

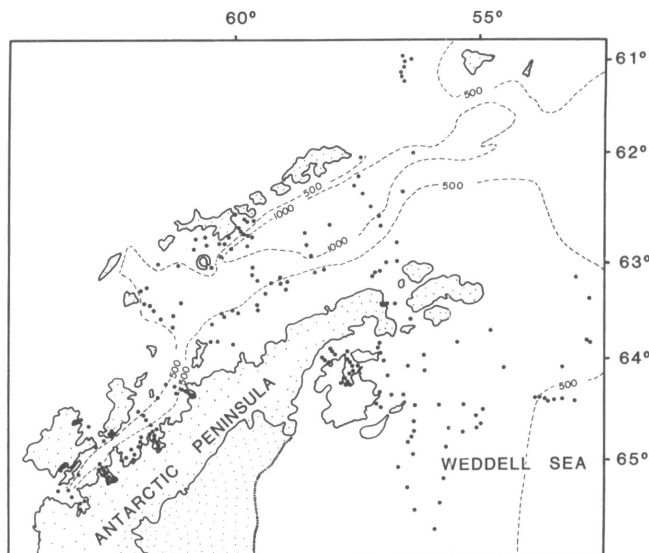
# Preliminary results from the USARP 1982 marine geologic investigation of the northern Antarctic Peninsula region

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During the 1982 marine geologic expedition of the U.S. Coast Guard icebreaker *Glacier*, 205 geologic sampling stations were occupied in the area of the northern Antarctic Peninsula (figure). Piston cores and bottom samples were acquired from previously unsampled areas of the northwestern Weddell Sea continental shelf and the Bransfield Strait, and more precise bathymetric maps of these areas were constructed. Included in this survey was the sampling and seafloor mapping of 14 fiords in the region (figure). In addition, sediment traps were deployed in the Bransfield Strait and water column geochemical studies were conducted at two stations, one in the Weddell Sea and the other in the Bransfield Strait. Pertinent sample information is listed in the table.

The northern Antarctic Peninsula region was selected for this investigation because it is a unique setting for studying the glacial-climatic history of the continent. Because of their higher latitude position and rather restricted drainage basins, the glaciers of this region undoubtedly are more sensitive to climatic change than are the east antarctic and west antarctic ice sheets. It is hoped that the Quaternary climatic record of the continent is imprinted in the sedimentary record of this region in such a way that it can be clearly interpreted and dated. Our



Station locations.

preliminary observation, made during the cruise, leaves us optimistic about achieving these objectives.

Several piston cores were collected from the continental shelf of the northwestern Weddell Sea, adjacent to the Larsen Ice Shelf. Preliminary examination of these cores suggests that they penetrated glacial marine sediments, not basal tills.

Sedimentation within the Bransfield Strait is dominated by siliceous ooze deposition in the deeper parts of the basin and marine current reworking of glacial sediments in shallower areas. Ancient sediments acquired from fiords include siliceous ooze, silts, and diamictons. These sediments are believed to represent variations in climatic conditions ranging from a cold glacial setting (colder than today) when glacial deposition

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1982 geologic stations

Station number	Latitude	Longitude	Depth (meters)	Piston core length (cm)	Grab
1	63°57.2'S	56°21.6'W	430	270	✓
2	64°13.8'S	56°24.1'W	190	10	N.T. <sup>a</sup>
3	64°22.3'S	56°26.7'W	280	82	✓
4	64°31.5'S	56°42.2'W	183	18	✓
5	64°32.1'S	56°47.8'W	211	N.T.	✓
6	64°34.7'S	56°48.0'W	232	N.T.	✓
7	64°42.5'S	56°30.5'W	345	19	✓
8	64°47.1'S	56°47.0'W	420	305	✓
9	64°55.0'S	56°27.0'W	442	272	✓
10	65°07.0'S	56°28.5'W	523	271	✓
11	65°14.6'S	56°14.2'W	525	323	✓
12	65°05.1'S	55°55.5'W	513	374	N.T.
13	64°53.0'S	55°47.0'W	457	82	N.T.
14	64°36.6'S	55°43.9'W	336	268	✓
15	64°30.1'S	55°42.8'W	293	175	✓
16	64°25.0'S	55°23.0'W	347	265	✓

(Table continues on next page.)

