

# **Sediment Monitoring: What good is it anyway??!?!?**

USGS Water Resources Discipline

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THE MARCH TO THE ARCH  
ILLINOIS BASKETBALL 2004-2005

- “It is a capital mistake to theorize before one has data.... Insensibly, one begins to twist facts to suit theories, instead of theories to suit facts.”

--Sir Arthur Conan Doyle (1859-1930)



- “As a general rule, the most successful man in life is the man who has the best information.”

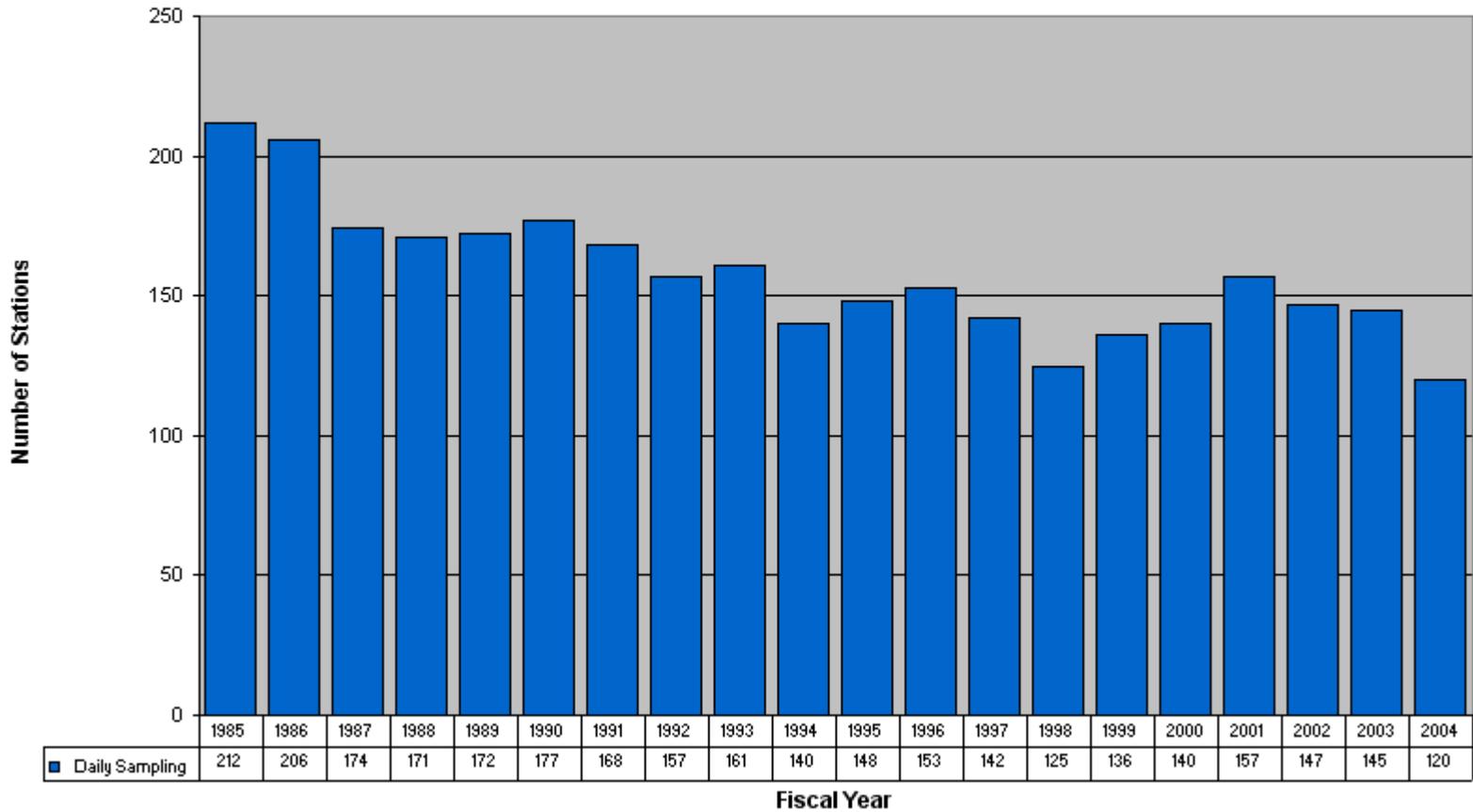
--Benjamin Disraeli (1804-1881)

# Topics I'll cover--

- Fundamentals of how USGS sediment stations operate
- Some applications of USGS sediment data

OPERATION OF HYDROLOGIC DATA-COLLECTION STATIONS BY THE  
USGS - NATIONAL TOTALS  
1983-2004

### Sediment Stations Daily Sampling



# Hydrologic Data-Collection Sites In And Adjacent To Illinois

[Help](#)

Find:

Show stations by year(s):

