

**Title: Washover deposits related to tsunami and storm surge along
the north coast of the Shimokita Peninsula in northern Japan**

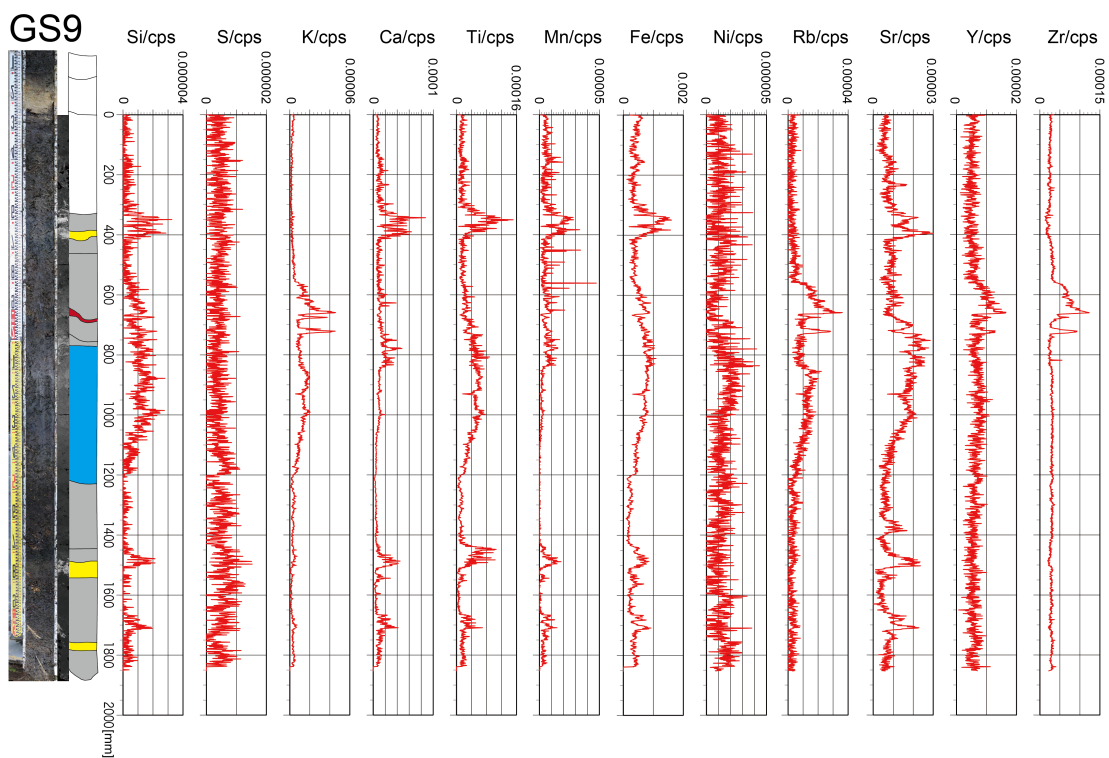
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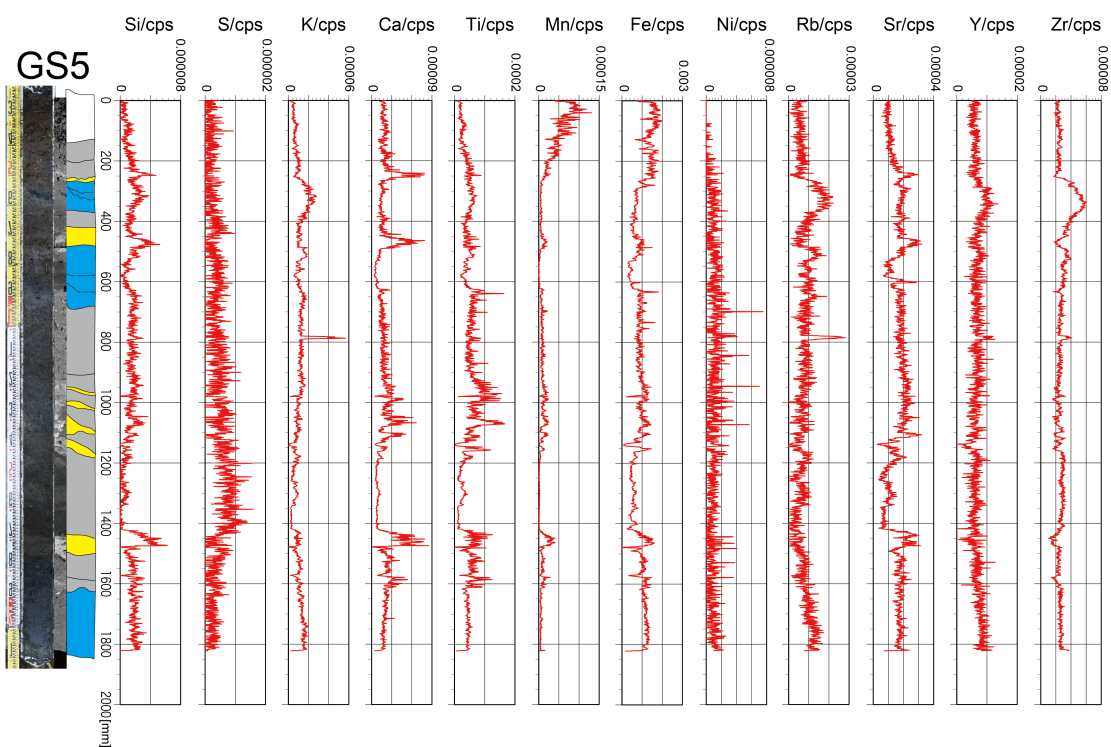
Correspondence and requests for materials should be addressed to D.I.
(email: ishimura@tmu.ac.jp).

