

# Illinois River Conservation Enhancement Program: Sediment and Nutrient Delivery Assessment

by

Mike Demissie, Director  
Illinois State Water Survey  
Prairie Research Institute  
University of Illinois  
Champaign, IL



# Acknowledgments

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- Debbie Bruce
- Richard Mollahan

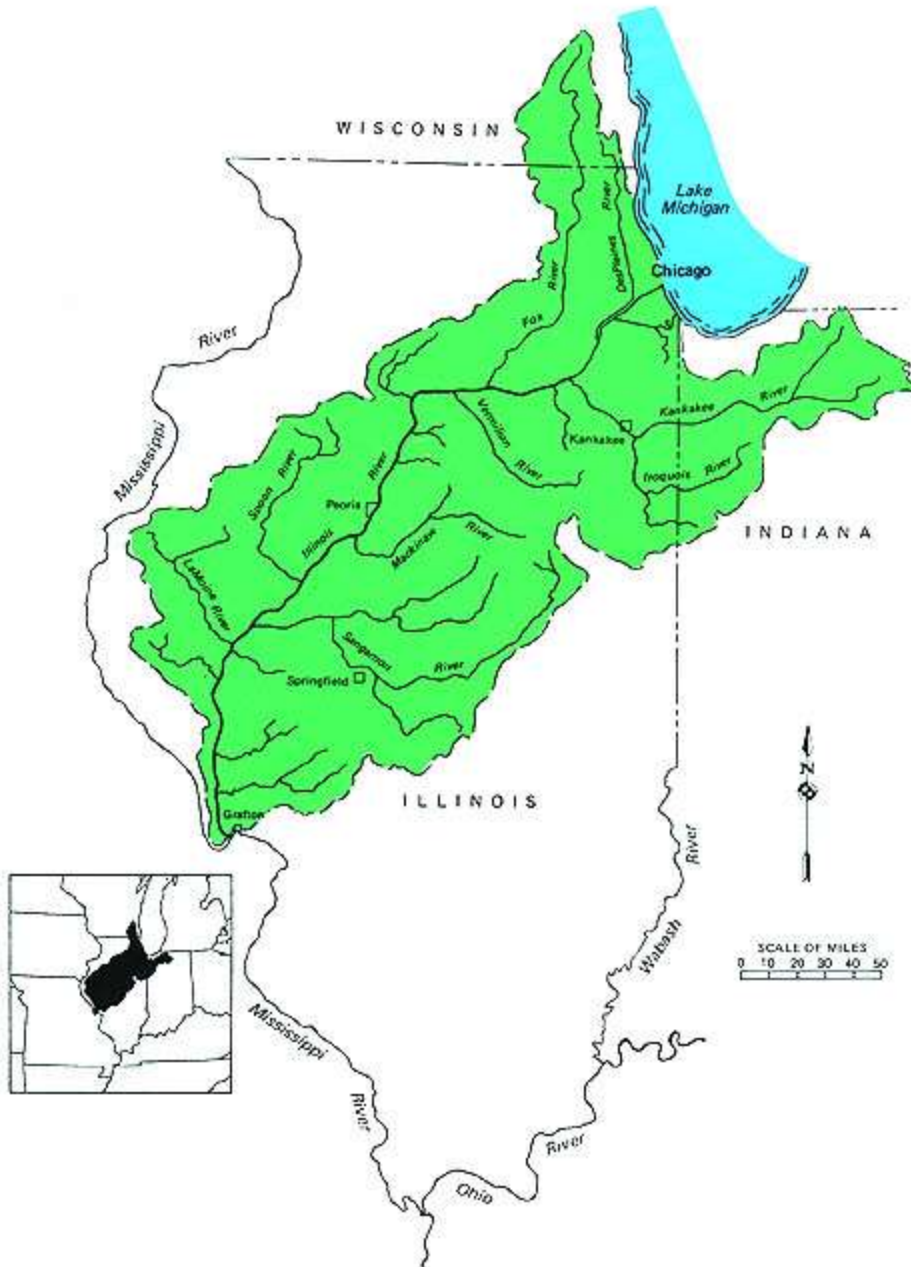
## ➤ *Project Staff – IDNR/SWS*

- Laura Keefer
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- Yanqing Lian
- Momcilo Markus
- Vern Knapp

# Background

## ➤ *Illinois River Issues*

- Sedimentation
- Hydrology
- Water Quality
- Habitat Degradation



# Illinois River Conservation Reserve Enhancement Program (CREP)

- Joint federal/state program with the goal of improving water quality and wildlife habitat in the Illinois River Basin
- Voluntary program
- Land retirements, easements & conservation practices
- The two main goals are:
  1. “Reduce the amount of silt and sedimentation entering the mainstem of the Illinois River by 20 percent.”
  2. “Reduce the amount of phosphorous and nitrogen in the Illinois River by 10 percent.”


# CREP Programs

- USDA-FSA Program (Federal)
  - Eligible acres enroll for 15-year conservation easements
- Illinois state option
  - Extend federal contract to 15-year, 35-year, or permanent conservation easements
- Eligible agricultural land
  - Within 100-year floodplain
  - Highly erodible land (HEL) with erodibility index  $\geq 12$  adjacent to riparian areas
  - Wetlands farmed under natural conditions or prior converted wetlands

# Evaluation Methods

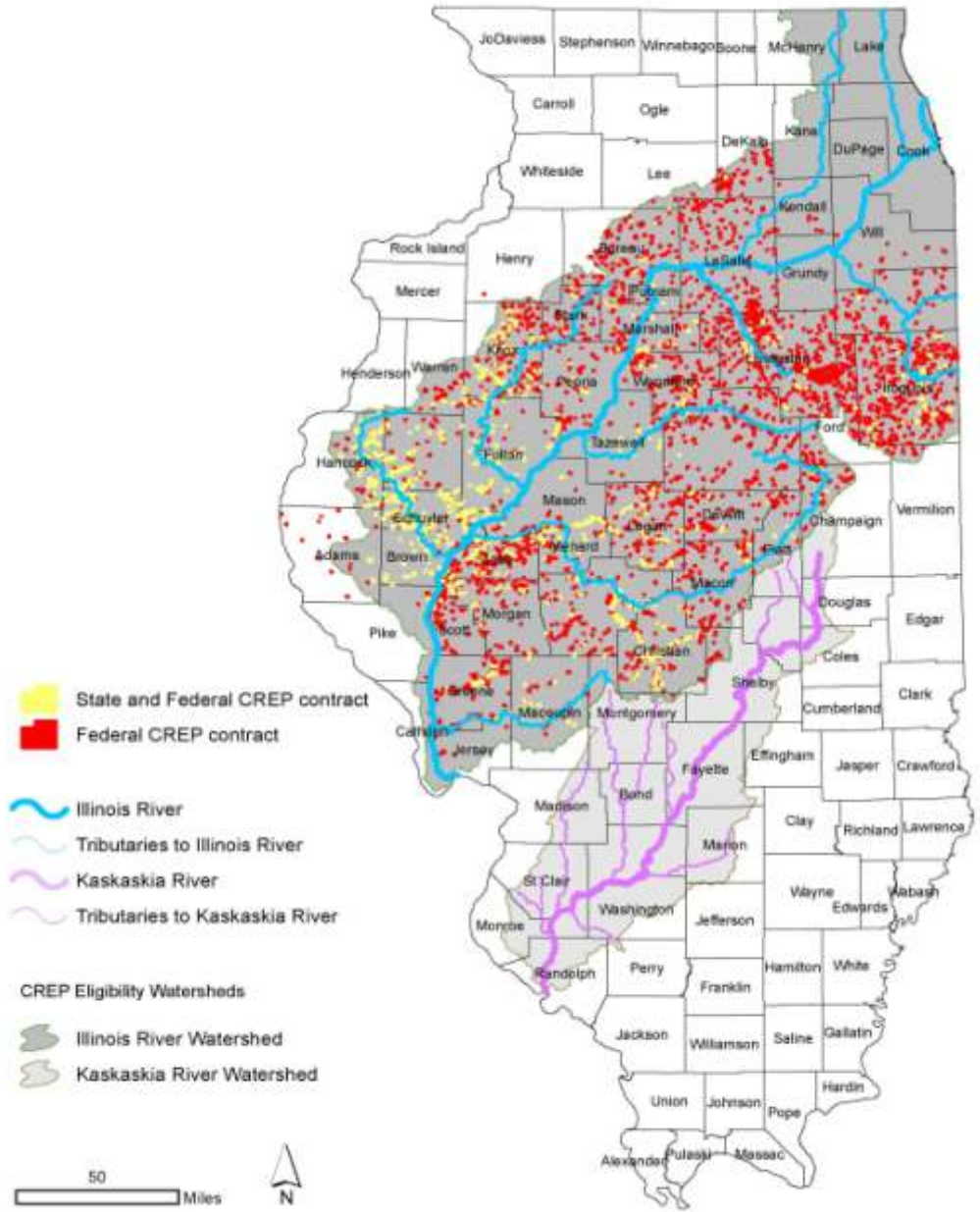
- *Monitor selected watersheds for changes in:*
  - Land use
  - Streamflow
  - Sediment transport
  - Nutrient transport
- *Develop tools to assess and evaluate the effectiveness of CREP in reducing sediment & nutrient delivery to the Illinois River*
  - Development of watershed models
  - Sediment and nutrient budgets
  - Statistical tests-analysis of covariance (ANCOVA)

# Data Sets Evaluated

- USGS – Sediment Budget
  - Benchmark Sediment Network – long term trend
  - Illinois River CREP – targeted small watersheds monitoring
  - IEPA long term water quality monitoring
- 

