Upper Mississippi River System
Flow Frequency Study

Hydrology & Hydraulics
Appendix C
Illinois River

Rock Island District

August 2003

UPPER MISSISSIPPI RIVER SYSTEM FLOW FREQUENCY STUDY
Rock Island District

Illinois River
Hydrology & Hydraulics Appendix C
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INTRODUCTION

PURPOSE

The purpose of the Upper Mississippi River System Flow Frequency Study is to update the discharge frequency relationships and water surface profiles for the Mississippi River and Illinois River above Cairo, Illinois, and the Missouri River downstream from Gavins Point Dam. The study area as shown on Plate C-I-1 includes five Corps Districts (Omaha, Kansas City, St. Paul, Rock Island, and St. Louis). The purpose of this appendix is to describe the work accomplished by the Rock Island District. Plate C-I-2 presents the study area encompassed by the Rock Island District (MVR).

AUTHORITY

The study was authorized by Section 216 of the 1970 Flood Control Act, which reads:

> *The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to significant changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying the structures or their operation, and for improving the quality of the environment in the overall public interest.*

PREVIOUS STUDIES

Flood Plain Management Assessment of the Upper Mississippi River and Lower Missouri Rivers and Tributaries. U.S. Army Corps of Engineers, June 1995. The Flood Plain Management Assessment (FPMA) recommended several actions that should be undertaken including, but not limited to:
update hydrology and hydraulics data of the Upper Mississippi River and Lower Missouri Rivers and Tributaries, including discharge-frequency relationships and water surface profiles; investigate a system-wide plan for flood damage reduction, and investigate developing a systemic management plan for natural resources.

Sharing the Challenge: Floodplain Management into the 21st Century. Report of the Interagency Floodplain Management Review Committee to the Administration Floodplain Management Task Force (a.k.a. "The Galloway Report"), June 1994. The Galloway report supports a management strategy for controlling runoff, managing ecosystems for all their benefits, planning the use of the land and identifying those areas at risk. Where the risk cannot be avoided, damage minimization approaches should be implemented in a systems approach to flood damage reduction in the Mississippi River basin. The Galloway Report also recommended that we reassess the methodology utilized for flow-frequency analysis.

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The Illinois River water surface profiles from river mile 80 to river mile 290 were developed by the Rock Island District Corps of Engineers for recurrence intervals of 2, 5, 10, 25, 50, 100, 200, and 500 year using the one-dimensional unsteady flow model UNET (UNET, 1992). These water surface profiles and corresponding discharges were published in September 1993 and have been used for project evaluations on the Illinois River (USACE, 1992).

ACKNOWLEDGEMENTS

This appendix is the result of the dedicated efforts of a number of employees of the Rock Island District and the Hydrologic Engineering Center. These employees include: S.K. Nanda, Task Force Chairman and Rock Island District Hydraulics Branch Chief; Marvin Martens, Hydrologic Engineering Section Chief; David Martin and John Burant, Hydraulic Engineers; Shirley Johnson, Hydrologist; and Dr. David Goldman, Hydraulic Engineer, Hydrologic Engineering Center.

BASIN DESCRIPTION

WATERSHED CHARACTERISTICS

The Rock Island District covers 78,318 square miles and includes 314 miles of the Mississippi River from Guttenberg, Iowa, downstream to Saverton, Missouri and 268 miles of the Illinois Waterway from Lake Street in downtown Chicago and the Thomas J. O'Brien Lock on the Calumet River to the LaGrange Lock and Dam, southwest of Beardstown, Illinois (see plate C-I-2). The drainage area at LaGrange Lock and Dam is 25,650 square miles. Agriculture has been and continues to be the predominant land use in the basin. Precipitation falling within its boundaries is the source of nearly all surface water runoff in the Upper Mississippi River basin. Runoff is subject to seasonal variations of temperature and precipitation. The average annual precipitation over the basin is 32 inches. Of this amount, an estimated 24 inches returns to the atmosphere by means of evaporation and transpiration. The remaining 8 inches or approximately 25 percent pass out of the basin as surface water runoff via the Mississippi River. However, the annual runoff as a percentage of the annual precipitation varies greatly over the basin. The months of highest runoff are generally March through June, roughly paralleling the monthly precipitation pattern. After June the average monthly flows generally taper off, reaching minimum values during the winter months. March and April flows in the northern half of the basin are augmented by melting snow which has accumulated during the winter months. Major flood events over the 120+ years of record are split between snowmelt and rainfall generated flood events. The largest flood events are often a combination of snow-melt and rainfall. Monthly flows in the southern portion of the basin are relatively high during the winter months compared to the northern parts because annual precipitation is more evenly distributed and temperatures are more moderate.

FLOOD HISTORY

Illinois River

Flood of 1943. The flood of May 1943 was produced by rainfall of more than twice the amount that normally occurs during the month. Rainfall over the Illinois River Basin during May totaled about 8.5 inches, as compared with the normal of 3.95 inches. The heaviest precipitation was recorded during the period 7-20 May. The peak flow of 83,100 c.f.s. at Kingston Mines (RM 145.4) occurred on May 23.

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Flood of 1982. The December 1982 flood resulted from a prolonged spell of abnormally warm weather and moderate rainfall through late November. Saturated conditions and intense rainfall in early December produced a high percentage of runoff in many areas of Illinois. The record peak flow of 88,800 c.f.s. at Kingston Mines occurred on December 7.

Flood of 1997. In late February—early March of 1997 a high water event occurred along the upper reach of the Illinois River with record discharge (89,600 c.f.s.) and stage occurring at Marseilles, Illinois on February 22. The same event produced the fourth highest discharge (76,600 c.f.s.) at Kingston Mines on March 1.

ILLINOIS RIVER
HYDROLOGIC ANALYSIS

HYDROLOGIC STUDY ASSUMPTIONS

1. Period of Record - The period 1940-1998 was chosen because land use was relatively consistent, the period of record flows can be adequately adjusted for the effects of channelization by using hydraulic models, and this period of record is long enough to provide useful estimates of flood frequency.

2. Climate Change - The climate for the period of record, 1940-1998, is assumed to be stationary; i.e., not significantly changing. The analysis by the Corps of Engineers' Institute for Water Resources (IWR) showed possible trends for some stations but no clear climate change trend for this period. IWR's recommendation was to assume that the period of record was stationary given the difficulty in distinguishing a climatic trend from overall climatic variability. Consequently, standard flood frequency statistical analysis will be used to capture the overall variability in the flood record.

3. Flow Frequency - The log-Pearson Type III analytical frequency distribution will be used for the flow-frequency analysis. Log Pearson Type III is the recommended method for flood flow frequency analysis used by all Federal agencies. Several new analytical distributions and parameter estimation methods were evaluated using the period of record. Significant differences between the application of the log-Pearson and other distributions were not found and hence it was decided to continue to use this standard distribution. The regional skew will be obtained by taking a best average estimate from gages situated in similar hydrologic and meteorologic conditions.

4. Stage-Frequency - Risk and uncertainty will be evaluated in the frequency analysis per current Corps requirements.

METHODOLOGY

The primary objective of the hydrology analysis was to establish the discharge frequency relationships for the Illinois River. The overall approach to accomplish this task was as follows:

1) Evaluate gage data
2) Compute flow frequency curves at gage locations using a regional shape estimation method. In this methodology the flow frequency curve is computed using the Bulletin 17B (IACWD, 1982) log-Pearson III distribution from the at-site mean and standard deviation, and a regional skew coefficient.

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FLOW RECORDS

Stream Flow Records

USGS mean daily stream flow gage records were used for all unregulated gage locations. This involved a comparison of discharges published by the USGS and discharges recorded by the Corps of Engineers.

Hydrologic Model Description.

Watershed models were developed for the main tributaries of the Illinois River to verify tributary inflow routing with the Rock Island District period-of-record model data. The watershed models were developed using the Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS). HEC-HMS is part of the 'new-generation' of software being developed by HEC. HMS models were built for ten Illinois River tributary rivers (see plate C-I-3). The building of the HMS models included the following tasks: GIS watershed delineation, precipitation and flow data retrieval, routing reach definition, and calibration event and parameter selection. The design of the HMS watershed models included features that would make these models compatible with the MODCLARK technique to estimate runoff with NEXRAD precipitation data. Sub-basins were delineated corresponding to the location of the Corps and USGS stream gaging stations.

Input Data Development. The GIS watershed delineation was accomplished using USGS 90 meter digital elevation model ARCINFO grid coverage and a series of arc macros (GRIDPARM) developed by HEC. GRIDPARM was used to develop basin work maps and arc macros were developed by the Rock Island District to develop Thiessen polygons for weighting of precipitation gages. Sub-basin drainage areas were based on Corps of Engineers (COE) and USGS published values.

The design of the HMS watershed models included features that would make these models compatible with the MODCLARK technique to estimate runoff using NEXRAD rainfall data. Hourly flow data (COE/USGS) and a combination of hourly and daily precipitation data (COE/NWS) were used for model calibration. COE flow data was used where available, otherwise USGS flow data was used. The period of record considered for this effort was limited to 1985-1997, due to the availability of hourly flow data. USGS hourly data prior to 1985 would have required data entry by the USGS from archived strip charts (requiring additional time and funding). Often large rainfall event data (1993) was not available—rainfall gages stopped recording, data was missing, or data was inaccurate.

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Model Calibration/Verification. The selection of calibration events included: (a) examination of USGS/COE hourly flow records for isolated large flow events and (b) examination of hourly rainfall data to verify that the large flow event was caused by an isolated rainfall event. The calibration of the models for infrequent events (1 and .5 percent chance exceedance) was not possible due to the lack of large events with which to calibrate the models—most readily available data was for more frequent events (50 and 20 percent chance exceedance). Missing precipitation and flow data as well as conflicting flow data from several data sources (COE/USGS) hampered model calibration. The HMS hydrologic elements include: losses, runoff transformation, and routing. The methods used for calculating losses were the SCS curve number and initial and constant loss. The SCS curve number losses are compatible with the MODCLARK techniques, however, were found to be inadequate during parameter optimization of long duration events. Transformations of precipitation excess to direct runoff were achieved using the Clark unit hydrograph method. Because cross-section data was not readily available, the Muskingum routing method was used in all of the HMS models. Differences in computed unit hydrograph parameters between events is the result of temporal and spatial variability of rainfall across the basin, gage recording errors (both flow and precipitation), and the interaction between local runoff and flows routed from an upstream watershed.

Routing parameters were estimated through a combination of modeling in HMS and through examination of historical flow records and observed flood travel times between gages. The travel time between gages varies with the magnitude of the event and the mode of flow (i.e., in or out of bank). The routing methods selected for the HMS models (Muskingum / Lag) are not appropriate for computing the attenuation typical of over-bank flow routing. Modified-Puls and/or Muskingum-Cunge routing methods will improve the model results when cross-sectional data becomes available for these basins and is incorporated into the models. Water control structures were not included in the HMS models. Detailed routing computations for these water control structures (usually not of significant consequence for large/extreme run-off events) were beyond the scope of this study.

Approximately 80 percent of the Rock Island District's watershed was modeled using HEC-HMS. The Illinois River tributary HEC-HMS models covering 20,000 square miles of drainage area (Big Bureau Creek, Du Page River, Fox River, Kankakee River, La Moine River, Mackinaw River, Mazon River, Sangamon River, Spoon River, and Vermilion River) are described and discussed in detail in a separate report available at the Rock Island District Headquarters office (USACE).

FREQUENCY ANALYSIS

FLOW FREQUENCY ANALYSIS

The Corps districts, HEC, Technical and Interagency Advisory Groups selected regional shape estimation methodology from among available statistical methods for estimating the annual peak flood distributions (see Hydrologic Engineering Center, 1999 and 2000, and Appendix A of the main report). Regional shape estimation employs the log-Pearson III distribution estimated from the method of moments as recommended in the federal guideline (Bulletin 17B, IACWD, 1982). However, this estimation method differs from the guideline method in that a regional skew is used instead of a weighted skew. The regional skew is taken as the average skew for stations within a homogenous flood region. The flow frequency estimates were developed using maximum daily discharges. A comparison of the 1% chance exceedance flow frequency estimates obtained in this and past studies is shown at selected locations in Tables C-I-1.

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Systematic records prior to 1940 were not used in estimating flood frequency distributions because the gage was moved (the record was not homogeneous). The Illinois River levee system is shown on Plate C-I-4. Methodology for the analysis was based on recommendations from the Technical and Interagency Advisory Groups (TAG and IAG). The TAG methodology recommendations are discussed in detail in the Main Report and Appendix A of this study documentation (see also HEC 1999 and 2000).

Table C-I-1

Illinois River Flow Frequency
One Percent Chance Exceedance

River Mile	Gage Location	Drainage Area (sq.mi.)	Published 1992 (1% chance exceed) CFS	Adopted Flow Frequency 2003 Study (1% chance exceed) CFS	At-site Mean	At-Site Standard Deviation	Regional Skew	Record (years) CY
291.1	Lockport L/D	740						
286.0	Brandon Road L/D	1,510						
271.5	Dresden Island L/D	7,280						
247.0	Marseilles L/D	8,259						
246.5	**Marseilles** (Calendar Year Record)	**8,259**	107,000	**114,000**	**4.675**	**0.1750**	**-0.2**	**59**
231.0	Starved Rock L/D	11,060						
157.7	Peoria L/D	14,550						
145.4	**Kingston Mines** (Calendar Year)	**15,818**	101,000	**97,900**	**4.672**	**0.1462**	**-0.2**	**58**
80.2	LaGrange L/D (Rock Island District)	25,650						
0	Grafton, Illinois	28,900						

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Illinois River Flow Records

Marseilles, Illinois. The Marseilles, Illinois USGS gage (05543500) is located at Illinois River mile 246.5. The drainage area at this gage site is 8,259 square miles. The unregulated calendar year annual peak mean daily period of record and flow frequency analysis for the Marseilles gage is shown on Plate C-I-5. The flow at this location is unregulated by water control structures.

Kingston Mines, Illinois. The Kingston Mines, Illinois USGS gage (05568500) is located at Illinois River mile 145.4. The drainage area at this gage site is 15,818 square miles. The unregulated calendar year annual peak mean daily period of record and flow frequency analysis for the Kingston Mines gage is shown on Plate C-I-6. The flow at this location is unregulated by water control structures.

REGIONALIZED FLOW FREQUENCY STATISTICS

The regional skew is taken as the average skew for stations within a homogenous flood region. An investigation of the variation of skew for the study drainage areas was performed (see HEC, 2000) to determine the appropriate regions. Based on this investigation, the TAG and IAG recommended, and the Corps adopted, average skew estimates for reaches of Illinois River mainstem affected by similar climate and with similar flood response characteristics. This average skew value is used with the at-site estimates of the mean and standard deviation of the flow logarithms to estimate the log-Pearson III distribution.

FLOW FREQUENCY ANALYSIS

The flow frequency curves computed using the regional shape estimation method at selected gages are shown in Plates C-I-7 to C-I-8. The adopted flow frequency values are shown in Table C-I-2. Table C-I-3 compares these estimates with those obtained from previous studies.

TABLE C-I-2
Illinois River
Adopted 2003 Final Flow Frequency
DISCHARGES AT SELECTED STREAM GAGES

FREQUENCY	Marseilles Gage	Kingston Mines Gage
	Flow (CFS)	Flow (CFS)
2-YEAR	48,000	47,600
5-YEAR	66,700	62,600
10-YEAR	78,600	71,800
20-YEAR	89,700	80,200
25-YEAR	91,000	83,000
50-YEAR	104,000	90,500
100-YEAR	114,000	97,900
200-YEAR	124,000	105,000
500-YEAR	137,000	114,000

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TABLE C-I-3
Illinois River
Published 1992 Study* and Adopted 2003 Study
DISCHARGES AT SELECTED STREAM GAGES

FREQUENCY	Marseilles Gage		Kingston Mines Gage	
	1992 Study	**2003 Study**	**1992 Study**	**2003 Study**
	Flow (CFS)	Flow (CFS)	Flow (CFS)	Flow (CFS)
Mean	**4.637**	**4.6751**	**4.669**	**4.6723**
Stand Dev	**.1827**	**.1750**	**.1596**	**.1462**
Skew	**-.3**	**-.2**	**-.4**	**-.2**
2-YEAR	44,500	48,000	47,800	47,600
5-YEAR	62,300	66,700	64,200	62,600
10-YEAR	73,600	78,600	74,000	71,800
50-YEAR	97,300	104,000	93,600	90,500
100-YEAR	107,000	114,000	101,000	97,900
200-YEAR	116,000	124,000	108,000	105,000
500-YEAR	128,000	137,000	118,000	114,000

* USACE, Rock Island, Corps of Engineers, 1992, Illinois River Water Surface Profiles, River Mile 80 to 290.

ILLINOIS RIVER
HYDRAULIC ANALYSIS

STUDY AREA DESCRIPTON

Geographic Coverage

The Rock Island District hydraulic model was developed for the reach of the Illinois River from Lockport, Illinois (~river mile 291) to near La Grange, Illinois (~river mile 80) and major tributaries from the tributary mouth upstream to the first discharge gage on each tributary. (The Illinois River UNET model schematic is shown on Plate C-I-9.) The model contains an additional reach of the river from La Grange, IL to Grafton, IL at river mile 0. This portion of the model lies within the St. Louis District.

Basin Description

The Illinois River basin has a watershed of 28,906 square miles which includes the 673 square miles of the diverted Lake Michigan basin that also drains into the Illinois Waterway. The Illinois River within the Rock Island District extends from Lockport (~river mile 291) to LaGrange (~river mile 80). Upstream of river mile 230, the river is steep with a gradient of about 1.5 feet per mile. In the reach from river mile 230 to river mile 80, the gradient of the Illinois River is extremely flat (0.3 feet per mile). Numerous backwater areas and lakes parallel the main channel. Downstream of river mile 202, extensive levee systems have been built to protect agricultural areas in the wide floodplain. Topography is generally characterized by high bluffs and rolling hills which descend to a wide, flat, floodplain adjacent to the river. Many small ungaged tributary streams as well as major rivers flow into the river along this reach.

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Connections with Other Districts

The Rock Island District portion of the Illinois River is located between the Chicago and St. Louis Districts. The UNET model begins at Lockport Dam Tailwater at Lockport, IL and continues downstream to Grafton, IL. The portion of the model from LaGrange, IL, the downstream limit of the Rock Island District, to Grafton is located in the St. Louis District. This additional river reach, developed as part of the St. Louis District UNET model, is necessary to prevent the influence of the downstream boundary on the Rock Island District portion of the model.

UNET APPLICATION

UNET Hydraulic Modeling Computer Program

UNET is the hydraulic analysis computer program selected and used for the Upper Mississippi River System Flow Frequency Study (FFS). UNET is a one-dimensional, unsteady open-channel flow computer model that can simulate flow in single reaches or complex networks of interconnected reaches. UNET also has the capability to simulate storage areas, which is used in this study to simulate the interaction of the river with levees. Storage areas are lake-like regions that can either divert water from, or provide water to, a channel. Primary development and application of UNET was accomplished by Dr. Robert L Barkau. The Hydrologic Engineering Center (HEC) maintains, distributes, and supports the standard version of UNET for Corps of Engineers' offices. The Hydraulic Technical Advisory Group for the Flow Frequency Study, Dr. Danny Fread and Mr. Tony Thomas, P.E., has reviewed the hydraulic modeling assumptions and has provided quality control reviews of hydraulic modeling results.

Previous Modeling

The Rock Island District developed a UNET hydraulic model for the Illinois River in 1992 and has used the model for river forecasting and stage frequency development. This model was built using available sounding data for channel geometry (circa 1970's) and USGS 7-minute quadrangle mapping for overbank areas geometry.

UNET Model Development—Model Geometry

The geometry of the newly developed model consists of the Illinois River and tributary cross sections, navigation dams, and the levees and levee systems. The geometric layout of the UNET computer model of the Illinois River in the Rock Island District is illustrated by the schematic diagram on Plate C-I-9. The cross sections are grouped into routing reaches in the cross section file. The mainstem routing reaches extend between tributary inflow points, and each tributary is a routing reach. The levees are defined as storage cells in a separate file, commonly referred to as the "Include" file. The Include file, contains the properties for each levee, such as top of levee crown elevation, elevation-volume relationship, upstream and downstream locations where overtopping will occur, and linear routing coefficients.

River Geometry

The main-stem geometry consists primarily of a series of geospatial cross sections extending bluff to bluff across the river valley. The cross sections were extracted from a digital surface of the river valley created from a combination of floodplain digital terrain models and digital hydrographic surveys. The floodplain

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digital terrain models were developed from 1998 aerial photography and photogrammetry. Illinois River floodplain ("bluff-to-bluff") digital terrain model data was designed and compiled so that spot elevations on well-defined features would be within 0.67 feet (vertical) of the true position (as determined by a higher order method of measurement) 67% of the time. The 0.67 feet (vertical) is as per ASPRS Class I Standards as stated in the USACE EM 1110-1-1000, dated 31 March 1993. It is approximately 1/6th of a contour interval (4 foot contours). The level of detail in the elevation data was kept to the minimum for this purpose. Mass points and break-lines to depict roads, railroads and levees were specified.

The hydrographic surveys were assembled from navigation channel maintenance surveys, dam periodic inspection surveys, and environment management project surveys. All digital hydrographic surveys date from 1997 or later. The horizontal accuracy of the hydrographic survey data is the accuracy usually attributed to the US Coast Guards Differential GPS (DGPS). The published accuracy of this system is +/- 9 feet. The vertical accuracy is published as being +/- 0.5 ft as per ASPRS Class III Standards as stated in the USACE EM1110-1-1000, dated 31 March 1993. The LaGrange navigation pool has complete Upper Midwest Environmental Science Center (UMESC 1997) gridded bathymetry of navigation channel and all side channels at 5-meter postings (no metadata available). For areas where no digital hydrographic surveys were available, such as in some side channels and chutes, depths were estimated from the most current printed surveys available. Approximately 480 cross sections were incorporated into the final Illinois River UNET model, spaced roughly every half mile. Bridge structures were not added to the model, as it is assumed that that bridge decks are sufficiently high and bridge piers sufficiently small compared with channel area as to not significantly alter the computed Illinois River water surface. Reach lengths between cross sections, bank stations, and effective flow limits were added to the geometry files.

Model development consisted of constructing HEC-RAS models for the individual navigation pools from the original cross sections, formatted specifically for RAS. Any necessary ineffective flow areas or obstructions not included in the original cross sections were added during this phase of development.

To form the UNET geometry of the main-stem, the individual HEC-RAS models were converted to UNET format using the HEC-developed application, RAS2UNET. Each of the converted RAS models was combined to create one continuous UNET geometry. The additional components required by UNET, such as navigation dams, levees and tributary reaches were added at this point.

Tributary Geometry

Cross section geometry is included in the UNET model for all tributaries that have USGS gaging stations. These gaging stations supply the inflow data needed to run the UNET model. Each tributary is modeled from its confluence with the Illinois River upstream to the USGS gaging station location. Tributary gaging stations are located between 5 and 59 river miles upstream of the confluence with the Illinois River. Tributary cross section data were taken either from preexisting HEC2 hydraulic models or developed from a combination of channel soundings taken at the USGS gage during flow measurements and USGS 7.5 minute series quadrangle topographic maps. The assembled cross section data for each tributary is suitable for flow routing only. Accurate stage computation on the tributaries is not possible with the coarse data employed in the development of the tributary cross sections.

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Boundary Conditions

Boundary conditions are required at every location where water passes into or out of the model. The inflow and stage data (input data), which drive the computations of the UNET program, are accessed via the boundary condition file. The primary boundaries for the model are the upstream end of the Illinois River at Lockport, the downstream end of the Illinois River at Grafton, and the most downstream USGS gage on each of the Illinois River tributaries. At Lockport, observed flow is used as the upstream boundary condition for all simulations. At Grafton, observed stage is used. For tributaries, observed flow is applied at the USGS gage for each. The input data is stored in Data Storage System files called "DSS" files. All observed stage and flow data for the period January 1, 1940 to September 30, 2000 have been assembled into DSS files for use in the FFS hydraulic modeling effort. Daily stages and flows are used in the UNET hydraulic analysis.

Levees

Levees protect much of the floodplain along the Illinois River in the Rock Island District from high river stages. The river in the lower half of the district, from Peoria, Illinois downstream, is largely confined between levees. These levees were built for either agricultural, environmental management or community flood protection purposes.

The consensus of the Flood Insurance Rate Map Subtask Force (the Corps of Engineers, Federal Emergency Management Agency (FEMA), and the States of Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, and Wisconsin) was that the final flood profiles should be based on existing conditions. The UNET model utilizes existing line and grade of all levees. Levee failure is modeled to occur at the actual overtopping elevation of the levee at two selected points (one each near the upstream and downstream ends of the mainstem levee). Potential future modifications of any structure are not incorporated into the existing conditions profiles. In previous flow frequency studies of the Illinois River, the levees were assumed to confine flood stages to an infinite level.

Levee Storage Areas

The model represents the areas protected by levees as storage areas with connections to the river channel. These storage areas are defined separately from the model cross sections. Each storage area is defined by an elevation versus volume relationship, a location and elevation for each connection to the river, and by inflow and outflow parameters associated with levee overtopping flow. The elevation versus volume relationship is calculated from the same digital survey of the floodplain used to generate model cross sections. Connections between the river and the storage area are located where the levee is likely to overtop first. Typically, there are two connection locations, one each near the upstream and downstream ends of the mainstem levee. The elevation of each connection is determined from the most recently verified survey available. For many levees, the 1998 Digital Terrain Models from aerial photography represent this survey, though other recent, ground survey have been provided by levee associations for this task.

The Illinois River levee system is shown on Plates C-I-4. The Illinois River levee overtopping elevations and storage areas are shown in Table C-I-4. This table was modified to reflect changes that were necessary from a public review period during this study. The crown elevations were verified with current as-built drawings and recent kinematic GPS levee profile surveys. Levee overtopping was assumed to occur at the top-of-levee elevation.

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Table C-I-4
Illinois River
Levee Overtopping Elevations and Locations

Name/District	Location of Levee District Upstream River Mile	Location of Levee District Downstream River Mile	Bank	Approx. Area Protected (Acres)	Overtopping Levee Elevation Upstream / Location	Overtopping Levee Elevation Downstream / Location
Ottawa (Urban)	240		R		476 @ RM 240	
Hennepin Drainage and Levee District	207	202.5	L	2,900	459.0 @ RM 207	458.7 @ RM 202.8
East Peoria Sanitary District	162.75	162.1	L		465.6 @ RM 162.75	457.0 @ RM 162.1
East Peoria	162	160.6	L	800	461 @ RM 161.7	460.9 @ RM 160.7
North Pekin Levee	156.6	156.1	L		459.9 @ RM 156.6	461.8 @ RM 156.1
Pekin & LaMarsh Drainage & Levee Dist	155	149.6	R	3,010	457.7 @ RM 155.0	456.0 @ RM 151.2
Rocky Ford Drainage and Levee District	151	148	L	1585	456.4 @ RM 150.8	456.6 @ RM 148.3
Banner Special Drainage & Levee District	145.5	138.1	R	4,561	459.3 @ RM 145.5	458.9 @ RM 138.2
Spring Lake Drainage and Levee District	147.7	134	L	13,120	458.6 @ RM 147.7	453.9 @ RM 135.2
East Liverpool Drainage & Levee District	131.7	128.3	R	2,885	458.8 @ RM 131.7	456.7 @ RM 128.4
Liverpool Drainage and Levee District	128.2	126.2	R	2,885	455.5 @ RM 127.9	455.2 @ RM 126.4
Chatauqua National Wildlife Refuge	129.4	124.4	L		447.0 @ RM 129.4	441.5 @ RM 124.4
Thompson Lake Drainage & Levee Dist	125.9	120.9	R	5,498	457.7 @ RM 125.9	452 @ RM 120.9
Lacey Drainage and Levee District	119.3	111.9	R	10,406	455.5 @ RM 119.3	455.8 @ RM 111.9
Seahorn Drainage and Levee District	111.8	111.2	R	2,000	454.5 @ RM 111.7	454.4 @ RM 111.2
Big Lake Drainage and Levee District	108.5	102.7	R	3,401	453.2 @ RM 108.2	451.6 @ RM 103.1
Kelly Lake Drainage and Levee District	102.6	100.3	R	1,045	455 @ RM 102.7	455.1 @ RM 100.7
Hager Slough Drainage & Levee District	94.7	89.2	L	3,698	451.7 @ RM 94.7	454.7 @ RM 89.2
Coal Creek Drainage and Levee District	92	85	R	6,794	455.8 @ RM 91.7	455.4 @ RM 85
Lost Creek Drainage and Levee District	90.2	89.2	L	2,740	454.9 @ RM 90.2	449.0 @ RM 92.7
Beardstown Floodwall	88.8	88.4	L		455.2 @ RM 88.8	455.1 @ RM 88.4
S. Beardstown & Valley Drainage Levee	88.1	79	L	10,516	454.2 @ RM 87.9	454.4 @ RM 80.4
Crane Creek Drainage and Levee District	85	83.8	R	5,417	450.7 @ RM 84.5	450.8 @ RM 83.9

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Levee Exceedance

When the computed river stage exceeds the elevation of a levee at one or more levee connections the levee storage area begins to fill. If the levee is overtopped at only one connection location, the storage area only acts to store the water from the river. A levee storage area may convey flow if the levee is overtopped at two connections and the storage volume is sufficiently full that flow enters the storage area through one connection and simultaneously leaves the storage area through another. The computation of conveyance into and out of a storage area is a dynamic process that uses linear routing to simulate the flow through a levee breach, considering available storage area volume.

The levees have the ability within the UNET model to recover to initial conditions after a simulated levee overtopping. After a levee is overtopped, once the river stage had receded to a predefined level that is below the levee toe, the levee is repaired within the model to protect against the next high water event. Any residual water within the storage area after the levee has recovered is pumped back to the river.

Control Structures

The navigation channel depth of the Illinois River within the Rock Island District is maintained by a series of six dams. The sole function of these dams is to maintain the nine-foot channel depth at all locations. Beyond the small amount of storage necessary to maintain the navigation pool level, the dam simply passes all the river flow. These dams have no capability to store water for flood control purposes. As river flows increase, dam gate openings are increased, so as not to increase the pool level. When the flows are high enough that the gates are no longer necessary to maintain the regulatory pool level, the gates are completely lifted above the water and the entire river flow passes beneath. For the Peoria and La Grange Dams, the wicket gates are lowered. Each of the dams reaches this open gate condition at a different flow rate.

Navigation dams within the UNET model are operated according to the structure's regulation rules. In the Rock Island District, that generally means that the regulatory pool is held fixed immediately upstream of the dam until the river's flow rate rises to the level at which the gates are no longer needed to maintain the pool. At that point the pool stage at the dam is controlled by the tailwater stage plus the computed swellhead at the dam. Swellhead is the headloss created by the contraction of flow through the dam's structure. The amount of swellhead is different at each structure and can vary by flow rate, but is typically less than one foot. The swellheads used within the model are either set at single value or computed dynamically by the model. The swellheads for Brandon Road and Marseilles Dams are model-computed. The remaining dams in the model use set swellheads, based on average recorded swellhead.

In addition to simulating navigation dam operations according to the regulation rules, the UNET model also allows the dams to be operated exactly as observed historically, by using the recorded pool stages as an internal boundary condition in the model. The recorded pool stages will fluctuate slightly, within allowable regulation limits, due to fluctuations in flow rate and changes in gate settings. The pool stage internal boundary condition is useful when attempting to finely calibrate the model to observed stages. However, for hypothetical simulations the dams must be operated according to rule. Pertinent information about the lock and dam locations and main stem gages along the study reaches is shown in Table C-I-5.

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UNET Calibration

The UNET model calibration is a multi-step process designed to adjust the model to reproduce observed stage and flow records. The model was calibrated to reproduce observed stages within one foot for the period from water years 1992 through 2000. The model was spot checked against water years 1943, 1973 through 1979, and 1983 through 1985 and adjusted to reproduce the crest stages of these supplemental events. The model was calibrated to reproduce observed flow at the USGS gages for the entire period of record, which for the Illinois River in the Rock Island District covers the dates from 1940-2000. A single geometry set is used to reproduce flows and stages for all time periods.

Calibration data

The following data sources are used to verify the UNET calibration accuracy.

- USGS flow measurements at Marseilles,IL and Kingston Mines, IL
- USGS daily discharge records at Marseilles, IL, Kingston Mines, IL and Valley City, IL
- Observed daily stage records at 25 mainstem gages, collected by the Corps.

Manning Roughness Values

The calibration of the UNET model is a multi-step process, beginning with the selection and adjustment of channel and overbank roughness values. Manning's n-value is the roughness parameter used to establish the initial conveyance properties for each cross section. Manning's n-value is the roughness parameter used. The placement and verification of n-values is completed in the early development of the hydraulic model using HEC-RAS software. Channel n-values were derived from experience gained in previous hydraulic modeling efforts of the Illinois River and range between 0.02 and 0.045. Overbank n-values were estimated using GIS spatial land cover data and guidance provided in the HEC-RAS hydraulic reference manual and range between 0.035 and 0.165. HEC-RAS N-values were adjusted using the development HEC-RAS model to reproduce the 1982 and 1997 flood events.

Null Internal Boundary Condition for Lateral Inflows

The Null Internal Boundary Condition (NIBC) is a tool for estimating ungaged lateral inflow in a river system. Use of the NIBC is an important component of calibrating the model to both flow and stage. The NIBC technique estimates ungaged inflow to reproduce either a stage hydrograph or a flow hydrograph at the NIBC station. When stage reproduction is the priority, the reproduction of flow is secondary, being dependent on the calibration of the model. Likewise, when flow reproduction is the priority, the reproduction of stage is secondary, being dependent on the calibration of the model. In either case, the ungaged inflow compensates for all the errors in the measurement of stage and flow and for systematic changes in roughness and geometry that may not be included in the model. As a result, the ungaged inflow determined using the NIBC procedure includes both flow and an error correction term.

The NIBC feature is used by the Rock Island District to reproduce the flow record at the USGS gage locations at Marseilles, Kingston Mines, and Valley City, IL from 01 Jan 1940 through 30 Sep 2000.

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Table C-I-5
Illinois River
Pertinent River Gage and Tributary Information

Illinois River Station	Gaged Tributary	Ungaged Tributary	River Mile	Ungaged Drainage Area	Drainage Area
				(sq. mi.)	(sq. mi.)
Lockport L/D			**291.1**		**740**
	Des Plaines River at Riverside		289.9		630
		IL and MI Canal	288.8		
	Hickory Creel At Joliet		286.3		107
Brandon Road L/D			**286.0**		**1,510**
	Du Page River at Shorewood		276.9		324
	Kankakee River at Wilmington		273.7		5,150
Dresden Island L/D			**271.5**		**7,280**
		Aux Sable Creek	268.1		
	Mazon River at Coal City		263.5		455
Marseilles L/D			**247.0**		
Marseilles USGS Gage			**246.5**		**8,259**
	Fox River at Dayton		239.6		2,642
Starved Rock L/D			**231.0**		**11,060**
	Vermillion River near Leonore		226.3		1,251
		Little Vermillion River	225.7		
		Sandy Creek	196.2		
	Big Bureau Creek At Princeton		199.2		196
		Crow Creek	182.2		
Peoria L/D			**157.7**		**14,550**
		Kickapoo Creek	154.5		
	Mackinaw River nr Congerville		147.7		1,089
Kingston Mines USGS			**145.4**		**15,818**
	Spoon River		119.4		1,636
	Sangamon River – Oakford		90.2		5,094
	La Moine River at Ripley		83.5		1,350
LaGrange L/D			**80.2**		**25,650**
Total W/in Rock Island District				~ 5,610	25,650
Meredosia (St. Louis Dist.)			71.3		26,028
Grafton					28,900

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In the NIBC process, model inflows are initially routed from the model boundaries to the USGS gages. The routed flow hydrograph is subtracted from the record flow hydrograph at the gage. The difference between the routed flow hydrograph and the recorded flow hydrograph is considered to be the best estimate of ungaged inflow. This estimated ungaged inflow hydrograph is then lagged back in time and applied uniformly to the upstream routing reach. The backward lag is adjusted by distance. The lag varies from one to four days on the upper end of the reach and transitions down to no lag at the lower end. Both the observed and estimated ungaged inflows are then routed again through the model to the USGS gages and, again, the difference is calculated between the routed and recorded flows. The difference between the routed and recorded flows should be less than without the estimated ungaged inflow. To further refine the flow calibration the NIBC process may be repeated a number of times.

Application of Automatic Calibration Conveyance Adjustment

Automatic Calibration Conveyance Adjustment provides a method to adjust the conveyance in a model reach using rating curves. At each stage gage location, the model-computed flow record is combined with the observed stage record for a given period of time. The result is a scatter of data through which a single rating curve can be estimated, also known in the model as a KR curve. These KR curves provide a good estimate of the stage versus flow relationship at each gage location, when no measured relationship may be available. The UNET model geometry processor applies a series of steady-flow backwater computations to reaches between gage locations in which the KR curves serve as the downstream boundary of each reach. From each backwater computation the computed stage is compared with the KR curve of the next upstream gage. Any conveyance adjustments necessary to make the computed stage match the upstream KR curve are applied uniformly to the geometric property tables of each cross section in that reach. In the Rock Island District, KR curves are computed and applied at each of the mainstem stage gage locations.

Calibration Fine Tuning for Flow/Stage Effects

Manning's n-values alone cannot fully describe the changes in conveyance caused by changes in discharge, water temperature, and other factors. The UNET program has three tools for fine-tuning the stage calibration of the model. These tools are applied within the boundary condition file and consist of different methods to adjust the discharge-stage-conveyance relationship at a cross section or series of cross sections within the model. The individual adjustments (factors) are applied as ratios of conveyance within the property tables of each cross section. A factor less than 1.0 reduces the cross section conveyance and increases the computed stage. Likewise, a factor greater than 1.0 increases the cross section conveyance and decreases the computed stage.

The Conveyance Change Factors adjust the conveyance at all cross-sections in a specified calibration reach for all stages and flows. A unique factor is available for the channel and another for the overbank. These factors simulate a systematic change in roughness that is apparent for all stages over the entire length of the simulation. For the Illinois River, these factors range between 0.8 and 1.1.

The Discharge-Conveyance Change Factors adjust conveyance based on a series of discharge ranges at all cross-sections in a specified calibration reach. These factors provide a conveyance change for changes in roughness specific to certain flow ranges. The factors are manually defined and applied to a table of equal intervals flow ranges that represent the full range of observed flows. For the Illinois River, these factors range between 0.75 and 1.3.

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The Seasonal Conveyance Change Factors change the overall conveyance multiplier with time, allowing the simulation of seasonal shifts in roughness. The seasonal adjustment, given by a time series of factors, is applied to all the cross-sections in a calibration reach at all stages. The factors simulate the variability of stage due to changes in viscosity caused by changes in water temperature. These factors were not necessary in the calibration of the Illinois River.