All years
All Years
2004

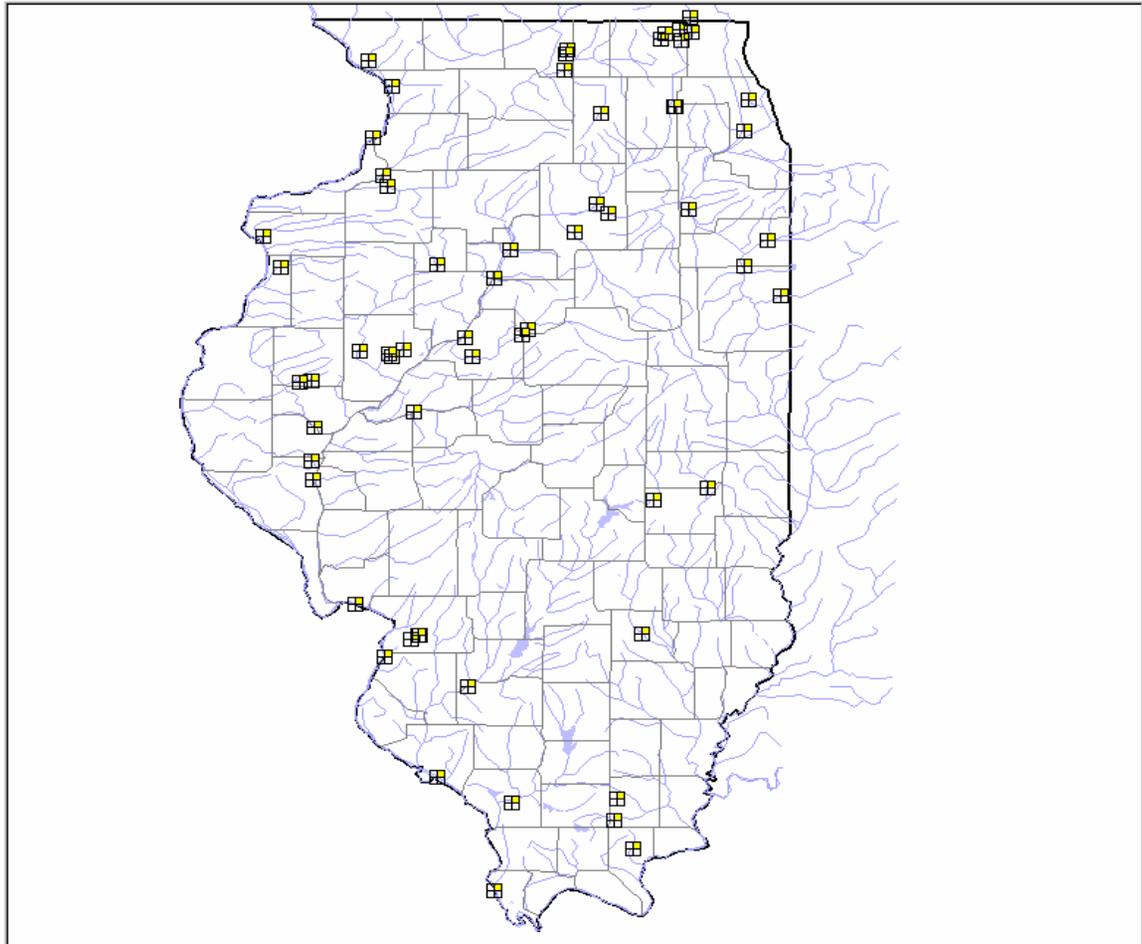
### EXPLANATION

#### Data types

- Discharge
- Stage
- Sediment
- Biology
- Surface-water Quality
- Meteorology
- Ground-water Levels
- Ground-water Quality

#### Features

- State Boundaries
- Municipalities
- Streams
- River Basins
- Counties
- State Highways
- U.S. Highways
- Interstate Highways