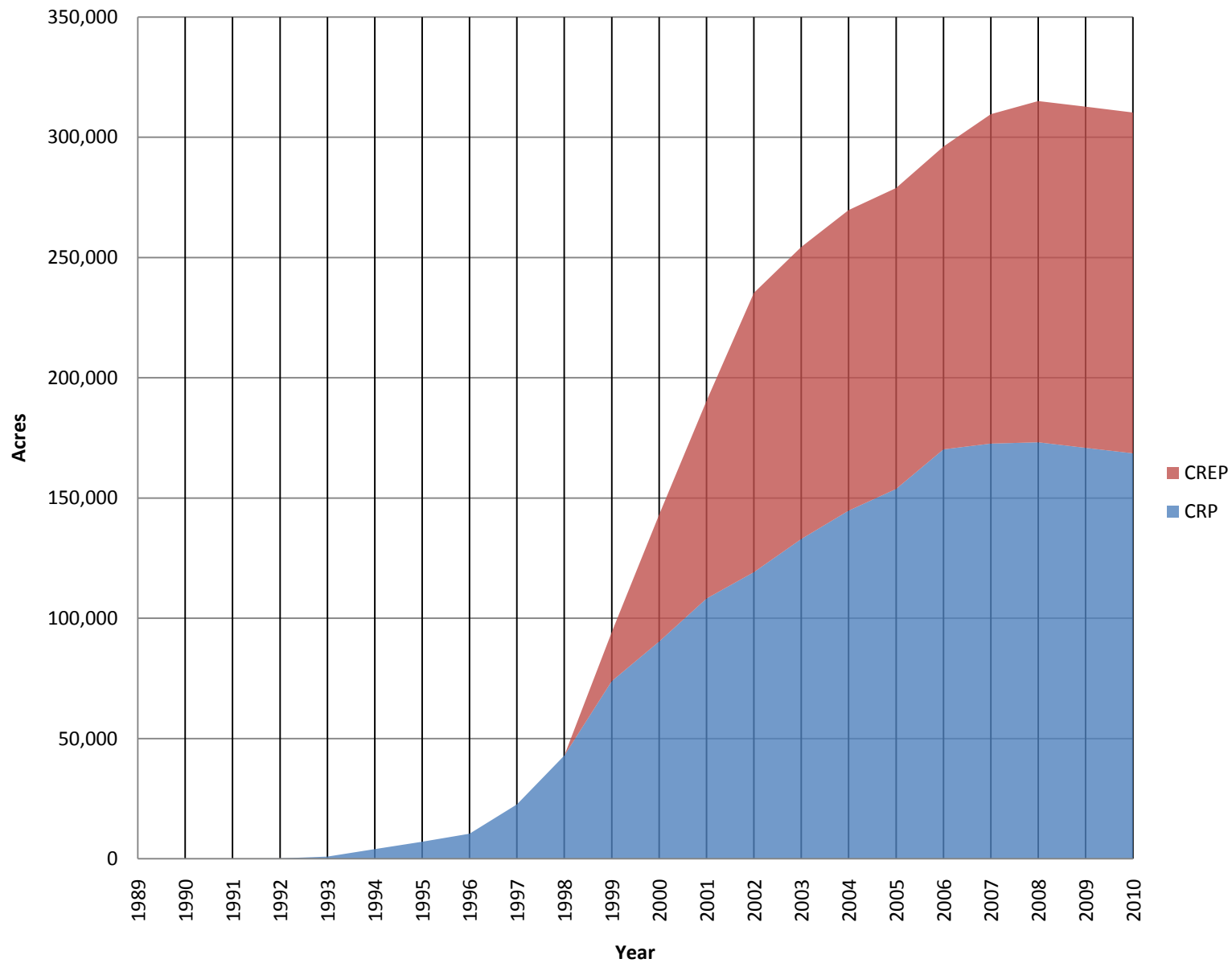
# CREP Enrollment Illinois River Basin

Illinois Conservation Reserve Enhancement Program  
Partnership between the USDA and the State of Illinois

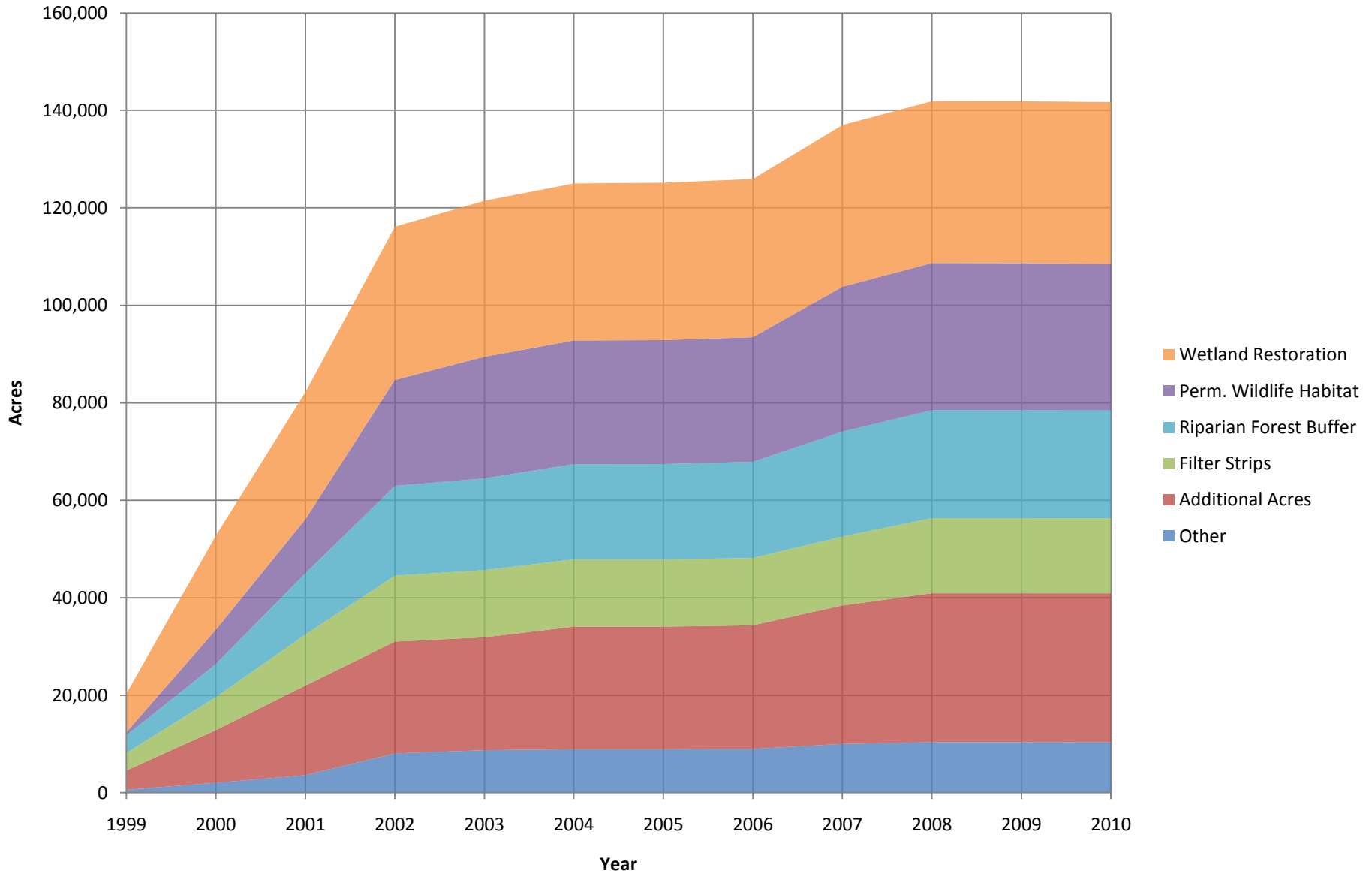




# CRP and CREP Enrollment, Illinois River Basin 1989-2010



# Illinois River Basin CREP Acres by Practice



# Sediment and Nutrient Data for CREP Monitoring Stations



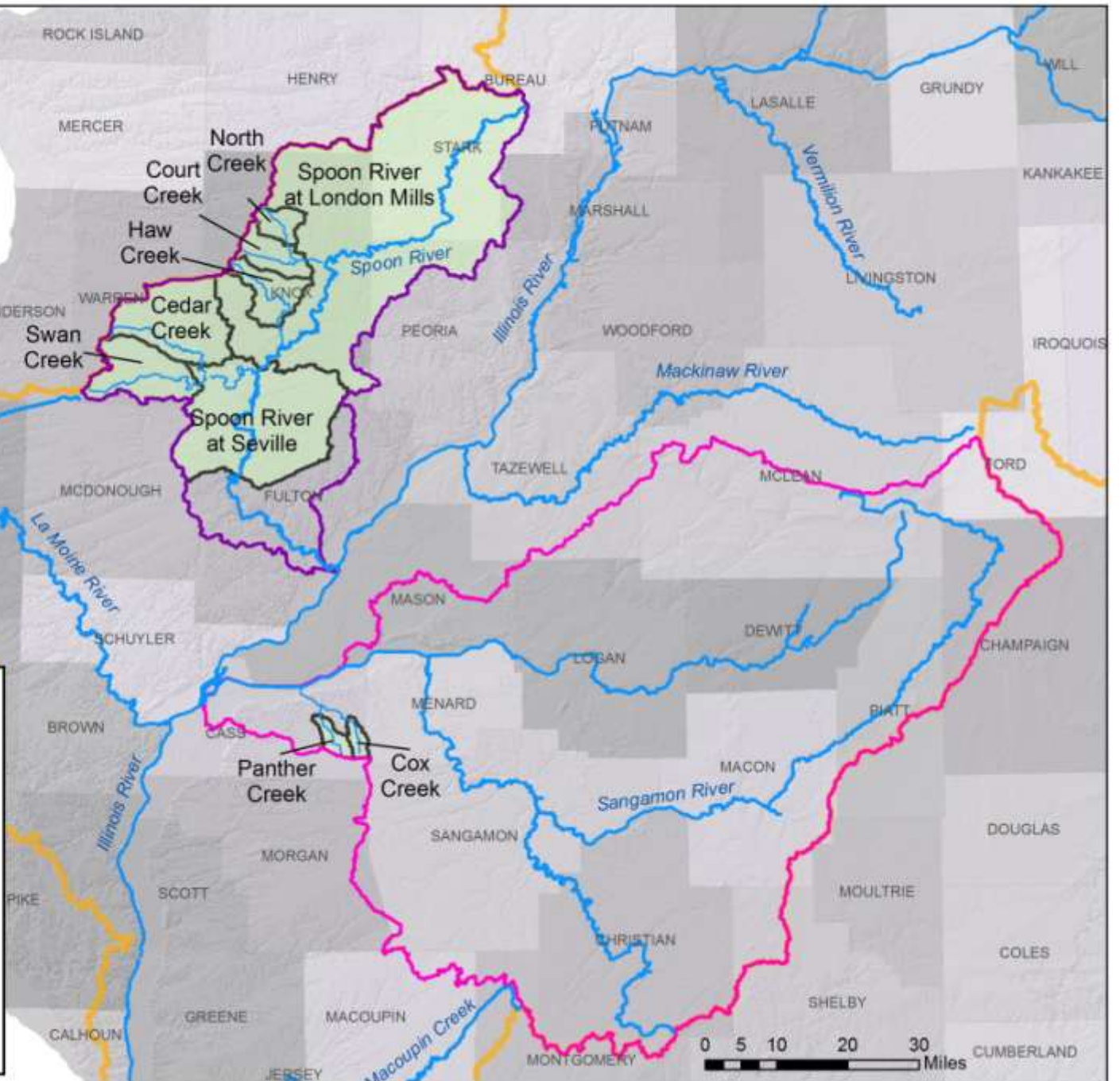
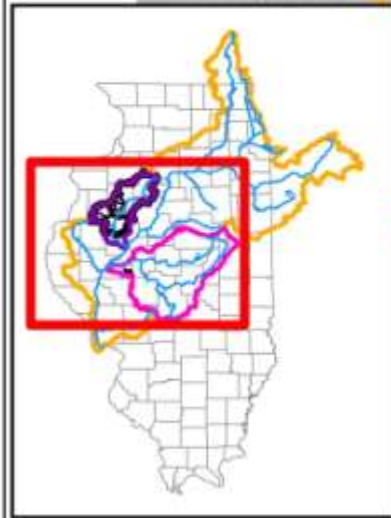
# CREP Intensive Monitoring Stations

