

**Water Quality Assessment
of
Northwest Arkansas Watersheds**

Marc Nelson PhD, PE

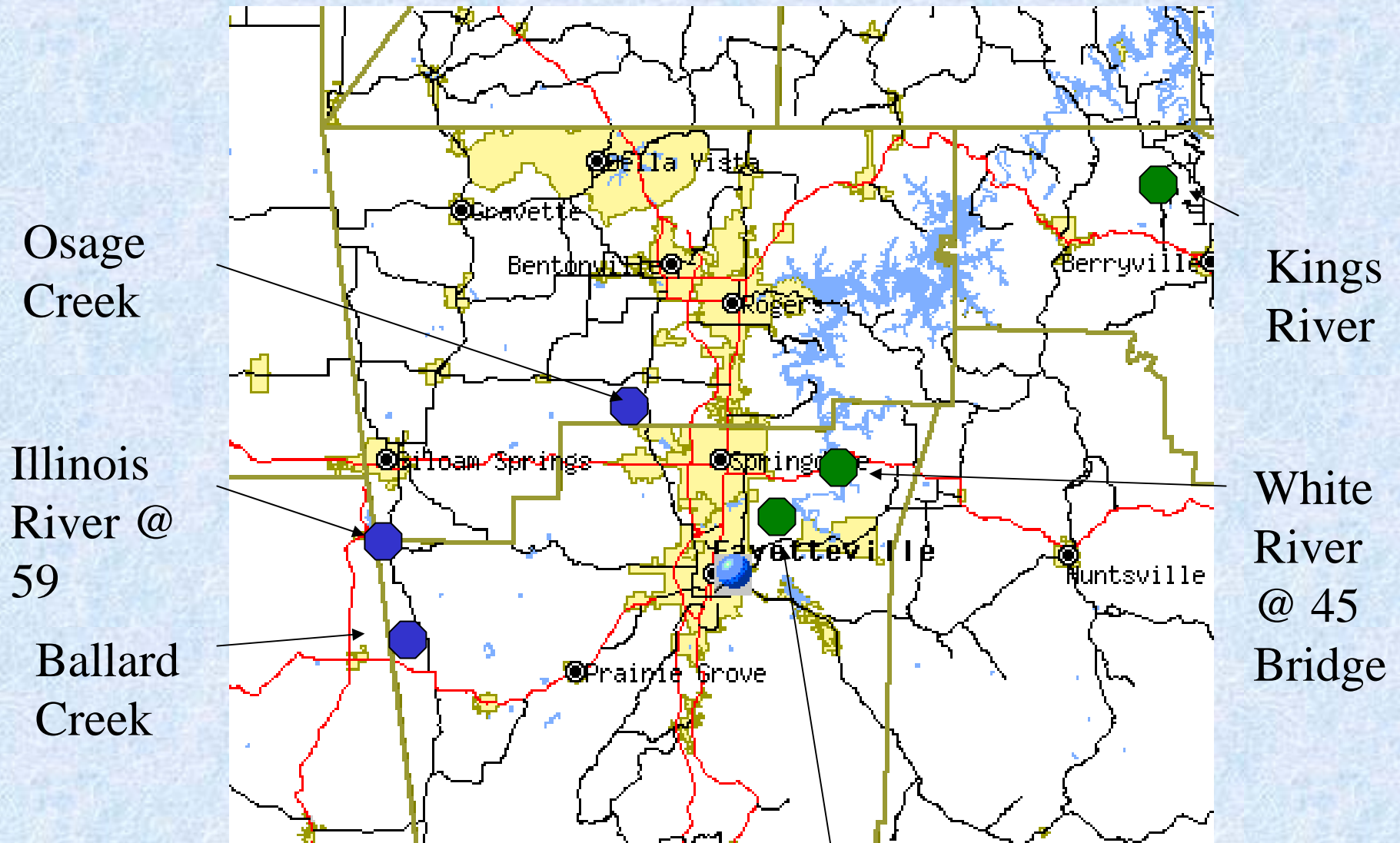
Funding provided by:

Arkansas Natural Resources Commission,
EPA 319 Grant Program

Summarize Water Quality Assessment

- Six watersheds NWA
- Illinois River @ 59 bridge
- Phosphorus
- 2007 results
- Details of sampling protocol
- Illinois trends
- Watershed comparisons

