USE OF THERMAL INERTIA DETERMINED BY HCMM TO PREDICT NOCTURNAL COLD PRONE AREAS IN FLORIDA

HCMM Data Investigation HFO-002
Contract NAS5-26453

L. H. Allen, Jr., Principal Investigator
University of Florida
Institute of Food and Agricultural Sciences
Building 164, Agronomy Physiology Lab.
Gainesville, FL 32611

Ellen Chen, Cooperator
J. D. Martsolf, Cooperator
P. H. Jones, Cooperator

June 15, 1982
Progress Report for December 16, 1981 to June 15, 1982.

Prepared for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
Greenbelt, MD 20771

LIST OF TABLES

LIST OF ILLUSTRATIONS

TABLE OF CONTENTS

INTRODUCTION

This progress report covers problems and progress for the period December 16, 1981 to June 15, 1982. Because of numerous problems with data tapes and processing, the HCMM Data Investigation contract was extended (no-cost) from July 15, 1982 to November 15, 1982.

USE OF THERMAL INERTIA DETERMINED BY HCMM TO PREDICT NOCTURNAL COLD PRONE AREAS IN FLORIDA

1. Problems:

A. Problems with HCMM computer-compatible data tapes (CCT's).

A total of 21 CCT's containing HCMM data were received between September 1981 and March 1982. Problems were encountered when we attempted to read some of the tapes. It was then decided to canvas all the tapes. Twelve tapes were found to contain inadequate data or header information. Results of the canvas are listed in Table 1. The information was relayed to HCMM Project personnel. Tapes 3, 5, 7, 8, 13, and 14 were confirmed to be bad. Information contained in Tapes 7 and 8 are no longer available. Information in Tapes 13 and 14 will be sent to us again.

A replacement tape for Tape 3 (AAC-233-071303) was received on June 3, 1982. (Another CCT was received on July 12, 1982, after this report was written.)

B. Problems in extracting data from CCT's.

The program we use to read the HCMM CCT's was sent to us by Dr. John C. Price. The print out was in temperatures in table form. We found the format not suitable for our purpose because it was difficult to locate the geographic latitude and longitude for areal analysis. The program was altered to printout the 0-255 grey scales in ASCII characters so that the result is displayed in a map format (Fig. 1), where only a small portion is shown.

There are several problems encountered when producing the results shown in Fig. 1. It was found that there are no data beyond line 807, whereas on the header information, the line number of frame center is 720, where one would expect a total of 1440 lines on the frame. Much time was spent in locating the desired geographic area. We also attempted to read beyond the first few files to get to the Florida peninsula (Fig. 2) but found that we could not read beyond the boxed area, a small portion was shown in Fig. 1.

C. Image Processing

The IMAGE 100 system was dismantled at Kennedy Space Center and loaned to the University of Florida. Parts of the total system are not yet fully operational, so we have not been able to proceed with image processing as an alternative to CCT processing.

2. Accomplishments:

   A. We are working with Dr. Toby Carlson, previous HCMM contractor, to try to adapt his model to Florida HCMM data and conditions.

   B. We have worked with Penny Masuoka to get replacement information on critical, but quality data (Tapes #22 and #23 in Table 1 have been received).

   C. Problems illustrated by Figures 1 and 2 have been overcome, and we now have a detailed quantitative temperature map completed of the northern Florida peninsula.

3. Significant Results:

   Because of limited accomplishments, we do not have any significant results since the last report. See previous quarterly reports.

4. Publications:

   None for this report.

5. Recommendations:

   No new recommendations. See previous quarterly reports.

6. Funds Expended to date (June 15, 1982) - $35,034

7. Data Utility:

   See previous quarterly reports.

8. Program for next reporting interval:

   A. Adapt Carlson model and develop thermal inertia map as related to surface conditions and antecedent soil moisture with the CCT data that are available.

   B. Use simple model to predict nighttime low surface temperature from daytime surface temperature, and compare with actual diurnal GOES data, HCMM data, ground level transect data, and NCC data.

   C. Develop maps of thermal inertia of Florida under a range of soil moisture conditions.

   D. Prepare final report in line with the objectives of the Statement of Work.

TABLE 1. Condition of HCMM CCT's received between September 1981 and March 1982.

