Supplementary Material

Diving Deeper Into Seep Distribution Along the Cascadia Convergent Margin, USA

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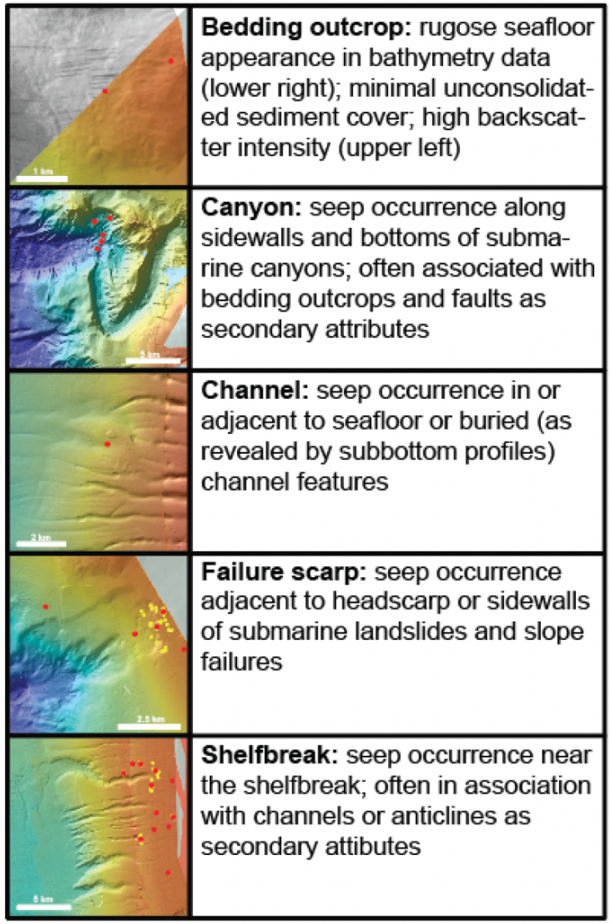
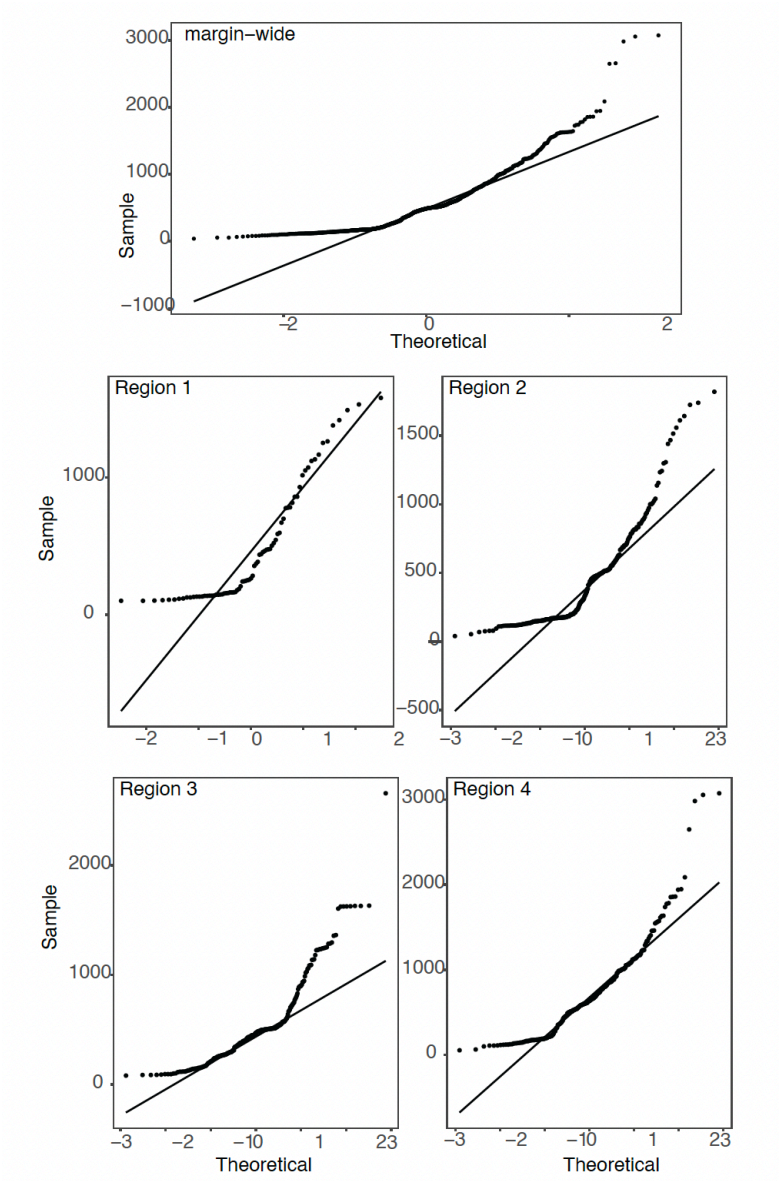
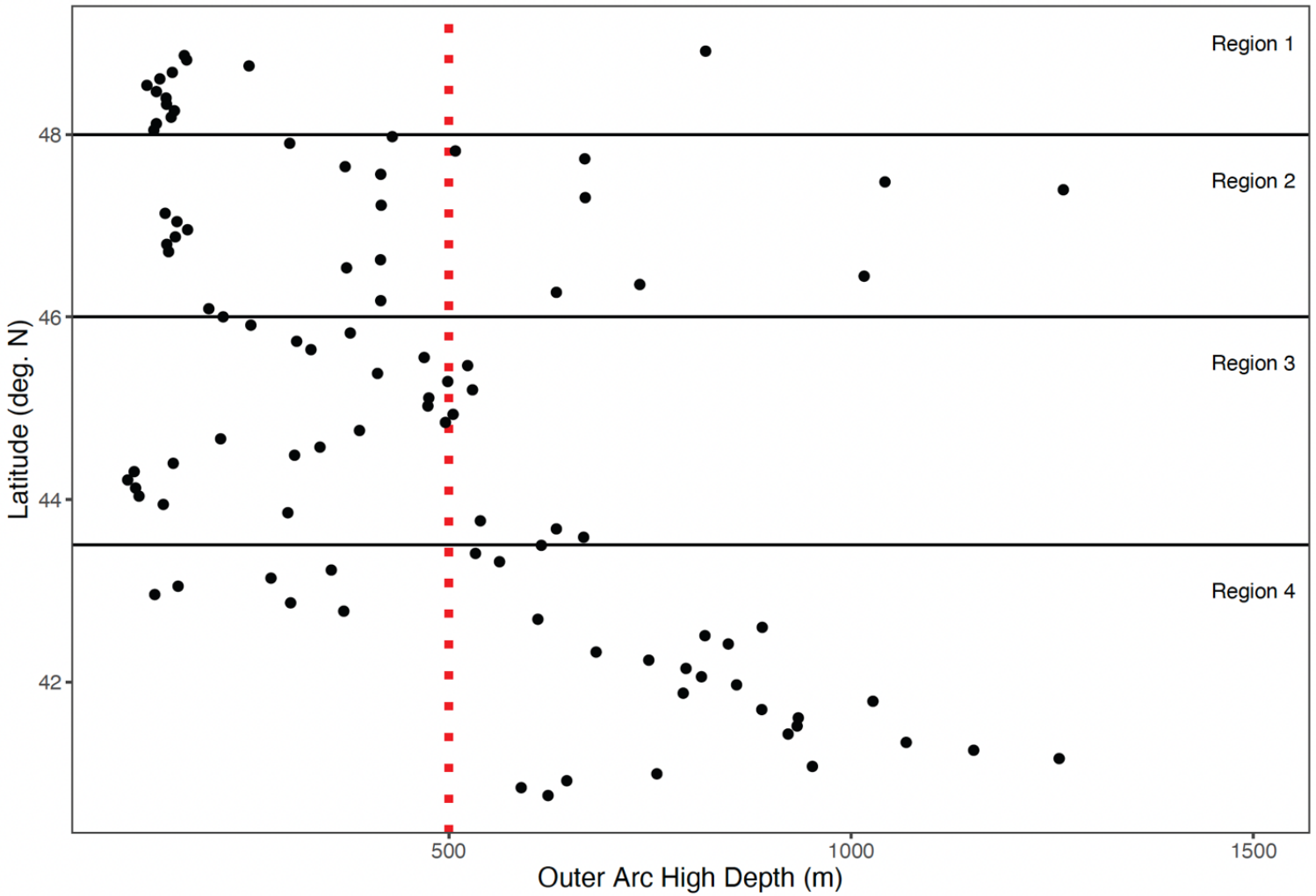
1 Supplementary Figures



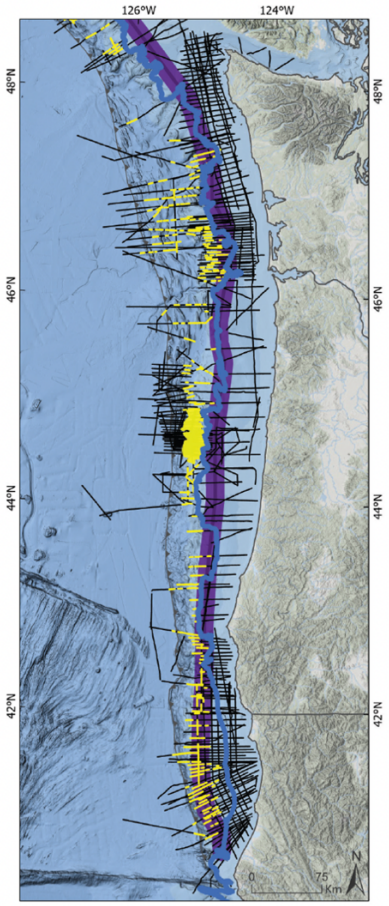
Supplemental Figure S1. Colored shaded relief bathymetry data and backscatter (where noted) showing examples of geologic/geomorphic attributes of seep occurrence in southern Cascadia. Warmer colors in bathymetry are shallower depths; higher backscatter (harder seafloor) is indicated by lighter colors. Yellow dots are locations of individual seep plumes (Merle et al., 2021; Conrad and Rudebusch, 2023); red dots are locations of aggregate seeps (this study). See Figure 4 for an example of the anticline attribute and Figure 5 for an example of the fault attribute.