Northwest Arkansas Water Quality Monitoring Sites

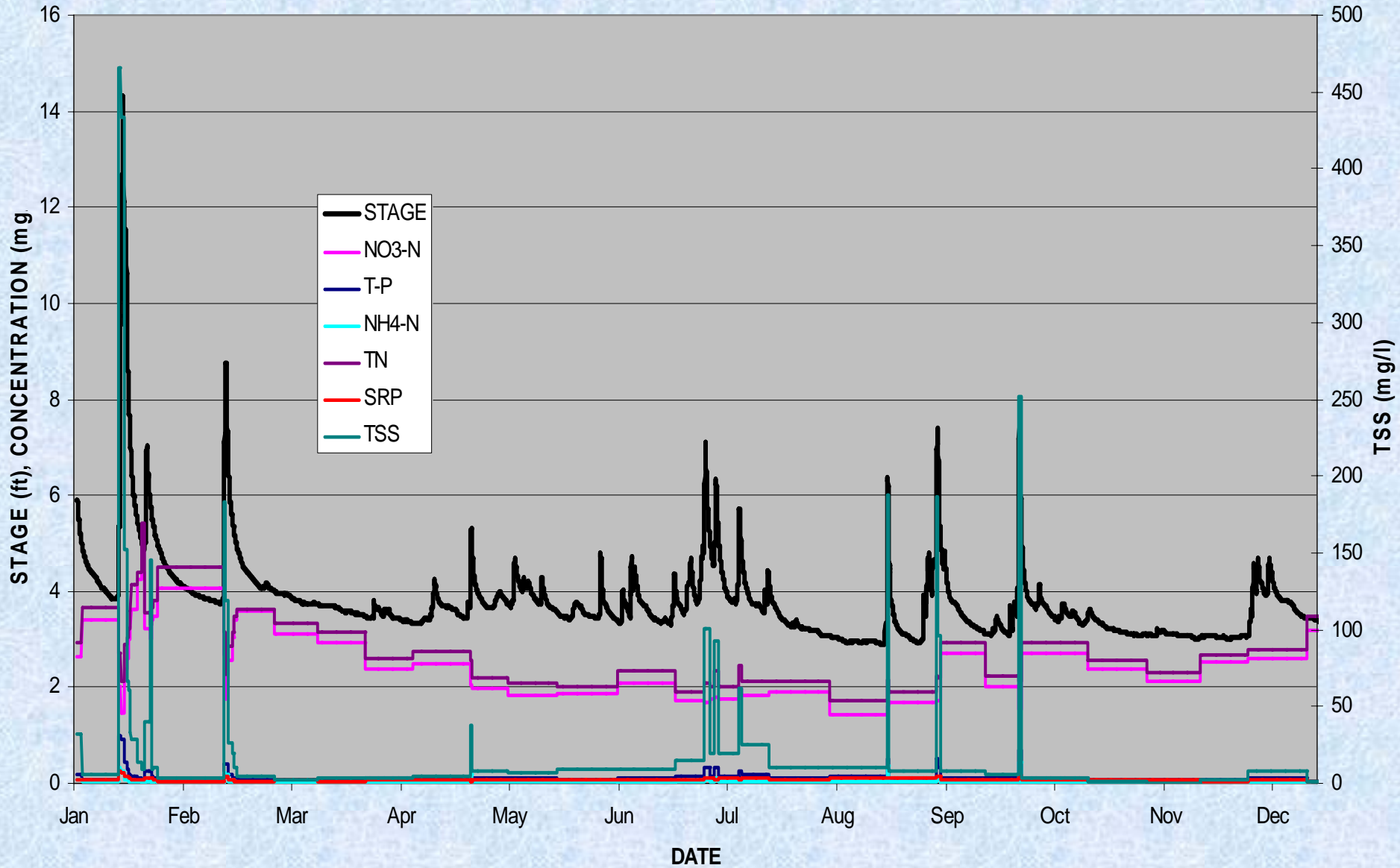


West Fork of White River

Water Quality Sampling

- Grab samples every two weeks
- Auto-sampler samples all storm events $> 5\text{ft}$
- Flow-weighted composite samples
- NH_4 , NO_3 , TN, T-P, SRP, and TSS
- Concentrations assigned to all times
- USGS discharge for all times
- Loads calculated by multiplying and summing for the year

ILLINOIS RIVER
HIGHWAY 59
2007



2007 Results Illinois River

(kg)	Discharge (M³)	NO3-N	T-P	NH4-N	TN	SRP	TSS
Total- flow	389,134,727	961,509	78,955	19,637	1,080,305	35,270	21,557,957

