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No. 716

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AUTHORSHIP

I. A. McLaren

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Montreal 18, Que.

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A Preliminary Analysis of Weather Suitable for
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by

I. A. McLaren

INTRODUCTION

One of the most important variables in determining the availability of seals to Eskimos is the weather. This is especially true for hunters who pursue their quarry from boats during the open-water season. Even light winds ruffle the water sufficiently to cut down visibility and prevent steady aim by the rifleman. This is a brief report of analyses made of wind records from some eastern arctic Weather Stations. Microfilms of hourly wind-record sheets were kindly made available by the Meteorological Branch of the Department of Transport. Much of the labour of reading the microfilms and recording the pertinent data was carried out by Mr. Brian Beck, formerly with this Unit.

Only fourteen weather stations were sufficiently well represented on the microfilms to be dealt with here. These stations, with the numbers of years of data available from each, are listed in the table. Much more material from these and other weather stations is available, but not on microfilm. A complete analysis of the effect of weather at all seasons on the economics of seal hunting in the Canadian

arctic is planned, but this preliminary enquiry seems worth recording for two reasons: 1) the information, however limited, might serve as an interim guide to those concerned with the suitability of regions for Eskimos and 2) the report may elicit comment on the suitability of the methods of analysis, in order that more accurate methods may be devised.

TREATMENT OF DATA

Defining the suitability of weather for seal hunting is difficult. The effect of local topography and the setting of recording instruments cannot be dealt with at this stage of the study, but there is still the problem of deciding what recorded wind speed would indicate suitable conditions for hunting.

It has been decided that only hours in which the wind averaged 5 m.p.h. or less would be considered. The upper limit is certainly "generous", for a wind of 5 m.p.h. in open water can cause too much chop to permit successful hunting. Not only wind speed but the duration of suitable conditions must be considered. Relatively calm conditions may occur even in the foulest of weather, but hunters are unlikely to venture out when the weather is obviously unstable, and some time must be allowed for the calming down of rough waters. For these reasons it was decided that only periods of light winds (≥ 5 m.p.h.) lasting for more than 4 hours would be considered suitable for hunting. However, hunting could only be carried out during daylight hours, here considered as between dawn and

dusk on the mid day of each semi-monthly period for each weather station used in this analysis.

Finally, when the length of the suitable period, as defined, was less than 2 daylight hours, these were ignored; when between 2 and 6, they were considered to be $\frac{1}{2}$ day of suitable hunting weather; when 6 or more hours occurred, they were considered to permit a full day's hunting. It should be noted that more than one period suitable for hunting, separated by windier weather, can occur on one day. Such periods, each of which may or may not have exceeded 6 hours, were not combined to form more than one day's suitable weather. It might be thought that this combining of hours to give days or half days of suitable weather results in a certain "blurring" of the data. However, the hunter can be expected to put in a full day's hunt, no more, when the calm weather is sustained, whereas he will make full use of shorter periods of suitable weather. Also, figures on catch per unit of effort in fine weather have hitherto been defined on the basis of a day's hunting (see McLaren 1958, Fish. Res. Bd. Canada, Arctic Unit Circular 1), and a more accurate estimate of suitable hunting, perhaps in hours, would seem pretentious at present.

The most useful way of expressing these data is in terms of the daily expectation of a suitable day for hunting. This is done by dividing the number of suitable days by the total number of days (15 or 16) in each semi-monthly period between July 1 and October 31, which might be considered the limits of the open-water season for all latitudes. There is

a considerable year-to-year variation in these figures, and confidence limits should be attached to the estimates in future analyses. However, only mean values are plotted on the maps which follow the text. The reader should note in using these maps that they incorporate both wind and daylight, so that the sudden drop of suitability in late October in the extreme north is due to the absence of daylight (the point is academic, since open-water hunting at these latitudes is unlikely anyway).

DISCUSSION

Many more records, especially from stations other than the 14 dealt with here, will have to be analysed before isopleths of the daily expectations of suitable seal-hunting weather can be drawn with some assurance of accuracy over the long term. Nevertheless, the values shown on the maps confirm and amplify a pattern which is familiar to many who have travelled widely in the north.

