

**KANSAS GEOLOGICAL SURVEY  
OPEN-FILE REPORT 90-55**

ARKANSAS RIVER STREAM-AQUIFER STUDY—KINSLEY TO  
GREAT BEND REACH:  
First Progress Report

by

Marios Sophocleous

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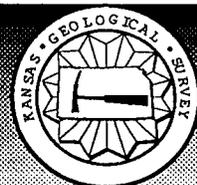
## Arkansas River Stream-Aquifer Study—Kinsley to Great Bend Reach: First progress report

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***GEOHYDROLOGY***



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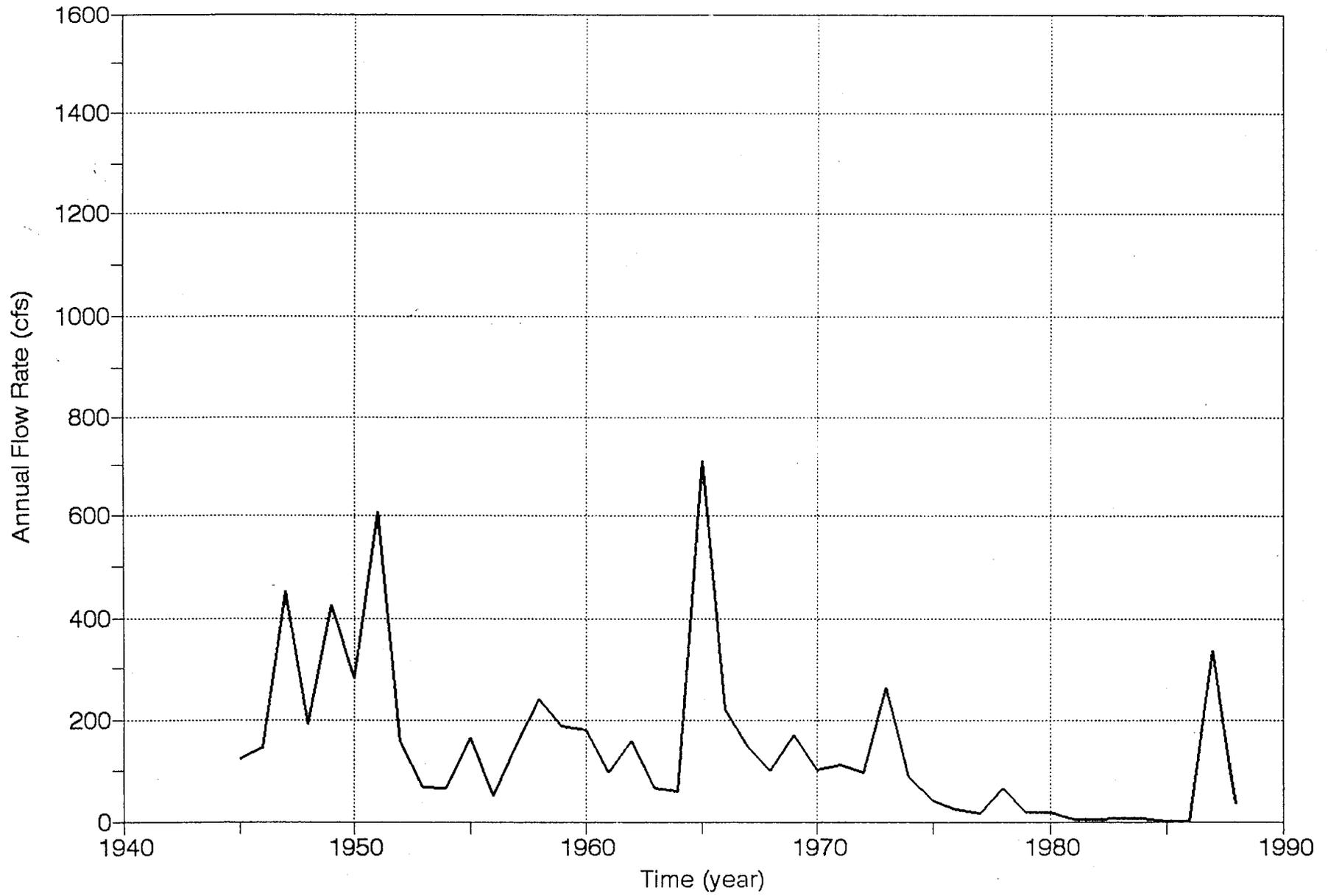
Arkansas River Stream-Aquifer Study, KWO Contract No. 91

The following presents a brief summary of activities to date related to the above-mentioned project:

1. Bedrock and predevelopment water level data for the Kinsley to Great Bend reach of the Arkansas River were compiled in separate files to be used in the planned numerical simulation model of the reach. A comprehensive bedrock and predevelopment water level data base and maps of the Great Bend Prairie region has been prepared earlier this year, and a copy of the relevant report with maps is being mailed to you separately.
2. A soils map of the Arkansas River Valley from Kinsley to Great Bend has been constructed and the hydrologic properties of the different soils has been compiled.
3. Water level maps of the Great Bend aquifer for various years have been analyzed for the purpose of delineating groundwater flow lines for possible selection of one boundary flow line separating the Arkansas River Valley system from the Great Bend aquifer proper. The recently released report on the Rattlesnake Creek watershed (KGS Groundwater Series 11, 1990) was also consulted for this purpose, especially with regards to the surface watershed boundary.
4. Based on superposition/overlaying items 1 through 3 above, the southeast boundary of the Arkansas River Valley system was separated from the rest of the Great Bend aquifer on a geohydrologically sound basis. The northwest boundary separation presented no significant