STAGE DISCHARGE FREQUENCY RELATIONSHIPS

Stage-Frequency from UNET Results

The methodology of hydraulic modeling for the Illinois River Stage Frequency varies from the TAG recommendations. For the UMRSFFS, the TAG recommended that stage frequency should be produced by combining unregulated flow frequency with a model-computed rating curve to establish stage frequency at each model cross section. However, due to the large attenuation of flow peaks between the major flow gages of the Illinois River, no method was found to realistically interpolate flow frequency statistics. For that reason, design flood events were used to develop stage frequency profiles.

The design flood event used for stage frequency profiles were based on a historic flood event. The December 1982 flood event was selected as the basis for the design events. The 1982 event was a rainfall event with high flows throughout the length of the Illinois River. To generate the design floods from the historic events, the observed tributary inflow and estimated ungaged inflows are multiplied by factors, which are user-selected and iteratively refined such that the model routed peak flow for the frequency design event will match the adopted frequency flow at each Illinois River USGS gage. Since a historic flood event does not represent a single frequency throughout the river reach, a single multiplying factor is not sufficient to produce each frequency profile. Instead, the UNET model hydrology is divided into reaches. Each reach is factored individually. The three inflow reaches for the Illinois River are Lockport to Marseilles, Marseilles to Kingston Mines, and Kingston Mines to Grafton. The flow adjustment factors are shown in Table C-I-6. The model-computed maximum water surface profile from each frequency design event becomes the stage frequency profile for that frequency. Individual design floods were generated for each of the frequencies of 50, 20, 10, 4, 2, 1, 0.5, and 0.2%. This matches the procedure used in the 1992 Illinois River Flow Frequency Study.

To test the sensitivity on the resulting stage frequency profiles of selecting a single historic event (1982 flood) as the design event, two additional historic flood events were factored for each frequency and compared with the selected design-event stage frequency profiles. For the frequencies between 4% and 0.2%, the two historic events are 1943 and 1985. For frequencies between 50% and 10%, other, lower magnitude floods were compared with the factored 1982 event. The profiles based on other historic events were within 1 foot of the final stage frequency profiles. This sensitivity analysis provided a reasonable correlation to the stage frequency profiles produced using the 1982 event.

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Table C-I-6
Flow Adjustment Factors

FREQUENCY	Lockport to Marseilles	Marseilles Gage	Marseilles To Kingston Mines	Kingston Mines Gage	Kingston Mines to Meredosia	Meredosia Gage (St. Louis District)
	Flow Adjustment Factor	Flow (CFS)	Flow Adjustment Factor	Flow (CFS)	Flow Adjustment Factor	Flow (CFS)
2-YEAR	0.51	48,000	0.50	47,600	0.48	59,000
5-YEAR	0.68	66,700	0.78	62,600	0.79	80,000
10-YEAR	0.84	78,600	0.91	71,800	1.03	93,000
25-YEAR	0.97	91,000	1.16	83,000	1.23	110,000
50-YEAR	1.10	104,000	1.26	90,500	1.36	121,000
100-YEAR	1.20	114,000	1.42	97,900	1.55	132,000
200-YEAR	1.31	124,000	1.55	105,000	1.83	143,000
500-YEAR	1.44	137,000	1.66	114,000	2.00	157,000

Graphical Stage Frequency

To further test the adequacy of using design events to produce stage frequency, graphical stage frequency analysis was performed at the gage locations. Due to limited (60-year) period of record available for model simulation, graphical stage frequency was not directly used to generate the final stage frequency profiles. To do so would require extrapolation of the graphical stage frequency curve for the 1, 0.5 and 0.2% floods. This extrapolation is subjective and unverifiable. However, a graphical stage frequency analysis is useful to verify the adequacy of stage frequency from design events for the frequency floods between 50% and 2% chance exceedance. The graphical stage frequency, based on the model-simulated period-of-record stages at each cross section, was within 1 foot of the design event stage frequency at most gages.

WATER SURFACE PROFILES

Water Surface Profile

Maximum discharge and maximum stage relationships were computed for the 2, 5, 10, 25, 50, 100, 200 and 500-year flood events. These flow frequency study water surface profiles are shown on Plates C-I-12 through C-I-17. The previously published 500-year profile (1992) versus the 2003 study 500-year (.2%) profiles are shown on Plates C-I-18 through C-I-27. The previously published 100-year profile (1992) versus the 2003 study 100-year (1%) profiles are shown on Plates C-I-28 through C-I-37. The plotted profiles have been smoothed using a distance-weighted averaging technique. The method averages the stage frequency value at each location with the distance–weighted average of the two values immediately upstream and the two immediately downstream. Stage values immediately upstream and downstream of each dam are not altered by the smoothing process. All Elevations are in NGVD 1929 in the UNET model. Illinois River location, elevation, discharge Table C-I-7 is based upon 1929 datum.

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Glossary -- Upper Mississippi River System Flow Frequency Study

Acre – foot	A measure of volume equal to an acre of land uniformly flooded to one foot in depth.
Channel slope	The change in elevation of the channel bottom divided by the distance between the measured elevations.
Coefficient of variation	The standard deviation divided by the mean.
Cubic-feet-per-second	(CFS) unit of flow.
Discharge	The volume of water passing a location in the river per unit time (e.g., cubic feet per second).
Drainage area	The surface area of the watershed contributing runoff to a particular location on the river system.
Exceedance frequency	The exceedance probability multiplied by 100, sometimes interpreted as the number of exceedances per 100 years on the average (e.g. the 1% exceedance frequency flood is the 0.01 exceedance probability multiplied by 100).
Exceedance probability	The probability that the annual flood will be equaled or exceeded in a year (e.g., the 0.01 exceedance probability flood has a 1/100 chance of being equal or exceeded in any year).
Flood distribution	A function or graphical curve expressing the relationship between exceedance probability and annual maximum flow (e.g., the log-Pearson III distribution is typically used by federal agencies to represent the peak annual flood distribution).
Flood frequency curve	See flood distribution.
Flood population	The true flood distribution describing the likely occurrence of annual floods. An idealization in that it is based on assumptions regarding the random occurrence of floods. The population can never be known, but estimates are made from the observed period of record.
Hydrograph	The variation of river discharge or stage with time at a particular cross section, usually for some period corresponding to a flood event.

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Flood rank	The position in an ordered list from largest to smallest of the observed annual maximum floods (e.g., the largest flood has rank equal to one, the smallest has rank equal to the number of observed floods).
Operating rule	The procedures to be followed and/or actions to be taken by dam operators given both reservoir inflows and downstream flow conditions.
Plotting position	An estimate obtained of flood exceedance probability from the observed record of annual maximum flow values independent of an assumed distribution. Various plotting position formulas exist for estimating plotting positions (e.g., Weibull annual maximum flood plotting position = flood rank/(number of observations + one)).
Probability	A number in the range 0 to 1 defining the likelihood of observing future values or magnitudes of a random variable (e.g., the probability of observing a head or a tail from flipping a coin is 0.5).
Quantile	The probability distribution quantity corresponding to a particular exceedance probability (e.g., the 0.01 exceedance probability flood is 100000 cfs, where 100000 is the quantile).
Rating curve	The relationship between discharge and river stage.
River Basin	(see watershed)
River cross section	The area of river at a given location defined by the channel bottom, and possibly levees, at right angles to the flow.
River main channel	The portion of river cross section carrying flow under normal circumstances.
River overbank	The portion of the river cross section conveying additional flow to the main channel during flood periods.
Sample estimate	A quantity derived from the observed data used to approximate the unknown population value (e.g., sample mean, sample standard deviation, sample skew coefficient, sample flood distribution).
Sample mean	An estimate of the central tendency of the data. The average (the sum of the observed values/number of observations).
Sample skew coefficient	A measure of the asymmetry of the distribution, for the same mean and standard deviation, a positive value results in a greater 1% exceedance frequency flood than a negative value. The average of the cube deviations from the mean divided by the standard deviation cubed.

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Sample standard deviation — Both a measure of the range of the observed data and the width of the flood distribution the square root of the average of the sum of squared deviations from the mean of the observations.

Unregulated flows — River flows unaffected by the influence of reservoir regulation (a major effort was undertaken by the Corps Districts to adjust the observed records for the influence of reservoir regulation).

Unsteady flow — The variation of stream flow at a given location with time, a condition always present within a river (note that although flow within a river is always unsteady, the change is gradual enough to be considered approximately steady for analysis purposes).

Volume duration frequency curves — A set of flood distribution curves for various annual maximum volumes defined for different durations at a particular location (e.g., flood distributions estimated from the observed 1-day, 3-day, 7-day, 10-day and 30-day maximum flood volumes obtained from the period of record).

Watershed — A closed boundary describing the land surface area contributing runoff to a particular location on a river.

