



Tale ESM-1. Chemical composition of sampled waters

Sample:	Coastal waters						Incoming springs				Incoming river
	T1	T3	T3	T4	T08	T11	T2	T09	T10	T12	
Date	Feb-08	Feb-08	Feb-10	Feb-10	Sep-10	Sep-10	Feb-08	Sep-10	Sep-10	Sep-10	
T, °C	11.0	10.0	10	10.5			9.0				
O ₂ , mg/L											
% saturation	98	99					80				
pH					9.26	9.08		8.87	8.67	7.95	
DOC, mg/L		3.8	3.68	3.77	4.60	3.82		0.43	0.48	1.58	
Alk, mol/L	0.0394	0.0358	0.02765	0.02763	0.03123	0.03325	0.019	0.0079	0.00739	0.00993	
Cl, mg/L			184.7	187.3	195.6	194.2		2.9	5.6	8.0	
SO ₄ , mg/L			16.2	18.7	14.48	14.55		3.82	2.93	7.09	
Na, mg/L	324.8	411.9	453.1	489.4	231.4	227.2	5.6	2.0	3.6	8.8	
Mg, mg/L	474.8	618.1	229	242	386	375	112.1	107	72	123	
Ca, mg/L	4.6	5.5	4.5	4.6	4.2	4.1	11.5	1.8	1.4	17.8	
K, mg/L	35.11	43.08	31	33	30	30	0.2659	0	0	2	
µg/L											
Li	3.495	3.453	< d.l.	0.085	1.7	1.6	0.6524	0.4	0.4	0.7	
B			132	146	120	119		4	4	19	
Al	0.712	0.9586	1.948	2.571	1.50	1.18	< d.l.	0.48	0.70	0.72	
Si	920.9	960.8	0.782	0.37	922	1283	11460	1485	2706	14716	
P	< d.l.	< d.l.	< d.l.	8.702	0.4	4	< d.l.	< d.l.	< d.l.	257	
Ti	0.1865	0.2556	0.197	0.174	0.2346	0.1838	0.7401	0.1439	0.2596	1.7396	
V	2.93	3.499	2.336	2.324	2.6045	2.4816	2.932	0.1467	0.0800	4.3269	
Cr	0.6994	0.9646	1.094	1.217	0.8229	0.7719	20.03	7.6923	7.1748	4.4310	
Mn	0.1925	0.2052	0.317	1.586	0.1001	0.2095	0.2149	< d.l.	< d.l.	7.1831	
Fe	1.366	1.457	1.482	1.376	4.9900	3.7439	1.268	3.1060	1.3000	10.6641	
Co	0.123	0.1395	0.060	0.099	0.0826	0.0354	0.03692	0.0106	0.0102	0.2085	
Ni	0.912	1.063	0.906	0.851	0.7861	0.7548	0.6828	0.1115	0.1103	5.6587	
Cu	0.150	0.09822	0.205	0.206	0.1034	0.1120	0.04492	0.0644	0.0868	0.3560	
Zn	4.1	3.4	1.6	1.8	1.7	2.1	2.6	1.4	1.2	2.0	
Ga	0.002	0.004	0.004	0.002	0.0028	0.0049	0.001	0.0009	0.0006	0.0023	
Ge	0.001	0.008	0.006	0.001	0.0026	0.0047	0.009	0.0009	-0.0007	0.0034	
As	0.656	0.716	0.619	0.724	0.6872	0.7239	0.1491	0.0360	0.0096	0.5772	
Rb	6.742	6.93	6.135	6.367	6.9251	6.9041	0.24	0.6113	0.1690	1.2422	
Sr	7.0	7.0	8.9	8.1	8.3	8.2	30.1	6.4	17.3	70.1	
Y	0.021	0.022	0.022	0.009	0.0134	0.0139	0.027	0.0004	0.0006	0.0748	
Zr	0.210	0.224	0.209	0.198	0.2170	0.0851	0.004	< d.l.	< d.l.	0.0070	
Mo	1.752	1.736	1.926	2.532	1.8292	1.9246	0.280	0.5051	0.0612	0.3790	
Cd	0.005	0.005	0.003	0.007	0.0008	0.0111	0.001	0.0019	0.0021	0.0040	
Sb	0.061	0.056	0.100	0.101	0.1102	0.1546	< d.l.	0.0125	0.0048	0.0510	
Cs	0.015	0.011	0.029	0.030	0.0069	0.0121	0.002	0.0084	0.0007	0.0041	