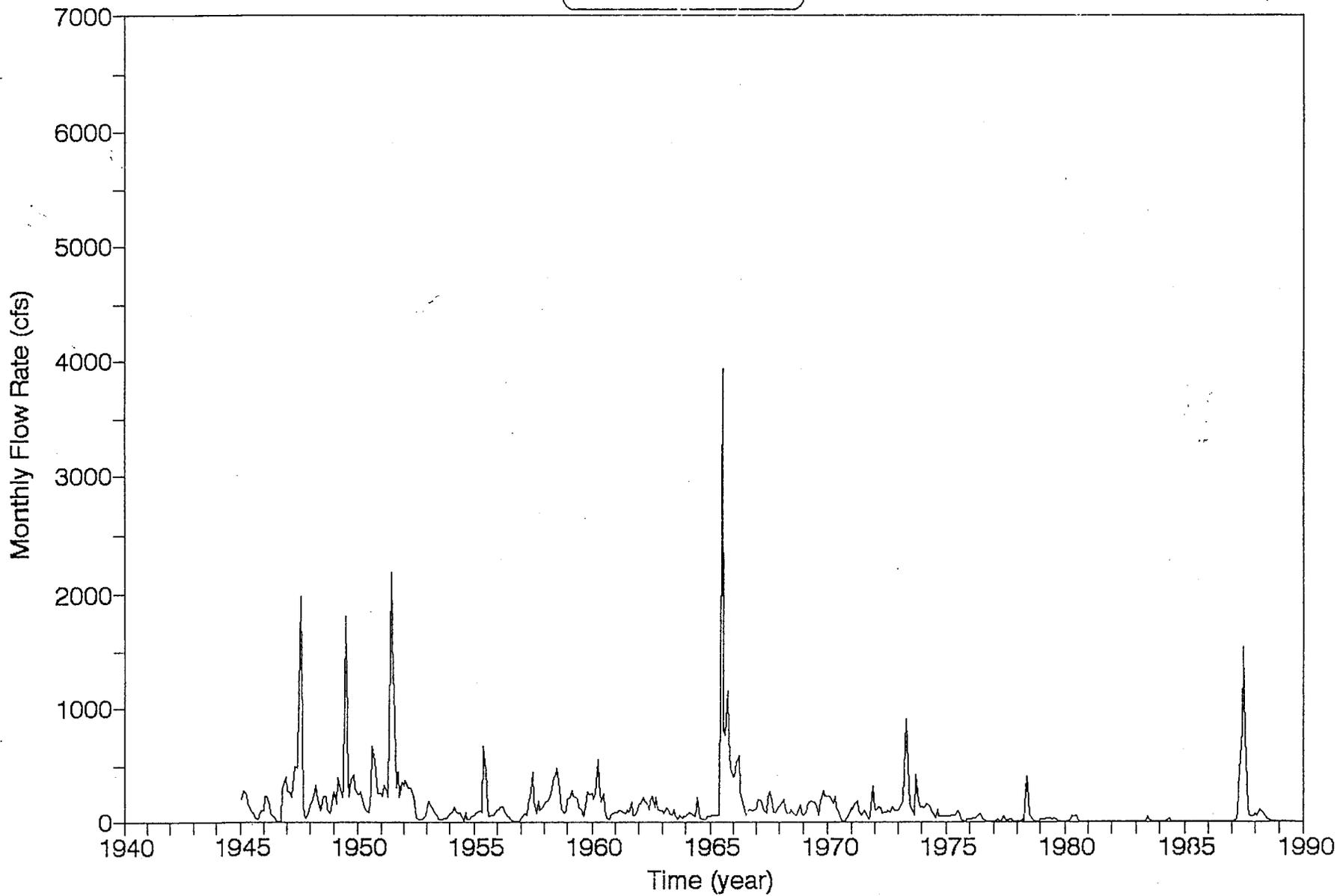
problems because the valley is mostly bounded by Lower Cretaceous (Dakota) strata and clayey soils in that direction. The northeast and southwest end boundaries were cut along appropriate iso-water level contours near Kinsley and Great Bend, respectively. A tentative map of the Great Bend region outlining the study area is enclosed. The major soil boundaries, the south-east flow line boundary, the northwest "no flow" boundary, and the NE and SW end "constant head" boundaries are shown on the map.

5. All current water rights for the whole Great Bend region were obtained on tape from the Division of Water Resources (DWR/KSBA), compiled, processed and displayed on the enclosed map. Separate files of wells in the Kinsley to Great Bend reach are being compiled.
6. All current and historic streamflow data for all the area streamgaging stations, including Kinsley, Great Bend and (near) Larned have been obtained, compiled and displayed on yearly and monthly bases using the recently acquired QUATTRO PRO spreadsheet and graphics PC package. I am enclosing graphs of the entire available record of monthly streamflow hydrographs for the three above-mentioned gaging stations as well as graphs of monthly streamflow differences between Great Bend and Kinsley and Great Bend and [Kinsley and Larned]. Please note that the frequency of streamflow losses from Kinsley to Great Bend increases significantly after the early sixties.