## 1982 geologic stations—Continued

Station number	Latitude	Longitude	Depth (meters)	Piston core length (cm)	Grab
17	64°30.0'S	55°00.7'W	360	234	✓
18	64°19.5'S	55°01.5'W	314	37	N.T.
19	64°15.1'S	55°28.0'W	342	276	✓
20	64°14.1'S	55°54.4'W	381	292	N.T.
21	64°05.5'S	54°14.0'W	415	8	✓
22	64°05.4'S	54°14.2'W	509	214	✓
23	64°06.3'S	54°11.6'W	621	267	N.T.
24	64°06.8'S	54°04.9'W	851	110	✓
25	64°08.0'S	53°56.0'W	1,252	256	✓
26	64°09.5'S	53°50.0'W	1,520	267	✓
27	64°07.3'S	53°46.0'W	1,462	Hydro cast	N.T.
28	63°52.6'S	53°18.7'W	703	210	✓
29	63°38.0'S	52°49.0'W	729	8	✓
30	63°17.0'S	52°50.0'W	448	10	✓
31	63°00.0'S	53°08.0'W	448	10	N.T.
32	62°04.0'S	57°24.0'W	97	10	N.T.
33	62°12.2'S	57°27.8'W	1,934	N.T.	✓
34	62°12.2'S	57°37.4'W	1,979	595	✓
35	62°21.7'S	57°22.0'W	1,484	613	✓
36	62°27.9'S	57°10.3'W	1,072	581	✓
37	62°33.2'S	56°59.3'W	728	48	N.T.
38	62°35.4'S	56°54.0'W	366	58	✓
39	62°45.8'S	56°44.1'W	190	N.T.	✓
40	62°57.7'S	56°48.4'W	91	N.T.	✓
41	63°06.5'S	57°12.7'W	521	16	N.T.
42	63°04.3'S	57°06.3'W	336	8	N.T.
43	63°01.7'S	57°03.3'W	56	40	✓
44	63°01.5'S	57°31.1'W	116	N.T.	✓
45	63°02.9'S	58°11.8'W	149	N.T.	✓
46	63°03.9'S	58°20.9'W	765	289	N.T.
47	62°55.3'S	58°23.7'W	723	297	✓
48	62°48.2'S	58°28.1'W	840	286	✓
49	62°42.5'S	58°29.7'W	1,587	62	✓
50	62°37.1'S	58°28.0'W	1,661	574	N.T.
51	63°43.4'S	60°02.9'W	560	287	✓
52	63°40.9'S	60°19.6'W	224	8	✓
53	63°36.6'S	60°28.0'W	364	N.T.	✓
54	63°29.1'S	60°23.4'W	588	190	✓
55	63°24.0'S	60°15.0'W	719	99	✓
56	63°25.0'S	60°12.5'W	425	15	✓
57	63°24.8'S	60°09.5'W	230	N.T.	✓
58	63°25.5'S	59°56'W	140	N.T.	✓
59	63°23.4'S	59°36.8'W	125	N.T.	✓
60	63°23.4'S	59°34.2'W	673	10	✓
61	63°17.0'S	59°20.2'W	728	280	✓
62	63°14.8'S	58°58.9'W	122	N.T.	✓
63	63°11.6'S	58°57.9'W	145	N.T.	✓
64	63°09.1'S	59°07.4'W	280	50	✓
65	63°09.6'S	59°13.2'W	560	56	N.T.
66 <sup>o</sup>	63°09.0'S	59°18.2'W	793	600	N.T.
67	63°08.7'S	59°43.4'W	466	10	N.T.
68	63°06.6'S	59°41.9'W	405	264	N.T.
69	62°59.9'S	59°38.1'W	916	275	✓
70	62°48.3'S	59°44.9'W	486	72	✓
71	62°38.4'S	59°32.0'W	1,350	305	✓
72	62°37.2'S	59°34.8'W	905	25	N.T.
73	62°36.5'S	59°40.3'W	551	285	✓
74	62°35.8'S	59°41.8'W	521	283	✓
75	62°31.0'S	59°57.0'W	200	282	✓

