EREP MONTHLY PROGRESS REPORT - NUMBER 2

Period: May 15, 1973, to June 15, 1973

INVENTORY OF FOREST AND RANGELAND RESOURCES, INCLUDING FOREST STRESS

Registration No. 418

Principal Investigator: Robert C. Heller

Coinvestigators: Robert C. Aldrich
Frederick P. Weber
Richard S. Driscoll

Forest Service, U. S. Department of Agriculture
Pacific Southwest Forest and Range Experiment Station
P. O. Box 245
Berkeley, California 94701
(415) 841-5121 ext. 540

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A. Overall Status

1. Atlanta, Georgia - forest inventory site (512 and 512A)

The period May 15 - June 15 has been particularly fraught with problems caused by the late SL-2 launch and poor weather conditions over our test site.

The 10-day delay in SL-2 launch meant that our original site along GT-43 was in darkness on all ascending nodes. Mr. Ryborn Kirby notified us on May 23 of this fact and informed us that we could get data along a displaced GT-19 if we could use these data in our experiment. We had five men in the field in preparation for a possible May 22 or 27 pass on GT-43 at this point. Four steel towers had been erected over representative forest classes for installation of five spectrometers.

We decided to pick a new forestry site (512A) east of site 512 along the same latitude to permit correlation of spectrometer data. We are using a pyrheliograph to do this and have requested C-130 24-channel multispectral scanner data over one four-square-mile block at each site--512 and 512A. We notified Mr. Kirby of the new site locations and indicated that the cost of collecting new ground data would be increased because of additional travel and analysis required. Mr. Kirby acknowledged this increased cost and indicated that adjustments might be made in our proposal costs.

After installation of one spectrometer at site 512, all field men returned to Berkeley, California, by May 24. On this date no one was certain whether the astronauts would be successful in making SL-1 a viable data collecting satellite for EREP (lack of power and excessive heat).

On May 29 we were notified that GT-19 was a primary track for June 4 and that our site 512A would be covered--weather permitting. R. C. Aldrich and F. P. Weber returned to Atlanta on May 31 and installed the remaining four spectrometers on the towers. These spectrometers are sending spectral data to ERTS via 3 DCP's. They stayed near the new site to report weather and indicate state of readiness to Mr. Kirby in Houston.

EREP data were taken on June 4 along GT-19. According to our ground observation, the western portion of our new area (512A) had scattered clouds and the southern and eastern portions had broken clouds at the time of the Skylab pass. A postmission report was made to this effect. The C-130 aircraft took airborne data at precisely the time of the Skylab overpass over one block in site 512; they were unable to fly the block at site 512A because of excessive clouds. A copy of the pyrheliograph (Fig. 1) for the period June 4-10 indicates the extreme cloudiness for the period. Note particularly the low irradiance readings on June 9, the date of the next EREP pass. Site 512A was not selected as a candidate site on June 9 because of the expected poor weather and excessive cloudiness--a good decision.

The Forest Service aircraft with Zeiss and Polaroid cameras was flown to Atlanta on June 5 to gather supplemental information needed because of the change in site location. Extremely cloudy conditions prevented us from taking aerial photographs during the period June 6 through June 12. CIR photos (scale 1:16,000) were obtained on June 13-14.

2. Black Hills, South Dakota - forest stress site (312)

During this period, the Black Hills site (312) was readied for a SL-3 pass in August by installing a new 70-foot tower to collect spectral data over dying beetle-attacked pine trees. Foliage on the dying pines is presently green but will change to yellow and yellow-red by August.

3. Manitou, Colorado - range inventory site (313)

The Manitou range inventory site (313) vegetation was catalogued, ground photographs were taken, and supplemental ground data were obtained in preparation for a SL-2 pass on June 11. No data were obtained on June 6 because of the EVA needed to free the solar panel on SL-1.

The SL-2 pass on GT-48 on June 11 at 0917 MDT (1517 GMT) was good. It was clear over the S-191 site. Some broken clouds were observed over the northwest corner of the area. By 0945 MDT there was a 25 percent cloud cover over the entire area. R. S. Driscoll reported the above conditions to Mr. Ryborn Kirby who indicated that the data would be processed.