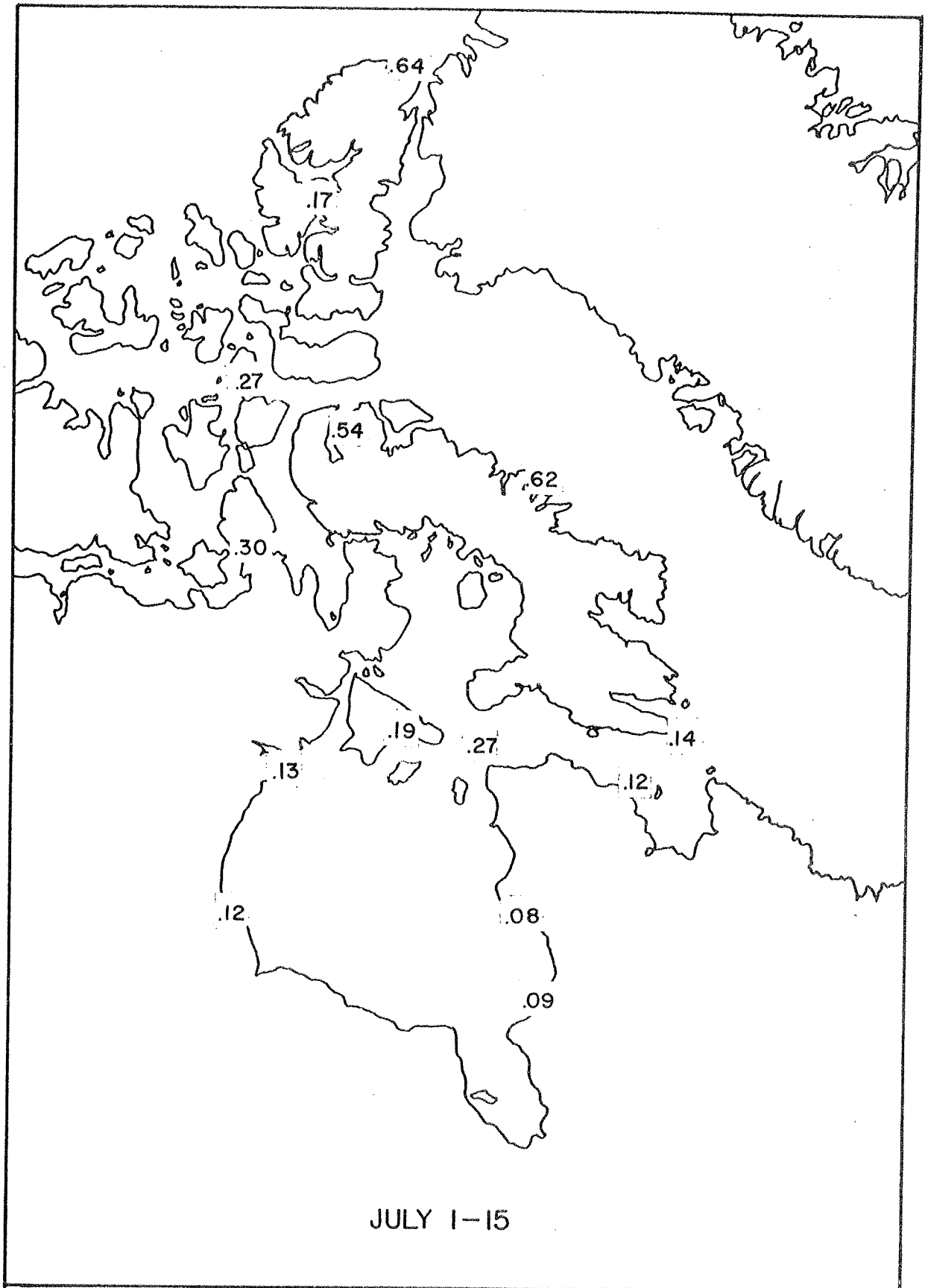
Hudson Bay is a persistently bad place for the seal hunter at all times during the open water season, with almost always a less than 10% expectation of a good day's weather. Conditions are somewhat better in northern Hudson Bay, where opportunities for hunting increase towards the western end of Hudson Strait. This is in accord with the regular, though infrequent, development of local high pressure centres in this area. The north and east coasts of Baffin Island are incomparably better. No figures are given for the important