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Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
80.2	438.2	60,000	442.1	82,000	444.9	95,000	447.6	111,000	448.5	122,000	449.6	133,000	450.2	144,000	450.8	156,000
80.35	438.2	60,000	442.1	82,000	444.9	95,000	447.6	111,000	448.5	122,000	449.5	133,000	450.2	144,000	450.8	156,000
80.7	438.3	60,000	442.2	82,000	444.9	95,000	447.6	111,000	448.6	122,000	449.6	133,000	450.2	144,000	450.9	156,000
81.1	438.3	60,000	442.3	82,000	445.0	95,000	447.7	111,000	448.7	122,000	449.7	133,000	450.3	144,000	451.0	156,000
81.6	438.4	60,000	442.4	82,000	445.1	95,000	447.8	111,000	448.8	122,000	449.8	133,000	450.5	144,000	451.1	156,000
82.1	438.5	60,000	442.4	82,000	445.2	95,000	447.9	111,000	448.9	122,000	450.0	133,000	450.6	145,000	451.3	156,000
82.35	438.6	60,000	442.5	82,000	445.3	95,000	448.0	111,000	448.9	122,000	450.0	133,000	450.7	145,000	451.4	156,000
82.6	438.6	60,000	442.6	82,000	445.3	95,000	448.1	111,000	449.0	122,000	450.1	133,000	450.8	145,000	451.5	156,000
82.85	438.7	60,000	442.6	82,000	445.4	95,000	448.1	111,000	449.1	122,000	450.2	133,000	450.8	145,000	451.6	156,000
83.1	438.7	60,000	442.7	82,000	445.5	95,000	448.2	111,000	449.2	122,000	450.3	133,000	450.9	145,000	451.7	156,000
83.6	438.8	57,000	442.8	77,000	445.6	89,000	448.3	106,000	449.3	113,000	450.4	119,000	451.1	129,000	451.9	142,000
83.9	438.9	57,000	442.9	77,000	445.7	89,000	448.4	106,000	449.4	113,000	450.5	119,000	451.2	131,000	452.0	144,000
84.18	438.9	57,000	442.9	77,000	445.7	89,000	448.5	106,000	449.4	113,000	450.5	119,000	451.2	131,000	452.0	144,000
84.45	439.0	57,000	443.0	77,000	445.7	89,000	448.5	106,000	449.4	113,000	450.6	119,000	451.3	131,000	452.1	144,000
84.72	439.0	57,000	443.0	77,000	445.8	89,000	448.5	106,000	449.5	112,000	450.6	119,000	451.3	131,000	452.1	144,000
85	439.1	57,000	443.0	77,000	445.8	89,000	448.6	106,000	449.5	112,000	450.7	119,000	451.3	134,000	452.1	147,000
85.5	439.2	57,000	443.1	77,000	445.9	89,000	448.6	106,000	449.6	112,000	450.7	119,000	451.4	134,000	452.2	147,000
85.75	439.2	57,000	443.2	77,000	445.9	89,000	448.7	106,000	449.6	112,000	450.8	119,000	451.5	134,000	452.3	147,000
86	439.3	57,000	443.2	76,000	446.0	89,000	448.7	106,000	449.7	112,000	450.8	119,000	451.5	134,000	452.3	147,000
86.5	439.3	57,000	443.3	76,000	446.1	89,000	448.8	106,000	449.7	112,000	450.9	119,000	451.6	134,000	452.4	147,000
87	439.4	57,000	443.4	77,000	446.1	89,000	448.9	106,000	449.8	112,000	450.9	119,000	451.7	134,000	452.5	147,000
87.25	439.5	57,000	443.4	77,000	446.2	89,000	448.9	106,000	449.8	112,000	451.0	119,000	451.7	134,000	452.5	147,000
87.5	439.5	57,000	443.5	77,000	446.2	89,000	448.9	106,000	449.9	112,000	451.0	119,000	451.8	134,000	452.6	147,000
87.9	439.6	57,000	443.5	77,000	446.3	89,000	449.0	106,000	450.0	112,000	451.1	119,000	451.8	134,000	452.7	147,000
88.4	439.7	57,000	443.6	77,000	446.4	89,000	449.1	105,000	450.0	112,000	451.2	119,000	451.9	134,000	452.8	147,000
88.6	439.7	57,000	443.7	77,000	446.4	89,000	449.1	105,000	450.1	112,000	451.2	119,000	452.0	134,000	452.8	147,000
88.85	439.8	57,000	443.7	77,000	446.5	89,000	449.2	105,000	450.1	112,000	451.3	119,000	452.1	134,000	452.9	147,000
89.2	439.9	57,000	443.8	77,000	446.6	89,000	449.3	105,000	450.2	112,000	451.3	120,000	452.1	134,000	453.0	147,000
89.7	439.9	57,000	443.9	77,000	446.6	89,000	449.4	105,000	450.3	112,000	451.4	120,000	452.2	134,000	453.1	147,000
90.2	440.0	49,000	444.0	66,000	446.7	73,000	449.4	84,000	450.4	88,000	451.5	87,000	452.3	96,000	453.2	106,000
90.45	440.1	49,000	444.0	66,000	446.8	73,000	449.5	84,000	450.4	88,000	451.5	87,000	452.4	96,000	453.3	105,000
90.7	440.1	49,000	444.0	66,000	446.8	73,000	449.5	84,000	450.5	88,000	451.6	87,000	452.4	96,000	453.3	105,000
90.95	440.1	49,000	444.1	66,000	446.8	73,000	449.5	84,000	450.5	88,000	451.6	87,000	452.4	96,000	453.3	105,000
91.2	440.1	49,000	444.1	66,000	446.8	73,000	449.5	84,000	450.5	87,000	451.6	86,000	452.4	95,000	453.3	105,000
91.45	440.1	49,000	444.1	66,000	446.9	73,000	449.6	84,000	450.5	87,000	451.6	86,000	452.4	95,000	453.3	105,000
91.7	440.2	49,000	444.1	66,000	446.9	73,000	449.6	84,000	450.5	87,000	451.6	86,000	452.4	95,000	453.3	105,000
92.2	440.2	49,000	444.1	66,000	446.9	73,000	449.6	84,000	450.5	87,000	451.6	86,000	452.5	95,000	453.3	105,000
92.45	440.2	49,000	444.2	65,000	446.9	73,000	449.6	84,000	450.5	87,000	451.6	86,000	452.5	95,000	453.4	104,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
92.7	440.2	49,000	444.2	65,000	446.9	73,000	449.6	83,000	450.6	87,000	451.6	86,000	452.5	95,000	453.4	104,000
93.2	440.3	49,000	444.2	65,000	446.9	73,000	449.6	83,000	450.6	87,000	451.6	85,000	452.5	95,000	453.4	104,000
93.45	440.3	49,000	444.2	65,000	447.0	73,000	449.6	83,000	450.6	87,000	451.7	85,000	452.5	95,000	453.4	104,000
93.7	440.3	48,000	444.3	65,000	447.0	72,000	449.7	83,000	450.6	87,000	451.7	85,000	452.5	94,000	453.4	104,000
94.2	440.4	48,000	444.3	64,000	447.0	72,000	449.7	83,000	450.6	86,000	451.7	84,000	452.5	94,000	453.4	103,000
94.7	440.4	48,000	444.3	63,000	447.1	71,000	449.7	82,000	450.7	86,000	451.7	91,000	452.6	99,000	453.4	107,000
94.95	440.5	48,000	444.4	63,000	447.1	71,000	449.8	82,000	450.7	86,000	451.7	91,000	452.6	99,000	453.5	107,000
95.2	440.5	47,000	444.4	62,000	447.1	70,000	449.8	82,000	450.7	85,000	451.7	91,000	452.6	98,000	453.5	107,000
95.45	440.6	47,000	444.4	62,000	447.2	70,000	449.8	82,000	450.7	85,000	451.7	91,000	452.6	98,000	453.5	107,000
95.7	440.6	47,000	444.5	62,000	447.2	70,000	449.8	81,000	450.7	85,000	451.8	90,000	452.6	98,000	453.5	107,000
95.95	440.6	47,000	444.5	62,000	447.2	70,000	449.8	81,000	450.7	85,000	451.8	90,000	452.6	98,000	453.5	107,000
96.2	440.6	46,000	444.5	61,000	447.2	69,000	449.8	81,000	450.8	85,000	451.8	90,000	452.6	98,000	453.5	106,000
96.45	440.6	46,000	444.5	61,000	447.2	69,000	449.8	81,000	450.8	85,000	451.8	90,000	452.6	98,000	453.5	106,000
96.7	440.6	46,000	444.5	61,000	447.2	69,000	449.8	81,000	450.8	84,000	451.8	89,000	452.6	97,000	453.5	106,000
97.2	440.7	46,000	444.5	60,000	447.2	68,000	449.9	80,000	450.8	84,000	451.8	89,000	452.7	97,000	453.6	106,000
97.7	440.7	45,000	444.5	59,000	447.2	68,000	449.9	80,000	450.8	84,000	451.8	88,000	452.7	97,000	453.6	106,000
97.95	440.7	45,000	444.6	59,000	447.3	68,000	449.9	80,000	450.8	84,000	451.8	88,000	452.7	96,000	453.6	106,000
98.2	440.7	45,000	444.6	59,000	447.3	67,000	449.9	80,000	450.8	83,000	451.8	88,000	452.7	96,000	453.6	105,000
98.7	440.7	44,000	444.6	58,000	447.3	67,000	449.9	79,000	450.8	83,000	451.8	88,000	452.7	96,000	453.6	105,000
99.2	440.8	44,000	444.6	58,000	447.3	67,000	449.9	79,000	450.9	83,000	451.8	87,000	452.7	96,000	453.6	105,000
99.45	440.8	44,000	444.7	58,000	447.3	67,000	450.0	79,000	450.9	83,000	451.9	87,000	452.7	96,000	453.6	105,000
99.7	440.9	44,000	444.7	58,000	447.4	67,000	450.0	79,000	450.9	83,000	451.9	87,000	452.8	96,000	453.7	105,000
100.2	441.0	44,000	444.8	58,000	447.4	67,000	450.0	79,000	451.0	83,000	451.9	87,000	452.8	95,000	453.7	105,000
100.7	441.1	44,000	444.8	58,000	447.5	67,000	450.1	79,000	451.0	83,000	451.9	87,000	452.8	95,000	453.7	105,000
100.95	441.1	44,000	444.9	58,000	447.5	67,000	450.1	79,000	451.0	83,000	452.0	87,000	452.8	95,000	453.7	105,000
101.2	441.1	44,000	444.9	58,000	447.5	67,000	450.1	79,000	451.0	83,000	452.0	87,000	452.8	95,000	453.7	105,000
101.7	441.2	44,000	444.9	58,000	447.5	67,000	450.1	79,000	451.0	83,000	452.0	87,000	452.8	95,000	453.8	105,000
102.2	441.2	44,000	444.9	58,000	447.5	67,000	450.1	79,000	451.0	83,000	452.0	87,000	452.8	95,000	453.8	105,000
102.45	441.2	44,000	444.9	58,000	447.5	67,000	450.1	79,000	451.0	83,000	452.0	87,000	452.9	95,000	453.8	105,000
102.7	441.2	44,000	444.9	58,000	447.6	67,000	450.1	79,000	451.0	83,000	452.0	87,000	452.9	95,000	453.8	105,000
102.95	441.2	44,000	444.9	58,000	447.6	67,000	450.1	79,000	451.0	83,000	452.0	86,000	452.9	95,000	453.8	104,000
103.2	441.2	44,000	444.9	58,000	447.6	67,000	450.1	79,000	451.0	83,000	452.0	90,000	452.9	98,000	453.8	105,000
103.45	441.2	44,000	444.9	58,000	447.6	67,000	450.1	79,000	451.1	83,000	452.0	89,000	452.9	98,000	453.8	105,000
103.7	441.2	44,000	444.9	58,000	447.6	67,000	450.2	79,000	451.1	82,000	452.0	89,000	452.9	98,000	453.8	105,000
104.2	441.3	44,000	445.0	58,000	447.6	67,000	450.2	79,000	451.1	82,000	452.0	89,000	452.9	97,000	453.8	105,000
104.7	441.3	44,000	445.0	58,000	447.6	67,000	450.2	79,000	451.1	82,000	452.0	89,000	452.9	97,000	453.8	105,000
104.95	441.3	44,000	445.0	58,000	447.6	67,000	450.2	79,000	451.1	82,000	452.0	89,000	452.9	97,000	453.8	105,000
105.2	441.3	44,000	445.0	58,000	447.6	67,000	450.2	79,000	451.1	82,000	452.0	89,000	452.9	97,000	453.8	105,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
105.7	441.3	44,000	445.0	58,000	447.6	67,000	450.2	79,000	451.1	82,000	452.1	89,000	452.9	97,000	453.8	105,000
106.2	441.4	44,000	445.1	58,000	447.7	67,000	450.3	79,000	451.2	82,000	452.1	89,000	453.0	97,000	453.9	105,000
106.7	441.4	44,000	445.1	58,000	447.7	67,000	450.3	79,000	451.2	82,000	452.1	88,000	453.0	97,000	453.9	104,000
107.2	441.5	44,000	445.1	57,000	447.8	67,000	450.3	79,000	451.2	82,000	452.2	88,000	453.0	97,000	454.0	104,000
107.45	441.5	44,000	445.2	57,000	447.8	67,000	450.3	79,000	451.2	82,000	452.2	88,000	453.1	97,000	454.0	104,000
107.7	441.5	44,000	445.2	57,000	447.8	67,000	450.4	79,000	451.3	82,000	452.2	88,000	453.1	97,000	454.0	104,000
108.2	441.6	44,000	445.2	57,000	447.8	67,000	450.4	79,000	451.3	82,000	452.2	88,000	453.1	96,000	454.0	105,000
108.4	441.6	44,000	445.2	57,000	447.9	67,000	450.4	79,000	451.3	82,000	452.2	88,000	453.1	96,000	454.0	105,000
108.7	441.6	44,000	445.2	57,000	447.9	67,000	450.4	79,000	451.3	82,000	452.3	88,000	453.1	96,000	454.1	105,000
109	441.6	44,000	445.2	57,000	447.9	67,000	450.4	79,000	451.3	82,000	452.3	88,000	453.2	96,000	454.1	105,000
109.3	441.6	44,000	445.3	57,000	447.9	67,000	450.5	79,000	451.3	82,000	452.3	88,000	453.2	96,000	454.1	105,000
109.6	441.6	44,000	445.3	57,000	447.9	67,000	450.5	79,000	451.4	82,000	452.3	88,000	453.2	96,000	454.1	105,000
109.9	441.7	44,000	445.3	57,000	447.9	67,000	450.5	79,000	451.4	82,000	452.3	88,000	453.2	96,000	454.1	105,000
110.2	441.7	44,000	445.3	58,000	447.9	67,000	450.5	79,000	451.4	83,000	452.3	88,000	453.2	96,000	454.1	105,000
110.45	441.7	45,000	445.3	58,000	447.9	67,000	450.5	79,000	451.4	83,000	452.3	88,000	453.2	96,000	454.1	105,000
110.7	441.7	45,000	445.3	58,000	447.9	67,000	450.5	79,000	451.4	83,000	452.3	87,000	453.2	96,000	454.1	105,000
111.2	441.8	45,000	445.3	58,000	448.0	67,000	450.5	79,000	451.4	84,000	452.3	87,000	453.2	96,000	454.1	105,000
111.45	441.8	45,000	445.3	59,000	448.0	67,000	450.5	79,000	451.4	84,000	452.3	87,000	453.2	96,000	454.1	105,000
111.7	441.8	45,000	445.4	59,000	448.0	67,000	450.5	79,000	451.4	84,000	452.3	87,000	453.2	96,000	454.2	105,000
111.9	441.8	45,000	445.4	59,000	448.0	66,000	450.5	78,000	451.4	84,000	452.3	86,000	453.2	94,000	454.2	103,000
112.15	441.8	45,000	445.4	59,000	448.0	66,000	450.6	78,000	451.4	84,000	452.4	87,000	453.3	94,000	454.2	103,000
112.4	441.8	45,000	445.4	59,000	448.0	66,000	450.6	78,000	451.5	84,000	452.4	87,000	453.3	94,000	454.2	103,000
112.9	441.9	45,000	445.4	59,000	448.1	66,000	450.6	77,000	451.5	84,000	452.4	87,000	453.3	94,000	454.2	104,000
113.18	441.9	45,000	445.5	59,000	448.1	66,000	450.6	77,000	451.5	84,000	452.4	87,000	453.3	94,000	454.3	104,000
113.47	442.0	45,000	445.5	59,000	448.1	66,000	450.7	77,000	451.5	85,000	452.4	87,000	453.3	94,000	454.3	104,000
113.74	442.0	45,000	445.5	59,000	448.1	66,000	450.7	77,000	451.5	85,000	452.5	87,000	453.4	94,000	454.3	104,000
114	442.0	45,000	445.5	59,000	448.1	66,000	450.7	77,000	451.6	85,000	452.5	87,000	453.4	94,000	454.3	104,000
114.3	442.1	45,000	445.6	59,000	448.2	66,000	450.7	77,000	451.6	85,000	452.5	87,000	453.4	94,000	454.4	104,000
114.6	442.1	45,000	445.6	59,000	448.2	66,000	450.8	77,000	451.6	85,000	452.6	87,000	453.5	94,000	454.4	104,000
114.85	442.1	45,000	445.6	59,000	448.2	66,000	450.8	77,000	451.7	85,000	452.6	87,000	453.5	94,000	454.4	104,000
115.1	442.1	45,000	445.6	59,000	448.3	66,000	450.8	77,000	451.7	85,000	452.6	87,000	453.5	94,000	454.5	104,000
115.6	442.2	45,000	445.7	59,000	448.3	66,000	450.9	77,000	451.7	85,000	452.7	87,000	453.6	94,000	454.5	104,000
116.1	442.2	45,000	445.7	60,000	448.3	66,000	450.9	77,000	451.8	85,000	452.7	87,000	453.6	94,000	454.6	104,000
116.35	442.2	45,000	445.7	60,000	448.4	66,000	450.9	77,000	451.8	85,000	452.7	87,000	453.7	94,000	454.6	104,000
116.6	442.3	45,000	445.8	60,000	448.4	66,000	451.0	77,000	451.8	85,000	452.8	87,000	453.7	94,000	454.6	104,000
116.85	442.3	46,000	445.8	60,000	448.4	66,000	451.0	77,000	451.9	85,000	452.8	87,000	453.7	94,000	454.7	104,000
117.1	442.3	46,000	445.8	60,000	448.4	66,000	451.0	77,000	451.9	85,000	452.8	87,000	453.7	94,000	454.7	104,000
117.6	442.4	46,000	445.8	60,000	448.5	66,000	451.1	77,000	451.9	85,000	452.8	87,000	453.8	94,000	454.8	104,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
117.85	442.4	46,000	445.9	60,000	448.5	66,000	451.1	77,000	452.0	85,000	452.9	87,000	453.8	94,000	454.8	104,000
118.1	442.4	46,000	445.9	60,000	448.6	66,000	451.2	77,000	452.0	85,000	452.9	88,000	453.9	94,000	454.9	104,000
118.6	442.5	46,000	446.0	60,000	448.6	66,000	451.2	77,000	452.1	85,000	453.0	88,000	453.9	94,000	454.9	104,000
119	442.5	46,000	446.0	60,000	448.6	66,000	451.3	77,000	452.1	85,000	453.0	88,000	454.0	94,000	455.0	104,000
119.3	442.6	46,000	446.0	60,000	448.7	66,000	451.3	77,000	452.1	85,000	453.1	88,000	454.0	94,000	455.0	104,000
119.4	442.6	41,000	446.1	53,000	448.7	61,000	451.3	72,000	452.1	73,000	453.1	77,000	454.0	84,000	455.0	93,000
119.56	442.6	41,000	446.1	53,000	448.7	61,000	451.3	72,000	452.2	73,000	453.1	77,000	454.1	84,000	455.1	93,000
120	442.6	41,000	446.1	53,000	448.8	61,000	451.4	72,000	452.2	73,000	453.1	77,000	454.1	84,000	455.1	93,000
120.4	442.7	41,000	446.2	53,000	448.8	61,000	451.4	72,000	452.2	73,000	453.2	77,000	454.1	84,000	455.1	93,000
120.75	442.7	41,000	446.2	53,000	448.8	61,000	451.4	72,000	452.3	74,000	453.2	77,000	454.1	84,000	455.2	93,000
120.92	442.7	41,000	446.2	53,000	448.9	61,000	451.5	72,000	452.3	81,000	453.2	82,000	454.2	90,000	455.2	98,000
121.16	442.8	41,000	446.3	53,000	448.9	61,000	451.5	72,000	452.3	81,000	453.2	82,000	454.2	89,000	455.2	98,000
121.4	442.8	41,000	446.3	53,000	448.9	61,000	451.5	72,000	452.3	81,000	453.2	82,000	454.2	89,000	455.2	98,000
121.9	442.8	41,000	446.3	53,000	448.9	61,000	451.5	72,000	452.4	81,000	453.3	82,000	454.2	89,000	455.2	98,000
122.15	442.9	41,000	446.3	53,000	449.0	61,000	451.5	72,000	452.4	81,000	453.3	82,000	454.2	89,000	455.3	98,000
122.4	442.9	41,000	446.4	53,000	449.0	61,000	451.6	72,000	452.4	81,000	453.3	82,000	454.3	89,000	455.3	98,000
122.65	442.9	41,000	446.4	53,000	449.0	61,000	451.6	71,000	452.5	81,000	453.3	82,000	454.3	89,000	455.3	98,000
122.9	442.9	41,000	446.4	52,000	449.1	59,000	451.6	69,000	452.5	78,000	453.4	82,000	454.3	85,000	455.4	95,000
123.15	443.0	41,000	446.5	52,000	449.1	59,000	451.7	69,000	452.5	78,000	453.4	82,000	454.4	85,000	455.4	95,000
123.4	443.0	41,000	446.5	52,000	449.1	59,000	451.7	69,000	452.6	78,000	453.4	82,000	454.4	85,000	455.4	95,000
123.65	443.0	41,000	446.5	52,000	449.1	59,000	451.7	69,000	452.6	78,000	453.4	82,000	454.4	85,000	455.5	95,000
123.9	443.0	41,000	446.5	52,000	449.1	59,000	451.7	69,000	452.6	78,000	453.5	82,000	454.4	85,000	455.5	95,000
124.4	443.1	44,000	446.6	56,000	449.2	60,000	451.7	70,000	452.6	81,000	453.5	85,000	454.5	87,000	455.5	96,000
124.65	443.1	44,000	446.6	56,000	449.2	60,000	451.7	71,000	452.6	81,000	453.5	85,000	454.5	87,000	455.5	96,000
124.9	443.1	44,000	446.6	56,000	449.2	60,000	451.8	71,000	452.6	81,000	453.5	85,000	454.5	87,000	455.5	96,000
125.15	443.1	44,000	446.6	56,000	449.2	60,000	451.8	71,000	452.6	81,000	453.5	85,000	454.5	87,000	455.5	96,000
125.4	443.2	44,000	446.6	56,000	449.2	60,000	451.8	71,000	452.7	81,000	453.5	85,000	454.5	87,000	455.5	96,000
125.9	443.3	44,000	446.7	57,000	449.2	61,000	451.8	71,000	452.7	81,000	453.5	85,000	454.5	87,000	455.5	96,000
126.4	443.5	44,000	446.7	57,000	449.3	61,000	451.8	71,000	452.7	81,000	453.5	85,000	454.5	87,000	455.6	95,000
126.65	443.5	44,000	446.7	57,000	449.3	61,000	451.8	71,000	452.7	81,000	453.5	85,000	454.5	87,000	455.6	95,000
126.9	443.6	44,000	446.8	57,000	449.3	61,000	451.8	71,000	452.7	81,000	453.5	86,000	454.5	87,000	455.6	95,000
127.35	443.7	44,000	446.8	57,000	449.3	61,000	451.8	72,000	452.7	81,000	453.6	86,000	454.5	87,000	455.6	95,000
127.62	443.8	44,000	446.9	57,000	449.3	61,000	451.8	72,000	452.7	81,000	453.6	86,000	454.5	87,000	455.6	95,000
127.9	443.8	44,000	446.9	57,000	449.4	61,000	451.9	72,000	452.7	81,000	453.6	86,000	454.6	87,000	455.6	95,000
128.15	443.9	44,000	447.0	57,000	449.4	61,000	451.9	72,000	452.8	81,000	453.6	86,000	454.6	87,000	455.6	95,000
128.4	444.0	44,000	447.0	57,000	449.4	61,000	451.9	72,000	452.8	81,000	453.6	86,000	454.6	87,000	455.6	95,000
128.65	444.0	44,000	447.1	57,000	449.5	61,000	451.9	72,000	452.8	81,000	453.7	86,000	454.6	87,000	455.7	95,000
128.9	444.1	44,000	447.1	57,000	449.5	62,000	452.0	72,000	452.9	81,000	453.7	86,000	454.7	87,000	455.7	95,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
129.39	444.2	44,000	447.2	58,000	449.6	62,000	452.0	73,000	452.9	81,000	453.8	87,000	454.7	87,000	455.8	95,000
129.4	444.2	44,000	447.2	60,000	449.6	66,000	452.0	76,000	452.9	84,000	453.8	89,000	454.7	90,000	455.8	97,000
129.41	444.2	44,000	447.2	60,000	449.6	66,000	452.1	76,000	453.0	84,000	453.8	89,000	454.7	90,000	455.8	97,000
129.9	444.3	44,000	447.3	60,000	449.7	66,000	452.1	76,000	453.0	84,000	453.8	90,000	454.8	90,000	455.8	97,000
130.4	444.3	45,000	447.3	60,000	449.7	66,000	452.1	76,000	453.0	84,000	453.8	90,000	454.8	90,000	455.8	97,000
130.66	444.3	45,000	447.3	60,000	449.7	66,000	452.1	76,000	453.0	84,000	453.9	90,000	454.8	90,000	455.8	97,000
130.93	444.4	45,000	447.3	60,000	449.7	66,000	452.1	76,000	453.0	84,000	453.9	90,000	454.8	90,000	455.8	97,000
131.4	444.4	45,000	447.4	60,000	449.7	66,000	452.1	76,000	453.0	84,000	453.9	90,000	454.8	90,000	455.9	97,000
131.7	444.4	45,000	447.4	60,000	449.7	66,000	452.1	77,000	453.0	84,000	453.9	90,000	454.8	90,000	455.9	97,000
131.95	444.4	45,000	447.4	60,000	449.7	67,000	452.2	77,000	453.1	84,000	453.9	90,000	454.8	90,000	455.9	97,000
132.2	444.5	45,000	447.4	60,000	449.8	67,000	452.2	77,000	453.1	84,000	453.9	90,000	454.8	90,000	455.9	97,000
132.7	444.5	45,000	447.4	60,000	449.8	67,000	452.2	77,000	453.1	84,000	453.9	91,000	454.9	91,000	455.9	97,000
133.2	444.6	45,000	447.5	60,000	449.8	68,000	452.2	78,000	453.1	85,000	454.0	92,000	454.9	92,000	455.9	97,000
133.7	444.6	46,000	447.5	60,000	449.8	68,000	452.2	78,000	453.1	85,000	454.0	92,000	454.9	93,000	455.9	98,000
134.2	444.7	46,000	447.5	60,000	449.8	68,000	452.2	79,000	453.1	85,000	454.0	93,000	454.9	94,000	455.9	97,000
134.6	444.7	46,000	447.5	60,000	449.9	69,000	452.2	79,000	453.1	85,000	454.0	93,000	454.9	94,000	455.9	97,000
134.9	444.7	46,000	447.6	60,000	449.9	69,000	452.2	79,000	453.1	85,000	454.0	94,000	454.9	95,000	456.0	97,000
135.2	444.8	46,000	447.6	60,000	449.9	69,000	452.2	79,000	453.2	86,000	454.0	97,000	454.9	104,000	456.0	113,000
135.45	444.8	46,000	447.6	60,000	449.9	69,000	452.3	80,000	453.2	86,000	454.1	96,000	454.9	104,000	456.0	113,000
135.7	444.8	46,000	447.6	61,000	449.9	69,000	452.3	80,000	453.2	86,000	454.1	96,000	455.0	104,000	456.0	113,000
135.95	444.9	47,000	447.6	61,000	449.9	70,000	452.3	80,000	453.2	87,000	454.1	96,000	455.0	105,000	456.0	113,000
136.2	444.9	47,000	447.7	61,000	450.0	70,000	452.3	81,000	453.2	87,000	454.1	96,000	455.0	105,000	456.0	113,000
136.45	444.9	47,000	447.7	61,000	450.0	70,000	452.3	81,000	453.2	87,000	454.1	96,000	455.0	105,000	456.1	113,000
136.7	444.9	47,000	447.7	61,000	450.0	70,000	452.3	81,000	453.2	88,000	454.1	96,000	455.0	105,000	456.1	113,000
136.95	444.9	47,000	447.7	62,000	450.0	71,000	452.3	81,000	453.2	88,000	454.1	96,000	455.0	105,000	456.1	113,000
137.2	445.0	47,000	447.7	62,000	450.0	71,000	452.3	82,000	453.2	88,000	454.1	96,000	455.0	105,000	456.1	113,000
137.45	445.0	47,000	447.7	62,000	450.0	71,000	452.3	82,000	453.3	88,000	454.2	97,000	455.1	105,000	456.1	113,000
137.7	445.0	47,000	447.8	62,000	450.0	71,000	452.4	82,000	453.3	89,000	454.2	97,000	455.1	105,000	456.1	113,000
137.95	445.0	47,000	447.8	62,000	450.1	71,000	452.4	82,000	453.3	89,000	454.2	97,000	455.1	105,000	456.1	113,000
138.2	445.1	47,000	447.8	62,000	450.1	71,000	452.4	82,000	453.4	89,000	454.3	97,000	455.2	105,000	456.2	113,000
138.7	445.1	47,000	447.9	62,000	450.2	71,000	452.5	82,000	453.4	89,000	454.3	97,000	455.2	105,000	456.3	113,000
139.2	445.2	47,000	448.0	62,000	450.2	71,000	452.5	82,000	453.5	89,000	454.4	97,000	455.3	105,000	456.3	113,000
139.7	445.2	47,000	448.0	62,000	450.3	71,000	452.6	82,000	453.5	89,000	454.4	97,000	455.4	105,000	456.4	113,000
139.95	445.2	47,000	448.1	62,000	450.3	71,000	452.6	82,000	453.6	89,000	454.5	97,000	455.4	105,000	456.5	113,000
140.2	445.3	47,000	448.1	62,000	450.3	71,000	452.7	82,000	453.6	89,000	454.6	97,000	455.5	105,000	456.5	113,000
140.45	445.3	47,000	448.2	62,000	450.4	71,000	452.7	82,000	453.7	89,000	454.6	97,000	455.5	105,000	456.6	113,000
140.7	445.3	47,000	448.2	62,000	450.4	71,000	452.7	82,000	453.7	89,000	454.7	97,000	455.6	105,000	456.7	113,000
140.95	445.4	47,000	448.3	62,000	450.4	71,000	452.8	82,000	453.7	89,000	454.7	97,000	455.6	105,000	456.7	113,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
141.2	445.4	47,000	448.3	62,000	450.5	71,000	452.8	82,000	453.8	90,000	454.7	97,000	455.7	105,000	456.8	113,000
141.45	445.4	47,000	448.4	62,000	450.5	71,000	452.9	82,000	453.8	90,000	454.8	97,000	455.8	105,000	456.8	113,000
141.7	445.5	47,000	448.4	62,000	450.6	71,000	452.9	83,000	453.9	90,000	454.9	97,000	455.8	105,000	456.9	113,000
142.2	445.5	47,000	448.5	62,000	450.7	71,000	453.0	83,000	454.0	90,000	455.0	97,000	456.0	105,000	457.0	113,000
142.7	445.6	47,000	448.6	62,000	450.7	71,000	453.1	83,000	454.1	90,000	455.1	98,000	456.0	105,000	457.1	113,000
143.2	445.7	47,000	448.7	62,000	450.8	71,000	453.1	83,000	454.2	90,000	455.2	98,000	456.2	105,000	457.2	113,000
143.7	445.7	47,000	448.8	62,000	450.9	71,000	453.2	83,000	454.2	90,000	455.2	98,000	456.2	105,000	457.3	113,000
143.95	445.8	47,000	448.9	62,000	450.9	71,000	453.2	83,000	454.3	90,000	455.3	98,000	456.3	105,000	457.4	113,000
144.2	445.8	47,000	448.9	63,000	451.0	72,000	453.3	83,000	454.4	90,000	455.4	98,000	456.4	105,000	457.5	113,000
144.7	445.9	48,000	449.0	63,000	451.0	72,000	453.3	83,000	454.4	90,000	455.4	98,000	456.5	105,000	457.6	113,000
144.95	445.9	48,000	449.0	63,000	451.1	72,000	453.4	83,000	454.5	90,000	455.5	98,000	456.5	105,000	457.6	114,000
145.2	445.9	48,000	449.1	63,000	451.1	72,000	453.4	83,000	454.5	90,000	455.6	98,000	456.6	105,000	457.7	114,000
145.45	446.0	48,000	449.2	63,000	451.2	72,000	453.5	83,000	454.6	90,000	455.6	98,000	456.7	105,000	457.7	114,000
145.7	446.0	48,000	449.2	63,000	451.2	72,000	453.5	83,000	454.7	90,000	455.7	98,000	456.8	105,000	457.9	114,000
146.2	446.1	48,000	449.3	63,000	451.3	72,000	453.6	83,000	454.8	90,000	455.8	98,000	456.9	105,000	458.0	114,000
146.45	446.1	48,000	449.4	63,000	451.4	72,000	453.7	83,000	454.9	90,000	456.0	98,000	457.0	105,000	458.1	113,000
146.7	446.2	48,000	449.5	63,000	451.5	72,000	453.8	83,000	455.0	90,000	456.1	98,000	457.1	105,000	458.2	113,000
146.95	446.2	48,000	449.6	63,000	451.5	72,000	453.9	83,000	455.1	90,000	456.2	98,000	457.3	105,000	458.4	113,000
147.2	446.3	44,000	449.6	57,000	451.6	66,000	454.0	75,000	455.2	81,000	456.3	88,000	457.4	95,000	458.5	103,000
147.7	446.4	44,000	449.8	57,000	451.8	66,000	454.1	75,000	455.3	82,000	456.4	88,000	457.5	95,000	458.7	103,000
147.98	446.4	44,000	449.9	57,000	451.9	66,000	454.2	75,000	455.4	82,000	456.5	88,000	457.7	95,000	458.8	103,000
148.26	446.5	44,000	449.9	57,000	452.0	66,000	454.3	75,000	455.5	82,000	456.6	88,000	457.8	95,000	458.9	103,000
148.7	446.5	44,000	450.0	57,000	452.1	66,000	454.4	75,000	455.6	82,000	456.7	88,000	457.9	95,000	459.0	103,000
149	446.6	44,000	450.1	57,000	452.1	66,000	454.5	75,000	455.7	82,000	456.8	88,000	457.9	95,000	459.1	103,000
149.3	446.6	44,000	450.1	57,000	452.2	66,000	454.5	75,000	455.7	82,000	456.8	88,000	458.0	95,000	459.1	103,000
149.6	446.6	44,000	450.2	57,000	452.3	66,000	454.6	75,000	455.8	82,000	456.9	88,000	458.0	95,000	459.2	103,000
149.7	446.6	44,000	450.2	57,000	452.3	66,000	454.6	75,000	455.8	82,000	456.9	88,000	458.1	95,000	459.2	105,000
149.95	446.7	44,000	450.3	57,000	452.3	66,000	454.7	75,000	455.9	82,000	457.0	88,000	458.1	95,000	459.2	105,000
150.2	446.7	44,000	450.3	57,000	452.4	66,000	454.7	75,000	455.9	82,000	457.0	88,000	458.2	95,000	459.3	105,000
150.5	446.7	44,000	450.4	57,000	452.4	66,000	454.8	75,000	456.0	82,000	457.1	88,000	458.3	95,000	459.4	105,000
150.8	446.8	44,000	450.4	57,000	452.5	66,000	454.9	75,000	456.0	82,000	457.2	89,000	458.3	96,000	459.5	106,000
151.2	446.8	44,000	450.4	58,000	452.6	66,000	454.9	75,000	456.1	82,000	457.2	91,000	458.4	99,000	459.5	108,000
151.45	446.8	44,000	450.5	58,000	452.6	66,000	455.0	76,000	456.2	82,000	457.3	91,000	458.5	99,000	459.6	108,000
151.7	446.8	44,000	450.5	58,000	452.6	66,000	455.0	76,000	456.2	82,000	457.3	91,000	458.5	99,000	459.7	108,000
151.95	446.9	44,000	450.6	58,000	452.7	66,000	455.1	76,000	456.3	82,000	457.4	91,000	458.6	99,000	459.7	108,000
152.2	446.9	44,000	450.6	58,000	452.7	66,000	455.1	76,000	456.3	82,000	457.4	91,000	458.6	99,000	459.8	108,000
152.5	446.9	44,000	450.6	58,000	452.8	66,000	455.2	76,000	456.4	82,000	457.5	91,000	458.7	99,000	459.9	108,000
152.8	446.9	44,000	450.7	58,000	452.9	66,000	455.2	76,000	456.4	82,000	457.6	91,000	458.8	99,000	460.0	108,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
153.3	447.0	44,000	450.8	58,000	453.0	66,000	455.3	76,000	456.6	82,000	457.7	91,000	458.9	99,000	460.1	108,000
153.7	447.0	44,000	450.8	58,000	453.0	66,000	455.4	76,000	456.6	82,000	457.8	91,000	459.1	99,000	460.3	108,000
154.1	447.1	44,000	450.9	58,000	453.1	66,000	455.5	76,000	456.7	82,000	457.9	91,000	459.1	99,000	460.3	108,000
154.6	447.1	44,000	451.0	57,000	453.2	65,000	455.6	75,000	456.8	81,000	458.0	90,000	459.2	98,000	460.4	107,000
155.1	447.2	44,000	451.0	57,000	453.2	66,000	455.6	75,000	456.8	81,000	458.0	90,000	459.3	103,000	460.5	110,000
155.6	447.2	44,000	451.0	57,000	453.3	66,000	455.6	75,000	456.9	81,000	458.1	90,000	459.3	103,000	460.5	111,000
156.1	447.2	44,000	451.1	57,000	453.3	66,000	455.7	75,000	456.9	81,000	458.1	90,000	459.4	103,000	460.6	111,000
156.6	447.3	44,000	451.2	58,000	453.4	66,000	455.8	75,000	457.0	81,000	458.2	90,000	459.5	103,000	460.7	111,000
157	447.4	45,000	451.3	58,000	453.5	66,000	455.9	75,000	457.1	81,000	458.3	90,000	459.6	103,000	460.7	111,000
157.5	447.4	45,000	451.3	58,000	453.6	66,000	456.0	75,000	457.1	82,000	458.4	90,000	459.7	103,000	460.8	111,000
157.6	447.4	45,000	451.4	58,000	453.6	66,000	456.0	75,000	457.2	82,000	458.4	90,000	459.7	103,000	460.9	111,000
157.7	447.5	45,000	451.4	58,000	453.7	66,000	456.0	76,000	457.2	82,000	458.4	90,000	459.7	103,000	460.9	111,000
157.75	447.6	45,000	451.5	58,000	453.8	66,000	456.1	76,000	457.3	82,000	458.5	90,000	459.8	103,000	461.0	111,000
157.85	447.6	45,000	451.5	58,000	453.8	66,000	456.1	76,000	457.3	82,000	458.5	90,000	459.8	103,000	461.0	111,000
158.04	447.6	45,000	451.5	58,000	453.8	66,000	456.1	76,000	457.3	82,000	458.6	90,000	459.9	103,000	461.0	111,000
158.4	447.7	45,000	451.6	58,000	453.8	66,000	456.2	76,000	457.4	82,000	458.6	90,000	459.9	103,000	461.1	111,000
158.9	447.7	45,000	451.6	58,000	453.9	66,000	456.2	76,000	457.4	82,000	458.7	90,000	460.0	103,000	461.2	111,000
159.17	447.7	45,000	451.6	58,000	453.9	67,000	456.3	76,000	457.4	82,000	458.7	90,000	460.0	103,000	461.2	111,000
159.4	447.8	45,000	451.7	58,000	453.9	67,000	456.3	76,000	457.5	82,000	458.8	90,000	460.1	103,000	461.3	111,000
159.9	447.8	45,000	451.7	58,000	454.0	67,000	456.3	76,000	457.5	82,000	458.8	90,000	460.1	103,000	461.3	111,000
160.2	447.9	45,000	451.7	59,000	454.0	67,000	456.4	76,000	457.6	82,000	458.9	90,000	460.2	103,000	461.4	111,000
160.5	447.9	45,000	451.8	59,000	454.0	67,000	456.4	76,000	457.6	82,000	458.9	90,000	460.3	103,000	461.5	111,000
160.66	447.9	45,000	451.8	59,000	454.1	67,000	456.5	76,000	457.7	82,000	459.0	90,000	460.3	103,000	461.5	111,000
160.8	448.0	45,000	451.8	59,000	454.1	67,000	456.5	76,000	457.7	82,000	459.0	90,000	460.4	103,000	461.6	112,000
161.1	448.0	45,000	451.8	59,000	454.1	67,000	456.5	76,000	457.7	82,000	459.0	90,000	460.4	103,000	461.7	112,000
161.4	448.0	45,000	451.9	59,000	454.2	67,000	456.6	76,000	457.8	82,000	459.1	90,000	460.5	103,000	461.7	112,000
161.55	448.0	45,000	451.9	59,000	454.2	67,000	456.6	76,000	457.8	82,000	459.2	90,000	460.6	103,000	461.8	112,000
161.7	448.1	45,000	451.9	59,000	454.2	67,000	456.7	76,000	457.9	82,000	459.2	90,000	460.7	103,000	461.9	113,000
162.1	448.2	45,000	452.0	59,000	454.4	67,000	456.8	76,000	458.0	82,000	459.4	90,000	460.9	103,000	462.1	114,000
162.25	448.2	45,000	452.1	59,000	454.4	67,000	456.9	76,000	458.1	82,000	459.5	90,000	461.0	103,000	462.3	114,000
162.4	448.3	45,000	452.2	59,000	454.5	67,000	457.0	76,000	458.2	82,000	459.6	90,000	461.1	103,000	462.4	114,000
162.6	448.3	45,000	452.2	58,000	454.5	67,000	457.0	76,000	458.3	82,000	459.7	90,000	461.2	103,000	462.5	113,000
162.75	448.3	45,000	452.2	59,000	454.6	67,000	457.1	76,000	458.3	82,000	459.7	90,000	461.2	103,000	462.6	113,000
162.9	448.3	45,000	452.2	59,000	454.6	67,000	457.1	76,000	458.3	82,000	459.7	90,000	461.3	103,000	462.6	114,000
163.15	448.4	45,000	452.3	59,000	454.6	67,000	457.1	76,000	458.4	82,000	459.8	90,000	461.3	103,000	462.6	114,000
163.4	448.4	45,000	452.3	59,000	454.6	67,000	457.1	76,000	458.4	82,000	459.8	90,000	461.3	103,000	462.7	114,000
163.86	448.4	45,000	452.3	59,000	454.6	67,000	457.2	76,000	458.4	82,000	459.8	90,000	461.4	103,000	462.7	114,000
164.1	448.4	45,000	452.3	59,000	454.7	67,000	457.2	76,000	458.4	82,000	459.8	90,000	461.4	103,000	462.7	114,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
164.34	448.4	45,000	452.3	59,000	454.7	67,000	457.2	76,000	458.4	82,000	459.8	90,000	461.4	103,000	462.7	114,000
164.8	448.4	45,000	452.3	59,000	454.7	67,000	457.2	76,000	458.4	83,000	459.8	90,000	461.4	103,000	462.7	114,000
165.05	448.4	45,000	452.3	59,000	454.7	67,000	457.2	76,000	458.4	83,000	459.8	90,000	461.4	103,000	462.7	114,000
165.3	448.4	45,000	452.3	59,000	454.7	67,000	457.2	76,000	458.4	83,000	459.9	91,000	461.4	103,000	462.7	114,000
165.8	448.4	45,000	452.3	59,000	454.7	67,000	457.2	77,000	458.4	83,000	459.9	91,000	461.4	103,000	462.8	114,000
165.94	448.4	45,000	452.3	60,000	454.7	68,000	457.2	77,000	458.4	83,000	459.9	91,000	461.4	103,000	462.8	114,000
166.1	448.4	46,000	452.3	60,000	454.7	68,000	457.2	77,000	458.5	83,000	459.9	91,000	461.5	103,000	462.8	114,000
166.45	448.4	46,000	452.3	60,000	454.7	68,000	457.2	77,000	458.5	83,000	459.9	91,000	461.5	103,000	462.8	114,000
166.75	448.5	46,000	452.3	60,000	454.7	68,000	457.3	77,000	458.5	83,000	460.0	91,000	461.5	103,000	462.8	114,000
167.13	448.5	46,000	452.4	60,000	454.8	68,000	457.3	77,000	458.5	83,000	460.0	91,000	461.6	103,000	462.9	114,000
167.59	448.5	46,000	452.4	60,000	454.8	68,000	457.3	77,000	458.6	84,000	460.1	91,000	461.6	103,000	462.9	114,000
167.83	448.6	46,000	452.4	60,000	454.8	68,000	457.3	77,000	458.6	84,000	460.1	91,000	461.6	103,000	462.9	114,000
168.08	448.6	46,000	452.4	60,000	454.8	68,000	457.4	77,000	458.6	84,000	460.1	91,000	461.6	103,000	463.0	114,000
168.54	448.6	46,000	452.4	60,000	454.8	68,000	457.4	77,000	458.6	84,000	460.1	92,000	461.6	103,000	463.0	114,000
169	448.6	46,000	452.4	60,000	454.8	68,000	457.4	77,000	458.6	84,000	460.1	92,000	461.6	103,000	463.0	114,000
169.45	448.6	46,000	452.4	61,000	454.8	69,000	457.4	77,000	458.6	85,000	460.1	92,000	461.6	103,000	463.0	114,000
169.68	448.6	46,000	452.4	61,000	454.8	69,000	457.4	78,000	458.6	85,000	460.1	92,000	461.6	103,000	463.0	115,000
169.92	448.6	46,000	452.5	61,000	454.8	69,000	457.4	78,000	458.6	85,000	460.1	93,000	461.7	103,000	463.0	115,000
170.37	448.6	47,000	452.5	61,000	454.8	69,000	457.4	78,000	458.6	86,000	460.1	93,000	461.7	103,000	463.0	115,000
170.82	448.6	47,000	452.5	62,000	454.8	69,000	457.4	79,000	458.6	86,000	460.1	94,000	461.7	104,000	463.0	115,000
171.06	448.6	47,000	452.5	62,000	454.8	70,000	457.4	79,000	458.6	86,000	460.1	94,000	461.7	104,000	463.0	115,000
171.3	448.6	47,000	452.5	62,000	454.8	70,000	457.4	79,000	458.6	87,000	460.1	94,000	461.7	104,000	463.0	115,000
171.55	448.6	47,000	452.5	63,000	454.8	70,000	457.4	80,000	458.6	87,000	460.1	94,000	461.7	104,000	463.0	115,000
171.8	448.6	47,000	452.5	63,000	454.8	70,000	457.4	80,000	458.6	87,000	460.1	95,000	461.7	104,000	463.0	115,000
172.25	448.6	48,000	452.5	63,000	454.8	71,000	457.4	80,000	458.6	88,000	460.1	95,000	461.7	104,000	463.0	115,000
172.71	448.6	48,000	452.5	64,000	454.8	71,000	457.4	81,000	458.6	88,000	460.2	96,000	461.7	104,000	463.0	116,000
173.29	448.6	48,000	452.5	64,000	454.8	72,000	457.4	81,000	458.7	89,000	460.2	96,000	461.7	104,000	463.0	116,000
173.54	448.6	48,000	452.5	64,000	454.9	72,000	457.4	82,000	458.7	89,000	460.2	96,000	461.7	104,000	463.0	116,000
173.8	448.6	48,000	452.5	64,000	454.9	72,000	457.4	82,000	458.7	89,000	460.2	97,000	461.7	105,000	463.0	116,000
174.22	448.6	49,000	452.5	65,000	454.9	72,000	457.4	82,000	458.7	90,000	460.2	97,000	461.7	105,000	463.0	116,000
174.53	448.6	49,000	452.5	65,000	454.9	73,000	457.4	83,000	458.7	90,000	460.2	97,000	461.7	105,000	463.0	116,000
174.84	448.6	49,000	452.5	65,000	454.9	73,000	457.4	83,000	458.7	90,000	460.2	98,000	461.7	105,000	463.1	116,000
175.32	448.6	49,000	452.5	65,000	454.9	74,000	457.4	84,000	458.7	91,000	460.2	98,000	461.7	106,000	463.1	117,000
175.57	448.7	49,000	452.5	66,000	454.9	74,000	457.4	84,000	458.7	91,000	460.2	98,000	461.7	106,000	463.1	117,000
175.81	448.7	49,000	452.5	66,000	454.9	74,000	457.4	85,000	458.7	91,000	460.2	98,000	461.7	106,000	463.1	117,000
176.27	448.7	50,000	452.5	66,000	454.9	75,000	457.4	86,000	458.7	92,000	460.2	99,000	461.7	107,000	463.1	117,000
176.49	448.7	50,000	452.5	67,000	454.9	76,000	457.4	86,000	458.7	93,000	460.2	99,000	461.7	107,000	463.1	118,000
176.72	448.7	50,000	452.5	67,000	454.9	76,000	457.4	87,000	458.7	93,000	460.2	100,000	461.7	108,000	463.1	118,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
177.2	448.7	50,000	452.5	67,000	454.9	77,000	457.5	87,000	458.7	94,000	460.2	100,000	461.8	108,000	463.1	118,000
177.7	448.7	50,000	452.5	68,000	454.9	78,000	457.5	88,000	458.7	95,000	460.2	101,000	461.8	109,000	463.1	119,000
178.12	448.7	51,000	452.5	68,000	454.9	79,000	457.5	90,000	458.7	97,000	460.3	103,000	461.8	110,000	463.1	120,000
178.54	448.7	51,000	452.5	69,000	454.9	80,000	457.5	91,000	458.7	98,000	460.3	105,000	461.8	112,000	463.1	122,000
179	448.7	52,000	452.6	70,000	454.9	82,000	457.5	93,000	458.7	100,000	460.3	107,000	461.8	114,000	463.1	124,000
179.29	448.7	52,000	452.6	70,000	454.9	83,000	457.5	95,000	458.7	102,000	460.3	109,000	461.8	115,000	463.1	125,000
179.58	448.7	52,000	452.6	71,000	454.9	84,000	457.5	96,000	458.7	103,000	460.3	110,000	461.8	116,000	463.1	126,000
179.8	448.7	52,000	452.6	71,000	454.9	84,000	457.5	96,000	458.8	104,000	460.3	111,000	461.8	117,000	463.1	127,000
180	448.7	53,000	452.6	71,000	454.9	84,000	457.5	97,000	458.8	104,000	460.3	112,000	461.8	117,000	463.1	128,000
180.5	448.8	53,000	452.6	72,000	454.9	85,000	457.5	98,000	458.8	106,000	460.3	113,000	461.8	118,000	463.2	129,000
180.75	448.8	53,000	452.6	72,000	454.9	86,000	457.5	99,000	458.8	107,000	460.3	114,000	461.8	119,000	463.2	130,000
181	448.8	53,000	452.6	72,000	455.0	86,000	457.5	100,000	458.8	107,000	460.3	115,000	461.8	120,000	463.2	130,000
181.3	448.8	54,000	452.6	73,000	455.0	87,000	457.5	101,000	458.8	109,000	460.3	116,000	461.8	121,000	463.2	131,000
181.6	448.9	54,000	452.6	73,000	455.0	88,000	457.5	102,000	458.8	110,000	460.4	117,000	461.9	123,000	463.2	132,000
181.9	448.9	54,000	452.6	74,000	455.0	89,000	457.6	102,000	458.8	110,000	460.4	118,000	461.9	124,000	463.2	133,000
182.2	448.9	54,000	452.7	73,000	455.0	88,000	457.6	102,000	458.9	110,000	460.5	118,000	461.9	123,000	463.3	132,000
182.45	449.0	54,000	452.7	74,000	455.1	89,000	457.6	103,000	458.9	111,000	460.5	119,000	462.0	124,000	463.3	133,000
182.7	449.0	54,000	452.7	74,000	455.1	89,000	457.7	103,000	458.9	112,000	460.5	120,000	462.0	125,000	463.4	134,000
183.2	449.0	54,000	452.7	75,000	455.1	90,000	457.7	104,000	459.0	113,000	460.5	121,000	462.0	127,000	463.4	135,000
183.45	449.0	54,000	452.7	75,000	455.1	91,000	457.7	105,000	459.0	114,000	460.6	122,000	462.0	127,000	463.4	136,000
183.7	449.0	55,000	452.7	75,000	455.1	91,000	457.7	106,000	459.0	114,000	460.6	122,000	462.0	128,000	463.4	136,000
184.2	449.0	55,000	452.7	76,000	455.1	92,000	457.7	107,000	459.0	116,000	460.6	124,000	462.1	130,000	463.4	138,000
184.45	449.1	55,000	452.8	76,000	455.1	93,000	457.7	107,000	459.0	116,000	460.6	125,000	462.1	131,000	463.4	138,000
184.7	449.1	55,000	452.8	76,000	455.1	93,000	457.7	108,000	459.0	117,000	460.6	125,000	462.1	132,000	463.4	139,000
184.95	449.1	55,000	452.8	77,000	455.1	93,000	457.7	108,000	459.0	118,000	460.6	126,000	462.1	132,000	463.4	139,000
185.2	449.1	55,000	452.8	77,000	455.1	93,000	457.7	109,000	459.0	118,000	460.6	126,000	462.1	133,000	463.4	140,000
185.7	449.1	56,000	452.8	77,000	455.1	94,000	457.7	109,000	459.0	119,000	460.6	127,000	462.1	134,000	463.4	141,000
185.95	449.1	56,000	452.8	77,000	455.1	94,000	457.7	110,000	459.0	119,000	460.6	128,000	462.1	134,000	463.5	141,000
186.2	449.1	56,000	452.8	77,000	455.1	95,000	457.8	110,000	459.1	120,000	460.7	128,000	462.1	135,000	463.5	142,000
186.45	449.2	56,000	452.8	78,000	455.2	95,000	457.8	110,000	459.1	120,000	460.7	129,000	462.1	135,000	463.5	142,000
186.7	449.2	56,000	452.8	78,000	455.2	95,000	457.8	111,000	459.1	121,000	460.7	129,000	462.1	136,000	463.5	143,000
187.2	449.2	56,000	452.8	78,000	455.2	96,000	457.8	111,000	459.1	121,000	460.7	130,000	462.2	137,000	463.5	144,000
187.45	449.2	56,000	452.9	78,000	455.2	96,000	457.8	112,000	459.1	122,000	460.7	131,000	462.2	138,000	463.5	144,000
187.7	449.2	57,000	452.9	79,000	455.2	96,000	457.8	112,000	459.1	122,000	460.7	131,000	462.2	138,000	463.5	144,000
188.2	449.3	57,000	452.9	79,000	455.2	97,000	457.8	113,000	459.1	123,000	460.7	132,000	462.2	139,000	463.5	145,000
188.7	449.3	57,000	452.9	79,000	455.2	97,000	457.8	113,000	459.1	124,000	460.8	133,000	462.2	140,000	463.6	146,000
189.1	449.3	57,000	452.9	79,000	455.2	97,000	457.9	114,000	459.2	124,000	460.8	133,000	462.2	141,000	463.6	147,000
189.3	449.3	57,000	452.9	79,000	455.3	97,000	457.9	114,000	459.2	124,000	460.8	134,000	462.3	141,000	463.6	147,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
189.7	449.4	57,000	453.0	80,000	455.3	98,000	457.9	114,000	459.2	125,000	460.9	134,000	462.3	142,000	463.7	148,000
190.2	449.4	57,000	453.0	80,000	455.3	98,000	458.0	115,000	459.3	126,000	460.9	135,000	462.4	143,000	463.7	149,000
190.7	449.4	58,000	453.0	80,000	455.3	99,000	458.0	115,000	459.3	126,000	461.0	136,000	462.4	144,000	463.8	151,000
190.95	449.4	58,000	453.0	81,000	455.4	99,000	458.0	116,000	459.3	127,000	461.0	137,000	462.4	144,000	463.8	151,000
191.2	449.5	58,000	453.0	81,000	455.4	99,000	458.0	116,000	459.4	127,000	461.0	137,000	462.4	145,000	463.8	152,000
191.7	449.5	58,000	453.1	81,000	455.4	100,000	458.1	117,000	459.4	128,000	461.0	138,000	462.5	146,000	463.8	153,000
192.2	449.5	58,000	453.1	81,000	455.4	100,000	458.1	117,000	459.4	129,000	461.0	139,000	462.5	147,000	463.9	154,000
192.45	449.5	58,000	453.1	81,000	455.4	100,000	458.1	118,000	459.4	129,000	461.1	139,000	462.5	148,000	463.9	155,000
192.7	449.6	58,000	453.1	82,000	455.4	101,000	458.1	118,000	459.4	129,000	461.1	140,000	462.5	148,000	463.9	155,000
192.95	449.6	58,000	453.1	82,000	455.4	101,000	458.1	118,000	459.4	130,000	461.1	140,000	462.5	149,000	463.9	156,000
193.2	449.6	58,000	453.1	82,000	455.5	101,000	458.2	119,000	459.5	130,000	461.1	141,000	462.5	149,000	463.9	156,000
193.7	449.7	59,000	453.2	82,000	455.5	101,000	458.2	119,000	459.5	131,000	461.2	141,000	462.6	150,000	463.9	157,000
194.2	449.7	59,000	453.2	82,000	455.5	102,000	458.2	120,000	459.5	131,000	461.2	142,000	462.6	151,000	464.0	158,000
194.45	449.7	59,000	453.2	83,000	455.5	102,000	458.2	120,000	459.5	132,000	461.2	143,000	462.6	151,000	464.0	159,000
194.7	449.7	59,000	453.2	83,000	455.5	102,000	458.2	120,000	459.5	132,000	461.2	143,000	462.6	152,000	464.0	160,000
194.95	449.7	59,000	453.2	83,000	455.5	102,000	458.2	120,000	459.6	132,000	461.2	144,000	462.6	153,000	464.0	160,000
195.2	449.8	59,000	453.2	83,000	455.5	102,000	458.3	121,000	459.6	133,000	461.2	144,000	462.6	153,000	464.0	161,000
195.53	449.8	59,000	453.3	83,000	455.6	103,000	458.3	121,000	459.6	133,000	461.3	145,000	462.7	154,000	464.1	161,000
195.96	449.9	59,000	453.3	83,000	455.6	103,000	458.4	121,000	459.7	133,000	461.3	145,000	462.7	154,000	464.1	162,000
196.2	450.0	59,000	453.4	83,000	455.7	102,000	458.4	120,000	459.7	132,000	461.4	143,000	462.8	152,000	464.2	160,000
196.6	450.0	59,000	453.4	83,000	455.8	102,000	458.5	120,000	459.8	133,000	461.5	144,000	462.8	153,000	464.2	161,000
197.1	450.1	59,000	453.5	83,000	455.8	102,000	458.5	121,000	459.8	133,000	461.5	144,000	462.9	153,000	464.3	161,000
197.35	450.1	59,000	453.5	83,000	455.8	103,000	458.6	121,000	459.9	133,000	461.5	145,000	462.9	154,000	464.3	162,000
197.6	450.2	59,000	453.6	83,000	455.9	103,000	458.6	121,000	459.9	134,000	461.5	145,000	462.9	154,000	464.3	162,000
198	450.2	60,000	453.6	83,000	455.9	103,000	458.6	121,000	459.9	134,000	461.6	146,000	462.9	155,000	464.3	163,000
198.4	450.3	60,000	453.6	83,000	455.9	103,000	458.6	122,000	459.9	134,000	461.6	146,000	463.0	155,000	464.3	163,000
198.7	450.3	60,000	453.6	84,000	455.9	103,000	458.6	122,000	459.9	134,000	461.6	146,000	463.0	156,000	464.3	164,000
198.95	450.4	60,000	453.7	84,000	456.0	103,000	458.6	122,000	459.9	135,000	461.6	147,000	463.0	156,000	464.4	164,000
199.2	450.4	60,000	453.7	84,000	456.0	104,000	458.7	122,000	460.0	135,000	461.6	147,000	463.0	157,000	464.4	165,000
199.45	450.4	60,000	453.7	84,000	456.0	104,000	458.7	123,000	460.0	136,000	461.6	148,000	463.0	158,000	464.4	166,000
199.7	450.5	60,000	453.7	84,000	456.0	104,000	458.7	123,000	460.0	136,000	461.6	149,000	463.0	159,000	464.4	167,000
200	450.5	61,000	453.8	84,000	456.0	105,000	458.7	124,000	460.0	137,000	461.6	149,000	463.0	159,000	464.4	168,000
200.3	450.6	61,000	453.8	85,000	456.0	105,000	458.7	124,000	460.0	137,000	461.6	150,000	463.0	160,000	464.4	169,000
200.75	450.6	61,000	453.8	85,000	456.0	105,000	458.7	125,000	460.0	138,000	461.6	151,000	463.0	162,000	464.4	170,000
201.02	450.7	61,000	453.8	85,000	456.0	106,000	458.7	125,000	460.0	139,000	461.6	152,000	463.0	162,000	464.4	171,000
201.3	450.7	61,000	453.8	85,000	456.1	106,000	458.7	125,000	460.0	139,000	461.6	152,000	463.0	163,000	464.4	172,000
201.55	450.7	62,000	453.9	86,000	456.1	106,000	458.7	126,000	460.0	140,000	461.6	153,000	463.0	164,000	464.4	173,000
201.8	450.8	62,000	453.9	86,000	456.1	106,000	458.7	126,000	460.0	140,000	461.6	154,000	463.0	165,000	464.4	174,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
202.3	450.8	62,000	453.9	86,000	456.1	107,000	458.7	127,000	460.0	140,000	461.6	154,000	463.0	165,000	464.4	175,000
202.8	450.8	62,000	453.9	87,000	456.1	107,000	458.7	127,000	460.0	141,000	461.7	155,000	463.1	166,000	464.4	178,000
203.05	450.9	62,000	454.0	87,000	456.1	107,000	458.8	127,000	460.0	141,000	461.7	155,000	463.1	167,000	464.4	178,000
203.3	450.9	62,000	454.0	87,000	456.1	107,000	458.8	128,000	460.0	142,000	461.7	156,000	463.1	167,000	464.4	179,000
203.6	451.0	63,000	454.0	87,000	456.2	108,000	458.8	128,000	460.0	142,000	461.7	156,000	463.1	168,000	464.4	180,000
203.9	451.0	63,000	454.0	88,000	456.2	108,000	458.8	129,000	460.1	143,000	461.7	157,000	463.1	169,000	464.5	181,000
204.2	451.1	63,000	454.1	88,000	456.2	108,000	458.8	129,000	460.1	143,000	461.7	158,000	463.1	170,000	464.5	182,000
204.5	451.1	63,000	454.1	89,000	456.2	109,000	458.8	129,000	460.1	144,000	461.7	158,000	463.1	171,000	464.5	183,000
204.75	451.2	63,000	454.1	89,000	456.2	109,000	458.8	130,000	460.1	144,000	461.7	159,000	463.1	171,000	464.5	183,000
205	451.2	64,000	454.2	89,000	456.2	109,000	458.8	130,000	460.1	145,000	461.7	160,000	463.1	172,000	464.5	184,000
205.5	451.3	64,000	454.2	90,000	456.3	110,000	458.9	132,000	460.1	147,000	461.7	162,000	463.1	175,000	464.5	187,000
205.75	451.4	64,000	454.3	91,000	456.3	110,000	458.9	132,000	460.1	147,000	461.7	162,000	463.1	176,000	464.5	188,000
206	451.4	65,000	454.3	91,000	456.3	111,000	458.9	132,000	460.2	147,000	461.7	163,000	463.2	176,000	464.5	188,000
206.5	451.5	65,000	454.4	91,000	456.4	111,000	458.9	133,000	460.2	148,000	461.8	164,000	463.2	177,000	464.5	190,000
206.75	451.6	65,000	454.4	92,000	456.4	111,000	458.9	133,000	460.2	149,000	461.8	164,000	463.2	178,000	464.5	190,000
207	451.6	65,000	454.4	92,000	456.4	112,000	458.9	133,000	460.2	149,000	461.8	165,000	463.2	180,000	464.5	195,000
207.4	451.7	66,000	454.5	93,000	456.4	112,000	458.9	134,000	460.2	150,000	461.8	166,000	463.2	181,000	464.5	196,000
207.58	451.7	66,000	454.5	93,000	456.5	112,000	459.0	134,000	460.2	150,000	461.8	166,000	463.2	181,000	464.6	197,000
207.84	451.8	66,000	454.6	93,000	456.5	112,000	459.0	134,000	460.3	150,000	461.8	166,000	463.3	182,000	464.6	197,000
208	451.8	65,000	454.6	92,000	456.5	111,000	459.0	133,000	460.3	149,000	461.9	165,000	463.3	180,000	464.6	195,000
208.1	451.8	65,000	454.7	92,000	456.6	112,000	459.1	133,000	460.3	149,000	461.9	165,000	463.3	180,000	464.7	195,000
208.35	451.9	65,000	454.7	92,000	456.6	112,000	459.1	133,000	460.3	149,000	461.9	165,000	463.3	180,000	464.7	196,000
208.6	451.9	66,000	454.8	92,000	456.6	112,000	459.1	134,000	460.4	150,000	461.9	166,000	463.3	181,000	464.7	196,000
209.1	452.0	66,000	454.8	93,000	456.7	112,000	459.1	134,000	460.4	150,000	461.9	166,000	463.4	181,000	464.7	197,000
209.35	452.0	66,000	454.9	93,000	456.7	112,000	459.2	134,000	460.4	150,000	462.0	166,000	463.4	182,000	464.7	197,000
209.6	452.1	66,000	454.9	93,000	456.7	113,000	459.2	134,000	460.4	151,000	462.0	167,000	463.4	182,000	464.8	198,000
209.85	452.1	66,000	454.9	93,000	456.7	113,000	459.2	135,000	460.5	151,000	462.0	167,000	463.4	182,000	464.8	198,000
210.1	452.1	66,000	455.0	94,000	456.8	113,000	459.2	135,000	460.5	151,000	462.0	168,000	463.4	183,000	464.8	199,000
210.5	452.2	66,000	455.0	94,000	456.8	113,000	459.2	135,000	460.5	152,000	462.0	168,000	463.4	183,000	464.8	199,000
211	452.3	67,000	455.1	95,000	456.9	114,000	459.3	136,000	460.5	152,000	462.1	169,000	463.5	184,000	464.8	201,000
211.4	452.4	67,000	455.2	95,000	456.9	114,000	459.3	136,000	460.6	153,000	462.1	169,000	463.5	185,000	464.8	201,000
211.9	452.5	67,000	455.3	95,000	456.9	114,000	459.3	136,000	460.6	153,000	462.1	170,000	463.5	185,000	464.9	202,000
212.15	452.5	67,000	455.3	95,000	457.0	114,000	459.3	137,000	460.6	153,000	462.1	170,000	463.5	185,000	464.9	202,000
212.4	452.6	67,000	455.3	95,000	457.0	115,000	459.4	137,000	460.6	153,000	462.1	170,000	463.5	185,000	464.9	202,000
212.65	452.6	68,000	455.4	95,000	457.0	115,000	459.4	137,000	460.7	154,000	462.1	170,000	463.6	186,000	464.9	202,000
212.9	452.7	68,000	455.4	96,000	457.0	115,000	459.4	137,000	460.7	154,000	462.2	171,000	463.6	186,000	464.9	203,000
213.3	452.7	68,000	455.5	96,000	457.1	115,000	459.4	137,000	460.7	154,000	462.2	171,000	463.6	186,000	464.9	203,000
213.66	452.8	68,000	455.5	96,000	457.1	115,000	459.4	137,000	460.7	154,000	462.2	171,000	463.6	186,000	464.9	203,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
213.88	452.8	68,000	455.5	96,000	457.1	115,000	459.4	137,000	460.7	154,000	462.1	171,000	463.6	187,000	464.9	204,000
214.2	452.9	68,000	455.7	96,000	457.3	115,000	459.5	137,000	460.8	154,000	462.3	171,000	463.7	187,000	465.0	204,000
214.58	453.0	68,000	455.8	96,000	457.4	115,000	459.6	137,000	460.9	154,000	462.3	171,000	463.7	187,000	465.1	204,000
214.96	453.1	68,000	455.9	96,000	457.5	115,000	459.6	137,000	460.9	154,000	462.4	171,000	463.8	187,000	465.1	204,000
215.28	453.1	68,000	455.9	96,000	457.5	115,000	459.6	137,000	461.0	154,000	462.4	171,000	463.8	187,000	465.1	204,000
215.6	453.2	68,000	456.0	96,000	457.6	115,000	459.7	137,000	461.0	154,000	462.4	171,000	463.8	187,000	465.2	204,000
215.85	453.2	68,000	456.0	97,000	457.7	115,000	459.7	137,000	461.0	155,000	462.4	172,000	463.8	187,000	465.2	204,000
216.1	453.3	68,000	456.1	97,000	457.7	116,000	459.7	138,000	461.0	155,000	462.5	172,000	463.9	187,000	465.2	204,000
216.4	453.4	69,000	456.1	97,000	457.8	116,000	459.8	138,000	461.1	155,000	462.5	172,000	463.9	187,000	465.2	205,000
216.7	453.4	69,000	456.2	97,000	457.9	116,000	459.8	138,000	461.1	155,000	462.5	172,000	463.9	188,000	465.2	205,000
216.9	453.5	69,000	456.2	97,000	457.9	116,000	459.8	138,000	461.2	155,000	462.6	172,000	463.9	188,000	465.3	205,000
217.13	453.5	69,000	456.3	97,000	458.0	116,000	459.9	138,000	461.2	155,000	462.6	172,000	464.0	188,000	465.3	205,000
217.37	453.6	69,000	456.3	97,000	458.0	116,000	459.9	138,000	461.2	155,000	462.6	172,000	464.0	188,000	465.3	205,000
217.6	453.6	69,000	456.4	97,000	458.1	116,000	459.9	138,000	461.3	155,000	462.6	172,000	464.0	188,000	465.3	205,000
217.95	453.7	69,000	456.4	97,000	458.2	116,000	460.0	138,000	461.3	155,000	462.7	172,000	464.1	188,000	465.4	205,000
218.3	453.7	69,000	456.5	97,000	458.2	116,000	460.0	138,000	461.3	155,000	462.7	173,000	464.1	188,000	465.4	205,000
218.45	453.8	69,000	456.5	97,000	458.3	116,000	460.0	138,000	461.3	156,000	462.7	173,000	464.1	188,000	465.4	206,000
218.7	453.8	69,000	456.6	98,000	458.4	116,000	460.1	138,000	461.4	156,000	462.8	173,000	464.2	188,000	465.5	206,000
219	453.9	69,000	456.7	98,000	458.5	116,000	460.2	138,000	461.5	156,000	462.8	173,000	464.2	189,000	465.5	206,000
219.3	454.0	69,000	456.9	98,000	458.6	116,000	460.3	138,000	461.6	156,000	462.9	173,000	464.3	189,000	465.6	206,000
219.8	454.1	70,000	457.0	98,000	458.8	117,000	460.5	139,000	461.7	156,000	463.0	173,000	464.4	189,000	465.7	206,000
220.1	454.2	70,000	457.2	98,000	458.9	117,000	460.6	139,000	461.8	156,000	463.1	173,000	464.4	189,000	465.7	206,000
220.4	454.3	70,000	457.3	98,000	459.0	117,000	460.7	139,000	461.9	156,000	463.2	174,000	464.5	189,000	465.8	207,000
220.9	454.4	70,000	457.5	99,000	459.2	117,000	460.9	139,000	462.0	157,000	463.3	174,000	464.6	190,000	465.9	207,000
221.15	454.4	70,000	457.6	99,000	459.3	117,000	461.0	139,000	462.1	157,000	463.4	174,000	464.6	190,000	465.9	207,000
221.4	454.5	70,000	457.7	99,000	459.4	117,000	461.1	139,000	462.2	157,000	463.4	174,000	464.7	190,000	466.0	207,000
221.65	454.5	70,000	457.8	99,000	459.4	117,000	461.2	139,000	462.3	157,000	463.5	174,000	464.7	190,000	466.0	207,000
221.9	454.6	70,000	457.9	99,000	459.5	117,000	461.2	139,000	462.4	157,000	463.6	174,000	464.7	190,000	466.0	207,000
222.15	454.6	71,000	458.0	99,000	459.6	117,000	461.3	139,000	462.5	157,000	463.7	174,000	464.8	190,000	466.1	208,000
222.4	454.7	71,000	458.1	99,000	459.7	117,000	461.4	139,000	462.6	157,000	463.8	174,000	464.9	190,000	466.2	208,000
222.85	454.8	71,000	458.3	99,000	459.9	117,000	461.7	139,000	462.9	157,000	464.2	175,000	465.3	190,000	466.5	208,000
223.02	454.9	71,000	458.5	99,000	460.1	117,000	461.9	139,000	463.1	157,000	464.4	175,000	465.5	191,000	466.7	208,000
223.26	455.0	71,000	458.6	99,000	460.2	118,000	462.0	139,000	463.3	157,000	464.5	175,000	465.7	191,000	466.8	208,000
223.5	455.0	71,000	458.6	99,000	460.3	118,000	462.1	139,000	463.4	157,000	464.7	175,000	465.8	191,000	466.9	208,000
224	455.1	71,000	458.7	99,000	460.4	118,000	462.2	140,000	463.5	157,000	464.8	175,000	465.9	191,000	467.0	208,000
224.25	455.2	71,000	458.8	100,000	460.4	118,000	462.3	140,000	463.6	158,000	464.8	175,000	466.0	191,000	467.1	208,000
224.5	455.2	71,000	458.9	100,000	460.5	118,000	462.4	140,000	463.6	158,000	464.9	175,000	466.1	191,000	467.2	208,000
224.79	455.3	71,000	459.0	100,000	460.6	118,000	462.5	140,000	463.8	158,000	465.1	175,000	466.2	191,000	467.3	209,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
225.1	455.4	71,000	459.1	100,000	460.7	118,000	462.6	140,000	463.9	158,000	465.2	175,000	466.4	191,000	467.5	209,000
225.42	455.4	71,000	459.2	100,000	460.8	118,000	462.7	140,000	464.0	158,000	465.4	175,000	466.5	191,000	467.6	209,000
225.5	455.5	72,000	459.3	100,000	461.0	118,000	462.9	140,000	464.2	158,000	465.5	175,000	466.7	191,000	467.8	209,000
225.8	455.6	72,000	459.5	100,000	461.1	118,000	463.1	140,000	464.4	158,000	465.7	176,000	466.9	191,000	468.0	209,000
226.3	455.6	57,000	459.5	78,000	461.2	93,000	463.2	109,000	464.5	123,000	465.8	136,000	467.0	148,000	468.1	163,000
226.8	455.7	57,000	459.6	78,000	461.3	93,000	463.2	109,000	464.6	124,000	465.9	136,000	467.1	149,000	468.2	163,000
227.05	455.7	57,000	459.6	78,000	461.3	93,000	463.3	109,000	464.6	124,000	466.0	136,000	467.1	149,000	468.2	163,000
227.3	455.8	57,000	459.7	78,000	461.4	93,000	463.3	109,000	464.7	124,000	466.0	136,000	467.1	149,000	468.3	163,000
227.7	455.8	57,000	459.7	78,000	461.4	94,000	463.4	109,000	464.7	124,000	466.0	137,000	467.2	149,000	468.3	163,000
228.2	455.9	57,000	459.7	79,000	461.5	94,000	463.4	109,000	464.8	124,000	466.1	137,000	467.2	149,000	468.4	163,000
228.45	455.9	57,000	459.8	79,000	461.6	94,000	463.5	109,000	464.8	124,000	466.2	137,000	467.3	149,000	468.4	163,000
228.7	455.9	57,000	459.8	79,000	461.7	94,000	463.5	109,000	464.9	124,000	466.2	137,000	467.3	149,000	468.4	163,000
228.96	456.0	57,000	459.8	79,000	461.8	94,000	463.6	109,000	464.9	124,000	466.3	137,000	467.4	149,000	468.5	163,000
229.47	456.0	58,000	459.9	79,000	461.9	94,000	463.7	109,000	465.1	124,000	466.4	137,000	467.5	149,000	468.6	163,000
229.6	456.1	58,000	459.9	79,000	462.0	94,000	463.8	109,000	465.1	124,000	466.4	137,000	467.5	149,000	468.7	163,000
229.8	456.1	58,000	460.0	79,000	462.1	94,000	463.9	109,000	465.3	124,000	466.6	137,000	467.7	149,000	468.8	164,000
229.9	456.1	58,000	460.0	79,000	462.2	94,000	464.0	109,000	465.4	124,000	466.7	137,000	467.8	149,000	468.9	164,000
230.02	456.1	58,000	460.0	79,000	462.2	94,000	464.1	109,000	465.5	124,000	466.8	137,000	467.9	149,000	469.1	164,000
230.4	456.2	58,000	460.2	79,000	462.5	94,000	464.2	109,000	465.6	125,000	466.9	137,000	468.1	149,000	469.2	164,000
230.72	456.3	58,000	460.3	79,000	462.6	94,000	464.3	109,000	465.7	125,000	467.0	137,000	468.1	150,000	469.3	164,000
230.81	456.5	58,000	460.4	79,000	462.7	94,000	464.4	109,000	465.8	125,000	467.1	137,000	468.2	150,000	469.3	164,000
230.91	456.7	58,000	460.6	79,000	462.9	94,000	464.5	110,000	465.8	125,000	467.1	137,000	468.3	150,000	469.4	164,000
231.1	458.5	58,000	461.5	79,000	463.8	94,000	465.4	110,000	466.7	125,000	468.0	137,000	469.2	150,000	470.3	164,000
231.35	458.6	58,000	461.6	79,000	463.8	94,000	465.5	110,000	466.8	125,000	468.1	137,000	469.2	150,000	470.4	164,000
231.6	458.9	58,000	461.8	79,000	464.0	94,000	465.6	110,000	466.9	125,000	468.2	138,000	469.3	150,000	470.5	164,000
231.89	459.3	58,000	462.0	79,000	464.1	94,000	465.7	110,000	467.1	125,000	468.3	138,000	469.4	150,000	470.6	164,000
232.18	459.7	58,000	462.2	79,000	464.3	94,000	465.9	110,000	467.2	125,000	468.5	138,000	469.5	150,000	470.7	164,000
232.45	460.0	58,000	462.4	79,000	464.5	94,000	466.0	110,000	467.3	125,000	468.6	138,000	469.6	150,000	470.8	164,000
232.73	460.3	58,000	462.7	80,000	464.7	94,000	466.2	110,000	467.5	125,000	468.7	138,000	469.7	150,000	470.9	164,000
233	460.6	58,000	462.9	80,000	464.8	94,000	466.3	110,000	467.6	125,000	468.8	138,000	469.9	150,000	470.9	164,000
233.25	461.0	58,000	463.2	80,000	465.0	94,000	466.5	110,000	467.7	125,000	468.9	138,000	470.0	150,000	471.0	165,000
233.5	461.2	58,000	463.4	80,000	465.2	94,000	466.6	110,000	467.8	126,000	469.0	138,000	470.1	150,000	471.1	165,000
234	461.5	58,000	463.6	80,000	465.4	94,000	466.8	110,000	468.0	126,000	469.2	138,000	470.2	150,000	471.3	165,000
234.25	461.7	58,000	463.8	80,000	465.5	94,000	466.9	110,000	468.1	126,000	469.3	139,000	470.3	151,000	471.4	165,000
234.5	461.8	58,000	464.0	80,000	465.7	94,000	467.1	110,000	468.3	126,000	469.4	139,000	470.4	151,000	471.5	165,000
235.1	462.0	58,000	464.2	80,000	466.0	94,000	467.3	110,000	468.5	126,000	469.7	139,000	470.7	151,000	471.7	165,000
235.7	462.2	58,000	464.5	80,000	466.3	94,000	467.7	110,000	468.9	126,000	470.0	139,000	471.0	151,000	472.0	165,000
235.85	462.3	58,000	464.7	80,000	466.5	94,000	467.9	110,000	469.1	126,000	470.2	139,000	471.2	151,000	472.2	166,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
236	462.4	58,000	464.9	80,000	466.7	95,000	468.1	110,000	469.3	126,000	470.4	139,000	471.4	151,000	472.4	166,000
236.15	462.6	58,000	465.1	80,000	466.9	95,000	468.3	110,000	469.5	126,000	470.6	139,000	471.5	151,000	472.6	166,000
236.52	462.7	58,000	465.3	80,000	467.1	95,000	468.5	110,000	469.7	126,000	470.8	139,000	471.7	151,000	472.8	166,000
236.9	462.9	58,000	465.5	80,000	467.3	95,000	468.7	110,000	469.9	126,000	471.0	139,000	471.9	151,000	473.0	166,000
237.15	463.0	58,000	465.6	80,000	467.4	95,000	468.8	110,000	470.1	126,000	471.1	139,000	472.1	151,000	473.1	166,000
237.4	463.0	58,000	465.7	80,000	467.6	95,000	469.0	110,000	470.2	126,000	471.3	139,000	472.3	151,000	473.3	166,000
237.65	463.1	58,000	465.9	80,000	467.7	95,000	469.2	110,000	470.4	126,000	471.5	139,000	472.5	151,000	473.5	166,000
237.9	463.3	58,000	466.1	80,000	468.0	95,000	469.4	110,000	470.7	126,000	471.8	139,000	472.7	151,000	473.8	166,000
238.3	463.5	58,000	466.4	80,000	468.3	94,000	469.8	110,000	471.0	126,000	472.1	139,000	473.1	151,000	474.1	166,000
238.62	463.8	58,000	466.8	80,000	468.6	94,000	470.1	110,000	471.4	126,000	472.4	139,000	473.4	151,000	474.5	166,000
238.95	464.0	58,000	467.1	80,000	469.0	94,000	470.4	110,000	471.7	126,000	472.8	139,000	473.8	151,000	474.8	166,000
239.17	464.3	58,000	467.4	80,000	469.3	94,000	470.7	110,000	472.0	126,000	473.1	139,000	474.0	151,000	475.1	166,000
239.4	464.5	58,000	467.6	80,000	469.5	94,000	471.0	110,000	472.3	126,000	473.3	139,000	474.3	151,000	475.3	166,000
239.6	464.6	48,000	467.8	66,000	469.7	79,000	471.2	91,000	472.5	105,000	473.5	115,000	474.5	125,000	475.6	137,000
239.7	464.7	48,000	467.9	66,000	469.8	79,000	471.3	91,000	472.6	105,000	473.7	115,000	474.6	125,000	475.7	137,000
240	464.8	48,000	468.0	66,000	469.9	79,000	471.4	91,000	472.7	105,000	473.8	115,000	474.8	125,000	475.8	137,000
240.27	464.9	48,000	468.2	66,000	470.2	79,000	471.7	91,000	473.0	105,000	474.1	115,000	475.1	125,000	476.2	137,000
240.55	465.1	48,000	468.4	66,000	470.3	79,000	471.8	91,000	473.2	105,000	474.3	115,000	475.3	125,000	476.4	137,000
240.8	465.2	48,000	468.5	66,000	470.5	79,000	472.0	91,000	473.4	105,000	474.5	115,000	475.5	125,000	476.6	137,000
241.05	465.3	48,000	468.6	67,000	470.6	79,000	472.1	91,000	473.5	105,000	474.5	115,000	475.5	125,000	476.7	137,000
241.3	465.4	48,000	468.7	67,000	470.7	79,000	472.2	91,000	473.5	105,000	474.6	115,000	475.6	125,000	476.7	137,000
241.65	465.5	48,000	468.7	67,000	470.8	79,000	472.3	91,000	473.6	105,000	474.7	115,000	475.7	125,000	476.8	137,000
242	465.6	48,000	468.8	67,000	470.9	79,000	472.4	91,000	473.8	105,000	474.8	115,000	475.8	125,000	476.9	137,000
242.3	465.7	48,000	469.0	67,000	471.1	79,000	472.6	91,000	473.9	105,000	475.0	115,000	476.0	125,000	477.1	137,000
242.6	465.9	48,000	469.2	67,000	471.3	79,000	472.8	91,000	474.2	105,000	475.2	115,000	476.3	125,000	477.4	137,000
242.96	466.1	48,000	469.3	67,000	471.5	79,000	473.0	91,000	474.4	105,000	475.5	115,000	476.5	125,000	477.6	137,000
243.44	466.2	48,000	469.6	67,000	471.8	79,000	473.3	91,000	474.7	105,000	475.8	115,000	476.8	125,000	478.0	137,000
243.79	466.2	48,000	469.6	67,000	471.9	79,000	473.5	91,000	474.9	105,000	476.0	114,000	477.1	124,000	478.2	137,000
244.15	466.6	48,000	470.0	67,000	472.3	79,000	473.8	91,000	475.2	105,000	476.4	114,000	477.4	124,000	478.6	137,000
244.25	466.5	48,000	469.9	67,000	472.3	79,000	473.9	91,000	475.2	105,000	476.4	114,000	477.5	124,000	478.7	137,000
244.95	468.7	48,000	471.8	67,000	473.8	79,000	475.4	91,000	476.5	105,000	477.6	114,000	478.6	124,000	479.7	137,000
245.17	469.5	48,000	472.5	67,000	474.4	79,000	476.0	91,000	477.1	105,000	478.2	114,000	479.2	124,000	480.3	137,000
245.33	470.0	48,000	473.0	67,000	474.9	79,000	476.5	91,000	477.5	105,000	478.5	114,000	479.5	124,000	480.6	137,000
245.6	470.7	48,000	473.6	67,000	475.5	79,000	477.1	91,000	478.1	105,000	479.1	114,000	480.0	124,000	481.1	137,000
245.83	471.3	48,000	474.2	67,000	476.0	79,000	477.5	91,000	478.5	105,000	479.4	114,000	480.4	124,000	481.4	137,000
246.15	472.0	48,000	474.7	67,000	476.4	79,000	478.0	91,000	478.9	105,000	479.8	114,000	480.7	124,000	481.8	137,000
246.46	472.7	48,000	475.3	67,000	477.0	79,000	478.6	91,000	479.4	105,000	480.3	114,000	481.2	124,000	482.4	137,000
246.71	473.4	48,000	475.8	67,000	477.4	79,000	478.9	91,000	479.7	105,000	480.6	114,000	481.6	124,000	482.9	137,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
Mile	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
246.96	474.5	48,000	476.5	67,000	477.9	79,000	479.1	91,000	479.9	105,000	480.7	114,000	481.5	124,000	483.5	137,000
247	483.2	48,000	483.2	67,000	483.2	79,000	483.2	91,000	483.2	105,000	483.2	114,000	485.5	124,000	486.3	137,000
247.1	483.2	48,000	483.2	67,000	483.2	79,000	483.3	91,000	483.3	105,000	483.3	114,000	485.4	124,000	486.2	137,000
247.48	483.5	48,000	483.7	67,000	483.8	79,000	484.1	91,000	484.4	105,000	484.6	114,000	486.5	124,000	487.3	137,000
247.74	483.7	48,000	484.1	67,000	484.3	79,000	484.8	91,000	485.3	105,000	485.7	114,000	487.3	124,000	488.1	137,000
248	484.0	48,000	484.6	67,000	485.0	79,000	485.7	91,000	486.4	105,000	486.9	114,000	488.4	124,000	489.1	137,000
248.3	484.5	48,000	485.3	67,000	486.0	79,000	486.9	91,000	487.8	105,000	488.4	114,000	489.6	124,000	490.3	137,000
248.6	485.0	48,000	486.1	67,000	486.9	79,000	488.1	91,000	489.0	105,000	489.6	114,000	490.6	124,000	491.4	137,000
248.88	485.5	48,000	486.8	67,000	487.8	79,000	489.0	91,000	490.0	105,000	490.6	114,000	491.5	124,000	492.3	137,000
249.15	486.0	48,000	487.4	67,000	488.5	79,000	489.7	91,000	490.7	105,000	491.3	114,000	492.2	124,000	493.0	137,000
249.4	486.3	48,000	487.8	67,000	489.0	79,000	490.3	91,000	491.3	105,000	491.9	114,000	492.7	124,000	493.5	137,000
249.7	486.7	48,000	488.3	67,000	489.5	79,000	490.9	91,000	491.9	105,000	492.5	114,000	493.3	124,000	494.1	137,000
250	487.0	48,000	488.8	67,000	490.1	79,000	491.5	91,000	492.5	104,000	493.1	114,000	494.0	124,000	494.8	137,000
250.3	487.3	48,000	489.1	67,000	490.5	79,000	491.9	91,000	493.0	104,000	493.7	114,000	494.5	124,000	495.4	137,000
250.6	487.5	48,000	489.4	66,000	490.9	79,000	492.3	91,000	493.4	104,000	494.1	114,000	495.0	124,000	495.9	137,000
250.9	487.7	48,000	489.7	66,000	491.2	79,000	492.7	91,000	493.8	104,000	494.5	114,000	495.4	124,000	496.3	137,000
251.31	487.9	48,000	490.0	66,000	491.5	79,000	493.1	90,000	494.2	104,000	495.0	114,000	495.9	124,000	496.8	137,000
251.58	488.1	48,000	490.2	66,000	491.8	79,000	493.4	90,000	494.6	104,000	495.3	114,000	496.2	124,000	497.2	137,000
251.85	488.2	48,000	490.4	66,000	492.1	79,000	493.7	90,000	494.9	104,000	495.6	114,000	496.6	124,000	497.6	137,000
252.12	488.4	48,000	490.7	66,000	492.3	79,000	494.0	91,000	495.2	104,000	496.0	114,000	496.9	124,000	497.9	137,000
252.48	488.6	48,000	490.9	66,000	492.6	79,000	494.3	91,000	495.6	104,000	496.3	114,000	497.3	124,000	498.3	137,000
252.83	488.8	48,000	491.2	66,000	493.0	79,000	494.7	91,000	495.9	104,000	496.7	114,000	497.7	124,000	498.7	137,000
253.27	489.1	48,000	491.5	66,000	493.3	79,000	495.1	91,000	496.4	104,000	497.2	114,000	498.2	124,000	499.2	137,000
253.64	489.3	48,000	491.8	66,000	493.7	79,000	495.5	91,000	496.8	104,000	497.6	114,000	498.6	124,000	499.7	137,000
254	489.5	48,000	492.1	66,000	494.0	79,000	495.8	91,000	497.2	104,000	498.0	114,000	499.0	124,000	500.1	137,000
254.04	489.5	48,000	492.1	66,000	494.1	79,000	495.9	91,000	497.2	104,000	498.0	114,000	499.0	124,000	500.1	137,000
254.1	489.6	48,000	492.2	66,000	494.2	79,000	496.0	91,000	497.4	104,000	498.2	114,000	499.2	124,000	500.3	137,000
254.38	489.7	48,000	492.4	66,000	494.3	79,000	496.2	91,000	497.6	104,000	498.4	114,000	499.4	124,000	500.6	137,000
254.66	489.9	48,000	492.6	66,000	494.6	79,000	496.5	91,000	497.8	104,000	498.7	114,000	499.7	124,000	500.9	137,000
254.94	490.1	48,000	492.9	66,000	494.9	79,000	496.8	91,000	498.1	104,000	499.0	114,000	500.0	124,000	501.2	137,000
255.22	490.3	48,000	493.1	66,000	495.1	79,000	497.1	91,000	498.4	104,000	499.3	114,000	500.3	124,000	501.5	137,000
255.68	490.5	48,000	493.3	66,000	495.4	79,000	497.3	91,000	498.7	104,000	499.6	114,000	500.6	124,000	501.7	137,000
255.94	490.7	48,000	493.5	66,000	495.6	79,000	497.5	91,000	498.9	104,000	499.8	114,000	500.8	124,000	501.9	137,000
256.2	490.8	48,000	493.6	66,000	495.7	79,000	497.7	91,000	499.1	104,000	499.9	114,000	501.0	124,000	502.1	137,000
256.46	490.9	48,000	493.8	66,000	495.9	79,000	497.8	91,000	499.2	104,000	500.1	114,000	501.2	124,000	502.3	137,000
256.71	491.0	48,000	493.9	66,000	496.1	79,000	498.0	91,000	499.4	104,000	500.3	114,000	501.4	124,000	502.5	137,000
257.22	491.2	48,000	494.2	66,000	496.3	79,000	498.3	91,000	499.7	104,000	500.6	114,000	501.7	124,000	502.9	137,000
257.71	491.5	48,000	494.4	66,000	496.6	79,000	498.6	91,000	500.0	104,000	500.9	114,000	502.0	124,000	503.2	137,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
257.96	491.6	48,000	494.6	66,000	496.8	79,000	498.8	91,000	500.2	104,000	501.1	114,000	502.2	124,000	503.4	137,000
258.22	491.7	48,000	494.7	66,000	496.9	79,000	499.0	91,000	500.4	104,000	501.3	114,000	502.4	124,000	503.6	137,000
258.47	491.8	48,000	494.9	66,000	497.1	79,000	499.1	91,000	500.5	105,000	501.5	114,000	502.5	124,000	503.7	137,000
258.9	492.0	48,000	495.1	66,000	497.4	79,000	499.4	91,000	500.8	105,000	501.7	114,000	502.8	125,000	504.0	137,000
259.2	492.2	48,000	495.3	66,000	497.5	79,000	499.5	91,000	501.0	105,000	501.9	114,000	503.0	125,000	504.2	137,000
259.5	492.3	48,000	495.5	66,000	497.7	79,000	499.7	91,000	501.1	105,000	502.1	114,000	503.2	125,000	504.4	137,000
259.8	492.5	48,000	495.6	66,000	497.9	79,000	499.9	91,000	501.3	105,000	502.3	114,000	503.3	125,000	504.6	137,000
260.1	492.6	48,000	495.8	66,000	498.0	79,000	500.1	91,000	501.5	105,000	502.4	115,000	503.5	125,000	504.7	137,000
260.38	492.7	48,000	495.9	66,000	498.2	80,000	500.2	91,000	501.6	105,000	502.5	115,000	503.6	125,000	504.8	137,000
260.67	492.8	48,000	496.0	66,000	498.3	80,000	500.3	91,000	501.7	105,000	502.6	115,000	503.7	125,000	504.9	137,000
260.95	492.9	48,000	496.1	66,000	498.4	80,000	500.4	91,000	501.8	105,000	502.7	115,000	503.8	125,000	505.0	137,000
261.23	493.1	48,000	496.2	66,000	498.5	80,000	500.5	91,000	501.9	105,000	502.8	115,000	503.9	125,000	505.1	137,000
261.52	493.2	48,000	496.4	66,000	498.6	80,000	500.6	92,000	502.0	105,000	502.9	115,000	504.0	125,000	505.2	137,000
261.8	493.3	48,000	496.5	66,000	498.7	80,000	500.8	92,000	502.1	105,000	503.0	115,000	504.1	125,000	505.3	138,000
262.3	493.4	48,000	496.6	66,000	498.9	80,000	500.9	92,000	502.3	105,000	503.2	115,000	504.2	126,000	505.4	138,000
262.76	493.6	48,000	496.8	66,000	499.0	81,000	501.0	92,000	502.4	106,000	503.3	116,000	504.3	126,000	505.5	138,000
263	493.7	48,000	496.9	66,000	499.1	81,000	501.1	92,000	502.5	106,000	503.4	116,000	504.4	126,000	505.6	138,000
263.46	493.8	48,000	497.0	66,000	499.3	81,000	501.3	93,000	502.7	106,000	503.6	116,000	504.6	126,000	505.8	138,000
263.5	493.9	40,000	497.1	52,000	499.4	64,000	501.4	72,000	502.7	83,000	503.6	91,000	504.7	99,000	505.9	108,000
264	494.1	40,000	497.3	52,000	499.6	64,000	501.6	72,000	502.9	83,000	503.8	91,000	504.9	99,000	506.1	109,000
264.25	494.1	40,000	497.4	53,000	499.7	64,000	501.6	73,000	503.0	83,000	503.9	91,000	505.0	99,000	506.2	109,000
264.5	494.3	40,000	497.5	53,000	499.8	65,000	501.7	73,000	503.1	83,000	504.0	91,000	505.1	99,000	506.3	109,000
265	494.4	41,000	497.6	53,000	499.9	65,000	501.9	74,000	503.3	83,000	504.2	91,000	505.2	99,000	506.4	109,000
265.5	494.6	41,000	497.7	53,000	500.1	65,000	502.0	75,000	503.4	83,000	504.3	91,000	505.3	100,000	506.5	109,000
265.75	494.7	41,000	497.9	53,000	500.2	66,000	502.1	75,000	503.5	84,000	504.4	92,000	505.4	100,000	506.6	110,000
266	494.9	41,000	498.0	54,000	500.3	66,000	502.2	76,000	503.6	84,000	504.5	92,000	505.5	101,000	506.7	110,000
266.5	495.0	41,000	498.1	54,000	500.5	66,000	502.3	76,000	503.7	84,000	504.6	92,000	505.7	101,000	506.8	111,000
266.75	495.2	41,000	498.2	54,000	500.6	66,000	502.4	76,000	503.8	84,000	504.7	92,000	505.8	101,000	506.9	111,000
267	495.3	41,000	498.3	54,000	500.7	67,000	502.5	77,000	503.9	84,000	504.8	93,000	505.9	101,000	507.0	111,000
267.5	495.5	41,000	498.5	55,000	500.9	67,000	502.6	77,000	504.1	85,000	505.0	93,000	506.0	101,000	507.1	111,000
267.75	495.6	41,000	498.7	55,000	501.0	67,000	502.8	78,000	504.2	85,000	505.2	93,000	506.2	101,000	507.3	111,000
268	495.7	41,000	498.8	55,000	501.2	68,000	502.9	78,000	504.4	86,000	505.3	93,000	506.3	102,000	507.4	111,000
268.3	495.8	41,000	498.9	55,000	501.3	68,000	503.1	78,000	504.5	86,000	505.5	93,000	506.5	102,000	507.6	112,000
268.6	495.9	41,000	499.0	54,000	501.4	67,000	503.2	77,000	504.7	86,000	505.6	93,000	506.6	102,000	507.7	111,000
268.97	496.1	41,000	499.1	54,000	501.6	67,000	503.3	77,000	504.8	86,000	505.7	93,000	506.7	102,000	507.8	111,000
269.34	496.2	41,000	499.3	55,000	501.7	67,000	503.4	78,000	504.9	87,000	505.8	93,000	506.8	102,000	507.9	112,000
269.67	496.4	41,000	499.4	55,000	501.8	68,000	503.6	78,000	505.1	87,000	506.0	93,000	507.0	102,000	508.1	112,000
270	496.5	41,000	499.5	55,000	502.0	68,000	503.8	78,000	505.3	88,000	506.2	94,000	507.2	102,000	508.3	112,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
270.35	496.7	41,000	499.7	55,000	502.2	68,000	504.0	78,000	505.5	88,000	506.5	94,000	507.5	102,000	508.6	112,000
270.7	496.8	41,000	499.9	55,000	502.4	68,000	504.1	79,000	505.7	89,000	506.7	94,000	507.7	103,000	508.8	112,000
270.9	496.8	41,000	499.9	55,000	502.5	68,000	504.3	79,000	505.8	89,000	506.8	94,000	507.8	103,000	508.9	113,000
271.1	496.9	42,000	500.0	55,000	502.5	68,000	504.3	79,000	505.9	89,000	506.9	95,000	507.9	103,000	509.0	113,000
271.44	497.0	42,000	500.1	55,000	502.7	68,000	504.5	79,000	506.1	89,000	507.1	95,000	508.1	103,000	509.2	113,000
271.5	504.5	42,000	504.5	55,000	504.5	68,000	505.7	79,000	507.3	89,000	508.3	95,000	509.3	103,000	510.4	113,000
271.59	504.5	42,000	504.5	55,000	504.5	68,000	505.7	79,000	507.3	89,000	508.3	95,000	509.3	103,000	510.4	113,000
271.73	504.5	42,000	504.5	55,000	504.5	68,000	505.7	79,000	507.3	89,000	508.3	95,000	509.3	103,000	510.4	113,000
271.87	504.5	42,000	504.5	55,000	504.5	68,000	505.7	79,000	507.3	89,000	508.4	95,000	509.4	103,000	510.5	113,000
272.26	504.6	42,000	504.6	55,000	504.7	68,000	505.9	79,000	507.5	89,000	508.5	95,000	509.5	103,000	510.6	113,000
272.65	504.7	42,000	504.9	55,000	505.1	68,000	506.2	79,000	507.8	89,000	508.8	95,000	509.8	103,000	510.9	113,000
273.1	505.0	42,000	505.4	55,000	505.8	68,000	506.8	79,000	508.3	89,000	509.3	95,000	510.3	103,000	511.4	113,000
273.45	505.3	42,000	505.8	55,000	506.3	68,000	507.3	79,000	508.8	89,000	509.8	95,000	510.7	103,000	511.8	113,000
273.79	505.9	15,000	506.6	20,000	507.4	25,000	508.3	30,000	509.7	32,000	510.6	35,000	511.5	39,000	512.6	42,000
274.04	506.0	15,000	506.9	20,000	507.6	25,000	508.6	30,000	509.9	32,000	510.9	35,000	511.8	39,000	512.8	42,000
274.3	506.2	15,000	507.0	20,000	507.9	25,000	508.8	29,000	510.1	32,000	511.0	35,000	512.0	39,000	513.0	42,000
274.65	506.2	15,000	507.1	20,000	507.9	25,000	508.8	29,000	510.2	32,000	511.1	35,000	512.0	39,000	513.1	42,000
275	506.2	15,000	507.1	20,000	508.0	25,000	508.9	29,000	510.2	32,000	511.1	35,000	512.1	39,000	513.1	42,000
275.25	506.2	15,000	507.1	20,000	508.0	25,000	508.9	29,000	510.3	32,000	511.2	35,000	512.1	39,000	513.2	42,000
275.5	506.3	15,000	507.2	20,000	508.1	25,000	509.0	29,000	510.3	32,000	511.3	35,000	512.2	39,000	513.2	42,000
275.8	506.3	15,000	507.2	20,000	508.1	25,000	509.0	29,000	510.4	32,000	511.3	35,000	512.2	39,000	513.3	42,000
276.1	506.3	15,000	507.2	20,000	508.1	25,000	509.1	29,000	510.4	32,000	511.4	35,000	512.3	39,000	513.3	42,000
276.5	506.3	15,000	507.3	20,000	508.2	25,000	509.1	29,000	510.5	32,000	511.4	35,000	512.3	39,000	513.4	42,000
276.8	506.4	13,000	507.3	17,000	508.3	21,000	509.2	24,000	510.5	27,000	511.4	30,000	512.4	33,000	513.4	36,000
276.85	506.4	13,000	507.3	17,000	508.3	21,000	509.2	24,000	510.5	27,000	511.5	30,000	512.4	33,000	513.4	36,000
277.08	506.4	13,000	507.4	17,000	508.3	21,000	509.2	24,000	510.6	27,000	511.5	30,000	512.4	33,000	513.4	36,000
277.3	506.4	13,000	507.4	17,000	508.3	21,000	509.3	24,000	510.6	27,000	511.5	30,000	512.4	33,000	513.5	36,000
277.7	506.4	13,000	507.4	17,000	508.3	21,000	509.3	24,000	510.6	27,000	511.5	30,000	512.4	33,000	513.5	36,000
277.9	506.4	13,000	507.4	17,000	508.3	21,000	509.3	24,000	510.6	27,000	511.5	30,000	512.4	33,000	513.5	36,000
278.2	506.5	13,000	507.4	17,000	508.4	21,000	509.3	24,000	510.6	27,000	511.6	30,000	512.5	33,000	513.5	36,000
278.5	506.5	13,000	507.5	17,000	508.4	21,000	509.3	24,000	510.7	27,000	511.6	30,000	512.5	33,000	513.5	36,000
278.75	506.5	13,000	507.5	17,000	508.4	21,000	509.4	24,000	510.7	27,000	511.6	30,000	512.5	33,000	513.6	36,000
279	506.5	13,000	507.5	17,000	508.5	21,000	509.4	24,000	510.7	27,000	511.6	30,000	512.6	33,000	513.6	36,000
279.27	506.5	13,000	507.5	17,000	508.5	21,000	509.5	24,000	510.8	27,000	511.7	30,000	512.6	33,000	513.6	36,000
279.55	506.5	13,000	507.6	17,000	508.5	21,000	509.5	24,000	510.8	27,000	511.7	30,000	512.7	33,000	513.7	36,000
279.82	506.6	12,000	507.6	17,000	508.6	21,000	509.6	24,000	510.9	27,000	511.8	30,000	512.7	33,000	513.7	36,000
280.2	506.6	12,000	507.7	17,000	508.7	21,000	509.7	24,000	511.0	27,000	511.9	30,000	512.8	33,000	513.8	36,000
280.6	506.7	12,000	507.7	17,000	508.7	21,000	509.7	24,000	511.0	27,000	511.9	30,000	512.9	33,000	513.9	36,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

