT
BP01-58	0	24,1	21,0	bucket
	20	28,3	21,7	CTD/RS
	60	33,7	40,7	BAT

BP01-59	0	21,8	21,9	bucket
	16	29,9	22,4	CTD/RS
	120	34,3	36,0	BAT
BP01-61b	0	18,5	23,0	bucket
	20	29,2	21,9	CTD/RS
	80	34,1	41,7	BAT
BP01-62	0	23,0	22,9	bucket
	12	29,4	22,5	CTD/RS
	90	34,1	41,9	BAT
BP01-65	0	18,5	21,0	bucket
	8	26,9	21,8	CTD/RS
	42	32,8	41,0	BAT
BP01-66	0	12,9	20,9	bucket
	10	26,6	22,5	CTD/RS
	38	33,4	24,0	BAT
BP01-67	0	11,2	21,5	bucket
	6	23,8	22,5	CTD/RS
	27	32,1	27,0	BAT
BP01-68	0	9,8	18,0	bucket
	6	21,4	22,0	CTD/RS
	4		11,0	BAT
	15	30,2	31,0	BAT
BP01-70	0	0,7	9,0	bucket
	7	29,9	9,0	CTD/RS
	12	31,2	9,0	BAT
BP01-72	0	0,0	9,0	bucket
	12	0,0	7,5	BAT
BP01-73	0	0,0	7,0	bucket
BP01-75	0	0,0	6,0	bucket
BP01-77	0	0,0	6,0	bucket
BP01-78	0	0,0	6,0	bucket
BP01-79	0	0,0	6,0	bucket
BP01-80	0	0,7	10,5	bucket
	4		10,0	BAT
BP01-82	0	10,0	20,4	bucket
	7	23,6	21,0	CTD/RS
	4	10,3	21,0	BAT
	15	32,2	24,0	BAT