

**WATER QUALITY AND BENTHIC
MACROINVERTEBRATE TRENDS AT
SELECTED SITES IN THE SUSQUEHANNA
RIVER BASIN, 1998-2005**

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BASIC CONCEPTS

AS WATER TEMPERATURE INCREASES DISSOLVED OXYGEN (DO) DECREASES

At 40°F, DO concentration=13 mg/l

At 80°F, DO concentration=8 mg/l

**AQUATIC PLANT GROWTH AFFECTS
DISSOLVED OXYGEN CONCENTRATION
OVER A 24 HOUR PERIOD DUE TO
PHOTOSYNTHESIS AND RESPIRATION**



Susquehanna River below mouth of Conodoguinet Creek, August, 1991

Time	Temperature	Dissolved Oxygen
6:27 am	70°F	3.4 mg/l
12:30 pm	80.6°F	20.2 mg/l

Q_{7-10} flow

Stated as the "*7-day, 10-year low flow*," this statistic is the average minimum streamflow expected for seven consecutive days once every ten years.

PaDEP Water Quality Network sites



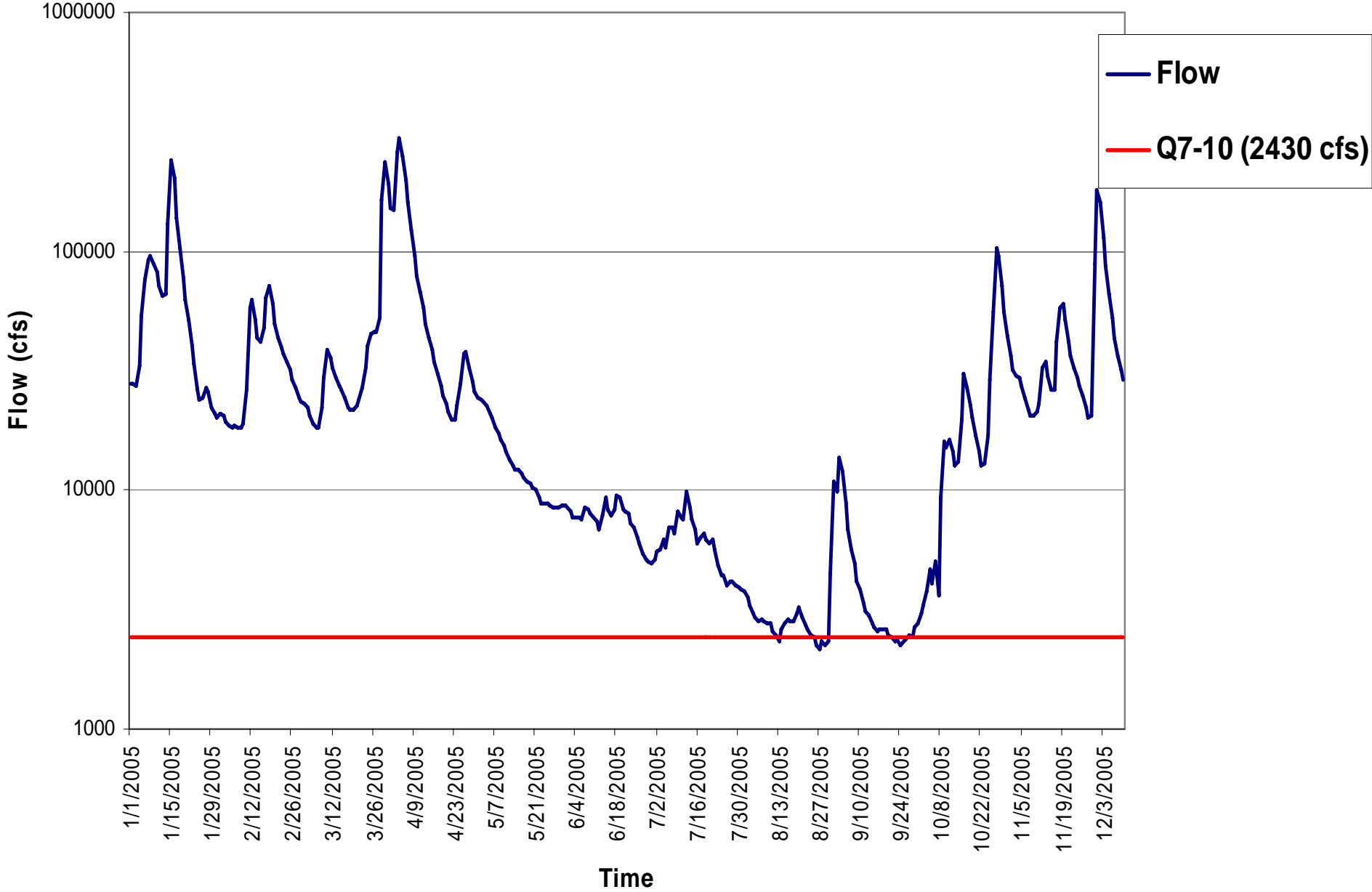
WATER QUALITY

AND QUANTITY

Susquehanna River at Sunbury

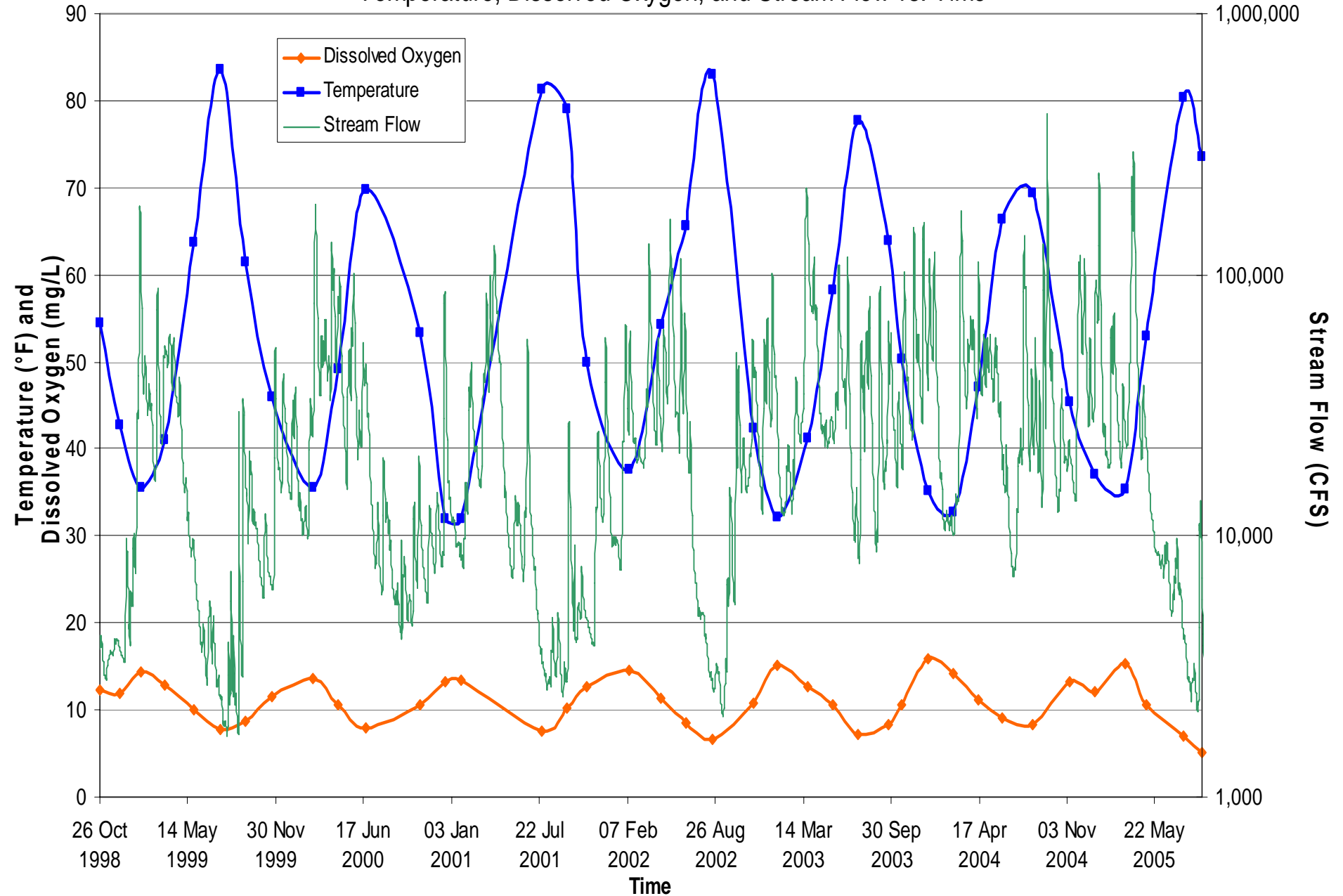
Juniata River at Newport

SUSQUEHANNA RIVER AT SUNBURY



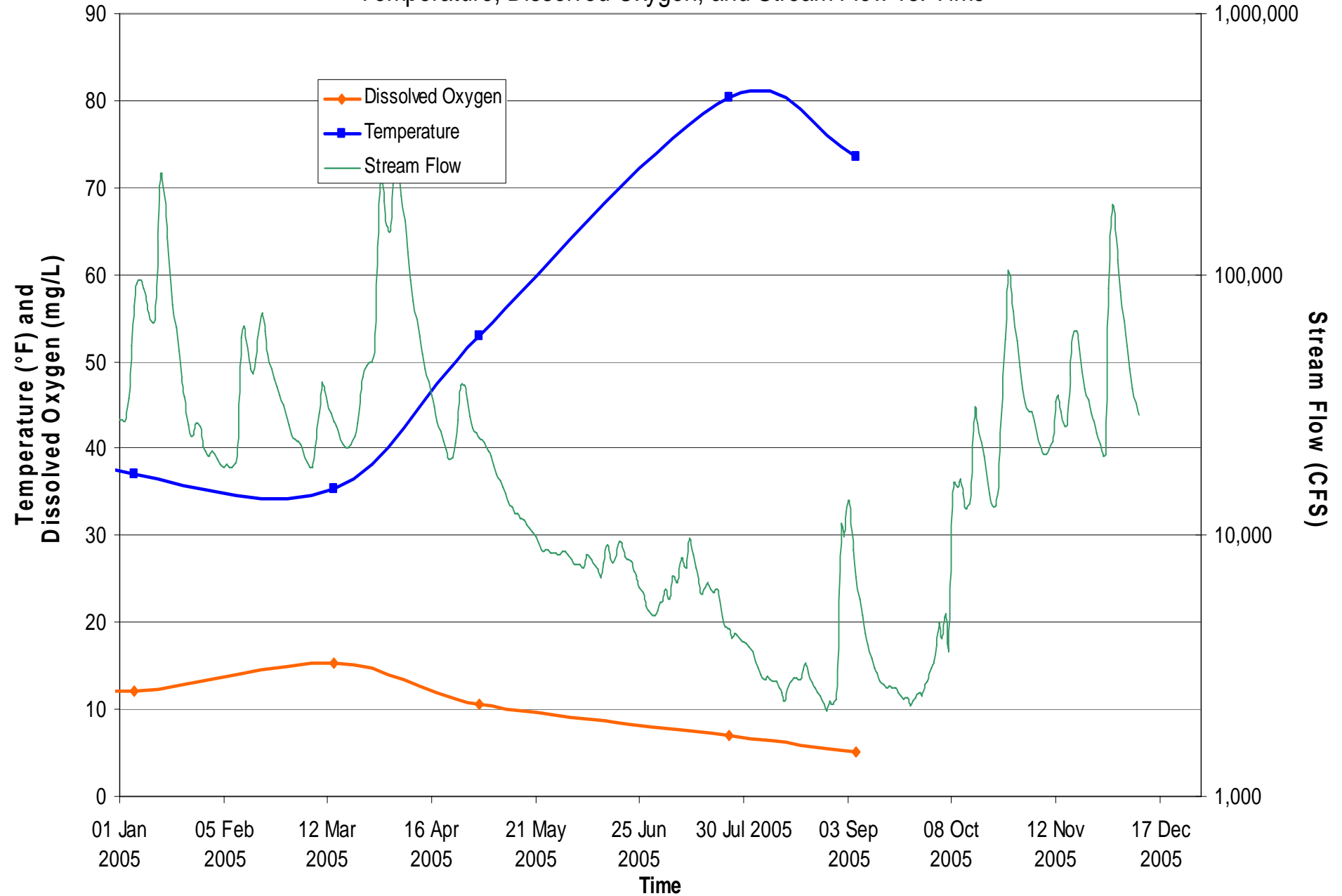
SUSQUEHANNA RIVER AT SUNBURY

Temperature, Dissolved Oxygen, and Stream Flow vs. Time



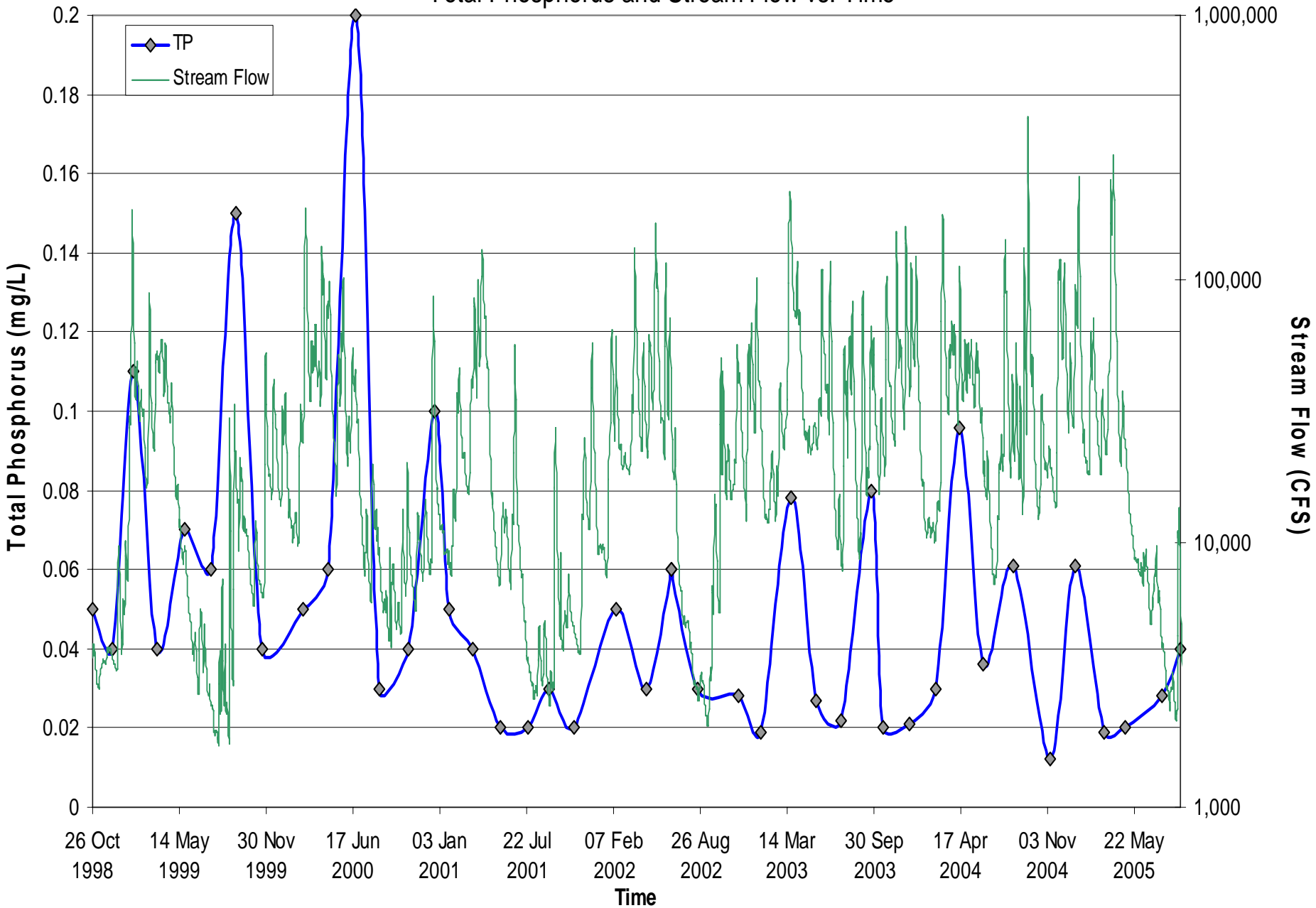
SUSQUEHANNA RIVER AT SUNBURY

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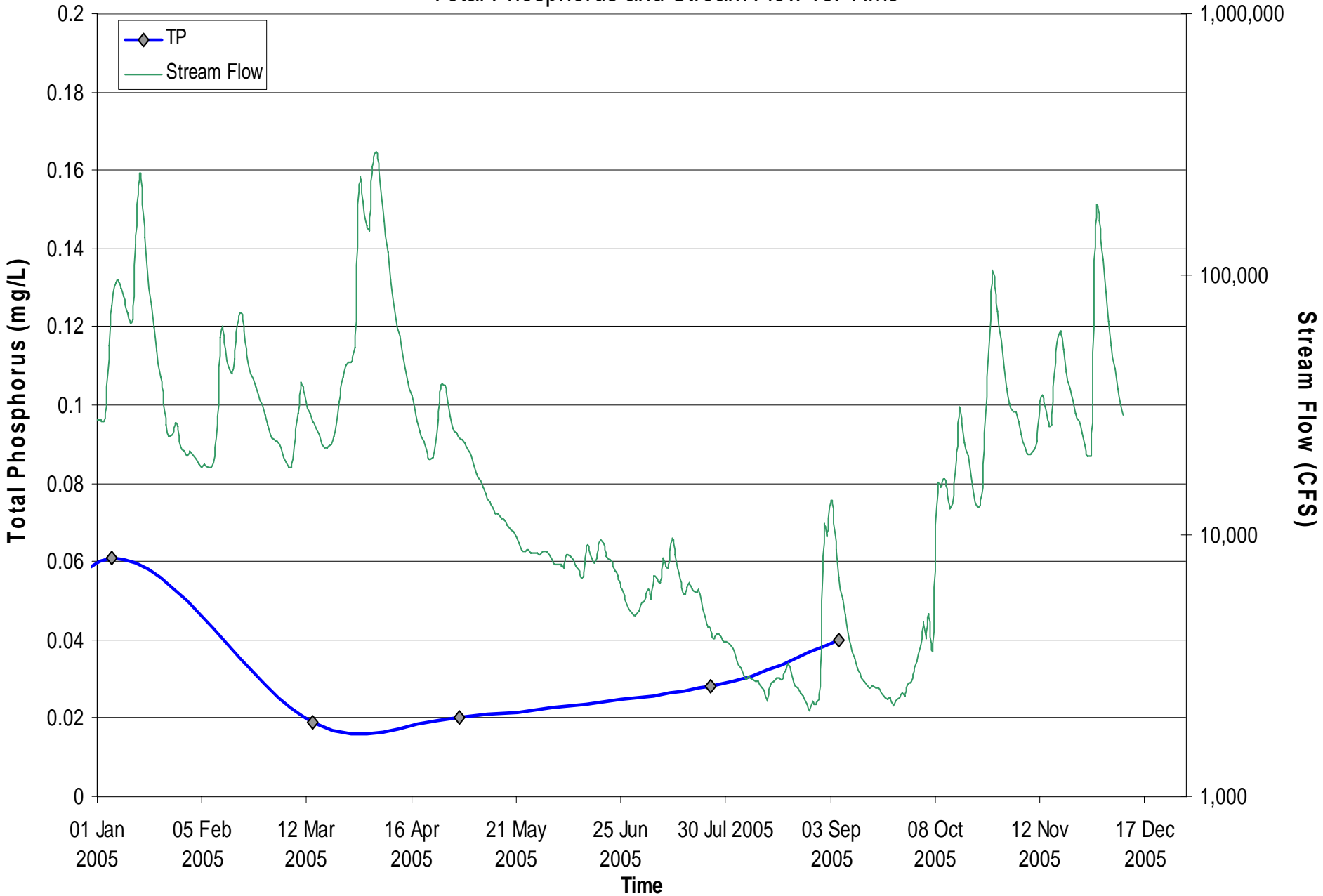
SUSQUEHANNA RIVER AT SUNBURY

