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SATELLITE SYSTEM TO STUDY OCEANS

The NASA fiscal 1981 budget contains start-up funds for the development of a proposed joint civil-military ocean monitoring satellite system.

The program, called the National Oceanic Satellite System, is planned to be a joint endeavor of NASA, the Department of Commerce's National Oceanic and Atmospheric Administration and the Department of Defense. The satellite system will be jointly funded and managed by the three agencies.

The new monitoring system is proposed as a limited operational demonstration of the feasibility of providing from polar-orbiting spacecraft -- in near real time and under varying weather conditions -- continuous observation of the Earth's ocean surface winds, sea state, surface water temperature, wave height, ice and other geophysical measurements.

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The design duration of the operational demonstration is five years at an estimated cost of $800 million.

Previous research and development spacecraft -- Nimbus, GEOS and Seasat -- showed that satellite observations of the oceans can play an important role both operationally and as a research tool.

Data from the proposed satellite system, due to its coverage and timeliness, should improve the efficiency, safety and cost of ship operations, transportation, off-shore oil and gas exploration and drilling, platform operations, marine construction, commercial fishing, pollution monitoring, ice monitoring and marine search and rescue. Also, it is expected to be especially useful in improving National Oceanic and Atmospheric Administration global weather forecasting services.

The U.S. Navy expects to use data from the monitoring system for the selection of operating areas, ship routing, strategic operations, anti-submarine warfare, acoustic predictions, tactical ship routing and global ocean data forecasting.

The proposed system has two major parts, the flight segment and the ground segment. The flight segment will be launched into intermediate orbit 300 kilometers (186 miles) altitude on the Space Shuttle. The major portion of this segment is an observatory, consisting of a spacecraft "bus" and a specific instrument complement. The spacecraft bus will provide power, attitude control, thermal control, communications, command and data handling, and the necessary propulsion capability to attain mission orbit of 600-900 km (373-560 mi.) altitude and return to the lower Shuttle orbit.

The basic instrument complement for the satellite consists of three previously flown instruments and one now in development. The new instrument is the Large Antenna Multichannel Microwave Radiometer, a much larger version, with a 3.6-meter (11.8-feet) diameter antenna, of the Scanning Multichannel Microwave Radiometer flown on Nimbus-7. Primary usage of the radiometer is monitoring the sea surface temperature, wind speed and sea ice and providing atmospheric corrections for the on-board Altimeter and Scatterometer.

The Altimeter is the same instrument flown on Seasat, except that two will be flown in the new system for redundancy to meet mission life requirements. It will monitor ocean wave parameters and ocean currents.

The Scatterometer is an upgraded version of the Seasat Scatterometer System. The new version will have six antennas instead of four and also redundant electronics. It will monitor surface wind velocity over the oceans.

The fourth instrument, the Coastal Zone Color Scanner, is the same as one flown on Nimbus-7 with three additional channels and will monitor chlorophyll concentration and water turbidity distributions.

The ground segment of the program is a combination of systems which, in conjunction with tracking and data spacecraft, and a domestic communications service, will provide on-orbit operation and ground data processing and data distribution for the mission. This segment includes a primary processing facility, observatory and system control facilities, archiving facility, and interfaces with primary National Oceanic and Atmospheric Administration and Department of Defense user facilities.

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