

December 15, 1992

World Data Center - A
Glaciology
National Snow and Ice
Data Center

18111 Connelley
Springfield VA 22153

FD170

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RECEIVED

Claire Hanson
WDC-A Glaciology
Boulder CO 80309

Dear Claire,

After a study of the data donated by Sea Ice Corporation (SIC), here are my comments on the various data sets.

1. Sea ice charts of the Alaskan/western Canadian Arctic and the Bering Sea, 1953-1986:

There are numerous 1953 charts (and a lesser number in 1954) which are blank except for brief shore station notes in the legend. This data is of marginal importance, but is probably unique and could be copied elsewhere to discard the blank charts.

In the course of the data extraction, I made numerous comparisons (but admittedly only a fraction of the whole) between SIC ice charts and Navy Hydrographic/Oceanographic Office (NDO) annual reports of the aerial ice recon program. From 1953-1971, the SIC data set largely duplicates the data published in the NDO annual reports. Duplication may well be 80 percent or greater for this time period. Both data sets rely primarily on the same U.S. Navy aerial reconnaissance missions. NDO reports were generally published within 1-2 years of the flights while SIC replotted the data after 1975. No doubt this passage of time caused some differences in interpretation where the recon data was unclear and probably there were isolated errors that were corrected in the replot process. There were also infrequent occasions when a mission plotted in one data set was absent from the other (no predominance observed one way or the other except as described in para 1. a.-c. below).

The most significant differences in the data sets follow:

a. Until a chart change beginning with the 1983 data, the two standard SIC charts extended only to approximately 73°00' N in the Chukchi and the U.S. Beaufort Seas and to 74°00' N in the Canadian Beaufort. Therefore, data from more northerly Arctic penetrations included in the NDO pubs do not appear in the SIC data. This was remedied in about 1962 when SIC began randomly inserting a smaller scale base which extended to beyond 80°00' N on which they were able to include the far north Arctic data. On numerous occasions however, the data south of 73°-74° N is plotted on the standard base with the observations from the area north of 73°-74° N handwritten at the bottom of the chart in the original coded format.

b. In 1967, NDO reports began to routinely include periodic satellite analyses. Except for a brief period in 1967, the SIC charts contain little to no satellite analyses prior to at least 1971.

c. From the mid 1960's, SIC charts include an abundant amount of Canadian aerial reconnaissance. Little of this is present in NOO annual reports.

d. I did not have time to look at the 1972-1974 charts in detail, but from a browse, it appears that comments above in 1. (b.-c.) continue valid through 1974. Beginning with the 1975 data, your file drawers which previously each held two years data hold only one. This near doubling of the yearly data signals the beginning of the SIC real time analysis/forecast years. From that date, the data base is comprised of frequent and extremely detailed sea ice analyses of the Alaskan regions using satellite and ship data, and U.S. Navy, Canadian, and SIC aerial reconnaissance. Without a certainty of the quality of the data, my professional knowledge of, and respect for, the people involved in this analysis would lead me to believe that dating from 1975, this is the best Alaskan data set available. It is certainly the most detailed.

In summary: **1953-1961--Far north aerial reconnaissance data not included on SIC charts.
1962-1971--Some of above still missing on SIC charts and others present only a coded message rather than a plot.
1967-1971--Satellite analyses appear in NOO reports, but not yet in SIC data (except rare).
1965-1971--Canadian aerial reconnaissance generally missing from NOO reports, abundant on SIC.
1972-1974--Uncertain but likely similar to 1967-1971.
1975-1986--All source Alaskan and western Canadian analyses in extreme detail; Joint Ice Center analyses for this period done on global rather than regional scale, precluding significant detail.

**Dates approximate. Changes are often phased in rather than abrupt events.

I should add a word of caution to those wishing to use the data. In 1968, the United States began reporting ice concentration in eighths rather than tenths, then returned to tenths reporting in 1980. Canada retained the tenths format throughout the period. Although SIC worked in eighths from their inception in 1975 until their close of business, they generally plotted both U.S. and Canadian reconnaissance as received. As a result, data may appear in either form throughout the data set and, not rarely in both eighths and tenths on the same chart. SIC summary analyses in eighths frequently overlay reconnaissance data which is plotted in tenths. Since SIC produced these charts for in-house, not public use, which of these formats is used is seldom noted on the charts.