Supplementary Figures and Table



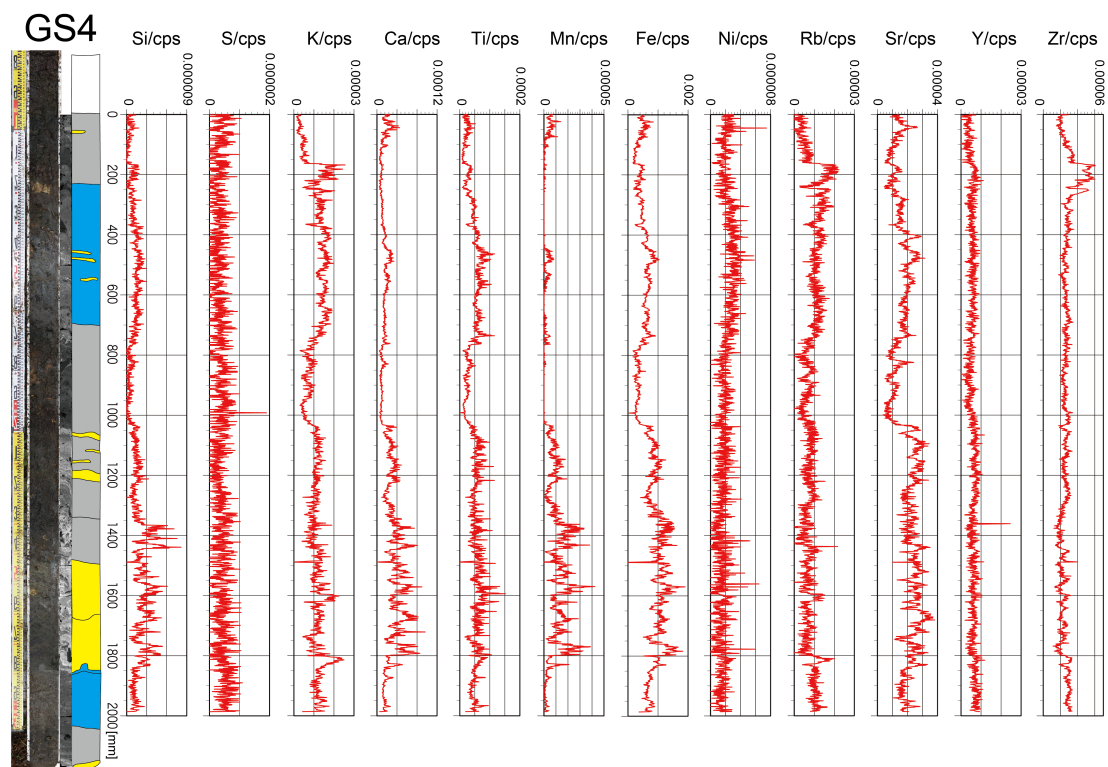
Supplementary Figure S1a Results of the ITRAX micro-X-ray fluorescence core scanning of SKN-GS9