Total Phosphorus and Stream Flow vs. Time



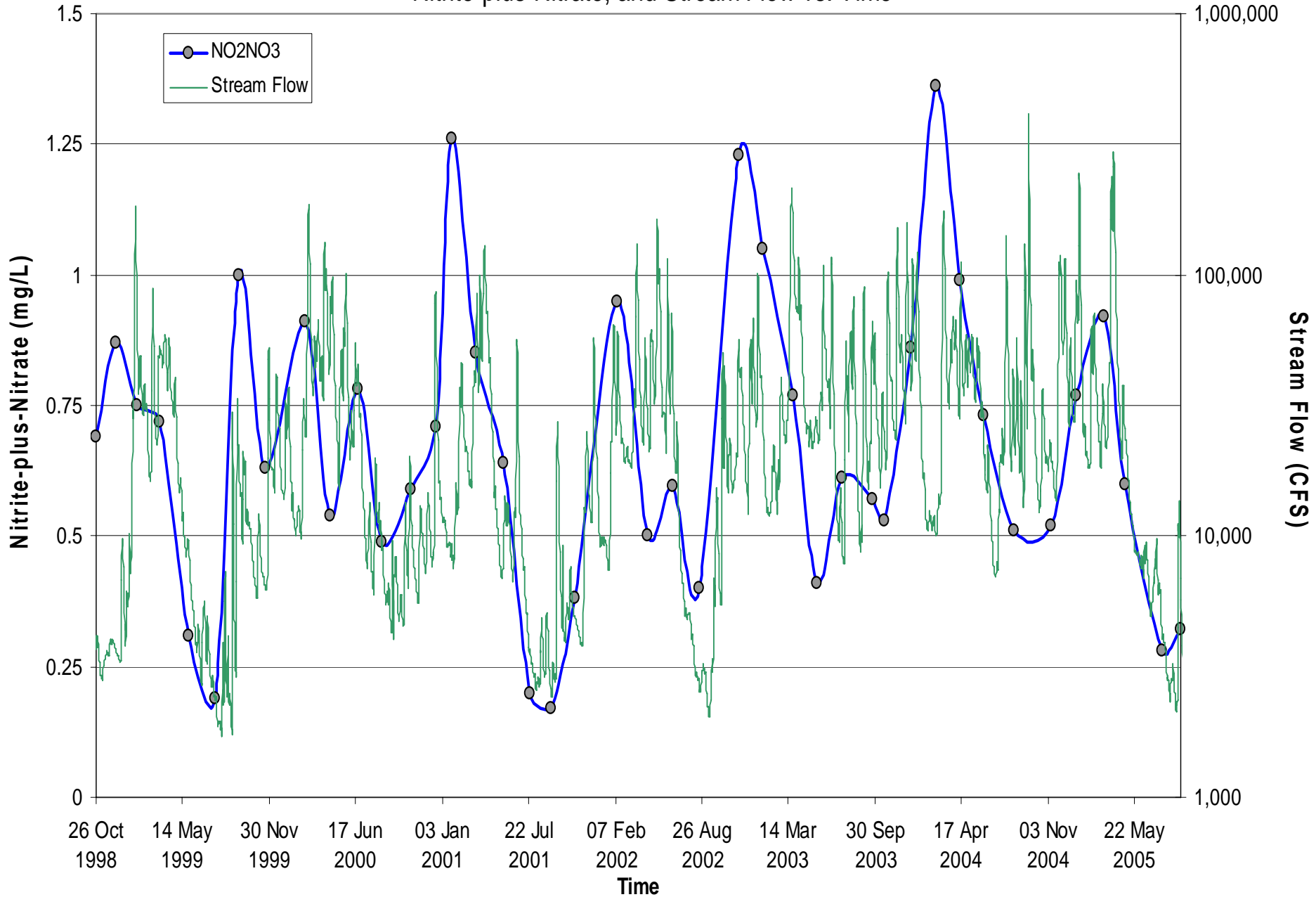
SUSQUEHANNA RIVER AT SUNBURY

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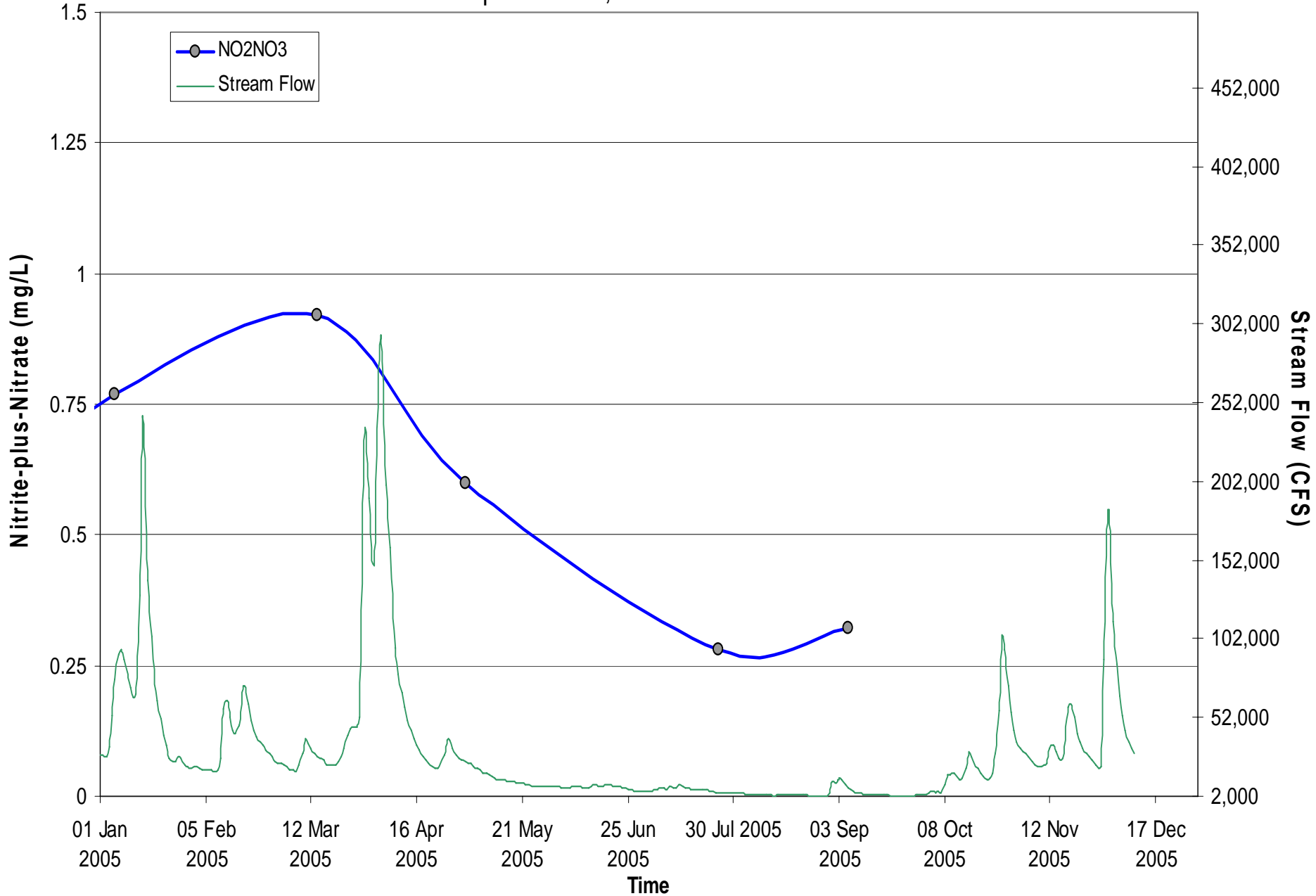
SUSQUEHANNA RIVER AT SUNBURY