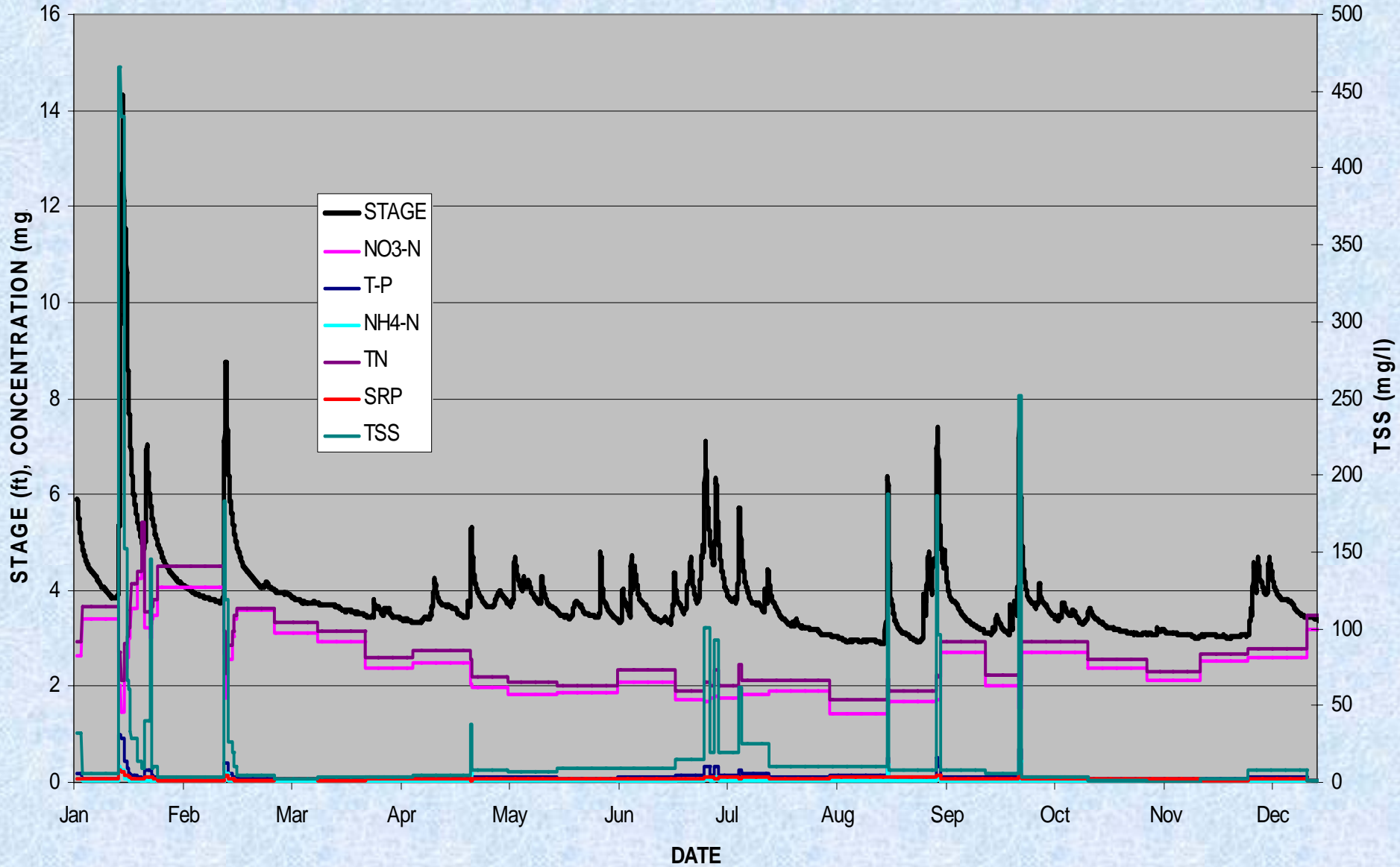
2007 Results Illinois River

(kg)	Discharge (M³)	NO3-N	T-P	NH4-N	TN	SRP	TSS
Total- flow	389,134,727	961,509	78,955	19,637	1,080,305	35,270	21,557,957
Storm- flow	115,365,022	267,589	52,168	15,260	321,366	16,216	14,428,226

2007 Results Illinois River

(kg)	Discharge (M ³)	NO3-N	T-P	NH4-N	TN	SRP	TSS
Total- flow	389,134,727	961,509	78,955	19,637	1,080,305	35,270	21,557,957
Storm- flow	115,365,022	267,589	52,168	15,260	321,366	16,216	19,608,214
Base- flow	273,769,705	693,920	26,787	4,377	758,939	19,054	1,949,743