<i>Site ID</i>	<i>Name</i>	<i>Drainage Area</i>
<b>Spoon River</b>		
301	Court Creek	66.4 sq mi / 172 sq km
302	North Creek	26.0 sq mi / 67.4 sq km
303	Haw Creek	55.2 sq mi / 143 sq km
305	Swan Creek	98.1 sq mi / 254 sq km
306	Cedar Creek	146.2 sq mi / 379 sq km
<b>Sangamon River</b>		
201	Panther Creek	16.5 sq mi / 42.7 sq km
202	Cox Creek	12.0 sq mi / 31.1 sq km

# Studied Watersheds

## Legend

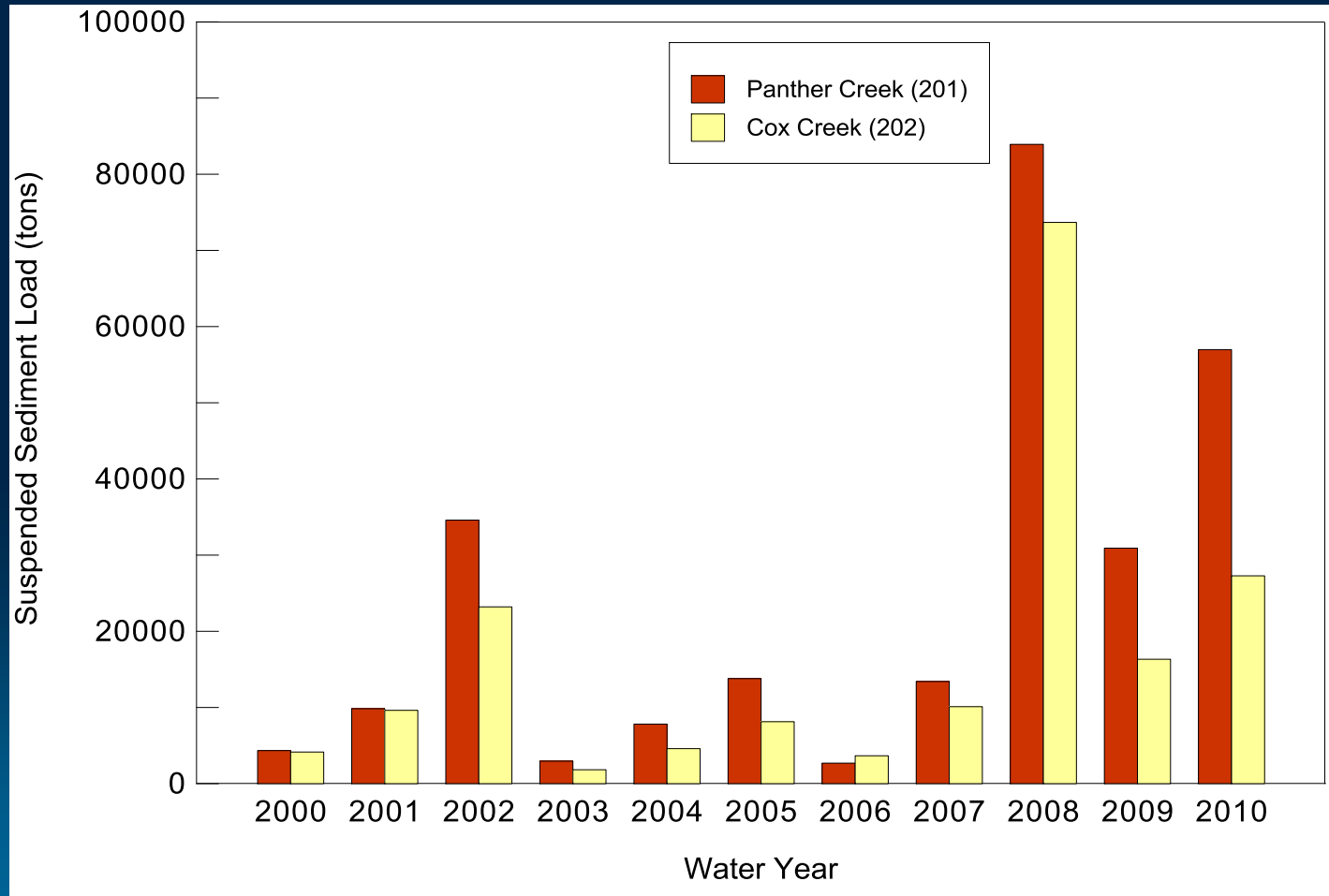
- Illinois River Watershed
- Sangamon Watershed
- Spoon Watershed
- Studied Watersheds
- Major Rivers