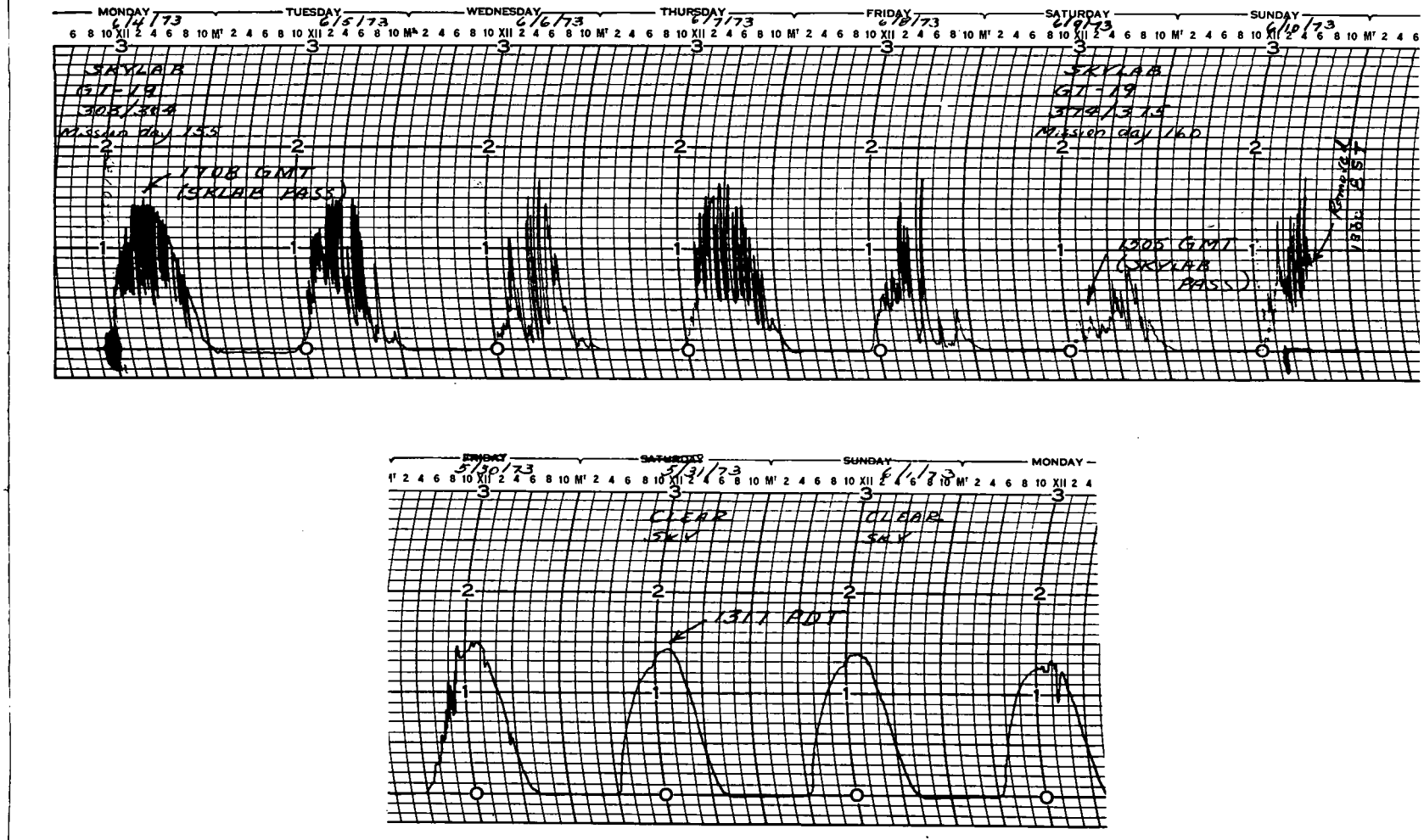

Figure 1. Pyrheliograph chart indicates cloudy conditions on June 4, 1973, at time of Skylab overpass 1308 EDT (1708 GMT)). On June 9, 1973, 1105 EDT (1505 GMT) heavy rains and extreme cloudiness prevailed at time of Skylab overpass. On portion of chart (below) note response of sensor on a clear day with no clouds.

Measurements made at the S-191 site during GT-48 pass included:

a. Apparent radiant energy - PRT-5

(1) Lakes and streams
(2) Meadows
(3) Upland grassland

b. Total irradiance by pyrometer

c. Examination of forest and range types along GT-48 for phenological development. Will continue for one week.

There was no aircraft support during the SL-2 pass. However, Mr. Kirby indicated that he would arrange for RB-57 aircraft support as per contract within one week.

Problems:

a. Change in ground track back to correct position precludes coverage of the same test site by all sensors on SL-3. For example,

S-190A - includes same area except for 10 percent in NE corner of site

S-190B - includes 60% of June 11 track 48

S-191 - will be covered by the spectrometer and S-190A and S-190B

S-192 - sensors will not cover S-191 site.

B. Recommendations Concerning Decisions Required to Ensure Attainment of Experiment's Scientific Objectives

We recommended to Mr. Kirby on May 31 that for SL-3 and SL-4 missions the laboratory (SL-1) by put back on its original track. Whatever the management decision becomes, we wish to be informed at the earliest possible date.

We request that any SL-2 190A and 190B photographs taken near our forest stress site (312) in South Dakota on displaced GT-19 be made available to us.

Because so much additional ground truth was obtained on site 512A on GT-19, we request that coverage be obtained for this site on SL-3 and SL-4. This coverage would be in addition to data for our original

site 512 on GT-43. The opportunity of getting favorable weather on two different days increases our chances of getting coverage from Skylab or by aircraft.

C. Expected Accomplishments During Next Reporting Period

None - unlikely that we will receive any Skylab data until after this period.

D. Significant Results, Practical Applications, and Operational Problems

It would be helpful to have as much advance notice as possible to aid in our planning regarding expected overflight dates for SL-3 and SL-4 for all three sites.

E. Summary Outlook

We shall keep to our original proposal and statement of work. We should know better about the extent of work after receipt of SL-2 photographs and supplemental data.

F. Travel Summary and Plans - June 15 to July 15, 1973

Four men will return from the Atlanta test site after completing the ground examination. No further SL-2 passes occurred after June 9 because of low sun angle and inclement weather on site 512A.

Two men will return to Fort Collins from the Manitou test site following the ground collection of data on June 11.

There is no expected travel during the next reporting period.