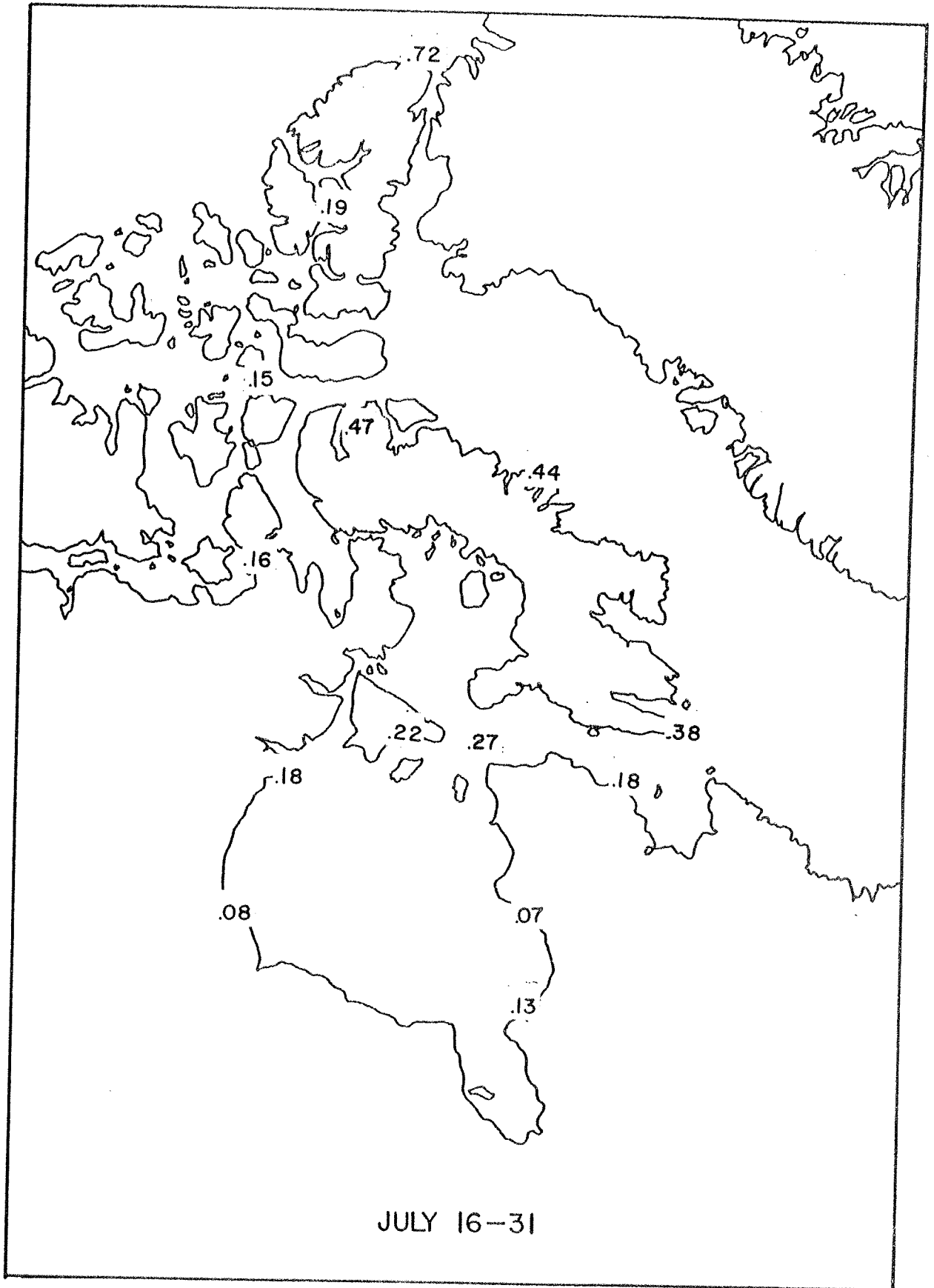
centres in southwest Baffin Island, Frobisher Bay and Cumberland Sound, but experience and some limited weather analyses suggest that these areas will prove to be intermediate in weather conditions between the western end of Hudson Strait and northern Baffin Island.