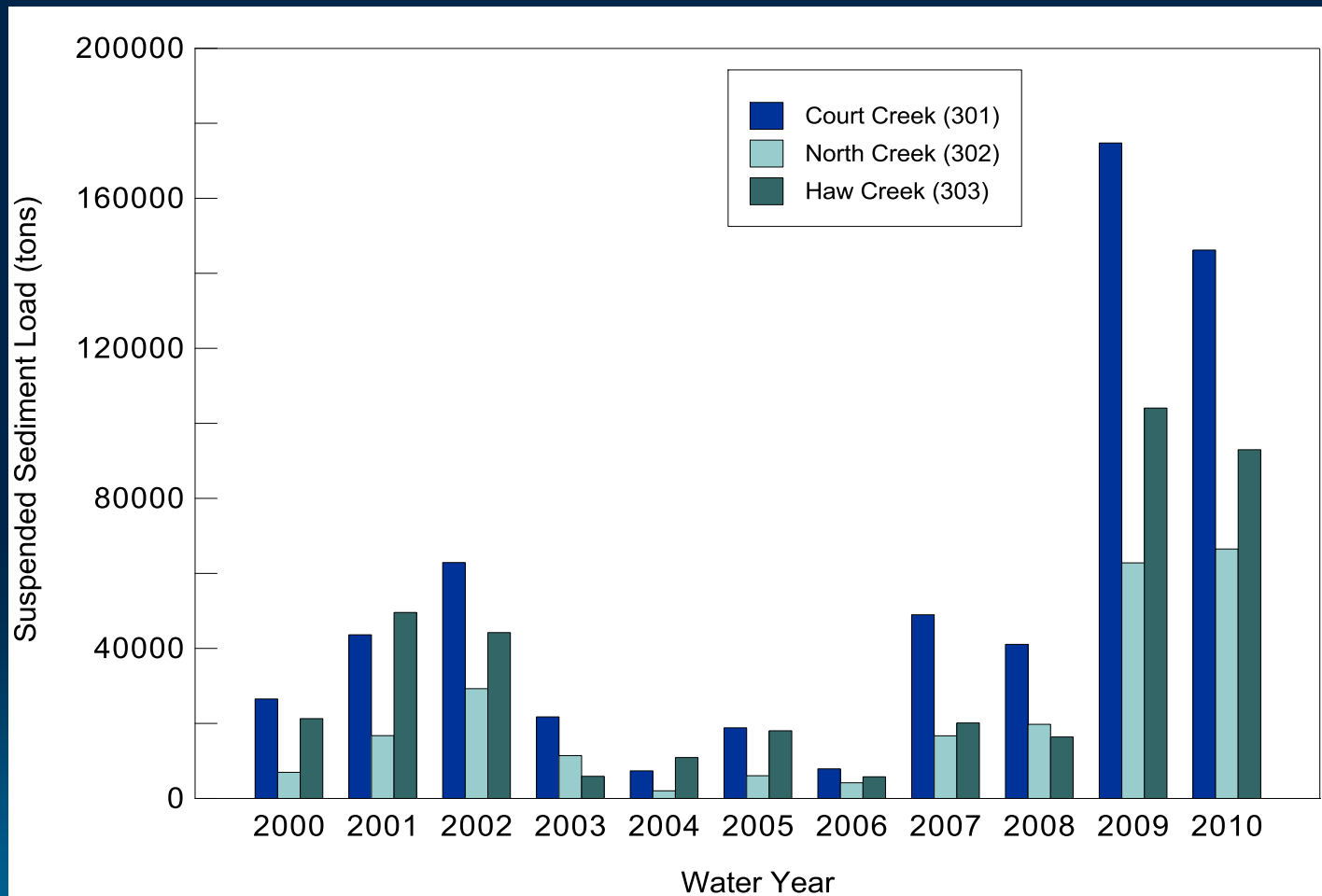
# Monitoring



# CREP Intensive Monitoring Data: Sangamon River Basin

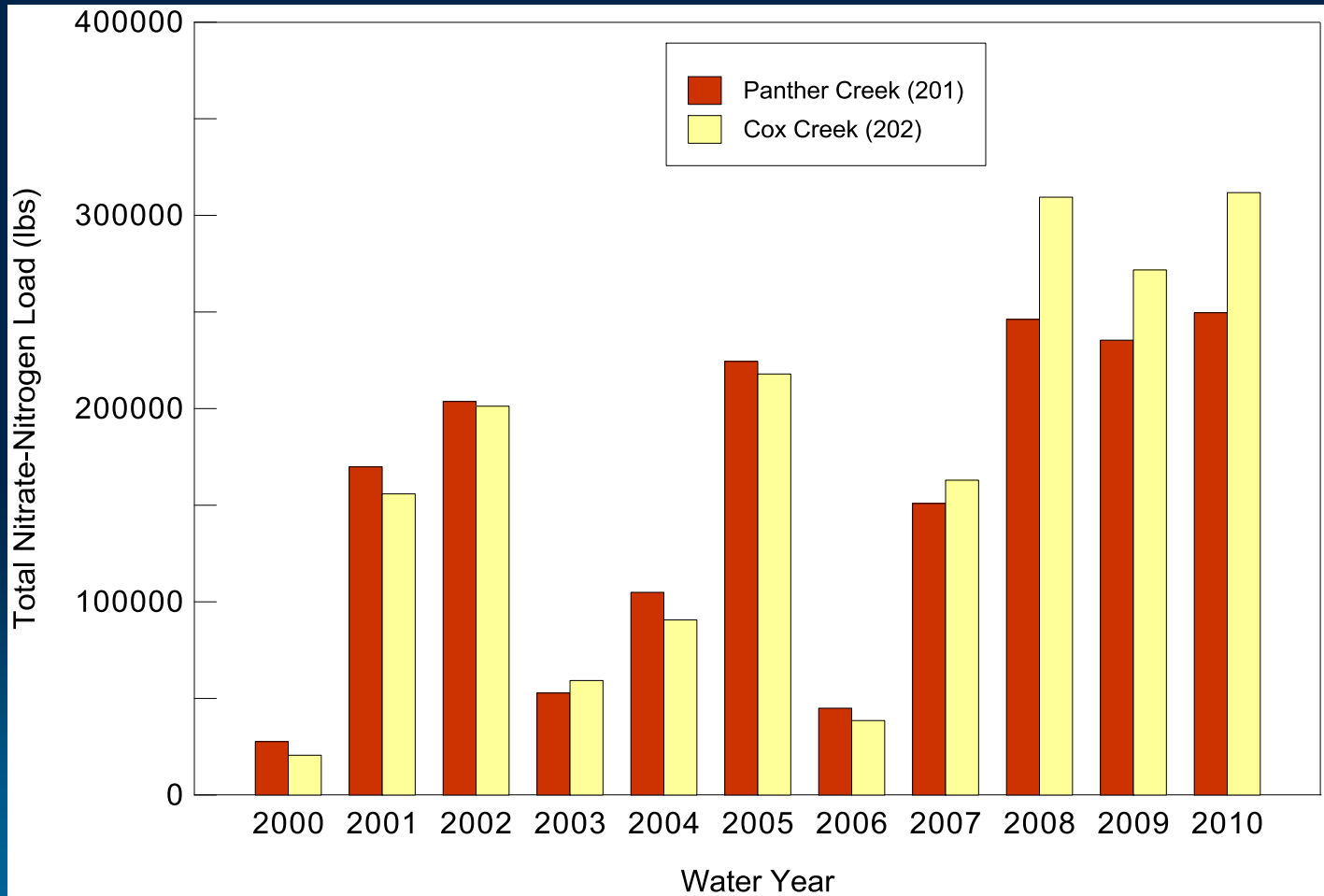


# CREP Intensive Monitoring Data: Spoon River Basin

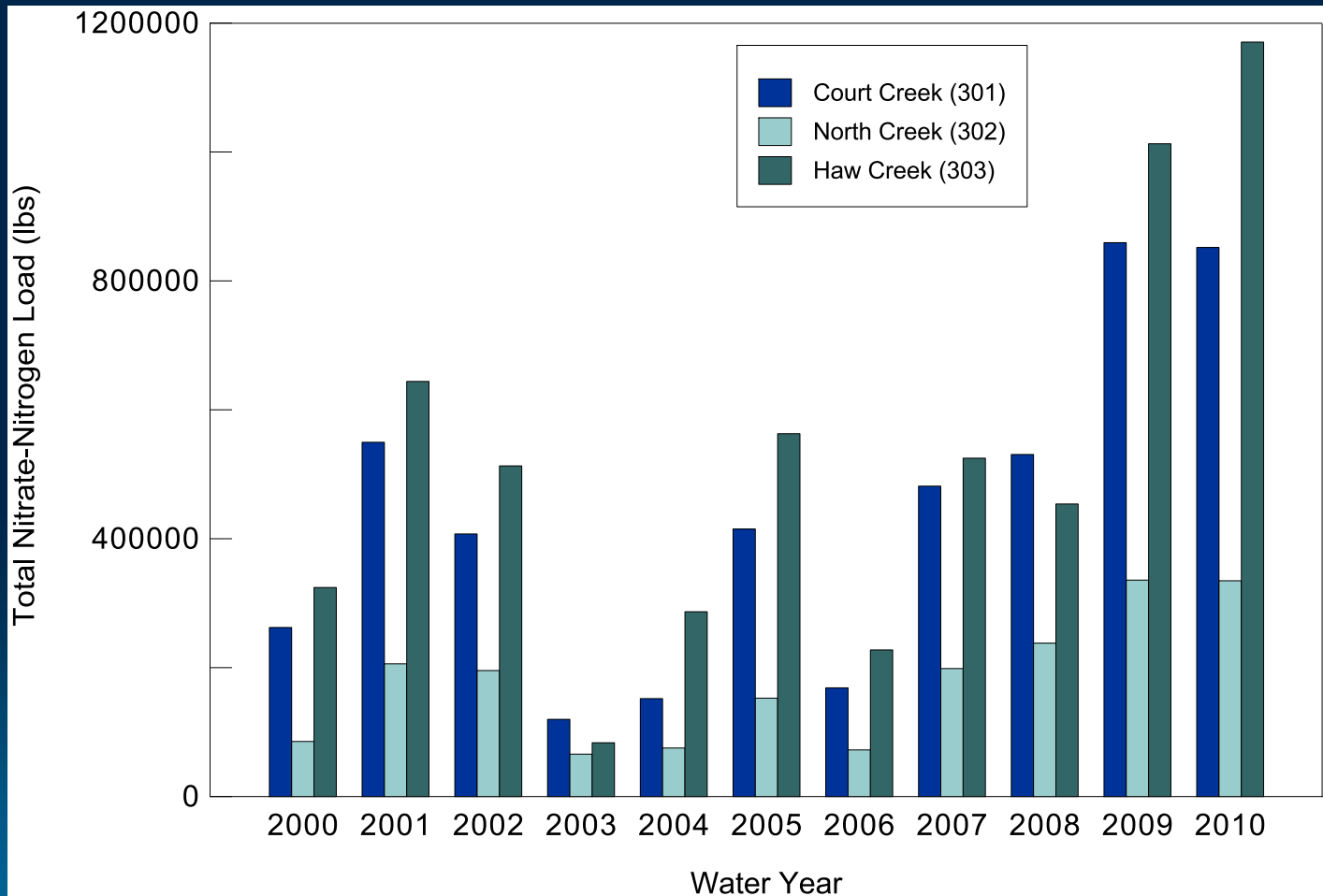




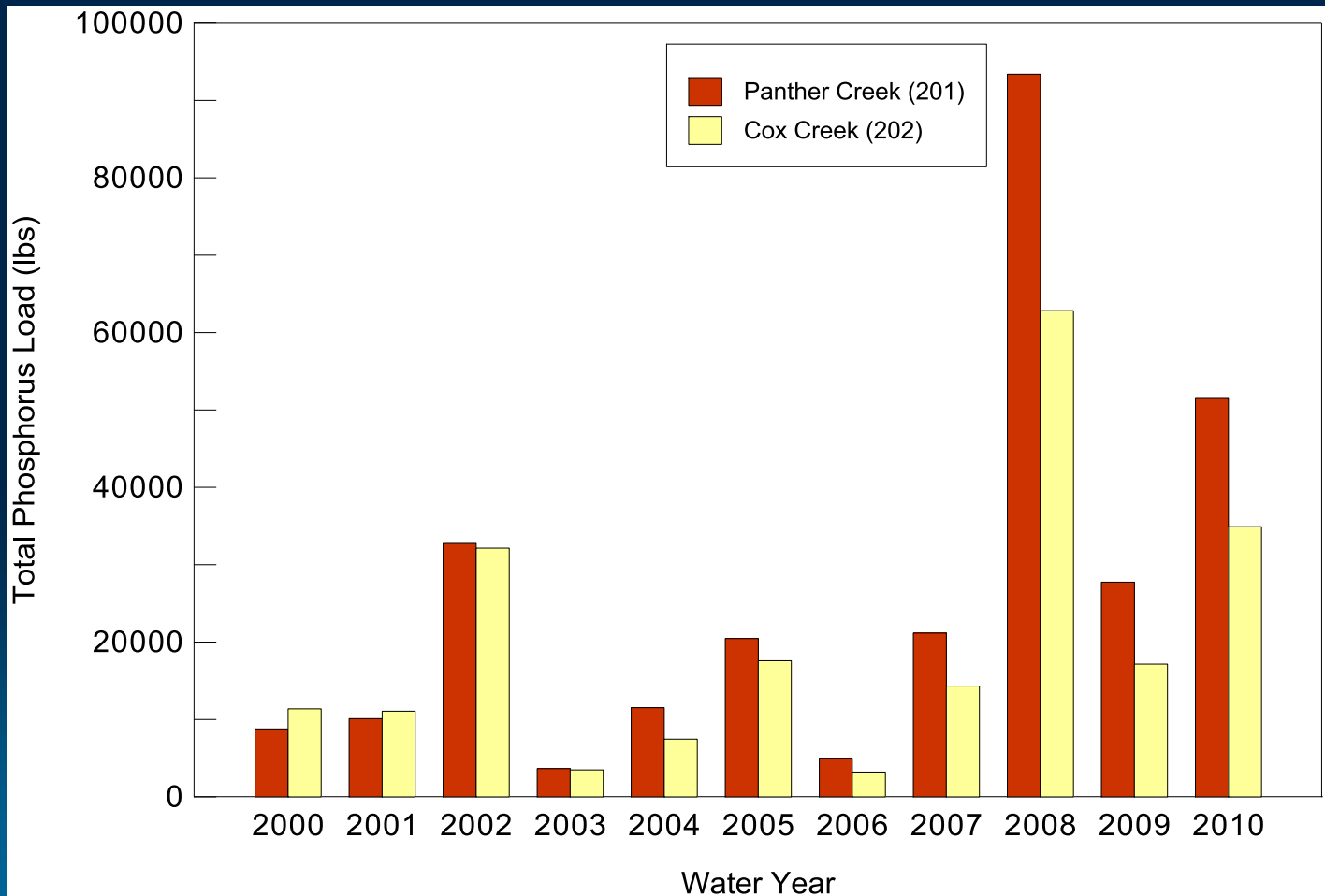
# CREP Intensive Monitoring Data: Sangamon River Basin