Nitrite-plus-Nitrate, and Stream Flow vs. Time

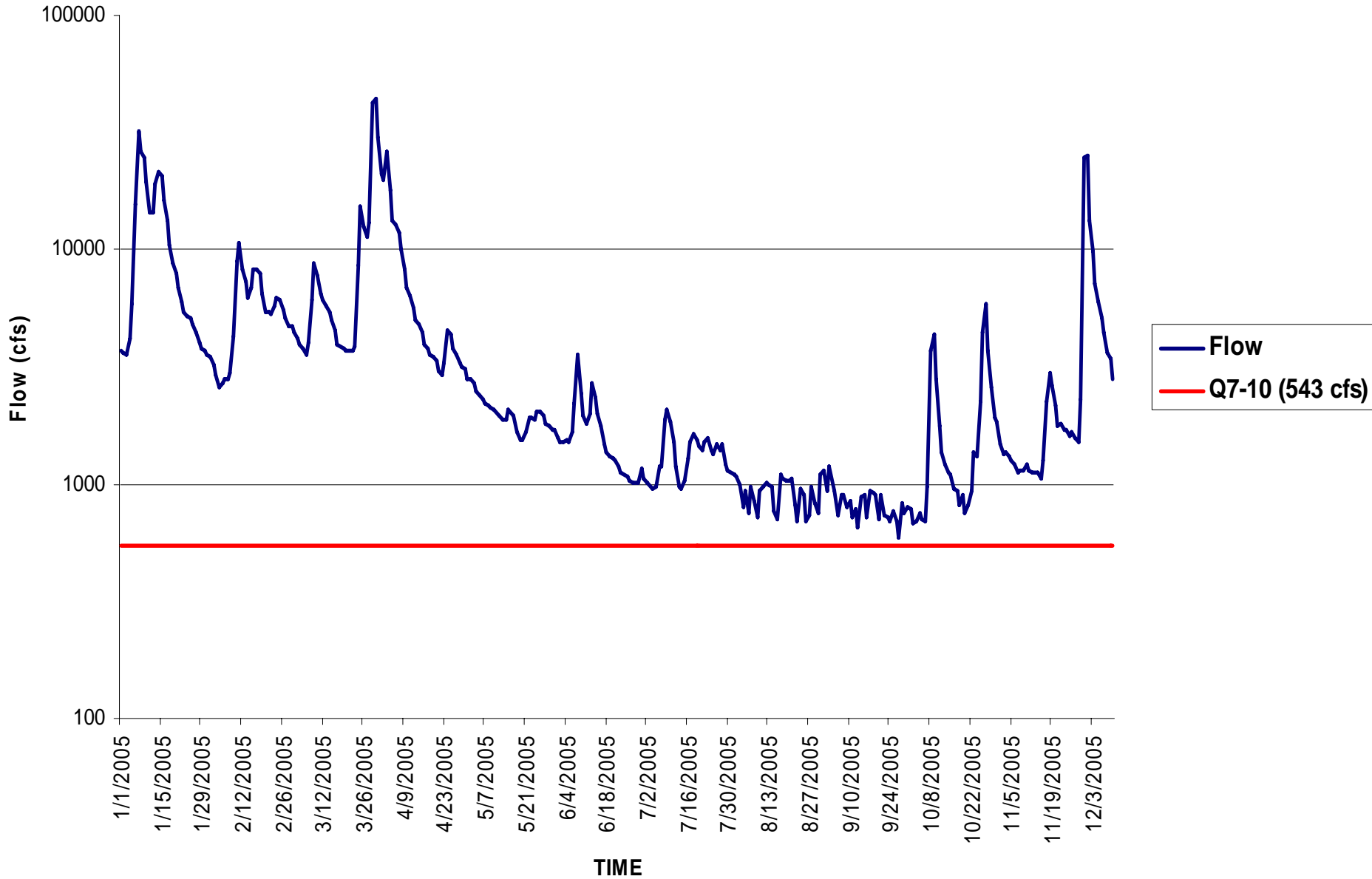


SUSQUEHANNA RIVER AT SUNBURY

Nitrite-plus-Nitrate, and Stream Flow vs. Time

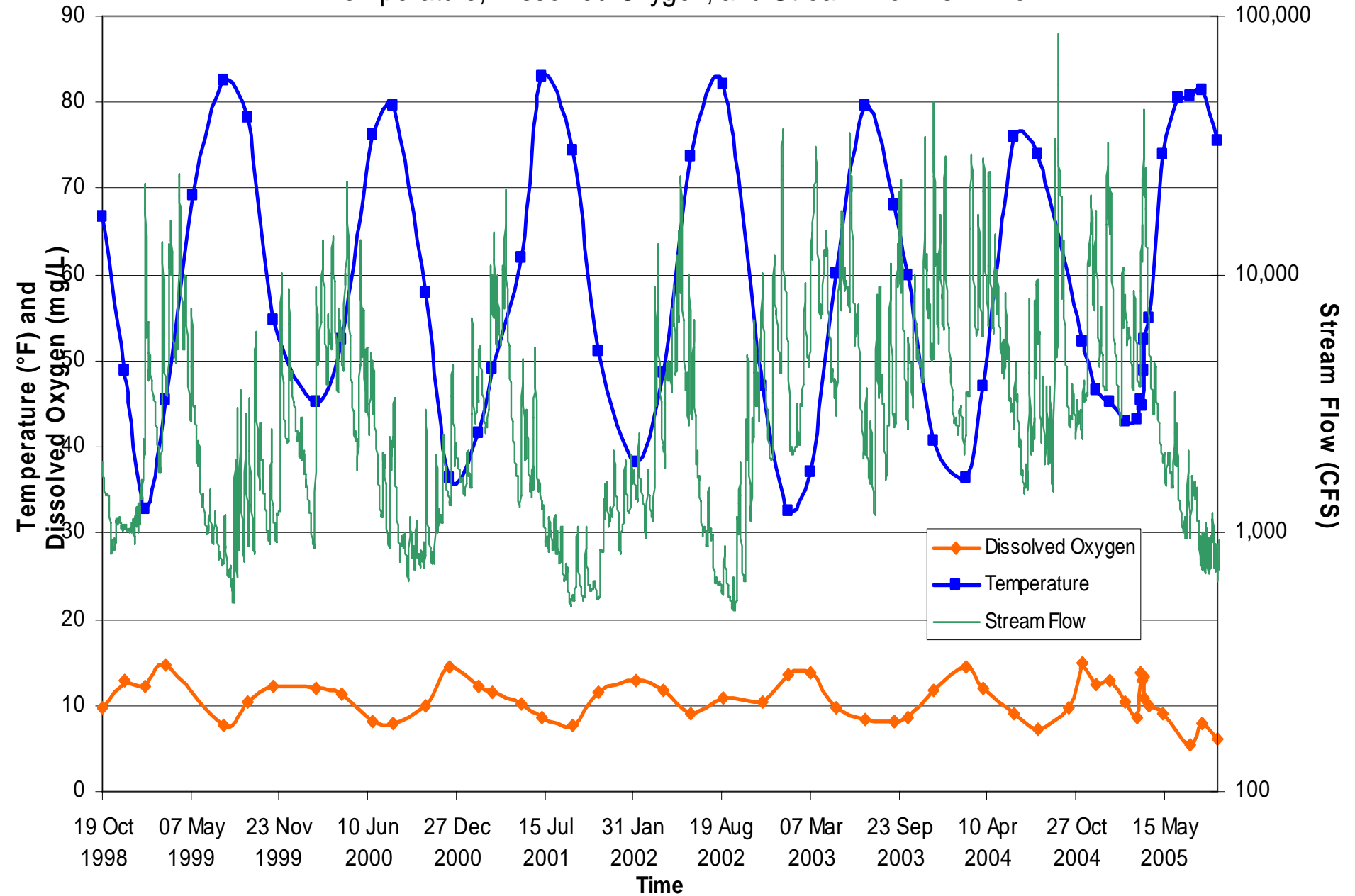


JUNIATA RIVER AT NEWPORT, 2005



