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2 April 1975

A SKYLAB PROGRAM FOR THE  
INTERNATIONAL HYDROLOGICAL DECADE (IHD)

Quarterly Report for Period December 1974 - February 1975

EREP Investigation 427 M  
NASA Contract NAS9-13275  
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A SKYLAB PROGRAM FOR THE  
INTERNATIONAL HYDROLOGICAL DECADE (IHD)

Quarterly Report for Period 1 December 1974 - 28 February 1975

This report covers progress during the eighth quarter (1 December 1974 - 28 February 1975) of contract NAS9-13275, "A SKYLAB Program for the International Hydrological Decade (IHD)," EREP No. 427 M. The principal objective of this program is the study of various hydrological aspects (soil moisture, water currents, etc.) of portions of the Lake Ontario basin using SKYLAB and aircraft data. The work is being conducted in the Infrared and Optics Division of the Environmental Research Institute of Michigan, under the general supervision of Mr. R. R. Legault. The principal investigator is Mr. F. C. Polcyn.

PROGRESS

In late February the S-192 data (CCT's) and screening film for this project (from SL-3 Pass 29, 9 September 1973) were finally received. SDO's received were 5 and 6 (.599 - .654  $\mu\text{m}$ ), 7 and 8 (.654 - .734  $\mu\text{m}$ ), 9 and 10 (.77 - .89  $\mu\text{m}$ ), and 16 and 21 (10.2 - 12.5  $\mu\text{m}$ ).

Initial examination of the data on the PDP-8 indicates that despite some preprocessing by NASA (including low frequency noise removal) the SDO's in the visible and near IR regions contain "smoothed out" but still quite evident effects from the alignment light left on during data take. Data currently on the tapes consist of the normal spectral information superimposed on a periodic wave form. This alignment light effect is fairly regular over certain sections of the data but does not remain constant over the entire data set. We have selected an area of interest (which includes the Bowmanville, Wilmot, and Soper basins currently being analyzed at ERIM using ERTS data) wherein the alignment light effect appears constant (periodicity of 274 pixels). During the next reporting period we will attempt to preprocess this data to remove this alignment light effect by subtracting a sinusoidal function with the same period. Such a correction is possible only because the S-192 data we received are conical.

Implementation of the thermal model for determination of surface soil moisture on non-vegetated areas based upon diurnal soil temperatures and ancillary data is continuing.

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#### FUTURE PLANS

During the next quarter we will complete the preprocessing of the S-192 data to reduce the alignment light effect. After this step the data will be converted to ERIM format and processing will be undertaken. It is expected that processing related to terrestrial hydrology, including soil moisture, will be concentrated in the Bowmanville, Wilmot, and Soper basins. An analysis of the quality of the S-192 data (dynamic range, etc.) will be done. In addition, implementation of the thermal model for determination of surface soil moisture on non-vegetated terrain will be completed.

#### TRAVEL

None

#### SPECIAL PROBLEMS

The extent of the periodic wave in the S-192 data (the result of the alignment light and NASA preprocessing) which is superimposed on the normal spectral data is considerable. Processing of the data will be relatively useless unless this effect can be removed or considerably ameliorated.

#### SIGNIFICANT RESULTS

None


#### PUBLICATIONS

None

Respectfully submitted:

  
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Approved by:

  
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