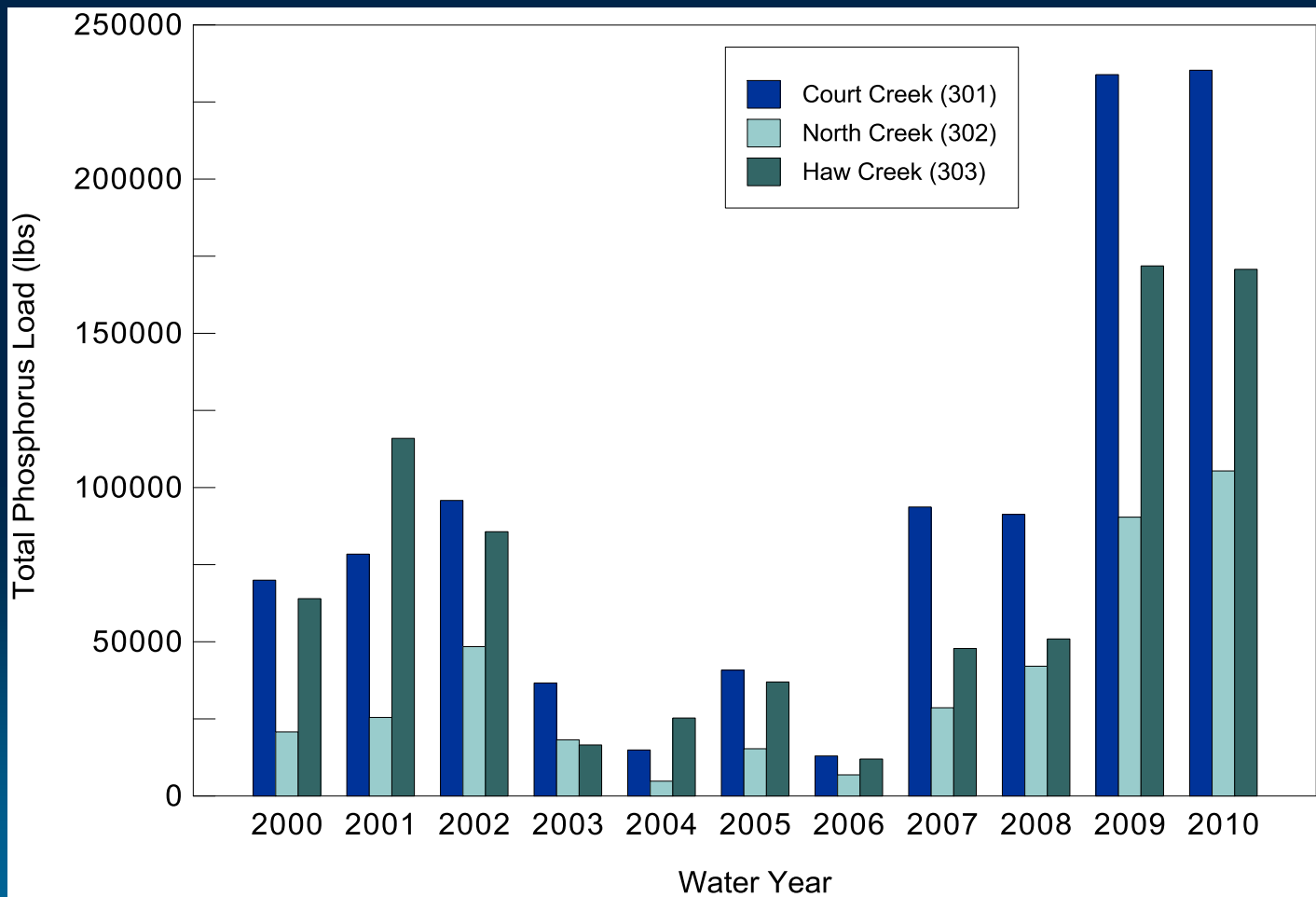
# CREP Intensive Monitoring Data: Spoon River Basin



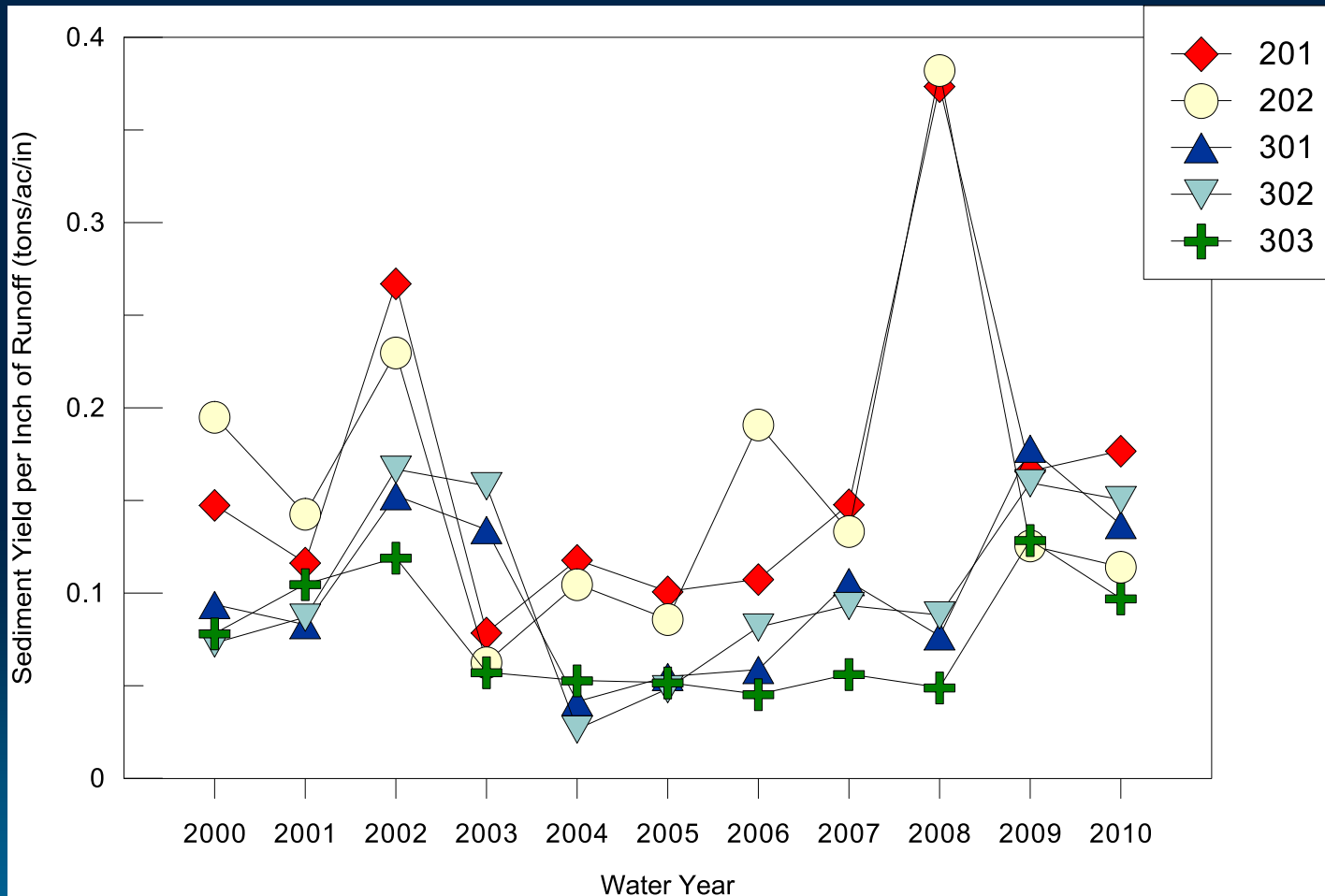
# CREP Intensive Monitoring Data: Sangamon River Basin



