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Sea Ice Studies in the Spitsbergen -Greenland Area
Investigation No 28540.

Report
from
Torgny E. Vinje
Norwegian Polar Institute
Postboks 158
1330 Oslo Lufthavn
NORWAY

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INTRODUCTION

The overall objective of this investigation is to utilize LANDSAT data to study sea ice in general and in the Spitsbergen - Fram Strait area in particular and to compare the usefulness of LANDSAT and weather satellite data (NOAA-2, ESSA-8, etc.) for studying sea ice. The specific objectives are as follows:

1. To develop a technique for forecasting changes in the position and concentration of sea ice in the Spitsbergen-Fram Strait area due to the influence of weather (primarily wind) and ocean currents.
2. To determine the physical characteristics of sea ice and ice boundaries, including statistical data on the dimensions and form of ice floes.
3. To determine ice drift velocities in the East Greenland Current, and thereby obtain an estimate of the outflow of ice from the Arctic Basin.

PROBLEMS

The two first scenes from the test site arrived here in the beginning of September, and after that no more data has been received. The Landsat Result Manager, Dr. Robert D. Price, has been told about the scarcity of data, and I have been informed that provided a good health of the satellite, there will be put a higher priority on the investigation which has been extended to include also 1976. However, I hope that data for the 1975 period will arrive here soon so that the investigation which is agreed upon can start.

DATA QUALITY AND DELIVERY

The data quality is excellent but it would be of great value for the planning of the investigation as well as for the operations in the test area if the imageries could arrive here in a relatively short time after they have been acquired. The first two scenes which arrived here in the beginning of September were obtained over the test area on May 29.

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RECOMMENDATIONS

Due to the high latitudes at the test area there will be an overlapping from day to day between 80 and 85 %. This is a special advantage which it was the intention to utilize. Even after three days there will be, as far as I can see, an overlapping of about 60% of the first image in a three days series. Thus a great number of ice floes could be traced if there is made daily maximum acquisitions of imageries for periods of 2-3 days, and all the three main objectives of the investigation could be accomplished. It is hoped that attention is paid to this very important point when scheduling the acquisition of imageries over the test area in 1976.

The Norwegian contribution to the international project Man and Biosphere will mainly concentrate on investigations in Svalbard. It is therefore recommended that the imageries received here also may be used for biological and land use investigations. If there is no objections the findings will be annexed to the future reports.

CONCLUSIONS

The information on the sea ice in the maritime areas as well as the information on snow cover, geomorphological phenomenon and glaciers which can be obtained from the LANDSAT imageries, are unique. It will be of great help for the Norwegian Polar Institute in its work in the Svalbard archipelago. New areas have already been far better mapped (LANDSAT-1) and still more unmapped islands in the east are expected to be covered during the present project.

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