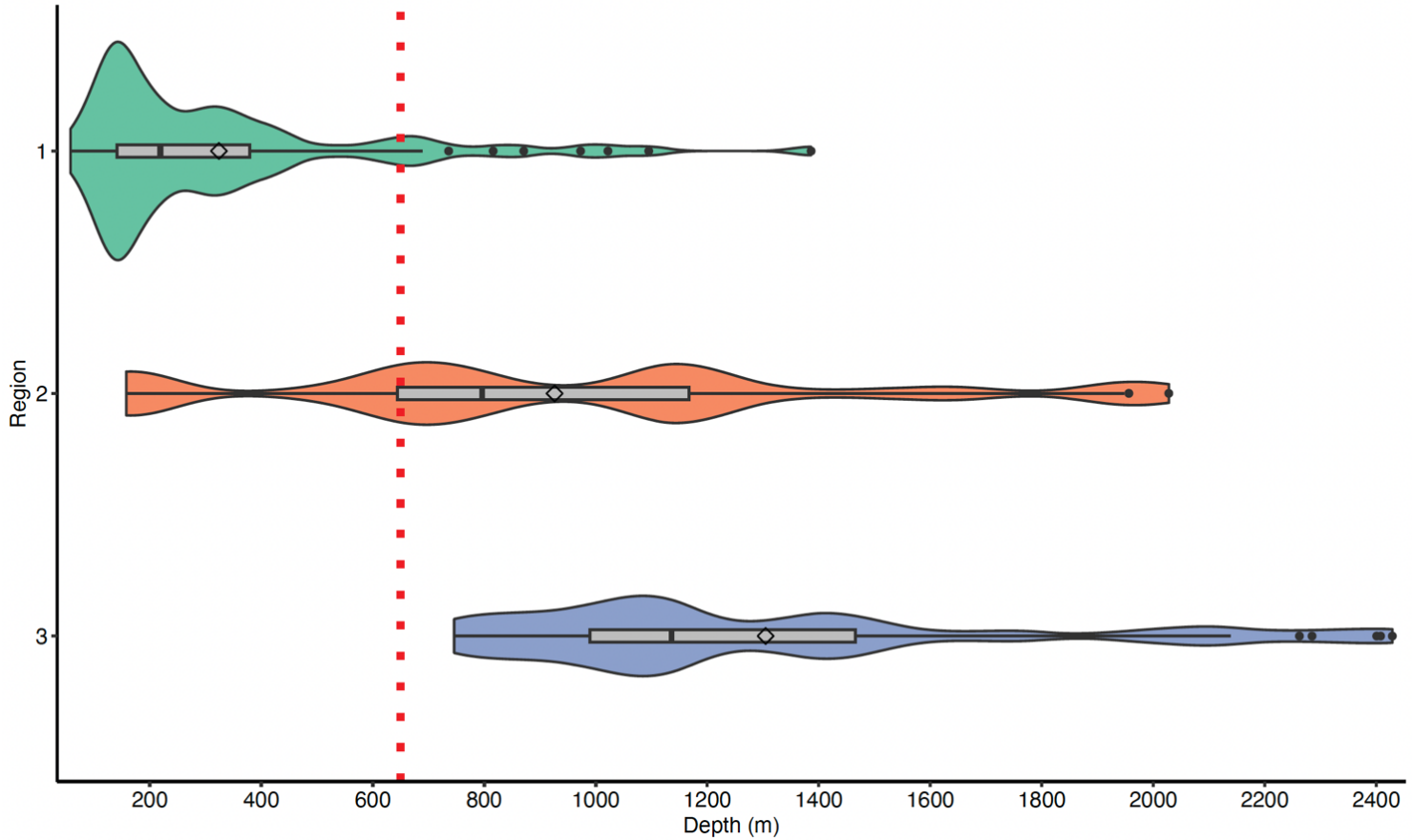
Supplemental Figure S2. Normal Q-Q plots for both margin-wide and morphotectonic region seep depths compared against the theoretical distribution (line).



Supplemental Figure S3. Variation in depth of the outer arc high with latitude from north to south along the Cascadia margin. Horizontal black lines indicate transition boundaries between morphotectonic regions and vertical dotted red lines indicate range of the landward limit of the gas hydrate stability zone (500 m).



Supplemental Figure S4. A map of the Cascadia margin showing the locations of the landward limit of gas hydrate stability zone (GHSZ) at 500 m depth (blue isoline), the outer arc high (OAH; purple shaded region), and bottom-simulating reflectors (BSR; yellow lines) identified along the margin in publicly available seismic survey data (black lines). The BSR was taken from a global compilation of BSR resources produced by How and Ruppel (2023), which for Cascadia were digitized from Figure 9.1 from Tréhu and Phrampus (2022). Seismic survey lines that were analyzed for BSR in that publication are shown (source information can be found in Tréhu and Phrampus (2022). The location of the OAH was identified in Watt and Brothers (2020). Digital elevation model basemap are from Global MultiResolution Terrain (GMRT) model (Ryan et al. 2009).



Supplemental Figure S5. Variability in seep depth distributions in the northern (1) central (2) and southern (3) regions of the Hikurangi as shown with violin plots inset with box plots. Violin plots show a kernel density estimation curve representing the probability of occurrence of seep emission sites at a given depth. Whisker-box plots display five-number summary statistics of seep depth, with both median (vertical line) and mean (diamond) depth values displayed inside the boxes. The landward limit of the gas hydrate stability zone for Hikurangi, estimated to be 650 m depth, is indicated with the red dashed line.

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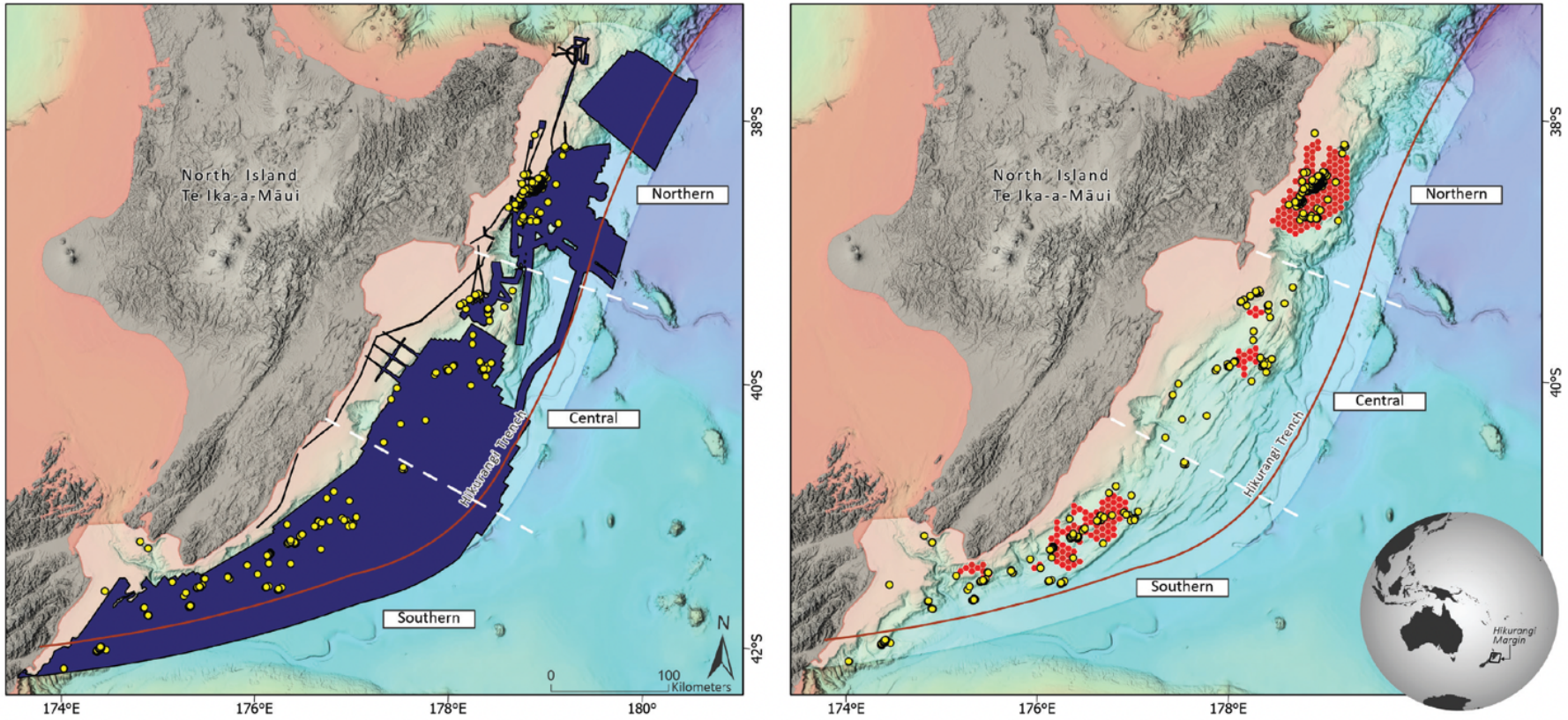

Supplemental Figure S6. The Hikurangi margin on the eastern coast of the North Island and spatial distribution of seeps (yellow points) identified as flares in acoustic water-column backscatter, chemosynthetic fauna, or authigenic carbonates. Left panel shows the seeps and the co-located multibeam survey extent (blue polygon) used as the analysis extent for determining normalized seep depth distributions and cluster analysis. Right panel shows the locations of the seeps and the seep clusters (red hexbins) identified by optimized hot spot analysis.

2 Supplementary Tables

Supplemental Table S1. Seeps and seep indicators used to create clustered emission sites used in this study, including coordinates (Latitude/Longitude), data source (cruise identifier, detection method, dataset owner), and recorded depth. Seeps come from a combination direct (acoustic water-column flares) and inferred (chemosynthetic biota, authigenic carbonates) indications of seepage.

