

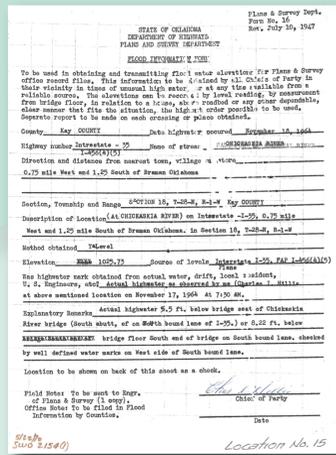
Flood Database for Oklahoma: A web-mapping application for historical flood information organization and access

By S. Jerrod Smith, U.S. Geological Survey, in cooperation with the Oklahoma Department of Transportation

Abstract

Historical peak-streamflow and peak-stage (flood) information is vital for the design of stream-related infrastructure such as bridges and dams. The U.S. Geological Survey (USGS) annually publishes these data from gaged sites, and the Oklahoma Department of Transportation (ODOT) conducts peak-stage surveys at selected sites during periods of flooding. This historical flood information often is underutilized because of a lack of knowledge of the existence, location, and usefulness of archived records. In cooperation with the ODOT, the USGS developed (1) a digital database of historical flood information, and (2) a web-based mapping application interface to facilitate access to this valuable information.

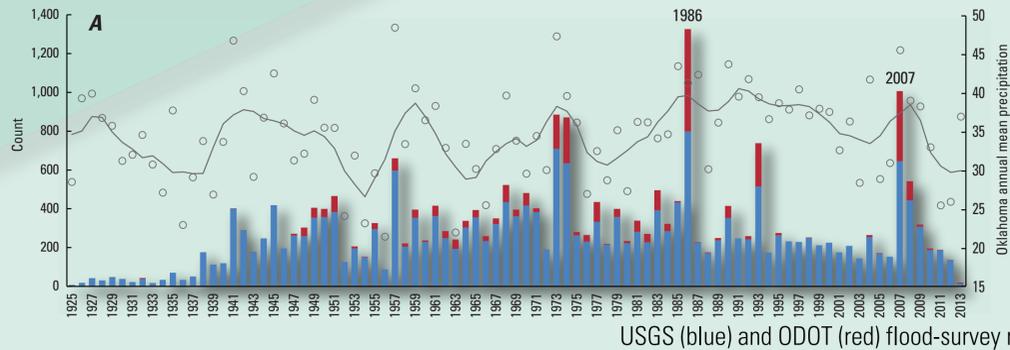
Flood records



Data records in the Flood Database for Oklahoma were organized using a two-table, one-to-many, site-has-events database schema. Sites were georeferenced to an accuracy of at least 1,000 feet and attributed using standardized datasets including the Geographic Names Information System (GNIS), the National Hydrography Dataset (NHD), the National Bridge Inventory (NBI), and U.S. Census Bureau TIGER political boundaries. Event records include hyperlinked references to original data sources, which were digitized as necessary.

Site has Events
3,676 1 : Many 22,377

ODOT flood survey of the Chikaskia River at I-35, Nov. 18, 1964



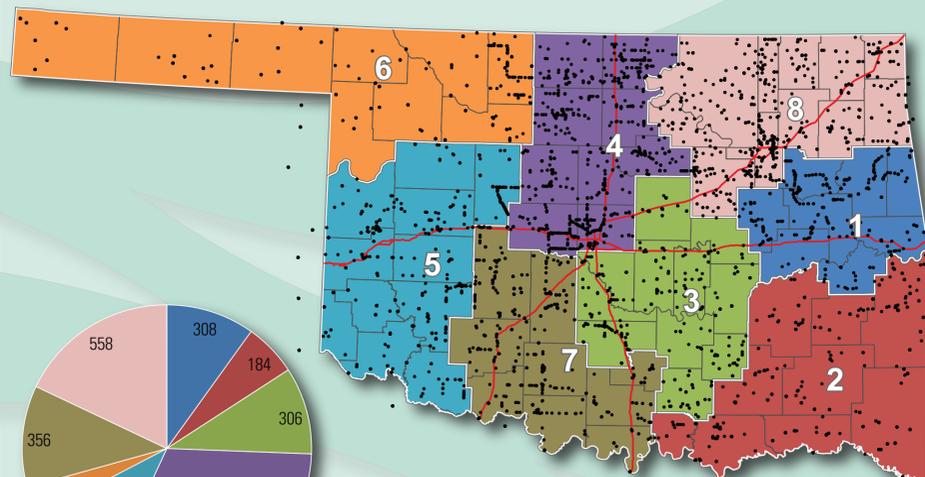
USGS (blue) and ODOT (red) flood-survey records by (A) year and (B) month

Quick facts:

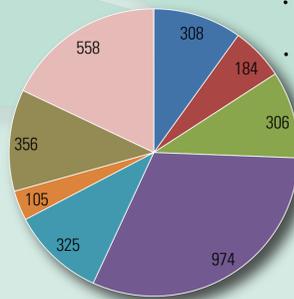
- 3,116 ODOT flood-survey measurements, 1923–2013
- 19,261 USGS indirect and annual peak-streamflow measurements, 1891–2012
- Georeferenced site locations accurate to 1,000 feet
- Standardized stream names, road/bridge numbers, and flood heights/elevations
- Links to original web data source or PDF (900 megabytes)
- Selected photos and news clippings from historic floods

ODOT flood-survey records by county: Top five

Rank	County	Count
1	KAY	179
2	TULSA	175
3	KINGFISHER	143
4	CANADIAN	130
5	LOGAN	116



USGS and ODOT sites with flood-survey records



ODOT flood-survey records by maintenance division



Oklahoma City Times, July 16, 1951

Web-mapping application

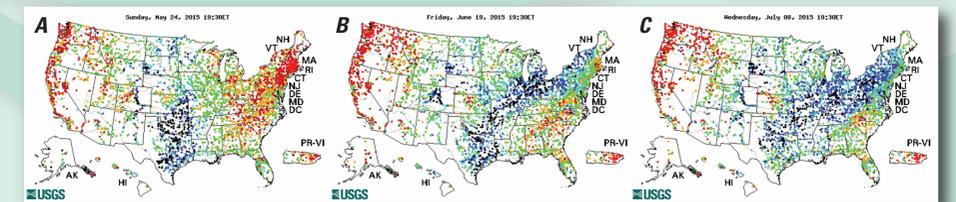
The web-mapping application includes simple tools for spatial and attribute queries and a tool for exporting selected data in a non-proprietary format. Selected photos and newspaper clippings also are available. The Flood Database for Oklahoma will support structural design near waterways and improve understanding of floods by providing engineers and scientists with simplified digital access to previously obscure or unavailable historical flood information.



Flood records (green circles) in the vicinity of Kingfisher, Oklahoma

Next update: 2015

Following statewide and historic flooding in May–July 2015, the next update is expected to add many records to the database.



USGS Waterwatch graphics showing high water on (A) May 24, (B) June 19, and (C) July 8, 2015