Zoom



Fit to Window

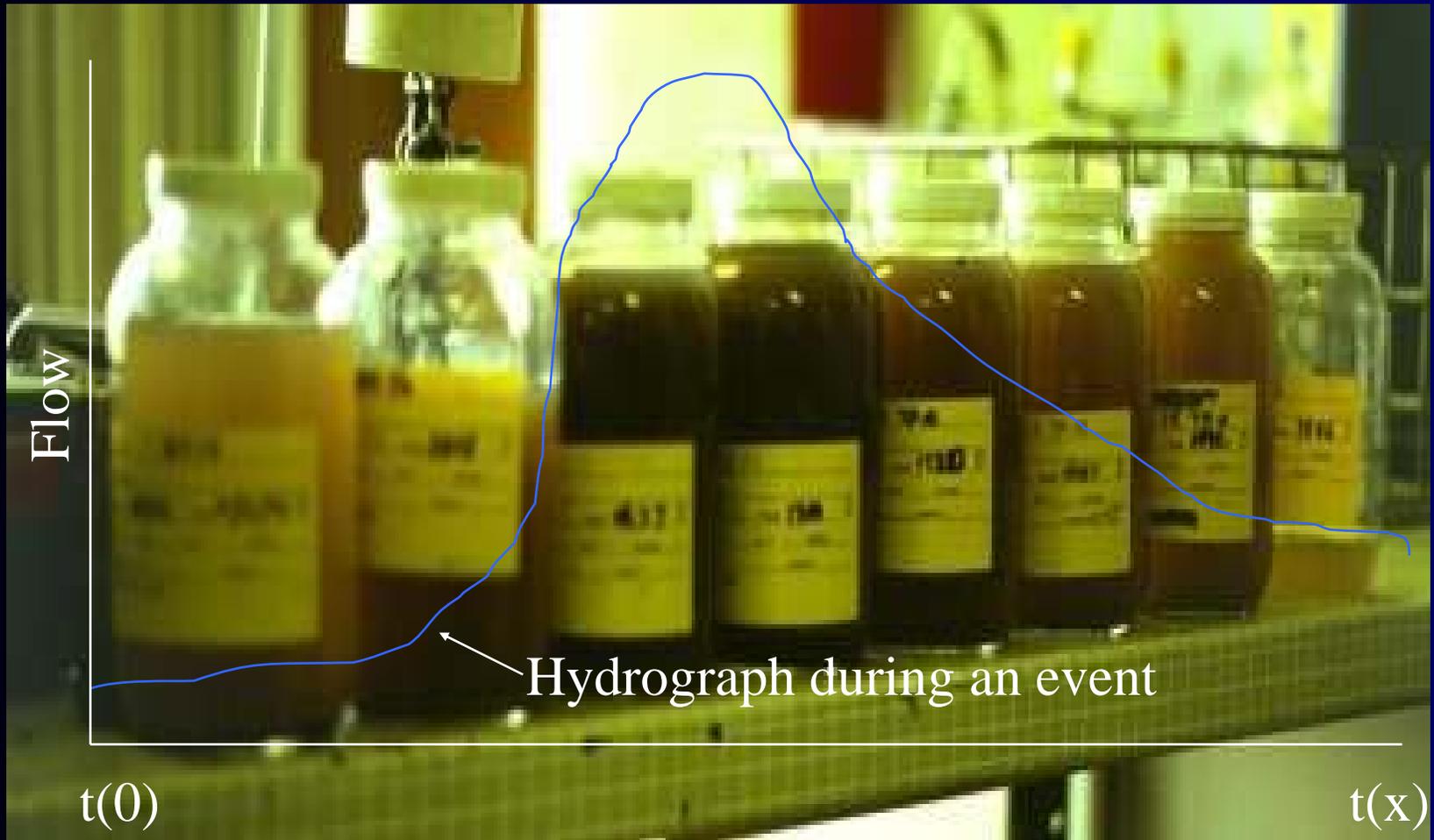


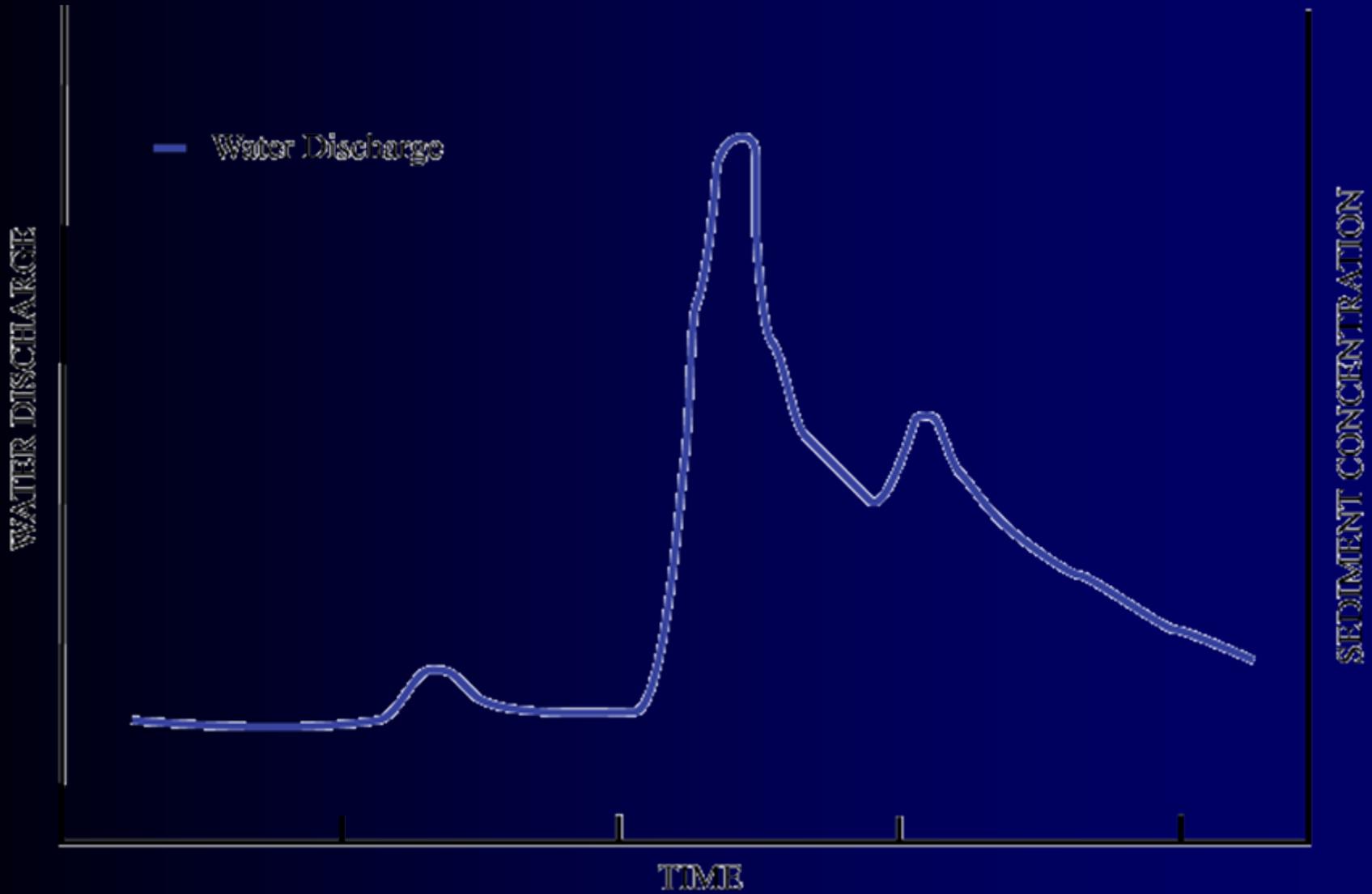
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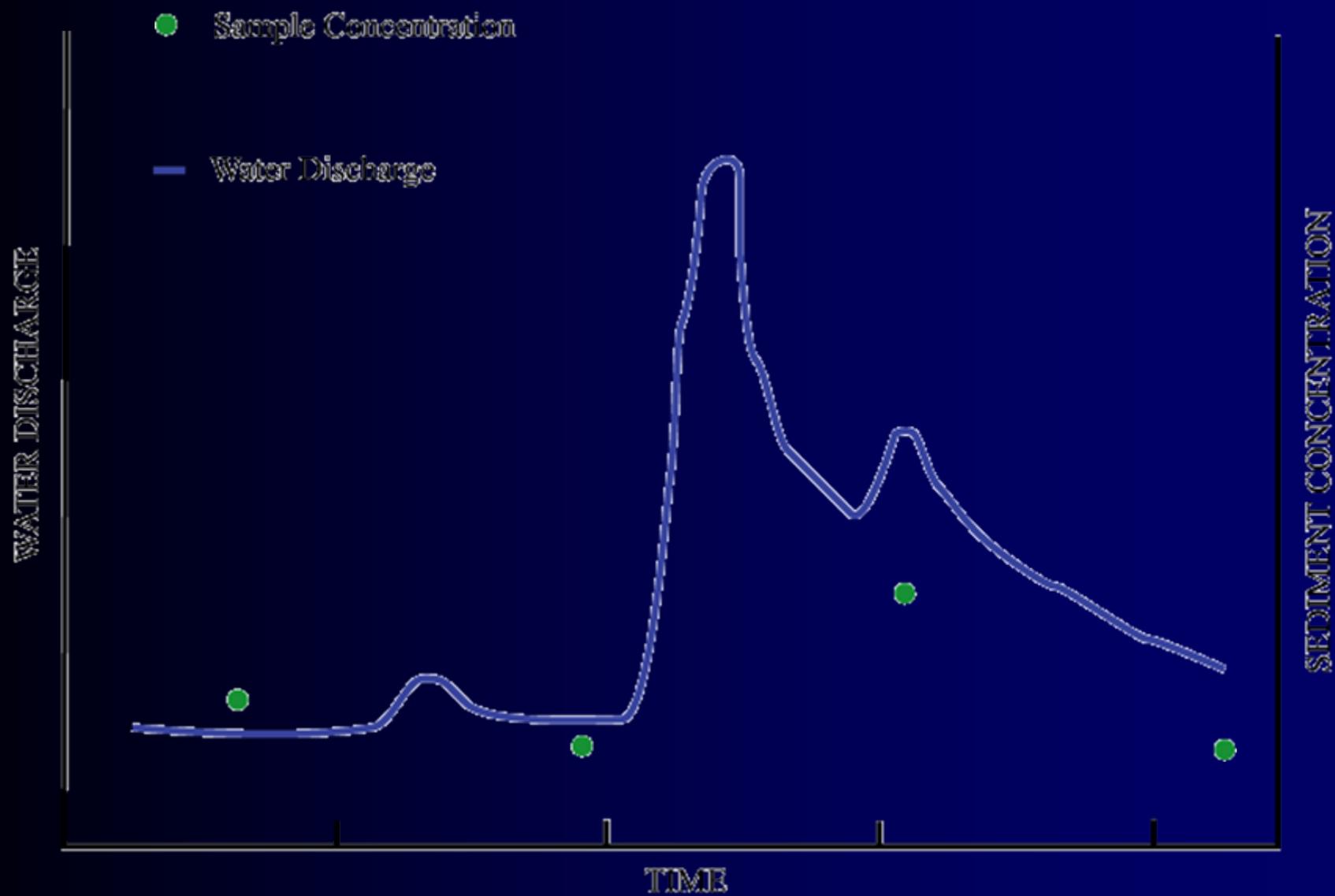
Sugar Creek