Cruise/Survey ID	Ship	System	Data Source	Seep Indicator Type	Latitude	Longitude	Depth (m)
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4615	-124.7722	114
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4413	-124.7618	115
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4416	-124.7619	115
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4414	-124.7626	116
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4405	-124.7622	116
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.3656	-124.7635	147
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.3646	-124.7639	148
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.3647	-124.7636	148
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.3639	-124.7625	148
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.3625	-124.7625	148
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.3633	-124.7630	148
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.3629	-124.7625	149
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4615	-124.8203	150
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4560	-124.8138	153
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4561	-124.8138	153
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4560	-124.8137	153
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4559	-124.8137	153
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4561	-124.8139	159
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.3158	-124.8112	287
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.3150	-124.8108	290
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2515	-124.9044	406
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2471	-124.9952	411

1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4215	-124.8203	414
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2513	-124.9066	415
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4258	-124.8218	417
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2498	-124.9068	447
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2493	-124.9069	458
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2487	-124.9067	471
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2480	-124.9062	475
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2478	-124.9079	476
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2470	-124.9085	490
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4511	-124.9527	591
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4555	-124.9484	633
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.2853	-124.9731	958
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4844	-124.7904	114
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4842	-124.7903	114
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4809	-124.7871	115
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4806	-124.7902	116
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4915	-124.8036	116
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4914	-124.8033	116
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4803	-124.7901	117
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4804	-124.7900	117
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4792	-124.7898	117
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4984	-124.8195	126
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4982	-124.8192	126
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4980	-124.8192	126
1605RA	NOAA Ship Rainier	EM710	[1]	acoustic flare	47.4981	-124.8183	126

Data sources: 1] Merle et al. (2021) [2] Conrad and Rudebusch (2023); [3] (C.K. Paull, MBARI, written commun., 09/29/22). [4] https://nautiluslive.org/science/data-management; [5] Prouty (2023); [6] Torres et al. (200); [7] Baumberger et al. (2018). Complete data for Supplemental Table S1 available in the file 1205211_SupplementalTableS1.csv

Supplemental Table S2. Geologic-geomorphic attributes assigned to aggregate seep emission sites in southern Cascadia (region 4). Each emission site (n=277) was assigned at least one, and up to two, geologic-geomorphic features that were determined possibly to be involved in the formation of that emission site. Attribute categories are labeled 1 and 2 but do not indicate a ranking of the attribute's importance to the seep site. For simplicity, only two attributes were assigned although it is possible that a combination of more than two features could be involved in facilitating the formation of a seafloor seep. Blank fields in the seep attribute column are intentional and indicate that no additional attributes were assigned.

Seep Number	Longitude	Latitude	Geo. attribute 1	Geo. attribute 2	Depth (m)	Data Source(s)	Survey ID	Detection Type
1	-124.64945	40.39590	buried anticline	fault	1007	[1]	NA072	MBES
2	-124.78383	40.53821	failure scarp		1855	[1] [2]	NA072, NA095	MBES + ROV
3	-124.65958	40.39657	buried anticline	fault	1076	[1]	TN265	MBES
4	-124.68669	40.49471	canyon wall	anticline	1221	[1]	TN265	MBES
5	-124.67688	40.49539	canyon wall		1089	[1]	TN265	MBES
6	-124.76721	40.64079	canyon wall	fault	1941	[1]	NA072	MBES
7	-124.76277	40.64675	canyon wall	fault	1860	[1]	NA072	MBES
8	-124.63853	40.38832	buried anticline	fault	1010	[1]	TN265	MBES
9	-124.63537	40.40564	buried anticline	fault	857	[1]	NA078	MBES
10	-124.63053	40.39995	buried anticline	fault	853	[1]	NA078	MBES
11	-124.63202	40.81721	anticline	fault	554	[3]	W00475	MBES
12	-124.62471	40.82242	anticline	fault	581	[1]	NA080	MBES
13	-124.67127	41.02371	anticline	fault	719	[1] [3] [4]	NA095, W00475, MBARI-2020-WF	MBES + ROV
14	-124.62954	40.95574	anticline	fault	460	[1] [3]	NA080, W00475	MBES
15	-124.63254	40.96424	anticline	fault	488	[1] [3]	NA080, W00475	MBES
16	-124.63981	40.99008	anticline	fault	712	[3]	W00475	MBES
17	-124.64582	40.99936	anticline	fault	700	[3]	W00475	MBES
18	-124.80051	40.53765	failure scarp		2087	[1]	NA072, NA095	MBES
19	-124.78879	40.57886	landslide headscarp		1555	[1]	NA072	MBES
20	-124.76120	40.65219	canyon wall	fault	1784	[1]	NA072	MBES

21	-124.77063	40.66326	canyon wall		1615	[1]	NA072	MBES
22	-124.72852	40.66303	anticline	fault	664	[1]	TN265	MBES
23	-124.70787	40.65900	anticline	fault	800	[1]	TN265	MBES
24	-124.67392	40.62899	anticline		833	[1]	NA095	MBES
25	-124.77206	40.75058	anticline		1175	[1] [3]	NA072, W00475	MBES
26	-124.79120	40.76487	anticline	pockmark	1338	[3]	W00475	MBES
27	-124.68069	40.72914	anticline		790	[3]	W00475	MBES
28	-124.52131	40.38035	canyon wall		564	[1]	TN265	MBES
29	-124.49829	40.43628	anticline	bedding outcrop	54	[1]	TN265	MBES
30	-124.53024	40.47200	anticline	fault	65	[1]	TN265	MBES
31	-124.48383	40.59463	canyon head	anticline	170	[1] [3]	TN265, H13549S	MBES
32	-124.62552	40.79172	buried anticline	fault	610	[1]	NA080	MBES
33	-124.56798	40.77057	anticline	fault	587	[1]	NA078	MBES
34	-124.78529	40.89384	anticline	pockmark	1289	[3]	W00475	MBES
35	-124.78961	41.03985	anticline	fault	866	[3]	W00475	MBES
36	-124.77570	41.12795	fault		1232	[3]	W00475	MBES
37	-124.76721	41.12251	fault		1229	[3]	W00475	MBES
38	-124.74327	41.05434	anticline		817	[3]	W00475	MBES
39	-124.85968	41.14863	canyon wall		1633	[4]	MBARI-2020-WF	ROV
40	-124.82317	41.16488	anticline		1147	[3]	W00475	MBES
41	-124.81305	41.16105	anticline		1154	[3]	W00475	MBES
42	-124.76210	41.17437	canyon		1459	[4]	MBARI-2020-WF	ROV
43	-124.85102	41.24081	fault	buried anticline	1097	[1]	NA078	MBES
44	-124.79566	41.28110	anticline		1129	[3]	W00475	MBES
45	-124.62627	40.85232	buried anticline	fault	623	[1]	NA080	MBES
46	-124.65310	40.87582	anticline		646	[1]	NA095	MBES
47	-124.61966	40.94066	anticline	fault	529	[3]	W00475	MBES
48	-124.63325	40.97156	anticline	fault	603	[1]	NA080	MBES
49	-124.60710	40.93387	anticline		569	[3]	W00475	MBES
50	-124.56308	40.92938	anticline	fault	545	[1]	NA072, NA080	MBES

51	-124.54551	40.92787	buried anticline		531	[3]	W00475	MBES
52	-124.53658	40.97297	buried anticline	fault	511	[3]	W00475	MBES
53	-124.48234	40.94948	anticline	fault	380	[1]	TN265	MBES
54	-124.48990	40.95225	anticline	fault	402	[3]	W00475	MBES
55	-124.54851	41.05202	buried anticline		699	[3]	W00475	MBES
56	-124.51973	41.02974	buried anticline	channel	611	[1] [2]	NA072, NA095	MBES + ROV
57	-124.62447	41.15678	buried anticline	channel	1132	[1] [3]	NA080, H13117	MBES
58	-124.49444	41.42644	fault	shelfbreak	277	[3]	W00475	MBES
59	-124.36193	41.26160	buried channel	shelfbreak	145	[1]	TN265	MBES
60	-124.35293	41.25812	buried channel	shelfbreak	138	[1]	TN265	MBES
61	-124.39359	41.39757	fault		111	[1]	TN265	MBES
62	-124.39957	41.41483	fault		109	[1]	TN265	MBES
63	-124.96945	41.48949	fault		1191	[1]	NA078, NA088	MBES
64	-124.93011	41.46497	anticline	fault	723	[1]	NA078	MBES
65	-124.89423	41.42955	anticline	fault	771	[3]	H13549S	MBES
66	-124.89656	41.49601	anticline		838	[1]	NA078	MBES
67	-124.88263	41.46385	anticline		886	[1]	NA078	MBES
68	-124.87445	41.46504	buried anticline		886	[1]	NA078	MBES
69	-124.88600	41.49848	buried anticline		858	[1]	NA078	MBES
70	-124.99375	41.63871	anticline		961	[1]	NA078	MBES
71	-124.94407	41.59380	buried anticline		1007	[1]	TN265	MBES
72	-124.88381	41.67174	anticline		732	[1]	NA072	MBES
73	-124.84139	41.48361	anticline	fault	799	[1]	NA078	MBES
74	-124.79893	41.57140	buried anticline	pockmarks	863	[1]	NA078	MBES
75	-124.80421	41.58133	buried anticline	pockmarks	858	[1]	NA078	MBES
76	-124.82499	41.68753	buried anticline	fault	877	[1]	NA078	MBES
77	-124.81602	41.71664	buried anticline		858	[1]	NA078	MBES
78	-124.80121	41.77730	buried anticline		846	[1] [3]	NA095, H13206	MBES
79	-124.51451	41.48080	fault	shelfbreak	403	[3]	H13117	MBES

80	-124.50485	41.48888	fault	shelfbreak	271	[3]	W00475	MBES
81	-124.54287	41.54059	channel		466	[1]	NA078	MBES
82	-124.40440	41.43377	fault		109	[1]	TN265	MBES
83	-124.43049	41.52907	anticline	fault	118	[1]	TN265	MBES
84	-124.43468	41.53919	anticline	fault	120	[1]	TN265	MBES
85	-124.75435	40.66620	canyon	fault	1463	[1]	NA072, TN265	MBES
86	-124.94633	41.57709	canyon	landslide?	1119	[4]	MBARI-2020-WF	ROV
87	-124.98932	41.54486	canyon		1338	[4]	MBARI-2020-WF	ROV
88	-124.45663	41.69256	buried channel	shelfbreak	162	[3]	H13549S	MBES
89	-124.46883	41.69568	buried channel	shelfbreak	216	[3]	H13549N	MBES
90	-124.47771	41.74309	buried channel	shelfbreak	217	[3]	H13549N	MBES
91	-124.47485	41.52477	fault	shelfbreak	162	[3]	H13549N	MBES
92	-124.48629	41.52255	fault	shelfbreak	182	[1] [3]	TN265, H13549N	MBES
93	-124.49601	41.48896	fault	shelfbreak	237	[3]	H13549N	MBES
94	-124.47955	41.48356	fault	shelfbreak	176	[3]	H13549N	MBES
95	-124.46071	41.47518	fault	shelfbreak	152	[3]	H13549N	MBES
96	-124.48360	41.47107	fault	shelfbreak	189	[3]	H13549N	MBES
97	-124.47796	41.44853	fault	shelfbreak	199	[3]	H13549N	MBES
98	-124.45911	41.44528	fault	shelfbreak	156	[3]	H13549N	MBES
99	-124.46399	41.43734	fault	shelfbreak	165	[3]	H13549N	MBES
100	-124.48009	41.43459	fault	shelfbreak	197	[3]	H13549N	MBES
101	-124.46377	41.39906	fault	shelfbreak	172	[3]	H13549N	MBES
102	-124.77990	41.33061	anticline		1052	[3]	H13549N	MBES
103	-124.77756	41.30661	anticline		1059	[3]	H13549N	MBES
104	-124.98182	41.11409	canyon		2650	[4]	MBARI-2020-WF	ROV
105	-124.38260	41.23851	channel head	shelfbreak	188	[3]	H13549N	MBES
106	-124.37089	41.23239	channel head	shelfbreak	182	[3]	H13549N	MBES
107	-124.35718	41.19603	channel head	shelfbreak	178	[3]	H13549N	MBES
108	-124.35458	41.16975	channel head	shelfbreak	179	[3]	H13549N	MBES
109	-124.36683	41.15634	channel head	shelfbreak	214	[3]	H13549N	MBES