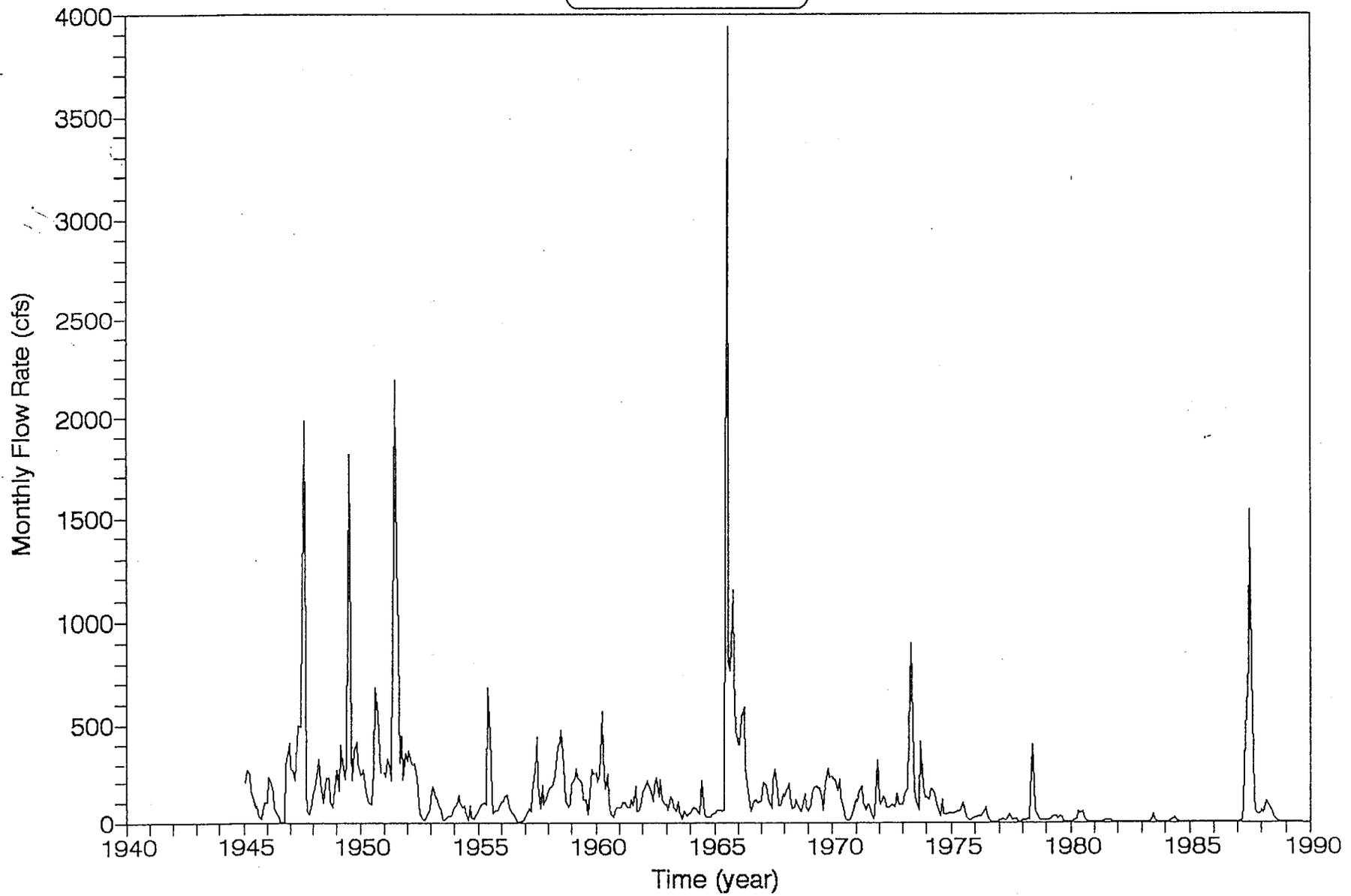
— Kinsley Station

# Arkansas River

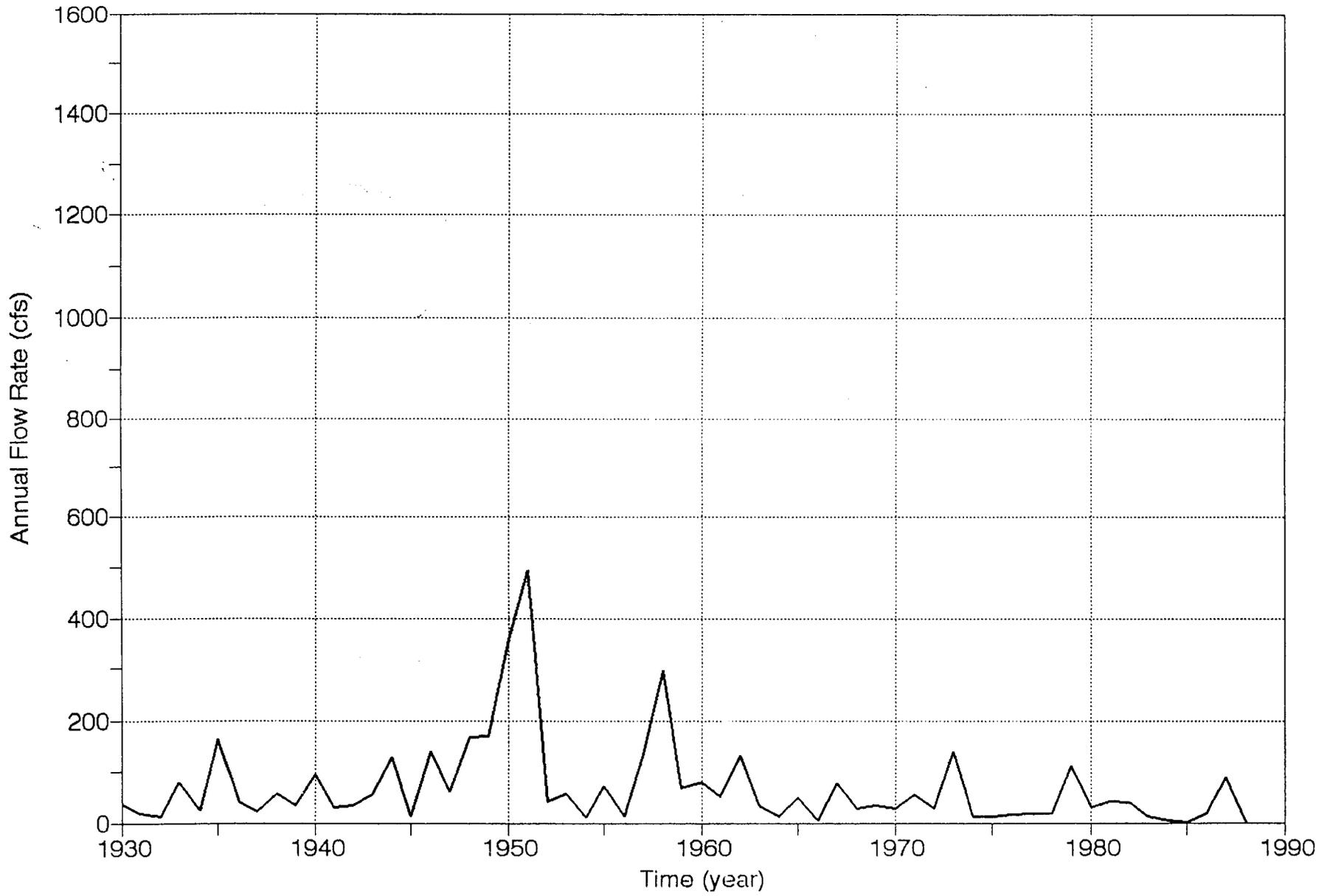


— Kinsley Station