Each elemental datum was normalized by counts per second (cps).



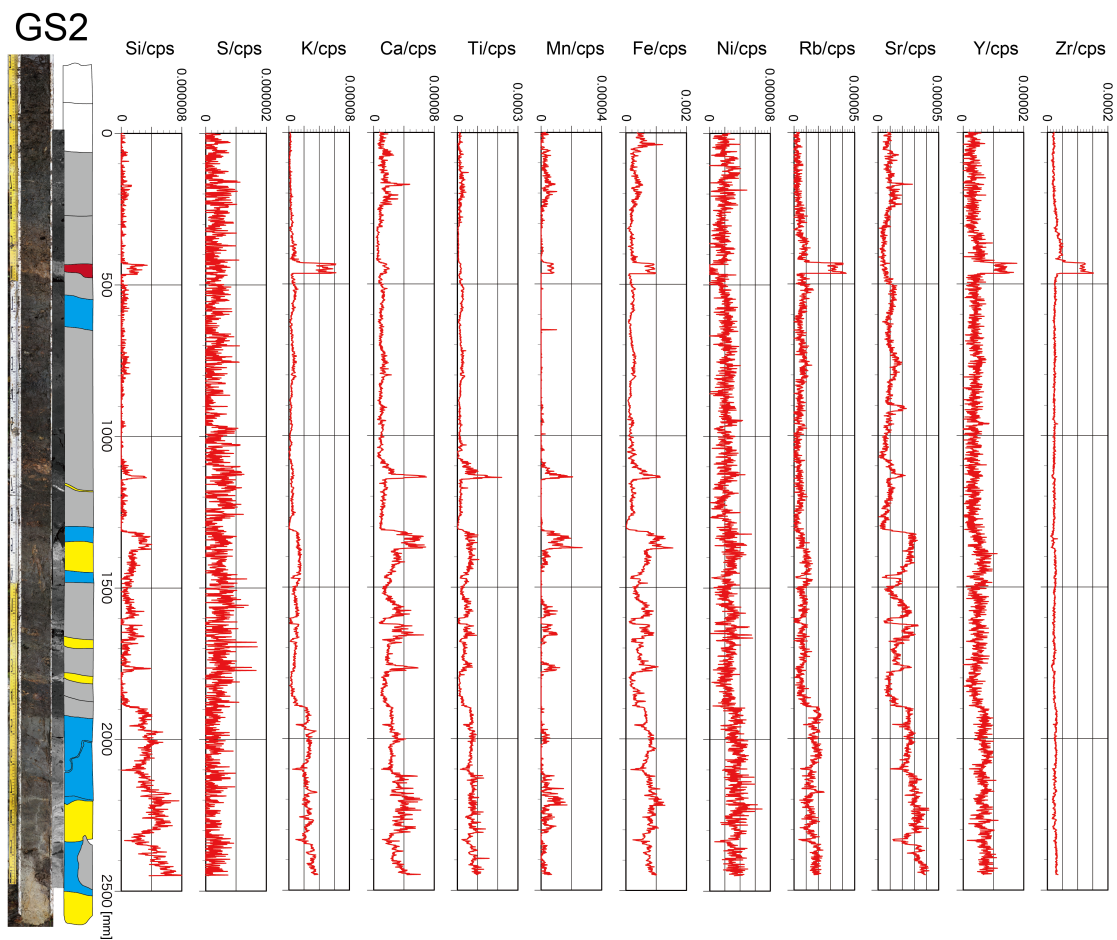
Supplementary Figure S1b Results of the ITRAX micro-X-ray fluorescence core scanning of SKN-GS5