There is also a period when U.S. recon data receives a slightly different treatment from chart to chart. E.g., in sample (1) below, the ice concentration appears next to the station symbol (Δ) whereas in sample (2), the number next to the station symbol is instead the visibility.

(1) $\frac{4}{FM} \frac{3}{FL} \frac{1}{NL} \frac{8}{\Delta} \frac{4}{MF} \frac{2}{SF} \frac{1}{VF} \frac{1}{SF}$ } (2) $\frac{A}{4FM3FL1NL} \frac{5}{\Delta} \frac{8}{4MF2BF1VF1SF}$

CONCENTRATION VISIBILITY

With a good knowledge of codes and the history of code changes and a dash of intuition and care, it is possible to roam the data set without great fear of misinterpretation. Others entering without some preparation may find it hazardous.

2. Box 1: Dehn Severity Index data?

This appears to be raw data and final results of work done to devise a Dehn Severity Index for selected Alaskan north slope areas. I have sent copies of several pages to John Walsh for verification; he has some familiarity with the subject. I yield to him on its value.

3. Box 2: Ice/weather forecasts.

These are operational plain language ice and weather forecasts issued to their prime customer. The forecasts are appended to a surface weather analysis chart. You may know better but I don't know that their would be a use for this data.

4. Box 3: Ice photographs.

Collection of nice looking photographs of ice from reconnaissance missions. I couldn't tell the source of these photos (U.S. Navy, SIC, etc.). I see no geographic location on the photos but can't deny that it might be in the printed numbers. They appear to be good show and tell material but of no significant value otherwise.

5. Box 4: Alaskan climatology.

Some interesting material here, e.g. samples of typical ice conditions in severe, normal, and mild years. I don't know the source of the data (SIC, JIC, NOO?). The data is interesting but certainly repeatable using any reliable data set. A copy might be of interest to Dave Benner at the Joint Ice Center. Much of the box is filled with duplicate copies.

6. Pile X: Small scale ice charts--1975-82:

These are highly detailed sea ice analyses of the Beaufort, Chukchi, and Bering Seas. Assume all source but mostly satellite data. From a spot check, it appears that Bering Sea analyses are duplicates of the analyses presented on the larger standard charts (data set of para 1.). Beaufort/Chukchi analyses appear to be unique additions to the larger data set.

7. Cook Inlet ice charts:

Reasonably detailed ice analyses of Cook Inlet. Probably from satellite imagery. A short period of record, but may be among only Cook Inlet analyses available. You may know better as to availability elsewhere (NOAA?).

8. Floe movement charts:

Charts show selected ice floes and their position/movement with time. I don't think these add much if anything to our present knowledge of ice drift in the Beaufort/Chukchi/Bering areas. Roger Colony or Carol Pease (Bering) at U. of Washington could answer that question.

9. Danish ice charts:

Plots of Danish aerial reconnaissance flown in the Greenland area (mostly southern Greenland). Don't know how complete this data set is for the period of record, but am sure that the data is readily available from the Dansk Met Institut.

10. East Greenland, Baffin Bay, Davis Strait charts, 1968-1970:

These large charts lie on the basement floor (stack nearest the door). They appear to be aerial reconnaissance plots only. All that were spot checked were also in the NOO annuals.

11. Floe size charts, approx 1954-1973:

In basement. Results of this study would be of interest. Charts show percentage of various floe sizes observed during the period in selected areas of the Alaskan seas. I don't know that anyone would want to construct a final conclusion from this raw data considering an uncertainty as to sources and comprehensiveness of the data but, this would save them time and effort if they did.

12. East Greenland charts for 1960:

Large East Greenland charts in basement present Keflavik to Keflavik aerial reconnaissance data. Of the 8 recons spot checked, 5 were not in NOO annual reports. It would appear that this is largely additional unique data.

13. Satellite analyses for East Greenland, Barents, Kara, Bering, and Sea of Okhotsk 1968-1971:

In basement. Appears to be original satellite analyses for all end of the month periods from November 1968 to February 1971. Some of this data has suffered light water damage. Blue ink of the base chart has run and some geographic boundaries cannot be easily distinguished. Data could be extracted easily using a transparent overlay as the ice data is in pencil and is still readable.

This may be more than you wanted to know without answering all your questions. Feel free to give me a call anytime. Thanks for providing the spacious work space and for the night/weekend access. And thanks to all for the hospitality.

Sincerely,

Don

Don Barnett

Copy to John Walsh