# Arkansas River

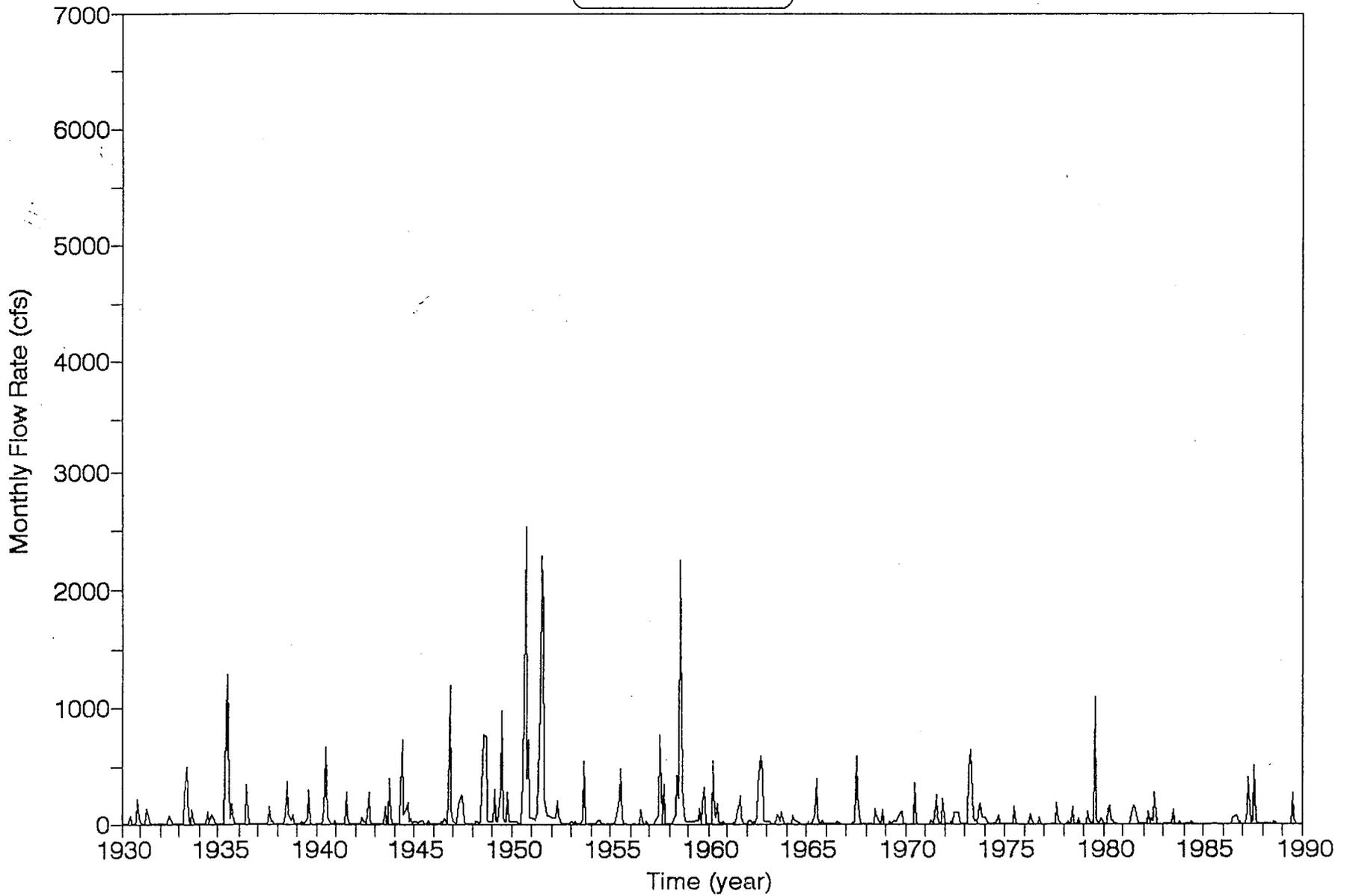


— Kinsley Station



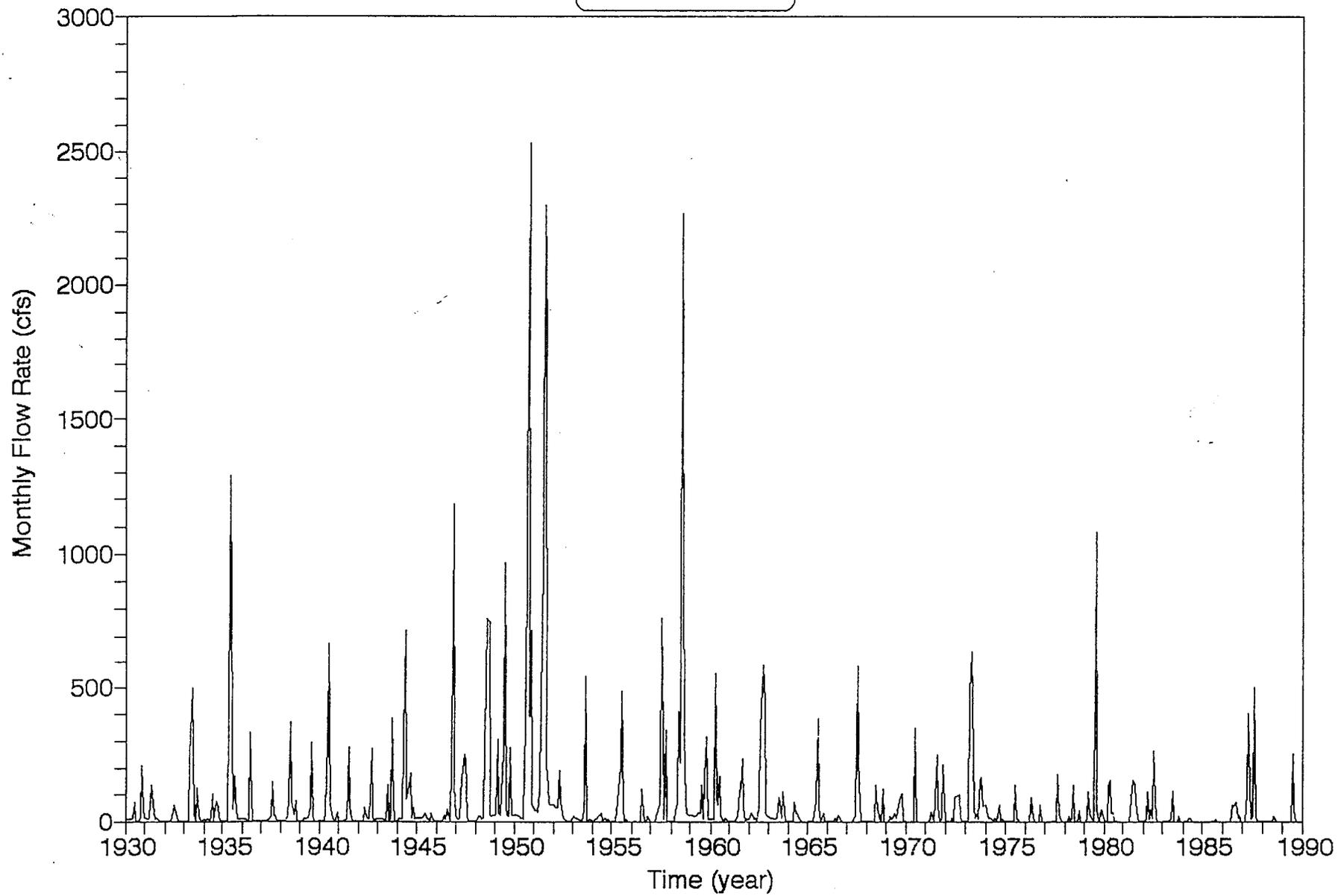
