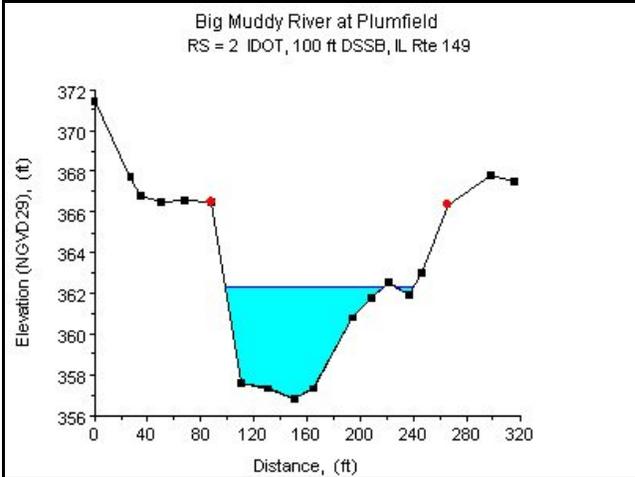
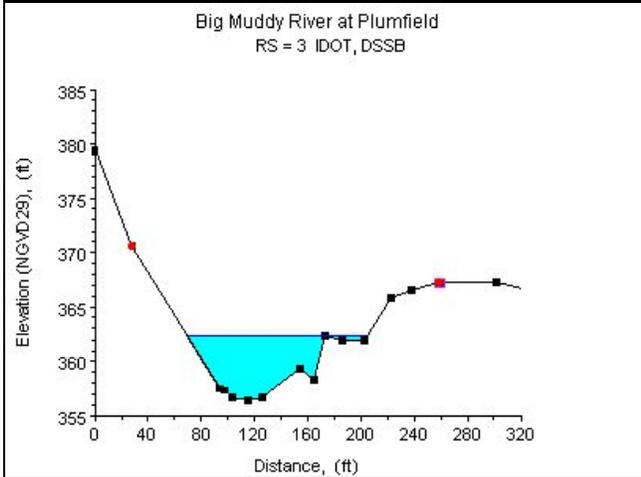
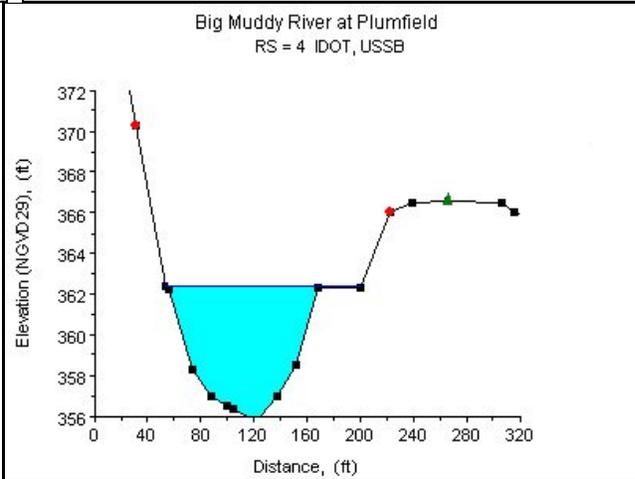
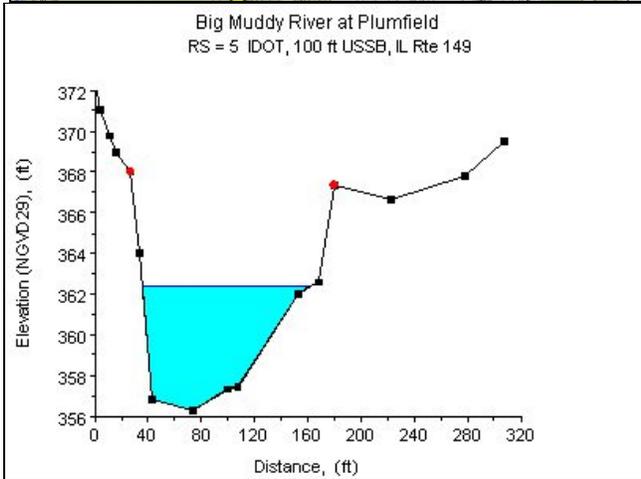
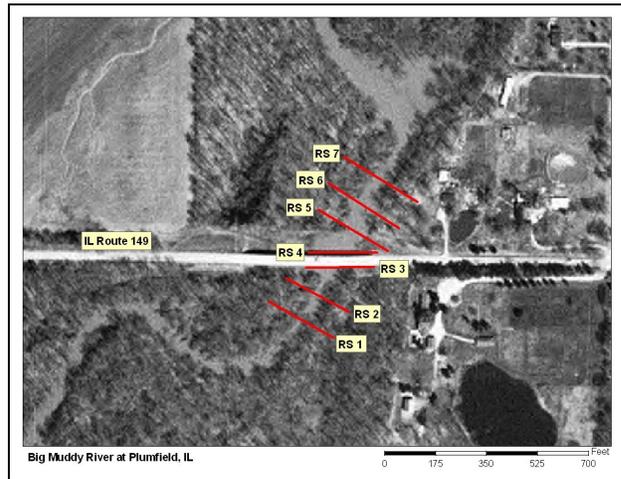
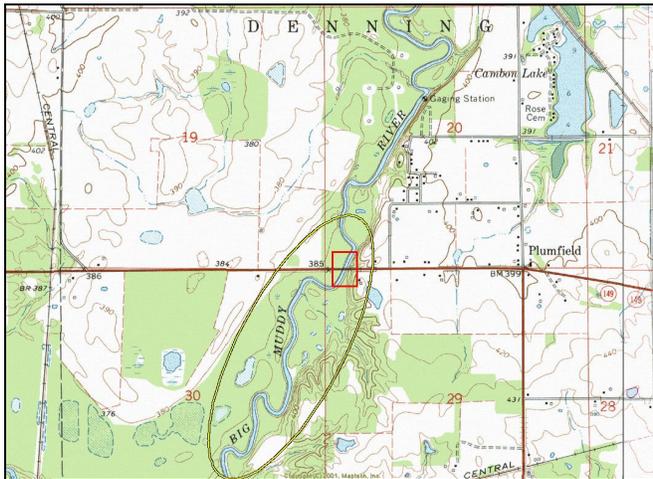