# CREP Intensive Monitoring Data: Spoon River Basin

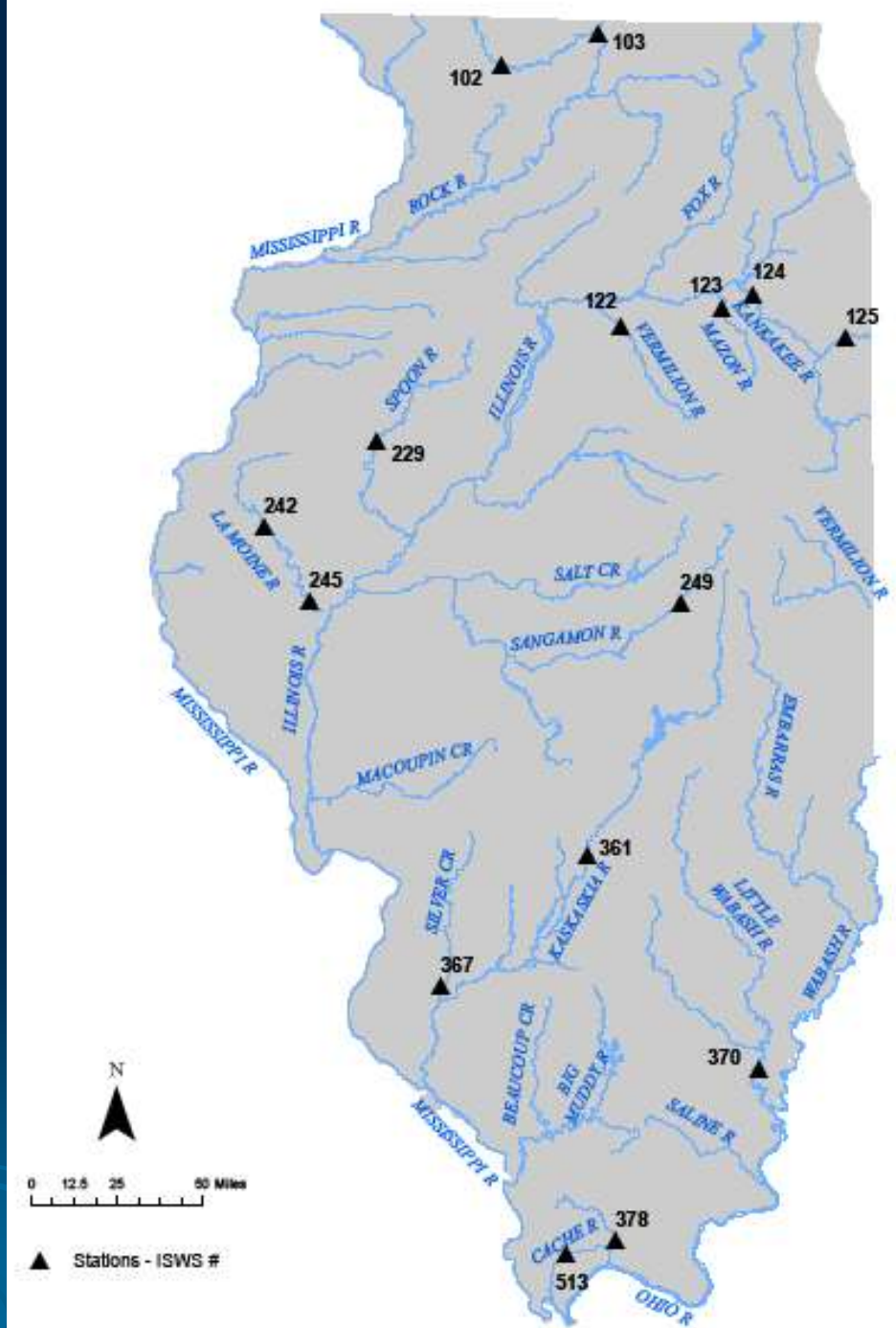


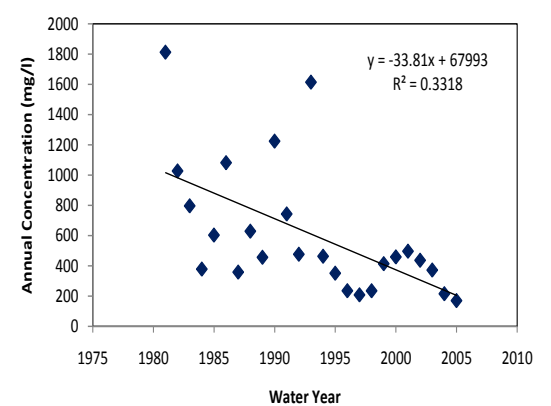
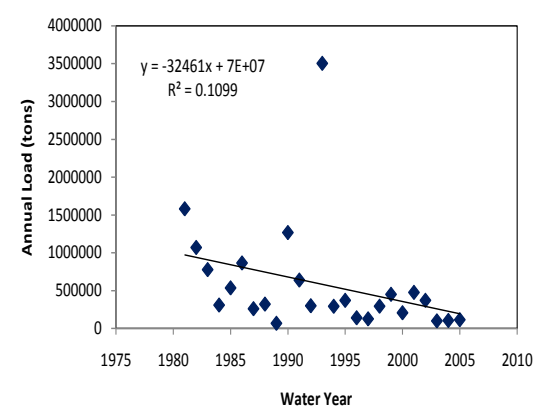
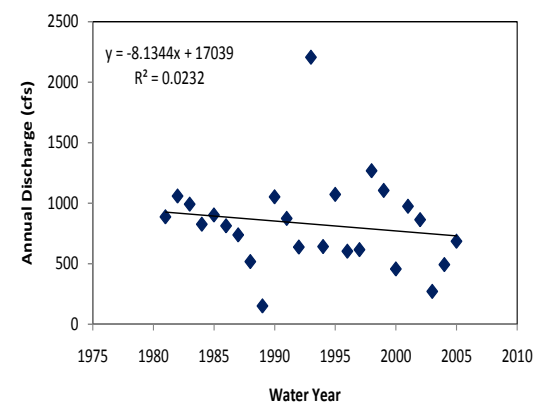
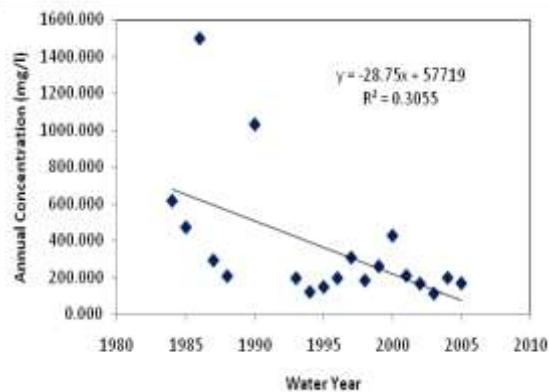
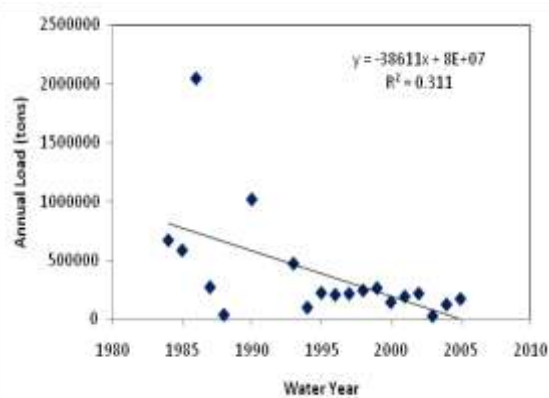
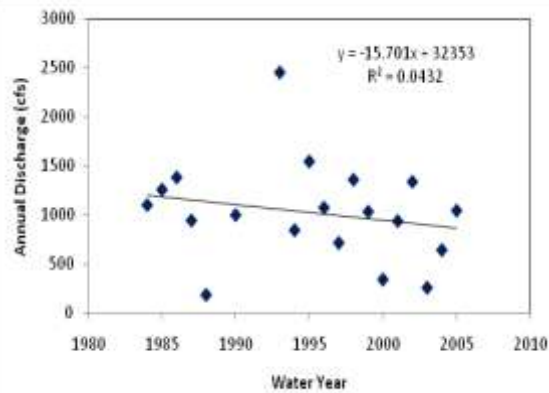
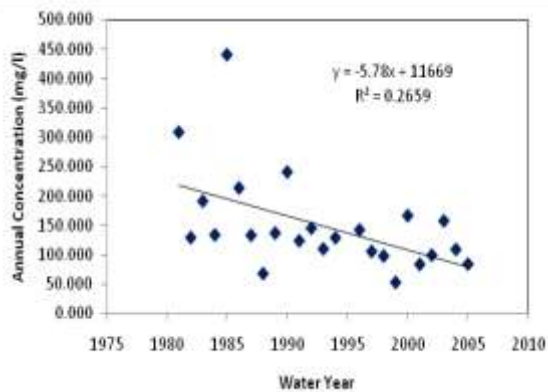
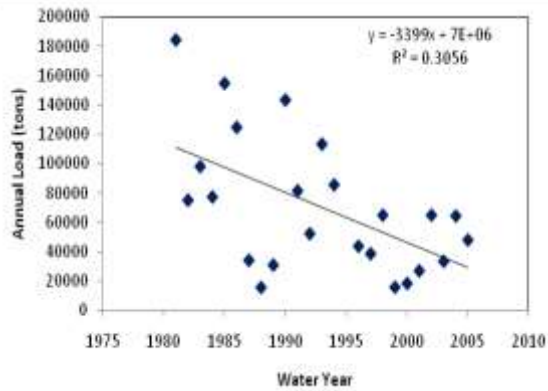
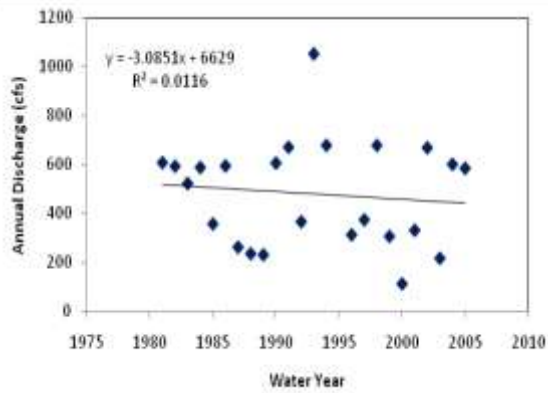
# Variability of sediment yield per inch of runoff for CREP monitoring stations



# Long Term Sediment Trends in the Illinois River Basin

## Illinois Benchmark Sediment Network: Current Stations





**ISWS #249: Sangamon  
at Monticello, IL**

**ISWS #245: La Moine River  
at Ripley, IL**

**ISWS #229: Spoon River  
at London Mills, IL**

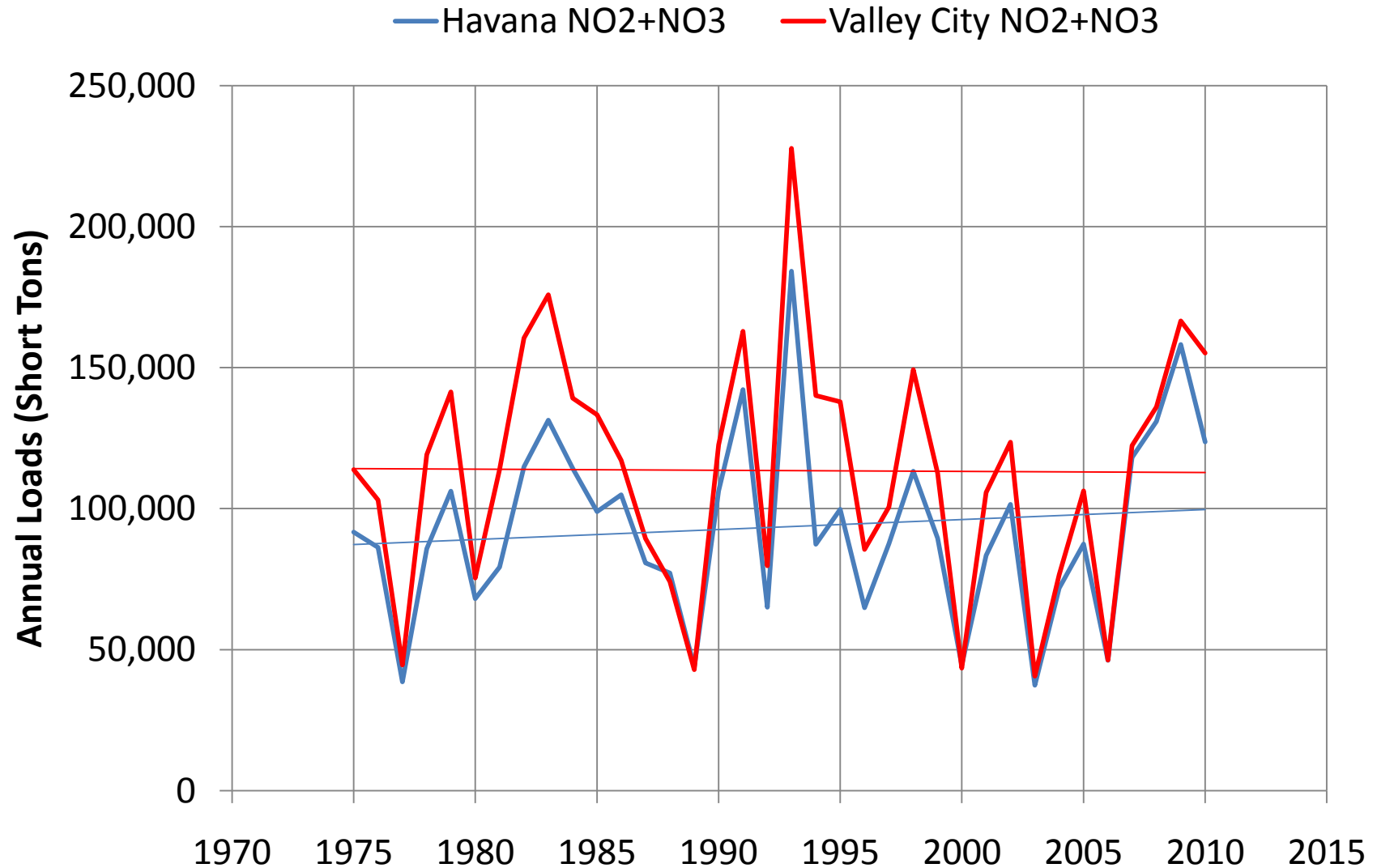
# Long Term Nutrient Trends in the Illinois River Basin