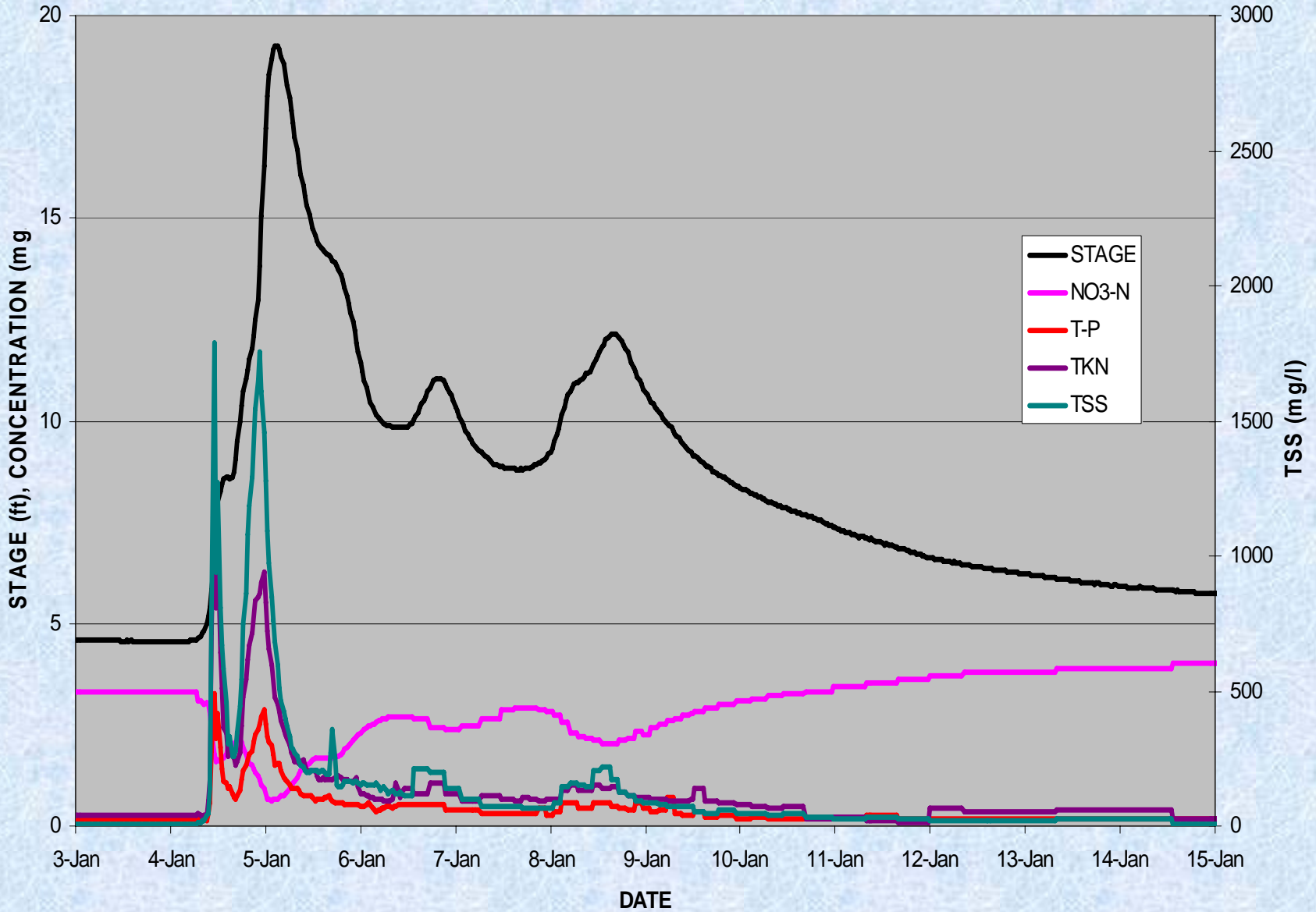
ILLINOIS RIVER
HIGHWAY 59
2007



January 13 storm transport

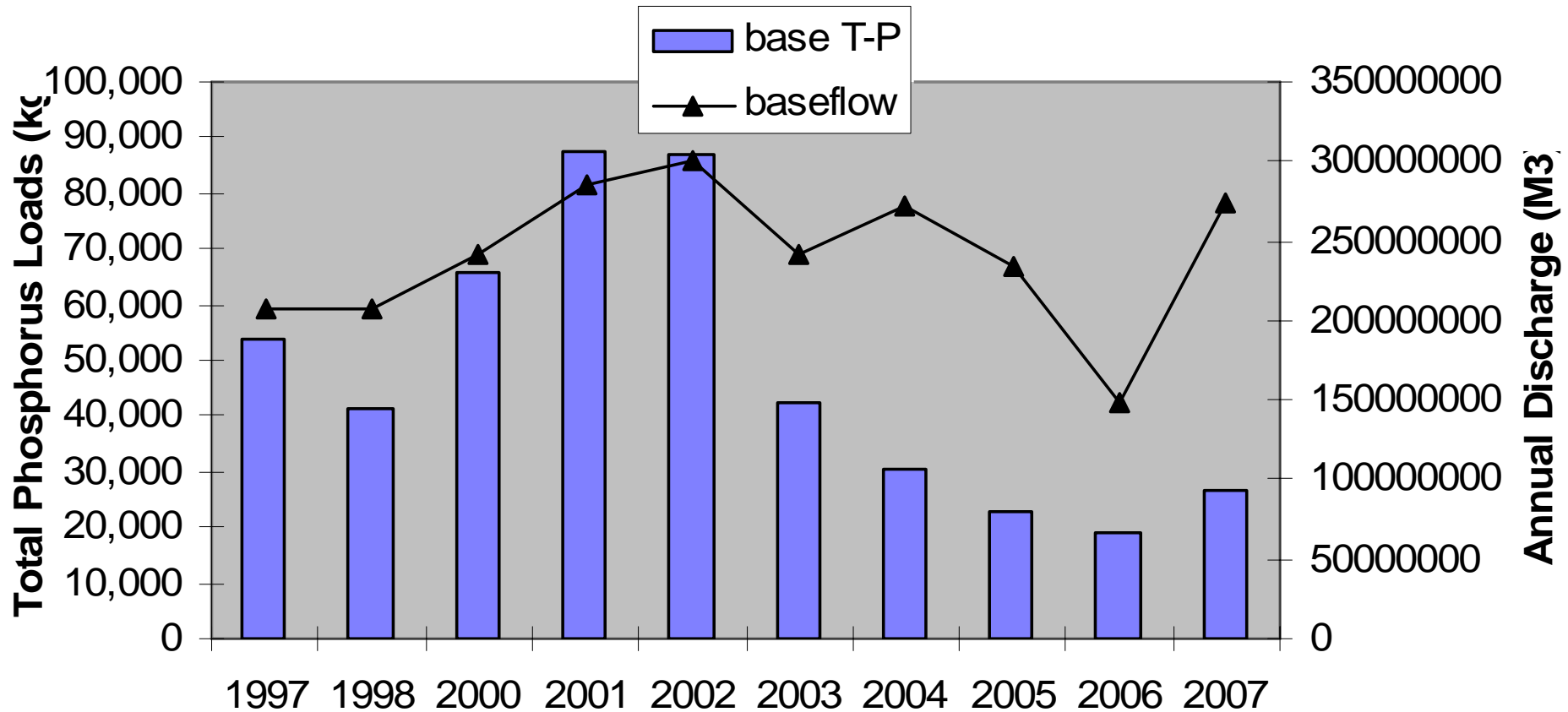
- Time = 2%
- Volume = 15%
- Total P = 43%
- TSS = 66%
- Several Storms in past over 100% previous year's T-P & TSS

