

Supplementary Table. Carbonate carbon and oxygen isotope composition of the studied samples.

Kulyumbe River section				
Sample number	Height from Sukharikha-Krasny Porog boundary	Formation	$\delta^{13}\text{C}$, V-PDB	$\delta^{18}\text{O}$, V-PDB
И2003-1	-125.2	Sukharikha	0.4	-6.7
И2003-2	-124.2	Sukharikha	0.4	-7.4
И2003-3	-121.7	Sukharikha	0.7	-7.4
И2003-3A	-117.7	Sukharikha	-0.8	-8.2
И2003-4	-113.6	Sukharikha	-1.8	-7.6
И2003-5	-112.2	Sukharikha	-1.6	-7.4
И2003-6	-110.7	Sukharikha	-0.1	-6.7
И2003-7	-109.2	Sukharikha	-0.1	-7.2
И2003-8	-105.7	Sukharikha	-0.1	-7.5
И2003-9	-104.2	Sukharikha	-0.5	-7.0
И2003-10	-102.7	Sukharikha	-1.4	-7.4
И2003-11	-101.7	Sukharikha	1.1	-7.0
И2003-12	-100.2	Sukharikha	-1.7	-7.1
И2003-13	-97.2	Sukharikha	-1.7	-7.3
И2003-14	-94.2	Sukharikha	-1.3	-7.7
И2001-1	-91.6	Sukharikha	-1.1	-8.3
И2001-2	-89.8	Sukharikha	0.6	-9.2
И2001-3	-85.6	Sukharikha	0.8	-7.5
И2001-5	-82.2	Sukharikha	2.8	-5.7
И2001-8	-80.8	Sukharikha	3.8	-7.1
И2001-9	-78.5	Sukharikha	2.8	-4.2
И2001-10	-76.1	Sukharikha	3.5	-5.9
И2001-12	-74.2	Sukharikha	2.8	-7.3
И2001-13	-72.9	Sukharikha	2.7	-5.2
И2001-14	-71.3	Sukharikha	2.7	-4.2
И2001-16	-69.9	Sukharikha	3.1	-4.6
И2001-17	-68.4	Sukharikha	3.0	-5.0
И2001-18	-66.7	Sukharikha	3.2	-3.7
И2001-19	-65.5	Sukharikha	4.0	-5.2
И2001-20	-64	Sukharikha	4.5	-7.0
И2001-21	-62.7	Sukharikha	3.9	-7.3
И2001-22	-62.5	Sukharikha	4.3	-7.0
И2001-23	-62.1	Sukharikha	3.4	-6.6
И2001-25	-60.9	Sukharikha	1.7	-6.7
И2001-26	-59.6	Sukharikha	0.2	-5.6
И2001-27	-57.9	Sukharikha	0.7	-7.8
И2001-28	-57	Sukharikha	-0.4	-5.4
И2001-29	-55.6	Sukharikha	-1.0	-7.5
И2001-30	-54.2	Sukharikha	0.5	-6.2
И2001-32	-52.8	Sukharikha	1.9	-7.2
И2001-33	-51.2	Sukharikha	1.7	-5.2
И2001-34	-49.6	Sukharikha	1.7	-5.4
И2001-35	-48.3	Sukharikha	0.2	-8.7
И2001-36	-47.4	Sukharikha	-0.8	-6.9

