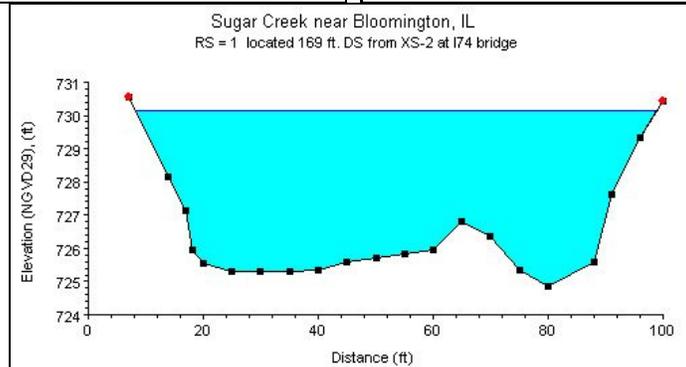
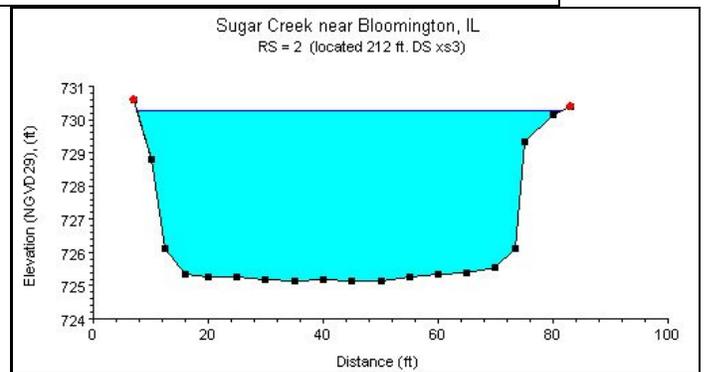
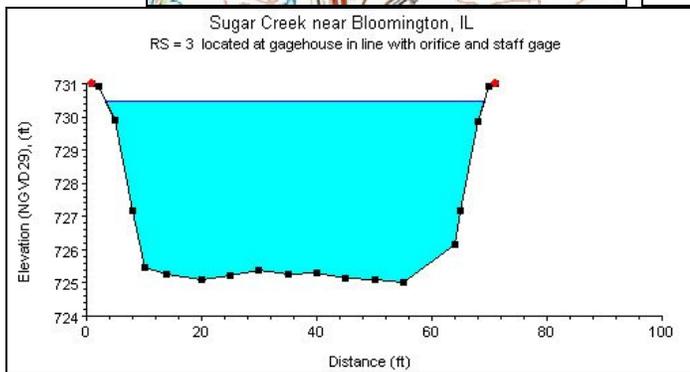
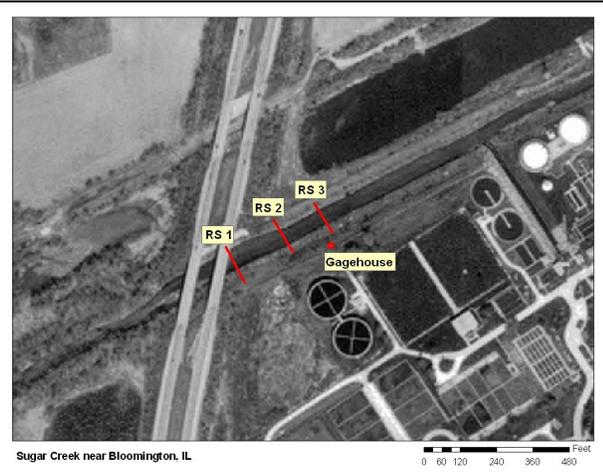
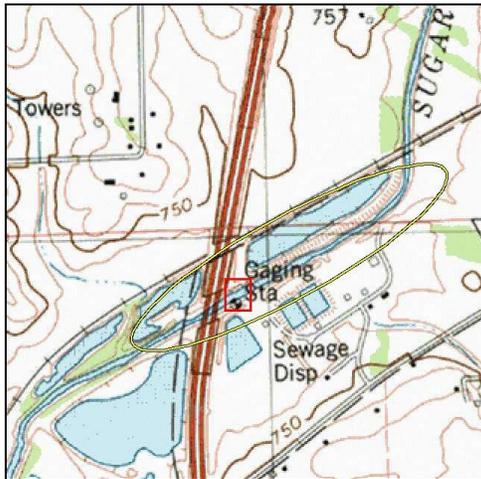


Sugar Creek near Bloomington, IL



Study Reach.--The channel reach under consideration is the artificially straightened river, as shown in the quadrangle map on the top left. The study reach selected, approximately 450 ft long, is a segment upstream of the I74 bridge extending from the USGS gage house at upstream to upstream of I74 bridge at the downstream end. Three surveyed cross sections (surveyed by the U.S. Geological Survey in September 2004) are available to define channel geometries at this site (see plots above). The alignment of the study reach, approximate variations in channel width and bank conditions, and locations of the surveyed cross sections are shown in the aerial photo on the top right.

