

SECTION 3

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DEVELOPMENT OF EARTH RESOURCES SURVEY

TECHNIQUES AT GSFC—OVERVIEW

by

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I should like to give a necessarily brief overview over the Earth resources survey activities at the Goddard Space Flight Center.

First, I should try to put these activities into the context of an overall Program rationale for Earth resources surveys from space (Figure 1). I believe, that such a basic programmatic framework applies to all Earth observations from space, regardless of their ultimate application, be it for weather forecasting or crop inventory. Within this programmatic framework, I will show you that activities at GSFC are primarily focussed on the following:

(1) Definition and demonstration of remote sensing techniques which lead to the measurements of physical quantities from which Earth resources related parameters can be determined. The presentations by Hovis, Curran, Shenk, and Gloersen which will follow are examples of this activity.

(2) Development of sensors, spacecraft, and on-board as well as ground based data management systems. These developments are geared to the flight of automated space observation systems such as NIMBUS and ERTS. These systems are operated by GSFC when they are flown. There will be no presentations of this part of the GSFC program since, I believe that our activities in this area are quite well known. I will, however, present a table which shows how the various remote sensing concepts relate to the sensors flown on ERTS and NIMBUS or to those which are yet to be developed for later missions (Figure 2). I will also show a chart to demonstrate the clear parallelism between the various characteristics of meteorological satellite missions, with which we have had more than 10 years of experience, and Earth resources survey missions, of which ERTS is our first (Figure 3).

(3) Determinations of Earth Resources related parameters from the remote sensing observations and measurements. Examples of these activities will be given in the presentations by Salomonson, MacLeod and Short.

(4) Applications of Earth observations to resource management, i.e., to the exploration and conservation of natural resources and to the protection from environmental hazards. This activity has just begun at GSFC in the sense that we consider the applications which will result from the ERTS observations as pilot experiments in this very important area. In this activity we expect to work very closely with User Agencies, with over 200 individual ERTS investigators and with other NASA centers, particularly as they will apply the observations in their own geographic regions to solve resource management problems.