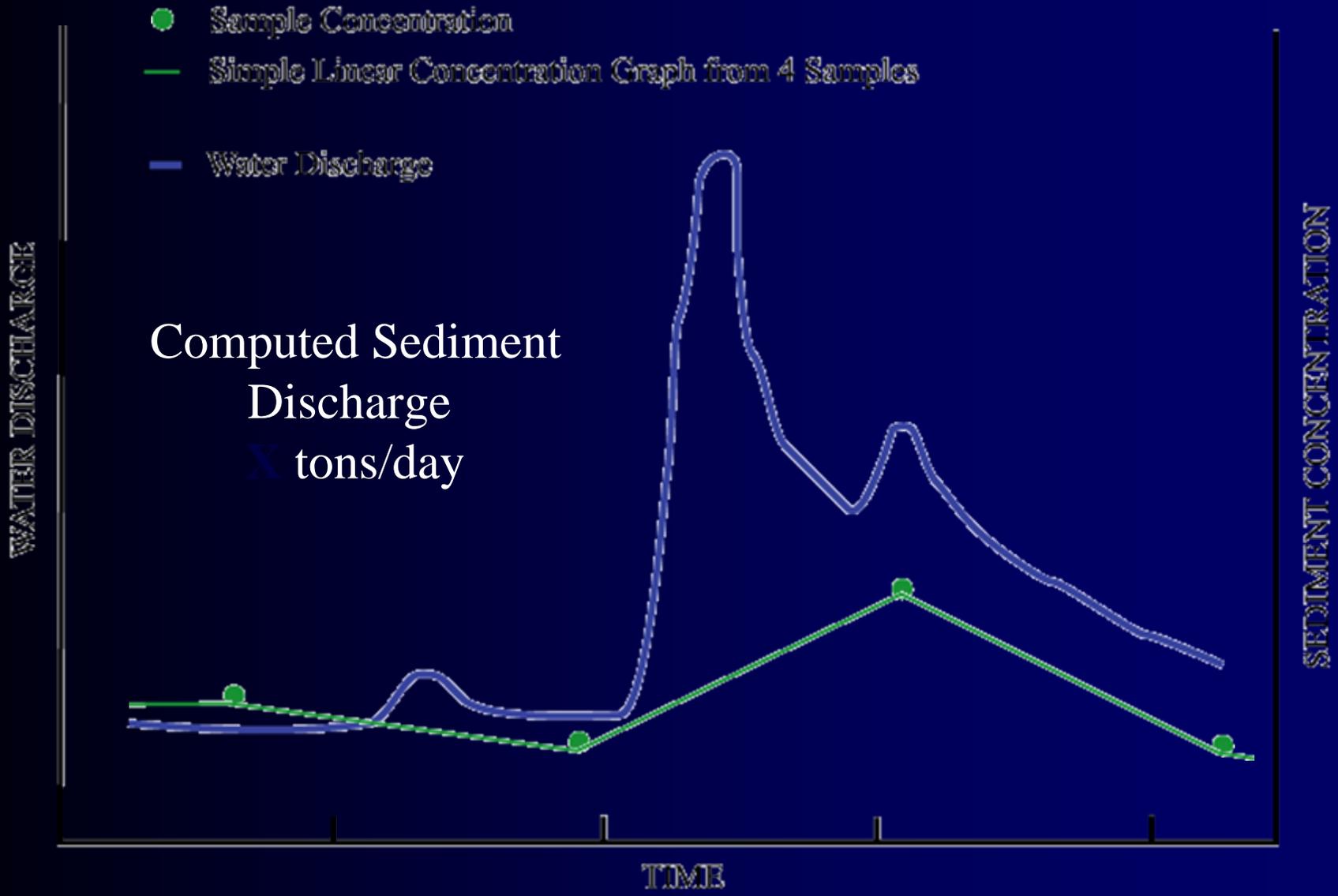


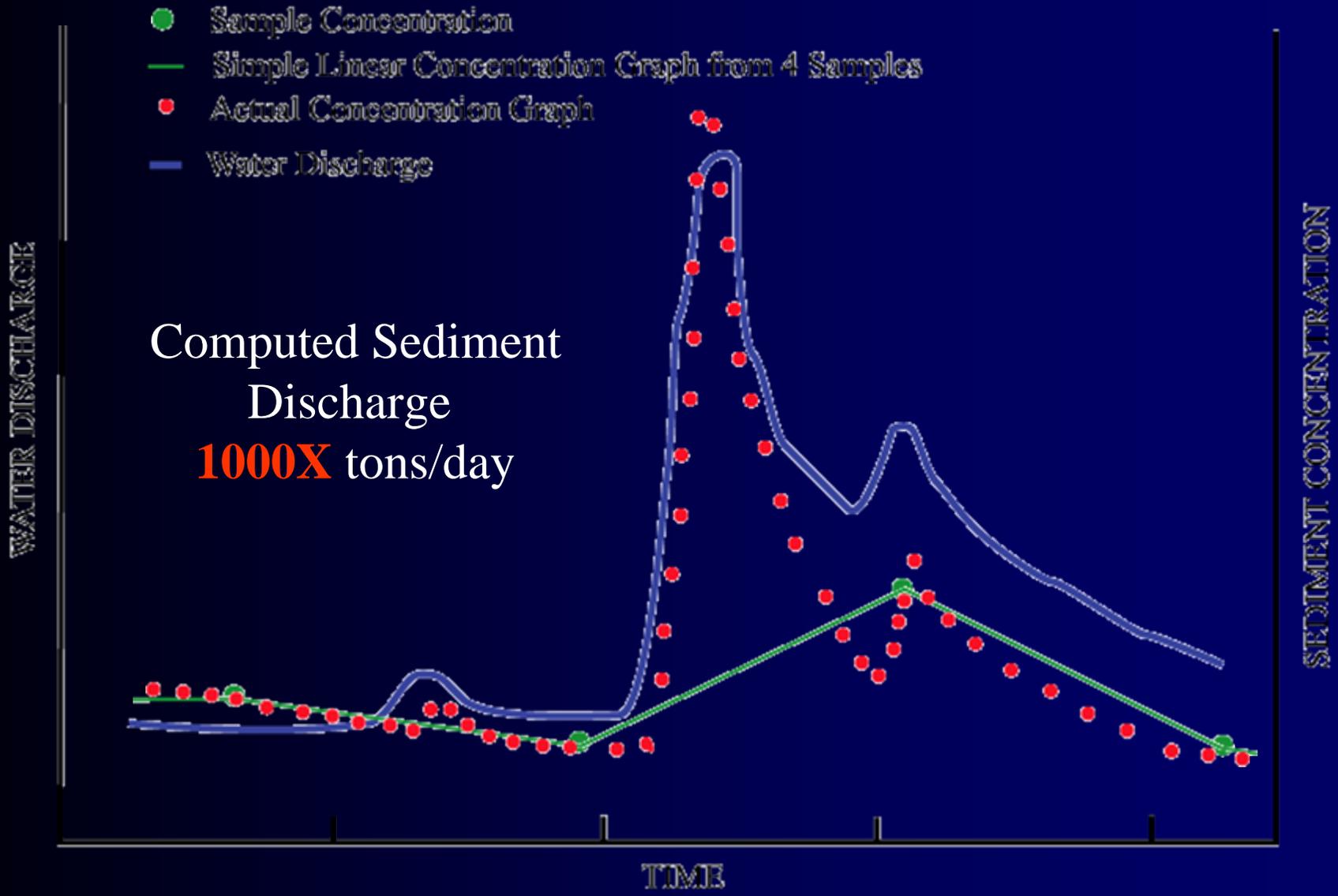
# Sediment concentration varies by time...











