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APPLICATION OF ERTS-1 IMAGERY TO FLOOD NUNDATION MAPPING*

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ABSTRACT

In September, 1972, heavy rains initiated major flooding in southwestern Iowa, concentrated in the East and West Nishnabotna basins. The flood crest moved downstream between September 11-15. A cooperative program to evaluate the possibility of mapping flood inundation using remote sensing techniques was initiated jointly by the Iowa Geological Survey, Remote Sensing Laboratory (IGSRSL), and the U. S. Geological Survey, Water Resources Division. Ground data and a variety of low altitude multispectral imagery was acquired for the East Nishnabotna River on September 14-15. This successful effort concluded that a near-visible infrared sensor could map inundated areas in late summer for at least two days after flood recession. ERTS-1 imagery of the area was obtained on September 18-19. Analysis of MSS imagery by IGSRSL, USGS, and NASA reinforced the conclusions of the low altitude study while increasing the time period critical for imagery acquisition to at least seven days following flood recession. The capability of satellite imagery to map late summer flooding at a scale of 1:250,000 is exhibited by the agreement of interpreted flood boundaries obtained from ERTS-1 imagery to boundaries mapped by low altitude imagery and ground methods. The synoptic coverage of ERTS-1 allowed extension of the flood mapping to the West Nishnabotna River. Satellite imagery allows rapid appraisal of the areal extent of flood inundation for the entire river systems. This satellite flood mapping should prove valuable to federal and state agencies involved in regional floodplain management and planning.

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