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ASSESSMENT OF FLOOD DAMAGE IN ARIZONA BY MEANS OF ERTS-1 IMAGERY

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ABSTRACT

ERTS-1 MSS images clearly show two important effects of a large flood in southeastern Arizona - the extent of inundation and the areas affected by severe sediment deposition and erosion - although the images were made a week and a half after the flood. On October 20 and 21, 1972, the upper Gila River had its second-largest flood on record. Peak flows attained about 42,000 and 82,000 cubic feet a second at Duncan and Safford, Arizona, respectively. Six lives were lost, hundreds of people made homeless, and more than 10,000 acres of cropland inundated.

The first ERTS-1 images after the flood were made on November 1 and 2. The inundated area is best displayed on the infrared bands, particularly on band 7, where it appears as a belt along the river that is distinctly darker than the adjoining flood plain. This dark belt does not appear on ERTS images that pre-date the flood. Presumably the low infrared reflectance of this belt is caused by still-moist soil. Inundation limits mapped from the ERTS imagery agree well with those obtained by aerial photography during the flood and by ground surveys. Areas of severe sand and gravel deposition and of local strong erosion show on band 5. By comparing before-and-after-flood images on this band, a quick assessment can be made of the severely flood-ravaged land.