110	-124.60710	40.88770	anticline		596	[1]	NA080	MBES
111	-124.46687	40.61735	canyon		117	[3]	H13549S	MBES
112	-124.46692	40.64024	canyon		100	[3]	H13549S	MBES
113	-124.47597	40.65585	canyon		127	[3]	H13549S	MBES
114	-124.48321	40.66341	canyon		121	[3]	H13549S	MBES
115	-124.49182	40.59000	canyon		140	[3]	H13549S	MBES
116	-124.51512	40.57979	canyon		195	[3]	H13549S	MBES
117	-124.51812	40.60396	canyon		354	[3]	H13549S	MBES
118	-124.52906	40.60859	canyon		508	[3]	H13549S	MBES
119	-124.53100	40.61463	canyon		445	[3]	H13549S	MBES
120	-124.54725	40.61635	canyon		388	[3]	H13549S	MBES
121	-124.55429	40.63255	canyon		525	[3]	H13549S	MBES
122	-124.57395	40.62158	canyon		365	[3]	H13549S	MBES
123	-124.55451	40.64918	canyon		771	[1] [2]	NA072	MBES + ROV
124	-124.55694	40.66705	canyon		436	[3]	H13549S	MBES
125	-124.57210	40.66714	canyon		453	[3]	H13549S	MBES
126	-124.58388	40.61934	canyon		437	[3]	H13549S	MBES
127	-124.57837	40.60030	shelfbreak	canyon	162	[3]	H13549N	MBES
128	-124.59450	40.60852	shelfbreak	canyon	183	[3]	H13549S	MBES
129	-124.86083	41.93036	anticline		611	[3]	W00475	MBES
130	-124.82162	42.23474	anticline	fault	591	[3]	H13206	MBES
131	-124.81734	42.23925	anticline	fault	576	[3]	H13206	MBES
132	-124.83624	42.45475	anticline	bedding outcrop	510	[1] [3]	NA072, W00475	MBES
133	-124.77328	42.42994	canyon wall	landslide headscarp	375	[3]	W00475	MBES
134	-124.74926	42.42468	landslide headscarp	anticline	219	[3]	W00475	MBES
135	-124.77520	42.51283	canyon wall		526	[1]	NA078, NA080, TN265	MBES
136	-124.78515	42.51948	canyon wall		449	[1]	NA080	MBES

137	-124.56528	42.08830	shelfbreak		174	[1]	NA080	MBES
138	-124.56768	42.09427	shelfbreak		175	[3]	W00475	MBES
139	-124.92255	42.69716	bedding outcrop	channel	783	[1]	NA080	MBES
140	-124.92683	42.70154	bedding outcrop	channel	804	[1]	NA080	MBES
141	-124.91734	42.76890	failure scarp		663	[1]	NA080	MBES
142	-124.91555	42.78197	failure scarp		636	[1]	NA080	MBES
143	-124.94864	42.81509	failure scarp		643	[1]	NA080	MBES
144	-124.93620	42.80746	failure scarp		603	[1]	NA080	MBES
145	-124.90550	42.78869	failure scarp		497	[1]	NA072, NA078, NA080	MBES
146	-124.92859	42.81254	failure scarp		537	[1]	NA080	MBES
147	-124.89984	42.71335	anticline	fault?	611	[1]	NA072, NA078	MBES
148	-124.88473	42.73623	anticline	bedding outcrop	505	[1]	NA080	MBES
149	-124.90140	42.76765	failure scarp		540	[1]	NA078	MBES
150	-124.94737	42.96653	anticline		600	[1]	NA080	MBES
151	-124.93943	42.96389	anticline		545	[3]	W00475	MBES
152	-124.90339	43.03010	anticline	fault	541	[1]	NA072, NA080	MBES
153	-124.91358	43.04179	anticline	fault	637	[3]	H13206	MBES
154	-124.89221	43.03450	anticline		425	[1]	NA080	MBES
155	-124.89915	43.16315	fault		495	[1]	NA072, NA080, NA088	MBES
156	-124.76253	42.43261	canyon head	landslide headscarp	277	[3]	W00475	MBES
157	-124.93588	42.78253	failure scarp		757	[1] [2]	NA078, NA080, NA095	MBES + ROV
158	-124.92268	43.00201	anticline	failure scarp	491	[1] [5]	NA072, NA080, FK190612	MBES + ROV
159	-125.27877	42.19273	fault		3000	[4]	MBARI-2020-WF	ROV
160	-124.91897	41.85254	anticline		921	[1]	NA078	MBES
161	-125.03237	41.91172	anticline		919	[1]	NA088	MBES
162	-124.99989	41.95794	anticline	fault	802	[1]	NA072	MBES

163	-124.95042	41.87844	anticline		820	[1]	NA078	MBES
164	-124.96202	41.92954	anticline		803	[1]	NA072, NA078	MBES
165	-124.96436	41.94076	anticline		812	[1]	NA078	MBES
166	-124.81756	41.86142	anticline	fault	724	[3]	H13206	MBES
167	-124.78517	41.85988	anticline	fault	722	[3]	H13206	MBES
168	-124.83402	41.86799	anticline	fault	742	[3]	H13206	MBES
169	-124.83697	41.89330	anticline		547	[1] [3] [5] [2]	NA072, NA095, H13206	MBES + ROV
170	-124.80539	41.87910	anticline	fault	682	[3]	H13206	MBES
171	-124.50175	41.86057	buried channel	shelfbreak	315	[3]	W00475	MBES
172	-124.49602	41.87035	buried channel	shelfbreak	299	[3]	W00475	MBES
173	-124.49284	41.96081	channel		236	[3]	W00475	MBES
174	-124.51862	42.01529	fault	anticline	205	[3]	W00475	MBES
175	-124.95381	42.02604	anticline	fault	969	[1]	NA078	MBES
176	-124.92771	42.07063	anticline	fault	1053	[1]	NA078	MBES
177	-124.97000	42.20654	anticline		1058	[1]	NA072	MBES
178	-124.90423	42.20665	anticline		917	[1]	NA072	MBES
179	-124.80798	42.05107	anticline		684	[3]	H13206	MBES
180	-124.79201	42.04699	anticline		657	[3]	H13206	MBES
181	-124.83136	42.14438	buried anticline		729	[3]	H13206	MBES
182	-124.77396	42.03604	anticline		637	[1]	NA080	MBES
183	-124.80146	42.16994	failure scarp		689	[3]	H13206	MBES
184	-124.85326	42.29984	anticline		589	[3]	H13206	MBES
185	-124.90793	42.32986	anticline		1079	[1]	NA095	MBES
186	-124.91341	42.45180	canyon wall	failure scarp	1738	[1]	NA072	MBES
187	-125.06353	42.51954	buried anticline		1635	[1]	NA078	MBES
188	-125.00586	42.48908	canyon		1859	[4]	MBARI-2020-WF	ROV
189	-125.04424	42.58504	fault	anticline	1231	[1]	NA078	MBES
190	-124.91819	42.50356	canyon		1420	[4]	MBARI-2020-WF	ROV
191	-124.94088	42.58234	canyon		1392	[4]	MBARI-2020-WF	ROV

192	-124.92193	42.57722	buried anticline	fault	1170	[1]	NA080	MBES
193	-124.88547	42.44206	canyon wall	failure scarp	1311	[1]	NA072, NA080	MBES
194	-124.88417	42.45343	canyon wall	landslide headscarp	1172	[1]	NA080	MBES
195	-124.81708	42.43911	landslide headscarp	bedding outcrop	536	[1] [3]	NA078, W00475	MBES
196	-124.75752	42.32531	buried anticline		572	[3]	W00475	MBES
197	-124.70389	42.36627	shelfbreak	anticline	223	[3]	W00475	MBES
198	-124.71785	42.37242	shelfbreak	anticline	247	[3]	W00475	MBES
199	-124.85197	42.46357	anticline	bedding outcrop	512	[1]	NA078	MBES
200	-124.86260	42.47733	anticline	bedding outcrop	592	[1]	NA080	MBES
201	-124.79803	42.46563	bedding outcrop		360	[3]	W00475	MBES
202	-124.78209	42.47126	bedding outcrop		178	[3]	W00475	MBES
203	-124.71518	42.49970	bedding outcrop	canyon	143	[1]	NA080	MBES
204	-124.71629	42.55067	buried anticline	shelfbreak	215	[1]	TN265	MBES
205	-124.70523	42.55592	buried fault	shelfbreak	189	[1]	NA080	MBES
206	-124.53823	42.03619	fault	anticline	187	[3]	W00475	MBES
207	-124.57649	42.06175	fault	anticline	185	[3]	W00475	MBES
208	-124.56388	42.07984	fault	anticline	175	[3]	W00475	MBES
209	-124.60722	42.28924	shelfbreak		190	[3]	W00475	MBES
210	-124.67650	42.34426	shelfbreak	anticline	212	[3]	W00475	MBES
211	-124.69955	42.56326	buried fault	shelfbreak	174	[3]	W00475	MBES
212	-124.66982	42.57182	buried fault	shelfbreak	136	[1]	NA080	MBES
213	-125.20003	42.98809	anticline		1947	[1]	NA080	MBES
214	-125.13180	43.15389	anticline	bedding outcrop	1565	[1]	NA080	MBES
215	-125.05586	42.61136	fault		1368	[1]	NA078	MBES
216	-124.99031	42.62197	channel	anticline	1122	[1]	NA088	MBES
217	-124.92925	42.64796	buried anticline		925	[1]	NA080	MBES
218	-124.96021	42.70181	fault		1080	[1]	NA078	MBES
219	-124.92881	42.68367	anticline		842	[1]	NA080	MBES
220	-124.94071	42.68646	fault	anticline	988	[1]	NA080	MBES