Each elemental datum was normalized by counts per second (cps).



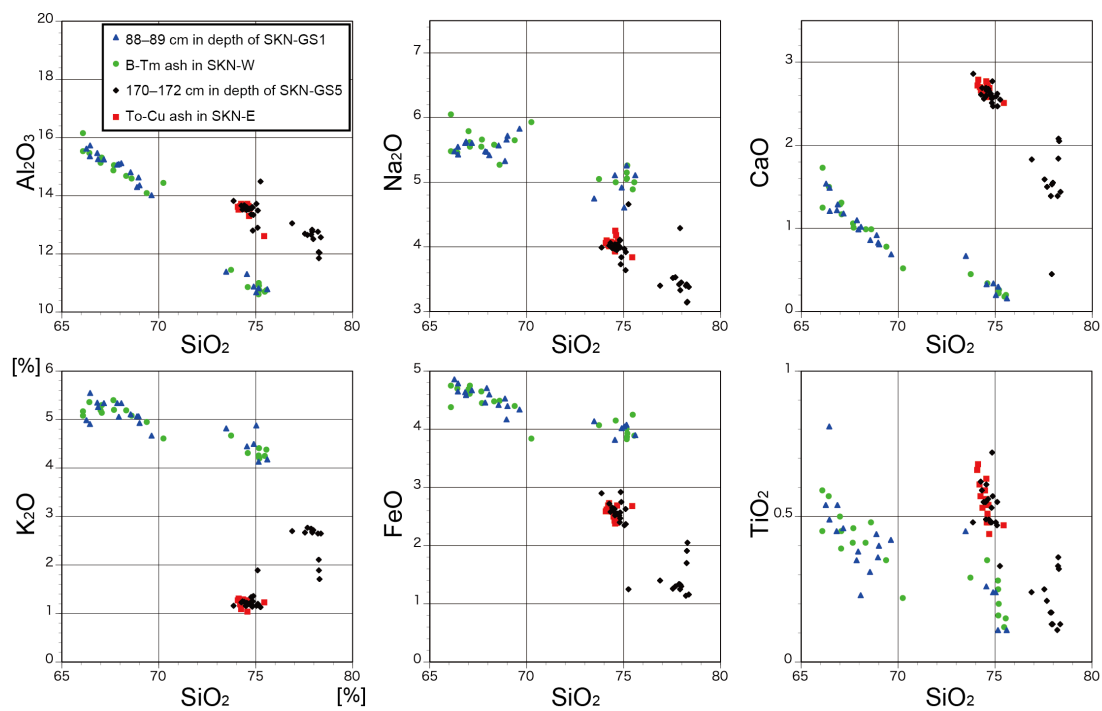
Supplementary Figure S1c Results of the ITRAX micro-X-ray fluorescence core scanning of SKN-GS4

Each elemental datum was normalized by counts per second (cps).