Sequence No. of CCT	Tape Information	Date Received	Tape Condition
	AAO-		
1	259-065703 files 1-4 265-070703 files 5-8 267-182801, 2; files 9-15	Sept. 18, 1981	Good
2	233-07130P, DU 8123811	Sept. 28, 1981	Good
3	233-07130P, DU 8123812	"	Header Info = -1 or 255 no lat. or long.
4	278-183506, 7, 8	"	Good
5	278-183506, 7, 8	"	Tape was dumped in Hex. contains zeros and 256. Header = -1 or 255
6	278-183506, 7, 8	"	Header Info = zeros. lat. long. = zeros
7	265-065806, 7, 8	Oct. 12, 1981	Header Info = zeros lat., long. = zeros
8	265-065806, 7, 8	"	Header Info = -1 or 255 no lat. or long. Tape was also dumped.
9	265-065806, 7, 8	"	Good
10	281-070403 files 1-7 283-183001, 2; files 8-14	Oct. 30, 1981	Good
11	262-183701, 2; files 1-7 235-183611, 2; files 8-14 264-064903, files 15-18 233-071303, files 19-22	"	Good
12	278-183501, 2; files 1-7 278-183601, 2; files 8-13	"	Dumped, file length = 0
13	281-06580P, files 1-8	Nov. 9, 1981	Header Info = some large number lat = .835, long = .885
14	281-06580P, files 1-6	"	Header Info = 0 lat., long. = 0

TABLE 1 (cont.)

Sequence No. of CCT	Tape Information	Date Received	Tape Condition
	AAO-		
15	281-06580P; files 1-6	Nov. 9, 1981	Good
16	259-064806	Nov. 10, 1981	Good
17	259-06480 259-064804, 5, 6, 7, 8	"	Header Info = -1 or 255 no lat. or long. given
18	262-18320 ln = 2236	Nov. 12, 1982	Header Info = zeros
19	262-18320 ln = 2279	"	Header Info = zeros
20	262-18320 ln = 2287	"	Dumped, no files found on tape
21	283-182801, 2; files 1-7	Mar. 5, 1982	Good
22*	233-0713-03; files 1-4	June 3, 1982	
23*	278-1835-01, 2; files 1-7 281-0658-03; files 8-11 259-0648-03; files 12-15 262-1832-01, 2; files 16-22	July 12, 1982	

---

* Replacement corrected CCT.

