APPLICATIONS OF SPACE TECHNOLOGY TO WATER RESOURCES MANAGEMENT

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Considerable effort accompanied by significant progress has occurred in the last several years in applying visible and infrared remote sensing measurement to water resources management needs. The Landsat and NOAA environmental satellite systems have provided spacecraft observations that are proving to have utility in several hydrologic areas. The major areas where the needs of the water resources management are being met involve the mapping and monitoring of snowcovered area, hydrologic landuse, and surface water area.

Landuse mapping from Landsat has been successful in providing appropriate inputs to engineering watershed models at accuracies comparable to conventional techniques with cost savings of 55 to 85 percent and order of magnitude time savings. Flooded area mapping and surface water surveys have also been accomplished in fractions of the time and cost entailed with conventional methodology. Lake area estimation accuracies have been found to be ±8 percent when water bodies 5 hectares in size are involved. The accuracies improve to ±1 percent for water bodies 500 hectares in surface area. The combination of the NOAA Very High Resolution Radiometer (VHRR) on the Landsat Multispectral Scanner Subsystem are being used successfully to map snowcovered area in the western United States.

In the case of snowcovered area mapping the transfer of technology process is now being accomplished in the western United States in a cooperative effort involving 6 federal agencies and 3 state agencies along with NASA. A new collaborative effort of the U.S. Army Corps of Engineers and NASA involves the mapping of landuse by Landsat and its use in hydrologic engineering watershed models employed in flood/control/waterworks planning, design, and management.

Improved systems planned for implementation in the 1978 to 1981 time frame can be expected to result in increased utilization of visible and near infrared, remote sensing observations. Research being carried out now also suggests that microwave observations may be able to monitor more fundamental hydrologic variables and, thereby, make a more essential contribution to water resources management.