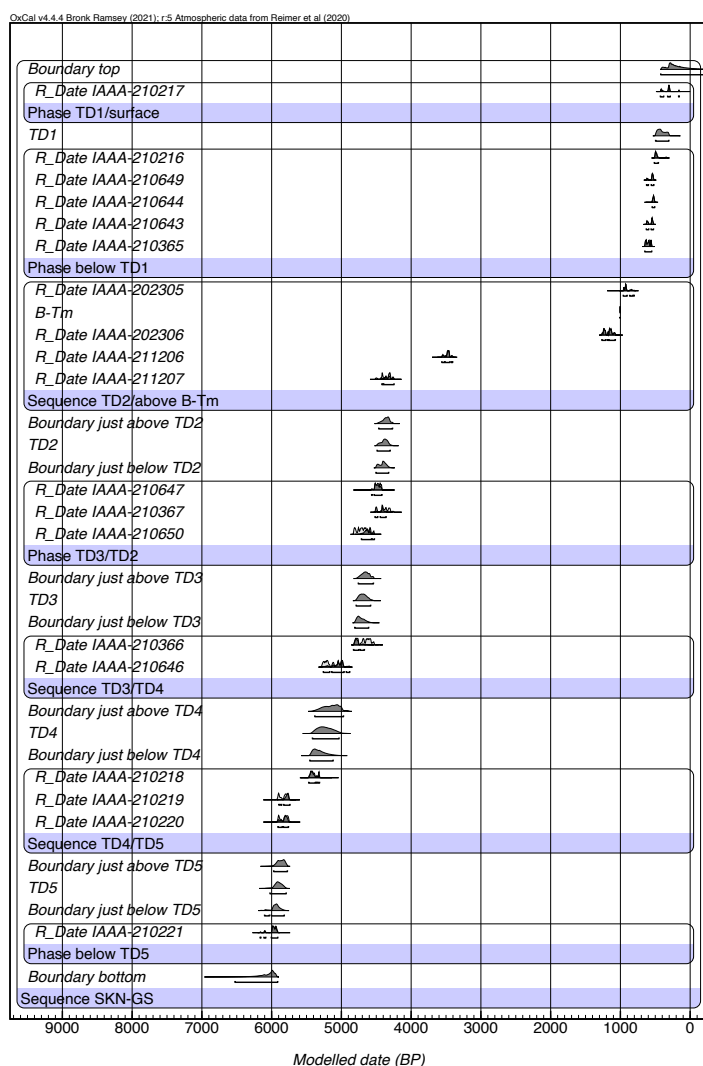


Supplementary Figure S1d Results of the ITRAX micro-X-ray fluorescence core scanning of SKN-GS2

Each elemental datum was normalized by counts per second (cps).



Supplementary Figure S2 Major element compositions of volcanic glass shards.



Supplementary Figure S3 OxCal output of TD1 to TD5

We performed OxCal modeling using the Sequence model (Bronk Ramsey, 2008).