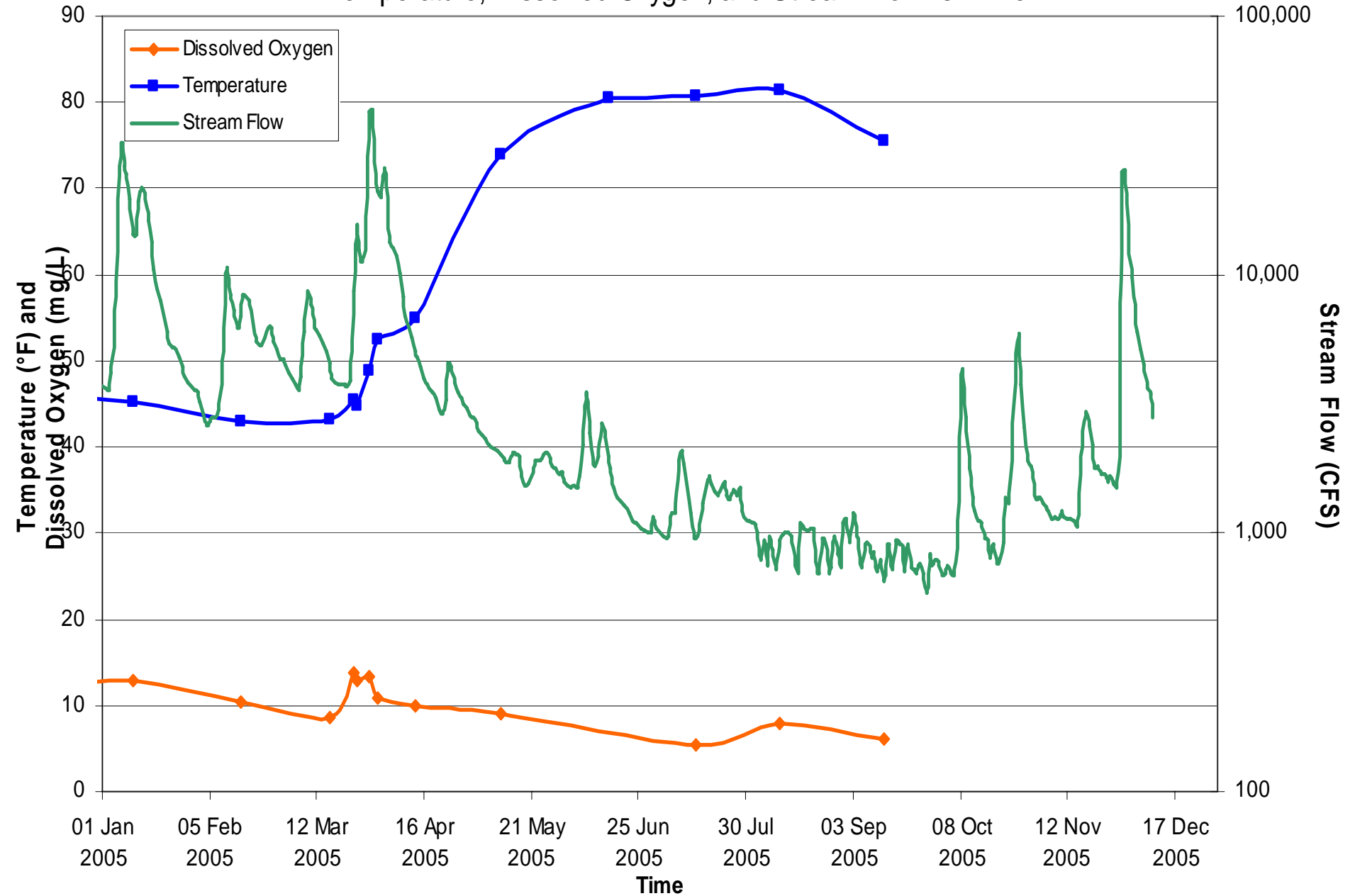
JUNIATA RIVER AT NEWPORT

Temperature, Dissolved Oxygen, and Stream Flow vs. Time



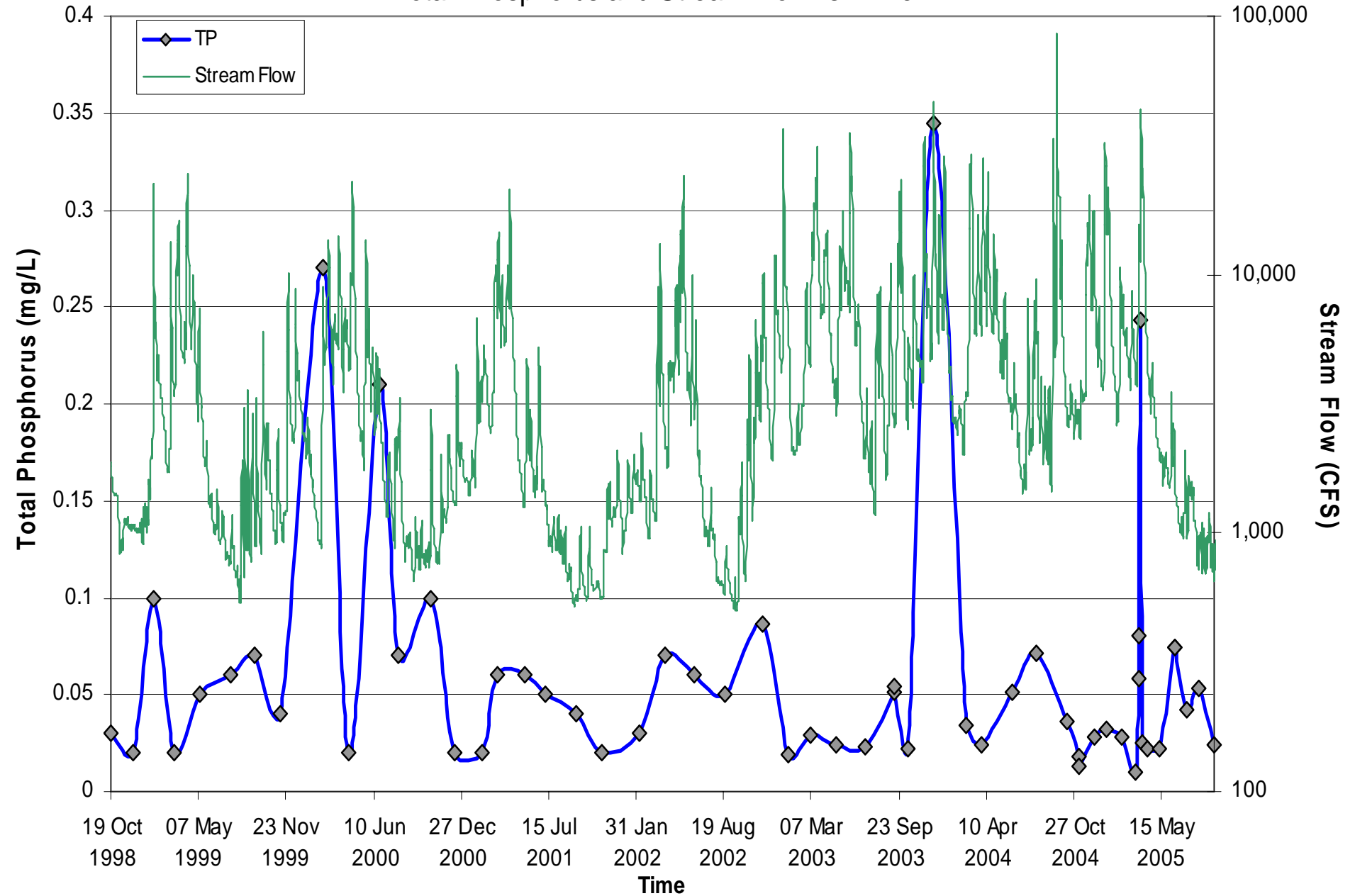
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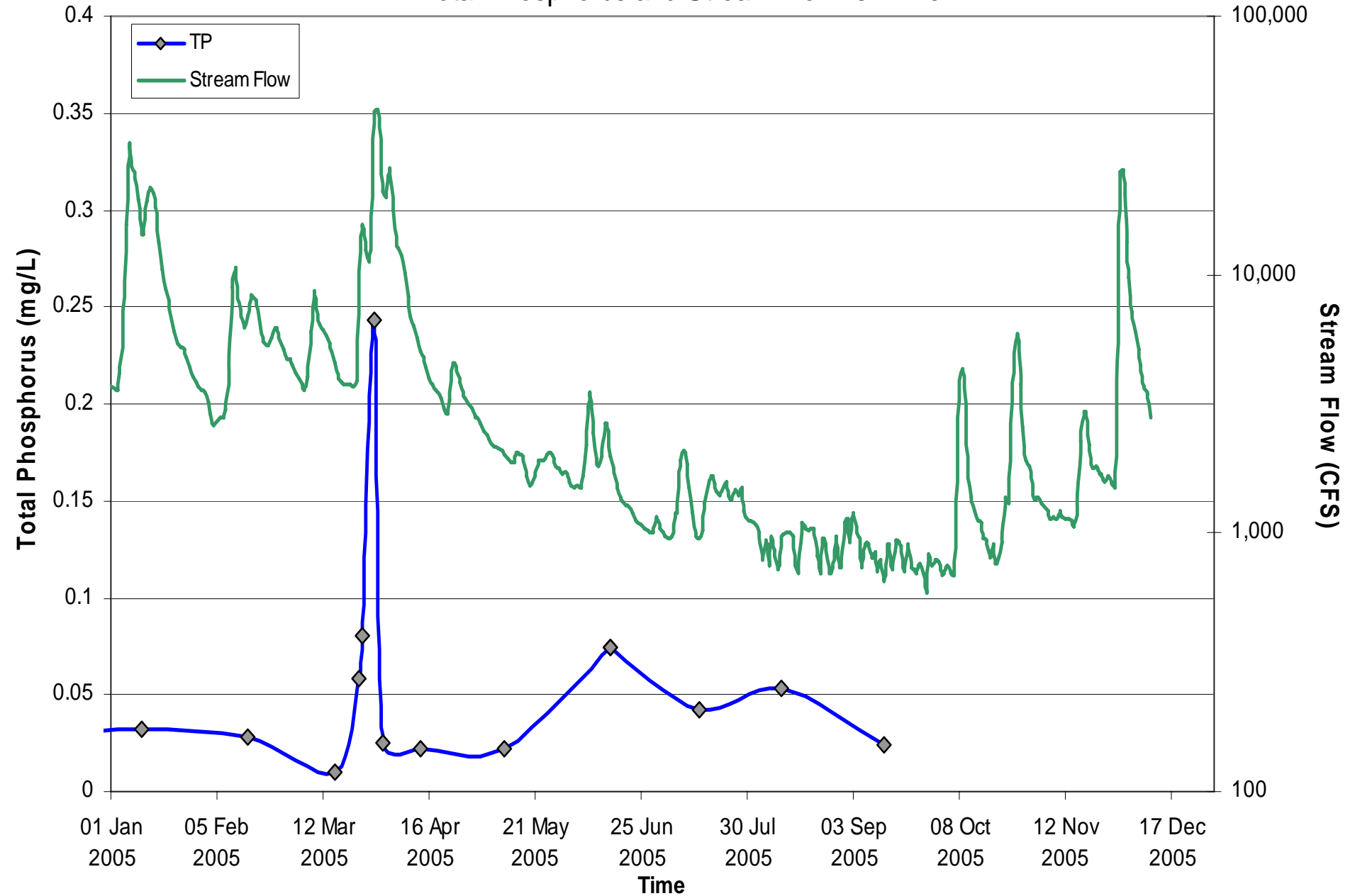
JUNIATA RIVER AT NEWPORT

