

USGS River Gage Records 100 Years of Data

Smoky Hill River at Ellsworth, Kansas--established by USGS April 1895

Timeline

- 1895 Gage established-staff gage
- 1918 Recording gage established
- 1938 Highest daily flow recorded- June 1
- 1951 Cedar Bluff Reservoir completed
- 1956 Lowest daily flow recorded- Sept. 28
- 1985 Real-time data started

The Ellsworth streamgage was established in 1895 with funds from the USGS Cooperative Water Program and the Kansas Board of Irrigation and Experiment that became the Division of Water Resources, Kansas Department of Agriculture. Currently, the U. S. Army Corps of Engineers, Kansas City District provides funding for the streamgage.

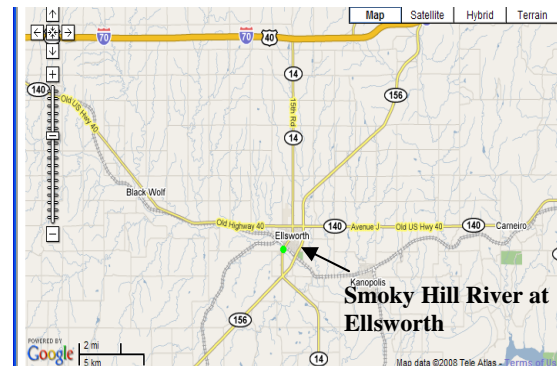
Real-time streamflow data is available for the Ellsworth gage and 169 other gages at <http://waterdata.usgs.gov/ks/nwis/rt>.

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
- Critical to operation of the Cedar Bluff Reservoir and Kanopolis Lake-U.S. Army Corps of Engineers, Kansas City District and U.S. Bureau of Reclamation
- Used for administration of water rights by Kansas Department of Agriculture-Division of Water Resources
- Flood and drought frequency statistics



Smoky Hill River at Ellsworth streamgage

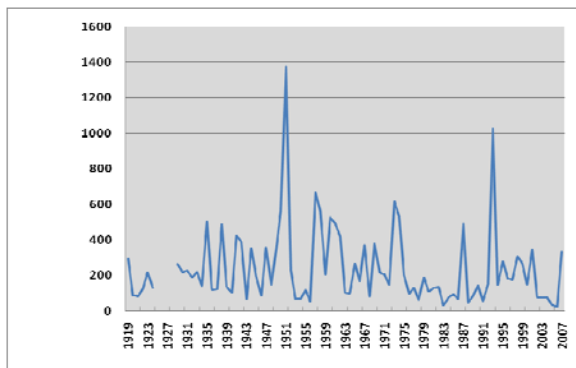


Location of Smoky Hill Ellsworth streamgage

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 Ellsworth streamgauge (cubic feet per second)

Because the Ellsworth 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 associated discharge before Cedar Bluff reservoir was constructed occurred on June 1, 1938 (27.20 river stage and discharge 61,000 cubic feet per second). The highest river stage and streamflow after Cedar Bluff was constructed occurred on July 23, 1993 (25.57 river stage and 30,300 cubic feet per second discharge). The lowest daily flow recorded at the Ellsworth streamgauge was 0.60 cubic feet per second on September 28, 1956. The first discharge measurement was made at the Ellsworth gage on April 16, 1895.

Five highest average annual streamflows		Five lowest average annual streamflows	
1951	1377	2006	24.2
1993	1026	1983	29.1
1957	669	2005	33.4
1973	615	1901	43.1
1958	564	1988	47.3
Streamflows in cubic feet per second			

Highest and lowest average annual streamflows at Smoky Hill River at Ellsworth



Continuous-record gage installed at Ellsworth bridge, April 1918

