UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

LOCATION MAP AND SUMMARY LOGS FOR THE U. S. GEOLOGICAL SURVEY'S 1979, BEAUFORT SEA OVER THE ICE DRILLING PROGRAM

by

R. W. Hartz, K. Holden, D. M. Hopkins, and

G. Shearer

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The proposed Beaufort Sea federal lease sale, scheduled for late 1979, and the exploratory drilling that will follow, led to the development of the U.S.G.S., Conservation Division's Beaufort Sea Over the Ice Drilling Program. The program, funded and managed by Conservation Division, was primarily aimed at recovering intact sediment cores for soils engineering and geochemical testing and making direct measurements of the subsea permafrost regime by thermally instrumenting the boreholes.

Borehole locations were selected by Conservation Division on the basis of existing seismic refraction profiles, bottom sampling surveys, and available borehole data. Ultimately detailed site location was dictated by sea ice conditions and a number of sites were relocated due to rough or unstable ice. Whenever relocation was necessary, alternate drill sites were established on previous geophysical tract lines, so as to make possible a correlation between the seismic profiles and the boring logs.

During February and March 1979, the engineering firm of Harding Lawson and Associates, under contract to the U.S.G.S., drilled and cored twenty offshore boreholes on potential federal lease tracts between Flaxman Island to the east and Long Island to the west. Two drill rigs, mounted on sledges, were utilized; a Failing 1500 drilling rig was used to drill the deep 300 ft. holes while a Mobile B-61 rig was employed on the majority of the shallower 100 ft. holes. In all, 12 boreholes were drilled seaward of the barrier islands; three of these reached depths greater than 300 ft., the deepest

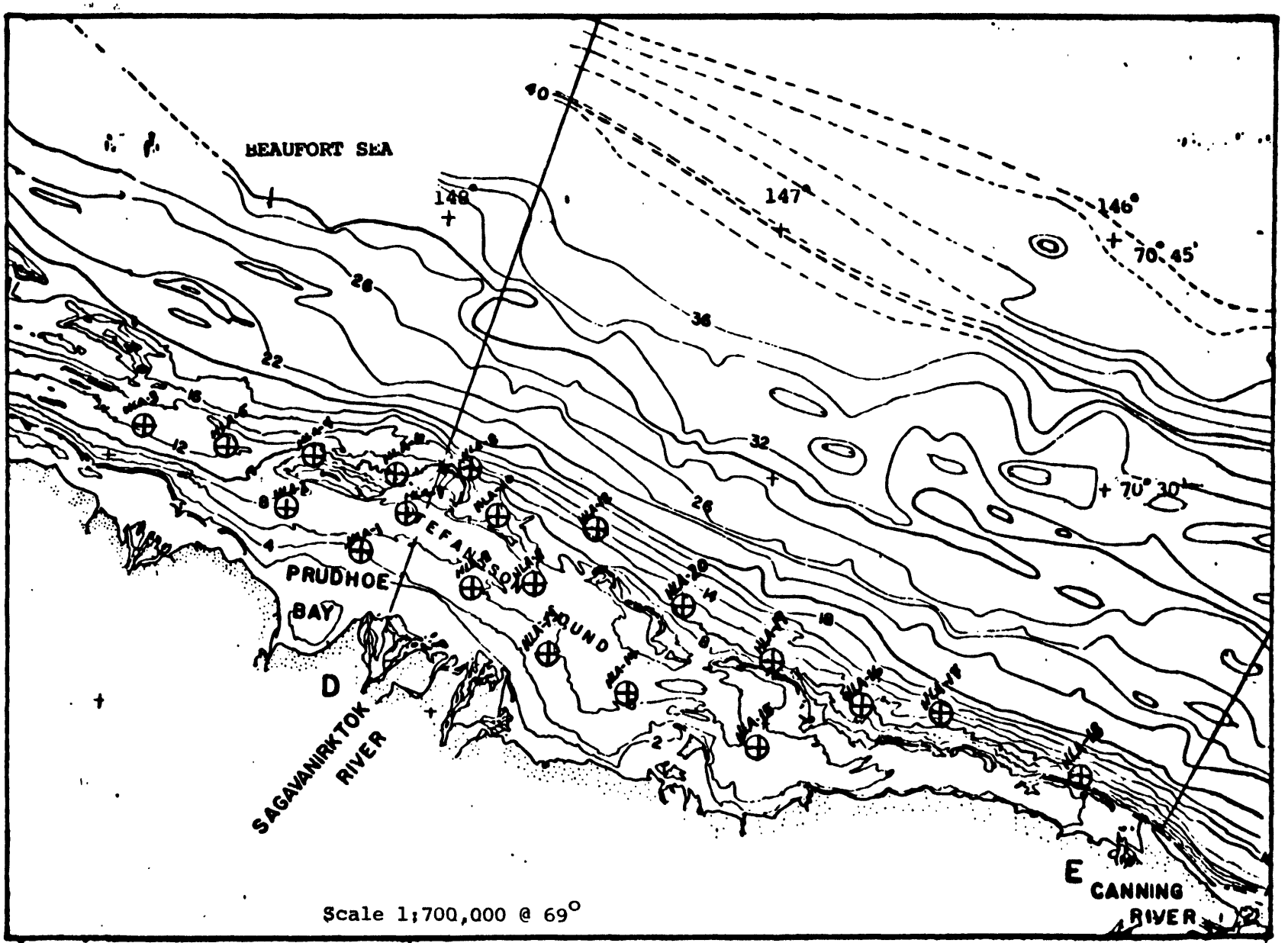
being borehole number 12 which was drilled to a depth of 351.3 ft. Eight holes were drilled on the lagoon side of the barrier islands, including number 2 between Stump Island and Reindeer Island, the deepest being number 15 at 318.0 ft.

