CR-138682

Organization: Naval Research Laobratory

Title: Determination of Sea Surface Conditions Using Skylab L-band and Radscat Passive Microwave Radiometers

Period Covered: 28 Aug. 1973 through 30 June 1974

EREP Number: EPN 384

Contract Number: NDPR T-4126B

Principal Investigator: James P. Hollinger

Date: 12 July 1974

Technical Monitor: Zack Byrns, Mail Code TF6





This report covers the time period since 28 August 1973 although budget figures are only available through 31 May 1974.

We received tapes of raw data on the S-194 antenna patterns from AIL. A program to unpack and decode these tapes was written and utilized. Second generation antenna pattern tapes were generated from the unpacked and decoded AIL tapes. These second generation tapes for S-194 are in the form necessary for utilization in our antenna convolution program.

Much time and effort has been expended on obtaining a usable S-193 antenna pattern. Two trips, one to the Univ. of Kansas and one to NASA Houston, as well as numerous, long, detailed phone conversations have been undertaken to obtain these patterns. To date we have not received usable S-193 antenna patterns. However we understand that detailed pattern measurements of the S-193 back-up antenna are now in progress and we hope to have them shortly.

A trip was made to New York, N. Y. to confer on ground truth data with Dr. Richard Moore of the Univ. of Kansas and Dr. Willard Pierson of NYU.

We have received and inventoried fifty-three S-193 and S-194 data tapes of which approximately fourteen S-194 tapes are supposedly error free. There is still some question on the skybet data on the S-194 tapes.

Due to deep space calibration anomalies and the software problems mentioned in TF6-74-4-30 we have been forced to consider the S-193 microwave data that we have received to date as unreliable. It is hoped that some of these problems can be solved at the forthcoming EREP PI's meeting in Houston.

The antenna convolution program and all software necessary for data analysis is now complete. This includes a subroutine to rotate the satellite centered coordinate system into an earth centered coordinate system. Another subroutine models the atmosphere and takes account of cloud formation, water vapor content, and liquid water content in the form of small water droplets, as well as ambient air temperature and pressure. A subroutine that models wind field effects on the sea surface has also been completed.

Utilization of the convolution program to investigate simulated sea surface and atmospheric conditions over a wide range of salinity, sea temperature, wind fields, humidity and air temperature is underway.

We have just received (July 12, 1974) S-194 lunar calibration data from SL-2 as well as data from two Amazon basin runs. We are hoping to receive shortly more data on S-194 runs over the Great Lakes and to commence analysis of this data.

In summary all software for the analysis of both S-193 and S-194 data is complete and we have accurate S-194 antenna pattern information in a form compatible with this software. We do not as yet have S-193 antenna pattern data but hope to have it soon. We do not have error free S-193 data or calibrations. We are recently in receipt of error-free S-194 data. These delays in receiving data and pattern information have resulted in a very low level of effort for the last four months which is reflected in the budget figures. We are now in a position to begin detailed analysis of S-194 data and this effort is now underway.

# FINANCIAL MANAGEMENT REPORT

Contract Number: NDPR T-4126B

Contractor: Naval Research Laboratory
Washington, D. C. 20375

Total Estimated Cost: $99,000.00

Task Description: Determination of Sea Surface Conditions Using Skylab L-Band and Radscat Passive Microwave Radiometers

Prepared by: James P. Hollinger

Date: 12 July 1974

Technical Monitor: Zack Byrns, Mail Code TF6

This financial report covers the period from 30 June 1973 through 31 May 1974. Figures for June 1974 are not yet available from our budget office.

| Month | Expenditure | Balance |
|---|---|---|
| July 1973 | $3 K | $81 K |
| August 1973 | 4 | 77 |
| September 1973 | 4 | 73 |
| October 1973 | 4 | 69 |
| November 1973 | 7 | 62 |
| December 1973 | 2 | 60 |
| January 1974 | 5 | 55 |
| February 1974 | 4 | 51 |
| March 1974 | 2 | 49 |
| April 1974 | 1 | 48 |
| May 1974 | 1 | 47 |