Total Phosphorus and Stream Flow vs. Time



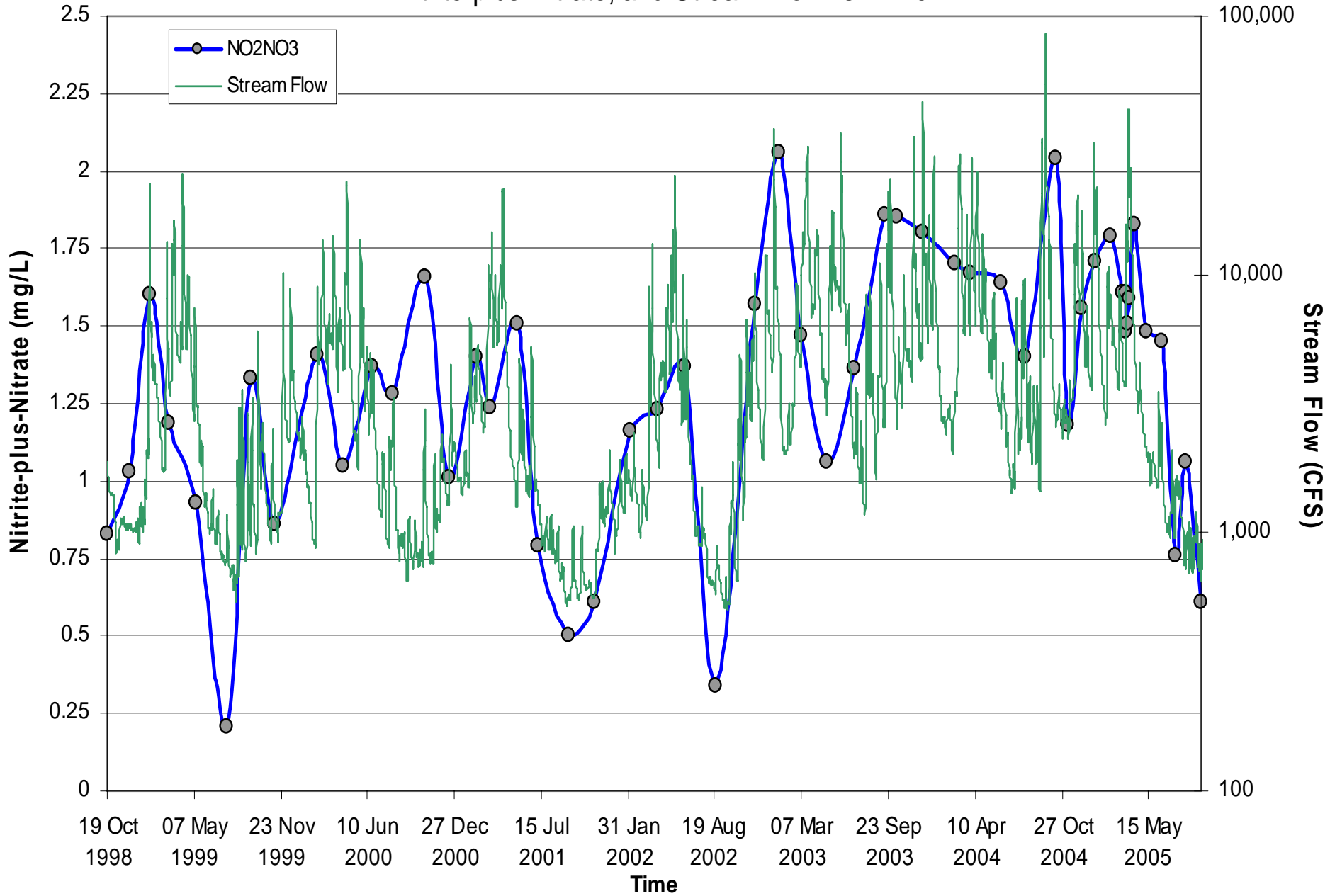
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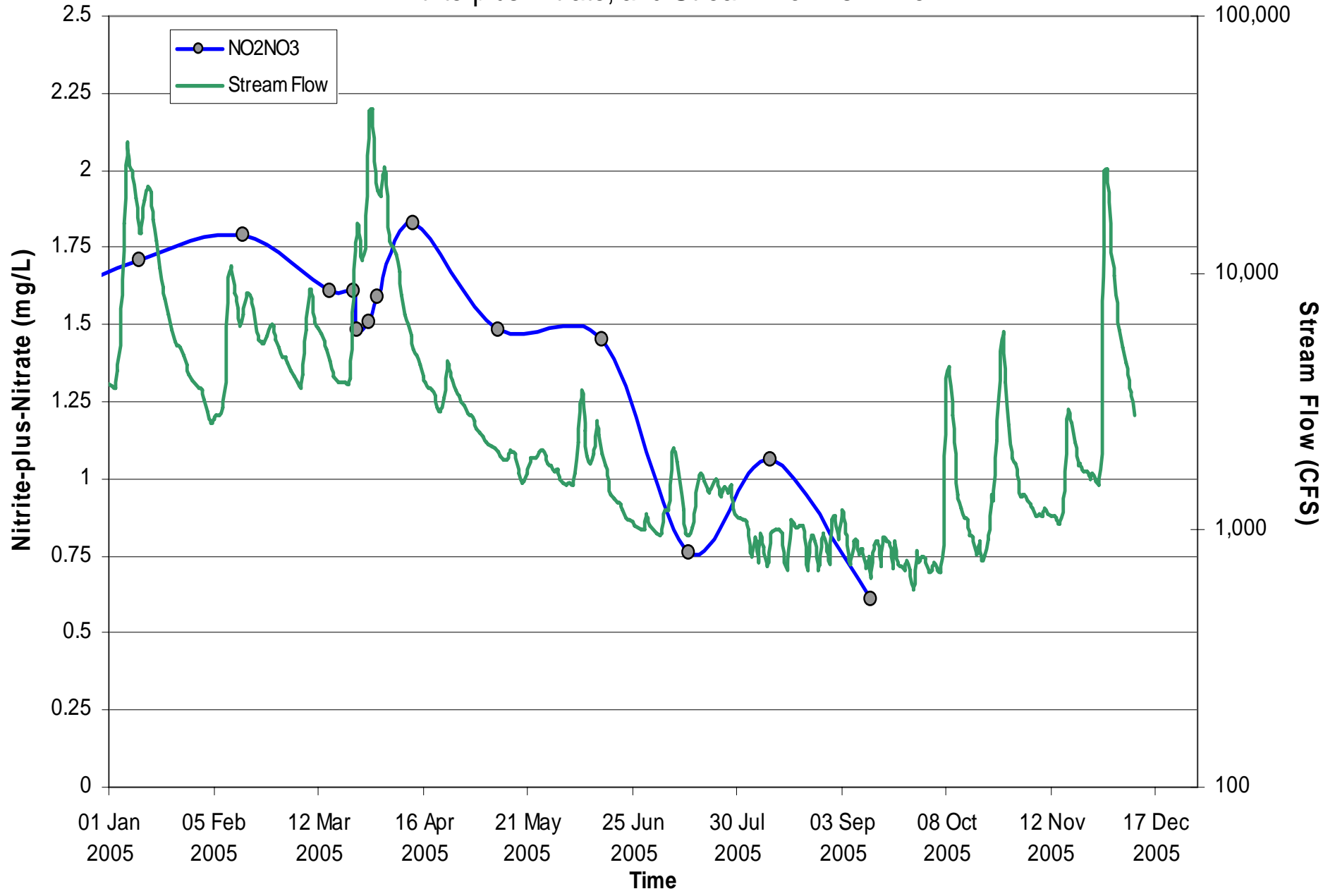
JUNIATA RIVER AT NEWPORT