# Big Muddy River at Plumfield, IL



**Study Reach.**--The reach under consideration has a series of bends, as shown in the quadrangle map on the top left. The study reach selected, approximately 535 ft long, is centered on the bridge on State Highway 149. There are seven surveyed cross sections (surveyed by the Illinois Department of Transportation, in December 1997) available for evaluating the channel geometry in the study reach. The alignment of study reach, approximate variations in channel width and bank conditions, and locations of surveyed cross sections are shown in the aerial photo on the top right.

Cross-sectional geometries vary gradually and continuously from upstream to downstream. The general shapes of cross sections in the study reach are represented with cross sections at river station (RS) 2, 3, 4, and 5 (see plots above).

**Gage Location.**--Lat 37°54'05", long 89°00'50", in NW1/4 sec.20, T.7S., R.2E., on left bank 0.8 mi upstream from bridge on State Highway 149, about 1.9 mi downstream from mouth of Middle Fork Big Muddy River, and about 0.8 mi north and west of intersection of Route 149 and Plumfield road, Franklin County. Auxiliary gage located at Zeigler, about 4 mi downstream. The auxiliary gage was discontinued September 30, 1991. The USGS streamgage-station number is 05597000.

**Drainage Area.**--794 sq mi.

**Gage Datum and Elevations of Reference Points.**--This is a slope station where the auxiliary gage is located at Zeigler, 4 mi downstream. Datum of gage is 353.24 ft. From November 13, 1938, to September 30, 1974, the datum at the auxiliary gage was 5.0 ft higher. The outside gage at the base gage consists of a series of staff gages mounted either on piers, or the landward side of the gage house, elevation of brass screw = 360.958 ft. A wire-weight gage (WWG) was located at Zeigler pump station, 4 mi downstream (datum = 353.24 ft). All elevations are in NGVD 1929 convention.