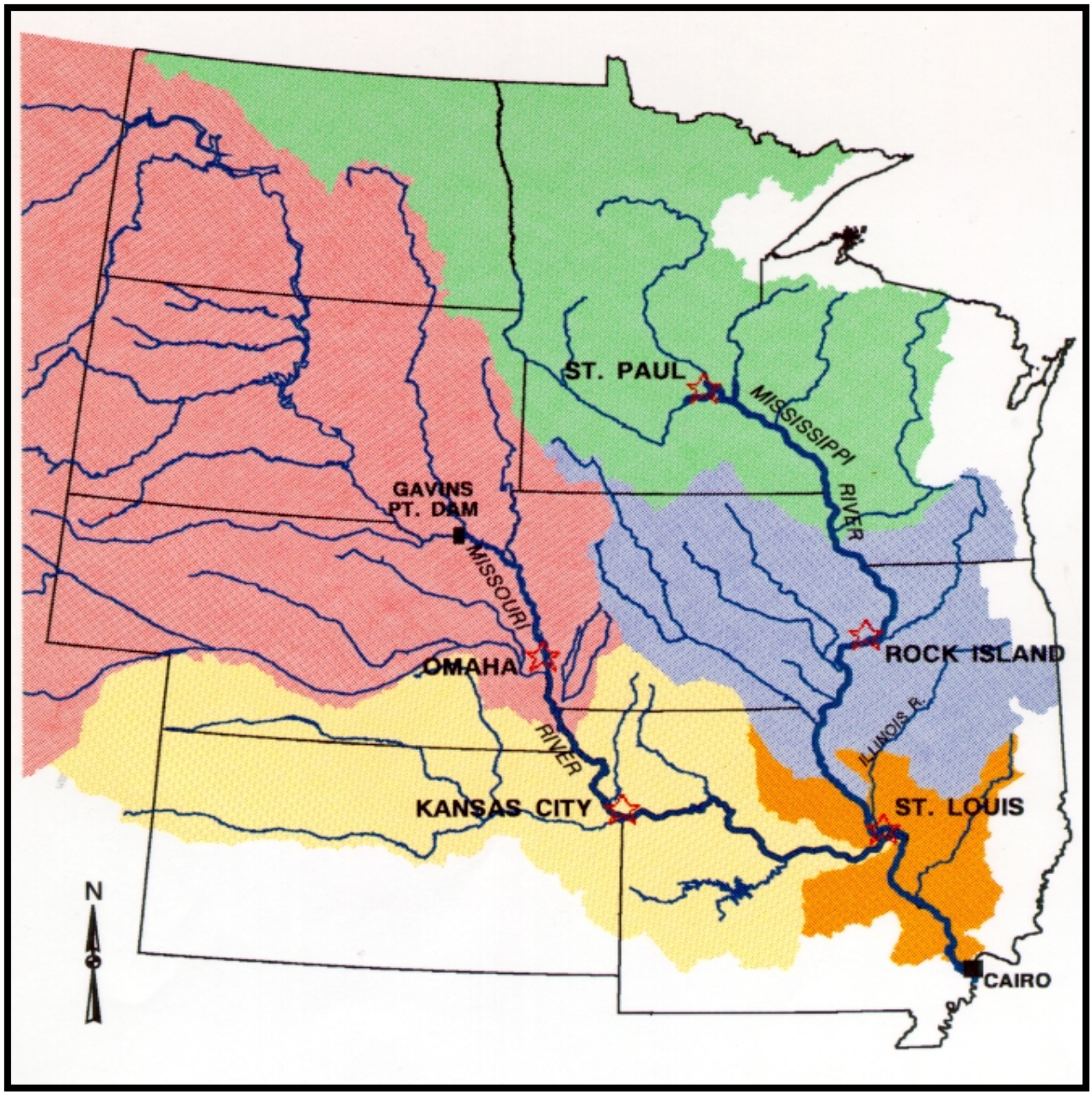
River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
281.05	506.7	12,000	507.8	17,000	508.8	21,000	509.8	24,000	511.1	27,000	512.0	30,000	512.9	33,000	513.9	36,000
281.3	506.7	12,000	507.8	17,000	508.8	21,000	509.8	24,000	511.1	27,000	512.0	30,000	512.9	33,000	514.0	36,000
281.8	506.7	12,000	507.8	17,000	508.8	21,000	509.8	24,000	511.1	27,000	512.0	30,000	513.0	33,000	514.0	36,000
282.09	506.7	12,000	507.8	17,000	508.9	21,000	509.9	24,000	511.2	27,000	512.1	30,000	513.0	33,000	514.0	36,000
282.38	506.8	12,000	507.9	17,000	508.9	21,000	509.9	24,000	511.2	28,000	512.1	30,000	513.0	33,000	514.0	36,000
282.67	506.8	12,000	507.9	17,000	508.9	21,000	509.9	24,000	511.2	28,000	512.1	30,000	513.0	33,000	514.0	36,000
283.04	506.8	12,000	507.9	17,000	508.9	21,000	509.9	24,000	511.2	28,000	512.1	30,000	513.0	33,000	514.0	36,000
283.4	506.8	12,000	507.9	17,000	509.0	21,000	510.0	24,000	511.2	28,000	512.1	30,000	513.1	33,000	514.1	36,000
283.75	506.8	12,000	508.0	17,000	509.0	21,000	510.0	24,000	511.3	28,000	512.2	30,000	513.1	33,000	514.1	36,000
284.1	506.9	12,000	508.0	17,000	509.0	21,000	510.0	24,000	511.3	28,000	512.2	30,000	513.1	33,000	514.1	36,000
284.6	506.9	12,000	508.1	17,000	509.1	21,000	510.1	24,000	511.4	28,000	512.3	30,000	513.2	33,000	514.2	36,000
284.85	507.0	12,000	508.2	17,000	509.3	21,000	510.3	24,000	511.5	28,000	512.4	30,000	513.3	33,000	514.3	36,000
285.1	507.1	12,000	508.3	17,000	509.4	21,000	510.4	24,000	511.6	28,000	512.5	30,000	513.4	33,000	514.4	36,000
285.35	507.2	12,000	508.4	17,000	509.5	21,000	510.5	24,000	511.7	28,000	512.6	30,000	513.5	33,000	514.5	36,000
285.39	507.2	12,000	508.4	17,000	509.5	21,000	510.5	24,000	511.8	28,000	512.6	30,000	513.5	33,000	514.5	36,000
285.45	507.2	12,000	508.5	17,000	509.6	21,000	510.6	24,000	511.8	28,000	512.7	30,000	513.6	33,000	514.6	36,000
285.55	507.2	12,000	508.5	17,000	509.6	21,000	510.6	24,000	511.8	28,000	512.7	30,000	513.6	33,000	514.6	36,000
285.65	507.3	12,000	508.5	17,000	509.6	21,000	510.6	24,000	511.9	28,000	512.7	30,000	513.6	33,000	514.6	36,000
285.75	507.3	12,000	508.5	17,000	509.6	21,000	510.6	24,000	511.9	28,000	512.7	30,000	513.6	33,000	514.6	36,000
285.76	507.3	12,000	508.5	17,000	509.6	21,000	510.6	24,000	511.9	28,000	512.7	30,000	513.6	33,000	514.6	36,000
285.83	507.5	12,000	508.7	17,000	509.8	21,000	510.7	24,000	511.9	28,000	512.7	30,000	513.6	33,000	514.6	36,000
285.9	507.9	12,000	509.0	17,000	510.0	21,000	510.8	24,000	511.9	28,000	512.7	30,000	513.6	33,000	514.6	36,000
285.95	509.5	12,000	510.2	17,000	510.8	21,000	511.2	24,000	512.0	28,000	512.6	30,000	513.5	33,000	514.5	36,000
286.05	538.5	12,000	538.5	17,000	538.5	21,000	538.5	24,000	538.5	28,000	538.5	30,000	538.5	33,000	538.5	36,000
286.11	538.5	12,000	538.5	17,000	538.5	21,000	538.5	24,000	538.5	28,000	538.5	30,000	538.5	33,000	538.5	36,000
286.3	538.5	12,000	538.5	17,000	538.5	21,000	538.5	24,000	538.5	27,000	538.5	30,000	538.6	33,000	538.6	36,000
286.92	538.5	12,000	538.6	17,000	538.6	21,000	538.6	24,000	538.6	27,000	538.7	30,000	538.7	33,000	538.7	36,000
287	538.6	12,000	538.6	17,000	538.6	21,000	538.7	24,000	538.7	27,000	538.8	30,000	538.8	33,000	538.9	36,000
287.28	538.6	12,000	538.7	17,000	538.7	21,000	538.8	24,000	538.9	27,000	538.9	30,000	539.0	33,000	539.1	36,000
287.6	538.7	12,000	538.8	17,000	538.9	21,000	539.0	24,000	539.1	27,000	539.2	30,000	539.4	33,000	539.5	36,000
287.93	538.7	12,000	538.9	17,000	539.1	21,000	539.2	24,000	539.4	27,000	539.6	30,000	539.8	33,000	540.0	36,000
288.08	538.8	12,000	539.0	17,000	539.2	21,000	539.5	24,000	539.7	27,000	539.9	30,000	540.1	33,000	540.4	36,000
288.13	538.8	12,000	539.1	17,000	539.3	21,000	539.6	24,000	539.9	27,000	540.1	30,000	540.4	33,000	540.7	36,000
288.34	539.0	12,000	539.3	17,000	539.7	21,000	540.1	24,000	540.4	27,000	540.7	30,000	541.1	33,000	541.5	36,000
288.46	539.2	12,000	539.6	17,000	540.1	21,000	540.5	24,000	540.9	27,000	541.3	30,000	541.7	33,000	542.2	36,000
288.7	539.4	12,000	540.0	17,000	540.6	21,000	541.2	24,000	541.7	27,000	542.2	30,000	542.7	33,000	543.3	36,000
288.78	539.6	12,000	540.3	17,000	541.0	21,000	541.6	24,000	542.2	27,000	542.7	30,000	543.3	33,000	543.9	36,000
289	539.8	12,000	540.6	17,000	541.4	21,000	542.1	24,000	542.8	27,000	543.3	30,000	543.9	33,000	544.6	36,000

