

# USGS River Gage Records 100 Years of Data

## Solomon River at Niles, Kansas--established by USGS May 1897

### Timeline

1897 Gage established-staff gage  
1903 Gage discontinued  
1917 Gage re-established at Bennington  
1919 Gage moved to current location  
1934 Recording gage established  
1951 Largest flood-July 14  
1951 Highest annual average flow  
1967 Waconda Lake dam completed  
1984 Real-time transmission began  
2006 Lowest annual average flow

The Niles streamgage was established in 1897 and is currently funded by the Kansas Water office and the U.S. Geological Survey through the National Streamflow Information Program and the Cooperative Water Program.

Real-time streamflow data is available for the Niles gage and over 180 other gages at <http://waterdata.usgs.gov/ks/nwis/rt>.



Solomon River at Niles streamgage

### Streamgage Information Uses

- National Weather Service flood forecast point-streamflow data used by NWS to issue flood warnings to protect lives and reduce property damage
- One of 32 streamgages in Kansas with State required Minimum Desirable Streamflow-monitored by the Kansas Department of Agriculture-Division of Water Resources
- Located 22 miles upstream from Kansas River and therefore critical for determining Solomon River contribution to Kansas River
- Used for administration of water rights by Kansas Department of Agriculture-Division of Water Resources
- Flood and drought frequency statistics

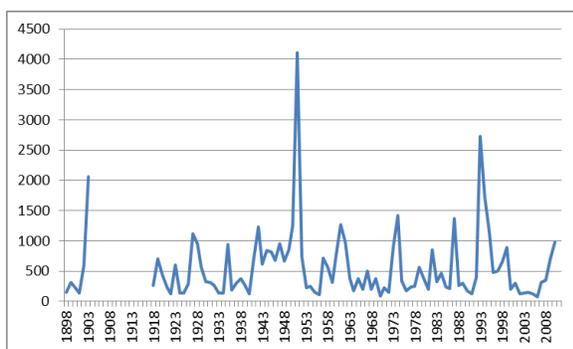


Location of Solomon River at Niles streamgage

## Benefits of Long-Term Streamflow Records

Users of streamgauge information benefit from long-term records. Long-term gage information is essential for National Weather Service River Forecast Centers (RFCs) to calibrate rainfall-runoff models that are the basis for flood warnings. A long-term historical record that includes extreme wet and dry periods allows forecasters to define watershed parameters that govern the watershed's response to a full range of hydrologic conditions. Real-time streamflow data allows forecasters to adjust models to match observed flows for better forecasting during floods.

The USGS uses historical high-flow records to develop flow frequency curves for design of bridges and culverts, bridge scour analysis, and stream stability measures. Flood frequency analyses are sensitive to both streamgauge record length and the consistency of station records over the period of gage operation. Long records and consistent measurement techniques provide a high degree of confidence in design estimates.



Average annual flow for Niles streamgauge (cubic feet per second)

Because the Niles streamgauge has been in operation for a long period of time, data has been collected during several historic floods and droughts. For example, the highest river

stage and streamflow before Waconda Lake was constructed occurred on July 14, 1951 (31.76 river stage and discharge 178,000 cubic feet per second). The highest river stage and streamflow after Waconda was filled occurred on October 11, 1973 (30.92 river stage and discharge 52,400 cubic feet per second). The lowest daily flow recorded at the Niles streamgauge was 1.0 cubic foot per second on September 4, 1926. The first discharge measurement was made at the Ellsworth gage on May 5, 1897.

Five highest average annual streamflows		Five lowest average annual streamflows	
1951	4113	2006	72.0
1993	2723	1970	92.3
1903	2059	1956	109
1994	1728	1940	120
1974	1419	2002	120
Streamflows in cubic feet per second			

Highest and lowest average annual streamflows at Solomon River at Niles



High flow at Niles streamgauge, September 29, 1973, 16,000 cubic feet per second