— Larned Station

**Pawnee River**

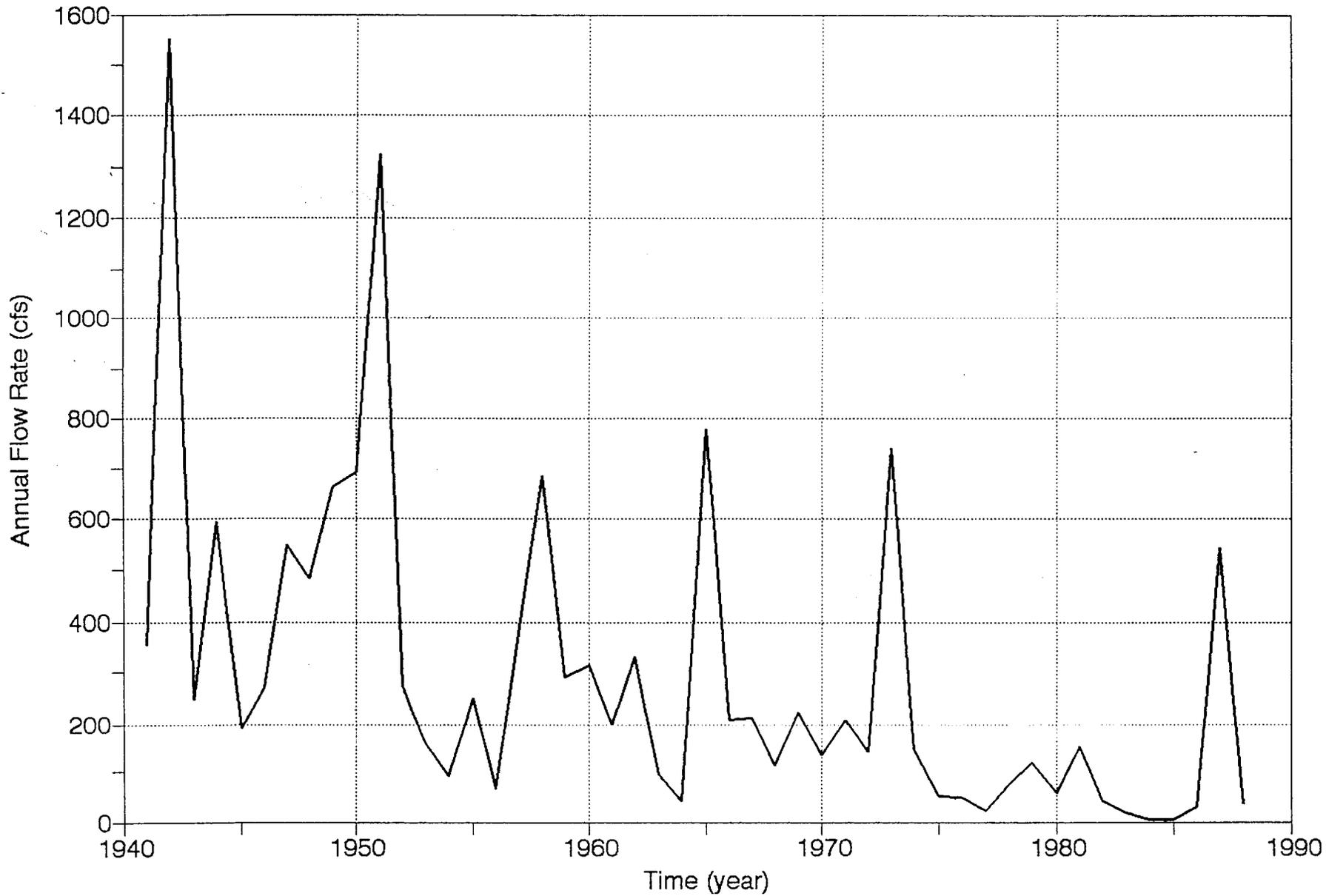


— Larned Station

**Pawnee River**

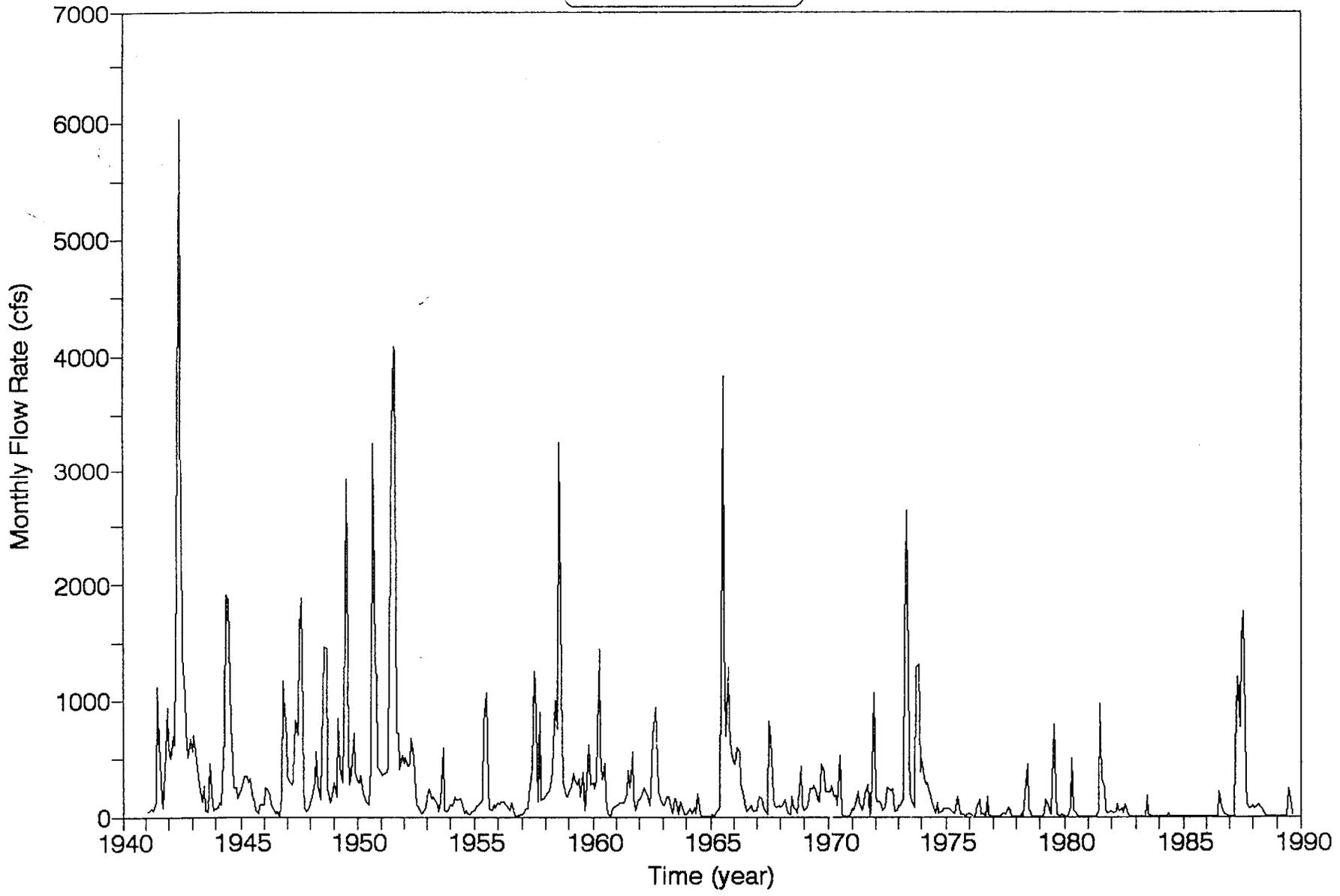