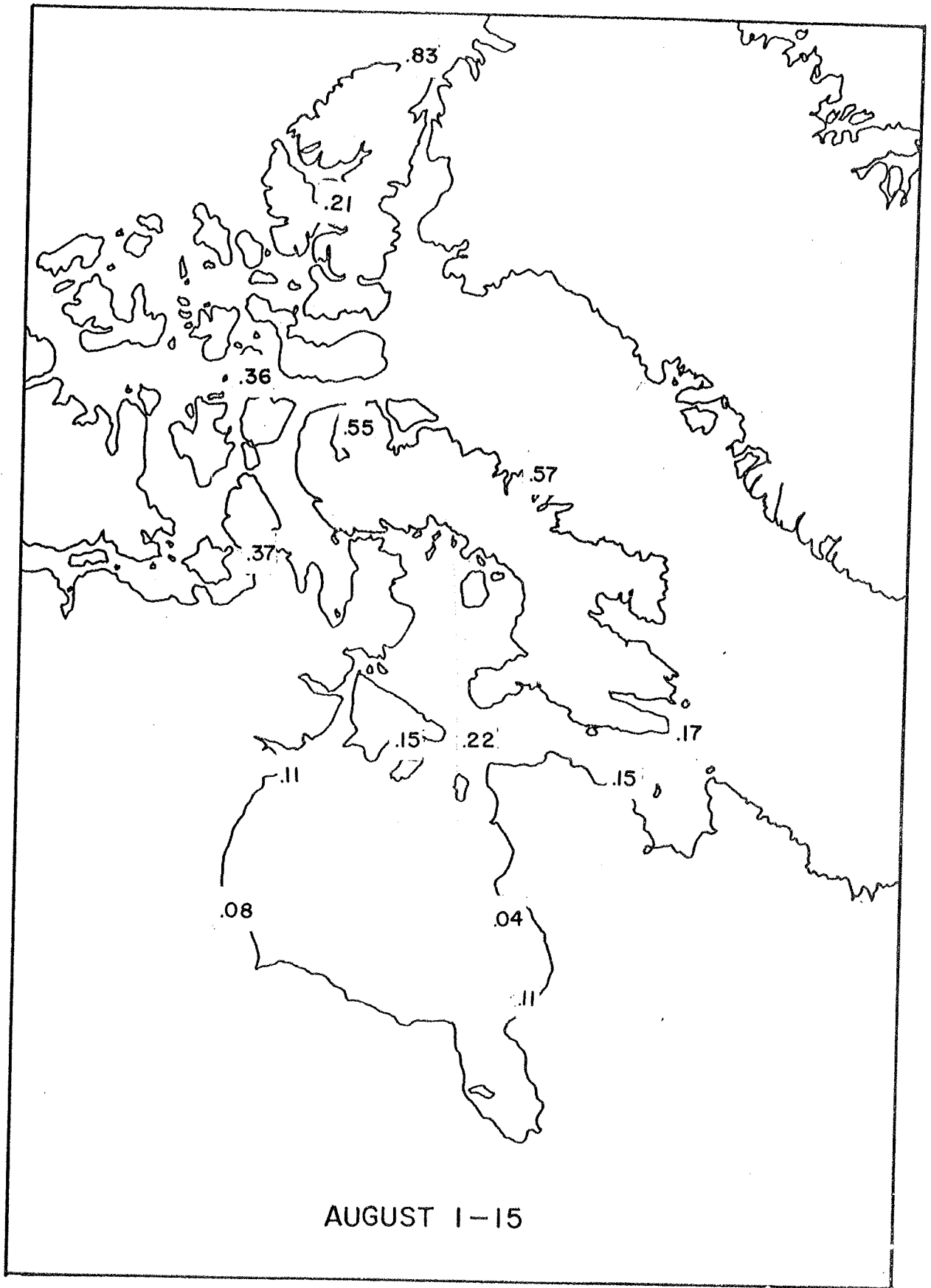
All in all, weather is a most serious problem for the Eskimos of Hudson Bay. Every effort should be made to introduce the technique of sea-mammal netting to these wind-swept regions, for this circumvents the problem of wind (see McLaren and Mansfield 1960, Fish. Res. Bd. Canada, Arctic Unit Circular 6).

