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14. Supplementary Notes

15. Abstract

The     report for project 29020, mapping of areal extent of snow-cover
for better management of water resources in Norway conclude that space-
acquired data can be valuable if it reach the user within a few days after
it has been acquired.  A simple and quick method is recommended taking out
areal extent of snow-cover directly from darker than normal photographic
enlargements of the LANDSAT-imagery, overlaying a sketch of the catch-
ment area and directly measuring the snow-covered area.  By establishing
a curve for snow-covered area vs. subsequent runoff, this curve can be
used to forecast runoff.  It seems to be possible to use the same curve
for other areas than those it was constructed for.

29020

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## II TECHNIQUES

The limited number of imagery obtained during the summer have been carefully evaluated and searched for new information which might be helpful. All imagery covering the test-areas have been photographically enlarged to match the scale of existing maps of the catchment areas. All snow-covered surfaces were enhanced by use of the termo copying process and the total area of snow-cover measured and recorded.

Eight CCT-tapes have been received from Sioux Falls and they were used as input for our ORSER-programs. By use of these programs it was possible to map the snow-line and measure areas of snow cover. The results were compared with available ground-truth.

## III ACCOMPLISHMENTS

There is a clear relationship between the snow-cover (as expressed in sq. km) and the subsequent runoff. We can see that, for example, 100 sq. km of snow cover in two subsequent years (measured during the snow-melt season) will produce approximately the same amount of runoff from the same catchment area.

We are now investigating the possible error which is introduced if the relationship for snow cover versus subsequent runoff as obtained for one given catchment area would be directly applied to another catchment area. If the error proves to be small, so that information from one area can be applied to adjacent areas, this would save much time beacause all parameters would not have to be determined again for each new area before the method could be applied for production planning at various power plants.

## IV SIGNIFICANT RESULTS

None at this point.

## V PUBLICATIONS

None.

## VI PROBLEMS

None.

## VII DATA QUALITY AND DELIVERY

Satisfactory.

VIII  RELATED PROJECTS

A) A project is underway to determine wether LANDSAT-CCT can be used to map vegetation on the Finmarks-vidda mountain plain in Northern Norway. This has great economic interest as grazing area for herds of reindeer during the winther. The use of MSS 5 and MSS 7 was not sufficient to separate various vegetation classes. New tests were made using MSS 4, 5 and 6. This gave a much better result and the combination contained 95 % of the available information. It is still difficult to separate all the classes satisfactory, but it is considered that the result is satisfactory at this stage. The use of the fourth channel (MSS 7) seems to add very little information. Further, because the computer time increases drastically with increasing number of channels, it is definitely worth while to keep the number of channels low, particulary when mapping large areas.

B) Mapping of trawlers in the North Sea

The Norwegian Government's oil company "Statoil" has asked us to investigate wether trawlers are identifyable in LANDSAT imagery. This problem came up in connection with the planning of a pipe-line from oil-wells in the North Sea to the Norwegian island Sotra on the west coast of Norway - a very good fishing area.

An experimental field was therefore placed in an area of frequent ferry-traffic. Two ships could be spotted on the computer printouts. They have about the same size as the trawlers. The "signature" of a ship is a black dot with a bright tail behind it. The trawlers, however, will travel at a much slower speed than the ferries do, and since the bright tail seems to be the most significant part of the signature, it seems difficult to use this method. The conclution will therefore be that the sensors in LANDSAT I and II are not particularly useful for this type of work.

Oslo, December 15, 1976

Helge Ødegaard