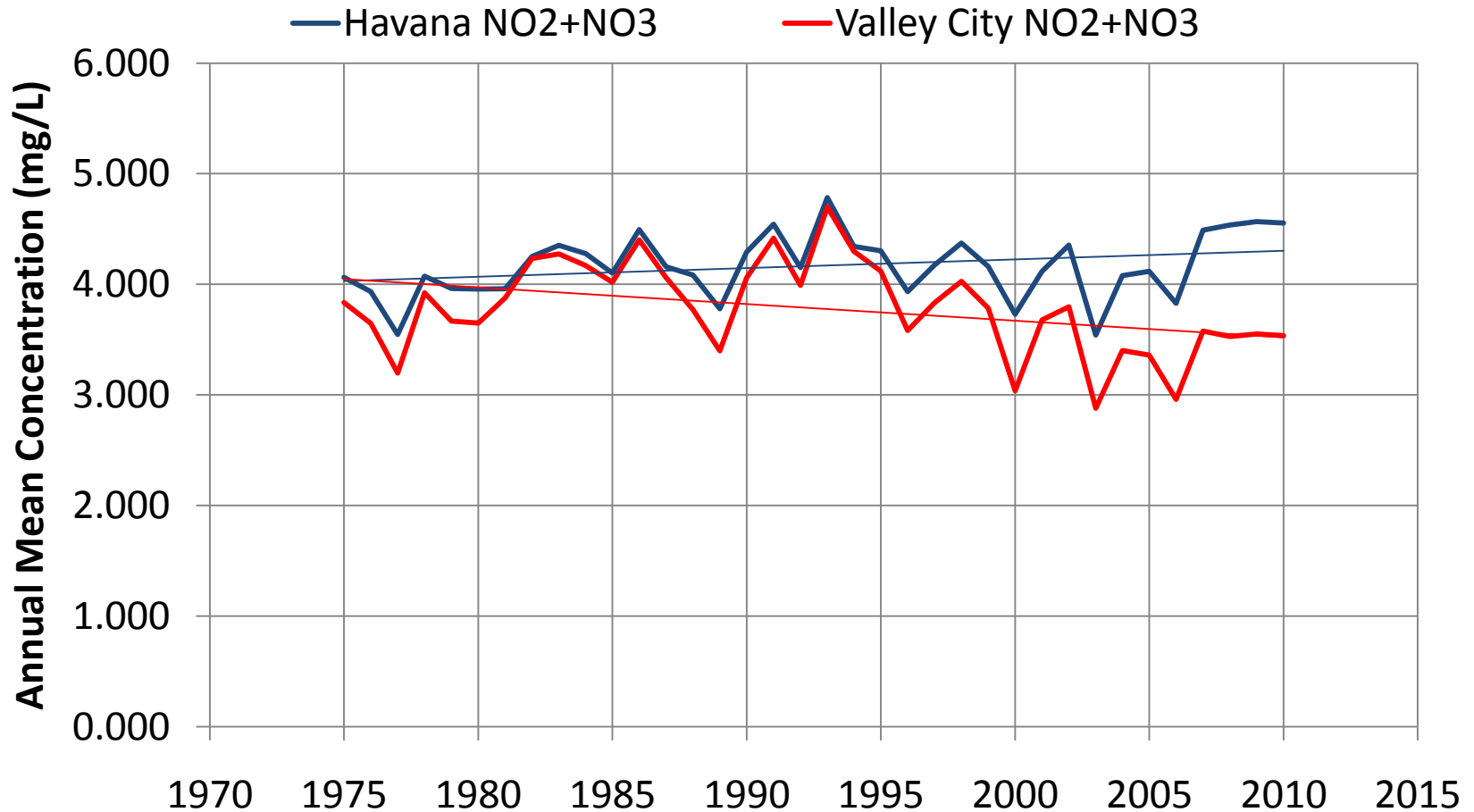


# Nitrate+Nitrite Loads

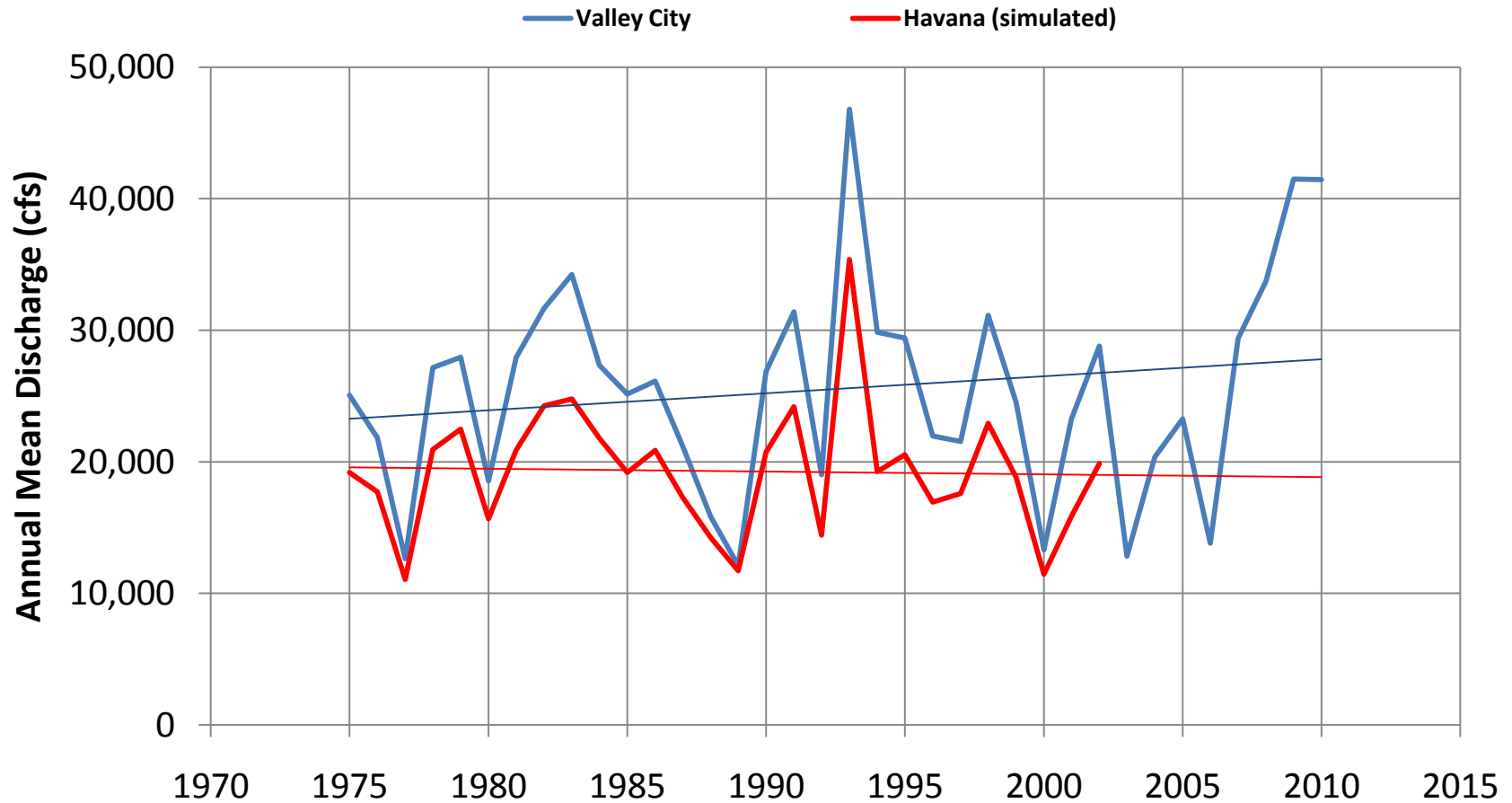
## Lower Illinois River – Main Channel



# Nitrate+Nitrite Concentration Lower Illinois River – Main Channel

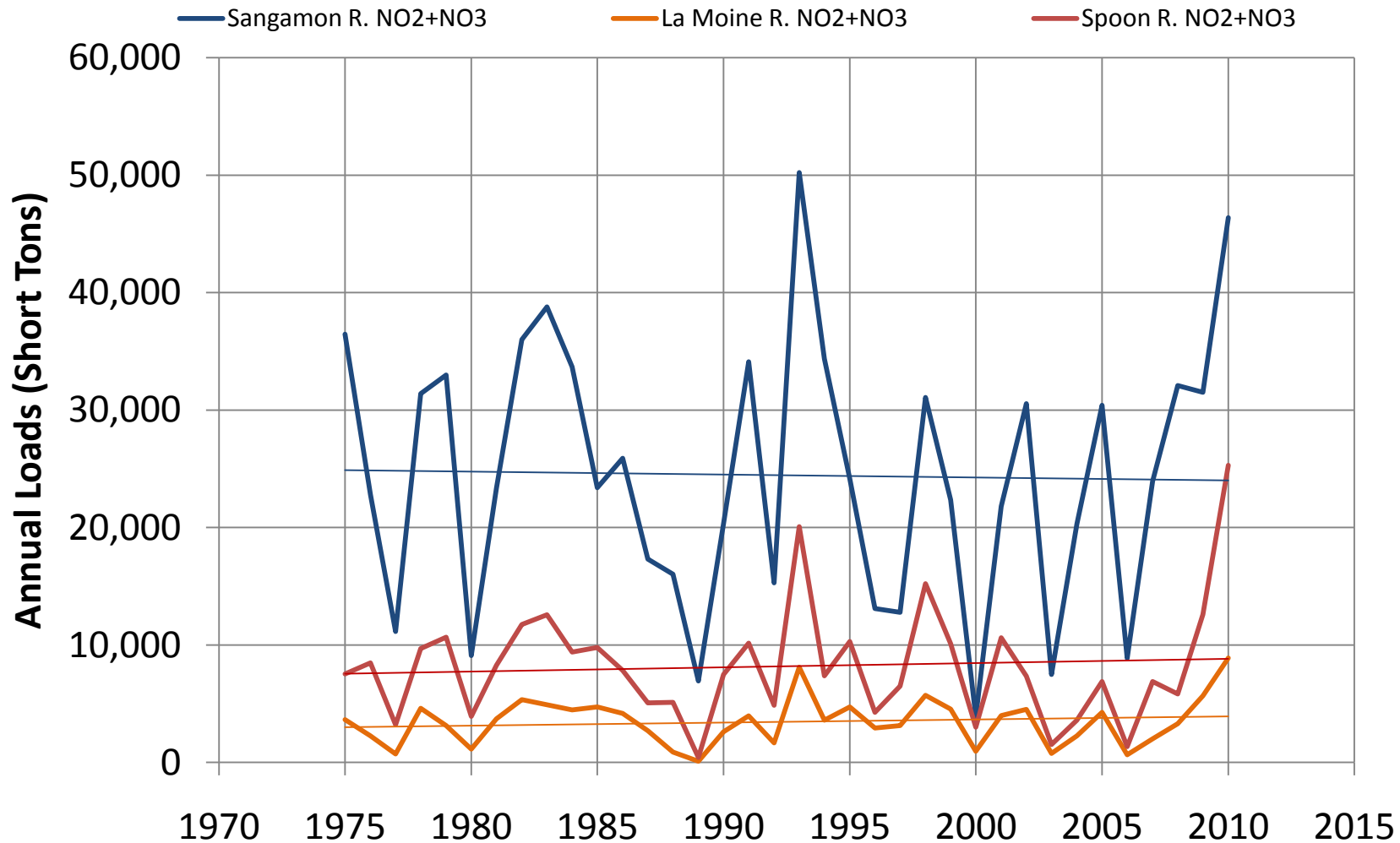


# Discharge (cfs) Lower Illinois River - Main Channel

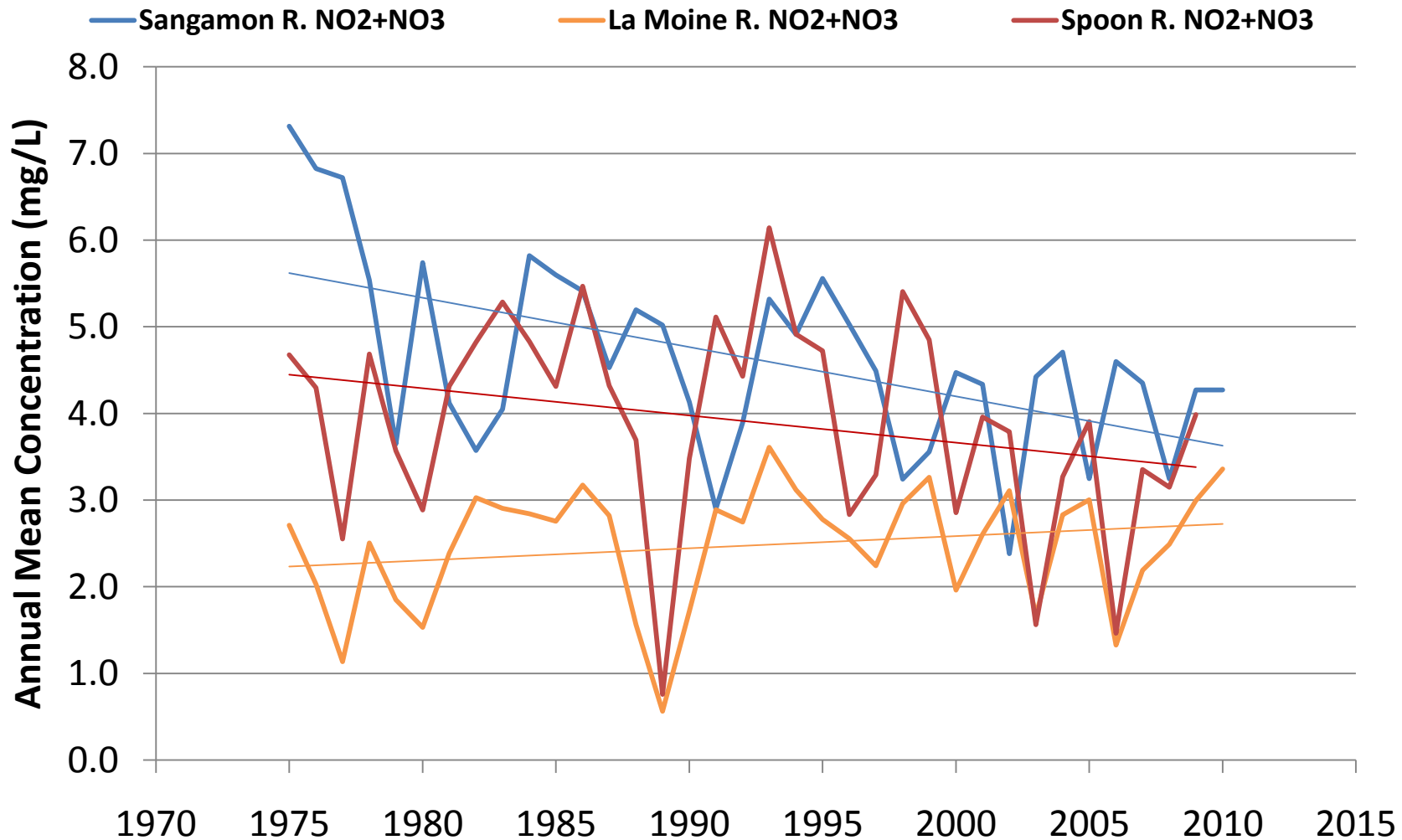