И2001-37	-45.8	Sukharikha	-1.1	-7.0
И2001-38	-44.3	Sukharikha	-0.6	-7.1
И2001-39	-42.9	Sukharikha	0.9	-5.8
И2001-40	-41.3	Sukharikha	1.6	-5.3
И2001-41	-40.3	Sukharikha	1.5	-5.5
И2001-42	-39.3	Sukharikha	1.5	-5.1
И2001-43	-38.3	Sukharikha	1.9	-5.5
И2001-44	-37.1	Sukharikha	3.0	-7.6
И2001-45	-35.6	Sukharikha	2.7	-6.7
И2001-46	-34	Sukharikha	2.7	-5.1
И2001-47	-32.3	Sukharikha	2.5	-5.0
И2001-48	-30.3	Sukharikha	2.6	-5.4
И2001-49	-28.3	Sukharikha	3.2	-6.2
И2001-50	-26.3	Sukharikha	2.7	-5.1
И2001-51	-24.3	Sukharikha	2.8	-5.0
И2001-52	-21.3	Sukharikha	2.8	-4.7
И2001-53	-19.3	Sukharikha	2.9	-4.4
И2001-54	-16.8	Sukharikha	3.3	-6.9
И2001-55	-14.3	Sukharikha	2.9	-5.7
И2001-56	-12.8	Sukharikha	3.3	-4.5
И2001-57	-11.3	Sukharikha	4.6	-7.3
И2001-58	-9.8	Sukharikha	3.5	-5.4
И2001-59	-8.3	Sukharikha	4.6	-8.3
И2001-60	-7	Sukharikha	4.7	-7.5
И2001-61	-6.4	Sukharikha	5.4	-7.8
И2001-62	-4.5	Sukharikha	4.5	-7.6
И2001-63	-3	Sukharikha	1.4	-8.1
И2001-65	-2	Sukharikha	-1.2	-8.3
И2001-66	-0.7	Sukharikha	-1.5	-7.9
И2001-67	1	Krasny Porog	-2.0	-8.0
И2001-68	2.5	Krasny Porog	-2.1	-8.2
И2001-69	3.4	Krasny Porog	-2.1	-8.6
И2001-70	4.8	Krasny Porog	-2.1	-8.0
И2001-71	7	Krasny Porog	-2.0	-8.0
И2001-72	9.2	Krasny Porog	-2.1	-8.8
И2001-73	10.8	Krasny Porog	-3.4	-8.3
И2001-74	14.1	Krasny Porog	-2.7	-8.3
И2001-75	15.8	Krasny Porog	-2.6	-7.9
И2001-76	17.8	Krasny Porog	-2.4	-8.3
И2001-77	20.3	Krasny Porog	-2.5	-8.0
И2001-78	22.3	Krasny Porog	-2.3	-8.1
И2001-79	24.3	Krasny Porog	-2.2	-8.1
И2001-80	29.8	Krasny Porog	-2.3	-7.6
И2001-81	35.3	Krasny Porog	-2.1	-7.8
И2001-82	41.3	Krasny Porog	-2.5	-7.1
И2001-83	47.8	Krasny Porog	-2.7	-6.9
И2001-84	53.3	Krasny Porog	-2.8	-8.0
И2001-85	59.3	Krasny Porog	-2.6	-8.1
И2001-86	64.5	Krasny Porog	-2.2	-8.0
И2001-87	69.3	Krasny Porog	-1.3	-7.9

И2001-88	75.8	Krasny Porog	-0.7	-7.6
И2001-89	80.8	Krasny Porog	0.8	-8.1
И2001-90	86.8	Krasny Porog	-0.5	-7.4
И2001-91	91.8	Krasny Porog	-0.3	-7.8
И2001-92	95.8	Krasny Porog	-0.8	-7.6
И2001-93	99.8	Krasny Porog	-1.5	-7.6
И2001-94	105.8	Krasny Porog	-1.6	-7.4
И2001-95	110.8	Krasny Porog	-1.3	-8.0
И2001-96	115.8	Krasny Porog	0.5	-7.6
И2001-97	120.8	Krasny Porog	2.3	-7.5
И2001-98	125.8	Krasny Porog	0.7	-7.2
И2001-99	130.8	Krasny Porog	-0.7	-7.4
И2001-100	137.8	Krasny Porog	-0.3	-7.5

Khantaisko-Sukhotungusskaya-1 well (KhS-1)