# Fundamentals of how our sediment stations operate

- Local “Observer”
  - Collects samples twice/wk during low flow
  - Collects at least one per day during floods
- USGS Cross-sections
  - Used to mathematically adjust observer samples
  - ~8 per year
- Samples to USGS Kentucky Lab

# Local observer “box sampler”



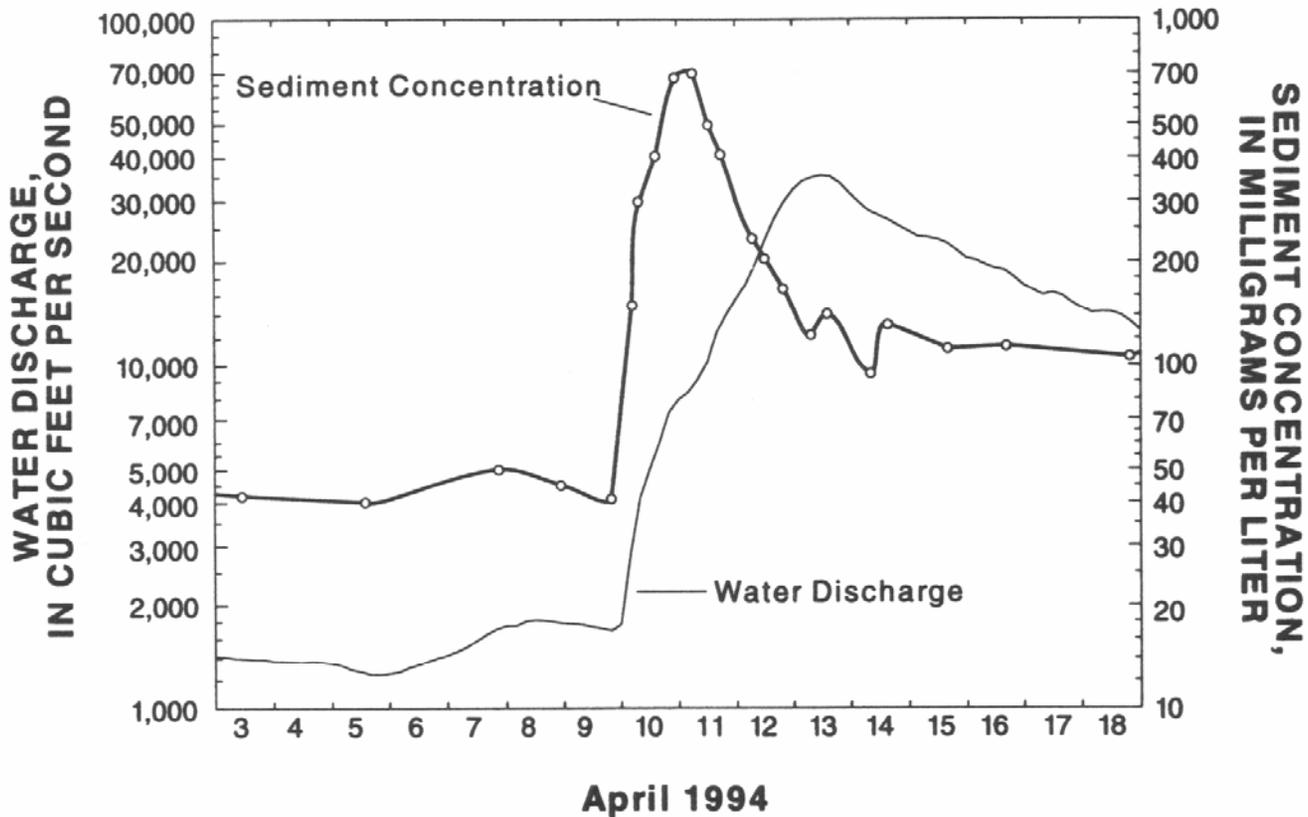


# Auto-Sampler Station

- Uses stage sensing device to “trigger” samples
- Very reliable
- Great for very flashy streams

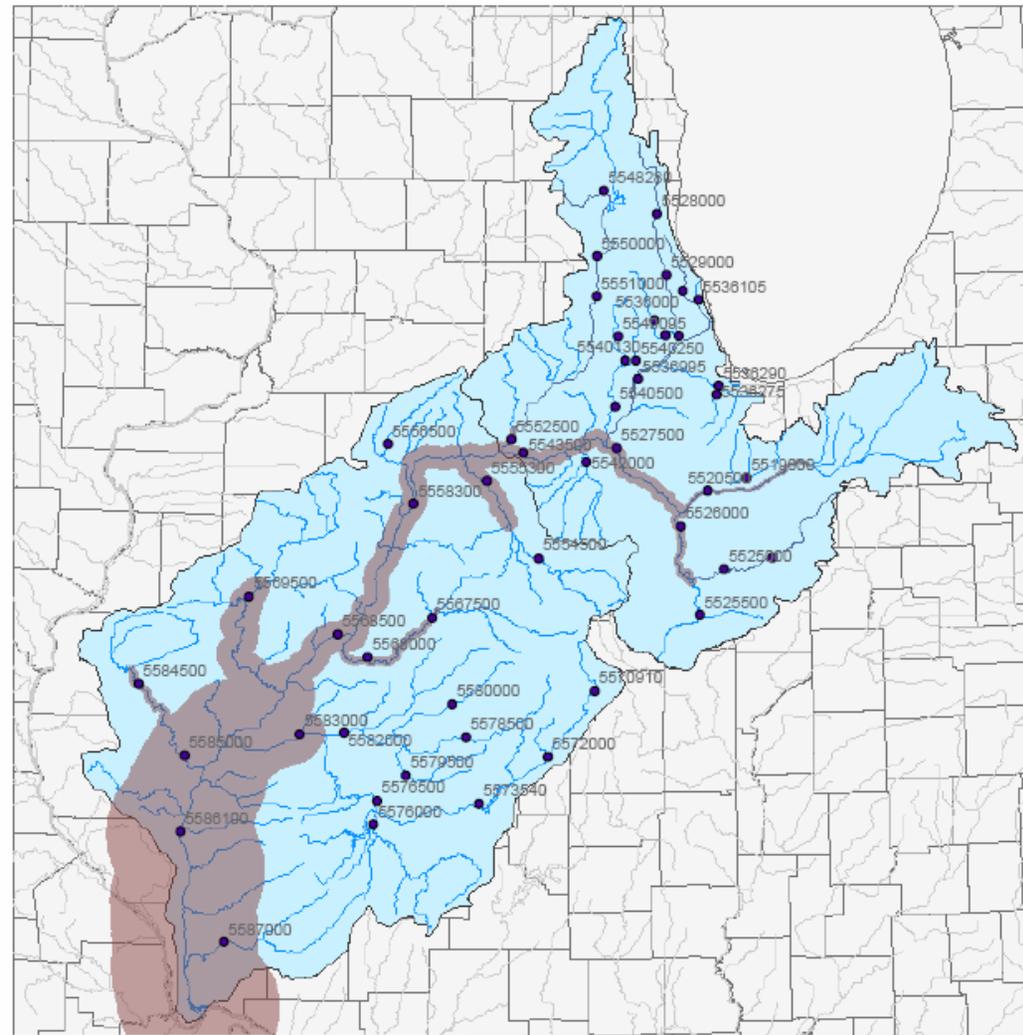
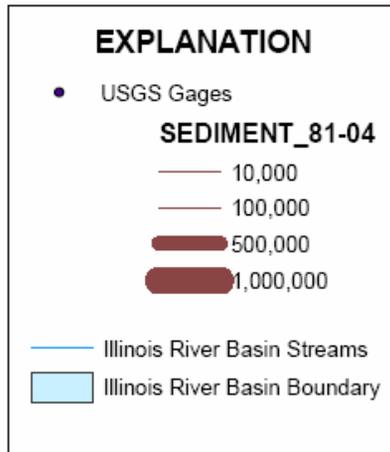


