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Hydrologic Effects of the 2004 Hurricane Season in Northwest Florida

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During August and September 2004, northwest Florida experienced impacts from five tropical storm systems: Tropical Storm Bonnie, and Hurricanes Charley, Frances, Ivan and Jeanne. Hurricanes Frances and Jeanne had a significant impact on the Suwannee and Waccasassa River Basins with heavy rainfall, storm surge, and flooding. Hurricane Ivan primarily affected the Perdido, Escambia, and Yellow River Basins in the western-most panhandle with high winds and the associated storm surge. Tropical Storm Bonnie produced abundant rainfall across the Suwannee Basin. Hurricane Charley's landfall in south Florida and its northeastern storm track across central Florida did not noticeably affects northwest Florida.

Significant rainfall from some of the storms resulted in high water on many rivers and streams in northwest Florida. Hurricane Frances produced an average of 8.80 inches of rain over the Suwannee River Basin, but 18 inches of rain was reported at some locations. Hurricane Jeanne produced about 6 inches, again primarily in the Suwannee and Waccasassa River Basins. Hurricane Ivan produced 3-11 inches in the Chipola, Choctawhatchee, Shoal, Blackwater, Perdido, Escambia, and Yellow River Basins in the western panhandle. Tropical Storm Bonnie produced an average of about 2-3 inches in the Suwannee River Basin. Rainfall from Hurricane Charley was negligible in northwest Florida.

Hydrographs of data collected at several stream gages in the Big Bend region of Florida documented storm surges. Surge from Hurricane Frances was the greatest, with a 9-foot rise at the Waccasassa River near Gulf Hammock. Hurricane Ivan produced 9 feet of storm surge at Escambia River near Gonzales, and a 6-foot surge upstream near Molino.

Monthly mean flows for September 2004 in northwest Florida ranged from 143 to 458 percent of normal, the highest in the Suwannee River Basin, and the lowest in the Steinhatchee River Basin. Peaks from rainfall associated with Tropical Storm Bonnie, and Hurricanes Frances and Jeanne were observed in the discharge hydrographs for several gages in the Suwannee River Basin. The greatest increase in flow was associated with Hurricane Frances, which produced the most rainfall. Significant overland flooding occurred in the Santa Fe and middle Suwannee River Basins, with a small rise in flow occurring before the larger one observed in the discharge hydrograph at the Suwannee River at Branford gage. At the Waccasassa River near Gulf Hammock gage, peak flow estimated at 8,330 cubic feet per second occurred, the second highest peak for the period of record (1963-present).