ILLINOIS RIVER
HIGHWAY 59
1998

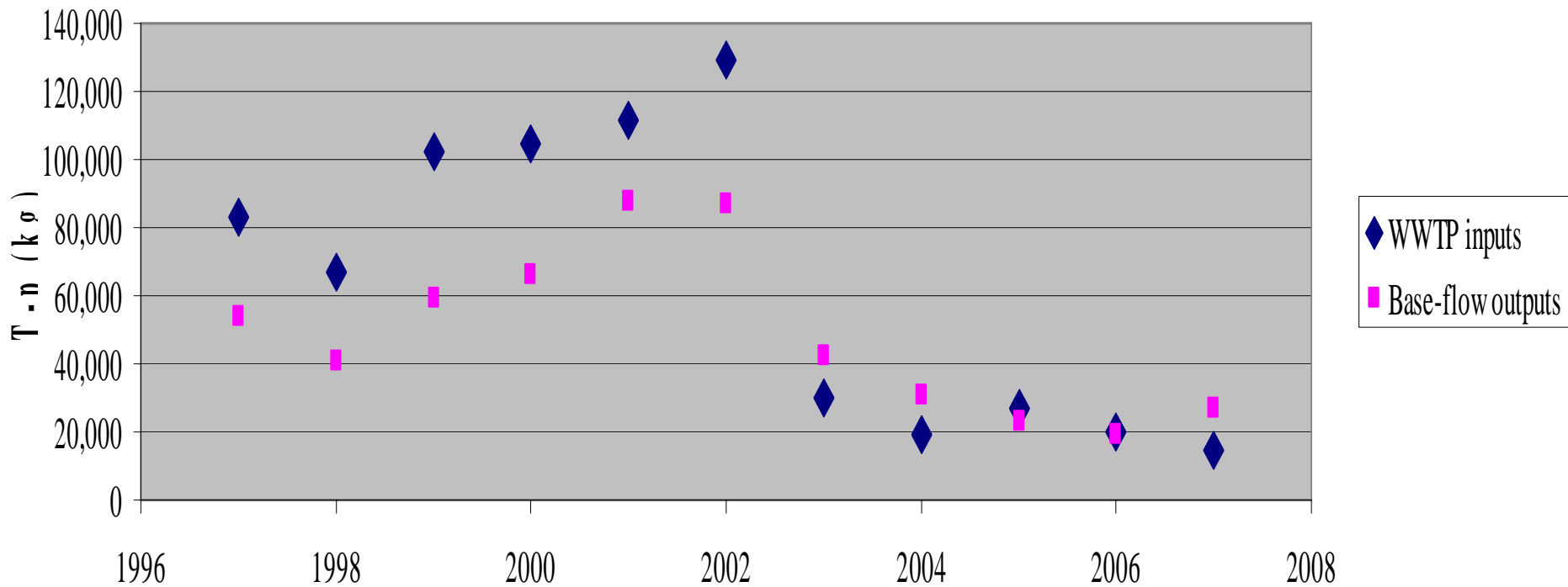


Illinois River Trends

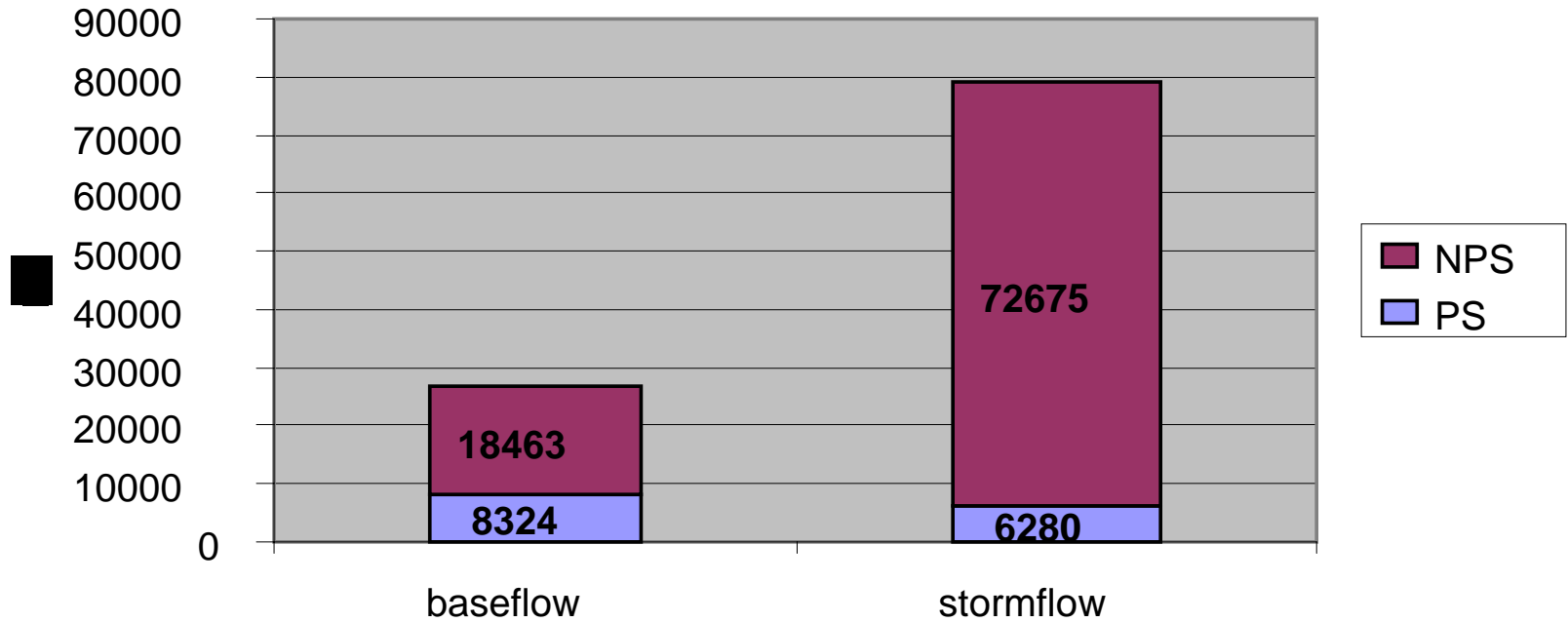