Ba	3.296	3.218	3.689	3.461	3.5582	3.8150	1.065	1.1058	0.4755	20.3467	
La	0.079	0.061	0.004	0.000	0.0046	0.0046	0.070	0.0041	0.0016	0.0118	
Ce	0.007	0.008	0.010	0.001	0.0105	0.0101	0.000	0.0012	0.0010	0.0126	
Pr	0.001	0.001	0.001	0.000	0.0006	0.0011	0.000	0.0000	0.0002	0.0027	
Nd	0.004	0.005	0.004	0.001	0.0053	0.0095	0.001	< d.l.	< d.l.	0.0131	
Eu	0.001	0.001	0.001	0.000	0.0007	0.0027	0.000	0.0000	0.0000	0.0024	
Gd	0.003	0.003	0.004	< d.l.	0.0009	0.0019	0.001	< d.l.	0.0014	0.0049	
Dy	0.003	0.002	0.003	0.001	0.0022	0.0006	0.002	0.0006	0.0004	0.0066	
Ho	0.001	0.001	0.001	0.001	0.0004	0.0005	0.001	0.0002	< d.l.	0.0017	
Er	0.002	0.003	0.002	0.001	0.0014	0.0019	0.003	< d.l.	0.0007	0.0048	
Tm	0.001	0.001	0.000	0.000	0.0003	0.0005	0.000	< d.l.	< d.l.	0.0006	
Yb	0.003	0.005	0.003	0.001	0.0022	0.0022	0.002	< d.l.	< d.l.	0.0060	
Lu	0.001	0.001	0.001	0.000	0.0001	0.0009	0.001	0.0000	0.0001	0.0012	
Hf	0.001	< d.l.	0.001	0.001	0.0017	0.0029	< d.l.	0.0002	< d.l.	0.0025	
W	0.749	0.634	0.659	0.628	0.6804	0.7303	0.006	0.0219	0.0139	0.0663	
Pb	0.044	0.055	0.118	0.141	0.1323	0.1970	0.024	0.0228	0.0117	0.0251	
Th	0.001	0.000	0.002	0.000	0.0012	0.0017	< d.l.	0.0001	< d.l.	0.0009	
U	0.187	0.160	0.179	0.173	0.1678	0.0731	0.022	0.0000	0.0002	0.0444	

Table ESM-1, continued.

Sample:	Vertical profile							
	T07, 0 m	T07, 10 m	T07, 20 m	T07, 30 m	T07, 40 m	T07, 50 m	T07, 60 m	T07, 70 m
Date	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10
T, °C	27.5	27.4	20	17.3	15.1	14.8	14	13.5
O ₂ , mg/L	7.76	7.76	9.22	9.68	9.36	8.38	7.71	7.25
% saturation	98.5	97.8	102	100.4	94.2	82.4	74.8	70.4
pH	9.14	9.16	9.02	8.89	9.03	9.06	9.065	9.03
DOC, mg/L	4.10	4.04	3.74	3.80	3.75	3.69	3.61	3.58
Alk, mol/L	0.03158	0.03095	0.03342	0.03172	0.03131	0.03214	0.03204	0.03057
Cl, mg/L	197.2	196.2	192.3	194.0	194.5	194.3	195.7	195.5
SO ₄ , mg/L	14.83	14.59	14.36	14.54	14.43	14.42	14.45	14.52
Na, mg/L	233.5	233.7	234.8	234.6	236.8	242.0	237.2	237.4
Mg, mg/L	384	385	389	389	392	399	394	397
Ca, mg/L	4.3	4.3	4.1	4.1	4.1	4.1	4.0	4.0
K, mg/L	31	30	31	31	31	32	31	31
µg/L								
Li	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.5
B	118	117	118	117	118	119	118	117
Al	1.73	1.27	1.25	1.06	1.21	1.03	1.12	0.83
Si	1405	1374	1649	1547	1742	1400	1659	1565
P	1.2	2.8	6.2	5.4	8.9	6.9	6.1	5.6
Ti	0.1960	0.2123	0.1520	0.1603	0.1817	0.1847	0.2244	0.1813
V	2.5570	2.6911	2.5176	2.5530	2.4188	2.4956	2.6845	2.7560
Cr	0.8304	0.8227	0.8718	0.8979	0.9710	0.7756	0.6915	0.7961
Mn	0.2488	0.1918	0.3441	0.2475	0.3108	0.0050	<d.l.	<d.l.