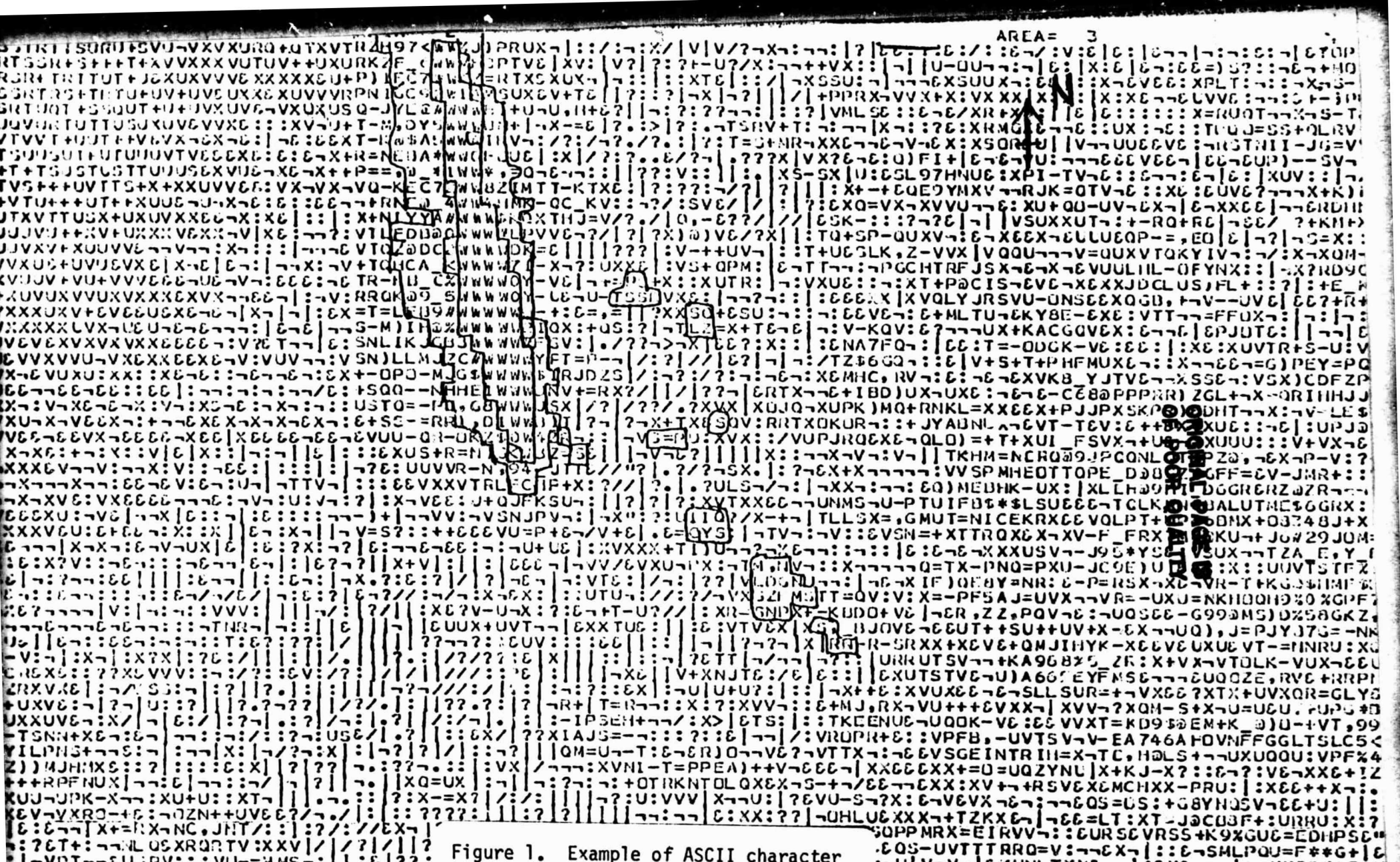

Figure 1. Example of ASCII character map from HCMM image for February 1, 1979, Night IR.

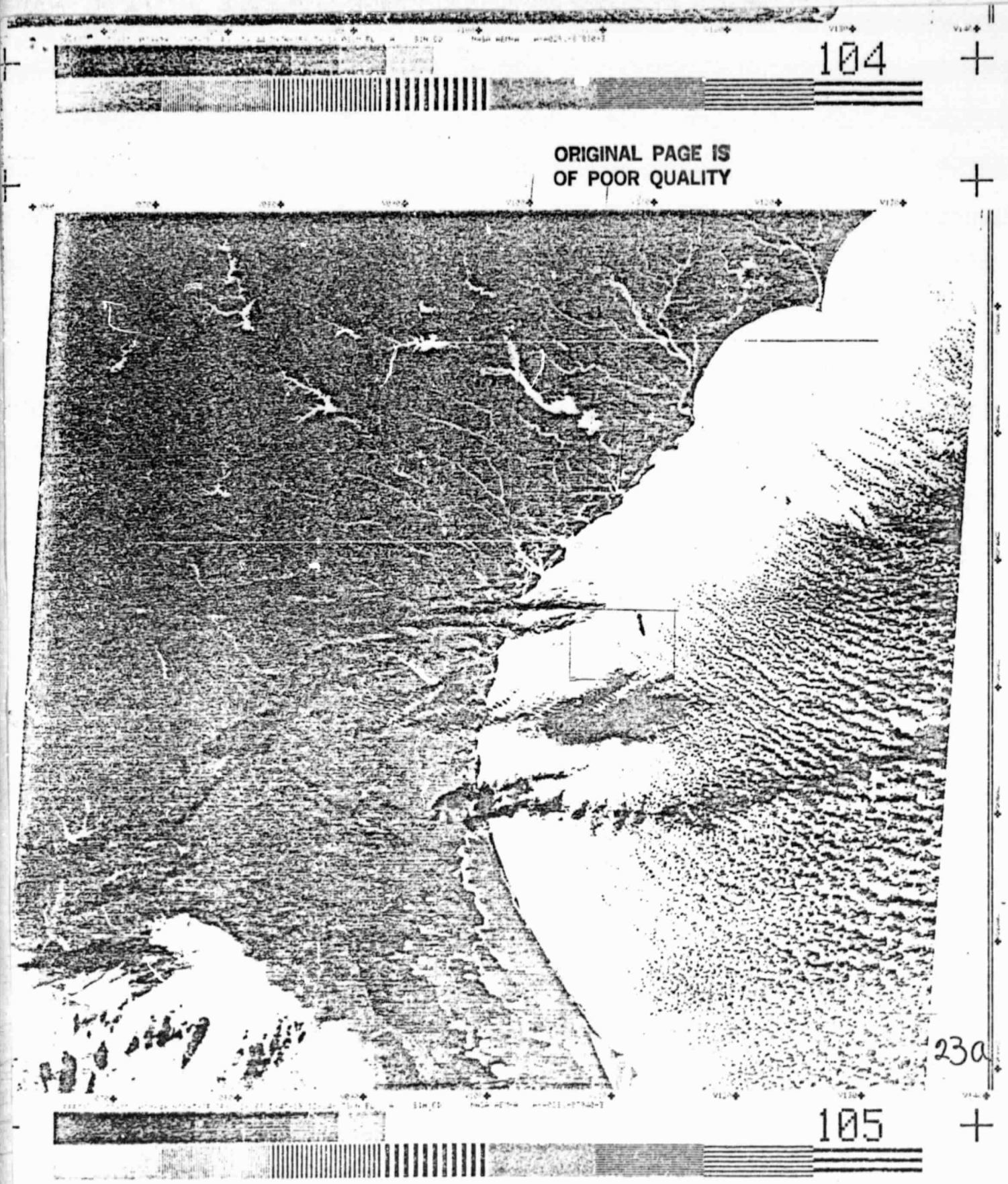

Fig. 2. HCMM image for Feb. 1, 1979, Night-IR, AA0-281-07040-3.