**Stage, Discharge Measurements, and Computed n-Values.**--Stage and discharge data for the n-value studies were retrieved from measured discharge records for this slope station site. Water-surface elevations were measured from the staff gage at the base gage and from the WWG at Zeigler at the time of the discharge measurement. Discharge measurements were made using the conventional current-meter method. For the present n-value analysis, events of no over-the-bank flows were selected from record prior to September 30, 1991. 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-value at a particular stage.

Date of Observation	Discharge (ft <sup>3</sup> /s)	Average Cross Section Area (ft <sup>2</sup> )	Hydraulic Radius (ft)	Mean Velocity (ft/s)	Slope	Coefficient of Roughness <i>n</i>
11/27/1974	369.0	500.1	3.25	0.75	0.000140	0.051
8/19/1975	424.0	521.6	3.29	0.83	0.000140	0.047
9/10/1974	469.0	648.7	3.87	0.74	0.000148	0.055
12/12/1974	478.0	627.5	3.77	0.78	0.000144	0.051
6/10/1975	610.0	776.8	4.40	0.81	0.000148	0.055
1/20/1975	954.0	1178.3	5.65	0.86	0.000145	0.062



05597000 Big Muddy River at Plumfield, IL  
Low flow, looking downstream from bridge  
7/24/2007



05597000 Big Muddy River at Plumfield, IL  
Low flow, looking upstream from bridge  
7/24/2007



05597000 Big Muddy River at Plumfield, IL  
Low flow, left bank downstream of bridge  
7/24/2007



05597000 Big Muddy River at Plumfield, IL  
Low flow, left bank upstream of bridge  
7/24/2007



05597000 Big Muddy River at Plumfield, IL  
Low flow, right bank downstream of bridge  
7/24/2007



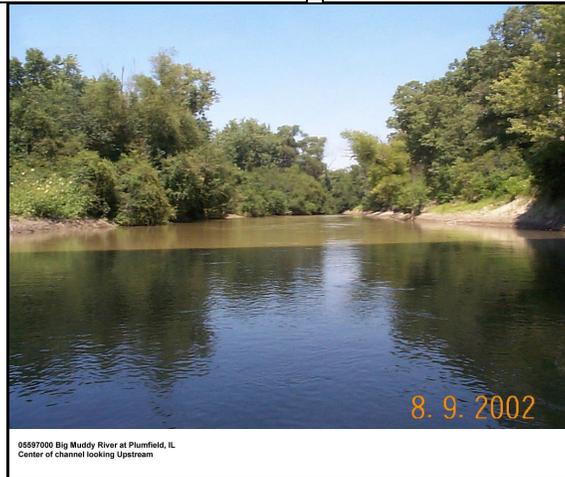
05597000 Big Muddy River at Plumfield, IL  
Low flow, right bank upstream of bridge  
7/24/2007



05597000 Big Muddy River at Plumfield, IL  
Right bank looking Upstream



05597000 Big Muddy River at Plumfield, IL  
Looking Downstream



05597000 Big Muddy River at Plumfield, IL  
Center of channel looking Upstream

**Description of Channel.**--This channel is natural. The study reach can be described as in the straight section of a bend. General cross sectional geometry is in trapezoidal shape. The bed material consists of bedrock overlain with mud and silt. Bottom width of the channel is about 50 ft. The left bank is steeper than the right bank and wooded. The right bank is partially wooded. The bank height is approximately 12 ft. The top width varies from approximately 150 to 200 ft.

**Floods.**--May 10, 1961, 42,900 ft<sup>3</sup>/s; maximum gage height 29.67 ft, datum then in use; Maximum discharge since construction of Rend Lake, 14,200 ft<sup>3</sup>/s, May 1, 1996, gage height, 31.83 ft; Maximum gage height since construction of Rend Lake, 31.84 ft, May 4, 1983.

**Estimated n-Values using Cowan's Approach.**--0.035 ~ 0.039