Fe	3.9220	4.4916	5.2650	6.2002	4.6818	5.2137	4.4693	4.7950
Co	0.0062	0.0451	-0.0049	0.0365	0.0165	0.0100	0.0227	0.0301
Ni	1.1695	0.8629	1.2677	1.0850	1.1356	0.9829	1.0024	1.0363
Cu	0.0677	0.1042	0.6703	0.0979	0.1440	0.3272	0.1179	0.1037
Zn	2.2	6.2	4.3	3.7	3.9	3.8	3.2	3.1
Ga	0.0042	0.0023	0.0037	0.0039	0.0039	0.0041	0.0023	0.0048
Ge	0.0061	0.0036	0.0023	0.0051	0.0075	0.0041	0.0130	0.0065
As	0.6737	0.6821	0.6699	0.6653	0.7243	0.7161	0.6977	0.7074
Rb	7.0551	7.0286	6.9647	6.9735	6.9888	7.1083	7.0382	7.0259
Sr	8.1	8.3	7.7	7.5	7.3	7.5	7.2	7.1
Y	0.0148	0.0140	0.0258	0.0239	0.0235	0.0251	0.0245	0.0248
Zr	0.0207	0.1193	0.0039	0.0269	0.0191	0.0058	0.0138	0.0110
Mo	1.8668	1.8993	1.8639	1.8266	1.7995	1.8152	1.8226	1.8031
Cd	0.0036	0.0198	0.0171	0.0155	0.0091	0.0076	0.0126	0.0064
Sb	0.1318	0.1142	0.1085	0.0986	0.1161	0.1080	0.1033	0.1037
Cs	0.0134	0.0142	0.0134	0.0123	0.0129	0.0131	0.0093	0.0101
Ba	3.6958	3.6869	3.3401	3.3770	3.1865	3.3454	3.2786	3.2304
La	0.0044	0.0036	0.0041	0.0041	0.0056	0.0039	0.0035	0.0029
Ce	0.0077	0.0106	0.0074	0.0091	0.0089	0.0076	0.0064	0.0070
Pr	0.0009	0.0009	0.0009	0.0017	0.0018	0.0008	0.0006	0.0011
Nd	0.0046	0.0031	0.0024	0.0072	0.0061	0.0068	0.0040	0.0051
Eu	0.0004	0.0013	0.0015	0.0007	0.0023	0.0015	0.0019	0.0017
Gd	0.0002	0.0026	0.0063	0.0031	0.0030	0.0028	0.0023	0.0032
Dy	0.0015	0.0027	0.0028	0.0041	0.0058	0.0036	0.0045	0.0031
Ho	0.0005	0.0005	0.0013	0.0011	0.0010	0.0008	0.0008	0.0009
Er	0.0014	0.0026	0.0040	0.0045	0.0035	0.0043	0.0050	0.0026
Tm	< d.l.	0.0002	0.0003	0.0008	0.0002	0.0007	0.0009	0.0003
Yb	0.0029	0.0013	0.0039	0.0022	0.0040	0.0024	0.0036	0.0029
Lu	0.0001	0.0005	0.0004	0.0011	0.0010	0.0006	0.0008	0.0008
Hf	0.0017	0.0022	0.0009	0.0019	0.0011	0.0007	0.0012	0.0022
W	0.7089	0.6993	0.7570	0.7051	0.6921	0.7210	0.6853	0.6581
Pb	0.1919	1.3178	0.4282	0.2803	0.2273	0.2193	0.1702	0.3065
Th	0.0020	0.0005	0.0017	0.0008	0.0014	0.0008	0.0015	0.0011
U	0.0260	0.0836	0.0042	0.0251	0.0199	0.0103	0.0183	0.0140

ESM-2. Chemical composition of experimental solutions and mineralogy of precipitates.