Annual Phosphorus Loads



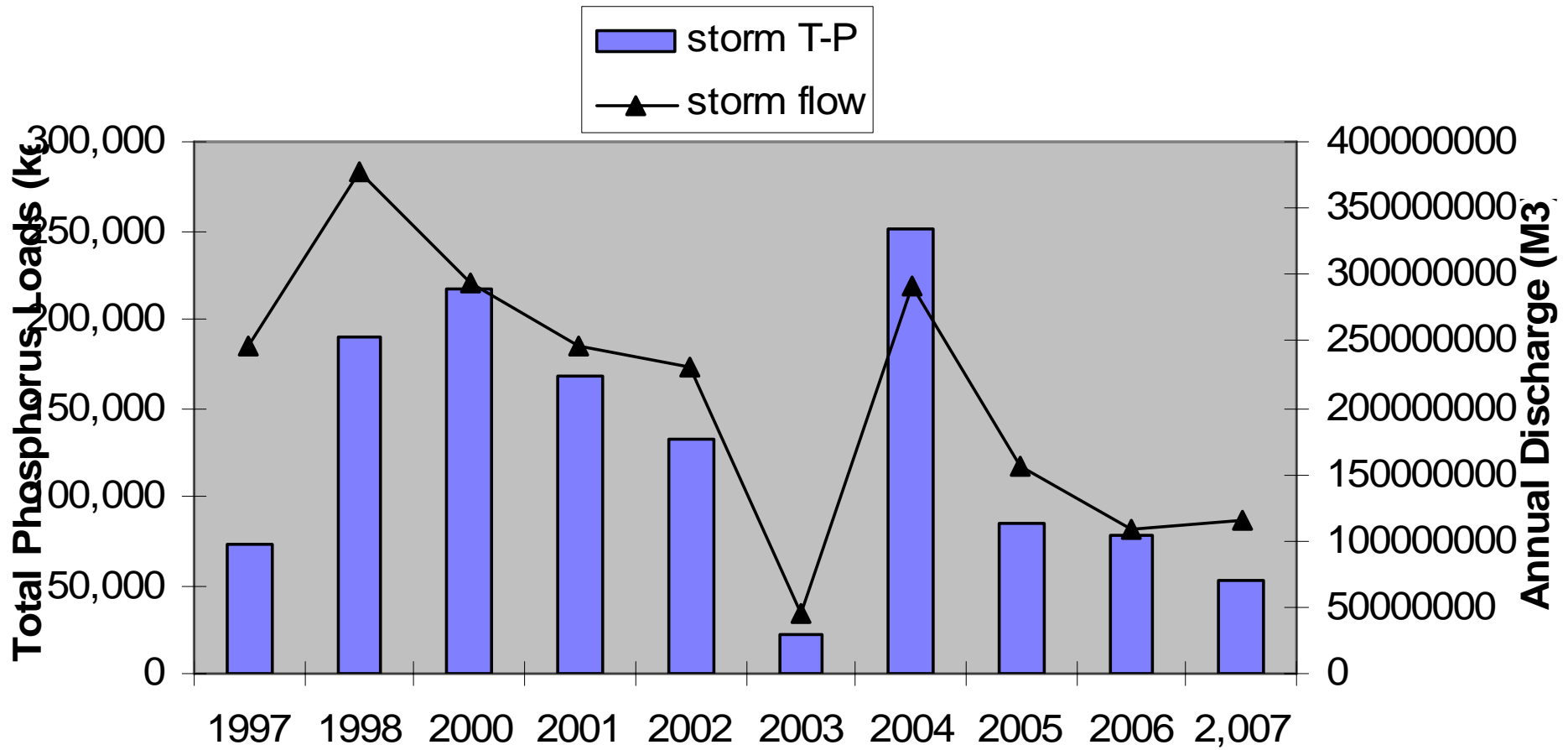
Comparison Between WWTP Inputs and Base-flow outputs