Table C-I-7

2003 Illinois River Stage and Flow Frequency Profiles (All elevations referenced to NGVD 1929)

River Mile	Exceedance Probability															
	0.5		0.2		0.1		0.04		0.02		0.01		0.005		0.002	
	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs	feet	cfs
289.25	540.0	12,000	540.9	17,000	541.8	21,000	542.6	24,000	543.3	27,000	543.9	30,000	544.5	33,000	545.2	36,000
289.5	540.2	12,000	541.2	17,000	542.1	21,000	542.9	24,000	543.7	27,000	544.3	30,000	545.0	33,000	545.7	36,000
289.9	540.4	2,000	541.4	3,000	542.5	3,000	543.3	4,000	544.2	4,000	544.8	5,000	545.5	5,000	546.2	6,000
290	540.4	2,000	541.5	3,000	542.5	3,000	543.4	4,000	544.2	4,000	544.9	5,000	545.6	5,000	546.3	6,000
290.15	540.4	2,000	541.5	3,000	542.6	3,000	543.5	4,000	544.3	4,000	544.9	5,000	545.6	5,000	546.4	6,000
290.5	540.4	2,000	541.5	3,000	542.6	3,000	543.5	4,000	544.3	4,000	544.9	5,000	545.6	5,000	546.4	6,000
290.9	540.4	2,000	541.5	3,000	542.6	3,000	543.5	4,000	544.3	4,000	545.0	5,000	545.7	5,000	546.4	6,000

Upper Mississippi River System
Flow Frequency Study Area Map



COE DISTRICT OFFICES

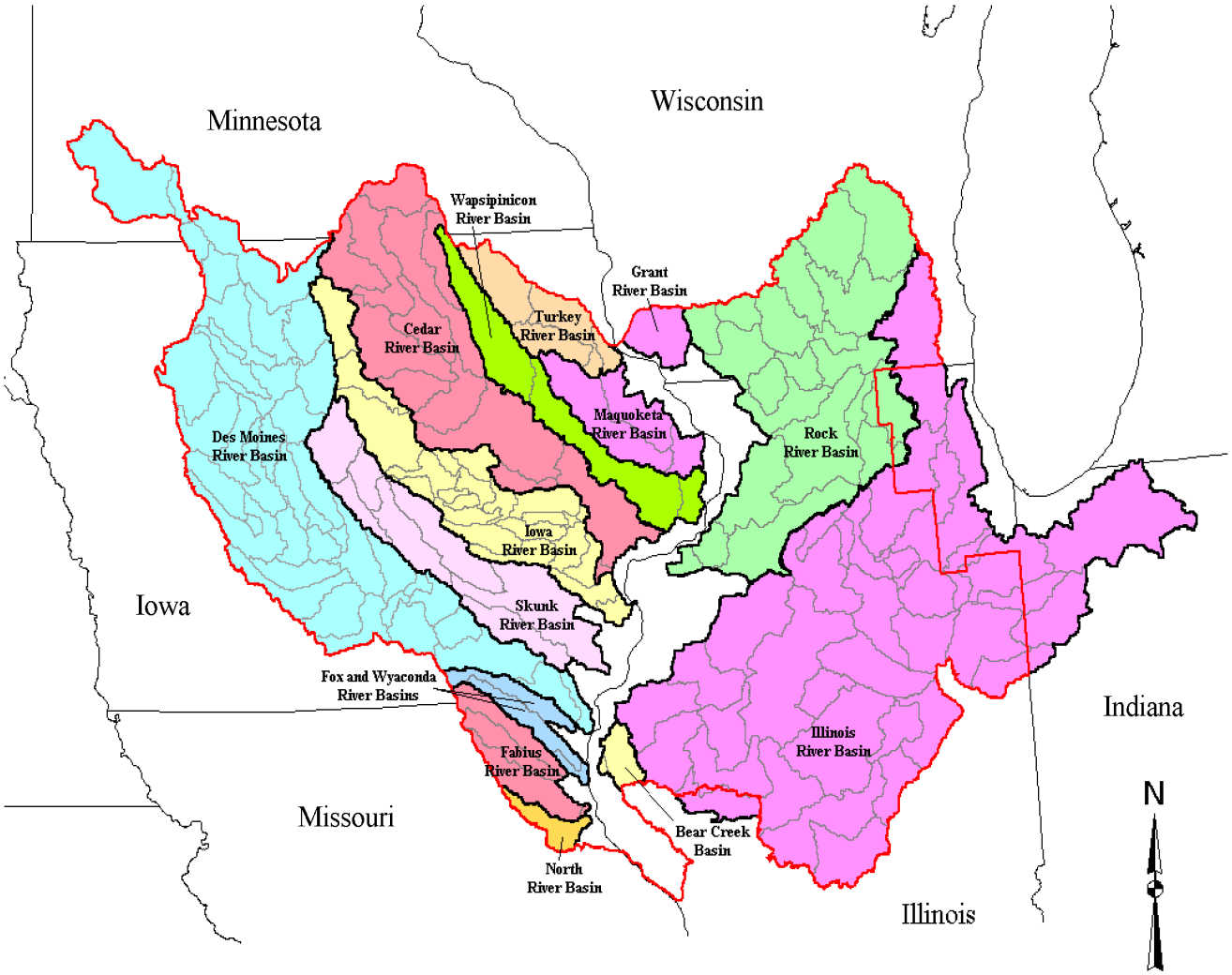
KANSAS CITY DIST.
OMAHA DIST.
ROCK ISLAND DIST.
SAINT LOUIS DIST.
SAINT PAUL DIST.

Plate C-I-1

Rock Island District Map

Plate C-I-2

Rock Island District HMS Basin Map



Rock Island District Drainage Basins

Plate C-I-3

Illinois River

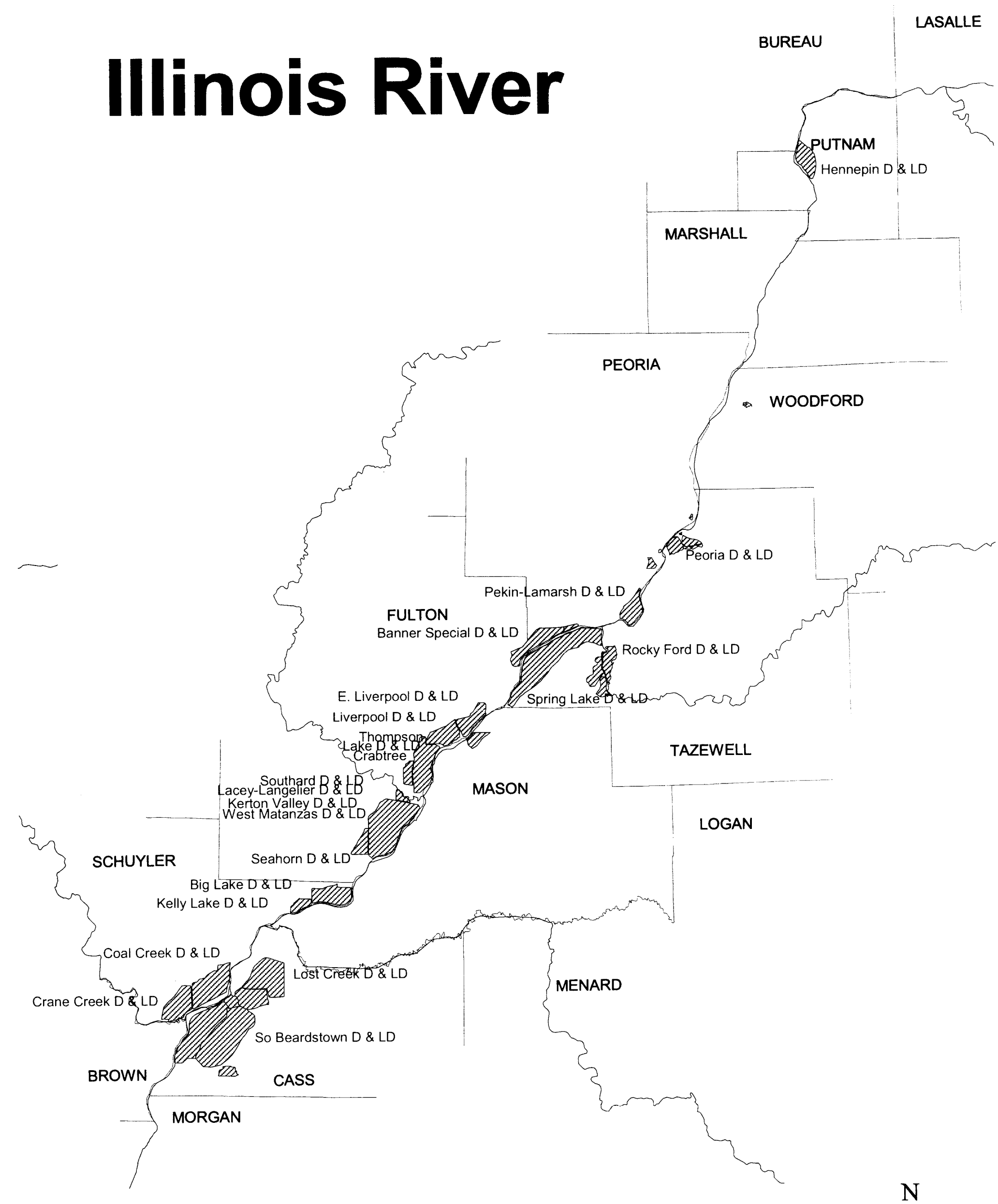


Plate C-I-4

N

W E

S

River

Levee

County

20 0 20 40 Miles

```
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*                                   *
*              FFA                  *
*     FLOOD FREQUENCY ANALYSIS      *
*     PROGRAM DATE:  FEB 1995       *
*          VERSION:  3.1            *
*     RUN  DATE  AND  TIME:         *
*        25 FEB 03    15:11:32      *
*                                   *
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*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
* THE HYDROLOGIC ENGINEERING CENTER *
*         609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616     *
*            (916) 756-1104         *
*                                   *
*************************************
```

INPUT FILE NAME: MARSCY40.DAT

TITLE RECORD(S)
TT Marseilles
TT Calendar Year
TT 1940-1998 Maximum Mean Daily

FINAL RESULTS -PLOTTING POSITIONS-

EVENTS ANALYZED				ORDERED EVENTS			
			FLOW		WATER	FLOW	MEDIAN
MON	DAY	YEAR	CFS	RANK	YEAR	CFS	PLOT POS
3	3	1940	15600.	1	1997	89600.	1.18
3	11	1941	33700.	2	1983	87800.	2.86
2	7	1942	65700.	3	1957	86600.	4.55
5	21	1943	70700.	4	1970	83200.	6.23
4	24	1944	53200.	5	1991	80900.	7.91
5	17	1945	41700.	6	1981	80500.	9.60
1	6	1946	38900.	7	1950	77900.	11.28
4	6	1947	66500.	8	1985	77000.	12.96
3	20	1948	61000.	9	1998	72600.	14.65
12	23	1949	33200.	10	1996	71900.	16.33
4	26	1950	77900.	11	1943	70700.	18.01
2	19	1951	48400.	12	1979	69400.	19.70
6	15	1952	40900.	13	1947	66500.	21.38
3	15	1953	29900.	14	1942	65700.	23.06
10	12	1954	54500.	15	1976	63000.	24.75
1	6	1955	27700.	16	1966	62300.	26.43
2	25	1956	27800.	17	1993	61400.	28.11
7	14	1957	86600.	18	1983	61300.	29.80
6	14	1958	47900.	19	1948	61000.	31.48
4	29	1959	46200.	20	1974	60400.	33.16
3	31	1960	41300.	21	1973	59300.	34.85
9	26	1961	47400.	22	1984	59300.	36.53
3	22	1962	44600.	23	1973	59100.	38.22
3	10	1963	24400.	24	1955	54500.	39.90
4	24	1964	17000.	25	1944	53200.	41.58
4	26	1965	45800.	26	1991	52200.	43.27
5	13	1966	62300.	27	1978	48700.	44.95
4	3	1967	38000.	28	1951	48400.	46.63
2	2	1968	46100.	29	1995	48400.	48.32
1	30	1969	31700.	30	1958	47900.	50.00
5	15	1970	83200.	31	1961	47400.	51.68
3	16	1971	26100.	32	1980	47100.	53.37
12	31	1972	59300.	33	1959	46200.	55.05
1	1	1973	59100.	34	1968	46100.	56.73
5	22	1974	60400.	35	1965	45800.	58.42
4	28	1975	45400.	36	1975	45400.	60.10
3	6	1976	63000.	37	1962	44600.	61.78
9	18	1977	34800.	38	1945	41700.	63.47
6	26	1978	48700.	39	1960	41300.	65.15
3	20	1979	69400.	40	1952	40900.	66.84
6	3	1980	47100.	41	1946	38900.	68.52
6	14	1981	80500.	42	1989	38300.	70.20
12	4	1982	87800.	43	1967	38000.	71.89
4	3	1983	61300.	44	1994	37300.	73.57
2	14	1984	59300.	45	1992	37000.	75.25
2	24	1985	77000.	46	1977	34800.	76.94
10	5	1986	25900.	47	1941	33700.	78.62
8	27	1987	28800.	48	1988	33600.	80.30
4	7	1988	33600.	49	1950	33200.	81.99
6	3	1989	38300.	50	1969	31700.	83.67
11	29	1990	80900.	51	1953	29900.	85.35
3	20	1991	52200.	52	1987	28800.	87.04
9	10	1992	37000.	53	1956	27800.	88.72
1	5	1993	61400.	54	1955	27700.	90.40
2	21	1994	37300.	55	1971	26100.	92.09
4	12	1995	48400.	56	1987	25900.	93.77
7	19	1996	71900.	57	1963	24400.	95.45
2	22	1997	89600.	58	1964	17000.	97.14
5	8	1998	72600.	59	1940	15600.	98.82

BASED ON 59 EVENTS, 10 PERCENT OUTLIER TEST VALUE K(N) = 2.831
      0 LOW OUTLIER(S) IDENTIFIED BELOW TEST VALUE OF 15123.1
BASED ON 59 EVENTS, 10 PERCENT OUTLIER TEST VALUE K(N) = 2.831
      0 HIGH OUTLIER(S) IDENTIFIED ABOVE TEST VALUE OF 148095.

FINAL RESULTS -FREQUENCY CURVE-

COMPUTED CURVE FLOW IN CFS	EXPECTED PROBABILITY FLOW IN CFS	PERCENT CHANCE EXCEEDANCE	CONFIDENCE LIMITS .05 FLOW IN CFS	.95 FLOW IN CFS
113000.	117000.	.2	136000.	98500.
107000.	109000.	.5	127000.	93200.
101000.	103000.	1.0	119000.	88700.
94700.	96100.	2.0	111000.	83700.
85200.	86100.	5.0	98000.	76100.
76800.	77300.	10.0	87200.	69200.
66900.	67100.	20.0	74700.	60800.
49300.	49300.	50.0	53800.	45200.
34300.	34100.	80.0	37600.	30800.
27700.	27300.	90.0	30900.	24200.
22900.	22400.	95.0	26000.	19500.
15600.	14800.	99.0	18400.	12500.

SYSTEMATIC STATISTICS

LOG TRANSFORM: FLOW, CFS		NUMBER OF EVENTS	
MEAN	4.6751	HISTORIC EVENTS	0
STANDARD DEV	.1750	HIGH OUTLIERS	0
COMPUTED SKEW	-.5535	LOW OUTLIERS	0
REGIONAL SKEW	-99.0000	ZERO OR MISSING	0
ADOPTED SKEW	-.6000	SYSTEMATIC EVENTS	59

FINAL RESULTS -FREQUENCY CURVE-

COMPUTED CURVE FLOW IN CFS	EXPECTED PROBABILITY FLOW IN CFS	PERCENT CHANCE EXCEEDANCE	CONFIDENCE LIMITS .05 FLOW IN CFS	.95 FLOW IN CFS
116000.	119000.	.2	140000.	100000.
109000.	111000.	.5	129000.	94700.
102000.	104000.	1.0	121000.	89900.
95700.	97200.	2.0	112000.	84500.
85700.	86700.	5.0	98700.	76500.
77000.	77600.	10.0	87500.	69400.
66800.	67100.	20.0	74700.	60800.
49100.	49100.	50.0	53600.	45000.
34200.	34000.	80.0	37600.	30700.
27700.	27400.	90.0	30900.	24300.
23000.	22500.	95.0	26100.	19600.
15800.	15000.	99.0	18700.	12700.

SYSTEMATIC STATISTICS

LOG TRANSFORM: FLOW, CFS		NUMBER OF EVENTS	
MEAN	4.6751	HISTORIC EVENTS	0
STANDARD DEV	.1750	HIGH OUTLIERS	0
COMPUTED SKEW	.0000	LOW OUTLIERS	0
REGIONAL SKEW	.0000	ZERO OR MISSING	0
ADOPTED SKEW	-.5535	SYSTEMATIC EVENTS	59

COMPUTED CURVE FLOW IN CFS	EXPECTED PROBABILITY FLOW IN CFS	PERCENT CHANCE EXCEEDANCE	CONFIDENCE LIMITS .05 FLOW IN CFS	.95 FLOW IN CFS
137000.	144000.	.2	169000.	116000.
124000.	128000.	.5	151000.	107000.
114000.	117000.	1.0	137000.	98800.
104000.	106000.	2.0	123000.	90800.
89700.	91000.	5.0	104000.	79700.
78600.	79300.	10.0	89500.	70700.
66700.	67000.	20.0	74400.	60700.
48000.	48000.	50.0	52400.	44000.
33900.	33700.	80.0	37200.	30300.
28000.	27700.	90.0	31200.	24500.
23900.	23400.	95.0	26900.	20400.
17500.	16800.	99.0	20400.	14300.

SYSTEMATIC STATISTICS

LOG TRANSFORM: FLOW, CFS		NUMBER OF EVENTS	
MEAN	4.6751	HISTORIC EVENTS	0
STANDARD DEV	.1750	HIGH OUTLIERS	0
COMPUTED SKEW	.0000	LOW OUTLIERS	0
REGIONAL SKEW	.0000	ZERO OR MISSING	0
ADOPTED SKEW	-.2000	SYSTEMATIC EVENTS	59

```
**********************************
*            FFA                 *
*    FLOOD FREQUENCY ANALYSIS    *
*    PROGRAM DATE:  FEB 1995     *
*         VERSION:  3.1          *
*    RUN  DATE  AND  TIME:       *
*       13 DEC 00    15:15:06    *
*                                *
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 INPUT FILE NAME: KINGMNCY.DAT
 OUTPUT FILE NAME: KINGMNCY.OUT

**TITLE RECORD(S)**
TT    Illinois River at Kingston Mines
TT    05568500
TT    Calendar year maximum mean daily discharges
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FINAL RESULTS -PLOTTING POSITIONS

EVENTS ANALYZED				ORDERED EVENTS			
MON	DAY	YEAR	FLOW CFS	WATER RANK	YEAR	FLOW CFS	MEDIAN PLOT POS
10	15	1941	32600.	1	1983	86700.	1.20
2	9	1942	53600.	2	1943	82200.	2.91
5	23	1943	82200.	3	1986	77800.	4.62
4	26	1944	64000.	4	1997	76600.	6.34
5	23	1945	43900.	5	1970	74700.	8.05
4	9	1946	49900.	6	1979	72200.	9.76
4	9	1947	47300.	7	1974	71900.	11.47
3	23	1948	57700.	8	1983	71600.	13.18
2	22	1949	33700.	9	1950	69700.	14.90
4	28	1950	69700.	10	1991	68700.	16.61
2	23	1951	47300.	11	1991	68400.	18.32
4	17	1952	39800.	12	1976	64200.	20.03
3	20	1953	27100.	13	1944	64000.	21.75
10	16	1954	37400.	14	1998	63800.	23.46
3	2	1955	27800.	15	1973	62200.	25.17
5	7	1956	24000.	16	1962	61000.	26.88
5	2	1957	44500.	17	1984	59800.	28.60
6	18	1958	42500.	18	1948	57700.	30.31
2	16	1959	37700.	19	1993	56400.	32.02
4	3	1960	49800.	20	1987	55200.	33.73
9	29	1961	38300.	21	1942	53600.	35.45
3	25	1962	61000.	22	1981	52100.	37.16
3	12	1963	28400.	23	1995	51800.	38.87
4	24	1964	22300.	24	1996	51800.	40.58
4	29	1965	41900.	25	1966	51700.	42.29
5	17	1966	51700.	26	1980	50900.	44.01
4	6	1967	44400.	27	1946	49900.	45.72
2	7	1968	42800.	28	1960	49800.	47.43
2	2	1969	29900.	29	1975	48800.	49.14
5	18	1970	74700.	30	1947	47300.	50.86
3	23	1971	29900.	31	1951	47300.	52.57
6	18	1972	39200.	32	1957	44500.	54.28
4	25	1973	62200.	33	1967	44400.	55.99
5	25	1974	71900.	34	1978	44300.	57.71
5	1	1975	48800.	35	1945	43900.	59.42
3	9	1976	64200.	36	1968	42800.	61.13
3	6	1977	29900.	37	1958	42500.	62.84
4	12	1978	44300.	38	1965	41900.	64.55
3	24	1979	72200.	39	1988	40400.	66.27
6	6	1980	50900.	40	1952	39800.	67.98
5	19	1981	52100.	41	1972	39200.	69.69
12	2	1982	86700.	42	1961	38300.	71.40
4	16	1983	71600.	43	1959	37700.	73.12
2	17	1984	59800.	44	1994	37400.	74.83
11	22	1985	77800.	45	1955	37400.	76.54
10	7	1986	55200.	46	1993	35300.	78.25
12	30	1987	31800.	47	1949	33700.	79.97
4	10	1988	40400.	48	1942	32600.	81.68
9	18	1989	31500.	49	1988	31800.	83.39
12	3	1990	68700.	50	1989	31500.	85.10
1	3	1991	68400.	51	1971	29900.	86.82
11	28	1992	35300.	52	1969	29900.	88.53
1	8	1993	56400.	53	1977	29900.	90.24
3	11	1994	37400.	54	1963	28400.	91.95
5	29	1995	51800.	55	1955	27800.	93.66
6	1	1996	51800.	56	1953	27100.	95.38
3	1	1997	76600.	57	1956	24000.	97.09
5	11	1998	63800.	58	1964	22300.	98.80

-OUTLIER TESTS -

LOW OUTLIER TEST

BASED ON 58 EVENTS, 10 PERCENT OUTLIER TEST VALUE K(N) = 2.824
0 LOW OUTLIER(S) IDENTIFIED BELOW TEST VALUE OF 18174.1

HIGH OUTLIER TEST

BASED ON 58 EVENTS, 10 PERCENT OUTLIER TEST VALUE K(N) = 2.824
0 HIGH OUTLIER(S) IDENTIFIED ABOVE TEST VALUE OF 121634.

-SKEW WEIGHTING -

BASED ON 58 EVENTS, MEAN-SQUARE ERROR OF STATION SKEW =-99.000
DEFAULT OR INPUT MEAN-SQUARE ERROR OF GENERALIZED SKEW = .302

FINAL RESULTS -FREQUENCY CURVE

COMPUTED CURVE FLOW IN CFS	EXPECTED PROBABILITY FLOW IN CFS	PERCENT CHANCE EXCEEDANCE	CONFIDENCE LIMITS .05 FLOW IN CFS	.95 FLOW IN CFS
114000.	119000.	.2	137000.	99600.
105000.	108000.	.5	124000.	92500.
97900.	100000.	1.0	114000.	86900.
90500.	92200.	2.0	104000.	81000.
80200.	81200.	5.0	90800.	72600.
71800.	72400.	10.0	80100.	65700.
62600.	62900.	20.0	68700.	57800.
47500.	47500.	50.0	51200.	44200.
35600.	35400.	80.0	38500.	32400.
30300.	30100.	90.0	33200.	27100.
26500.	26100.	95.0	29400.	23300.
20500.	19800.	99.0	23300.	17200.

SYSTEMATIC STATISTICS

LOG TRANSFORM: FLOW, CFS		NUMBER OF EVENTS	
MEAN	4.6723	HISTORIC EVENTS	0
STANDARD DEV	.1462	HIGH OUTLIERS	0
COMPUTED SKEW	-.2006	LOW OUTLIERS	0
REGIONAL SKEW	-99.0000	ZERO OR MISSING	0
ADOPTED SKEW	-.2000	SYSTEMATIC EVENTS	58

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*            FFA                 *
*    FLOOD FREQUENCY ANALYSIS    *
*    PROGRAM DATE:  FEB 1995     *
*         VERSION:  3.1          *
*    RUN  DATE  AND  TIME:       *
*       03 NOV 00    15:35:35    *
*                                *
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 OUTPUT FILE NAME: KINGOOST.OUT
    **TITLE RECORD(S)**
TT    mean and st.dev from kingmncy
TT    input skew of -0.
TT
**INPUT STATISTICS**
      DURN IPART   ISTN  NSYS  NYR
SS  PEAK                    0
        XM       S       G      SKEW      AG
SS  4.6723    .1462   .0000   .0000   -.2000
```

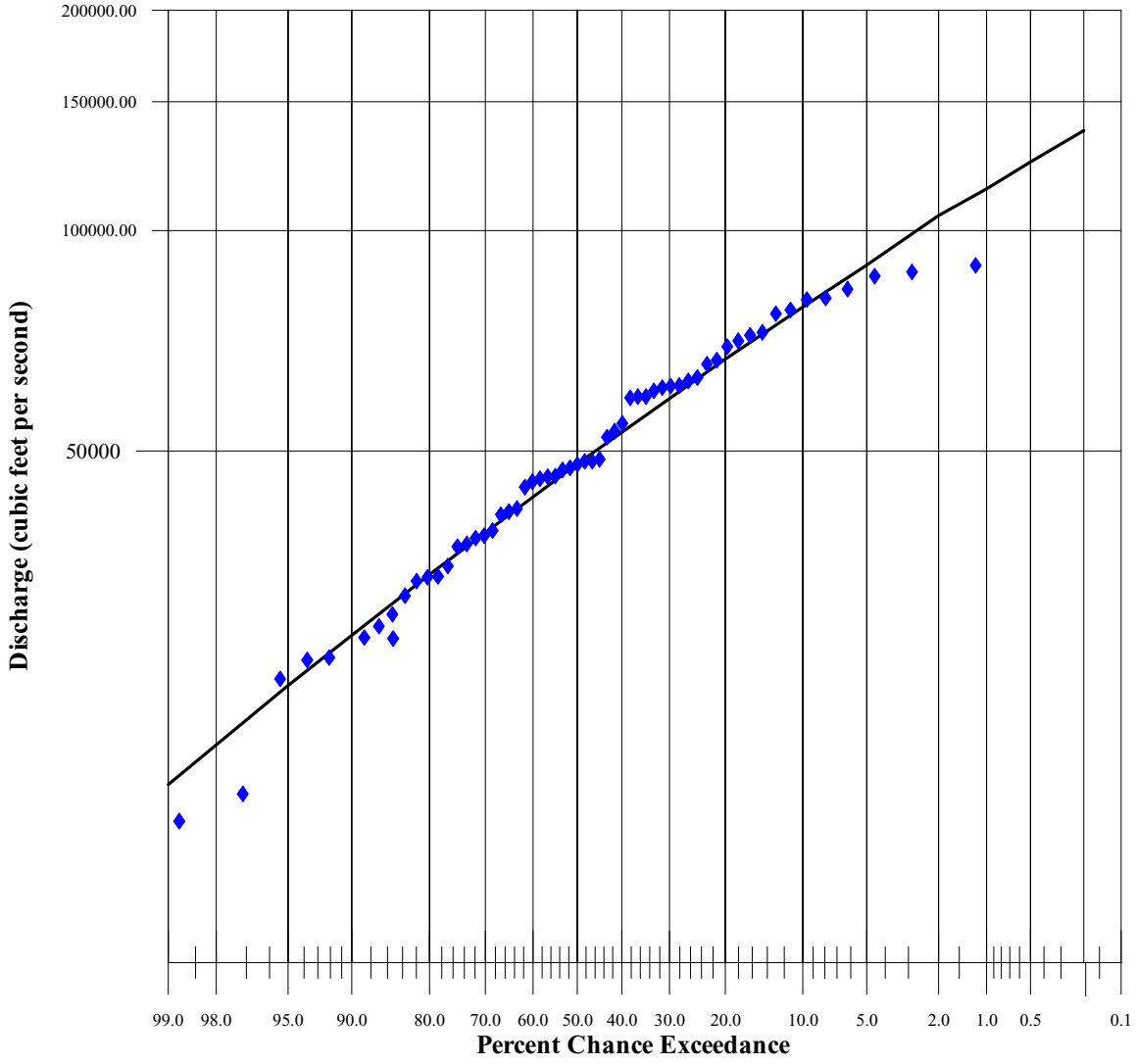
ILLINOIS RIVER AT KINGSTON MINES,IL
FINAL RESULTS -FREQUENCY CURVE

COMPUTED CURVE FLOW IN CFS	EXPECTED PROBABILITY FLOW IN CFS	PERCENT CHANCE EXCEEDANCE	CONFIDENCE LIMITS .05 FLOW IN CFS	.95 FLOW IN CFS
114000.	117000.	.2	130000.	103000.
105000.	107000.	.5	119000.	95200.
97900.	99300.	1.0	110000.	89200.
90500.	91500.	2.0	100000.	83000.
80200.	80800.	5.0	87900.	74300.
71800.	72100.	10.0	77800.	67000.
62600.	62700.	20.0	67100.	58900.
47600.	47600.	50.0	50300.	45000.
35600.	35500.	80.0	37800.	33200.
30300.	30200.	90.0	32500.	28000.
26500.	26300.	95.0	28700.	24100.
20500.	20100.	99.0	22600.	18100.