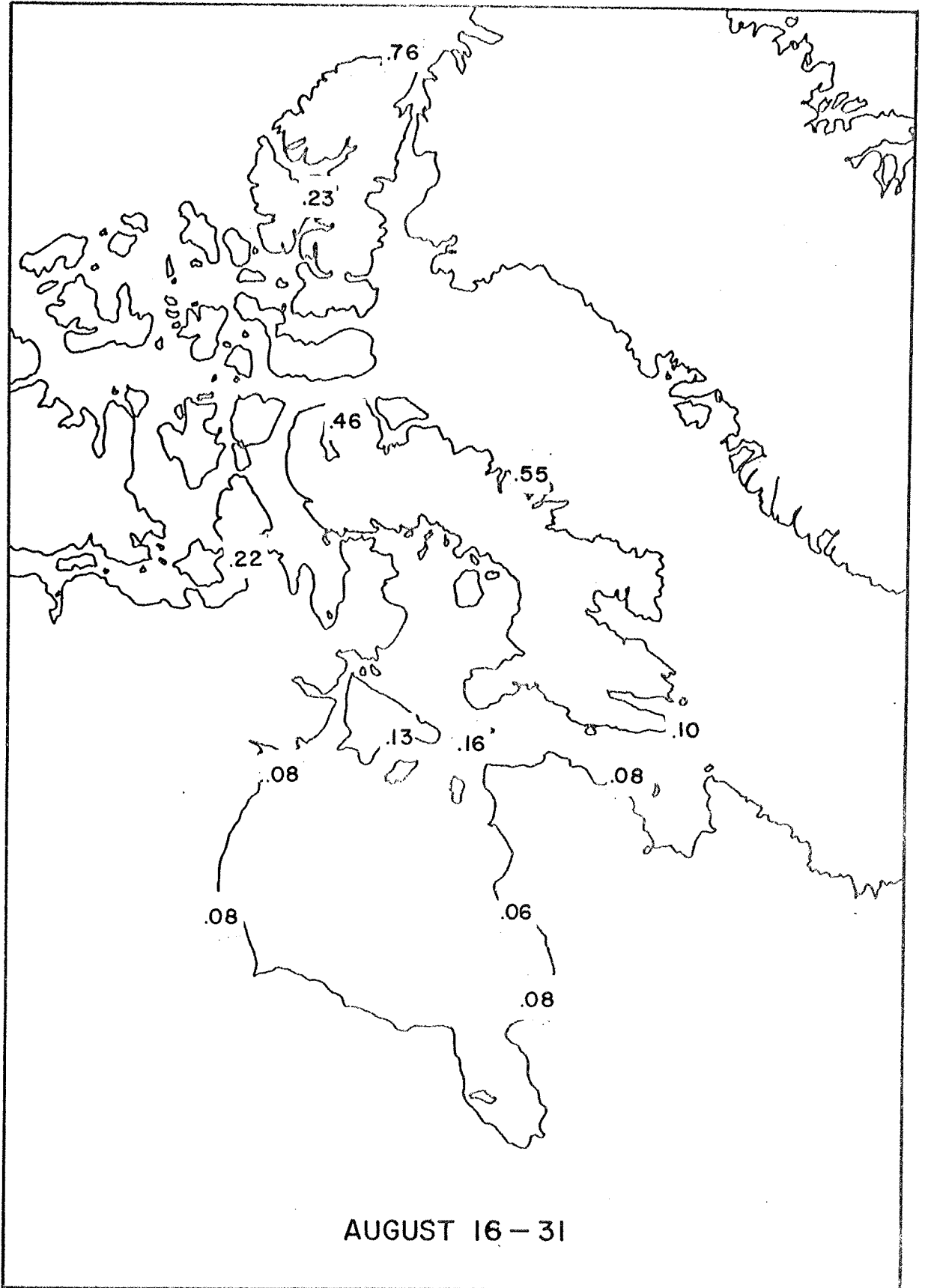
Weather stations and lengths of records analysed
in this study.

