

Project 760039

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During the 1976 cruise of *C. S. S. HUDSON* to the Arctic an oil slick was observed off Baffin Island. The occurrence is off Scott Inlet, near the northern edge of the Hecla and Griper Bank in the vicinity of 71°24'N, 70°15'W (Fig. 99.1). It is possible that this oil slick is caused by a seepage along edges of flat-lying sedimentary beds, where these have been truncated and eroded by glaciers emerging from Scott Inlet. The economic significance of the observation of this oil slick is not clear. The laboratory analyses are not complete and only preliminary results are available. Nevertheless, it is considered important to report this discovery now.

Regional investigations in Baffin Bay include studies of surficial geology, shallow stratigraphy, and deep crustal structure. As a part of this program *C. S. S. HUDSON* carried out a seismic reflection profiling line in the north-south direction over the Hecla and Griper Bank on 10 August, 1976. The sea was covered by 6-8 tenths of one year old ice fragments. The ship was positioned using a satellite navigator aided by frequent fixes on three grounded icebergs. The largest of these was almost 100 m high above the sea surface and over 200 m in length of waterline. Its position was fixed as 71°20'N, 70°22'W.

Shortly after the beginning of the seismic line a large chunk of ice tangled the four cables streamed

astern the ship: air gun, hydrophone eel, magnetometer and towed side-scan sonar. The ship had to stop to unravel the spaghetti-like mass. While working on the quarter deck several people noticed a number of small oil slicks around the ship. Later the bridge reported noticing these oil slicks ahead of us, so they were not caused by any leak from the ship.

Small blobs of light material were coming to the surface at a rate of one every three to five minutes. The material had very low viscosity and dispersed into a thin film quickly covering an area of up to 1-2 m². No bubbles were observed so it is not likely that there was any gas. When dispersed on the sea surface, the material produced a multicoloured sheen, usually associated with liquid hydrocarbons. The strong southward current and wind driven surface circulation was moving the slicks away and they could be observed over an area of a couple of square kilometres. Concentrations could be observed locked in small pools or embayments between ice flows.

Some ten hours later, on completion of the seismic line, we returned to the area where the slicks were first observed. Although it was the middle of the night it was easy to see the slicks in the Arctic twilight, in the same position where they were first observed. An *ad hoc* sampling program was quickly organized: two short bottom cores, two mid-water Nisken bottle samples

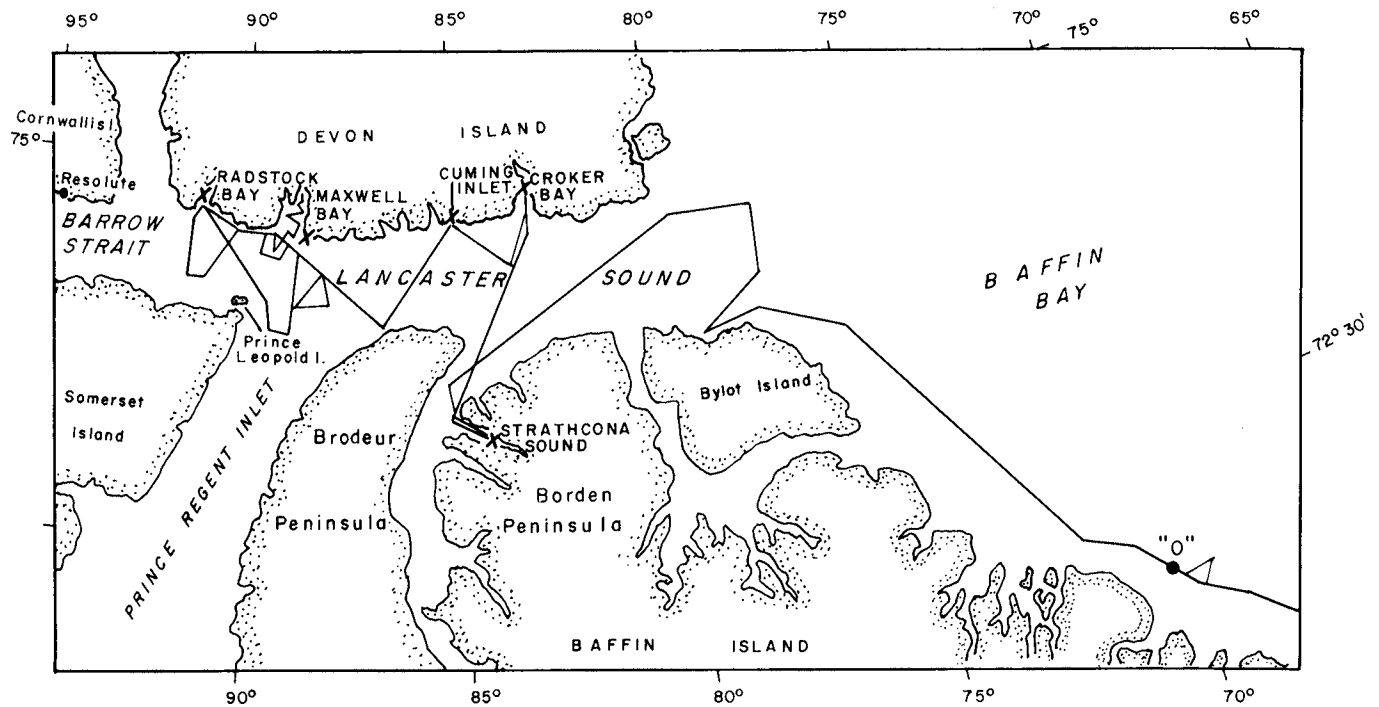


Figure 99.1. Oil slick was found at point marked with an "O" off the east coast of Baffin Island.

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and some sea surface samples were taken. Sampling the sea surface was difficult. The first attempts with a bucket were unsuccessful. Dropping the bucket in the water quickly dispersed the slick. Samples were eventually obtained by lowering a bunch of tissue paper and skimming the surface thus soaking up slicks.

On completion of the Arctic program *C.S.S. HUDSON* passed through the area on its way south 25 days later on 4 September 1976. The oil slicks were detected again. By reference to the grounded icebergs it could be determined that the position of slicks had not changed over the 25-day period in spite of the southerly current.

The analysis of the cores did not detect any hydrocarbons. The analysis of the sea water indicates an order of magnitude higher concentration of hydrocarbon

than observed as background level on the Nova Scotia Shelf (40-60 ppm). The gas chromatographic studies of surface samples continue.

Although we refer in this report to "oil slicks", evidence regarding the nature of these hydrocarbons is inconclusive at the present time. The three possible causes of the observed slicks may be: (a) natural crude; (b) animal (whale?) oil; (c) refined oil (snowmobile lost through ice, a sunken boat, or a crashed plane?). The fact that the slick was observed over a large area would argue against (b) and (c). RCMP detachment in Resolute did not have any report of a recent crash or sinking in the area but search of historical records was not undertaken. The laboratory investigations continue but it is questionable whether the samples collected will be sufficient to provide definitive answers.