SYSTEMATIC STATISTICS

LOG TRANSFORM: FLOW, CFS		NUMBER OF EVENTS	
MEAN	4.6723	HISTORIC EVENTS	0
STANDARD DEV	.1462	HIGH OUTLIERS	0
COMPUTED SKEW	.0000	LOW OUTLIERS	0
REGIONAL SKEW	.0000	ZERO OR MISSING	0
ADOPTED SKEW	-.2000	SYSTEMATIC EVENTS	

Unregulated Flow Frequency Curve
Illinois River at Marseilles, Illinois

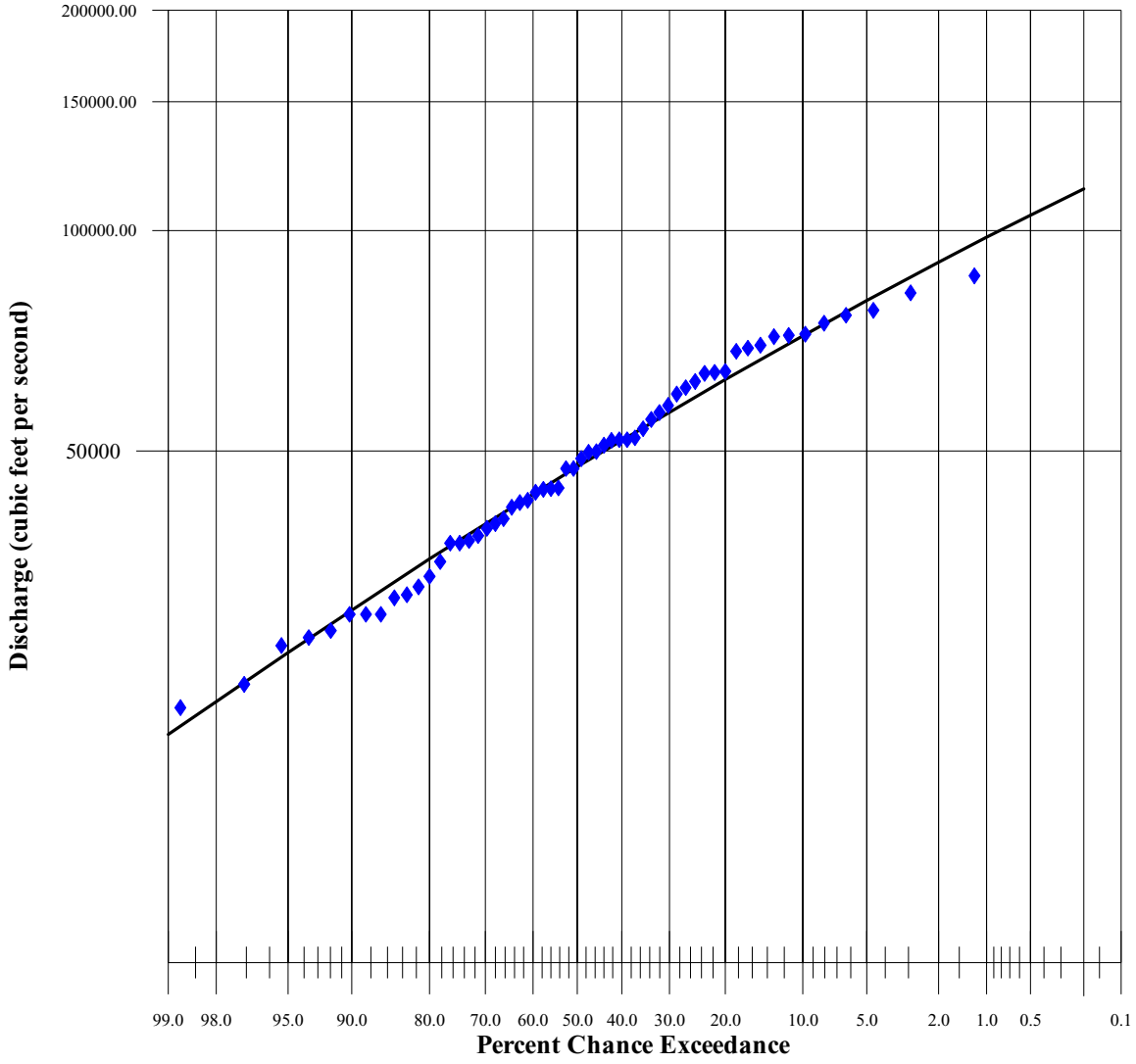


Illinois River @ Marseilles, IL
Unregulated USGS Gage 05543500
Annual Mean Daily Peak
Computed Frequency Curve
Median Plotting Positions
Calendar Years (1940-1998)
Adopted Statistics
Mean 4.6751
Standard Deviation .1750
Regional Skew -.2

%Chance Exceedance	Discharge
0.2	137,000
0.5	124,000
1.0	114,000
2.0	104,000
10.0	78,600
20.0	66,700
50.0	48,000

Plate C-I-7

Unregulated Flow Frequency Curve
Illinois River at Kingston Mines, Illinois



Illinois River @ Kingston Mines, IL
Unregulated USGS Gage 05568500
Annual Mean Daily Peak
Computed Frequency Curve
Median Plotting Positions
Calendar Years (1941-1998)
Adopted Statistics
Mean 4.6723
Standard Deviation .1462
Regional Skew -.2

%Chance Exceedance	Discharge
0.2	114,000
0.5	105,000
1.0	97,900
2.0	90,500
10.0	71,800
20.0	62,600
50.0	47,600

ILLINOIS RIVER SYSTEM

R.M. 291.1 AT LOCKPORT DAM
(D.A. 740 SQ. MI.)

Des Plaines River — **289.9**
(D.A. 630 SQ. MI.)

286.0 — **Brandon Rd. Dam**
(Ungaged Area in Pool 140 SQ. MI.)

DuPage River — **276.9**
(D.A. 320 SQ. MI.)

273.7 — **Kankakee River**
(D.A. 5,150 SQ. MI.)

Dresden Is. Dam — **271.5**
(Ungaged Area in Pool 430 SQ. MI.)

263.5 — **Mazon River**
(D.A. 460 SQ. MI.)

Marseilles Dam — **247.0**
(Ungaged Area in Pool 530 SQ. MI.)

R.M. 246.5 AT MARSEILLES
(D.A. 8,260 SQ. MI.)

Fox River — **239.6**
(D.A. 2,640 SQ. MI.)

231.0 — **Starved Rock Dam**
(Ungaged Area in Pool 160 SQ. MI.)

226.3 — **Vermilion River**
(D.A. 1,250 SQ. MI.)

Big Bureau Creek — **199.2**
(D.A. 200 SQ. MI.)

Peoria Dam — **157.7**
(Ungaged Area in Pool 2050 SQ. MI.)

147.7 — **Mackinaw River**
(D.A. 1,090 SQ. MI.)

R.M. 145.4 AT KINGSTON MINES
(D.A. 15,820 SQ. MI.)

Spoon River — **119.4**
(D.A. 1,640 SQ. MI.)

90.2 — **Sangamon River**
(D.A. 5,090 SQ. MI.)

La Moine River — **83.5**
(D.A. 1,350 SQ. MI.)

80.2 — **La Grange Dam**
(Ungaged Area in Pool 2300 SQ. MI.)

R.M. 71.3 AT MEREDOSIA
(D.A. 26,030 SQ. MI.)

The drainage areas shown represent the most downstream U.S.G.S gage on each tributary

R.M. 0.0 AT GRAFTON
(D.A. 28,900 SQ. MI.)

Plate C-I-9

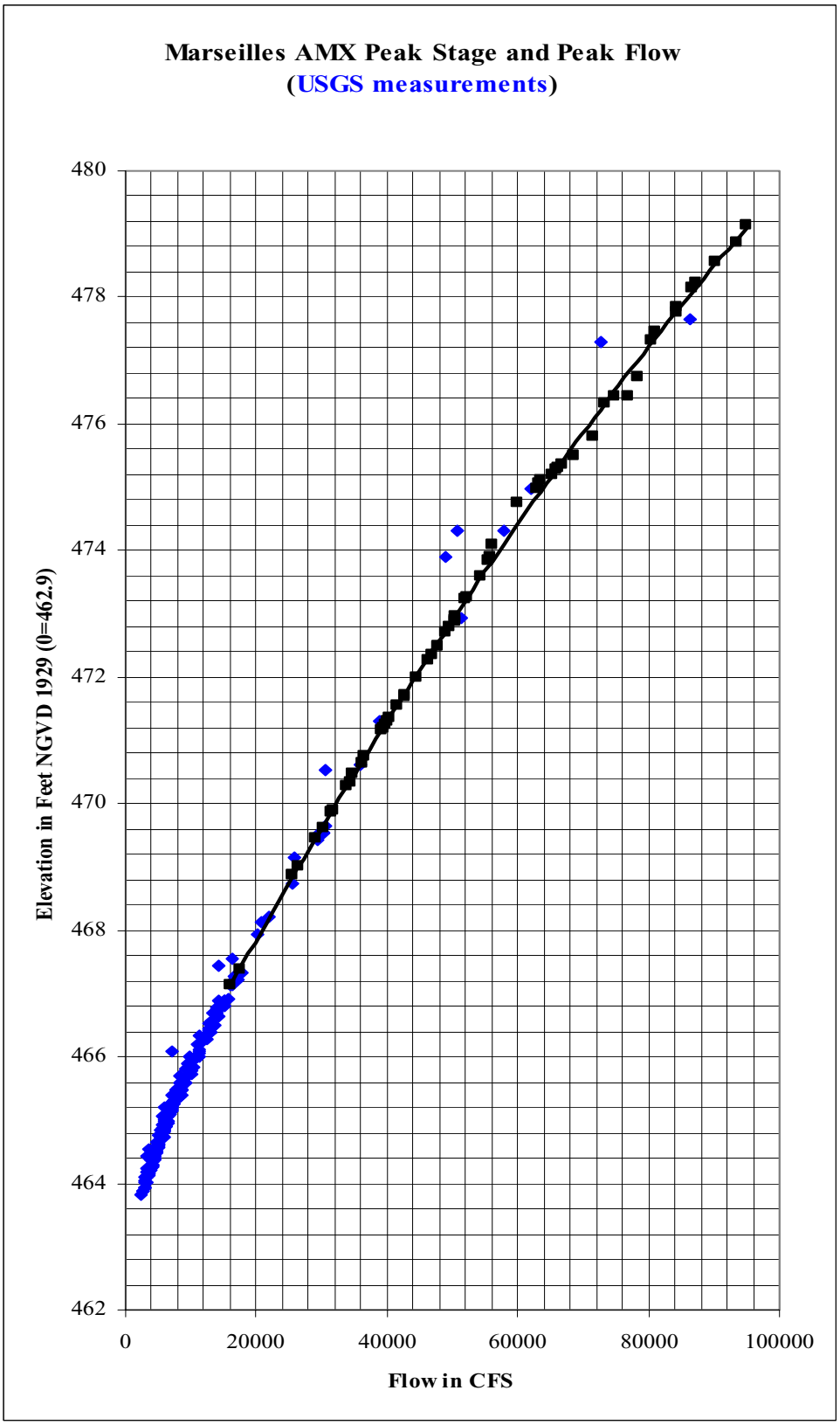

Marseilles AMX Peak Stage and Peak Flow
(USGS measurements)
Elevation in Feet NGVD 1929 (0=462.9)
480
478
476
474
472
470
468
466
464
462
0
20000
40000
60000
80000
100000
Flow in CFS

Plate C-I-10

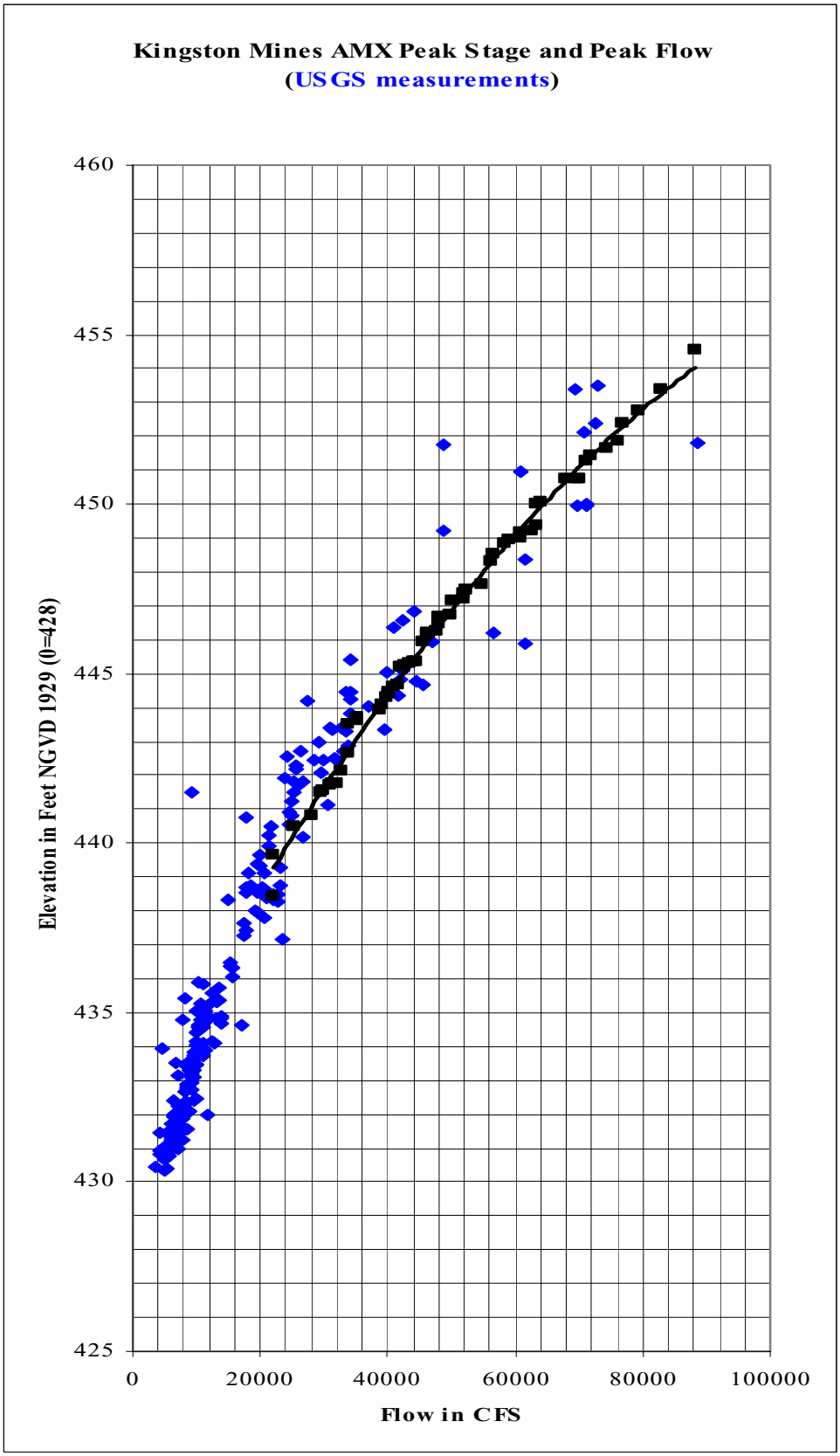

Kingston Mines AMX Peak Stage and Peak Flow
(USGS measurements)
Elevation in Feet NGVD 1929 (0=428)
460
455
450
445
440
435
430
425
0
20000
40000
60000
80000
100000
Flow in CFS

Plate C-I-11

2003 Illinois River Stage Frequency Profiles

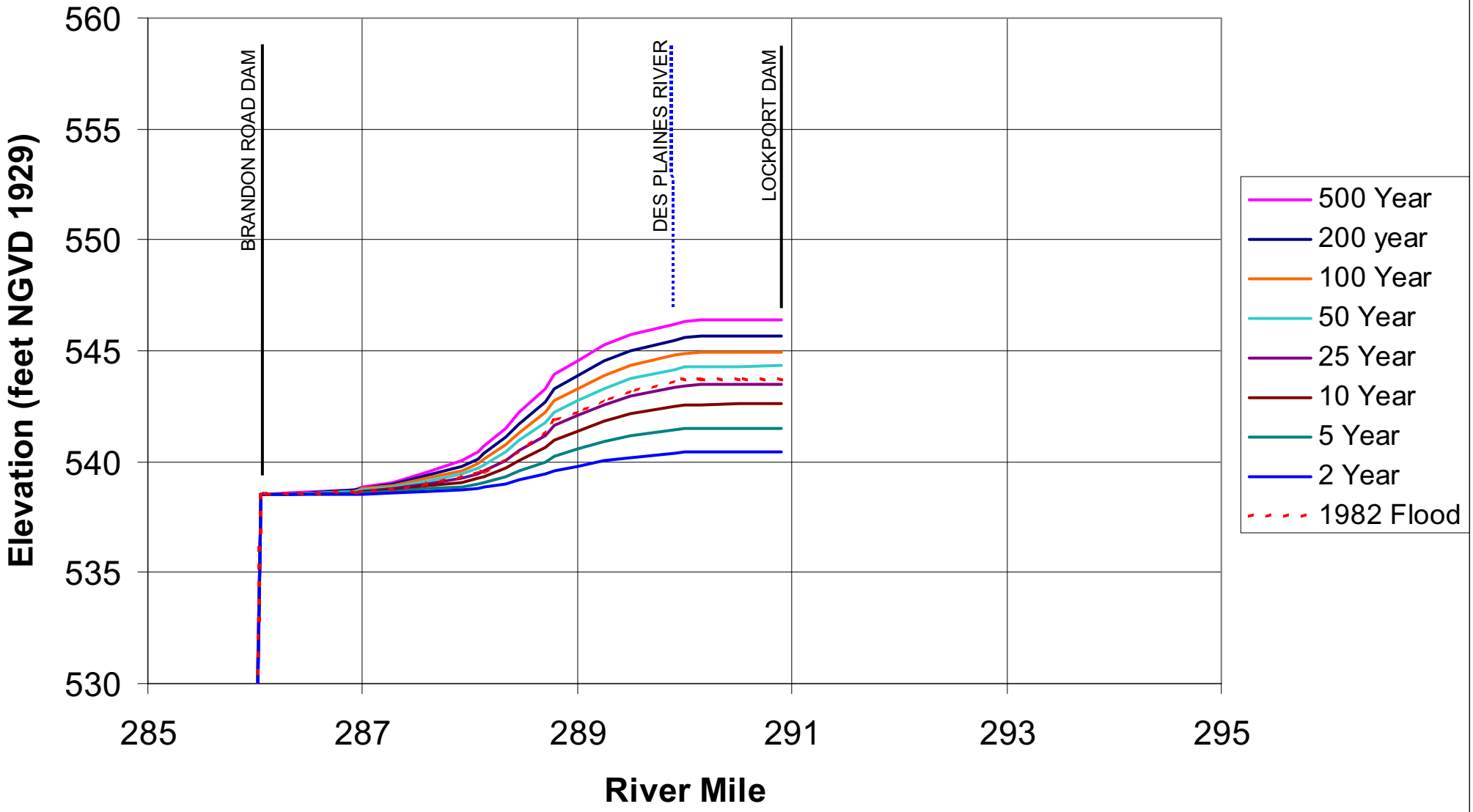


Plate C-I-12

2003 Illinois River Stage Frequency Profiles

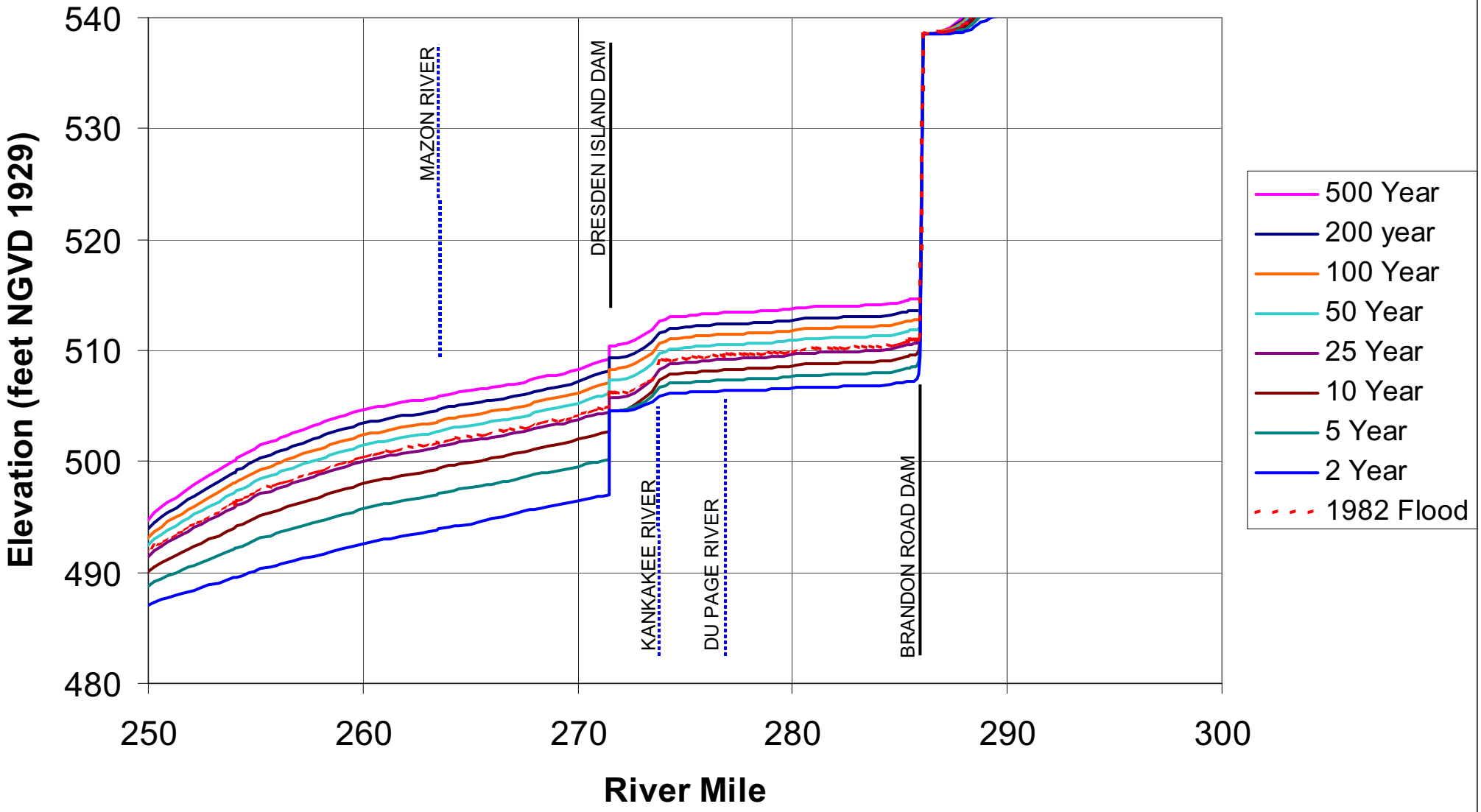


Plate C-I-13

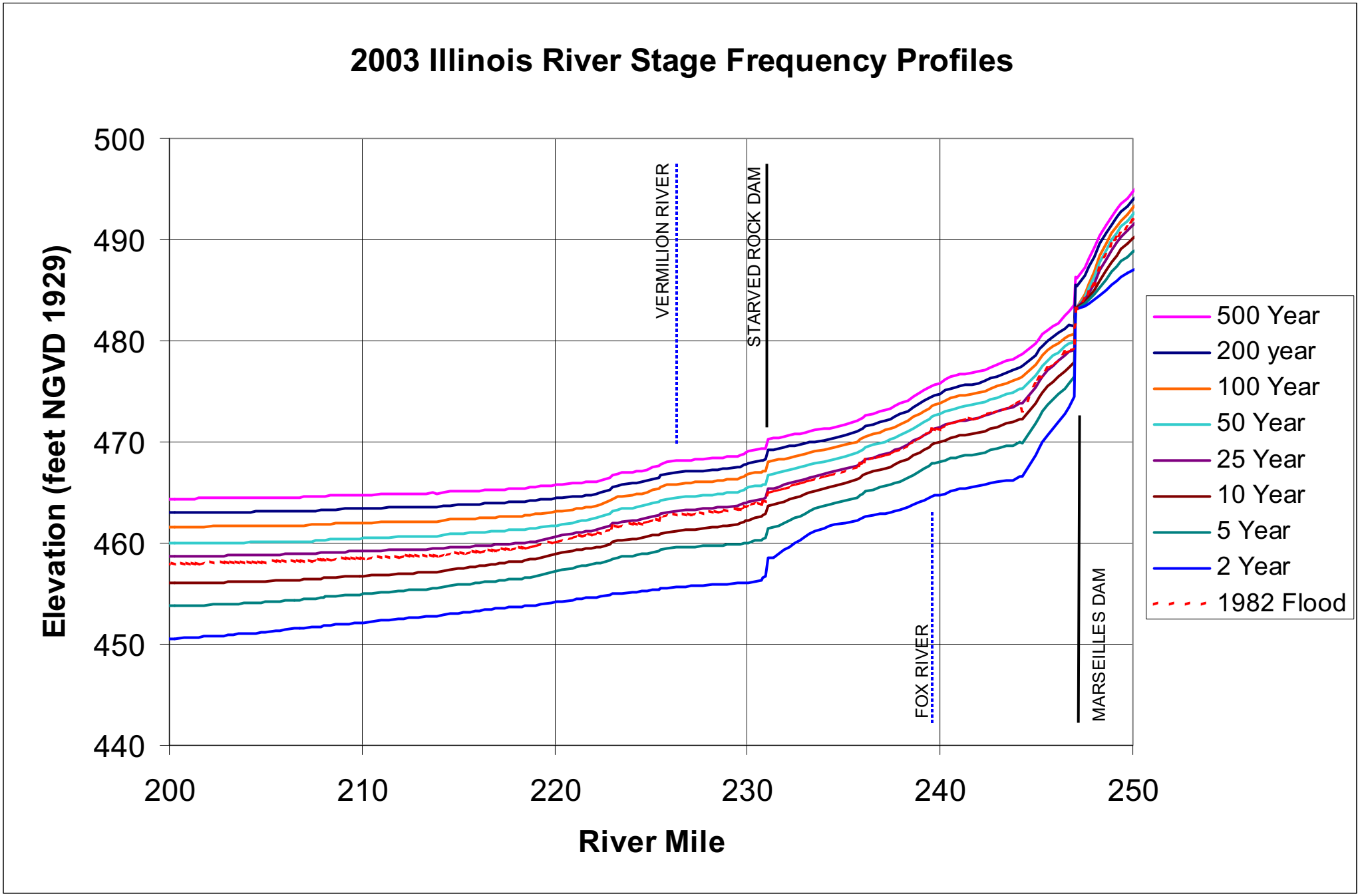

2003 Illinois River Stage Frequency Profiles
Elevation (feet NGVD 1929)
500
490
480
470
460
450
440
200
210
220
230
240
250
River Mile
VERMILION RIVER
STARVED ROCK DAM
FOX RIVER
MARSEILLES DAM
500 Year
200 year
100 Year
50 Year
25 Year
10 Year
5 Year
2 Year
1982 Flood

Plate C-I-14

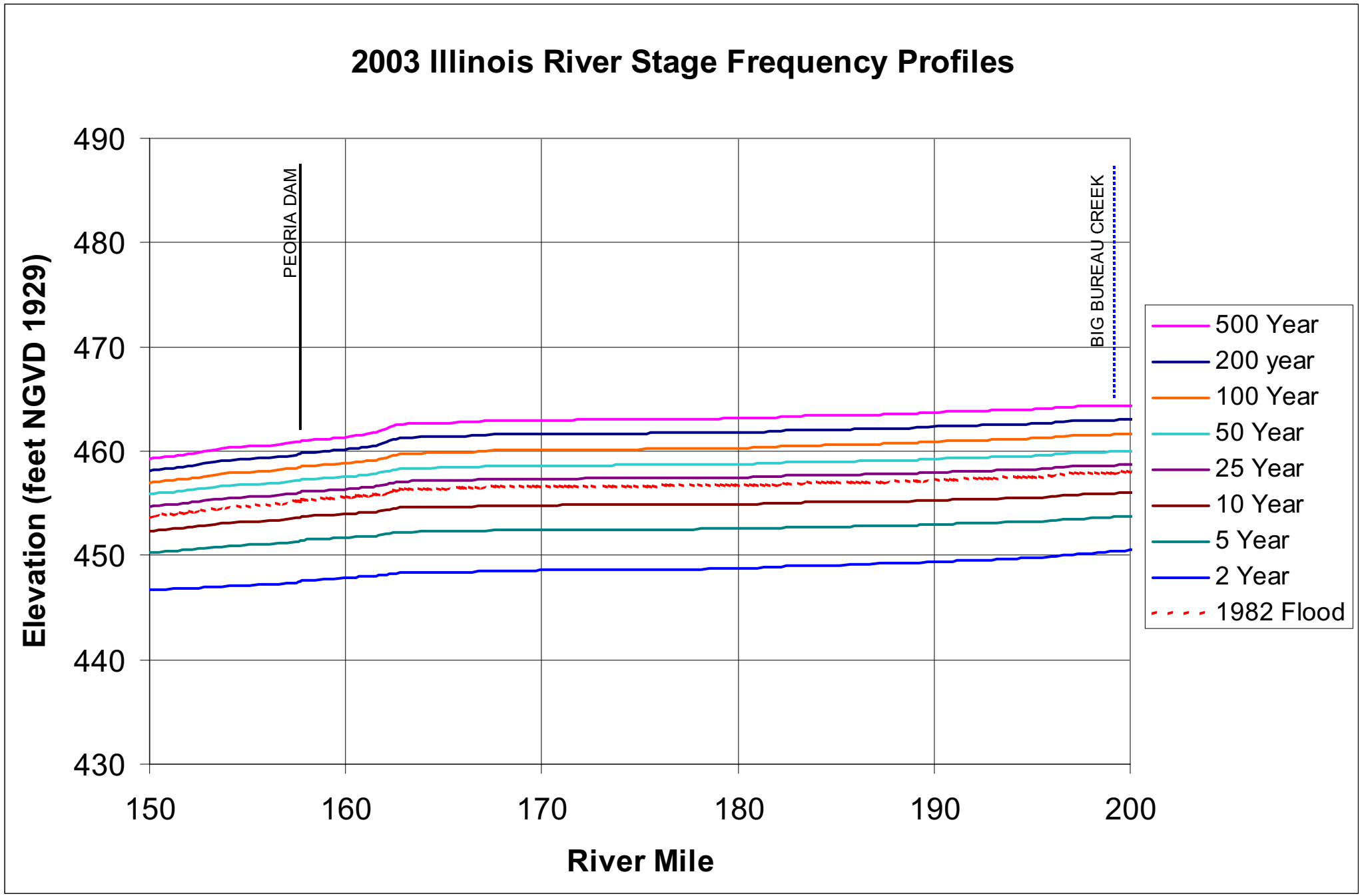

2003 Illinois River Stage Frequency Profiles
Elevation (feet NGVD 1929)
490
480
470
460
450
440
430
150
160
170
180
190
200
River Mile
PEORIA DAM
BIG BUREAU CREEK
500 Year
200 year
100 Year
50 Year
25 Year
10 Year
5 Year
2 Year
1982 Flood

Plate C-I-15

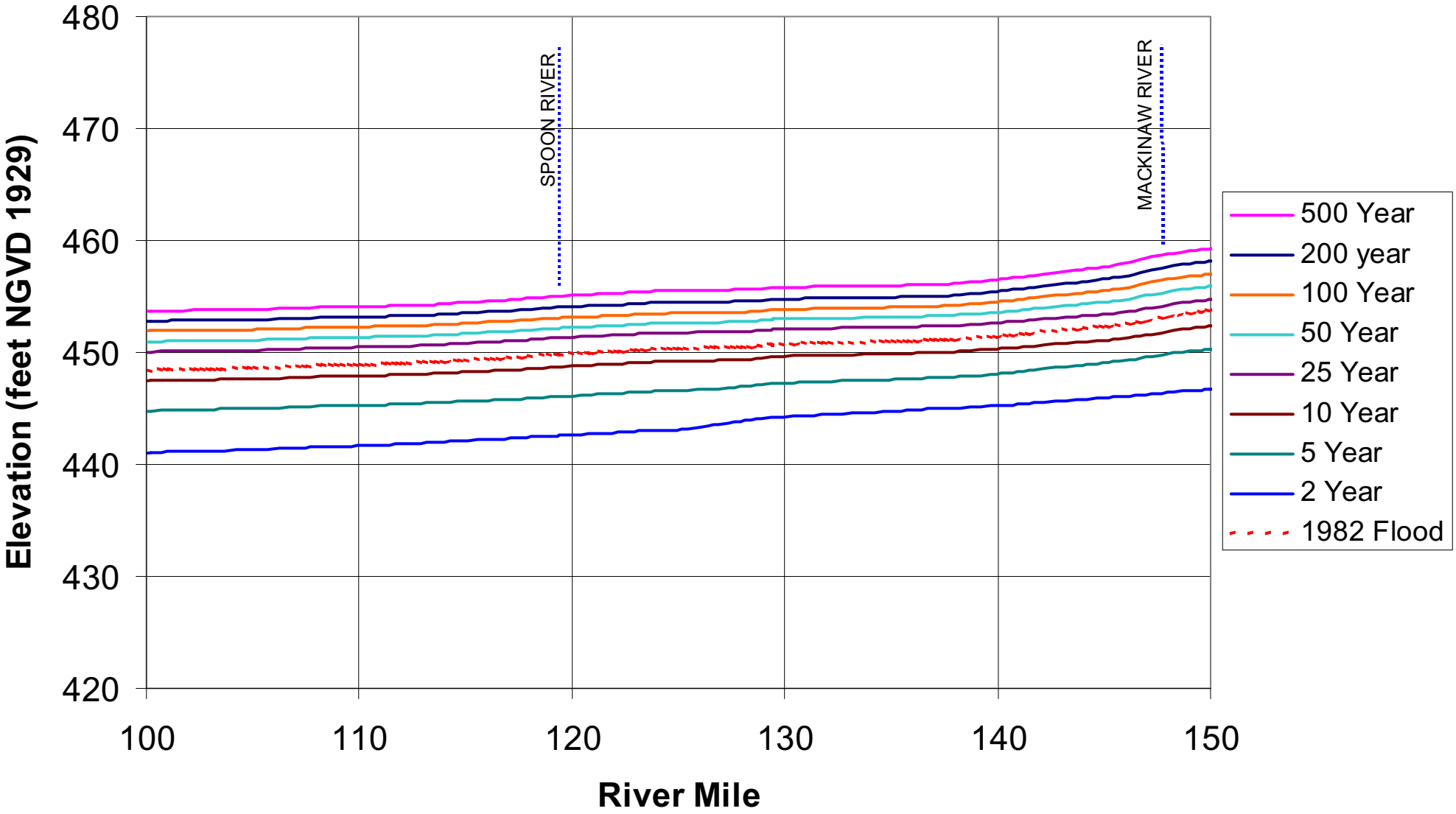

2003 Illinois River Stage Frequency Profiles
Elevation (feet NGVD 1929)
480
470
460
450
440
430
420
100
110
120
130
140
150
River Mile
SPOON RIVER
MACKINAW RIVER
500 Year
200 year
100 Year
50 Year
25 Year
10 Year
5 Year
2 Year
1982 Flood