Illinois River @ Highway 59



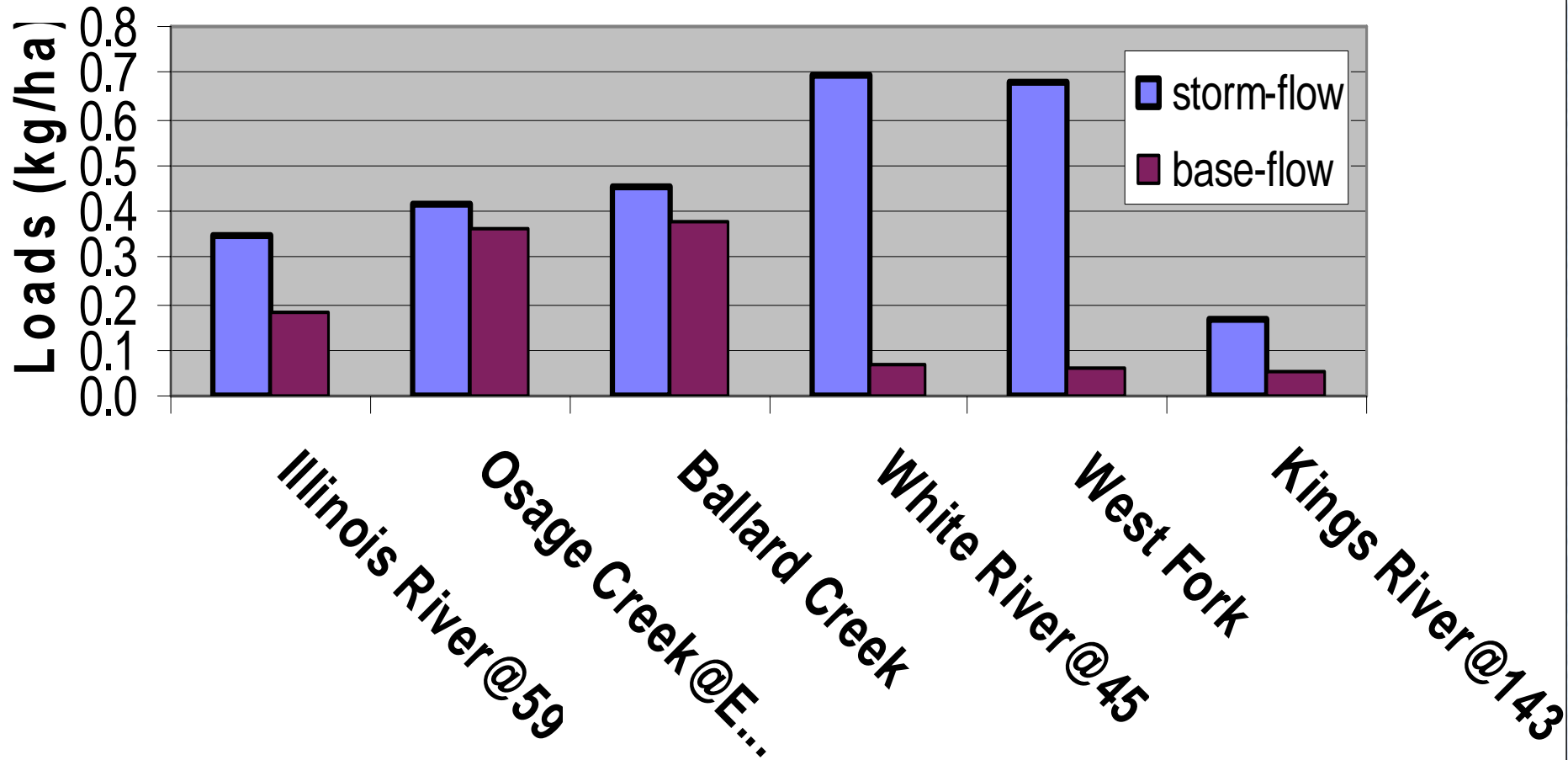
Contributions to Base and Storm flow T-P Illinois River 2007