— Larned Station



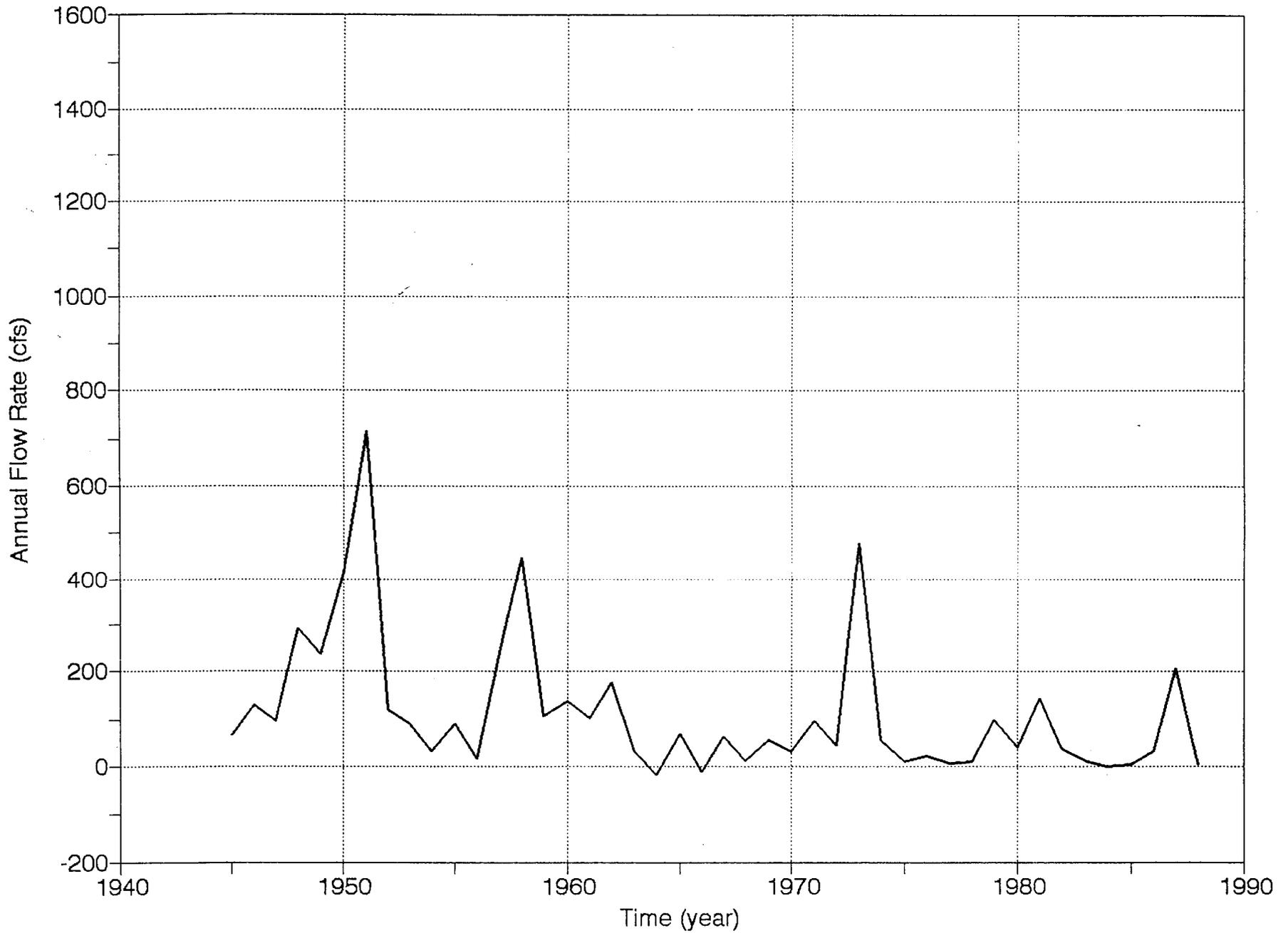
— Great Bend Station

**Arkansas River**