Plate C-I-16

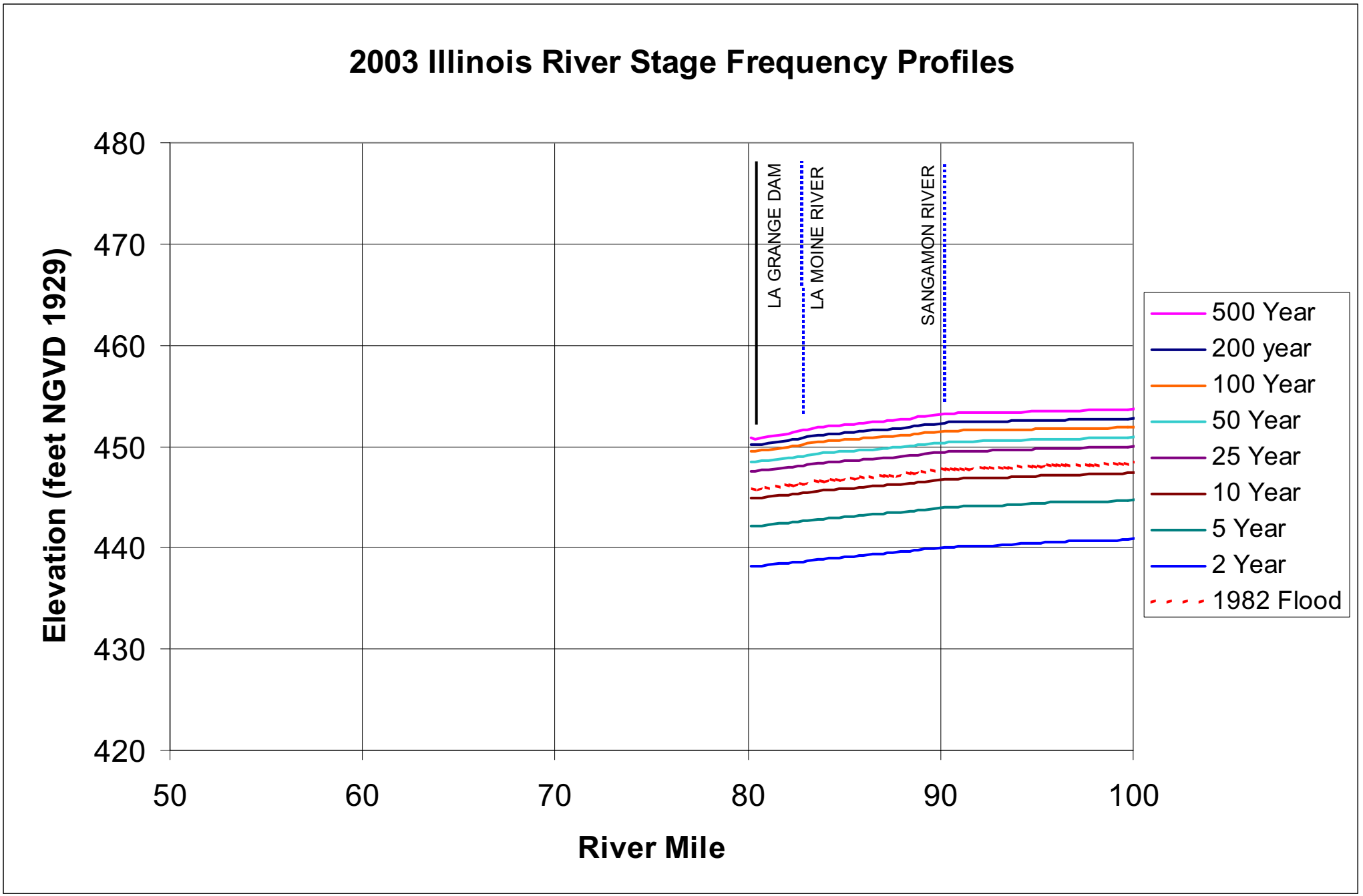
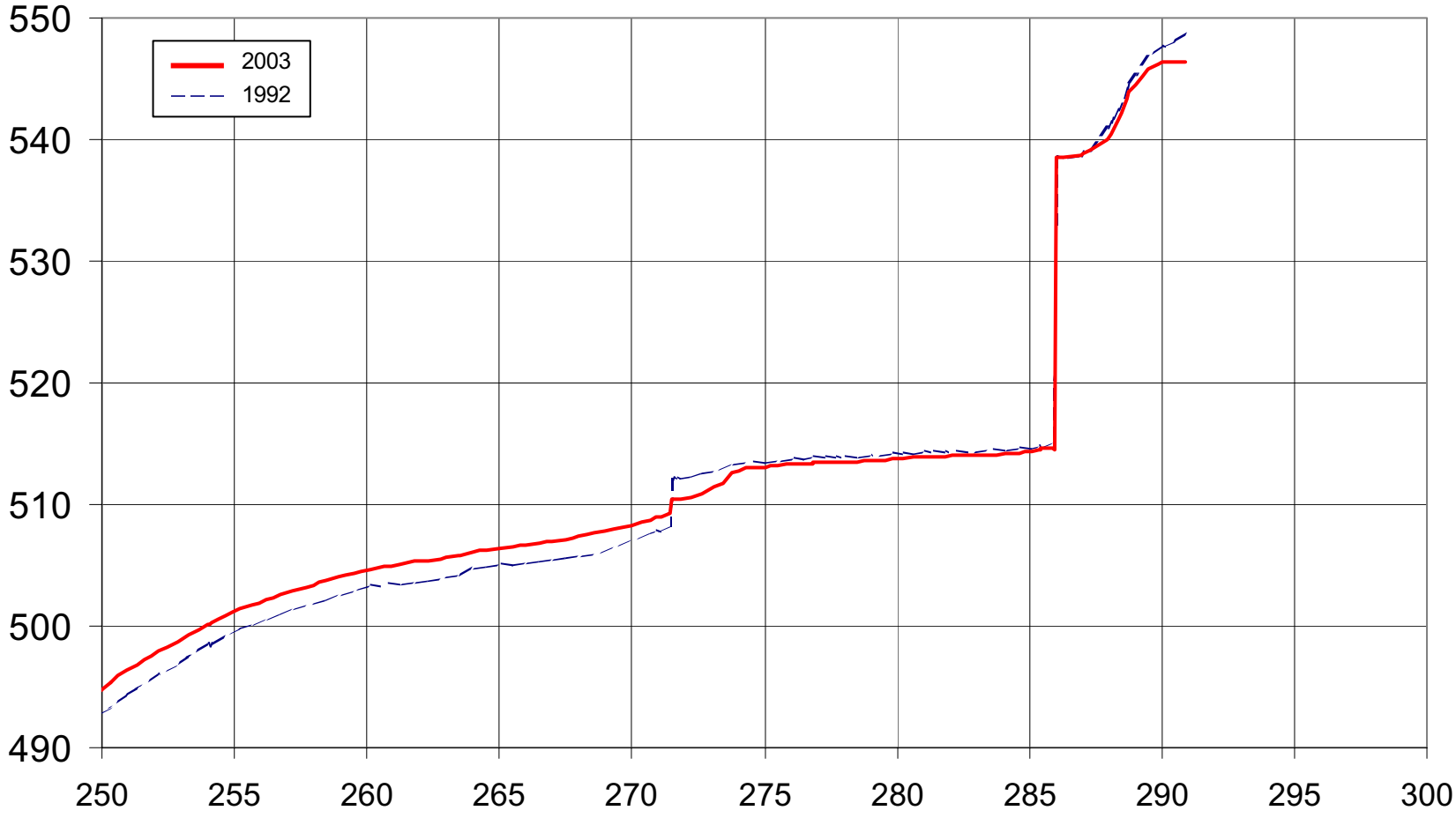
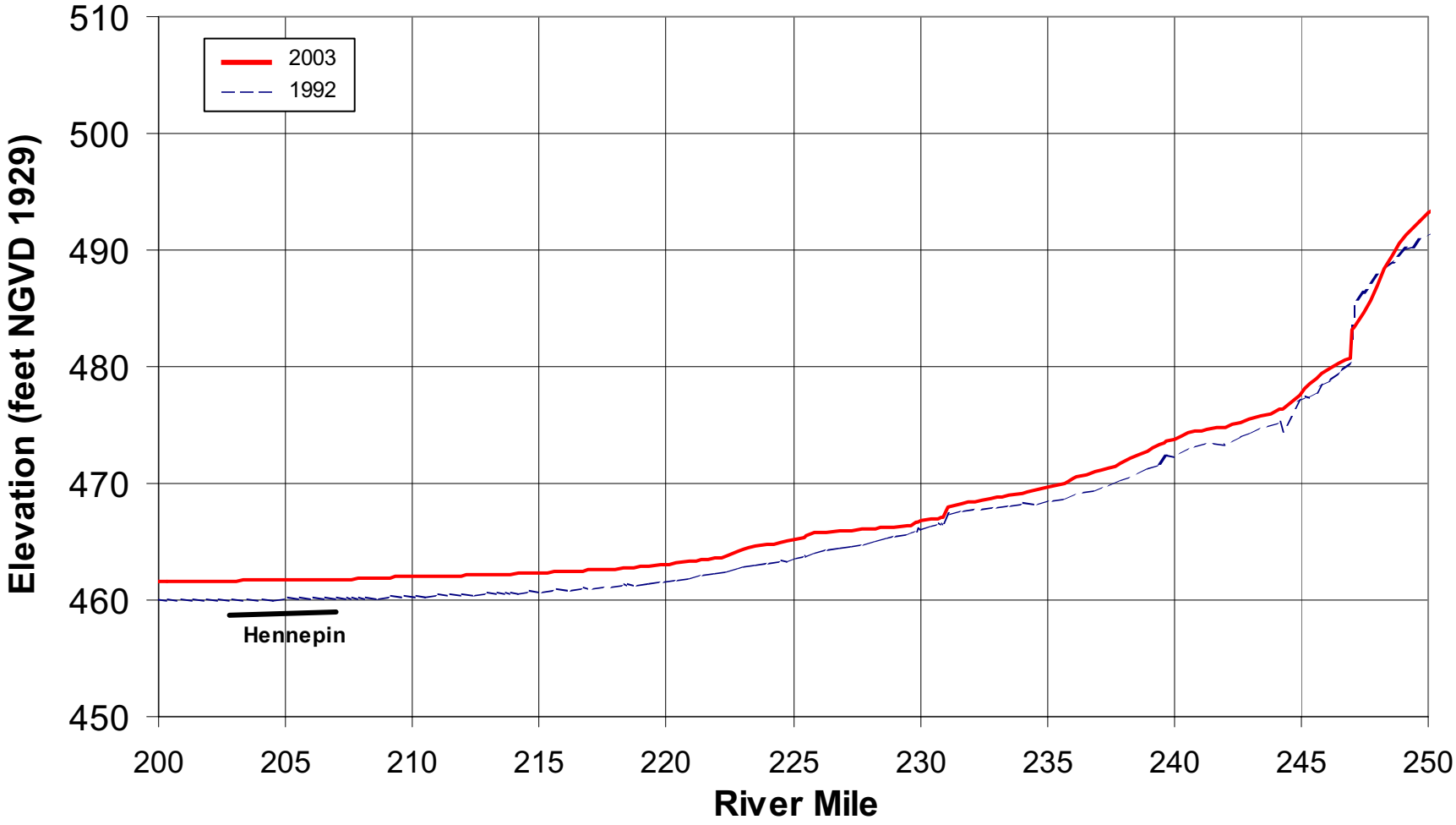

2003 Illinois River Stage Frequency Profiles
Elevation (feet NGVD 1929)
480
470
460
450
440
430
420
50
60
70
80
90
100
River Mile
LA GRANGE DAM
LA MOINE RIVER
SANGAMON RIVER
500 Year
200 year
100 Year
50 Year
25 Year
10 Year
5 Year
2 Year
1982 Flood

Plate C-I-17

Illinois River 500 Year Stage Frequency Profile
Left Bank

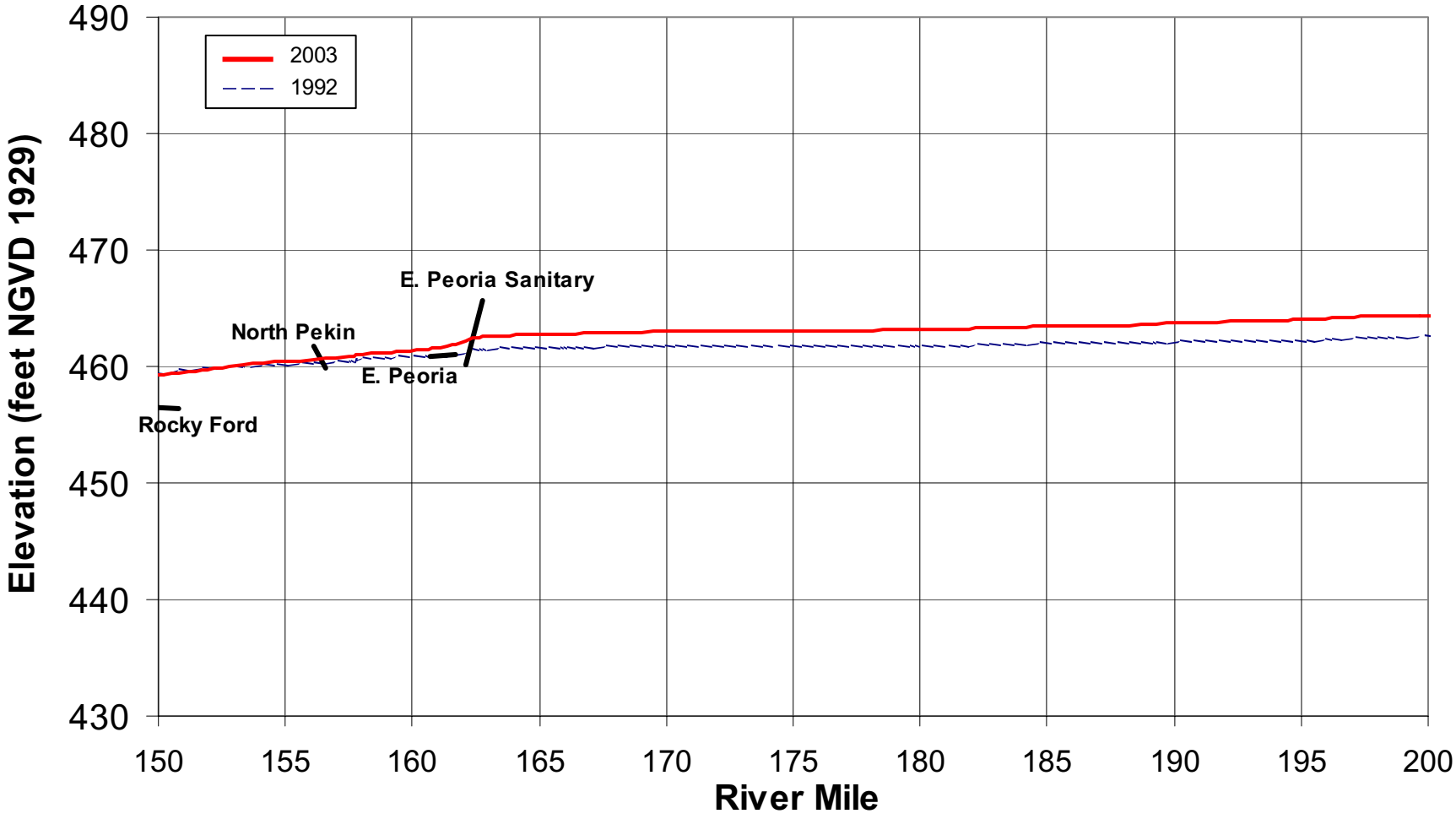


Illinois River 500 Year Stage Frequency Profile
Left Bank



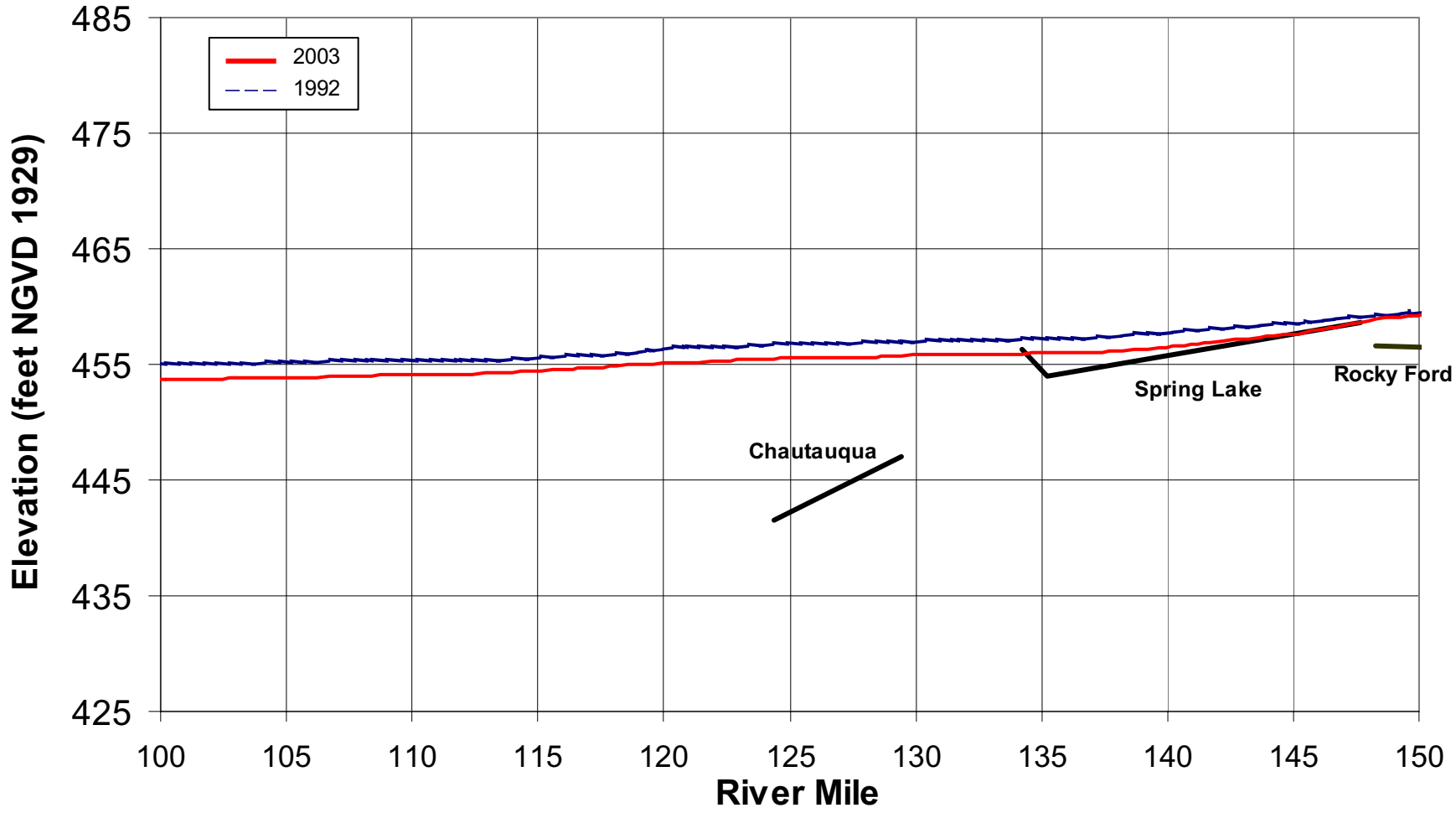
The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations between the illustrated end points should not be assumed linear.

Illinois River 500 Year Stage Frequency Profile
Left Bank



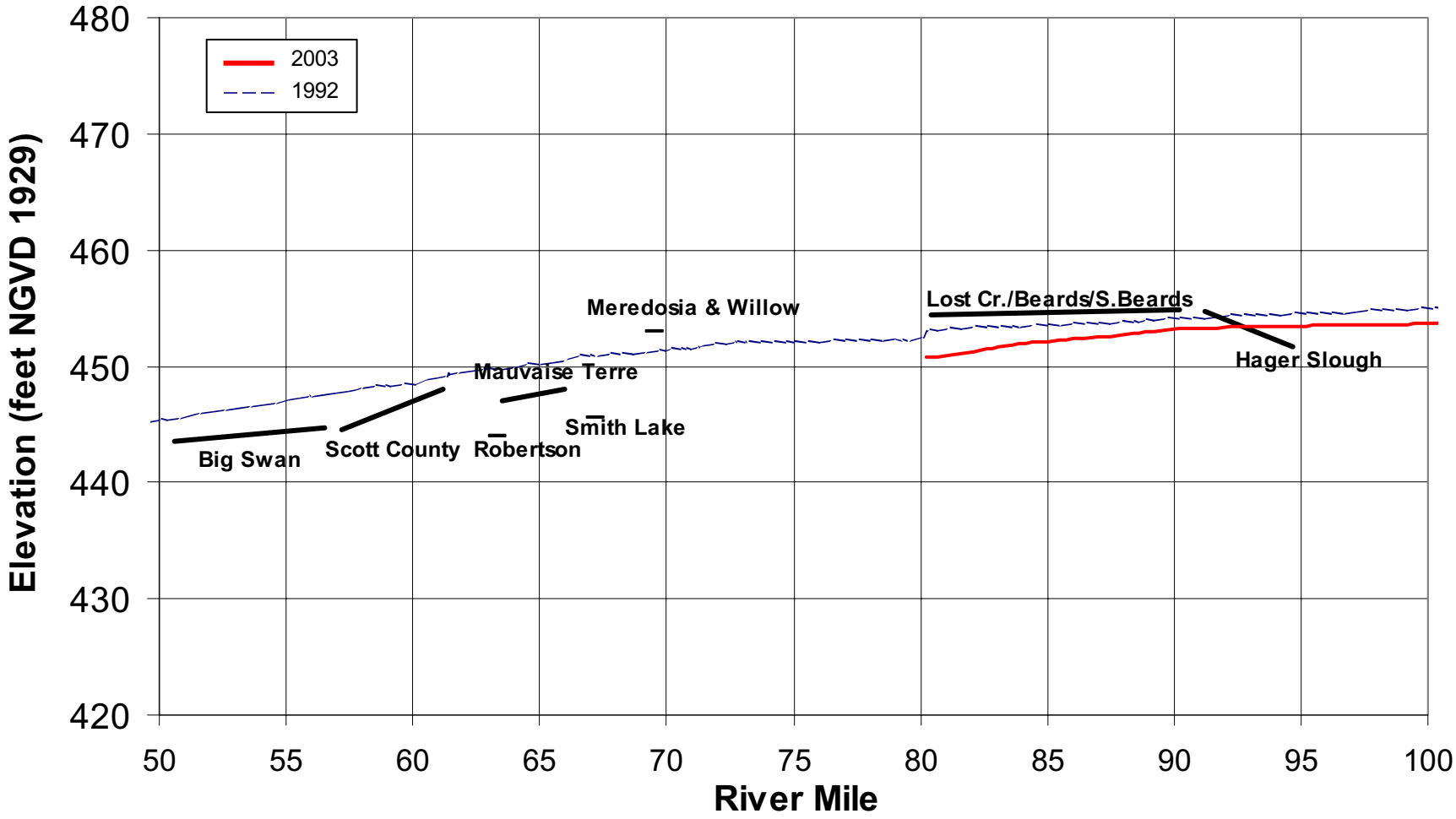
The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations betw een the illustrated end points should not be assumed linear.

Illinois River 500 Year Stage Frequency Profile
Left Bank



The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations between the illustrated end points should not be assumed linear.

Illinois River 500 Year Stage Frequency Profile
Left Bank



The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations between the illustrated end points should not be assumed linear.

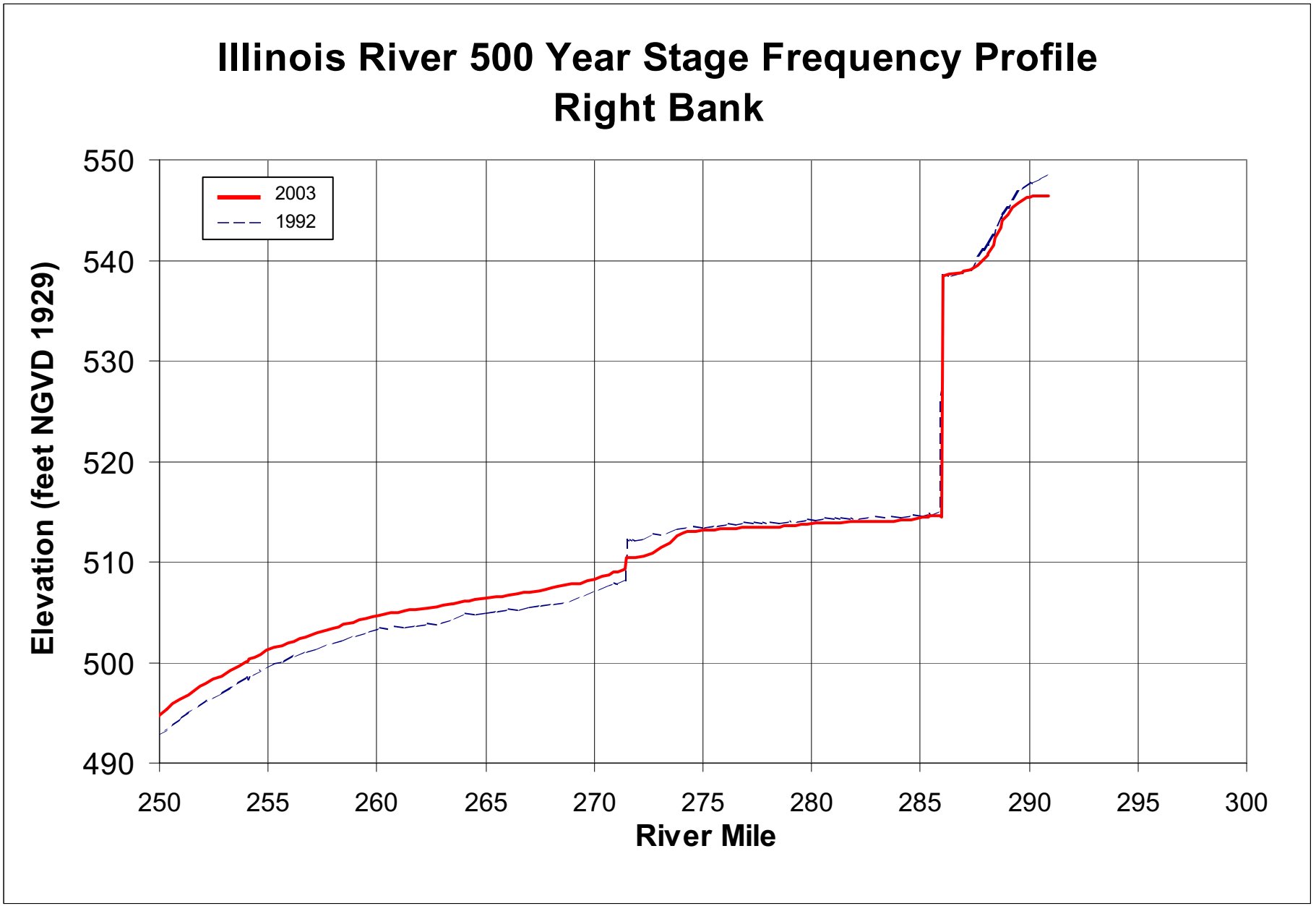
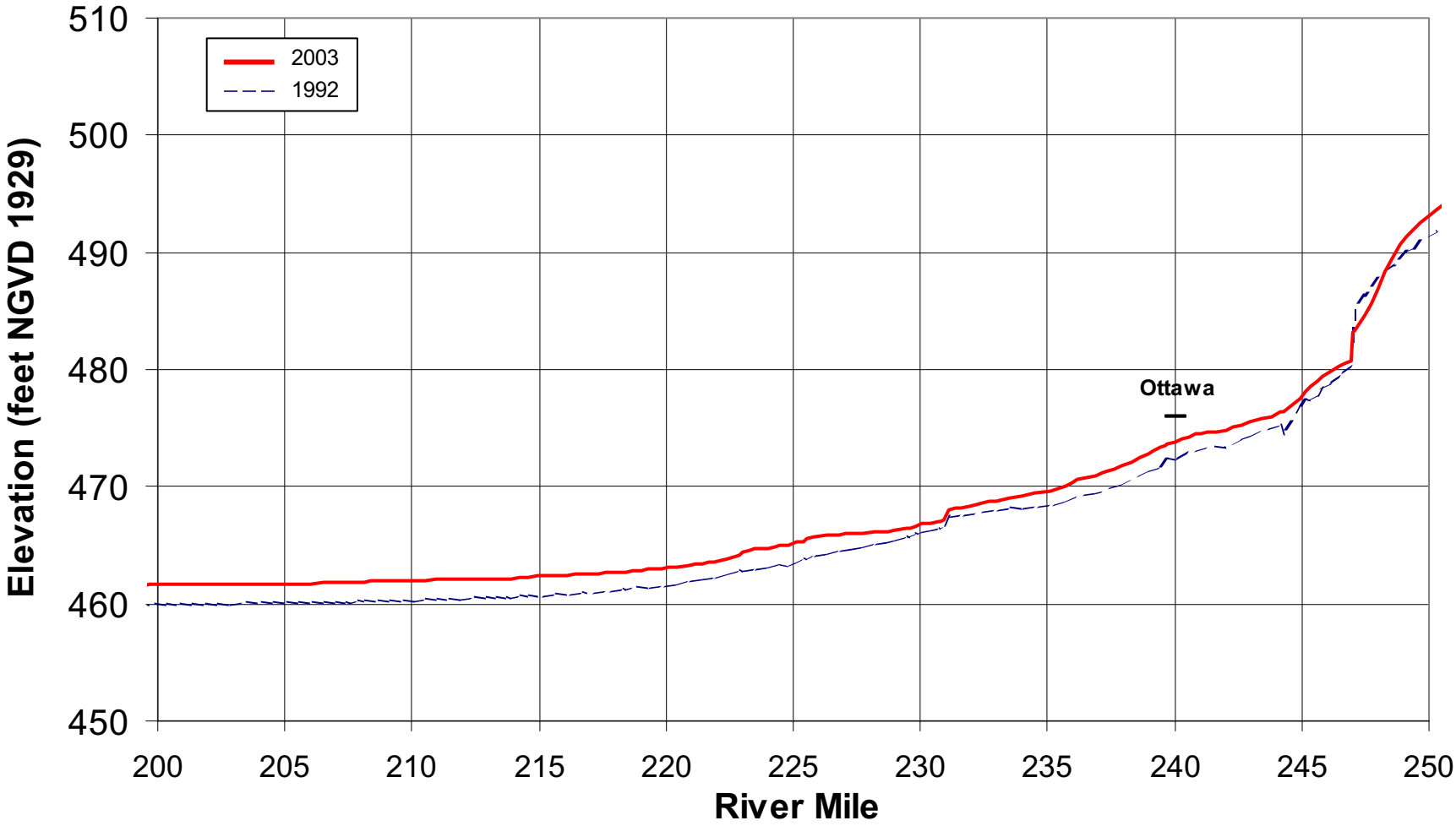

Illinois River 500 Year Stage Frequency Profile
Right Bank
2003
1992
Elevation (feet NGVD 1929)
550
540
530
520
510
500
490
250
255
260
265
270
275
280
285
290
295
300
River Mile

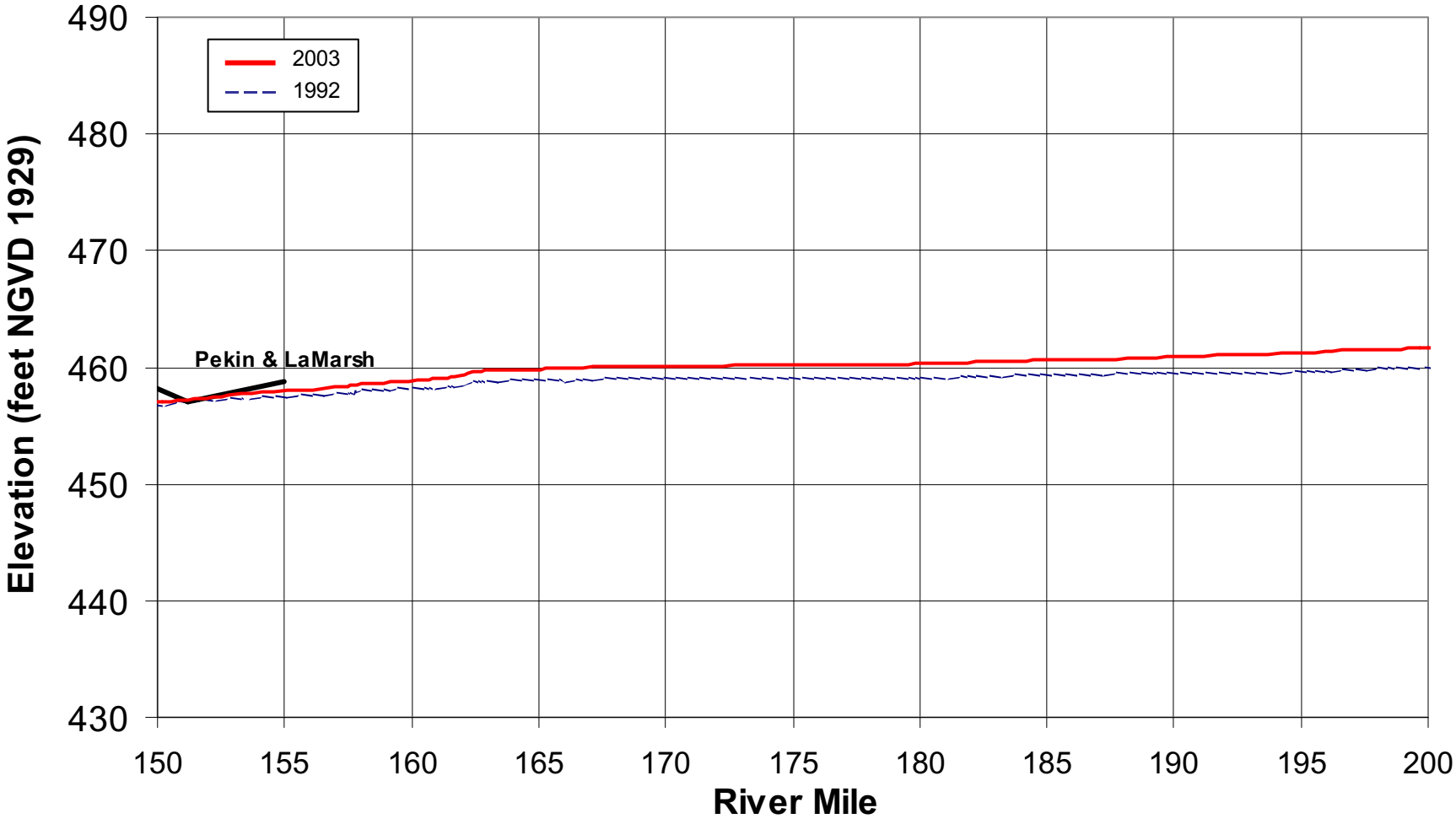
Plate C-I-23

Illinois River 500 Year Stage Frequency Profile
Right Bank



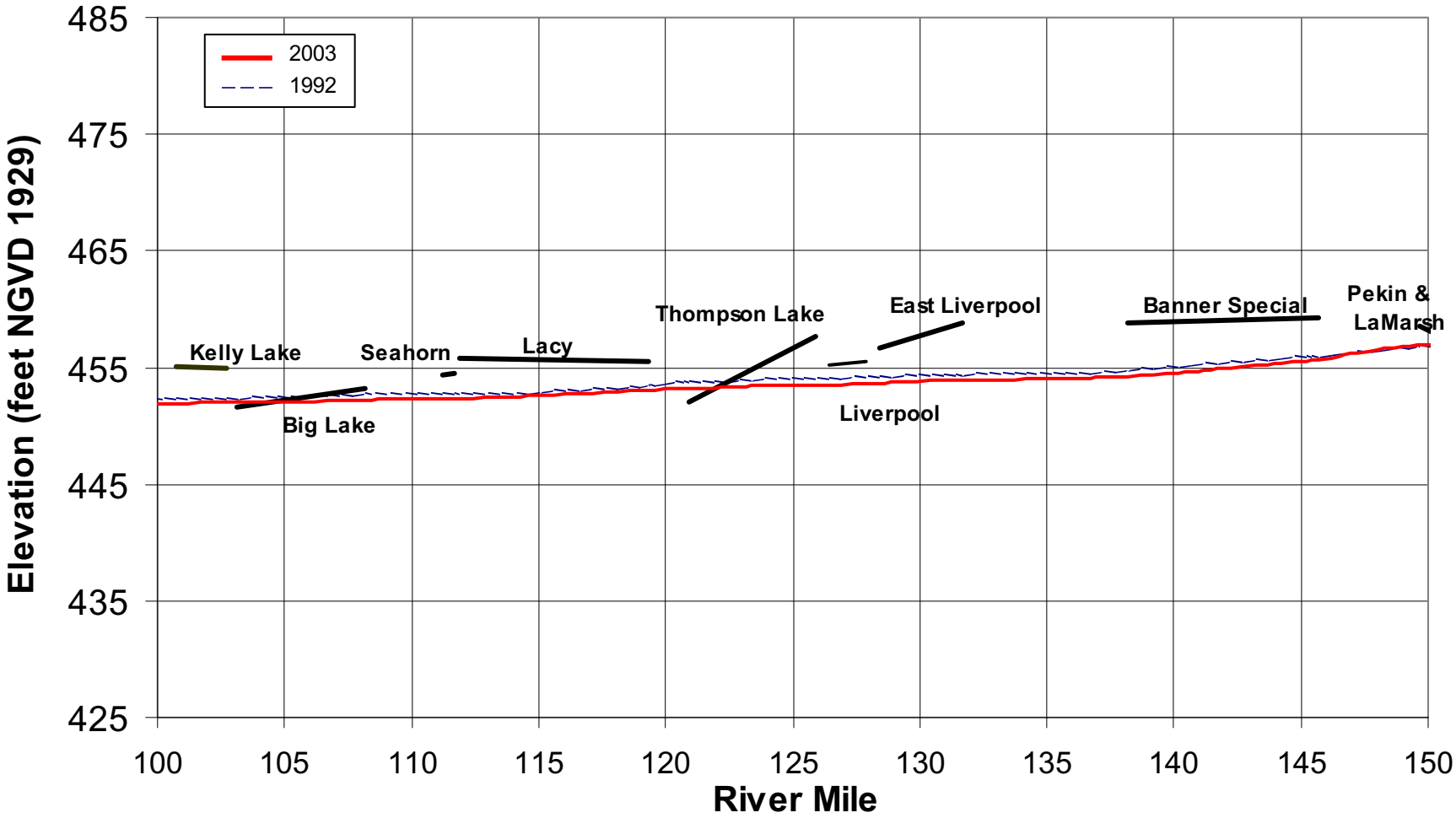
The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations between the illustrated end points should not be assumed linear.

Illinois River 500 Year Stage Frequency Profile
Right Bank



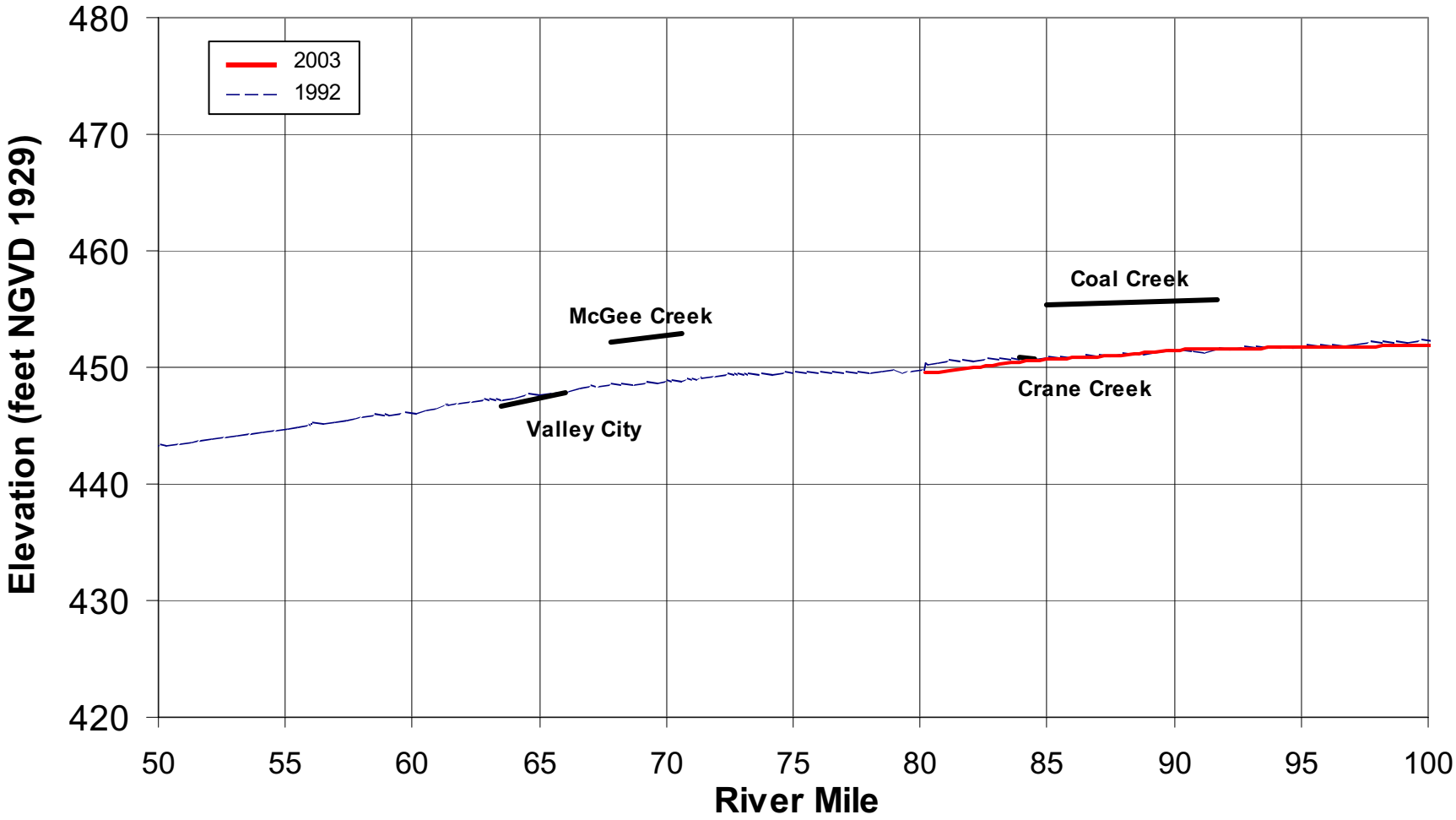
The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations between the illustrated end points should not be assumed linear.

Illinois River 500 Year Stage Frequency Profile
Right Bank



The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations betw een the illustrated end points should not be assumed linear.

Illinois River 500 Year Stage Frequency Profile
Right Bank



The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations between the illustrated end points should not be assumed linear.