Nitrite-plus-Nitrate, and Stream Flow vs. Time

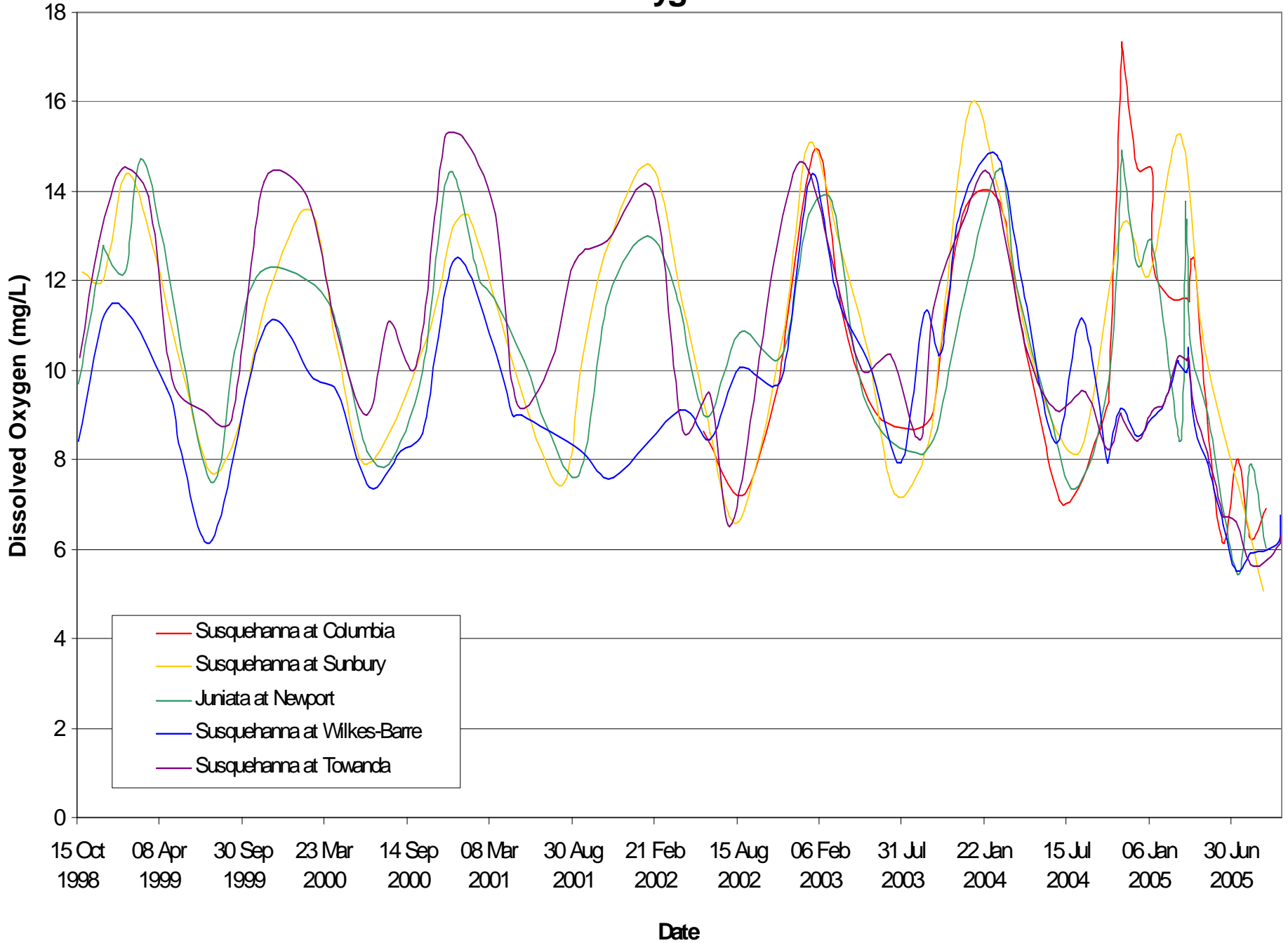


JUNIATA RIVER AT NEWPORT, 2005

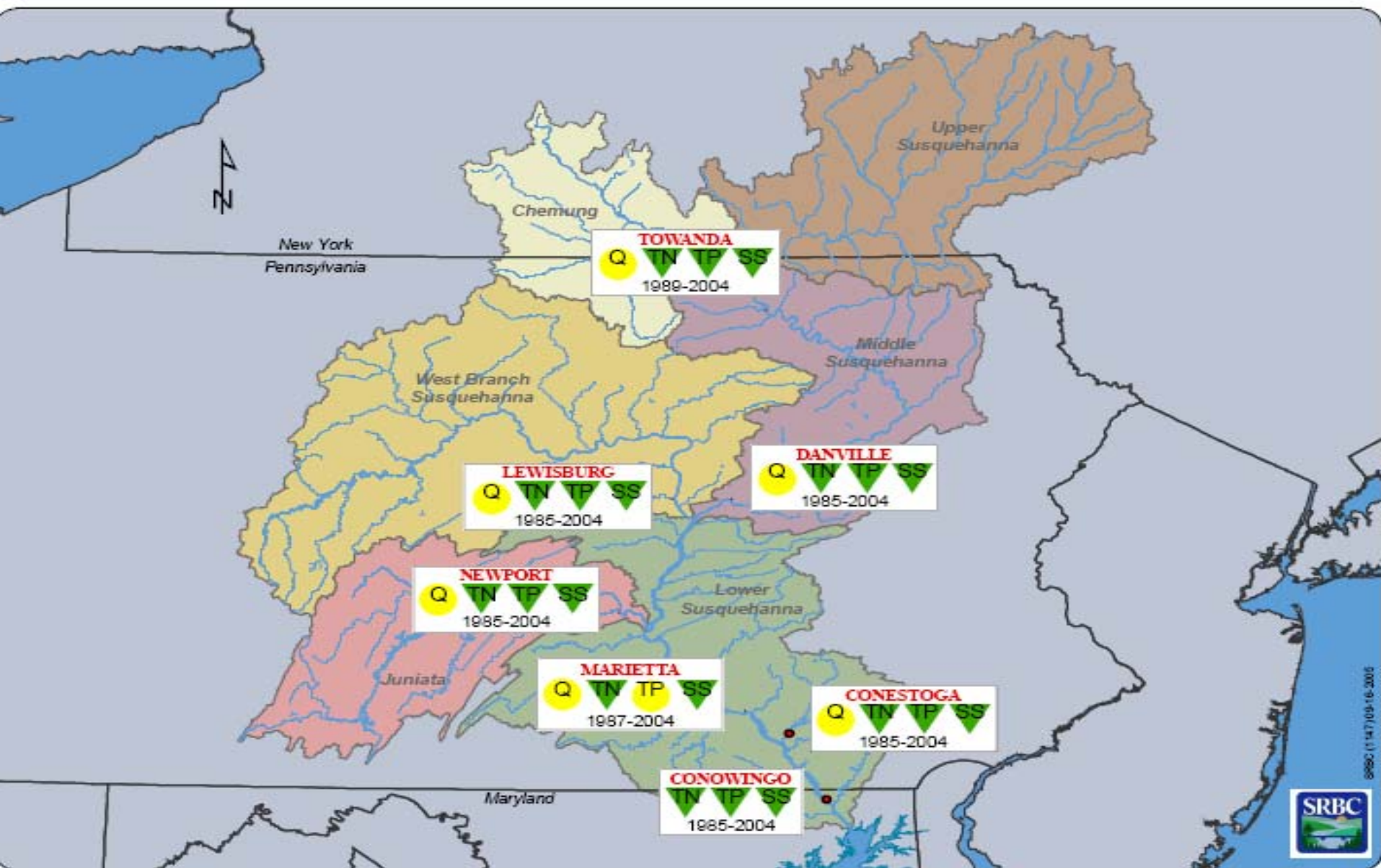
Nitrite-plus-Nitrate, and Stream Flow vs. Time



Dissolved Oxygen vs. Time



Susquehanna River Basin Commission FLOW-ADJUSTED CONCENTRATIONS 2004



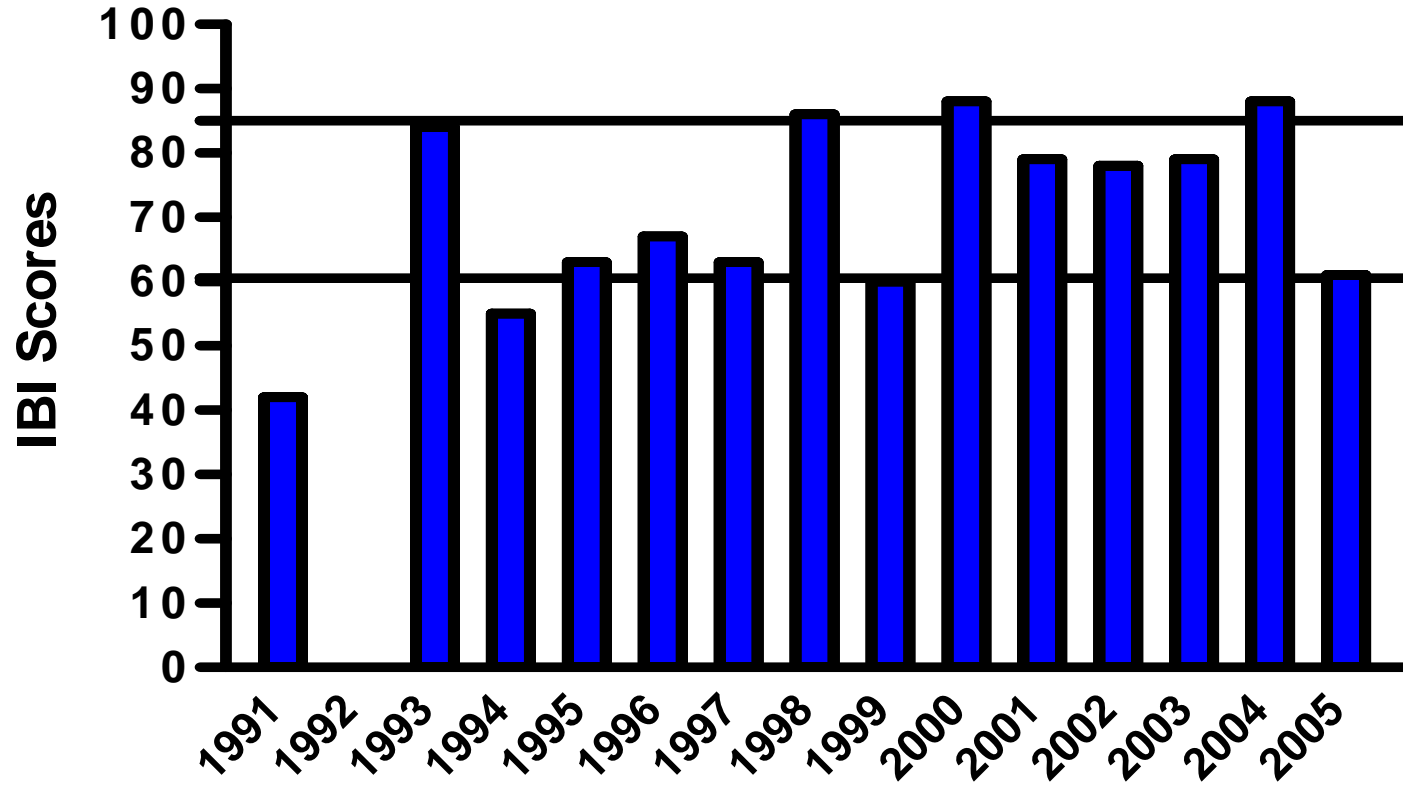
**TRENDS IN FLOW, NITROGEN, PHOSPHORUS AND SUSPENDED SEDIMENT
IN THE SUSQUEHANNA RIVER BASIN THROUGH 2004**

