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MONITORING OF STREAMFLOW IN THE VERDE RIVER BY ERTS-1 DATA COLLECTION SYSTEM (DCS)

Herbert H. Schumann, *U. S. Geological Survey, Water Resources Division, Phoenix, Arizona*

ABSTRACT

The Verde River watershed of central Arizona furnishes municipal, industrial and agricultural water to the Salt River Valley - an area that contains more than half of Arizona's population and about one-fourth of the State's irrigated land. Water management decisions related to the operation of large multiple-use reservoirs require accurate and continuous monitoring of moisture conditions over large remote areas.

The U. S. Geological Survey in cooperation with the Salt River Project installed a specially designed gaging station on the Verde River near the town of Camp Verde to evaluate near-real time streamflow data furnished by the ERTS-1 Data Collection System (DCS). On November 3, 1972, this installation was equipped with a Stevens digital water-level recorder, modified for telemetry, and an ERTS-1 data collection platform operating in the digital-parallel mode. During the 43-day period between November 3 and December 15, 1972, the DCS relayed 552 transmissions during 193 data passes. The DCS system transmitted stream stage information 4.5 times per day on the average. The amount of data received far exceeded the expected single high quality transmission rate of once per 12-hour period from the DCS system.

The digital-parallel ERTS-1 Data Collection System has furnished data sufficient to accurately compute mean daily gage heights. These, in turn, are used to compute the average daily streamflow rates during stable or slowly changing flow conditions. The digital-parallel DCS data has also furnished useful information during peak flow periods. However, the serial-digital DCS capability, currently under development for transmitting streamflow data, should provide data of greater utility for determining times of flood peaks.