# Computation/publication of sediment record



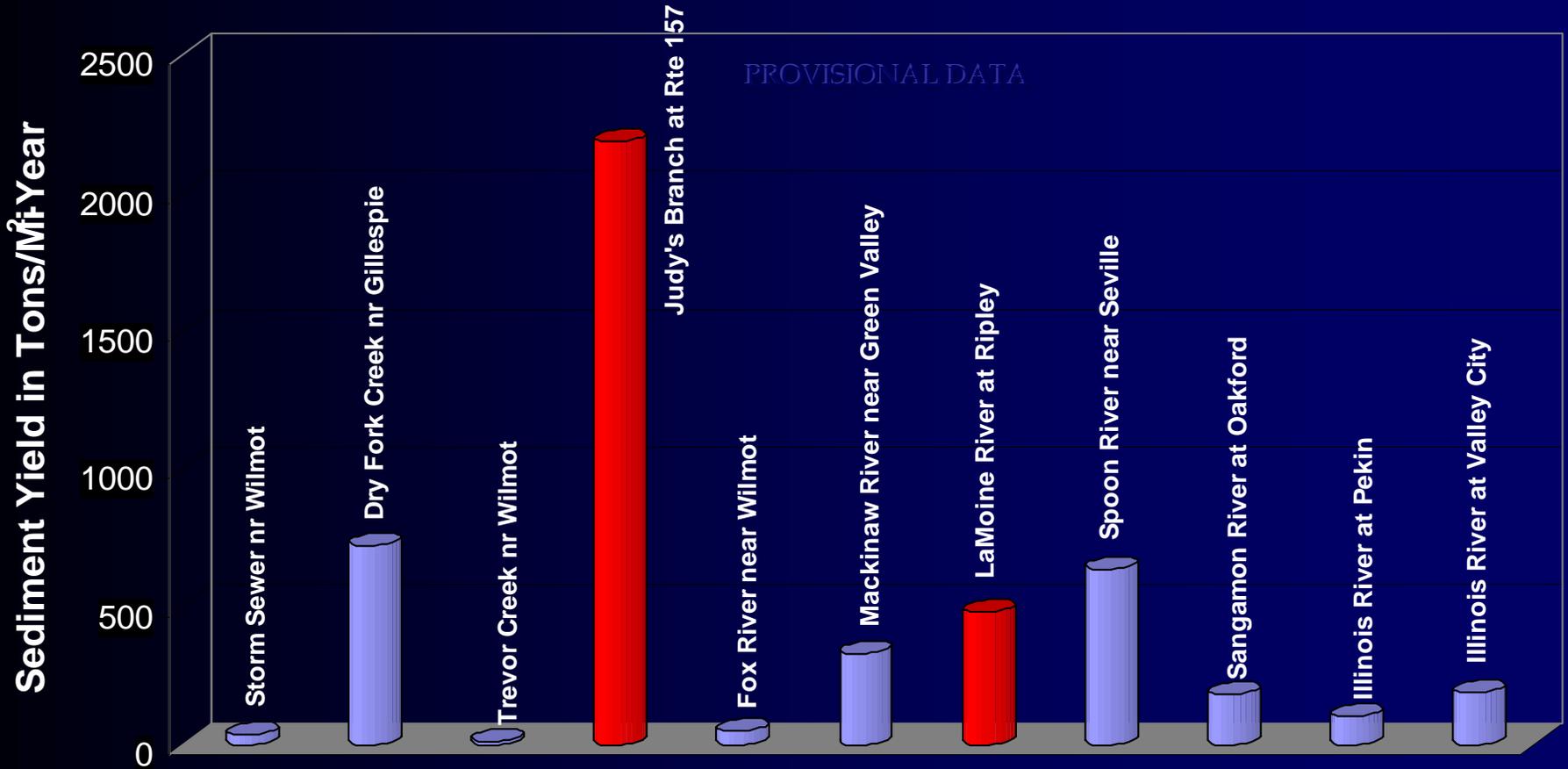
**Figure 3.** Relation of water discharge and sediment concentration with time, Kaskaskia River near Venedy Station, Illinois, April 1994.

# Sediment Average Load (Tons/Year), 1981-2004



# Sediment Yield at Various Illinois Sites

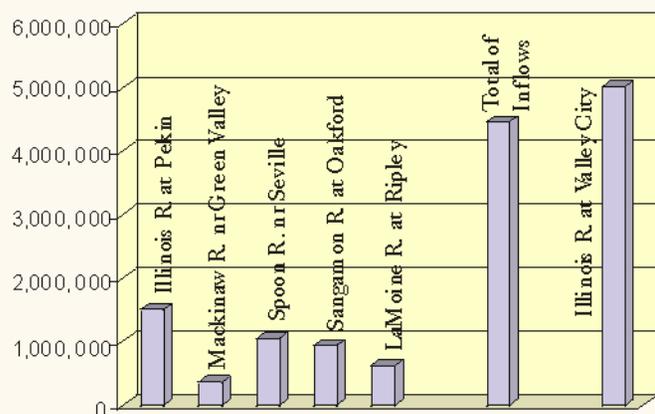
(Sites Arranged by Increasing Drainage Area)



