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1 March 1978

QUARTERLY REPORT #2

APPLICATIONS OF HCMM DATA  
TO  
SOIL MOISTURE SNOW  
AND  
ESTUARINE CURRENT STUDIES

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A. Problems

Coordination between NASA aircraft flights and the principal investigator's ground teams is a continuing problem but we seem to be slowly getting better. The February overflight for Cranberry Lake did not come off owing to poor weather. It has been rescheduled for late March.

B. Accomplishments

John Pritchard of NESS has completed a set of software programs for computer enhancement and Earth-rotation and scan-line distortion for preparing printouts and DMD images at various scales. A set of specially processed VHRR thermal-IR images has been furnished to the Project Scientist for dissemination to the HCMM Evaluation Team Members.

A summary of the 20 October 1977 field data report is attached as Appendix A.

C. Significant results

None.

D. Publications

None.

E. Recommendations

As per our letter to the Project Manager we are requesting a small increase (\$2.5K) to install a recording soil moisture gage on the Luverne Test Site.

F. Funds expended to date

Balance of funds	\$2.9K
Spent this period	0.0
Funds remaining	<u>\$2.9K</u>

G. Data utility

Earliest data from aircraft program are not useable owing to excessive "noise" problem. Latest aircraft tapes received are in need of a readout program. This is being worked on. Temperature conversion and printout program furnished by Dr. Price was checked by John Pritchard and was pronounced satisfactory.

APPENDIX A

Summary of the 20 October 1977

Field Data Report

Luverne, Minn.

The purpose of the 20 October 1977 Luverne experiment was to collect sufficient ground information to evaluate the aircraft (U-2) HCMR data, which was to be flown concurrently. It was a typical pre-launch experiment designed to test the instruments and techniques specified and locate any problems that might develop.

The field party consisted of four persons, two from NOAA/NESS (Wiesnet and McGinnis) and two from the SCS at Marshall, Minn. (Hokanson and Nelson).

A recording meteorological station was set up on the test site. Wind direction, wind speed, air temperature and relative humidity were continuously recorded at this site. Additional daily data for the preceding month was obtained from the local NWS cooperative observer.

On the survey date (20 Oct) a total of 18 soil moisture samples were collected; soil temperatures at the surface and at depth, via a probe (0-5 cm), were taken at each sampling site. Sample sites included:

1. bare soil
2. soybean field
3. cornfield (standing corn)
4. cornfield (stubble)
5. disced field
6. plowed field
7. soybean stubble

On 21 October Wiesnet and McGinnis extended the ground-based observations by taking 8 more samples and temperatures. This made a total of 26 soil moisture samples. The location of these samples is

shown in figure A-1.

Skin temperature ranged from 23.0°C to 31.0°C on 20 October; from 16.5°C to 25.6°C on 21 October. Soil temperature (0-5 cm) at depth ranged from 9.8°C to 15.9°C on 20 October, and from 8.4°C to 13.9°C the following day.

Soil moisture values were obtained from Twin City Testing Laboratory, Sioux Falls, S.D. They ranged from 19.6% to 49.2% on 20 October, and from 21.6% to 28.0% on 21 October.

Air temperature ranged from 19°C to 21°C during the period of data collection on 20 October, and from 9°C to 10°C on 21 October.

Several problems were noted: (1) a drive or clock mechanism on the weather station drum was not accurate and (2) some of the probe measurements were apparently done without waiting for the probe to reach equilibrium with the deeper soil temperature. Both problems are correctable.

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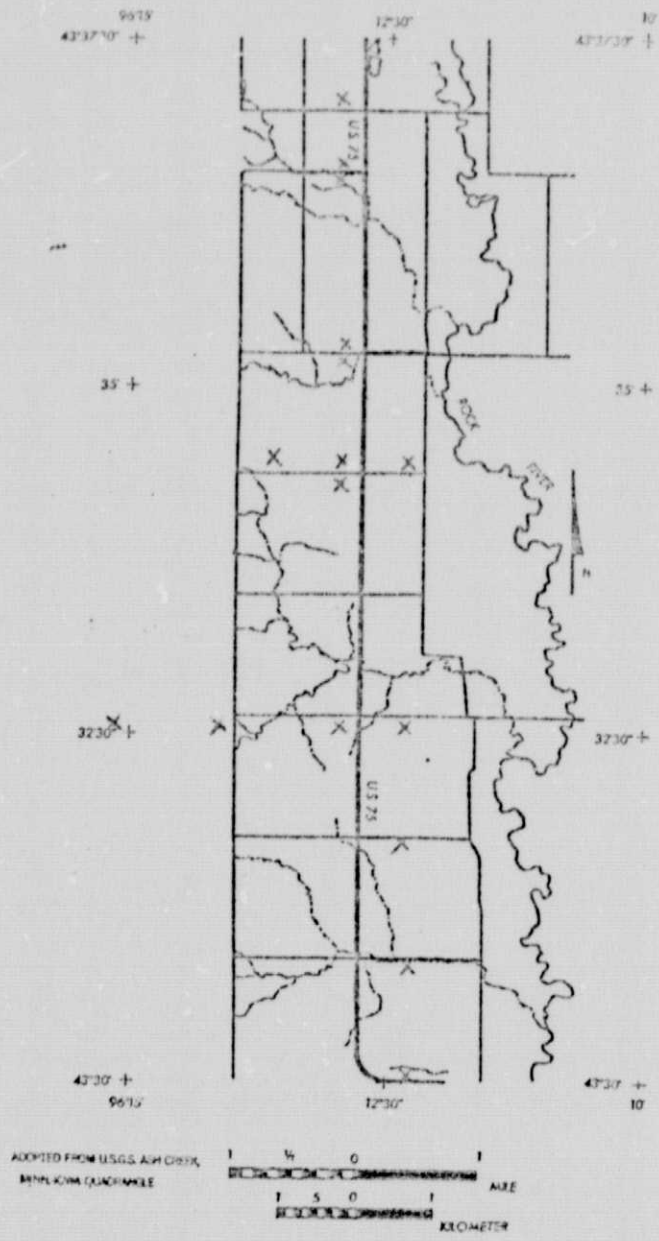


FIGURE A-1 LUVERNE TEST AREA