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EVALUATION OF ERTS DATA FOR CERTAIN HYDROLOGICAL USES

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ERTS Proposal NASA No. 109
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Task No. 432-641-14-03

Objective:

The overall objective of this investigation is to evaluate ERTS data for hydrologic information in two areas in which extensive ground truth is available.

a. Sierra Nevada studies.--Here the objective is to evaluate ERTS data from mountainous region with extensive ground truth and where a prolonged melting snowpack is the primary source of surface runoff to a highly managed river system. To determine--by comparing satellite and ground truth data--the feasibility of indirect quantitative assessments of water storage in reservoirs and possibly in the snowpack as snow. Snow mapping in mountainous terrain is an extremely challenging task.

b. Lake Ontario (IFYGL) studies.--Here the objective is to assess in a quantitative way, the ERTS data from a temperate region lake and from its drainage basin, in terms of hydrologic information content, relating ground truth to spectral band, ground resolution, etc. Coincident use of ITOS-D imagery and data will permit evaluation of the effect of the 18-day revisit cycle on hydrologic phenomenologic monitoring.

Significant Results

A snow-extent map of the American River basin was prepared for 27 May 1973 from MSS band 4 imagery. The basin was 14% snow covered. NOAA-2 visible band imagery was used to determine date of disappearance of snow in basin: 15 July 1973.

A snowmelt curve comparing ERTS-1 and NOAA-2 snow-extent maps is shown in figure 1. ERTS-1 data were superior in quality and outstanding in cartographic fidelity and were found to be an excellent control or "calibration" for the distorted and coarse resolution (1 km) imagery

from NOAA-2's VHRR which, however, is available on a daily basis.

Work Plans:

- Map Lake Ontario basin snow cover using VHRR imagery from NOAA-2.
 - Continue to search for proper program for CCT digital printouts of soil moisture effect on reflectance in Scipio, N.Y. area.
- Continue reduction and collation of multispectral aircraft data, thermal-IR data, gamma ray data and ground truth data of same site.
- We plan to purchase new color analyzer. Several brands are under consideration.

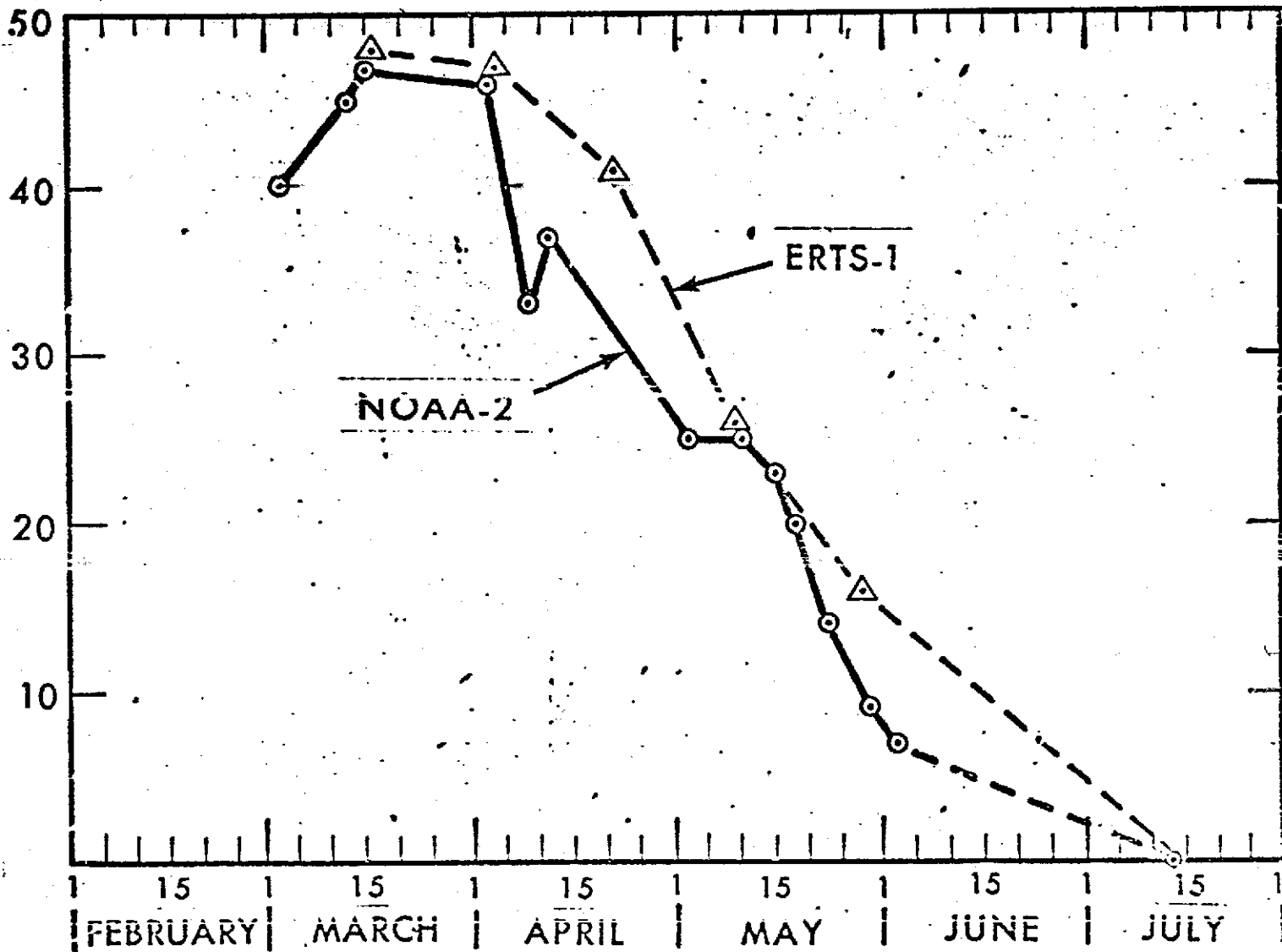
Problems

The color enhancer in use in NESS has not been operating well. This has caused certain problems in examination and evaluation of the ERTS data. We are now seeking to purchase a suitable replacement. Hopefully, delivery time can be before 1 December 1973.

Vacation and training courses slowed down production during this period.

Figure 1. Comparison of snow-extent mapping of the American River basin, California, by NOAA-2 and ERTS-1 satellites.

PERCENT OF BASIN COVERED WITH SNOW



1973