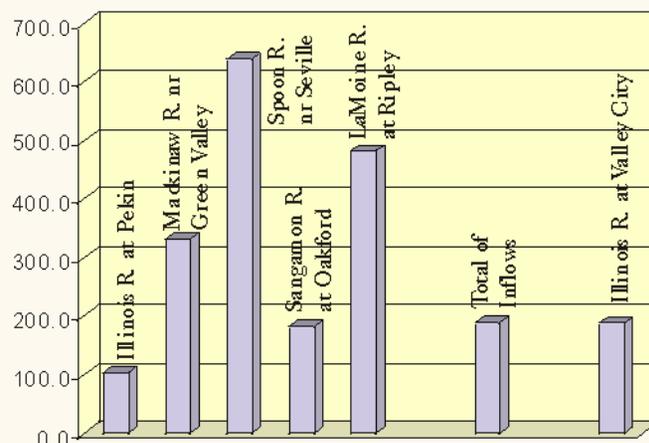
# Suspended Sediment Transport, Illinois River, La Grange Pool, Oct. 1, 1994 – Sept. 30, 1997

By Gary Johnson, U.S. Geological Survey, Urbana, Illinois

	DRAINAGE AREA (in square miles)	WY95 LOAD (in tons)	WY96 LOAD (in tons)	WY97 LOAD (in tons)	YEARLY AVG. (in tons)	SEDIMENT YIELD (in tons/mi <sup>2</sup> )
<b>INFLOWS TO LA GRANGE POOL</b>						
Illinois River at Pekin	14,585	1,213,782	1,416,795	1,884,803	1,505,127	103.2
Mackinaw River near Green Valley	1,073	618,153	302,393	146,628	355,725	331.5
Spoon River near Seville	1,636	1,383,378	1,026,100	721,146	1,043,541	637.9
Sangamon River at Oakford	5,093	1,231,423	1,055,732	509,526	932,227	183.0
LaMoine River at Ripley	1,293	708,384	797,804	362,235	622,808	481.7
<b>TOTAL</b>	<b>23,680</b>				<b>4,459,427</b>	<b>188.3</b>
<b>OUTFLOWS OF LA GRANGE POOL</b>						
Illinois River at Valley City	<b>26,743</b>	5,559,897	5,385,797	4,096,610	<b>5,014,101</b>	<b>187.5</b>