Annual Phosphorus Loads

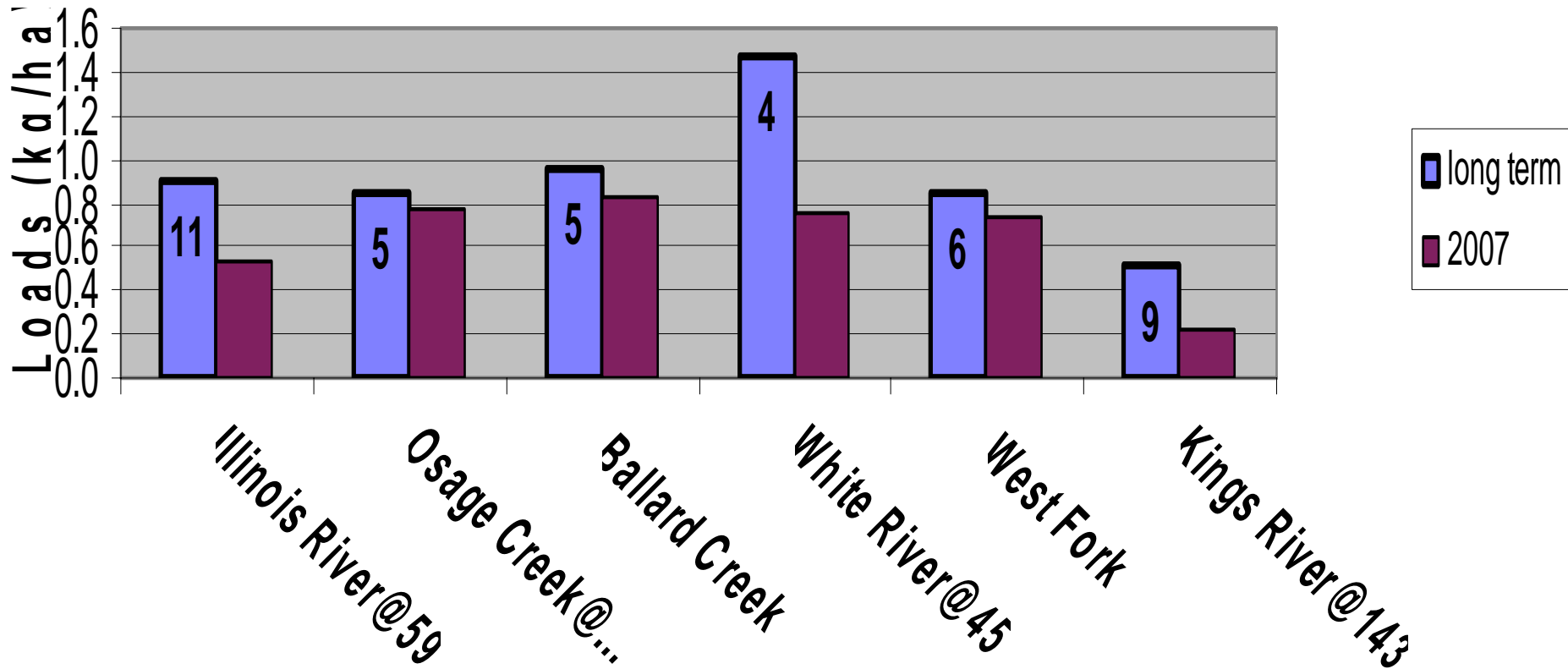


T-P Storm and Base-Flow Annual Loads per Hectare 2007



T-P Storm and Base-Flow Annual Loads per Hectare

2007



Questions?