

Figure 1—AT DISCHARGE OF 5,000 CUBIC FEET PER SECOND (CFS)



Figure 2—AT DISCHARGE OF 30,000 CUBIC FEET PER SECOND

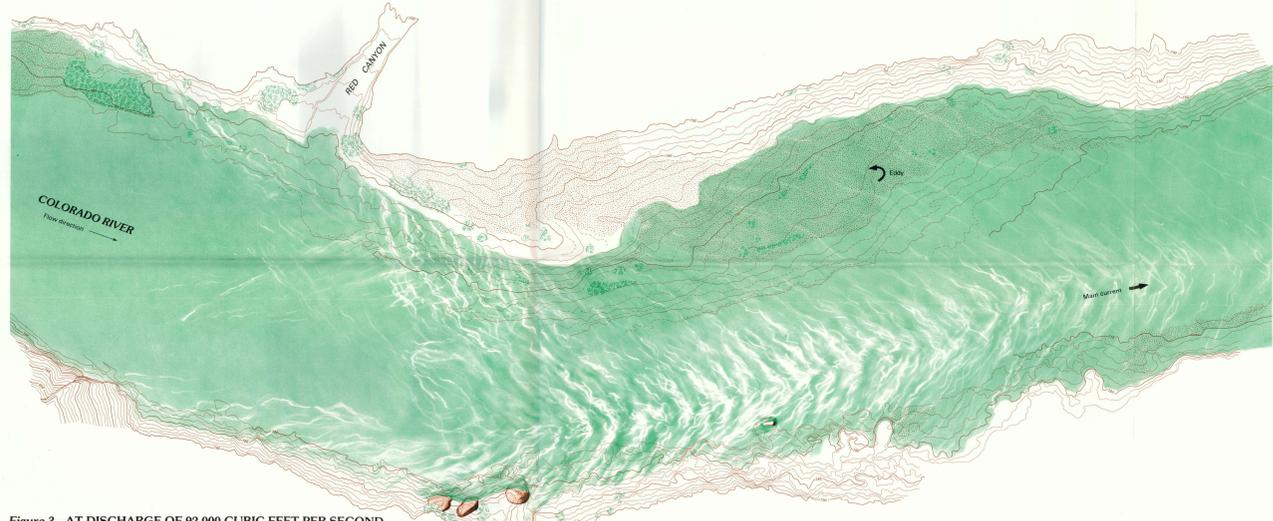


Figure 3—AT DISCHARGE OF 92,000 CUBIC FEET PER SECOND

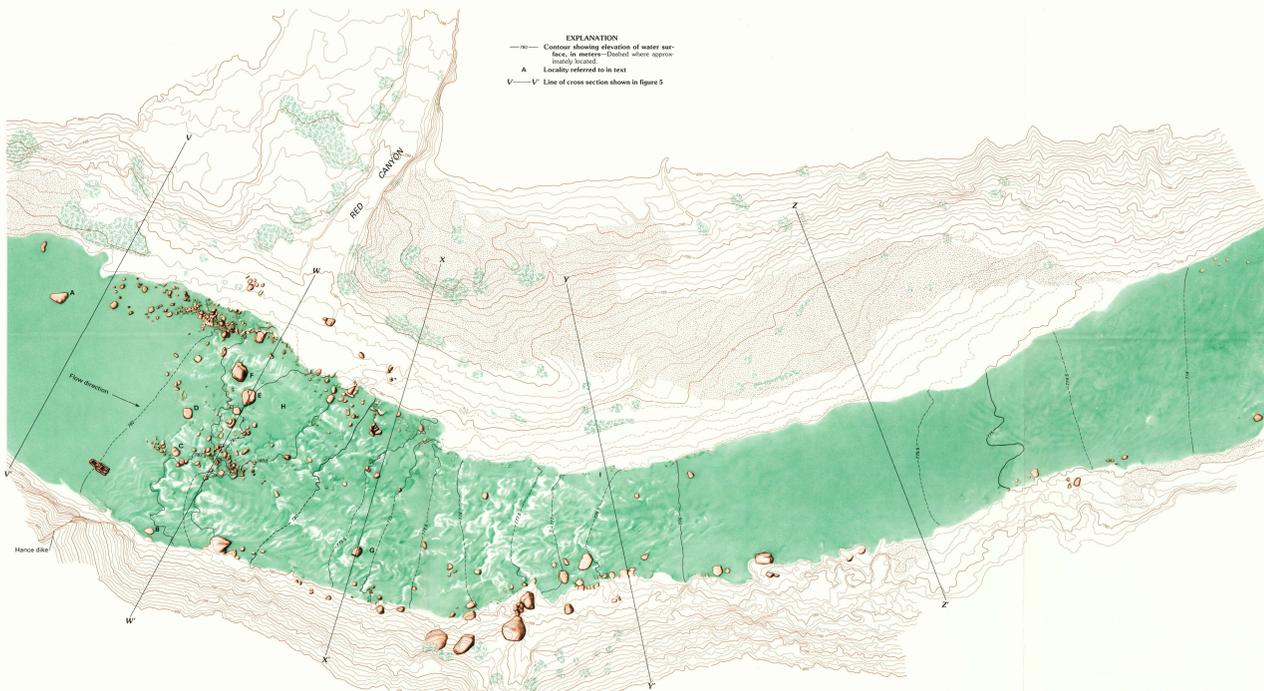


Figure 4—WATER-SURFACE CONTOURS AT DISCHARGE OF 5,000 CUBIC FEET PER SECOND

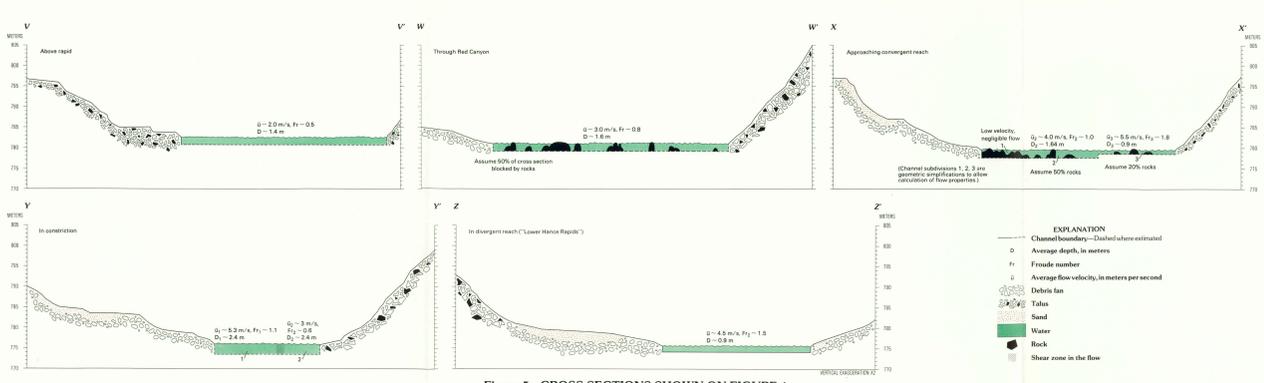


Figure 5—CROSS SECTIONS SHOWN ON FIGURE 4

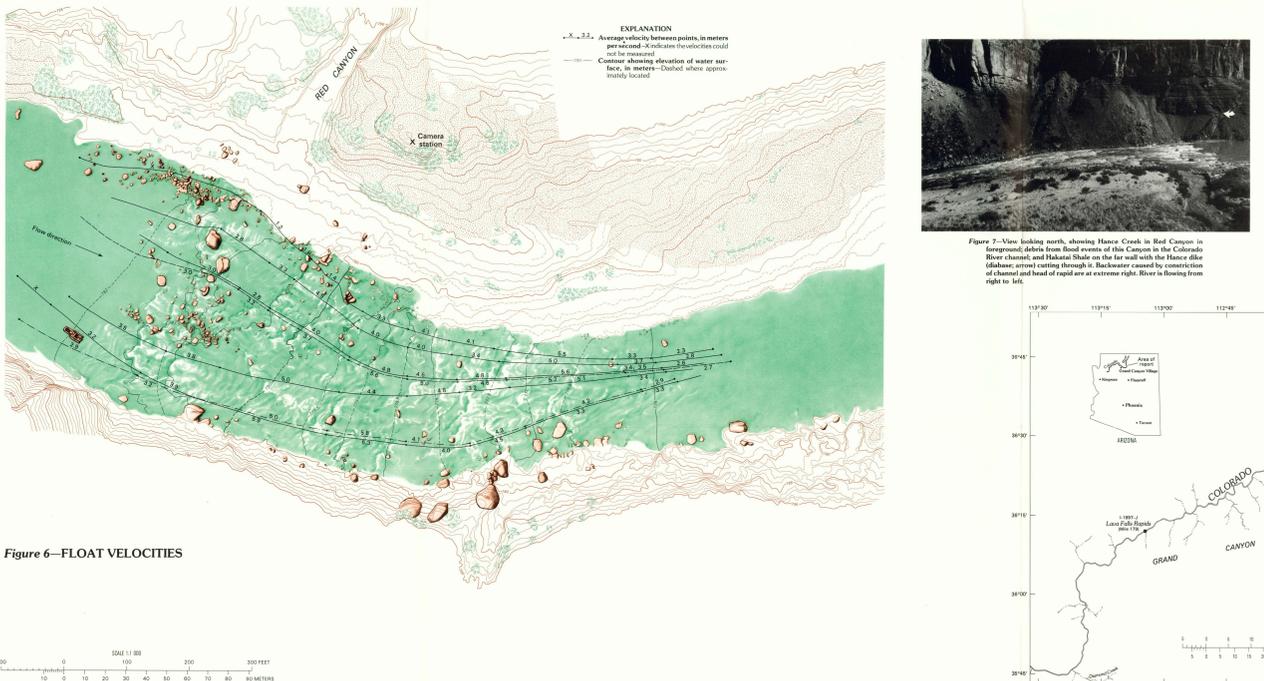


Figure 6—FLOAT VELOCITIES

DISCUSSION

The general configuration of Hance Rapids (figs. 1, 2, and 3) is caused by a series of debris fans from Red Canyon, many of the rocks in the debris fans are from the Stone Formation. The debris fans are situated in the Colorado River; remnants of others, occur to a lesser degree on the north side of the Colorado River. The debris fans are situated in the Colorado River; remnants of others, occur