221	-124.94476	42.71332	channel wall	anticline	913	[1]	NA078, NA080	MBES
222	-124.90506	42.69770	failure scarp		665	[1]	NA072	MBES
223	-124.95257	42.73979	landslide headscarp	bedding outcrop	987	[1]	NA078	MBES
224	-124.92276	42.74822	failure scarp		734	[1]	NA095	MBES
225	-124.91508	42.73727	failure scarp	anticline	601	[1]	NA072, NA095	MBES
226	-124.90824	42.74741	failure scarp	anticline	583	[1]	NA072, NA095	MBES
227	-125.06175	42.79256	anticline		1458	[1] [2]	NA080, NA095	MBES + ROV
228	-124.96371	42.76143	anticline		1061	[1]	NA078	MBES
229	-124.91159	42.77600	failure scarp	anticline	618	[1]	NA072	MBES
230	-124.94721	42.82453	failure scarp		627	[1]	NA080	MBES
231	-124.87662	42.66462	fault	anticline	659	[3]	H13206	MBES
232	-124.88424	42.69180	anticline	bedding outcrop	606	[1]	NA080	MBES
233	-124.88380	42.74993	fault		461	[1]	NA080	MBES
234	-124.81371	42.70653	canyon wall	anticline	524	[1]	NA078	MBES
235	-124.89605	42.75301	failure scarp	anticline	512	[1]	NA078	MBES
236	-124.71907	42.81145	canyon head		144	[1]	TN265, NA095	MBES
237	-124.95368	42.93469	fault	failure scarp	670	[1]	NA080	MBES
238	-124.97333	43.03296	failure scarp		992	[1]	NA080	MBES
239	-124.94525	42.97356	anticline		596	[5]	RL-19-05	ROV
240	-124.93519	42.97428	anticline		508	[1]	Na072, NA080	MBES
241	-124.95671	43.01811	failure scarp		984	[1]	NA080	MBES
242	-124.95186	43.02468	failure scarp		885	[1]	NA080, AT26-01, AT26-16	MBES
243	-124.96256	43.03309	failure scarp		962	[1]	NA080	MBES
244	-124.94996	43.03612	failure scarp		881	[1]	NA088	MBES
245	-125.08599	43.07190	bedding outcrop	fault	1573	[1]	NA080	MBES
246	-125.02738	43.05936	failure scarp	anticline	1165	[1]	NA080	MBES
247	-124.99093	43.05342	unknown		1011	[1]	NA080	MBES
248	-124.97964	43.06091	unknown		1023	[1]	NA080	MBES

249	-124.98920	43.06374	unknown		1019	[1] [5] [6]	NA080, FK190612	MBES + ROV
250	-124.92628	43.10506	fault	failure scarp	677	[1]	AT26-01	MBES
251	-124.99830	43.15309	fault	bedding outcrop	998	[1]	NA080	MBES
252	-124.98624	43.12740	fault	bedding outcrop	1002	[1]	NA080	MBES
253	-124.98987	43.13669	fault	bedding outcrop	989	[1]	NA080	MBES
254	-124.84123	42.95094	anticline		134	[1]	NA095	MBES
255	-124.88110	43.04394	failure scarp		323	[1]	NA080	MBES
256	-124.83227	42.98044	anticline		125	[1]	NA095	MBES
257	-124.91153	43.10857	fault	failure scarp	579	[1]	NA080, NA088	MBES
258	-124.91794	43.17696	fault		629	[1]	AT26-16	MBES
259	-124.80334	43.17171	anticline		314	[1]	EX1503L2	MBES
260	-124.80834	42.06519	anticline		659	[1]	NA072, NA080	MBES
261	-125.14259	42.39662	fault		3074	[4]	MBARI-2020-WF	ROV
262	-125.01770	42.04266	anticline	fault	1135	[2]	NA072	ROV
263	-124.87960	42.94550	anticline		201	[5]	SH-18-12	ROV
264	-125.18821	43.32460	failure scarp	fault	1775	[1] [2]	NA080, NA128	MBES + ROV
265	-125.15081	43.35692	anticline		1547	[4]	MBARI-2020-WF	ROV
266	-125.04058	43.30437	fault		1003	[1]	NA080	MBES
267	-124.93169	43.30054	anticline		648	[1]	NA080	MBES
268	-125.00591	43.35369	anticline	fault	775	[1]	NA080	MBES
269	-125.01103	43.38740	anticline	fault	766	[1]	NA080	MBES
270	-124.84250	43.24279	anticline	shelfbreak	351	[1]	NA080	MBES
271	-124.89432	43.28347	anticline	bedding outcrop	502	[1]	NA072, AT26-16	MBES
272	-124.69314	43.35729	bedding outcrop	shelfbreak	359	[1]	TN265	MBES
273	-125.37170	43.29561	fault		3056	[4]	MBARI-2020-WF	ROV
274	-124.84247	43.42308	anticline		523	[3]	W00474	MBES
275	-125.06525	43.54503	mud volcano		1060	[3]	H13118	MBES
276	-125.01398	43.52702	fault	pockmarks associated	1123	[3]	H13118	MBES

277	-124.65322	43.55616	unknown	371	[1]	TN265	MBES

Data sources:[1] Merle et al. (2021) [2] https://nautiluslive.org/science/data-management; [3] Conrad and Rudebusch (2023); [4] Paul, C. person comm.; [5] Prouty (2023); [6] Baumberger et al. (2018)

Supplemental Table S3. Geochemical analysis of authigenic carbonates from the Cascadia Subduction Zone. Powdered carbonate samples for stable carbon ($\delta^{13}C$) and oxygen ($\delta^{18}O$) isotopic analysis in per mil (‰) major carbonate phase. Designation of n.a. indicates no analysis was performed.

Sample ID	Latitude	Longitude	Depth (m)	Date of Collection	$\delta^{13}C$ (‰)	$\delta^{18}O$ (‰)	Carbonate phase	Reference
FK190612-S0260-93/94	46.9594	-125.1496	1005	6/16/19	-34.49	3.88	Mg-calcite	[1]
FK190612-S0260-93/94	46.9594	-125.1496	1005	6/16/19	-32.6	4.11	n.a.	[1]
NA095-70-C-PMEL	43.6769	-124.704	454	6/23/18	-15.86	4.74	n.a.	[1]
NA095-70-C-PMEL	43.6769	-124.704	454	6/23/18	-19.75	5.63	n.a.	[1]
NA095-10-C-PMEL	41.8977	-124.8434	558	6/19/18	-27.17	4.88	aragonite	[1]
NA095-10-C-PMEL	41.8977	-124.8434	558	6/19/18	-29.03	4.06	n.a.	[1]
NA095-10-C-PMEL	41.8977	-124.8434	558	6/19/18	-28.86	4.63	n.a.	[1]
NA095-10-C-PMEL	41.8977	-124.8434	558	6/19/18	-31.93	4.54	aragonite	[1]
NA095-10-C-PMEL	41.8977	-124.8434	558	6/19/18	-29.76	4.67	n.a.	[1]
NA095-10-C-PMEL	41.8977	-124.8434	558	6/19/18	-27.02	3.71	n.a.	[1]
NA095-10-C-PMEL	41.8977	-124.8434	558	6/19/18	-27.09	3.94	n.a.	[1]
NA095-71-C-PMEL	43.6768	-124.7038	452	6/23/18	-18.11	5.07	Mg-calcite	[1]
NA095-71-C-PMEL	43.6768	-124.7038	452	6/23/18	-17.24	4.3	n.a.	[1]
NA095-71-C-PMEL	43.6768	-124.7038	452	6/23/18	-18.66	3.72	n.a.	[1]
R609-3	44.1924	-124.97	275	8/7/01	-21.75	4.06	n.a.	[1]
R609-3	44.1924	-124.97	275	8/7/01	-28.08	4.06	n.a.	[1]
NA095-78-C-PMEL	43.682	-124.6974	421	6/23/18	2.68	9.15	n.a.	[1]
NA095-78-C-PMEL	43.682	-124.6974	421	6/23/18	3	8.85	n.a.	[1]
NA095-78-C-PMEL	43.682	-124.6974	421	6/23/18	-6.69	7.25	n.a.	[1]
NA095-78-C-PMEL	43.682	-124.6974	421	6/23/18	-6.13	7.69	n.a.	[1]
NA095-78-C-PMEL	43.682	-124.6974	421	6/23/18	-9.95	6.15	n.a.	[1]
NA095-78-C-PMEL	43.682	-124.6974	421	6/23/18	-10.4	6.23	n.a.	[1]
NA095-78-C-PMEL	43.682	-124.6974	421	6/23/18	-3.29	8.26	n.a.	[1]

NA095-78-C-PMEL	43.682	-124.6974	421	6/23/18	-3.71	8.21	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	8.6	7.57	dolomite	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	7.93	7.51	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	8.59	7.67	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	8.47	7.4	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	8.13	7.29	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	8.61	7.44	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	8.69	7.65	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	7.93	7.16	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	8.21	7.35	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	8.82	7.44	n.a.	[1]
RL-19-05-035	40.8877	-124.6071	608	10/15/19	8.86	7.65	n.a.	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	9.97	1.76	calcite	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	10.03	1.73	n.a.	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	4.89	-1.83	calcite	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	4.89	-1.72	n.a.	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	4.31	-1.71	n.a.	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	4.05	-1.65	n.a.	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	3.72	-1.85	n.a.	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	3.68	-1.69	n.a.	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	4.08	-1.64	n.a.	[1]
RL-19-05-034	43.6826	-124.6986	426	10/13/19	4.03	-1.67	n.a.	[1]
NA095-97-C-PMEL	44.2496	-124.9576	490	6/24/18	-12.2	3.23	n.a.	[1]
NA095-97-C-PMEL	44.2496	-124.9576	490	6/24/18	-11.56	3.07	aragonite	[1]
NA095-97-C-PMEL	44.2496	-124.9576	490	6/24/18	-20.95	3.5	n.a.	[1]
NA095-97-C-PMEL	44.2496	-124.9576	490	6/24/18	-20.93	3.41	n.a.	[1]
NA095-97-C-PMEL	44.2496	-124.9576	490	6/24/18	-19.09	2.93	aragonite	[1]
FK190612-S0260-105	46.9603	-125.1502	1004	6/17/19	-35.65	1.96	n.a.	[1]
FK190612-S0260-105	46.9603	-125.1502	1004	6/17/19	-32.25	3.37	n.a.	[1]