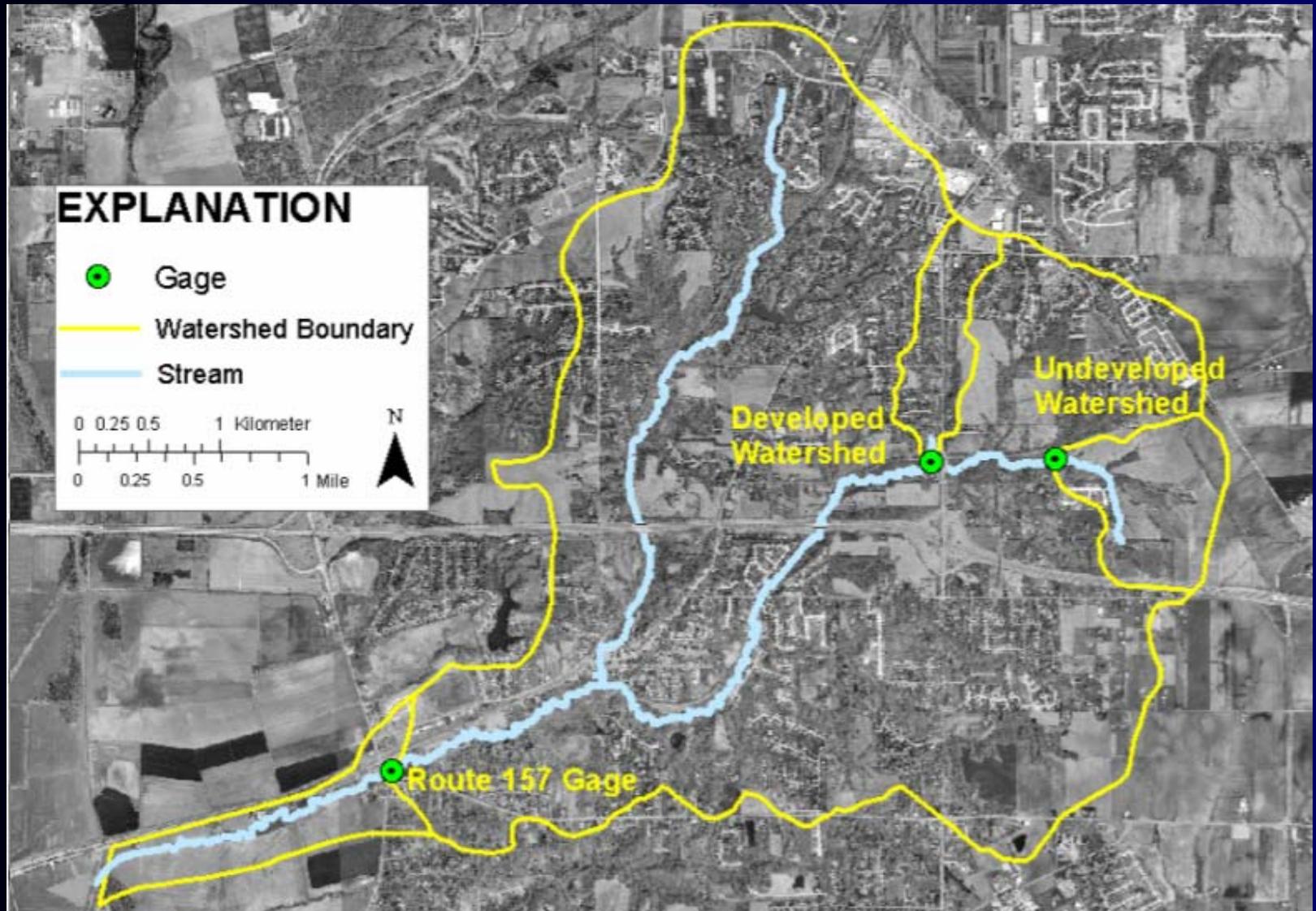


**AVERAGE ANNUAL SEDIMENT TRANSPORT (IN TONS)  
OF MAJOR DRAINAGE AREAS IN THE  
LA GRANGE POOL OF THE ILLINOIS RIVER**

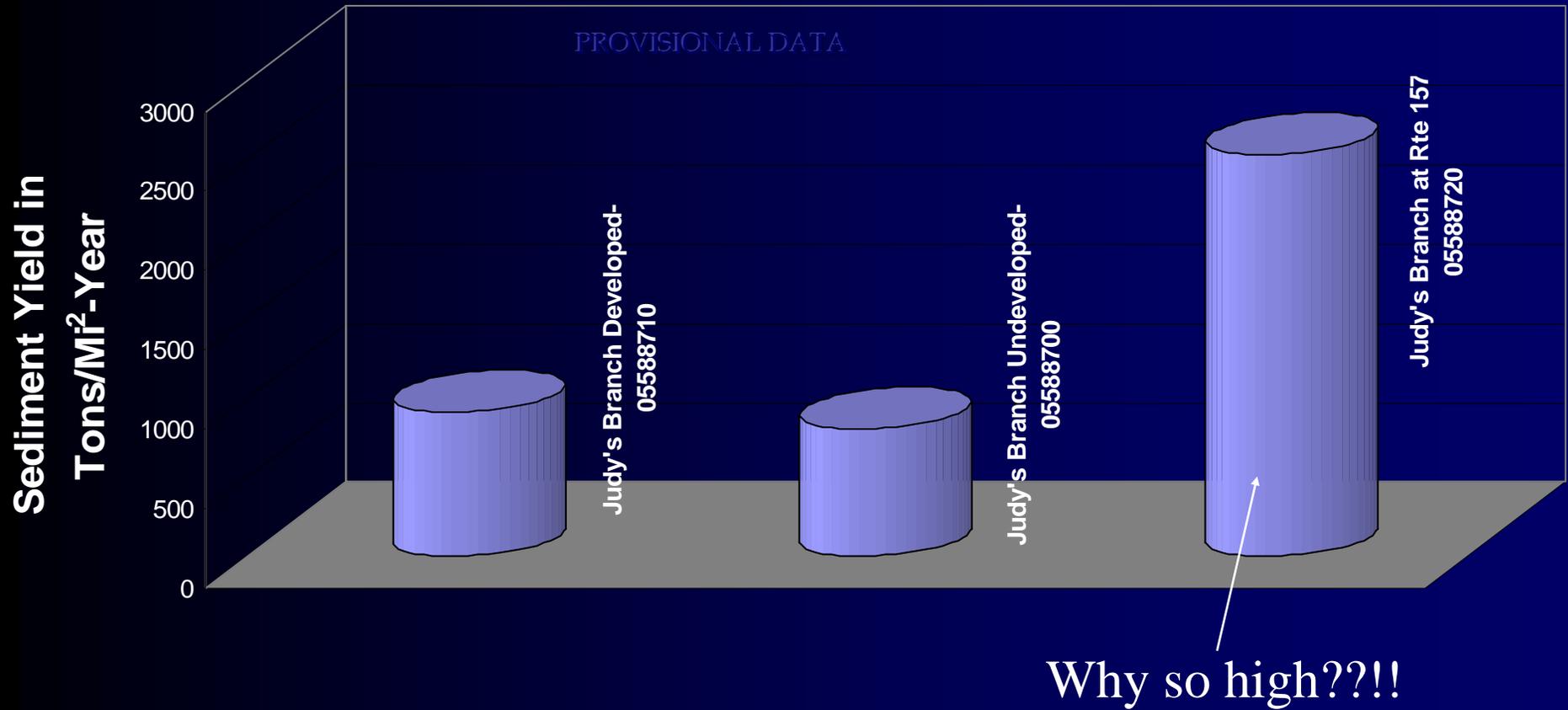


**AVERAGE SUSPENDED SEDIMENT YIELD (IN TONS/MI<sup>2</sup>)  
OF MAJOR DRAINAGE AREAS IN THE  
LA GRANGE POOL OF THE ILLINOIS RIVER**

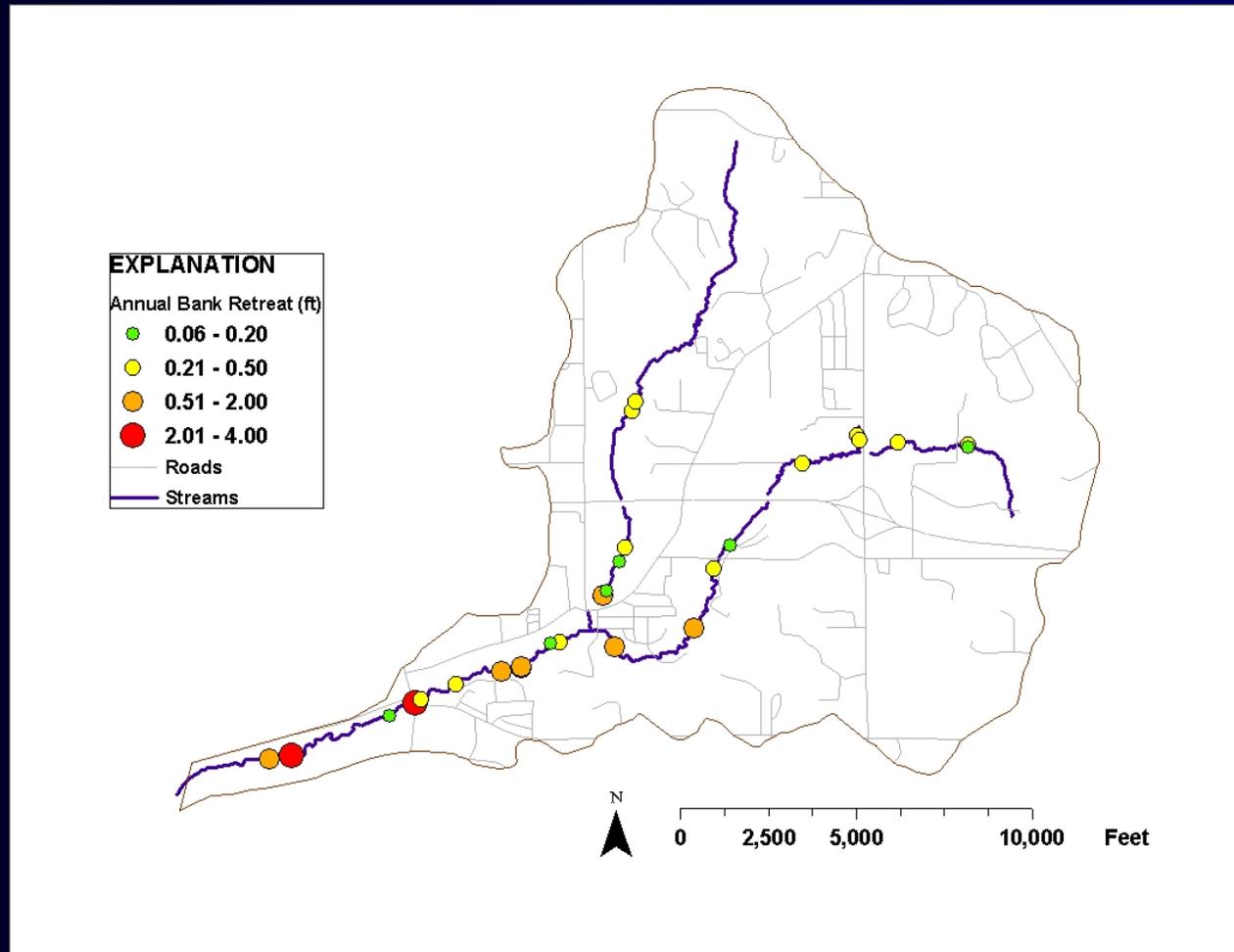
# Locations of Gaging Stations in Judy's Branch Watershed



# Sediment Yield at Judy's Branch



# Bed and bank instability!





**Any questions?**

Thanks!!