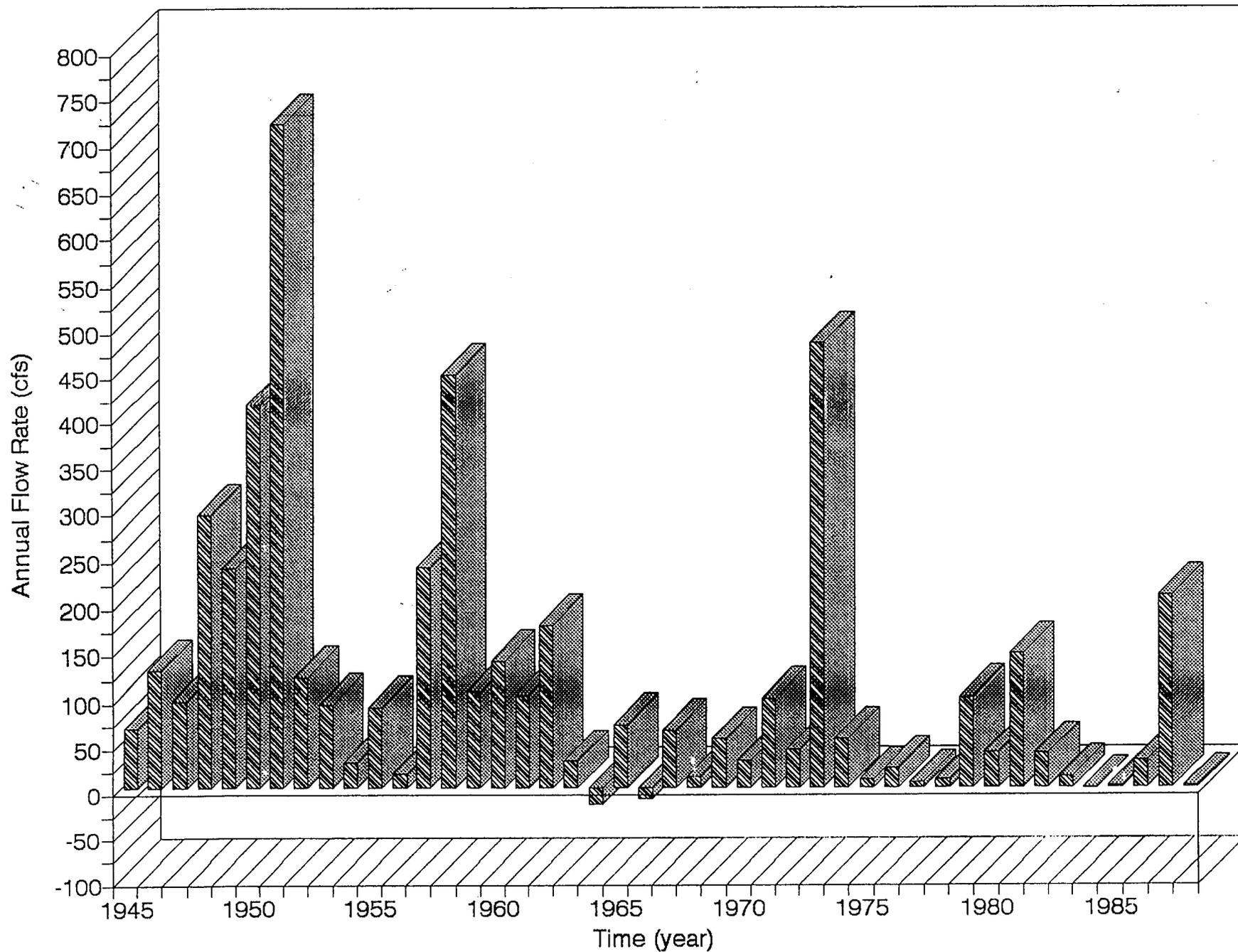


— **Great Bend Station**

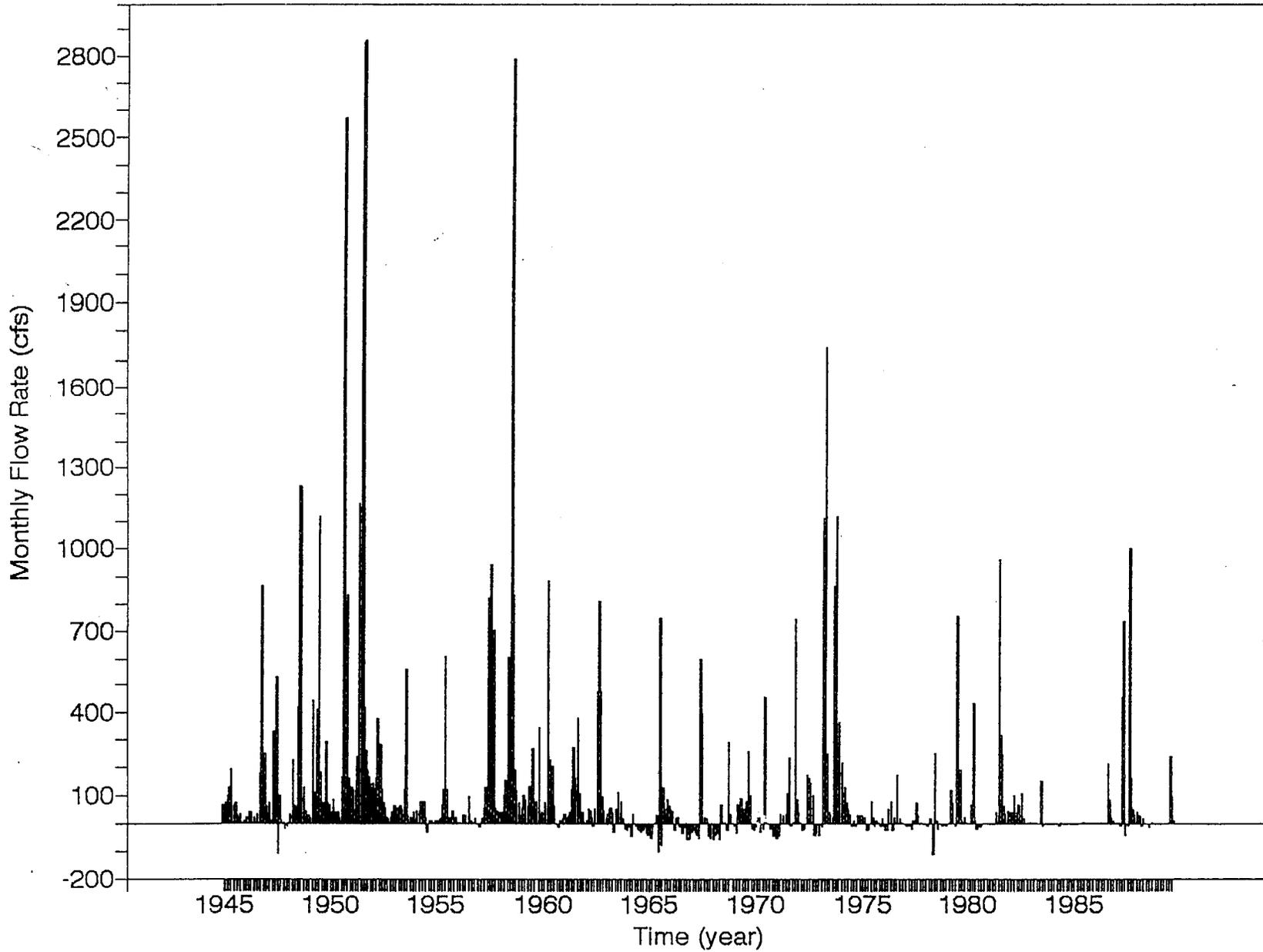
Great Bend(cfs)-Kinsley(cfs)