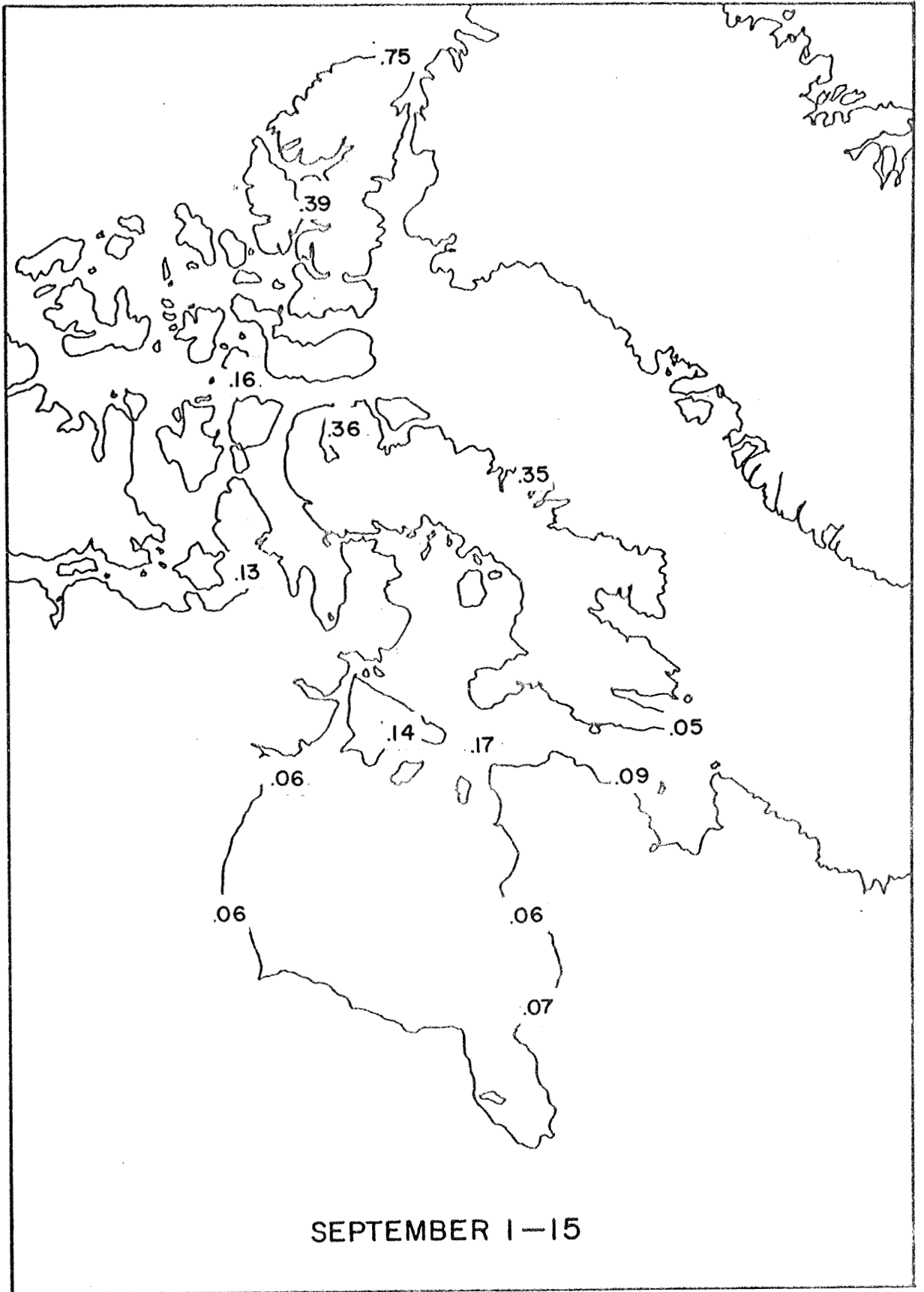
<u>Locality</u>	<u>No. of years of data</u>
Alert	6
Arctic Bay	13
Cape Hopes Advance	11
Chesterfield	15
Churchill	9
Clyde River	3
Coral Harbour	10
Eureka	6
Fort Ross and Spence Bay (together)	4
Great Whale River	8
Nottingham Island	14
Port Harrison	12
Resolute	9
Resolution Island	4