Sample	Time (days)	Mg (mM) mM	Alk M	pH	Biomass g _{wet} /L	DOC mg L ⁻¹	MINERAL
SBio1-1	1.16	26.855	0.0462	8.66	0.066	2.27	
SBio1-2	2.16	25.617	0.0481	8.75	0.08		
SBio1-3	3.1		0.0481	8.85	0.072	3.97	
SBio1-4	7	22.185	0.0485	8.95	0.098		
SBio1-5	9	25.591	0.0481	9.13	0.25	11.2	
SBio1-6	11	26.893		9.5	0.482		
SBio1-7	13		0.0502	9.74	0.652	16.5	
SBio1-8	17	13.296	0.0277	10.26	1.76		
SBio1-9	21	12.982	0.0245	10.35	2.434	17.2	
SBio1-10	24	4.114	0.012	10.51			
SBio1-11	30	5.253	0.0111	10.58	2.364	17.2	
SBio1-12	37	4.513	0.0111		2.762		
SBio1-13	43	2.214	0.0095	10.34	3.132		Brucite
S-Bio2-1	0.02	29.6	0.0487	8.21	0.16	21.3	
S-Bio2-2	0.83	30.8	0.05		0.19		
S-Bio2-3	2.87	27.32	0.0491	9.35	0.24		
S-Bio2-4	4	28.36	0.0503	9.55	0.43		halite
S-Bio2-5	5	27.1	0.0486	9.74	0.7	18.6	
S-Bio2-6	7	18.13	0.0269	9.78	2.052		nesquehonite
S-Bio2-7	10	13.05	0.0228	10.25			nesquehonite
S-Bio2-8	11	10.39	0.0229	10.44	1.912		
S-Bio2-9	12	14.78	0.0232	10.36	2.102		nesquehonite
S-Bio2-10	15	5.37	0.0099	10.46	2.514	15.91	Dypingite
S-Bio2-11	17	4.73	0.0083	10.45	2.442		Dypingite
S-Bio2-12	20	4.62	0.0086	10.53	2.54		
S-Bio2-13	23	4.36	0.0075	10.5	2.656		dypingite+brucite
S-Bio2-14	26	3.15	0.0068	10.45	2.86	62.9	dypingite+brucite
S-Bio2-15	30	4.08	0.0062	10.46	3.724		brucite
S-Bio3-1	0	15.12	0.0262	9.22	0.136		
S-Bio3-2	1	12.6	0.0276	9.26	0.216	6.66	
S-Bio3-3	2	12.14	0.0286	9.3	0.21		
S-Bio3-4	3	11.99	0.0275	9.47	0.354		
S-Bio3-5	7	9.04	0.025	10.46	1.442	9.07	
S-Bio3-6	10	7.72	0.0233	10.19	1.048		hydromag+dyping
S-Bio3-7	14	7.61	0.0266	10.15	0.85		hydromag+dyping
S-Bio3-8	17	8.78	0.0255	10.41	1.016	14.6	
S-Bio3-9	24	3.04	0.013	10.72	1.52	17.6	hydromag+dyping
S-Bio3-10	29	2.59	0.012	10.73	1.696		
S-Bio3-11	34	2.48	0.0119	10.76	1.86	17.9	hydromag+dyping
S-Bio3-12	66	3.09	0.0118	10.63	2.296		hydromag+dyping

Table ESM-2, continued.