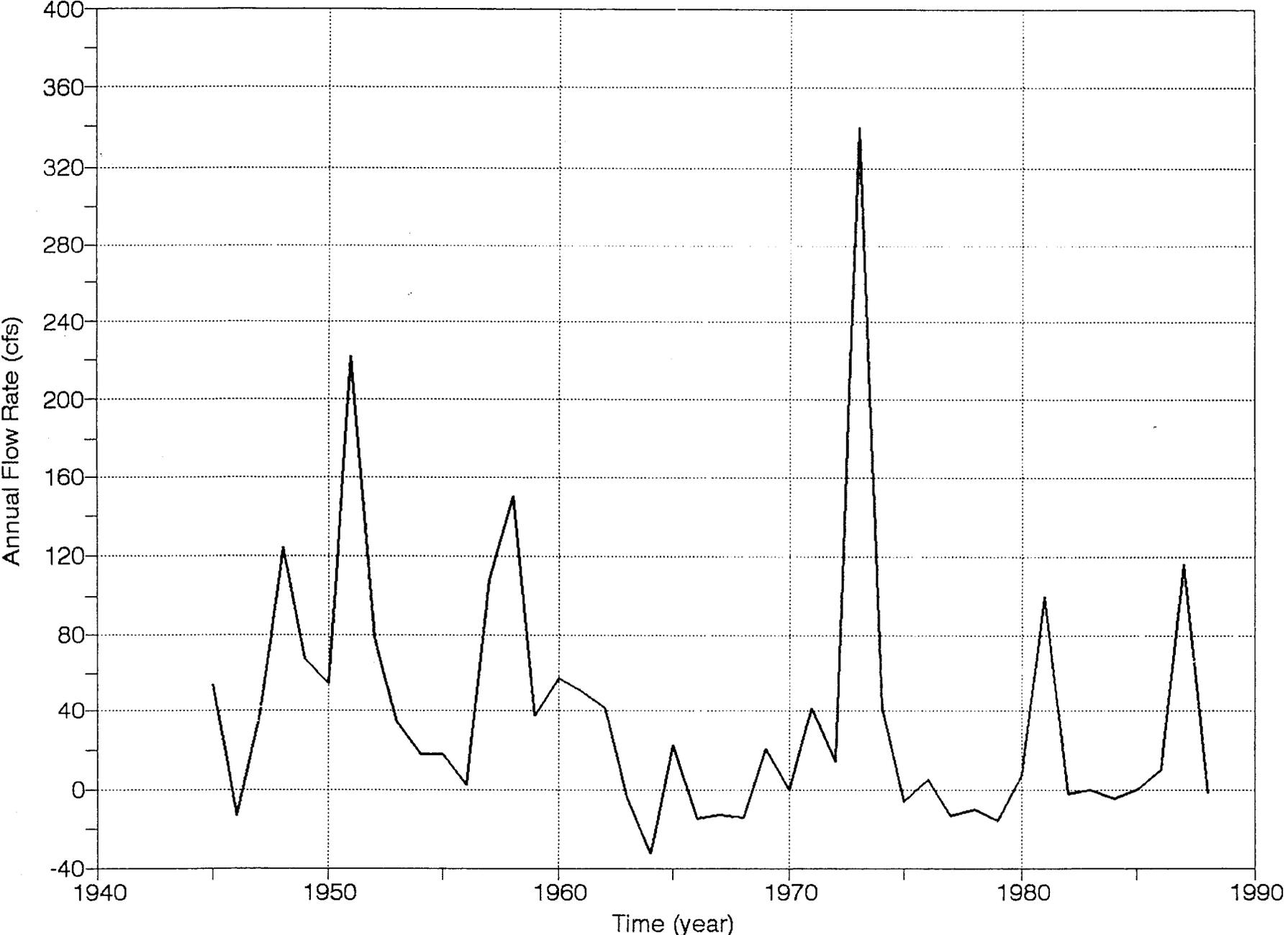
Great Bend(cfs)-Kinsley(cfs)



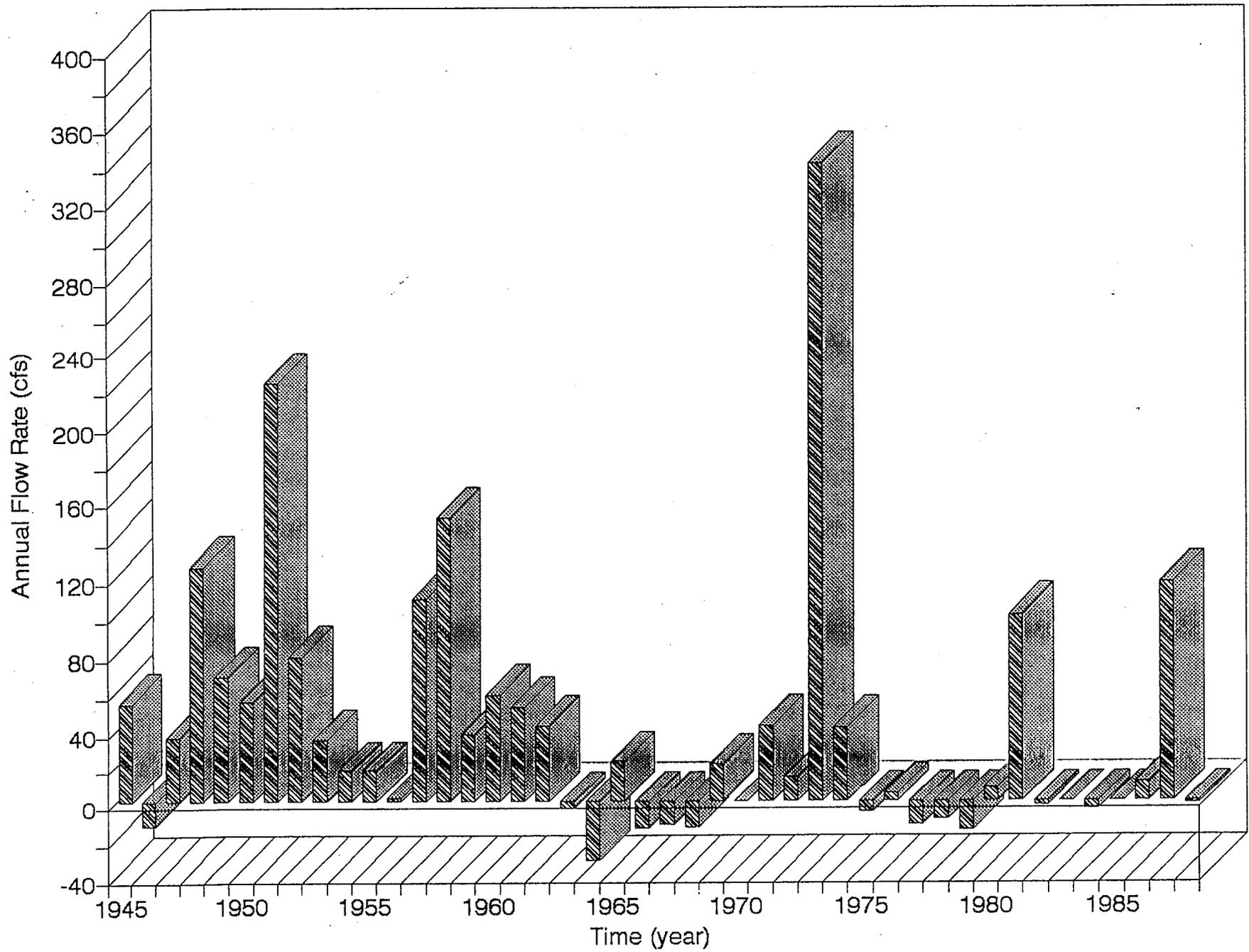
# Great Bend - Kinsley



Great Bend - (Kinsley + Larned)



# Great Bend - (Kinsley + Larned)



Great Bend - (Kinsley + Larned)