## 1982 geologic stations—Continued

Station number	Latitude	Longitude	Depth (meters)	Piston core length (cm)	Grab
76	62°39.8'S	59°54.6'W	93	N.T.	✓
77	62°40.9'S	59°54.1'W	186	N.T.	✓
78	62°44.3'S	59°52.9'W	278	N.T.	✓
79	62°41.2'S	59°51.3'W	448	N.T.	✓
80	62°40.9'S	59°50.1'W	522	8	N.T.
81	62°47.8'S	60°19.8'W	106	N.T.	✓
82	62°48.9'S	60°16.2'W	205	N.T.	✓
83	62°46.2'S	60°16.0'W	308	N.T.	✓
84	62°49.5'S	60°11.4'W	840	253	✓
85	62°48.5'S	60°42.4'W	200	77	✓
86	62°42.5'S	60°39.9'W	150	N.T.	✓
87	62°42.1'S	60°33.0'W	265	288	✓
88	62°49.5'S	60°26.7'W	455	98	✓
89	62°57.3'S	60°13.0'W	990	132	✓
90	63°02.8'S	60°26.3'W	538	N.T.	✓
91 <sup>c</sup>	63°06.9'S	61°09.1'W	766	500	N.T.
92	63°05.4'S	61°34.4'W	635	84	N.T.
93	64°04.1'S	61°19.6'W	690	295	✓
94	64°05.1'S	61°11.0'W	273	N.T.	N.T.
95	64°06.5'S	61°00.7'W	215	N.T.	✓
96	64°07.7'S	60°58.0'W	304	N.T.	✓
97	64°08.8'S	60°54.5'W	334	272	✓
98	64°08.2'S	60°56.0'W	284	282	✓
99	64°07.0'S	60°59.5'W	289	44	N.T.
100	64°09.5'S	61°16.8'W	526	294	✓
101	64°11.8'S	61°33.0'W	161	N.T.	✓
102	64°18.6'S	61°52.7'W	540	279	✓
103	64°21.2'S	61°48.6'W	275	N.T.	✓
104	64°21.8'S	61°45.2'W	482	N.T.	N.T.
105	64°25.0'S	61°45.5'W	170	17	✓
106	64°30.7'S	61°40.2'W	482	N.T.	✓
107	64°33.7'S	61°37.0'W	298	N.T.	✓
108	64°33.0'S	61°40.0'W	341	276	✓
109	64°36.2'S	61°34.0'W	439	286	✓
110	64°36.2'S	62°30.5'W	157	N.T.	✓
111	64°38.1'S	61°37.5'W	344	578	✓
112	64°36.5'S	61°38.0'W	600	N.T.	✓
113	64°36.2'S	61°39.6'W	144	372	✓
114	64°34.8'S	61°38.3'W	429	N.T.	✓
115	64°31.8'S	61°36.7'W	299	N.T.	✓
116	64°33.0'S	61°40.9'W	162	N.T.	✓
117	64°33.2'S	61°57.7'W	340	250	✓
118	64°38.2'S	62°01.5'W	243	N.T.	✓
119	64°33.8'S	62°58.0'W	345	71	N.T.
120	64°30.5'S	62°29.7'W	299	10	N.T.
121	64°29.3'S	62°30.7'W	112	41	✓
122	64°28.0'S	62°31.5'W	130	16	N.T.
123	64°28.4'S	62°31.8'W	233	307	✓
124	64°42.2'S	62°13.5'W	396	133	✓
125	64°41.5'S	62°03.9'W	314	260	✓
126	64°42.6'S	62°03.4'W	246	31	✓
127	64°39.5'S	62°07.4'W	443	264	✓
128	64°26.3'S	63°19.6'W	317	20	N.T.
129	64°25.7'S	63°18.1'W	498	20	N.T.
130	64°24.5'S	63°15.0'W	631	242	✓
131	64°23.5'S	63°14.8'W	345	565	✓
132	64°22.7'S	63°11.4'W	560	595	N.T.

(Table continues on next page.)