Sample	Time (days)	Mg (mM)	Alk M	pH	Biomass, $\xi_{\text{wet}}/\text{L}$	DOC mg L^{-1}	MINERAL
S-Bio4-1	0.063	13.77	0.0291	9.27	0.124	8.9	
S-Bio4-2	1	12.72	0.028	9.36	0.104		
S-Bio4-3	4	13.21	0.0295	9.4	0.156		
S-Bio4-4	6	13.29	0.03	9.74	0.392	9.2	
S-Bio4-5	8	13.36	0.0286	9.74	0.892		
S-Bio4-6	9	9.99	0.0247	9.83	1.178		
S-Bio4-7	11	9.92	0.0252	10.37	1.092	11.9	hydromagnesite+dypingite precurs.
S-Bio4-8	13	9.96	0.0264	10.46	0.904		
S-Bio4-9	15	9.58	0.0251	10.52	1.048		hydromagnesite+dypingite precurs.
S-Bio4-10	18	7.68	0.0214	10.82	1.52	16.7	
S-Bio4-11	20	5.25	0.0163	10.72	1.44		
S-Bio4-12	22	4.07	0.015	10.75	1.58		hydromag+dyping
S-Bio4-13	26	2.95	0.0129	10.74	1.66	17.4	
S-Bio4-14	31	2.84	0.0128	10.80	1.68		hydromag+dyping
S-Bio4-15	36	2.69	0.0124	10.74	1.66		
S-Bio5-1	0.025	31.26	0.0499	8.16	0.16		
S-Bio5-2	3	27.37	0.0498	9.25	0.44		
S-Bio5-3	4	27.25	0.0501	9.29	0.48		
S-Bio5-4	10	21.9	0.0364	9.26	1.36		
S-Bio5-5	11	21.51	0.0348	9.27	1.49		
S-Bio5-6	12	27.55	0.0352	9.29	1.49	23.23	nesquehonite
S-Bio5-7	15	20.82	0.0352	9.30	1.13		
S-Bio5-8	17	19	0.0345	9.40	1.54		
S-Bio5-9	20	15.84		9.72			
S-Bio5-10	23	15.85	0.024	10.42	2.38		nesquehonite
S-Bio5-11	26	13.12	0.0214	10.35	2.26	29.2	
S-Bio5-12	30	7.07	0.0103	10.40	2.83		dypingite
S-Bio6-1	0.02	12.67	0.0253	9.22	0.39		
S-Bio6-2	1	11.67	0.0271	9.38	0.60		
S-Bio6-3	2	11.17	0.0278	9.52	0.64		
S-Bio6-4	3	12.19	0.0281	9.56	0.72		
S-Bio6-5	7	8.42	0.0246	9.42	0.75		
S-Bio6-6	10	8.46	0.0217	9.27	0.95		
S-Bio6-7	14	9.66	0.0205	9.23	0.77		
S-Bio6-8	17	10.66	0.0394	9.27	0.79		
S-Bio6-9	24	11.04	0.0217	9.20	0.93		
S-Bio6-10	28	9.45	0.0218	9.25	0.87		
S-Bio6-11	33	10.98	0.021	9.30	0.99		No precipitation
S-Bio7-1	0.02	52.14	0.0049	8.06	0.05		
S-Bio7-2	1	49.24	0.0052	8.67	0.11		
S-Bio7-3	2	51.3	0.0056	8.92	0.20		
S-Bio7-4	7	56.03	0.0056	9.99	0.83		
S-Bio7-5	8	41.5	0.005	9.87	0.98		
S-Bio7-6	11	44.8	0.007	9.73	1.28		
S-Bio7-7	13	50.69	0.007	9.48	1.56		
S-Bio7-8	15	38.93	0.0082	9.10	1.64		
S-Bio7-9	17	49.58	0.0089	9.12	1.87		
S-Bio7-10	23	55.17	0.0104	9.01	3.32		
S-Bio7-11	27	54.29	0.0119	8.88	2.52		No precipitation