Table S1 Results of grain analysis

Outcrop or core name	Event No.	Mean [phi]	Median [phi]	Mode [phi]	Skewness	Kurtosis
SKN-E	E1	1.71	1.63	1.60	1.514	7.582
	E2	1.89	1.73	1.65	1.268	4.645
	E3	1.85	1.73	1.60	0.736	3.703
	E4	1.88	1.78	1.50	1.034	4.396
	E5 upper	1.82	1.74	1.65	0.403	3.557
	E5 middle	1.65	1.57	1.35	0.622	3.670
	E5 lower	1.74	1.67	1.50	0.196	2.903
	E6 upper	1.95	1.89	1.35	0.082	2.725
	E6 middle	1.99	1.94	2.15	0.081	2.670
	E6 lower	2.04	2.09	1.90	-0.167	3.134
	E7 upper	2.31	2.16	3.60	0.052	1.908
	E7 lower	1.59	1.58	1.80	0.056	3.330
SKN-W	E8	2.16	2.06	1.80	0.282	2.450
	E9	1.95	1.88	1.80	0.248	2.949
	E10	2.08	1.90	1.65	0.716	2.778
	E11 upper	2.54	2.48	2.10	-0.285	2.567
	E11 lower	2.66	2.60	2.25	-0.106	2.162
	E12	2.41	2.36	2.15	-0.064	2.602
	E3	2.08	1.96	1.65	0.575	2.989
	E4	2.28	2.07	1.60	0.456	2.059
	E5	1.92	1.72	1.50	1.076	3.640
	E6	1.92	1.66	1.35	0.476	2.169
	E7	2.03	1.86	1.65	0.948	3.295
	E8	2.33	2.35	2.65	0.477	3.888
SKN-W-GS2	E9	2.29	2.19	1.90	0.339	2.333
	E10	2.16	1.95	1.70	0.494	2.333
	E11 upper	2.08	1.81	1.65	0.692	2.442
	E11 lower	1.89	1.73	1.60	1.003	4.119
	E12	2.23	2.11	1.50	0.149	2.087
	E13	1.99	1.80	1.45	0.719	2.784
	E14 upper	2.14	1.99	1.50	0.529	2.675
	E14 lower	1.70	1.58	1.45	0.314	2.770
	E15	2.62	2.71	3.20	-0.340	2.250
	E16 upper	2.39	2.29	1.90	0.090	1.917
	E16 lower	2.55	2.62	3.60	-0.271	1.932
	E17	2.50	2.43	2.00	-0.026	2.036
SKN-W-GS2	E1-1	2.37	2.21	2.05	0.380	2.315
	E1-2	2.04	1.98	1.85	0.530	3.749
	E1-3	2.33	2.28	2.10	0.492	3.054
	E1-4	2.13	2.06	2.00	1.057	5.034
	E1-5	1.85	1.80	2.10	1.417	6.861
	E1-6	1.81	1.77	1.70	1.275	6.870
	E1-7	1.70	1.62	1.55	1.375	6.494
	E1-8	1.66	1.59	1.50	1.575	7.859
	E2	1.88	1.77	1.55	0.806	3.549
	E3	1.73	1.61	1.45	1.401	5.453
	E4 upper	1.71	1.62	1.65	1.636	7.022
	E4 middle	1.75	1.63	1.50	1.385	5.529
	E4 lower	1.60	1.54	1.45	0.661	5.406
SKN-GS	E5	1.66	1.57	1.55	1.129	5.010
	GS9-E1	1.90	1.77	1.80	1.127	4.299
	GS9-E2	2.64	2.77	3.10	-0.426	2.280
	GS9-E3	1.86	1.68	1.55	0.956	3.481
	GS9-E4	1.65	1.62	1.70	1.318	8.054
	GS8-E1	2.10	1.91	1.65	0.709	2.685
	GS8-E2	1.98	1.79	1.40	0.705	2.776
	GS8-E3	2.06	1.93	1.75	0.617	3.023
	GS8-E4	2.21	2.11	1.90	0.151	2.447
	GS8-E4	2.21	2.07	2.00	-0.096	2.188
	GS8-E4	2.28	2.29	3.45	-0.284	2.012
	GS8-E4	1.82	1.71	1.55	0.131	2.292
SKN-GS	GS8-E5	2.47	2.30	1.95	0.321	2.087
	GS8-E6	2.10	1.99	2.00	0.419	2.607
	GS1-E1	2.00	1.82	1.65	1.028	3.385
	GS1-E2	1.67	1.56	1.40	1.133	4.835
	GS1-E3 upper	1.99	1.79	1.85	0.854	2.944
	GS1-E3 lower	2.19	2.08	1.65	0.373	2.440
	GS1-E4	2.09	1.93	1.30	0.168	2.038
	GS1-E4	2.93	3.15	3.55	-0.746	2.567
	GS1-E4	1.76	1.66	1.55	0.405	2.926
	GS1-E4	1.92	1.81	1.75	0.224	2.619
	GS1-E5	2.00	1.95	1.95	0.665	3.956
	GS1-E6	2.09	2.02	2.10	0.403	2.955