Illinois River 100 Year Stage Frequency Profile
Left Bank

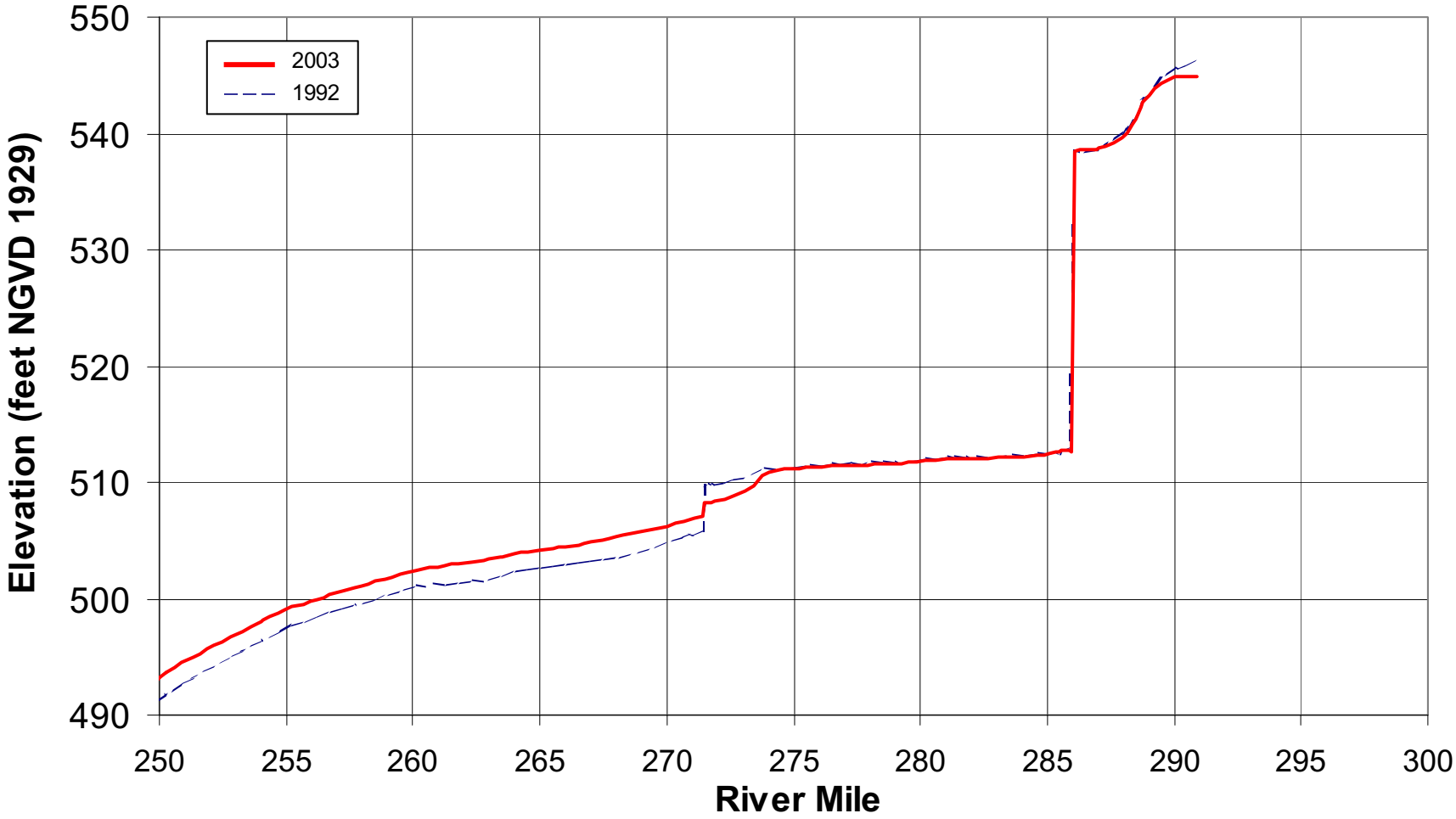
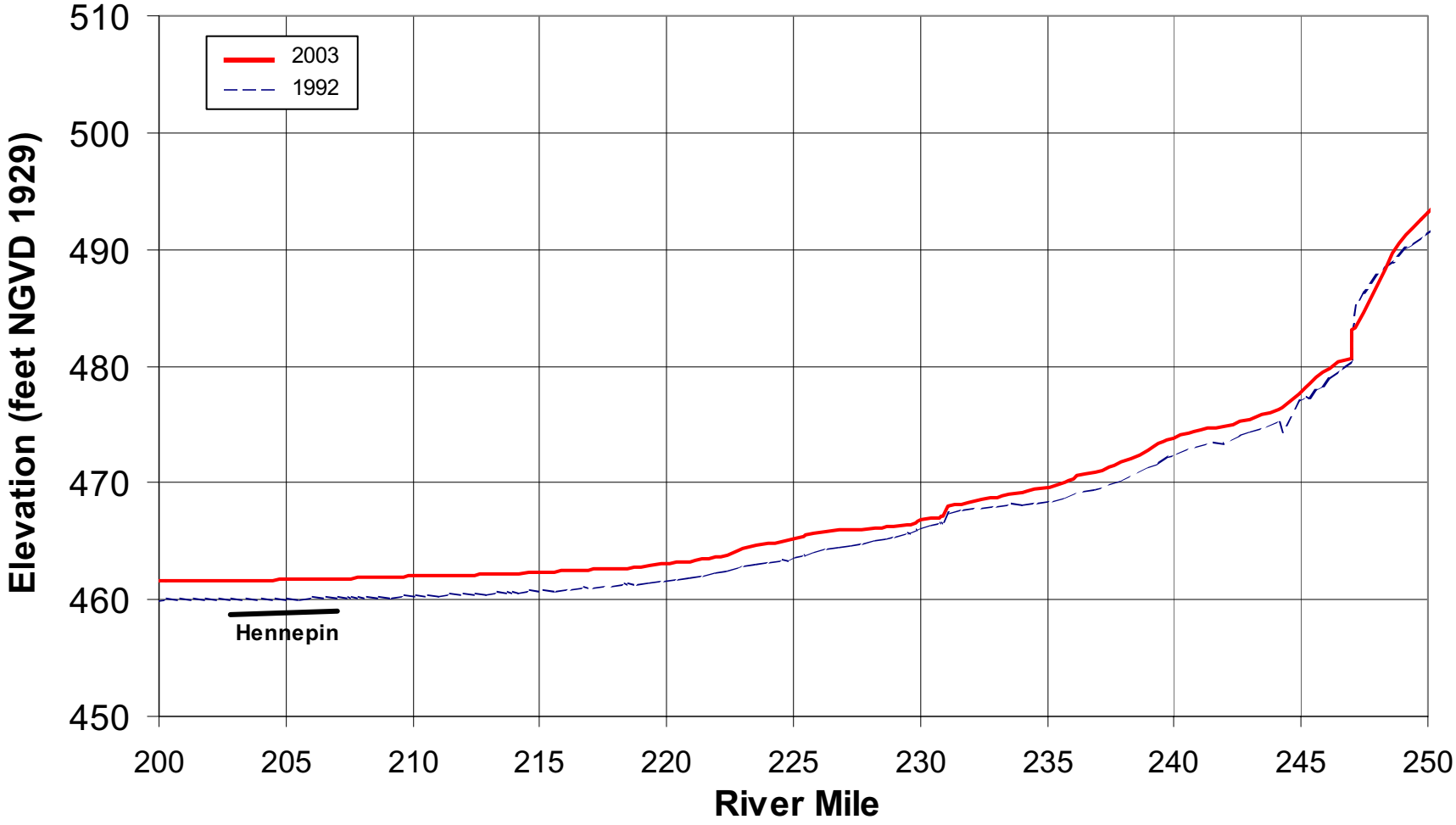


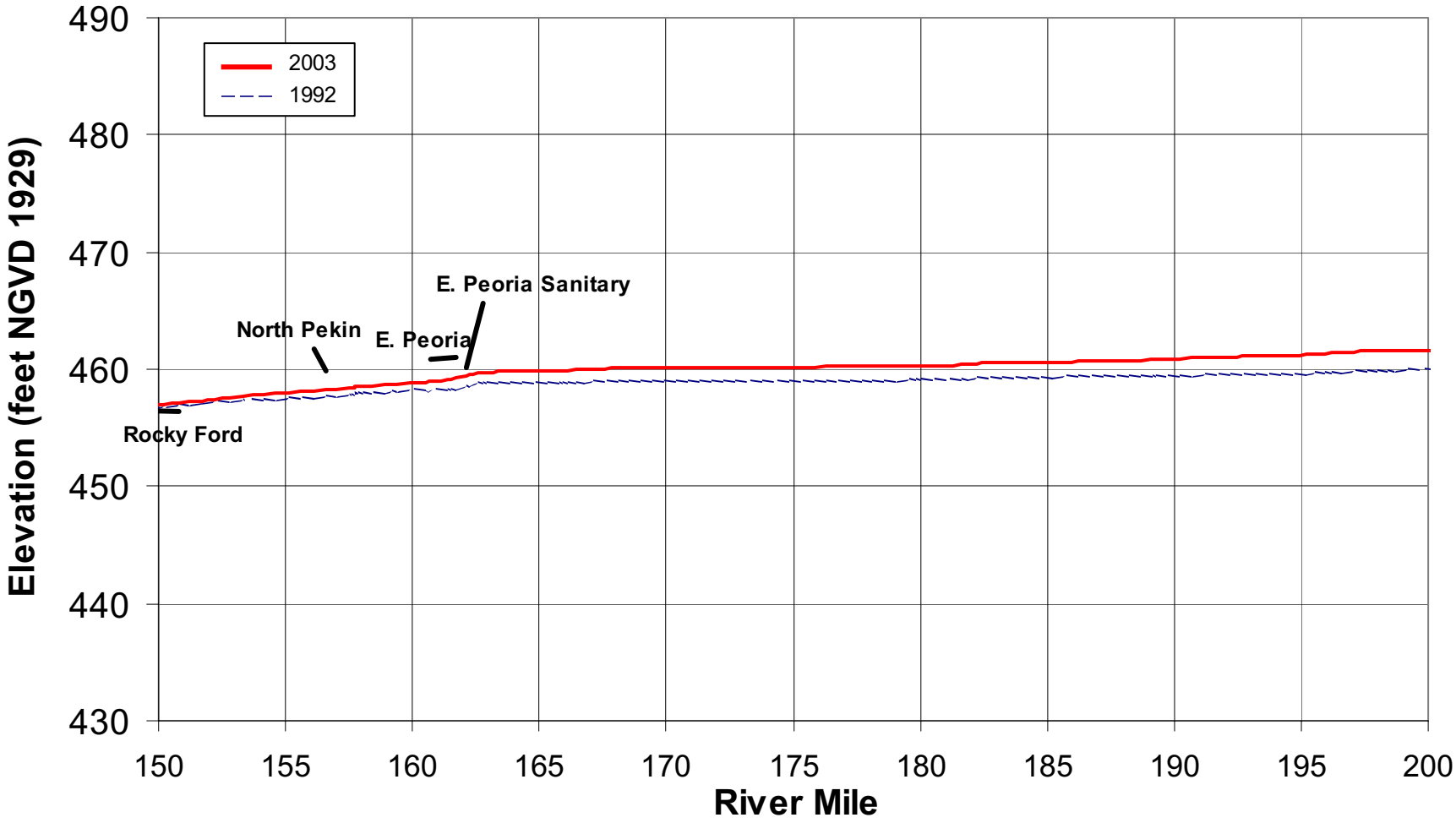
Plate C-I-28

Illinois River 100 Year Stage Frequency Profile
Left Bank



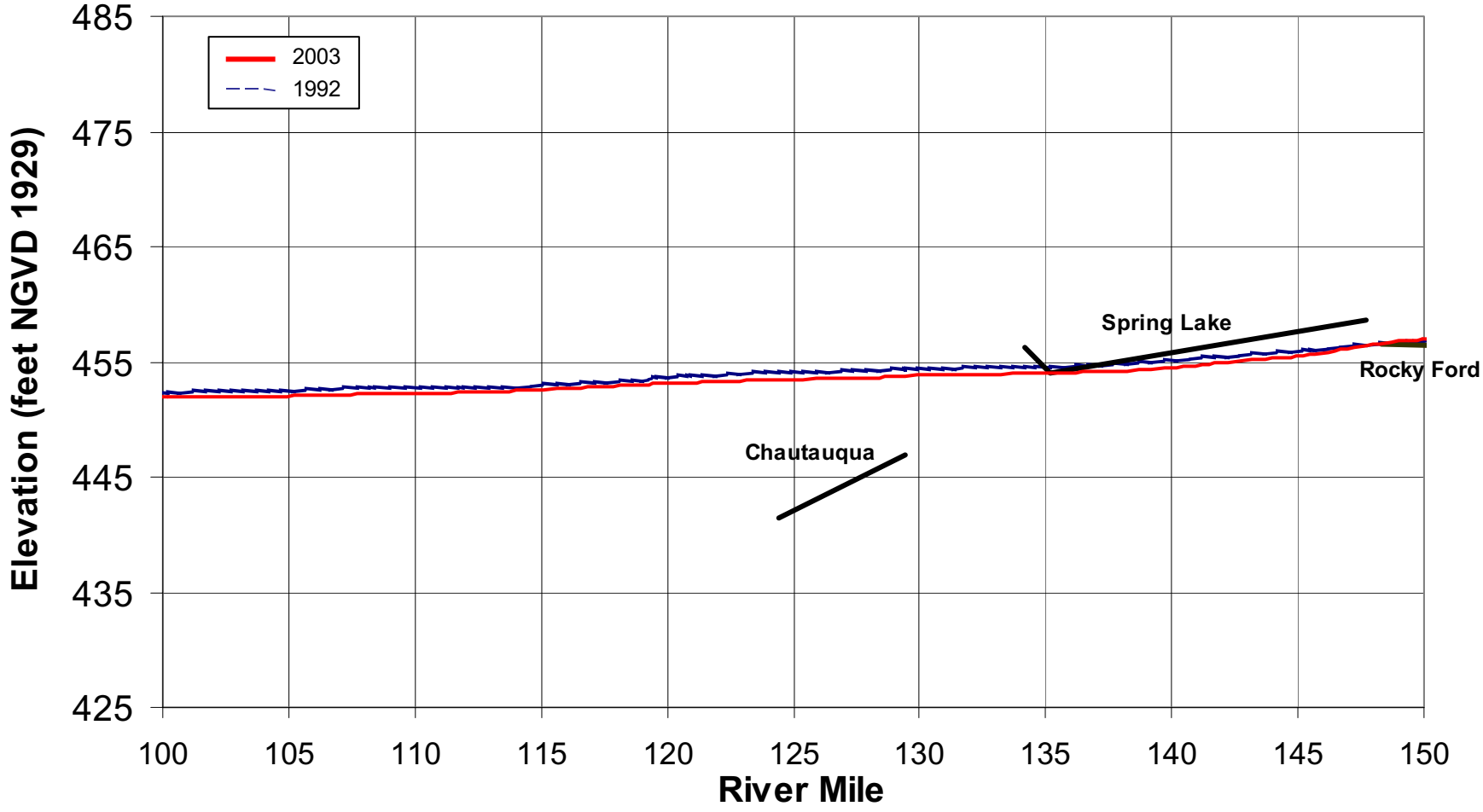
The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations betw een the illustrated end points should not be assumed linear.

Illinois River 100 Year Stage Frequency Profile
Left Bank



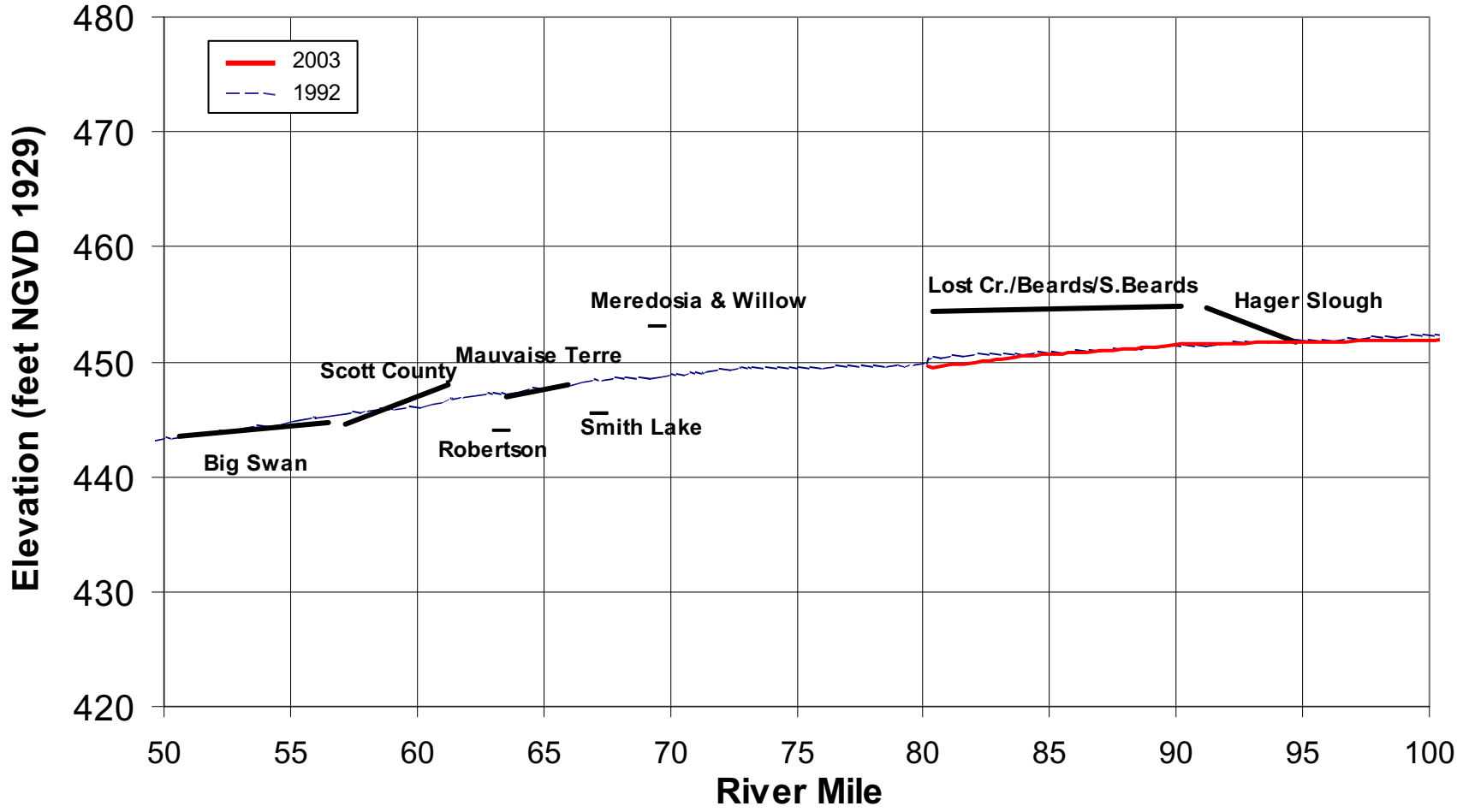
The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations betw een the illustrated end points should not be assumed linear.

Illinois River 100 Year Stage Frequency Profile
Left Bank



The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations betw een the illustrated end points should not be assumed linear.

Illinois River 100 Year Stage Frequency Profile
Left Bank



The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations betw een the illustrated end points should not be assumed linear.

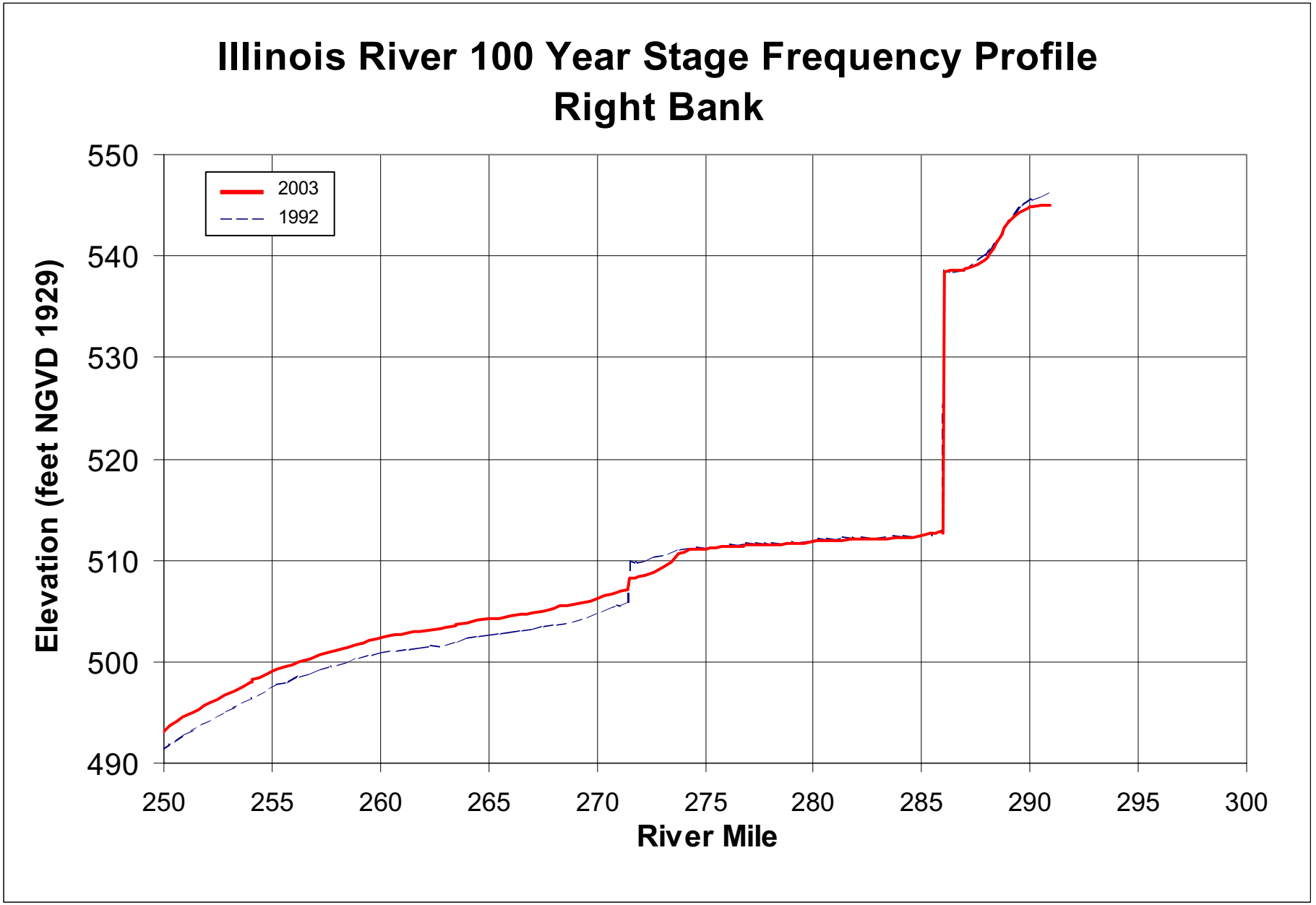
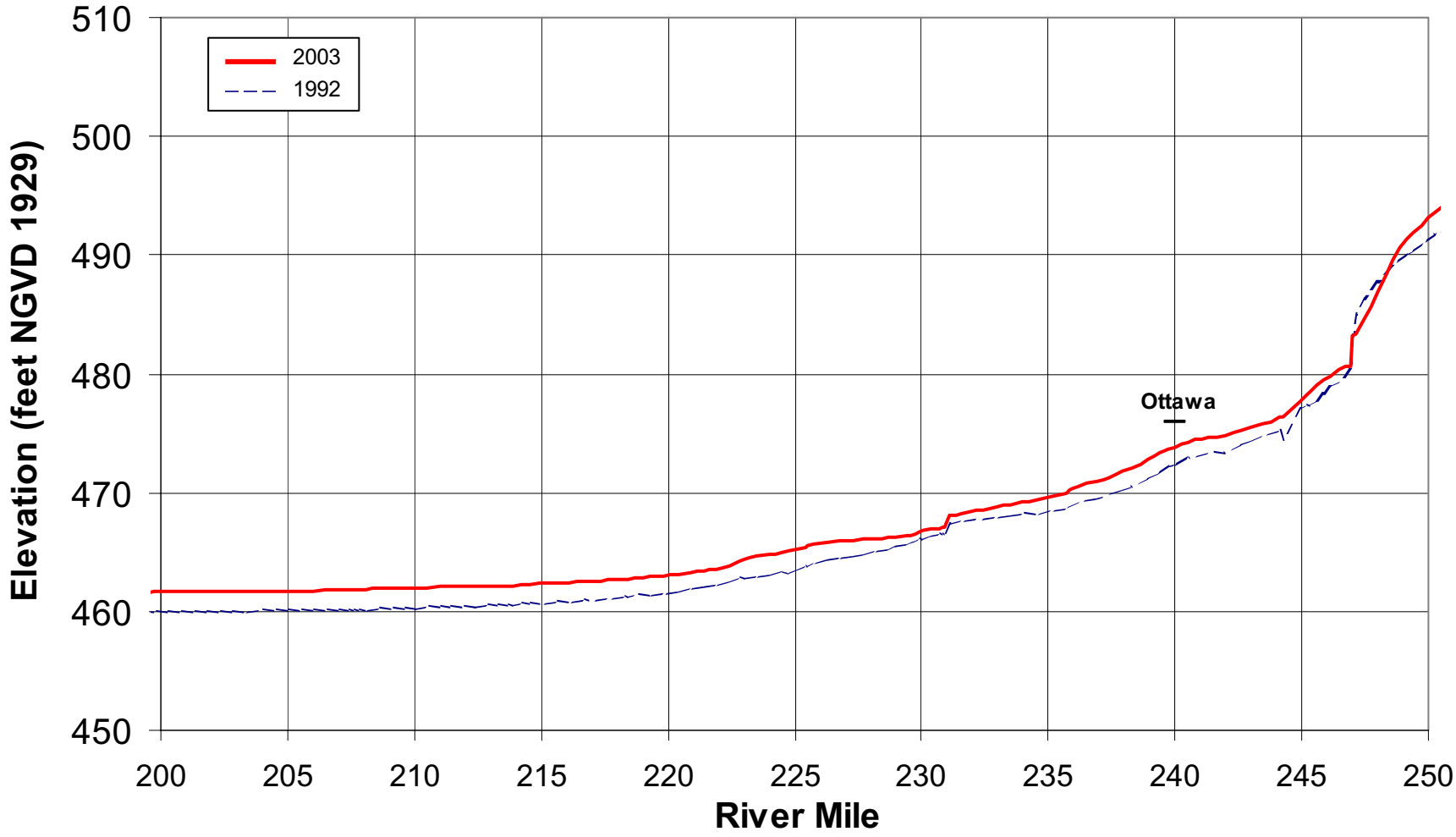

Illinois River 100 Year Stage Frequency Profile
Right Bank
2003
1992
Elevation (feet NGVD 1929)
550
540
530
520
510
500
490
250
255
260
265
270
275
280
285
290
295
300
River Mile

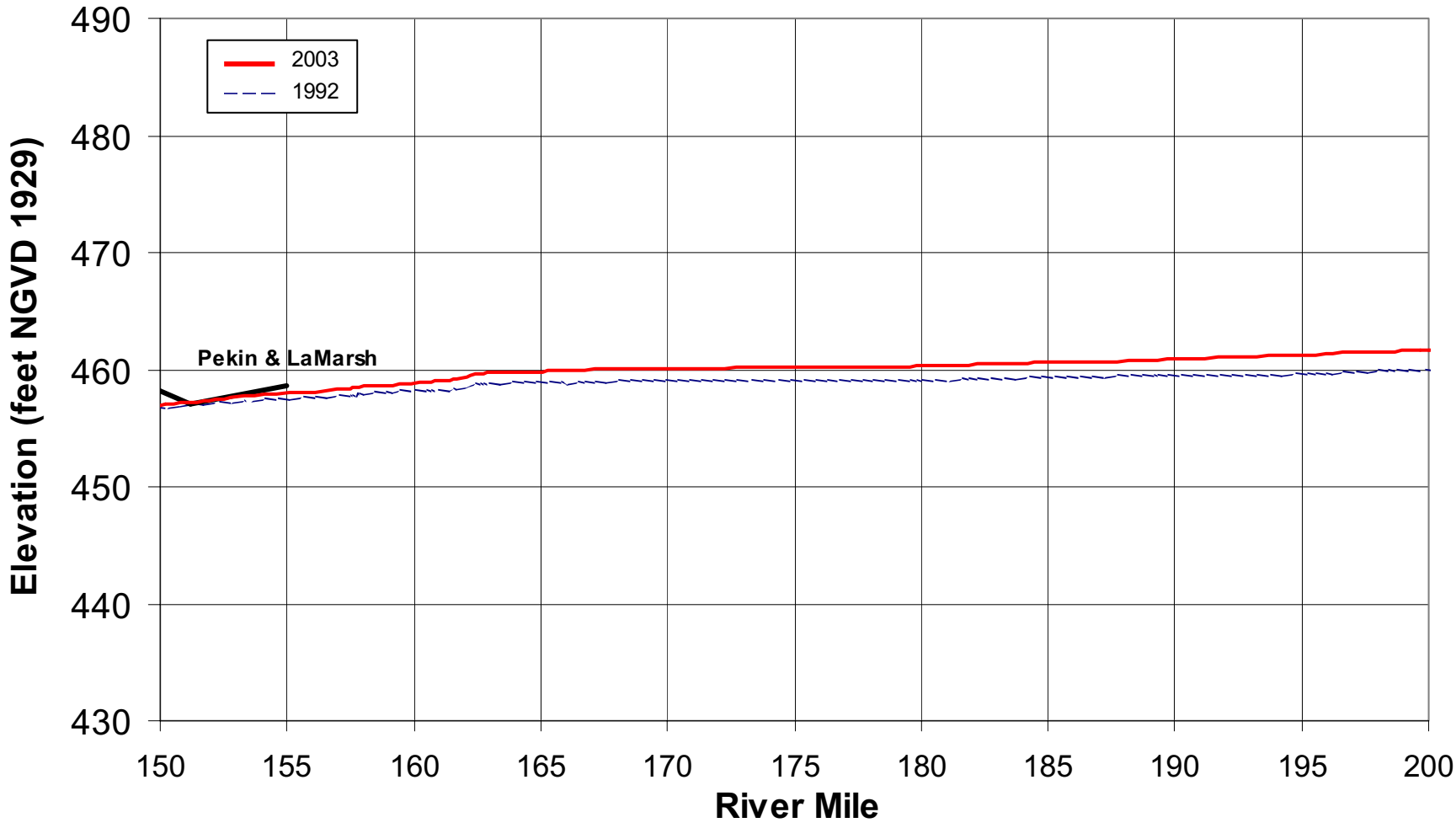
Plate C-I-33

Illinois River 100 Year Stage Frequency Profile
Right Bank



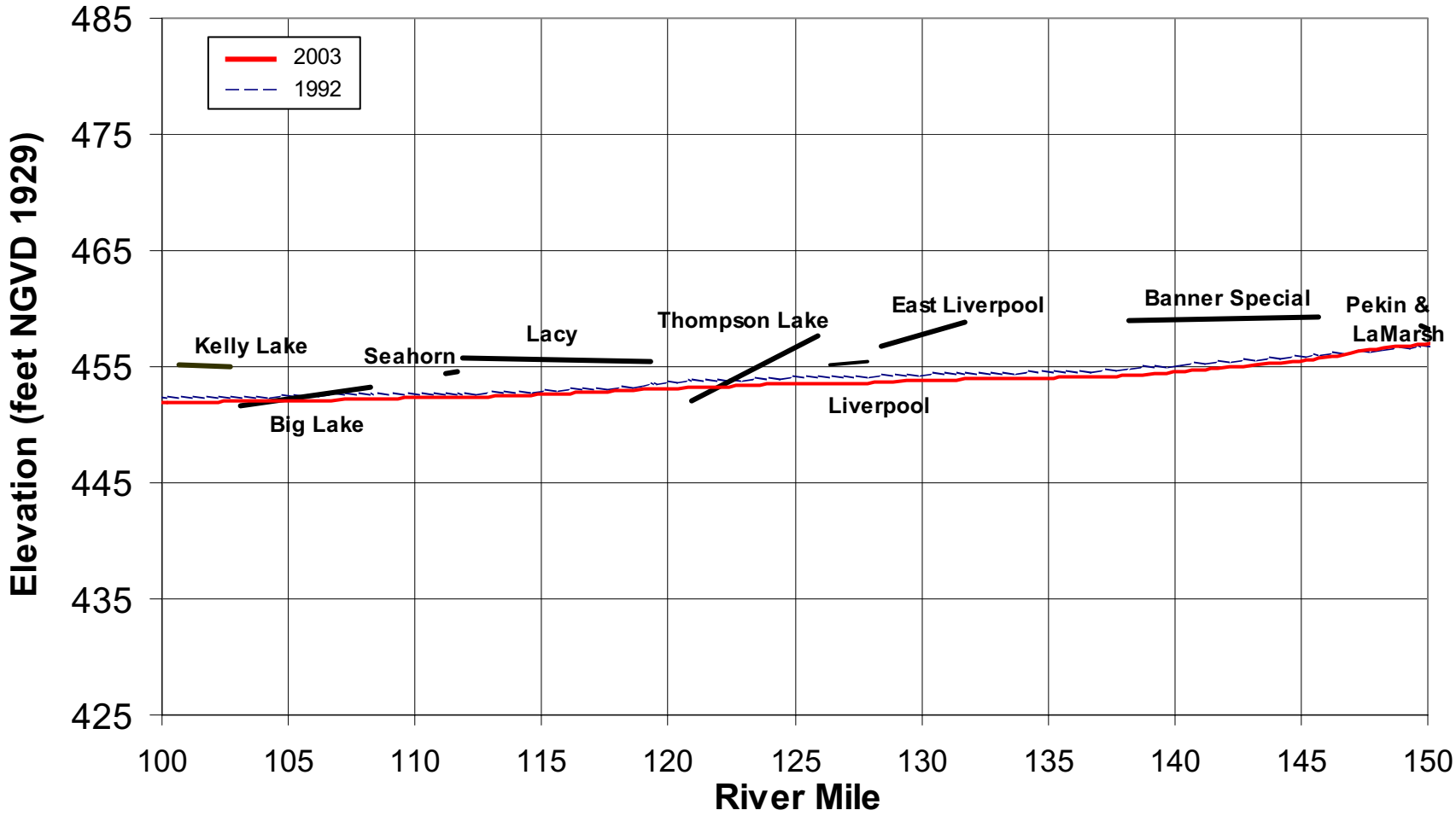
The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations between the illustrated end points should not be assumed linear.

Illinois River 100 Year Stage Frequency Profile
Right Bank



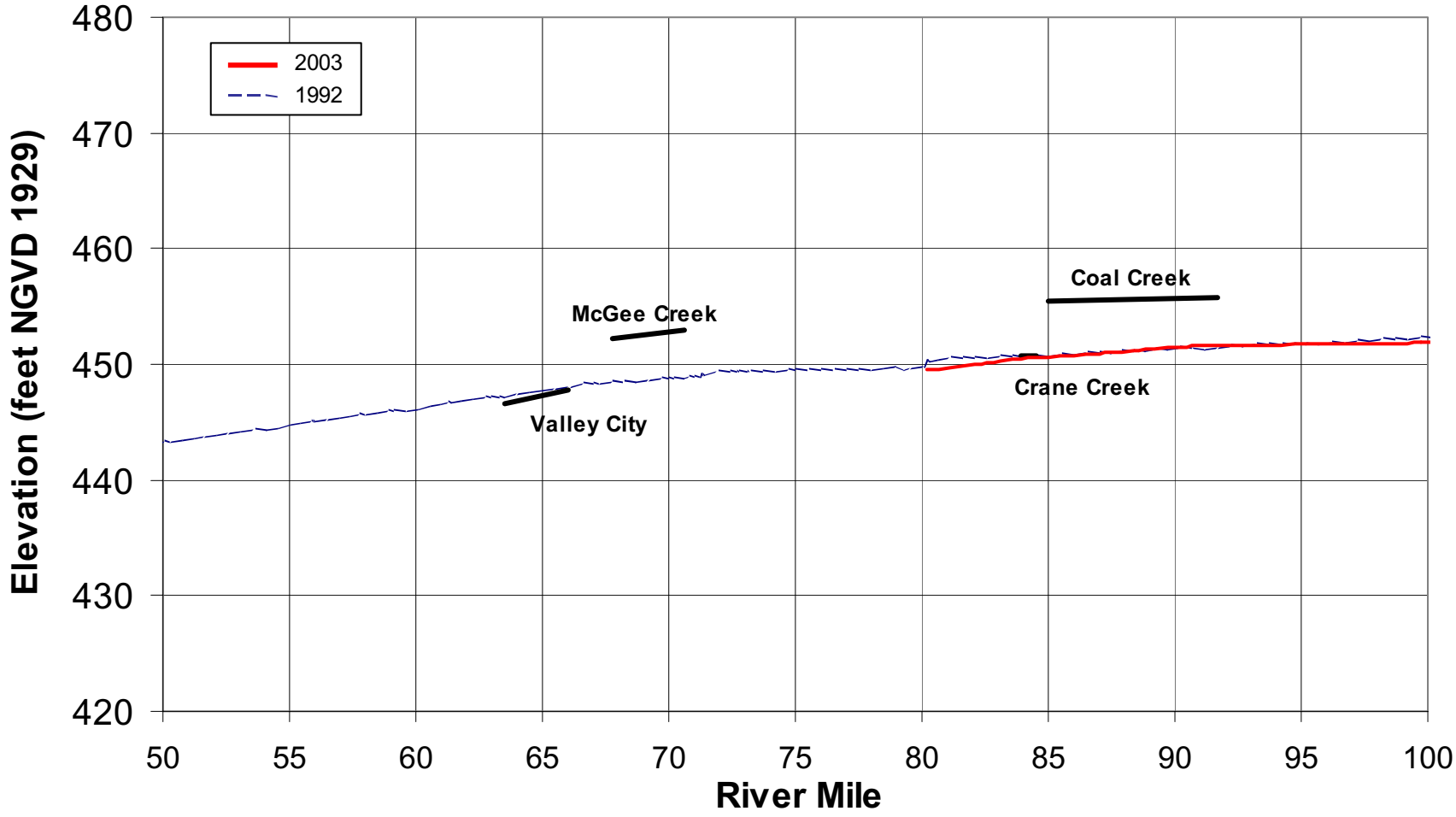
The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations betw een the illustrated end points should not be assumed linear.

Illinois River 100 Year Stage Frequency Profile
Right Bank



The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations between the illustrated end points should not be assumed linear.

Illinois River 100 Year Stage Frequency Profile
Right Bank



The illustrated levees represent a linear connection of overtopping elevations used in the UNET model.
Actual levee elevations betw een the illustrated end points should not be assumed linear.