Gage Location.--Lat 40°28'16", long 89°01'48" (NAD of 1927), in NE1/4 NW1/4 sec.7, T.23N., R.2E., McLean County, Hydrologic Unit 07130009, on left bank at Bloomington-Normal Sanitary District sewage-treatment plant, 450 ft upstream from Interstate 74 bridge, 0.4 mi west of Bloomington, and at river mi 48.8. The USGS streamgage-station number is 05580950.

Drainage Area.--34.4 sq mi.

Gage Datum and Elevations of Reference Points.--Datum of the gage is 725.11 ft. A staff gage is installed at upper end of the reach, elevation of brass screw=730.020 ft. A reference point (RP-C1L), is two file marks on top of outer edge of lower bracket of crest-stage gage (CSG-1) located 450 ft downstream from the staff gage, elevation=732.966 ft. All elevations are in NGVD 1929 convention.

Stage, Discharge Measurements, and Computed n-Values.--Water-surface elevations were determined by reading the staff gage at the upstream end, by tape down from the RP-C1L at the downstream end and also were determined from levels run to high water marks. Discharge measurements were made either using the conventional current-meter method or tethered boat acoustic Doppler profiler (ADCP). The computed n-values are listed in the following table. Whenever possible, the computed n-values are associated with a photo taken at the time of the measurement. The photos are arranged from low stage to high stage in order to illustrate contributing factors of n-values at a particular stage.

Date of Observation	Discharge (ft ³ /s)	Average Cross Section Area (ft ²)	Hydraulic Radius (ft)	Mean Velocity (ft/s)	Slope	Coefficient of Roughness <i>n</i>
7/10/2003	1290.0	317.9	4.04	4.09	0.000236	0.020
7/10/2003	1360.0	327.0	4.10	4.19	0.000236	0.021



05580950 Sugar Creek near Bloomington, IL
7/10/2007
Low flow, looking downstream



05580950 Sugar Creek near Bloomington, IL
7/10/2007
Low flow, looking upstream



05580950 Sugar Creek near Bloomington, IL
7/11/2007
Low flow, looking at right bank



05580950 Sugar Creek near Bloomington, IL
7/10/2007
Low flow, looking at bed material



05580950 Sugar Creek near Bloomington, IL
Looking Downstream from gage



05580950 Sugar Creek near Bloomington, IL
Looking Upstream from gage



05580950 Sugar Creek near Bloomington, IL
Looking Downstream, stage visualization

07/10/03



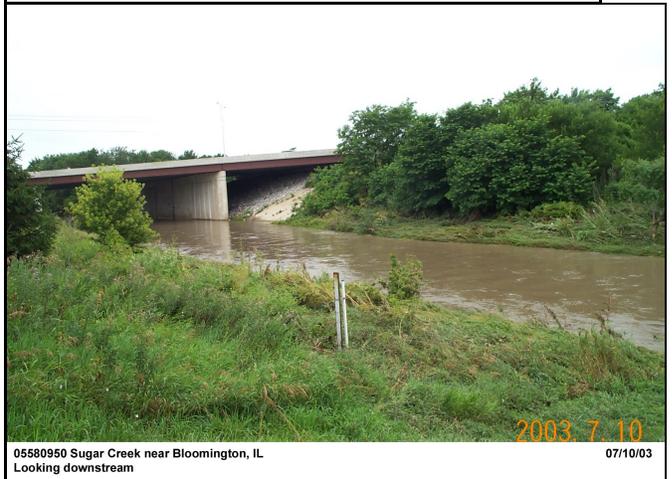
05580950 Sugar Creek near Bloomington, IL
Looking Downstream, stage visualization

07/10/03



05580950 Sugar Creek near Bloomington, IL
Looking at right bank

07/10/03



05580950 Sugar Creek near Bloomington, IL
Looking downstream

07/10/03



Description of Channel.--The study reach represents a channelized, straightened river in a suburban environment. The streambed material is sand and gravel with scattered small cobbles. Tall grasses and sparse small brush line both banks. Appreciable amounts of algae grow in the channel during summer months. The channel has moderately steep-sloping banks about 6 ft high. The top width varies from 70 ft to 90 ft. The channel bed has a flat bottom about 65 ft wide. The cross-sectional shape is trapezoidal. The channel is straight.

Floods.--Maximum discharge, 6,600 ft³/s, Dec. 3, 1982, gage height, 14.02 ft, from floodmark.

Estimated n-Values using Cowan's Approach.--0.022 - 0.035