FK190612-S0260-105	46.9603	-125.1502	1004	6/17/19	-35.53	3.94	Mg-calcite	[1]
FK190612-S0260-105	46.9603	-125.1502	1004	6/17/19	-34.34	3.94	Mg-calcite	[1]
FK190612-S0260-105	46.9603	-125.1502	1004	6/17/19	-34.07	4.6	n.a.	[1]
RL-19-05-021	43.6098	-124.8148	632	10/12/19	-35.06	6.09	dolomite	[1]
RL-19-05-021	43.6098	-124.8148	632	10/12/19	-33.34	5.43	n.a.	[1]
RL-19-05-021	43.6098	-124.8148	632	10/12/19	-32.13	4.87	dolomite, calcite	[1]
RL-19-05-021	43.6098	-124.8148	632	10/12/19	-35.83	6.15	n.a.	[1]
NA095-77-C-PMEL	43.6803	-124.7003	452	6/23/18	-17.32	4.56	n.a.	[1]
NA095-77-C-PMEL	43.6803	-124.7003	452	6/23/18	-17.21	4.28	n.a.	[1]
NA095-77-C-PMEL	43.6803	-124.7003	452	6/23/18	-18.47	5.28	Mg-calcite	[1]
NA095-77-C-PMEL	43.6803	-124.7003	452	6/23/18	-16.42	4.67	n.a.	[1]
NA095-77-C-PMEL	43.6803	-124.7003	452	6/23/18	-18.6	5.03	n.a.	[1]
NA095-77-C-PMEL	43.6803	-124.7003	452	6/23/18	-18.33	4.83	n.a.	[1]
NA095-106-C-PMEL	44.0169	-124.8829	102	6/25/18	-7.96	2.42	n.a.	[1]
NA095-106-C-PMEL	44.0169	-124.8829	102	6/25/18	-14.9	2.53	Mg-calcite	[1]
NA095-106-C-PMEL	44.0169	-124.8829	102	6/25/18	-13.02	2.34	n.a.	[1]
NA095-106-C-PMEL	44.0169	-124.8829	102	6/25/18	-13.14	2.1	n.a.	[1]
NA095-106-C-PMEL	44.0169	-124.8829	102	6/25/18	-13.95	2.6	aragonite	[1]
NA095-106-C-PMEL	44.0169	-124.8829	102	6/25/18	-10.38	2.82	n.a.	[1]
NA095-106-C-PMEL	44.0169	-124.8829	102	6/25/18	-4.43	2.34	n.a.	[1]
R536-5	44.2791	-124.9024	221	6/25/00	-35.81	2.49	aragonite	[1]
R536-5	44.2791	-124.9024	221	6/25/00	-36.28	2.27	n.a.	[1]
R536-5	44.2791	-124.9024	221	6/25/00	-36.91	2.08	n.a.	[1]
R536-5	44.2791	-124.9024	221	6/25/00	-38.59	1.21	aragonite	[1]
R536-5	44.2791	-124.9024	221	6/25/00	-33.09	2.21	n.a.	[1]
R609-3	44.1924	-124.97	275	8/7/01	-0.04	5.27	n.a.	[1]
R609-3	44.1924	-124.97	275	8/7/01	7.4	5.29	dolomite	[1]
R609-3	44.1924	-124.97	275	8/7/01	-2.9	4.91	n.a.	[1]
R609-3	44.1924	-124.97	275	8/7/01	-6.18	0.1	n.a.	[1]
R609-6	44.1921	-124.9708	275	8/7/01	-30.23	3.39	aragonite	[1]

R609-6	44.1921	-124.9708	275	8/7/01	-31.96	1.81	n.a.	[1]
R609-6	44.1921	-124.9708	275	8/7/01	-26.4	3.58	n.a.	[1]
R609-6	44.1921	-124.9708	275	8/7/01	-1.58	2.65	n.a.	[1]
NA095-136-C-PMEL	45.9421	-125.1756	1354	6/27/18	-43.61	3.18	aragonite	[1]
NA095-136-C-PMEL	45.9421	-125.1756	1354	6/27/18	-45.88	3.19	calcite, aragonite	[1]
NA095-136-C-PMEL	45.9421	-125.1756	1354	6/27/18	-42.86	2.61	n.a.	[1]
NA095-136-C-PMEL	45.9421	-125.1756	1354	6/27/18	-47.6	3.56	n.a.	[1]
NA095-136-C-PMEL	45.9421	-125.1756	1354	6/27/18	-12.77	2.91	n.a.	[1]
RL-19-05-033	43.6807	-124.7007	459	10/13/19	-17.72	5.41	Mg-calcite	[1]
RL-19-05-033	43.6807	-124.7007	459	10/13/19	-17.58	4.91	n.a.	[1]
RL-19-05-033	43.6807	-124.7007	459	10/13/19	-12.64	4.7	n.a.	[1]
RL-19-05-033	43.6807	-124.7007	459	10/13/19	-16.79	4.67	n.a.	[1]
RL-19-05-033	43.6807	-124.7007	459	10/13/19	-16.81	4.15	n.a.	[1]
RL-19-05-033	43.6807	-124.7007	459	10/13/19	-14.55	4.82	n.a.	[1]
RL-19-05-033	43.6807	-124.7007	459	10/13/19	-14.54	5.04	aragonite, Mg-calcite	[1]
RL-19-05-033	43.6807	-124.7007	459	10/13/19	-15.96	4.99	n.a.	[1]
R536-15	44.2888	-124.8972	240	6/25/00	-26.08	2.62	aragonite	[1]
R536-15	44.2888	-124.8972	240	6/25/00	-20.7	3.18	n.a.	[1]
R536-15	44.2888	-124.8972	240	6/25/00	-23.75	2.53	aragonite	[1]
R536-15	44.2888	-124.8972	240	6/25/00	-17.34	3.35	n.a.	[1]
NA095-135-C-PMEL	45.9439	-125.1774	1343	6/27/18	-45.09	3.02	aragonite	[1]
NA095-135-C-PMEL	45.9439	-125.1774	1343	6/27/18	-50.92	3.37	n.a.	[1]
NA095-135-C-PMEL	45.9439	-125.1774	1343	6/27/18	-51.95	3.07	aragonite	[1]
NA095-135-C-PMEL	45.9439	-125.1774	1343	6/27/18	-55.99	3.85	n.a.	[1]
NA095-135-C-PMEL	45.9439	-125.1774	1343	6/27/18	-52.42	2.98	n.a.	[1]
NA095-98-C-PMEL	44.2496	-124.9576	490	6/24/18	-22.16	3.54	n.a.	[1]
NA095-98-C-PMEL	44.2496	-124.9576	490	6/24/18	-3.68	2.77	n.a.	[1]
NA095-98-C-PMEL	44.2496	-124.9576	490	6/24/18	-29.01	3.09	n.a.	[1]
NA095-98-C-PMEL	44.2496	-124.9576	490	6/24/18	-28.14	3.96	aragonite	[1]

NA095-98-C-PMEL	44.2496	-124.9576	490	6/24/18	-27.52	3.54	n.a.	[1]
NA095-98-C-PMEL	44.2496	-124.9576	490	6/24/18	-23.49	3.48	n.a.	[1]
NA095-98-C-PMEL	44.2496	-124.9576	490	6/24/18	-28.09	3.09	n.a.	[1]
FK190612-S0270-289/290	43.0639	-124.9892	1013	6/25/19	-35.17	3.3	aragonite	[1]
FK190612-S0270-289/290	43.0639	-124.9892	1013	6/25/19	-34.47	3.5	aragonite	[1]
FK190612-S0270-289/290	43.0639	-124.9892	1013	6/25/19	-32.73	3.21	n.a.	[1]
FK190612-S0270-289/290	43.0639	-124.9892	1013	6/25/19	-35.89	3.35	n.a.	[1]
FK190612-S0260-92	46.9602	-125.1497	1007	6/16/19	-25.17	3.41	n.a.	[1]
FK190612-S0260-92	46.9602	-125.1497	1007	6/16/19	-28.07	3.46	n.a.	[1]
RL-19-05-023(1)	43.6097	-124.8198	576	10/12/19	-20.7	6.24	dolomite	[1]
RL-19-05-023(1)	43.6097	-124.8198	576	10/12/19	-21.77	5.84	n.a.	[1]
RL-19-05-023(1)	43.6097	-124.8198	576	10/12/19	-21.48	5.13	dolomite	[1]
RL-19-05-023(1)	43.6097	-124.8198	576	10/12/19	-21.33	5.34	n.a.	[1]
NA095-139-C-PMEL	45.9418	-125.175	1353	6/27/18	-47.6	3.21	aragonite	[1]
NA095-139-C-PMEL	45.9418	-125.175	1353	6/27/18	-44.71	3.35	calcite, aragonite	[1]
NA095-139-C-PMEL	45.9418	-125.175	1353	6/27/18	-48.36	3.54	aragonite	[1]
NA095-139-C-PMEL	45.9418	-125.175	1353	6/27/18	-2.1	3.7	n.a.	[1]
NA095-139-C-PMEL	45.9418	-125.175	1353	6/27/18	-47.49	3.23	aragonite	[1]
RL-19-05-023(2)	43.6097	-124.8198	576	10/12/19	-25.99	6.67	dolomite	[1]
RL-19-05-023(2)	43.6097	-124.8198	576	10/12/19	-26.48	6.04	n.a.	[1]
RL-19-05-023(2)	43.6097	-124.8198	576	10/12/19	-27.26	5.14	dolomite, Mg-calcite	[1]
RL-19-05-031	43.6767	-124.7012	469	10/13/19	-24.54	5.51	n.a.	[1]
RL-19-05-031	43.6767	-124.7012	469	10/13/19	-24.37	5.65	n.a.	[1]
RL-19-05-031	43.6767	-124.7012	469	10/13/19	-24.26	6.47	n.a.	[1]
R614-1	43.877	-124.9194	493	10/7/01	-31.29	5.68	n.a.	[1]
R614-1	43.877	-124.9194	493	10/7/01	-30.34	5.67	n.a.	[1]
R614-1	43.877	-124.9194	493	10/7/01	-31.87	4.92	n.a.	[1]
R614-1	43.877	-124.9194	493	10/7/01	-31.31	5.39	dolomite	[1]
R614-1	43.877	-124.9194	493	10/7/01	-30.49	5.27	n.a.	[1]
R614-1	43.877	-124.9194	493	10/7/01	-30.45	5.36	n.a.	[1]