continued

	GS7-E1	1.92	1.79	1.55	1.156	4.240
	GS7-E2	3.00	3.09	3.45	-0.589	2.813
	GS7-E3	2.13	2.00	1.75	0.091	2.223
	GS7-E3	2.30	2.14	1.70	0.104	1.908
	GS7-E3	2.36	2.28	1.60	-0.064	1.876
	GS7-E3	2.52	2.81	3.10	-0.739	2.823
	GS7-E3	2.51	2.63	3.35	-0.286	1.940
	GS7-E4	2.09	1.99	1.65	0.274	2.582
	GS6-E1	1.97	1.81	1.65	1.098	3.719
	GS6-E2	2.23	2.08	1.95	0.293	2.198
	GS6-E3	2.17	2.03	1.65	0.566	2.663
	GS6-E4	2.95	3.22	3.75	-0.907	2.767
	GS6-E5	2.47	2.48	3.65	-0.197	2.079
	GS6-E6	2.37	2.21	1.85	0.315	2.116
	GS6-E7	2.57	2.73	3.45	-0.436	2.340
	GS5-E1	2.09	1.90	1.65	0.917	3.055
	GS5-E2	2.74	2.77	3.70	-0.160	1.950
	GS5-E3	2.47	2.43	1.95	-0.025	2.073
	GS5-E3	2.63	2.66	3.50	-0.185	1.971
	GS5-E3	2.51	2.56	3.25	-0.343	2.642
	GS5-E4	2.97	3.10	3.35	-0.626	2.585
	GS5-E5	3.04	3.20	3.55	-0.794	2.927
	GS5-E6	2.38	2.32	1.80	0.043	2.243
	GS4-E1	2.17	1.86	1.50	0.736	2.271
	GS4-E2	3.40	3.55	3.90	-1.426	4.962
	GS4-E3	3.05	3.24	3.50	-1.024	3.442
	GS4-E4	2.99	3.18	3.60	-0.798	2.849
	GS4-E5-1	2.58	2.69	2.90	-0.385	2.447
	GS4-E5-2	3.05	3.26	3.75	-0.767	2.649
	GS4-E6 upper	2.83	3.08	3.70	-0.609	2.353
	GS4-E6 lower	2.65	2.95	3.50	-0.503	2.029
	GS4-E6 lower	2.19	1.94	1.75	0.560	2.392
	GS4-E6 lower	2.36	2.24	2.20	0.434	2.538
	GS4-E6 lower	2.84	3.06	3.75	-0.416	1.884
	GS3-E1	1.91	1.82	1.65	1.211	4.915
	GS3-E2	3.05	3.15	3.35	-0.728	3.022
	GS3-E3	2.24	2.12	2.05	0.188	2.150
	GS2-E1	1.84	1.82	1.65	0.470	3.911
	GS2-E2	2.50	2.40	2.20	0.146	1.972
	GS2-E3	3.14	3.29	3.90	-0.933	3.224
	GS2-E4	3.05	3.26	3.80	-0.775	2.626
	GS2-E5	1.97	1.84	1.75	0.893	3.725
Present beach	20201011-1	2.11	2.04	2.05	0.970	4.538
	20201011-2	2.04	2.01	1.95	0.900	5.637
	20201011-3	2.19	2.08	2.10	0.714	3.352
	20210925-1	1.77	1.75	1.80	1.664	10.926
	20210925-2	1.72	1.69	1.60	1.400	9.956
Sand dune on the Pleistocene marine terrace	20201014-1	2.24	2.13	2.55	0.626	3.114
Pleistocene marine terrace deposits	20201014-2	1.88	1.82	2.00	0.152	3.035
Creek sediments in the incised valley	20201013-1	1.79	1.66	1.45	0.338	2.789
	20201013-2	1.92	1.80	1.50	0.703	3.310