# Nitrate+Nitrite Loads

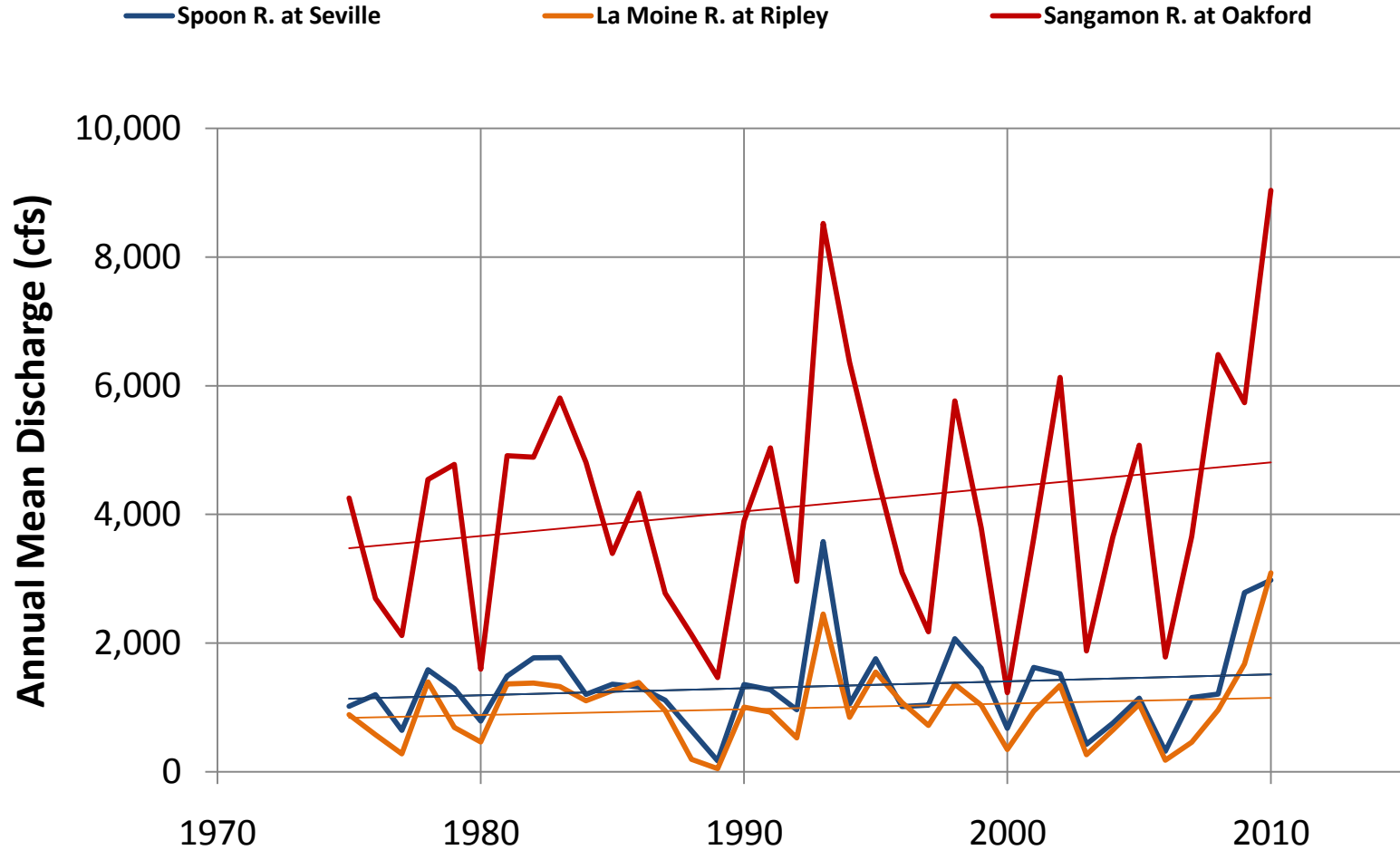
## Lower Illinois River - Tributaries



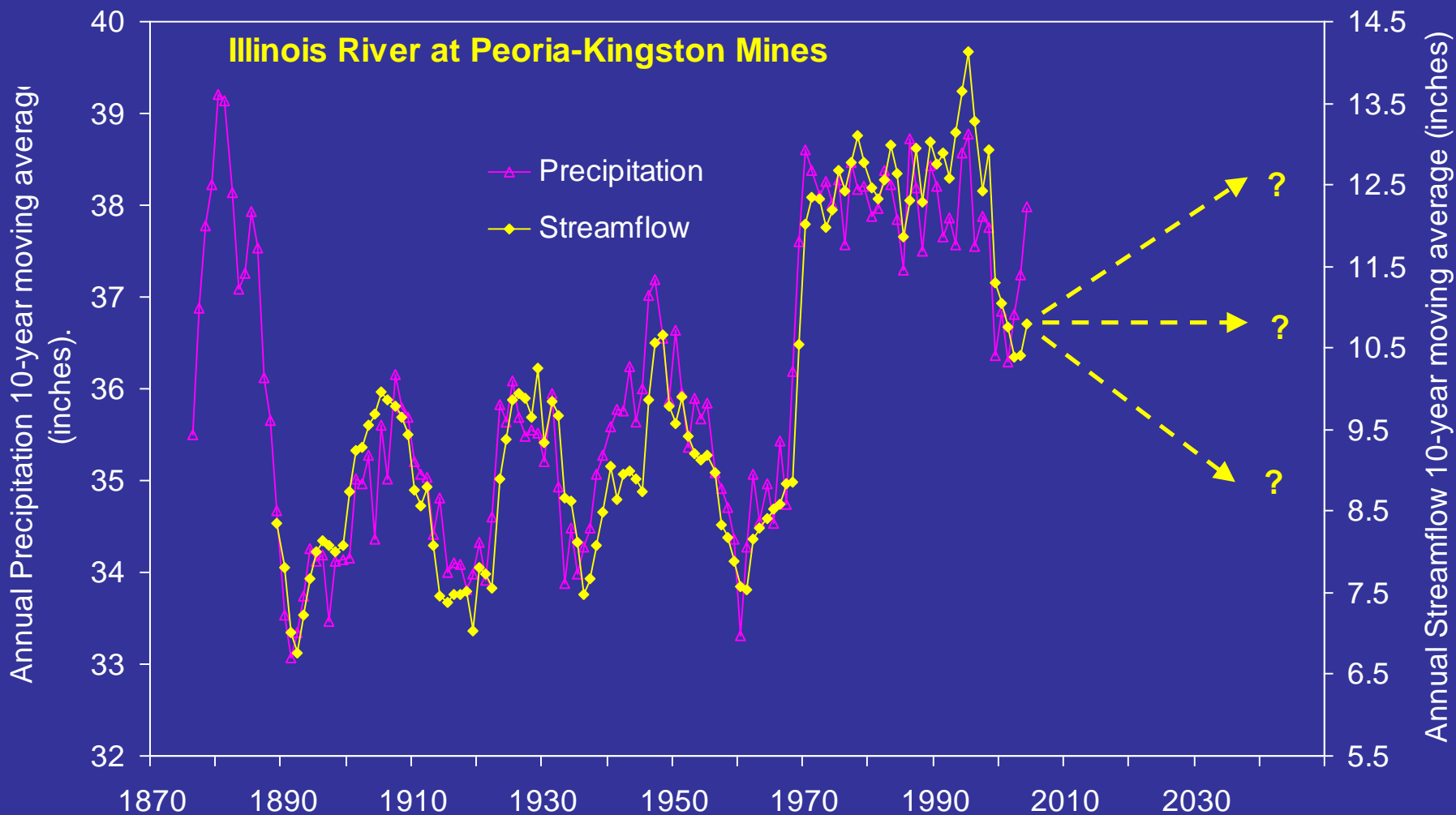
# Nitrate+Nitrite Concentrations Lower Illinois River - Tributaries



# Discharge (cfs) Lower Illinois River - Tributaries



# Trends in Streamflow and Precipitation: Illinois River



***Thank You!***

***<http://www.isws.illinois.edu/>***