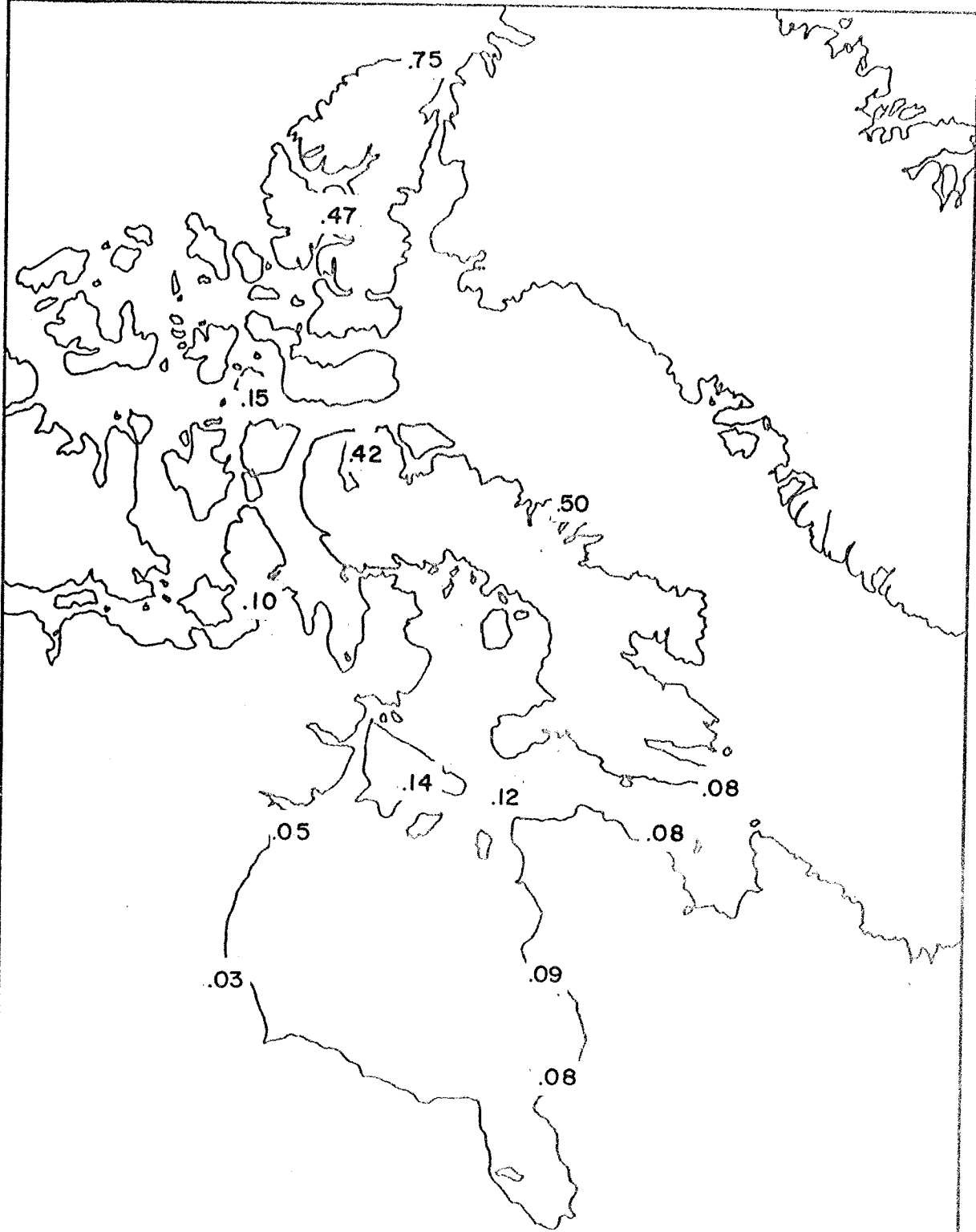












SEPTEMBER 16-30