Sampling was nearly continuous through the upper fine grained sections and at 10 ft. intervals through the coarsegrained units. Standard 36-inch Shelby Tubes were used to recover fines whenever possible. In coarse materials or in tough overconsolidated fines an 18 inch split barrel core with three six inch brass liners was utilized. Cores were logged and sealed as they were recovered, frozen cores were stored at sub-zero temperatures, while non-frozen cores were allowed to set at room temperature. Detailed lithologic boring logs were compiled for all the boreholes and preliminary stratigraphic correlations were attempted and are presented here in summary form.

Upon completion of drilling operations but before drill casing was pulled, PCB pipe was set in each borehole. Thermal measurements were then conducted and the results will be available in the final report released by Conservation Division. Preliminary results of the thermal measurements indicate that subsea permafrost temperatures encountered in the boreholes are much colder than had been expected.

Due to the eminent lease sale we felt an urgent need to make this preliminary data available to the public. In order to expedite its publication we have chosen to release the summary boring logs and location map in "rough" form.

BOREHOLE LOCATION MAP

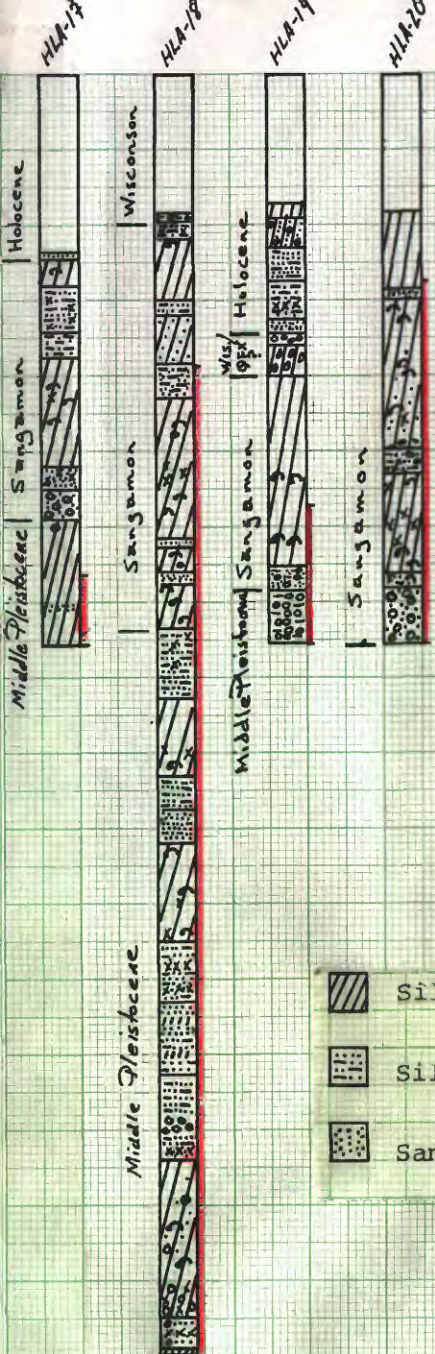


Core Hole Locations

1979 USGS Over the Ice Drilling Program

Beaufort Sea

Hole #	Latitude	Longitude
1.	70° 24' 47.6112"	148° 13' 16.5091"
2.	70° 27' 07.4789"	148° 26' 45.0535"
3.	70° 31' 54.4848"	148° 53' 53.5031"
4.	70° 30' 16.3343"	148° 22' 42.9157"
5.	70° 30' 41.0464"	148° 37' 49.5267"
6.	70° 29' 35.3739"	148° 07' 42.5130"
7.	70° 27' 12.1418"	148° 05' 16.7115"
8.	70° 30' 01.8221"	147° 53' 21.4410"
9.	70° 22' 48.2591"	147° 52' 42.3173"
10.	70° 27' 07.6444"	147° 48' 28.1534"
11.	70° 23' 00.4264"	147° 41' 00.1086"
12.	70° 26' 39.6603"	147° 30' 26.0310"
13.	70° 18' 56.6726"	147° 38' 48.4579"
14.	70° 16' 35.9599"	147° 23' 42.3768"
15.	70° 13' 18.3653"	147° 00' 20.9002"
16.	70° 16' 11.7455"	146° 42' 46.3550"
17.	70° 16' 08.5329"	146° 27' 31.5567"
18.	70° 12' 37.4033"	146° 02' 35.8526"
19.	70° 18' 48.9562"	146° 58' 03.0345"
20.	70° 21' 59.7638"	147° 14' 38.9035"



Condensed Boring logs USGS/HLA
Bore hole, 1979

Bonded Permafrost

COLOR XEROX PAGE 1

COLOR XEROX PAGE 2

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10 X 10 TO THE CENTIMETER 18 X 25 CM
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