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Glaciological and Marine Biological Studies at
Perimeter of Dronning Maud Land, Antarctica
Investigation No. 28550

Report
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INTRODUCTION

The overall objective of this investigation is to utilize LANDSAT imagery to analyze changes in the Dronning Maud Land coastline and to obtain statistical data on ocean dynamics, plankton distribution, and sea ice and iceberg distribution in this region of Antarctica. The specific objectives are as follows:

1. To develop a technique for assessing the rate of iceberg calving from the Dronning Maud Land coast so that the mass balance of Antarctica in general and of the Dronning Maud Land Ice Dome in particular can be understood.
2. To study iceberg drift in the coastal waters of Dronning Maud Land and to develop techniques for charting marine currents in this area.
3. To determine the distribution and frequency of large sheets of plankton in these coastal waters in order to better understand their relationship to the primary and secondary production rates, and the geographic distribution, of organisms higher in the food chain.
4. To study the statistical distribution of sea ice and icebergs in this area in order to determine any prevailing patterns which might affect the selection of a site for a new scientific station on the Dronning Maud Land coast.

PROBLEMS

The first two scenes, covering different parts of the test area, arrived here in the beginning of September. These scenes were taken in February, and the quality was excellent. No further data ^{have} ~~has~~ been received. I did not expect to receive many scenes from the first part of this year, as the satellite went into operation when only a relatively short part of the 1974/75 austral summer was remaining. But I and the co-

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investigators are somewhat disturbed that we have not yet received any images taken during the present daylight period, although we well appreciate that heavy cloud cover may be a problem. We hope that we soon will receive more images, and in particular of a repetitive nature, so that this investigation can proceed as planned.

RECOMMENDATIONS

In the proposal for this investigation, dated 29 January 1973, it was stated that there were no definite plans for field investigations to obtain ground truth. This should now be amended, as our parliament recently approved that Norsk Polarinstitutt (The Norwegian Polar Institute) sends an expedition to western Dronning Maud Land from January to March 1977. The expedition will consist of about 16 senior scientists, including probably one or two of the co-investigators of this investigation, and the expedition will work partly in the test area of this investigation and partly west of it. This expedition will be collecting relevant ground truth, for example iceberg distribution, plankton distribution, ice shelf thickness measurements, ice movement measurements, and probably ice drift tracking by satellite telemetry.

A second Norwegian expedition is also being planned for the 1976/77 austral summer. This is to study the krill in the Southern Ocean, and will partly work in the same longitudes as the test area of this investigation, ^{but} further north, probably no further south than 65°S. This expedition has not yet received approval, but decision on it will be made by March 1976. This expedition will collect extensive ground truth on the plankton distribution in these waters.

If the life of the satellite permits, then I recommend that it is attempted to collect imagery for this investigation during the 1976/77 austral summer from the working area of the above mentioned expeditions.

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CONCLUSIONS

This investigation has not yet got fully under way because of lack of imagery. But we trust we shall receive such soon, and we are still confident that the LANDSAT tool is of great importance in Antarctic studies.

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