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E82-10248

TECHNICAL REPORT STANDARD TITLE PAGE

CR-168829

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1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Interactive initialization of heat flux parameters for numerical models using satellite temperature measurements.		5. Report Date May 22 1981
7. Author(s)	6. Performing Organization Code	
9. Performing Organization Name and Address FRENCH		8. Performing Organization Report No.
12. Sponsoring Agency Name and Address NASA Goddard Space Flight Center Code 902.6, Greenbelt, MD 20771		10. Work Unit No.
		11. Contract or Grant No.
		13. Type of Report and Period Covered 1st Quarterly Report
		14. Sponsoring Agency Code
15. Supplementary Notes		
16. Abstract During the first three months of this grant, efforts were made in two directions (i) to bring the image processing and boundary layer model operation into a completely interactive mode and (ii) to test our present method for determining the surface energy budget and surface moisture availability and thermal inertia on a scale appreciably larger than that of the city which was the focus of our previous HCMM grant.  (E82-10248) INTERACTIVE INITIALIZATION OF HEAT FLUX PARAMETERS FOR NUMERICAL MODELS USING SATELLITE TEMPERATURE MEASUREMENTS Quarterly Report, 10 Mar. - 31 May 1981 (Pennsylvania State Univ.) 4 p N82-24526 HC A02/MF A01 Unclas G3/43 00248		
17. Key Words (as listed by Author(s)) heat flux surface temperature interactive surface soil moisture		18. Distribution Statement
19. Security Classif. (of this report) unclassified	20. Security Classif. (of this page) unclassified	21. No. of Pages
		22. Price*

\*For sale by the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Figure 2. Technical Report Standard Title Page

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MAY 29 1981  
SIS/902.6  
HFO-003  
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First Quarterly Report  
to  
National Aeronautics and Space Administration  
Interactive Initialization of Heat Flux Parameters  
for Numerical Models Using  
Satellite Temperature Measurements

March 10 - May 31, 1981

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## I. Introduction

During the first three months of this grant, efforts were made in two directions (i) to bring the image processing and boundary layer model operation into a completely interactive mode and (ii) to test our present method for determining the surface energy budget and surface moisture availability and thermal inertia on a scale appreciably larger than that of the city which was the focus of our previous HCMM grant.

## II. Results

### 1. Model development

At present only a month of work or less remains to be done in order to be able to employ our method in a completely interactive mode. Both the boundary layer model and the image rectification and resampling programs have been converted for use in the minicomputer and incorporated into the job stream. It was necessary to streamline the boundary layer model in order that it would operate more efficiently on the slower computer with limited core space. The model now executes on the minicomputer at about the same speed as it ran on the IBM 370.

2. We are examining a region a few hundred kilometers on a side centered over southern Indiana during a period 21-22 August 1978. Because of the orbital schedule and the presence of clouds over some parts of the region, it was necessary to use a 36-hr orbital day/night pass rather than a pair 12 hours apart. Throughout August, southern Illinois and southwestern Indiana were experiencing a notable drought, as indicated by very low precipitation amounts and negative crop moisture indices. Conversely, central Indiana received near or above normal precipitation and the crop moisture index was positive.

The purpose of performing our analyses of surface parameters on a regional scale is to learn if significant changes in rainfall can be detected by variations in the surface moisture availability and also to find out if our method will yield reasonable results on this scale. A further use in performing these analyses on the IBM 370 is that the patterns obtained will be compared with those determined on the minicomputer by the interactive method, which should become operational this summer.