FK190612-S0260-88	46.9602	-125.1499	996	6/16/19	-34.17	3.71	n.a.	[1]
FK190612-S0260-88	46.9602	-125.1499	996	6/16/19	-35.02	3.44	aragonite	[1]
FK190612-S0260-88	46.9602	-125.1499	996	6/16/19	-33.29	3.68	n.a.	[1]
FK190612-S0260-88	46.9602	-125.1499	996	6/16/19	-33.49	3.87	n.a.	[1]
NA095-162-C-PMEL	45.8697	-124.6372	177	6/28/18	-22.92	3.55	n.a.	[1]
NA095-162-C-PMEL	45.8697	-124.6372	177	6/28/18	-20.29	3.03	n.a.	[1]
NA095-162-C-PMEL	45.8697	-124.6372	177	6/28/18	-24.57	2.02	n.a.	[1]
NA095-162-C-PMEL	45.8697	-124.6372	177	6/28/18	-20.72	3.14	calcite	[1]
NA095-162-C-PMEL	45.8697	-124.6372	177	6/28/18	-25.75	3.69	n.a.	[1]
NA095-162-C-PMEL	45.8697	-124.6372	177	6/28/18	-24.49	2.46	n.a.	[1]
NA095-162-C-PMEL	45.8697	-124.6372	177	6/28/18	-25.64	3.22	calcite	[1]
FK190612-S0260-89	46.9602	-125.1499	997	6/16/19	-23.31	4.63	n.a.	[1]
FK190612-S0260-89	46.9602	-125.1499	997	6/16/19	-22.64	4.9	n.a.	[1]
FK190612-S0260-89	46.9602	-125.1499	997	6/16/19	-24.23	4.96	n.a.	[1]
FK190612-S0260-89	46.9602	-125.1499	997	6/16/19	-25.5	3.93	aragonite	[1]
R616-7	44.0078	-124.9365	223	11/7/01	-29.55	3.29	aragonite	[1]
R616-7	44.0078	-124.9365	223	11/7/01	-21.65	2.94	aragonite	[1]
R616-7	44.0078	-124.9365	223	11/7/01	-15.76	3.17	n.a.	[1]
R616-7	44.0078	-124.9365	223	11/7/01	-27.46	2.75	n.a.	[1]
R616-7	44.0078	-124.9365	223	11/7/01	-26.03	2.67	n.a.	[1]
R616-7	44.0078	-124.9365	223	11/7/01	-21.69	2.46	n.a.	[1]
R539-2	44.1128	-124.9432	219	6/26/00	-14.25	2.25	n.a.	[1]
R539-2	44.1128	-124.9432	219	6/26/00	-15.62	1.71	n.a.	[1]
R539-2	44.1128	-124.9432	219	6/26/00	-16.95	2.29	aragonite	[1]
R539-2	44.1128	-124.9432	219	6/26/00	-17.18	2.39	n.a.	[1]
FK190612-S0260-89	46.9602	-125.1499	997	6/16/19	-27.33	4.6	aragonite	[1]
FK190612-S0260-89	46.9602	-125.1499	997	6/16/19	-19.44	4.48	n.a.	[1]
FK190612-S0260-89	46.9602	-125.1499	997	6/16/19	-24.31	4.85	aragonite	[1]
FK190612-S0260-89	46.9602	-125.1499	997	6/16/19	-22.18	4.84	n.a.	[1]

FK190612-S0260-89	46.9602	-125.1499	997	6/16/19	-24.3	4.72	n.a.	[1]
FK190612-S0262-108/109	46.2224	-124.6564	494	6/17/19	-25.41	2.55	Mg-calcite	[1]
FK190612-S0262-108/109	46.2224	-124.6564	494	6/17/19	-28.36	3.15	aragonite	[1]
FK190612-S0262-115	46.2231	-124.6564	479	6/17/19	-23.72	3.18	aragonite	[1]
FK190612-S0262-115	46.2231	-124.6564	479	6/17/19	-31.42	2.59	aragonite	[1]
FK190612-S0265-179	45.9422	-125.1756	1350	6/20/19	-49.58	3.99	aragonite	[1]
FK190612-S0265-179	45.9422	-125.1756	1350	6/20/19	-50.07	3.79	n.a.	[1]
FK190612-S0265-167	45.9429	-125.1778	1352	6/20/19	-54.03	3.97	aragonite	[1]
FK190612-S0269-264	43.0157	-124.9117	494	6/24/19	-24.11	2.66	aragonite	[1]
FK190612-S0269-264	43.0157	-124.9117	494	6/24/19	-17.76	3.48	Mg-calcite	[1]
FK190612-S0269-264	43.0157	-124.9117	494	6/24/19	-24.25	2.6	n.a.	[1]
FK190612-S0268-230/231	44.2491	-124.9577	489	6/23/19	-31.13	4.09	Mg-calcite	[1]
FK190612-S0275-336	45.944	-125.1771	1347	6/29/19	-55.34	3.9	aragonite	[1]
FK190612-S0275-336	45.944	-125.1771	1347	6/29/19	-56.73	3.58	n.a.	[1]
FK190612-S0275-336	45.944	-125.1771	1347	6/29/19	-48.63	3.48	aragonite	[1]
FK190612-S0274-327	45.8832	-124.6453	191	6/28/19	-27.14	3.43	Mg-calcite	[1]
FK190612-S0268-224/225	44.2483	-124.9577	494	6/23/19	-27.88	3.16	aragonite	[1]
FK190612-S0268-224/225	44.2483	-124.9577	494	6/23/19	-28.37	3.99	n.a.	[1]
FK190612-S0268-224/225	44.2483	-124.9577	494	6/23/19	-30.55	2.84	aragonite	[1]
FK190612-S0277-374	45.849	-124.8951	824	6/30/19	-49.78	4.08	aragonite	[1]
FK190612-S0277-374	45.849	-124.8951	824	6/30/19	-49.15	4.02	n.a.	[1]
FK190612-S0277-374	45.849	-124.8951	824	6/30/19	-49.35	4.41	Mg-calcite	[1]
FK190612-S0259-74	46.8614	-124.9819	486	6/15/19	-38.76	3.66	n.a.	[1]
FK190612-S0259-74	46.8614	-124.9819	486	6/15/19	-40.4	3.9	n.a.	[1]
FK190612-S0260-82	46.9595	-125.1498	1004	6/16/19	-28.17	3.87	n.a.	[1]
FK190612-S0260-82	46.9595	-125.1498	1004	6/16/19	-29.68	3.82	n.a.	[1]
FK190612-S0262-119	46.2249	-124.6555	500	6/18/19	-29.27	3.53	n.a.	[1]
FK190612-S0262-119	46.2249	-124.6555	500	6/18/19	-29.19	3.58	n.a.	[1]
FK190612-S0265-177	45.9432	-125.1779	1350	6/20/19	-53.57	3.94	n.a.	[1]
FK190612-S0265-177	45.9432	-125.1779	1350	6/20/19	-53.18	3.77	n.a.	[1]

FK190612-S0275-337	45.9436	-125.1753	822	6/29/19	-55.02	4.75	n.a.	[1]
FK190612-S0275-337	45.9436	-125.1753	822	6/29/19	-55.02	4.83	n.a.	[1]
FK190612-S0275-337	45.9436	-125.1753	822	6/29/19	-55.51	4.99	n.a.	[1]
FK190612-S0262-119	46.2249	-124.6555	500	6/18/19	-29.53	3.68	n.a.	[1]
FK190612-S0262-119	46.2249	-124.6555	500	6/18/19	-29.19	3.5	n.a.	[1]
FK190612-S0265-177	45.9432	-125.1779	1350	6/20/19	-54.19	3.9	n.a.	[1]
FK190612-S0265-177	45.9432	-125.1779	1350	6/20/19	-54.26	3.91	n.a.	[1]
FK190612-S0265-177	45.9432	-125.1779	1350	6/20/19	-54.39	3.88	n.a.	[1]
FK190612-S0267-189/190/209/219	43.9106	-125.0755	1223	6/22/19	-40.69	3.81	n.a.	[1]
FK190612-S0267-189/190/209/219	43.9106	-125.0755	1223	6/22/19	-40.54	3.76	n.a.	[1]
FK190612-S0274-325	45.8831	-124.6461	194	6/28/19	-29.44	3.41	aragonite, Mg-calcite	[1]
FK190612-S0274-325	45.8831	-124.6461	194	6/28/19	-28.13	3.5	n.a.	[1]
FK190612-S0269-249	43.0135	-124.9172	502	6/24/19	-15.87	2.8	aragonite	[1]
FK190612-S0262-110/111	46.2232	-124.6536	500	6/17/19	-30.01	3.77	n.a.	[1]
FK190612-S0262-114	46.2231	-124.6565	488	6/17/19	-29.02	4.28	n.a.	[1]
FK190612-S0269-275/276	43.012	-124.9185	498	6/25/19	-23.72	5.14	Mg-calcite, albite	[1]
FK190612-S0269-275/276	43.012	-124.9185	498	6/25/19	-28.52	4.16	n.a.	[1]
FK190612-S0268-221	44.2496	-124.9574	489	6/23/19	-21.64	3.23	aragonite	[1]
FK190612-S0268-221	44.2496	-124.9574	489	6/23/19	-20.51	3.26	n.a.	[1]
FK190612-S0268-221	44.2496	-124.9574	489	6/23/19	-21.81	2.81	n.a.	[1]
FK190612-S0260-94	46.9594	-125.1496	1005	6/16/19	-40.38	4.46	Mg-calcite	[1]
FK190612-S0270-297/298/299	43.0642	-124.9892	1015	6/25/19	-39.44	3.69	n.a.	[1]
FK190612-S0270-297/298/299	43.0642	-124.9892	1015	6/25/19	-39.87	3.84	aragonite	[1]
FK190612-S0277-376/377	45.8487	-124.8947	823	6/30/19	-49.57	3.45	n.a.	[1]
FK190612-S0277-376/377	45.8487	-124.8947	823	6/30/19	-49.49	3.47	aragonite	[1]
FK190612-S0270-285/286/287	43.0637	-124.9888	1013	6/25/19	-38.62	3.59	aragonite	[1]
FK190612-S0270-285/286/287	43.0637	-124.9888	1013	6/25/19	-37.03	3.64	n.a.	[1]
FK190612-S0270-285/286/287	43.0637	-124.9888	1013	6/25/19	-36.81	3.64	n.a.	[1]