Sample number	Depth, m	Height from Sukharikha-Krasny Porog boundary	Formation	$\delta^{13}\text{C}$, V-PDB	$\delta^{18}\text{O}$, V-PDB
XC-1/1021,55	1021.55	116.6	Shumny	-0.2	-7.2
XC-1/1029,35	1029.35	108.8	Shumny	0.6	-6.9
XC-1/1034,4	1034.4	103.75	Krasny Porog	0.2	-7.1
XC-1/1036,9	1036.9	101.25	Krasny Porog	1.8	-7.4
XC-1/1041,5	1041.5	96.65	Krasny Porog	0.7	-7.6
XC-1/1043,05	1043.05	95.1	Krasny Porog	0.6	-7.8
XC-1/1046,35	1046.35	91.8	Krasny Porog	-0.4	-7.4
XC-1/1050,13	1050.13	88.02	Krasny Porog	0.3	-7.8
XC-1/1053,85	1053.85	84.3	Krasny Porog	1.6	-7.4
XC-1/1054,2	1054.2	83.95	Krasny Porog	1.6	-7.2
XC-1/1057,00	1057	81.15	Krasny Porog	2.4	-7.2
XC-1/1059,9	1059.9	78.25	Krasny Porog	1.2	-7.9
XC-1/1062,9	1062.9	75.25	Krasny Porog	0.3	-7.3
XC-1/1065,75	1065.75	72.4	Krasny Porog	-0.5	-7.8
XC-1/1068,6	1068.6	69.55	Krasny Porog	-0.9	-7.5
XC-1/1071,95	1071.95	66.2	Krasny Porog	-1.4	-7.7
XC-1/1074,4	1074.4	63.75	Krasny Porog	-1.4	-7.5
XC-1/1077,2	1077.2	60.95	Krasny Porog	-1.7	-7.7
XC-1/1080,3	1080.3	57.85	Krasny Porog	-1.5	-7.5
XC-1/1082,6	1082.6	55.55	Krasny Porog	-1.4	-7.3
XC-1/1085,5	1085.5	52.65	Krasny Porog	-1.1	-7.2
XC-1/1088,4	1088.4	49.75	Krasny Porog	-0.9	-7.7
XC-1/1091,2	1091.2	46.95	Krasny Porog	-0.3	-7.4
XC-1/1094,25	1094.25	43.9	Krasny Porog	-0.4	-7.3
XC-1/1097,0	1097	41.15	Krasny Porog	-0.7	-7.5
XC-1/1100,3	1100.3	37.85	Krasny Porog	-0.5	-7.4
XC-1/1103,35	1103.35	34.8	Krasny Porog	0.4	-7.0
XC-1/1106,05	1106.05	32.1	Krasny Porog	0.3	-7.4
XC-1/1109,05	1109.05	29.1	Krasny Porog	0.7	-7.4
XC-1/1111,9	1111.9	26.25	Krasny Porog	0.4	-7.5
XC-1/1114,3	1114.3	23.85	Krasny Porog	0.2	-7.1

XC-1/1117,55	1117.55	20.6	Krasny Porog	-0.2	-7.5
XC-1/1120,45	1120.45	17.7	Krasny Porog	-0.3	-7.5
XC-1/1123,75	1123.75	14.4	Krasny Porog	-0.4	-7.2
XC-1/1125,9	1125.9	12.25	Krasny Porog	-0.6	-7.1
XC-1/1128,65	1128.65	9.5	Krasny Porog	-0.9	-7.3
XC-1/1131,65	1131.65	6.5	Krasny Porog	-1.2	-6.8
XC-1/1134,85	1134.85	3.3	Krasny Porog	-1.5	-8.5
XC-1/1137,5	1137.5	0.65	Krasny Porog	-1.4	-7.2
XC-1/1139,95	1139.95	-1.8	Sukharikha	-1.5	-7.7
XC-1/1142,8	1142.8	-4.65	Sukharikha	-1.6	-7.5
XC-1/1145,5	1145.5	-7.35	Sukharikha	-1.5	-7.3
XC-1/1148,22	1148.22	-10.07	Sukharikha	-1.8	-7.6
XC-1/1150,92	1150.92	-12.77	Sukharikha	2.1	-7.5
XC-1/1153,2	1153.2	-15.05	Sukharikha	4.0	-5.7
XC-1/1155,94	1155.94	-17.79	Sukharikha	3.4	-7.0
XC-1/1158,65	1158.65	-20.5	Sukharikha	2.7	-5.6
XC-1/1161,25	1161.25	-23.1	Sukharikha	2.8	-7.1
XC-1/1163,98	1163.98	-25.83	Sukharikha	1.9	-5.4
XC-1/1166,34	1166.34	-28.19	Sukharikha	0.4	-7.2
XC-1/1169,25	1169.25	-31.1	Sukharikha	-1.3	-6.7
XC-1/1172,35	1172.35	-34.2	Sukharikha	-2.2	-6.7
XC-1/1174,95	1174.95	-36.8	Sukharikha	-1.7	-7.3
XC-1/1177,58	1177.58	-39.43	Sukharikha	-1.2	-7.2
XC-1/1180,03	1180.03	-41.88	Sukharikha	-0.1	-6.1
XC-1/1182,8	1182.8	-44.65	Sukharikha	0.6	-6.7
XC-1/1185,76	1185.76	-47.61	Sukharikha	1.2	-6.9
XC-1/1188,3	1188.3	-50.15	Sukharikha	2.7	-6.8
XC-1/1191,78	1191.78	-53.63	Sukharikha	3.6	-6.3
XC-1/1193,6	1193.6	-55.45	Sukharikha	4.1	-6.4
XC-1/1196,15	1196.15	-58	Sukharikha	4.2	-6.7
XC-1/1198,27	1198.27	-60.12	Sukharikha	4.2	-6.6
XC-1/1202,05	1202.05	-63.9	Sukharikha	4.3	-6.9