## 1982 geologic stations—Continued

Station number	Latitude	Longitude	Depth (meters)	Piston core length (cm)	Grab
133	64°26.1'S	62°57.2'W	644	592	N.T.
134	64°34.5'S	62°39.0'W	793	564	✓
135 <sup>d</sup>	64°38.9'S	62°53.4'W	532	49	N.T.
136	64°45.4'S	62°45.5'W	452	277	N.T.
137	64°47.7'S	62°43.0'W	368	269	N.T.
138	64°49.2'S	62°37.2'W	112	N.T.	✓
139	64°51.4'S	62°39.0'W	85	N.T.	✓
140	64°49.6'S	62°37.8'W	392	280	✓
141	64°52.0'S	62°32.7'W	306	113	✓
142	64°53.1'S	62°26.4'W	541	226	✓
143	64°52.4'S	62°30.1'W	411	276	✓
144	64°54.0'S	62°37.3'W	261	80	✓
145	64°54.9'S	62°35.5'W	261	N.T.	✓
146	64°53.5'S	62°37.6'W	158	N.T.	✓
147	64°53.2'S	62°36.1'W	317	167	✓
148	64°51.0'S	62°37.5'W	345	120	✓
149	64°48.5'S	62°42.5'W	332	252	✓
150	64°51.2'S	63°10.0'W	336	41	✓
151	64°58.0'S	63°20.1'W	360	287	N.T.
152	65°05.3'S	63°10.1'W	485	212	✓
153	65°08.0'S	63°11.5'W	351	46	✓
154	65°05.3'S	63°10.0'W	689	232	✓
155	65°01.2'S	63°15.6'W	437	281	✓
156	64°56.4'S	63°37.0'W	608	273	N.T.
157	63°35.0'S	64°44.5'W	224	208	N.T.
158	64°44.8'S	61°33.0'W	136	N.T.	✓
159	64°43.8'S	63°15.3'W	374	8	✓
160	64°46.0'S	63°19.5'W	374	62	✓
161	64°44.5'S	63°29.0'W	187	157	✓
162	64°47.0'S	63°31.5'W	317	6	✓
163	63°23.5'S	57°01'W	317	207	✓
164	63°23.2'S	56°59.8'W	299	160	N.T.
165	63°22.9'S	56°59.0'W	243	8	N.T.
166 <sup>o</sup>	63°28.2'S	56°35.9'W	952	554	N.T.
167	63°52.5'S	56°36.6'W	448	285	✓
168	63°52.1'S	57°00.0'W	429	266	✓
169	64°03.2'S	56°34.5'W	228	36	✓
170	64°00.0'S	56°50.0'W	177	25	✓
171	64°15.0'S	57°09.5'W	224	281	✓
172	64°14.5'S	57°13.2'W	131	83	N.T.
173	64°08.0'S	57°04.4'W	233	N.T.	✓
174	64°10.0'S	56°48.5'W	288	295	✓
175	63°50.2'S	58°14.6'W	560	5	✓
176	63°53.6'S	58°06.5'W	168	145	✓
177	63°52.4'S	58°10.5'W	211	N.T.	N.T.
178	63°48.3'S	58°01.0'W	689	44	✓
179	63°48.0'S	58°05.1'W	747	8	✓
180	63°50.0'S	57°58.5'W	65	6	✓
181	63°48.4'S	58°04.5'W	769	206	N.T.
182	63°51.3'S	57°42.8'W	405	259	✓
183	63°59.4'S	57°43.5'W	299	290	✓
184	64°02.7'S	57°45.5'W	383	304	N.T.
185	64°04.5'S	57°45.0'W	383	268	N.T.
186	64°05.0'S	57°49.0'W	299	236	✓
187	64°02.0'S	57°47.0'W	265	276	✓
188	63°58.8'S	57°50.3'W	198	22	✓
189	63°57.2'S	57°39.7'W	340	74	N.T.
190	65°55.9'S	57°38.6'W	41	N.T.	✓
191	63°55.3'S	57°34.1'W	95	21	✓
192 <sup>f</sup>	63°54.5'S	57°41.6'W	350	533	N.T.

## 1982 geologic stations—Continued

Station number	Latitude	Longitude	Depth (meters)	Piston core length (cm)	Grab
193	63°45.5'S	57°43.0'W	786	110	N.T.
194	63°48.0'S	57°44.6'W	282	N.T.	✓
195	63°47.2'S	57°23.5'W	234	N.T.	✓
196	63°45.5'S	57°20.0'W	696	122	✓
197	63°43.0'S	57°13.6'W	750	235	✓
198	62°21.3'S	56°24.3'W	629	96	✓
199	61°57.5'S	56°18.6'W	1,980	129	N.T.
200	61°17.2'S	56°32.0'W	560	10	N.T.
201	61°15.7'S	56°33.2'W	898	15	N.T.
202	61°13.4'S	56°36.0'W	452	80	N.T.
203 <sup>a</sup>	61°11.2'S	56°37.5'W	1,102	8	N.T.
204 <sup>b</sup>	61°08.3'S	56°38.1'W	1,367	101	N.T.
205	61°07.1'S	56°37.0'W	1,639	10	N.T.

<sup>a</sup>N.T. = not taken.

<sup>b</sup>Trigger core, 20 centimeters.

<sup>c</sup>Trigger core, 50 centimeters.

<sup>d</sup>Trigger core, 9 centimeters.

<sup>e</sup>Trigger core, 8 centimeters.

<sup>f</sup>Trigger core, 30 centimeters.

<sup>g</sup>Trigger core, 4 centimeters.

<sup>h</sup>Trigger core, 22 centimeters.

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prevailed to much warmer episodes when meltwater input of silts occurred. Currently, siliceous ooze is filling these fiords; ice-rafting and meltwater sediment input are insignificant.

Ongoing sedimentologic investigations of piston cores from antarctic fiords are aimed at investigating sedimentation within these unique glacial marine environments and at developing a high-resolution, Quaternary glacial-climatic record using rapidly sedimented deposits.

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