to a lesser degree on the north side of the Colorado River. The debris fans are situated in the Colorado River; remnants of others, occur to a lesser degree on the north side of the Colorado River.

At a discharge of 5,000 cubic feet per second (cfs), the elevation of the water surface above the rapids drops 1.5 m (4.9 ft) in a distance of 100 m (328 ft) to a value of 77.4 m (254 ft) above the datum. The slope (average gradient) of the water surface through the rapids decreases as the discharge increases, at an average rate of 0.015 m (0.049 ft) per 100 m (328 ft) above and below the rapids in figures 1, 2, and 3.

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REFERENCES CITED

Kiefer, Susan Werner, 1985, The 1981 hydraulic jump in Crystal Rapids, implications for geomorphic evolution in the Grand Canyon, *Journal of Geology*, v. 93, p. 461-466.

Kiefer, Susan Werner, 1987, The rapids and waves of the Colorado River, Grand Canyon, Arizona, U.S. Geological Survey Open File Report 87-596.

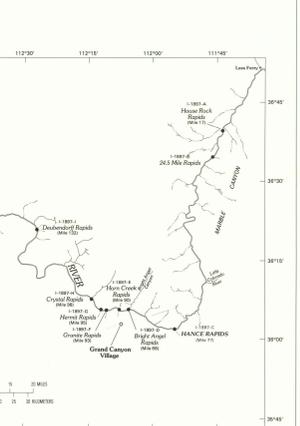


Figure 7—View looking north, showing Hance Rapids in Red Canyon in the Colorado River channel, and Hance dike on the far wall with the Hanco dike (dashed arrow) cutting through it. Backwater caused by constriction of channel and head of rapids are at extreme right. River is flowing from right to left.

HYDRAULIC MAP OF HANCE RAPIDS, GRAND CANYON, ARIZONA

By
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1988

Hydraulic data collected in October-November 1981 by Susan Werner Kiefer and Susan Werner. The rapids and waves of the Colorado River, Grand Canyon, Arizona, U.S. Geological Survey Open File Report 87-596.

Locations of major rapids in the Colorado River, Grand Canyon, Arizona, 1:80,000. A distance scale in meters is shown on the right.