S-Bio7-12	31	55.12	0.0166	8.81	2.93		

Sample	Time (days)	Mg (mM)	Alk M	pH	Biomass, g _{wet} /L	DOC mg L ⁻¹	MINERAL
S-Abio1-1	0.02	23.13	0.0517	8.15			
S-Abio1-2	4	20.41	0.0502	9.36		92.4	
S-Abio1-3	5	21.4	0.0365	9.13			
S-Abio1-4	6	14.12	0.0318	9.16			dypingite
S-Abio1-5	8	12.25	0.0275	9.22		48.37	dypingite
S-Abio1-6	11	8.77	0.024	9.24			
S-Abio1-7	12	9.93	0.0229	9.27			
S-Abio1-8	13	8.14	0.0235	9.28			dypingite
S-Abio1-9	16	12.36	0.0221	9.29			
S-Abio1-10	18	11.41	0.0225	9.27			
S-Abio1-11	20	11.14	0.0228	9.31		27.9	dypingite
S-Abio1-12	22	10.2	0.0214	9.32			
S-Abio1-13	25	9.28	0.0217	9.27			dypingite
S-Abio2-1	0.02	13.73	0.0273	9.2		7.43	
S-Abio2-2	14	13	0.028	9.39			No precipitation
S-Abio2-3	30	12.65	0.0281	9.39			
S-Abio2-4	35	12.1	0.0278	9.38			
S-Abio2-5	55	12.55	0.0281	9.4			
S-Abio3-1	0.025	37.54	0.0458	8.09			
S-Abio3-2	4	24.81	?	8.99			
S-Abio3-3	11	20.99	0.0327	8.95		29.5	hydromagnesite+dypingite
S-Abio3-4	12	15.93	0.0292	8.98			hydromagnesite+dypingite
S-Abio3-5	16	11.07	0.0233	9.17			hydromagnesite+dypingite
S-Abio3-6	18	11.41	0.0177	9.26			
S-Abio3-7	25	12.99	0.0166	9.25			hydromagnesite+dypingite
S-Abio4-1	6	53.13	0.0794	8.33			
S-Abio4-2	14	52.14	0.0769	8.54			
S-Abio4-3	16	52.25	0.0659	8.43			
S-Abio4-4	19	46.11	0.0615	8.44			
S-Abio4-5	22		0.0656	8.47			
S-Abio4-6	26	42.56	0.0644	8.57			nesquehonite
S-Abio4-7	30	39.59	0.0521	8.64			
S-Abio4-8	33		0.0505	8.7			nesquehonite
S-Abio4-9	37	33.94	0.051	8.84			
S-Abio4-10	40		0.0455	8.8			nesquehonite
S-Abio4-11	44	27.15	0.0426	9.13			
S-Abio4-12	48	30.21	0.0415	8.9			nesquehonite + dypingite
S-Abio5-1	0.02	21.72	0.0454	8.22			
S-Abio5-2	14	21.59	0.0473	9.42			
S-Abio5-3	30	22.53	0.0494	9.46			No precipitation
S-Abio5-4	35	22	0.0485	9.41			
S-Abio5-5	55	21.5	0.0481	9.39			
S-Abio6-1	0.02	13.24	0.03	9.27			
S-Abio6-2	1	13.08	0.0289	9.34			
S-Abio6-3	6	13.53	0.0298	9.18			
S-Abio6-4	11	13.58	0.0302	9.38			
S-Abio6-5	13	13.82	0.0302	9.36			
S-Abio6-6	15	13.79	0.0297	9.41			No precipitation
S-Abio6-7	27	13.47	0.0311	9.38			
S-Abio6-8	37	13.61	0.0307	9.43			