FK190612-S0270-285/286/287	43.0637	-124.9888	1013	6/25/19	-36.52	3.5	aragonite	[1]
FK190612-S0278-416	46.959	-125.1493	1004	7/1/19	-33.29	3.84	aragonite, Mg-calcite	[1]
FK190612-S0278-416	46.959	-125.1493	1004	7/1/19	-33.72	3.77	n.a.	[1]
FK190612-S0278-402	46.9597	-125.1491	1004	7/1/19	-31.74	3.79	n.a.	[1]
FK190612-S0278-402	46.9597	-125.1491	1004	7/1/19	-32.97	3.54	n.a.	[1]
FK190612-S0278-402	46.9597	-125.1491	1004	7/1/19	-11.06	3.55	calcite	[1]
FK190612-S0278-402	46.9597	-125.1491	1004	7/1/19	-36.73	3.83	aragonite	[1]
FK190612-S0278-402	46.9597	-125.1491	1004	7/1/19	-23.84	4.36	aragonite, Mg-calcite	[1]
FK190612-S0277-364	45.8484	-124.8955	824	6/30/19	-52.62	3.79	aragonite	[1]
FK190612-S0277-364	45.8484	-124.8955	824	6/30/19	-36.71	3.65	aragonite	[1]
FK190612-S0270-289/290	43.0639	-124.9892	1013	6/25/19	-34.71	3.52	aragonite	[1]
FK190612-S0270-289/290	43.0639	-124.9892	1013	6/25/19	-31.32	3.61	n.a.	[1]
FK190612-S0270-289/290	43.0639	-124.9892	1013	6/25/19	-28.58	3.91	aragonite	[1]
FK190612-S0270-289/290	43.0639	-124.9892	1013	6/25/19	-33.41	3.38	n.a.	[1]
FK190612-S0278-401	46.9595	-125.1496	1005	7/1/19	-28.06	4.47	aragonite	[1]
FK190612-S0278-401	46.9595	-125.1496	1005	7/1/19	-27.21	4.46	n.a.	[1]
FK190612-S0278-401	46.9595	-125.1496	1005	7/1/19	-10.39	5.13	aragonite, dolomite	[1]
FK190612-S0260-81	46.9595	-125.1498	1007	6/16/19	-34.5	3.56	aragonite, calcite	[1]
FK190612-S0260-81	46.9595	-125.1498	1007	6/16/19	-33.91	3.65	n.a.	[1]
FK190612-S0269-257/258/259	43.0154	-124.9156	504	6/24/19	-25.6	3.16	aragonite	[1]
FK190612-S0269-257/258/259	43.0154	-124.9156	504	6/24/19	-25.82	2.7	n.a.	[1]
FK190612-S0274-326	45.8831	-124.646	195	6/28/19	-26.21	3.27	n.a.	[1]
FK190612-S0274-326	45.8831	-124.646	195	6/28/19	-25.24	3.38	n.a.	[1]
FK190612-S0274-326	45.8831	-124.646	195	6/28/19	-27.98	3.74	calcite, aragonite	[1]
FK190612-S0278-403	46.9608	-125.1486	1043	7/1/19	-27.76	4.26	n.a.	[1]
FK190612-S0278-403	46.9608	-125.1486	1043	7/1/19	-28.69	4.46	aragonite	[1]
FK190612-S0268-223	44.2497	-124.9575	487	6/23/19	-30.99	3.11	aragonite	[1]
FK190612-S0268-223	44.2497	-124.9575	487	6/23/19	-30.78	3.22	n.a.	[1]
FK190612-S0268-223	44.2497	-124.9575	487	6/23/19	-29.59	3.06	n.a.	[1]
FK190612-S0268-228/229	44.2485	-124.9571	488	6/23/19	-20.12	3.25	n.a.	[1]

FK190612-S0268-228/229	44.2485	-124.9571	488	6/23/19	-32.57	3.18	n.a.	[1]
FK190612-S0268-228/229	44.2485	-124.9571	488	6/23/19	-26.95	2.97	n.a.	[1]
NA128-130-C-USGS	46.2424	-124.6006	705	8/3/21	-14.41	2.18	aragonite, calcite	[1]
NA128-130-C-USGS	46.2424	-124.6006	705	8/3/21	-21.56	3.12	aragonite	[1]
NA128-130-C-USGS	46.2424	-124.6006	705	8/3/21	-18.5	2.97	Mg-calcite, aragonite	[1]
NA128-066-C-USGS	46.885	-124.779	152	7/29/21	-26.65	2.63	aragonite	[1]
NA128-066-C-USGS	46.885	-124.779	152	7/29/21	-6.72	0.5	aragonite	[1]
NA128-066-C-USGS	46.885	-124.779	152	7/29/21	-24.38	2.54	aragonite	[1]
NA128-092-C-USGS	46.7893	-125.4929	1599	7/30/21	-41.98	4.38	aragonite	[1]
NA128-092-C-USGS	46.7893	-125.4929	1599	7/30/21	-51.17	4.91	aragonite	[1]
NA128-092-C-USGS	46.7893	-125.4929	1599	7/30/21	-52.72	4.14	aragonite	[1]
NA128-001-C-USGS	44.838	-124.9234	539	7/23/21	-8.54	7.1	dolomite	[1]
NA128-001-C-USGS	44.838	-124.9234	539	7/23/21	-8.45	6.72	dolomite	[1]
NA128-013-02-C-USGS	44.8325	-124.923	495	7/23/21	-5.22	7.14	dolomite	[1]
NA128-013-02-C-USGS	44.8325	-124.923	495	7/23/21	-7.29	7.08	dolomite	[1]
NA128-104-C-USGS	46.7188	-124.6902	149	7/31/21	-36.83	3.37	Calcite, dolomite + clay minerals	[1]
NA128-104-C-USGS	46.7188	-124.6902	149	7/31/21	-37.01	3.12	Mg-calcite	[1]
NA128-099-C-USGS	46.72	-124.6902	147	7/31/21	-36.66	3.29	Mg-calcite	[1]
NA128-032-C-USGS	46.72	-124.6902	147	7/31/21	-40.15	3.39	Mg-calcite	[1]
NA128-032-C-USGS	46.72	-124.6902	147	7/31/21	-43.79	4	Mg-calcite	[1]
NA128-032-C-USGS	46.72	-124.6902	147	7/31/21	-41.35	2.87	Mg-calcite, aragonite	[1]
NA128-006-C-USGS	44.8346	-124.9248	494	7/23/21	-40.29	4.16	aragonite	[1]
NA128-006-C-USGS	44.8346	-124.9248	494	7/23/21	-35.41	4.69	aragonite	[1]
NA128-006-C-USGS	44.8346	-124.9248	494	7/23/21	-35.33	4.25	Mg-calcite	[1]
536.5.1	44.279	-124.902	221	2000	-40.07	2.54	aragonite	[2]
536.5.2	44.279	-124.902	221	2000	-39.36	2.71	aragonite	[2]
536.5.3	44.279	-124.902	221	2000	-38.82	2.66	aragonite	[2]
536.5.4	44.279	-124.902	221	2000	-39.35	2.88	aragonite	[2]
536.5.5	44.279	-124.902	221	2000	-39.91	2.85	aragonite	[2]

536.5.6	44.279	-124.902	221	2000	-39.21	2.93	aragonite	[2]
536.5.7	44.279	-124.902	221	2000	-39.34	2.65	aragonite	[2]
536.5.8	44.279	-124.902	221	2000	-39.58	2.93	aragonite	[2]
539.2.1	44.112	-124.943	219	2000	-9.44	2.9	aragonite	[2]
539.2.2	44.112	-124.943	219	2000	-3.68	3.06	aragonite	[2]
539.2.3	44.112	-124.943	219	2000	-9.9	2.89	aragonite	[2]
539.2.4	44.112	-124.943	219	2000	-6.66	3.02	aragonite	[2]
539.2.5	44.112	-124.943	219	2000	-11.72	3	aragonite	[2]
539.2.6	44.112	-124.943	219	2000	-11.82	3.11	aragonite	[2]
539.2.7	44.112	-124.943	219	2000	-16.27	2.93	aragonite	[2]
609.3.1	44.192	-124.969	275	2000	-5.59	5.7	dolomite	[2]
609.3.2	44.192	-124.969	275	2000	-14.76	4.96	dolomite	[2]
609.3.3	44.192	-124.969	275	2000	2.55	5.92	dolomite	[2]
609.3.4	44.192	-124.969	275	2000	-5.17	5.52	dolomite	[2]
609.3.5	44.192	-124.969	275	2000	3.06	5.96	dolomite	[2]
609.3.6	44.192	-124.969	275	2000	-16.17	4.82	dolomite	[2]
609.3.7	44.192	-124.969	275	2000	-0.46	5.86	dolomite	[2]
614.1.1	43.876	-124.919	493	2000	-30.71	5.53	Mg-calcite	[2]
614.1.2	43.876	-124.919	493	2000	-30.78	5.25	Mg-calcite	[2]
614.1.3	43.876	-124.919	493	2000	-30.99	5.24	Mg-calcite	[2]
614.1.4	43.876	-124.919	493	2000	-32.17	5.09	Mg-calcite	[2]
614.1.5	43.876	-124.919	493	2000	-31.18	5.49	Mg-calcite	[2]
614.1.6	43.876	-124.919	493	2000	-30.64	5.53	Mg-calcite	[2]
614.1.7	43.876	-124.919	493	2000	-31.15	5.28	Mg-calcite	[2]
616.7.1	44.007	-124.936	223	2000	-30.36	3.29	aragonite	[2]
616.7.2	44.007	-124.936	223	2000	-32.12	3.05	aragonite	[2]
616.7.4	44.007	-124.936	223	2000	-23.77	3.37	aragonite	[2]
616.7.5	44.007	-124.936	223	2000	-21.18	3.44	aragonite	[2]
616.7.7	44.007	-124.936	223	2000	-27.62	3.43	aragonite	[2]
167.1	44.847	-124.838	567	1999	-30.8	5.05	Mg-calcite	[2]

167.2	44.847	-124.838	567	1999	-34.88	5.04	Mg-calcite	[2]
167.3	44.847	-124.838	567	1999	-35.97	4.9	Mg-calcite	[2]
167.4	44.847	-124.838	567	1999	-36.17	4.96	Mg-calcite	[2]
167.5	44.847	-124.838	567	1999	-35.54	5.02	Mg-calcite	[2]
49.1	44.836	-124.836	344	1999	-2.89	6.13	Fe-Mg-Ca	[2]
49.2	44.836	-124.836	344	1999	-2.49	6.35	Fe-Mg-Ca	[2]
49.3	44.836	-124.836	344	1999	-2.08	6.28	Fe-Mg-Ca	[2]

Data sources: [1] Prouty (2023); [2] Torres et al. (2009)

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