MACROINVERTEBRATE MONITORING



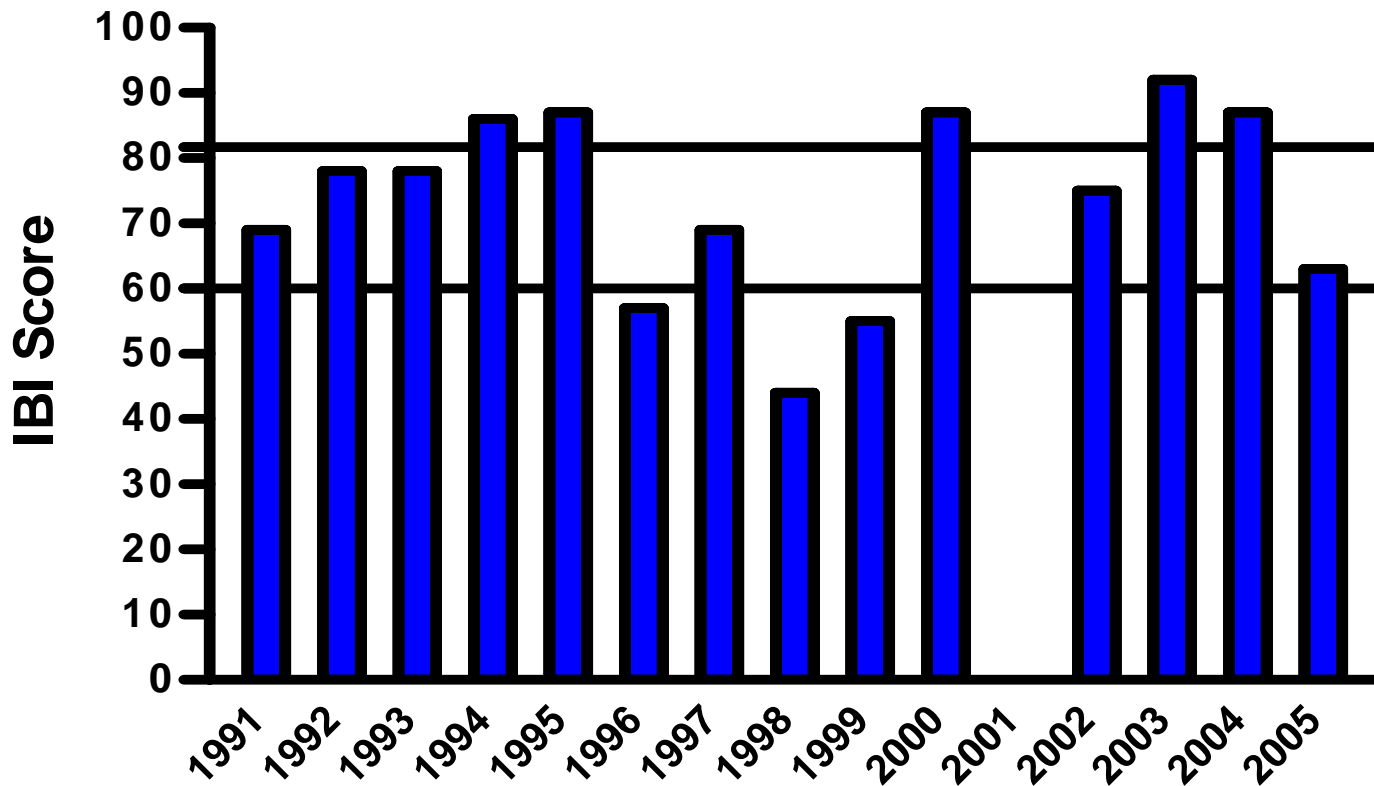
SUSQUEHANNA RIVER AT SUNBURY

WQN 203



JUNIATA RIVER AT NEWPORT

WQN 214



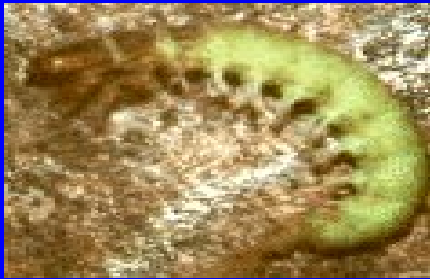
EPT SCORE



Ephemeroptera : Mayflies



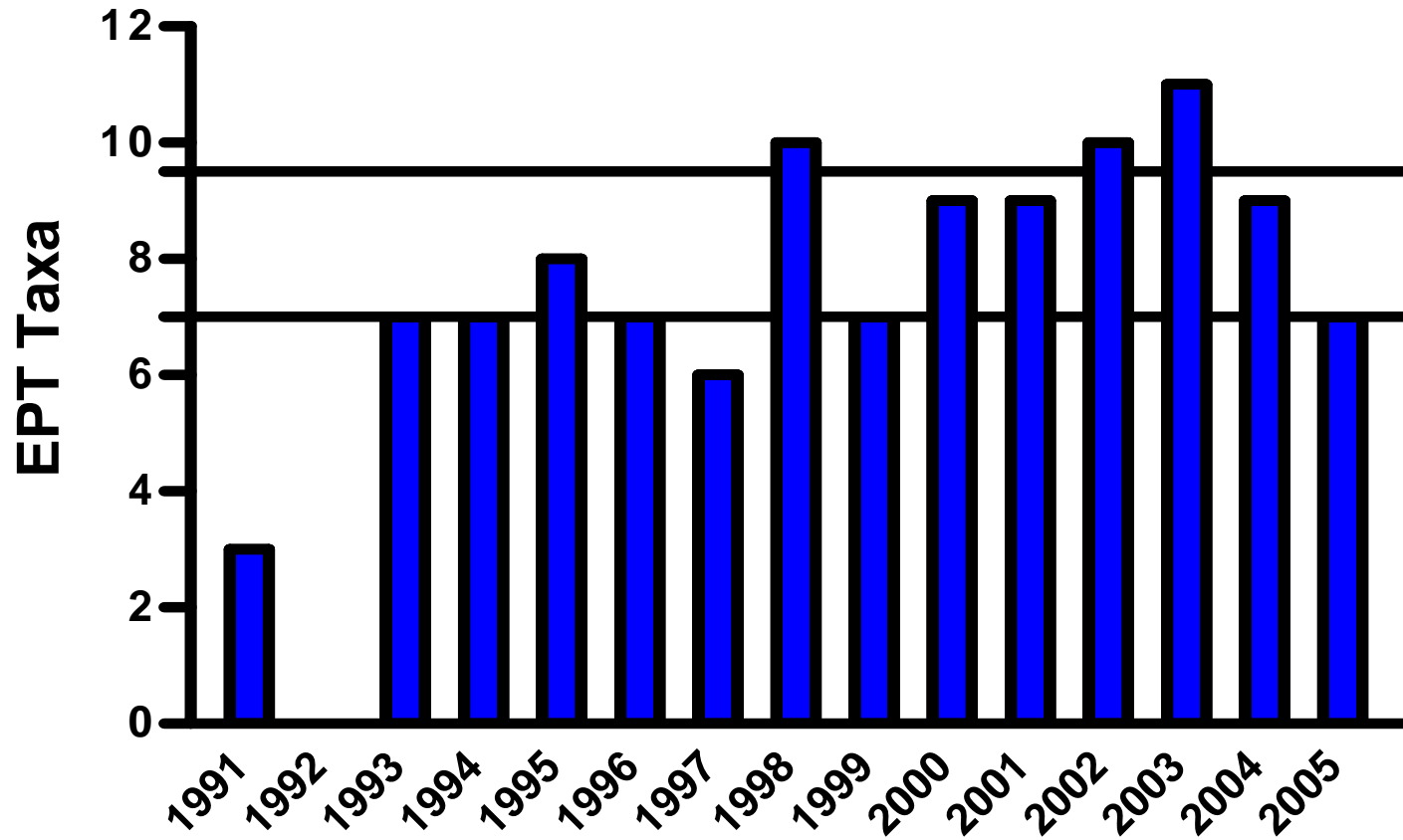
Plecoptera : Stoneflies



Trichoptera : Caddisflies

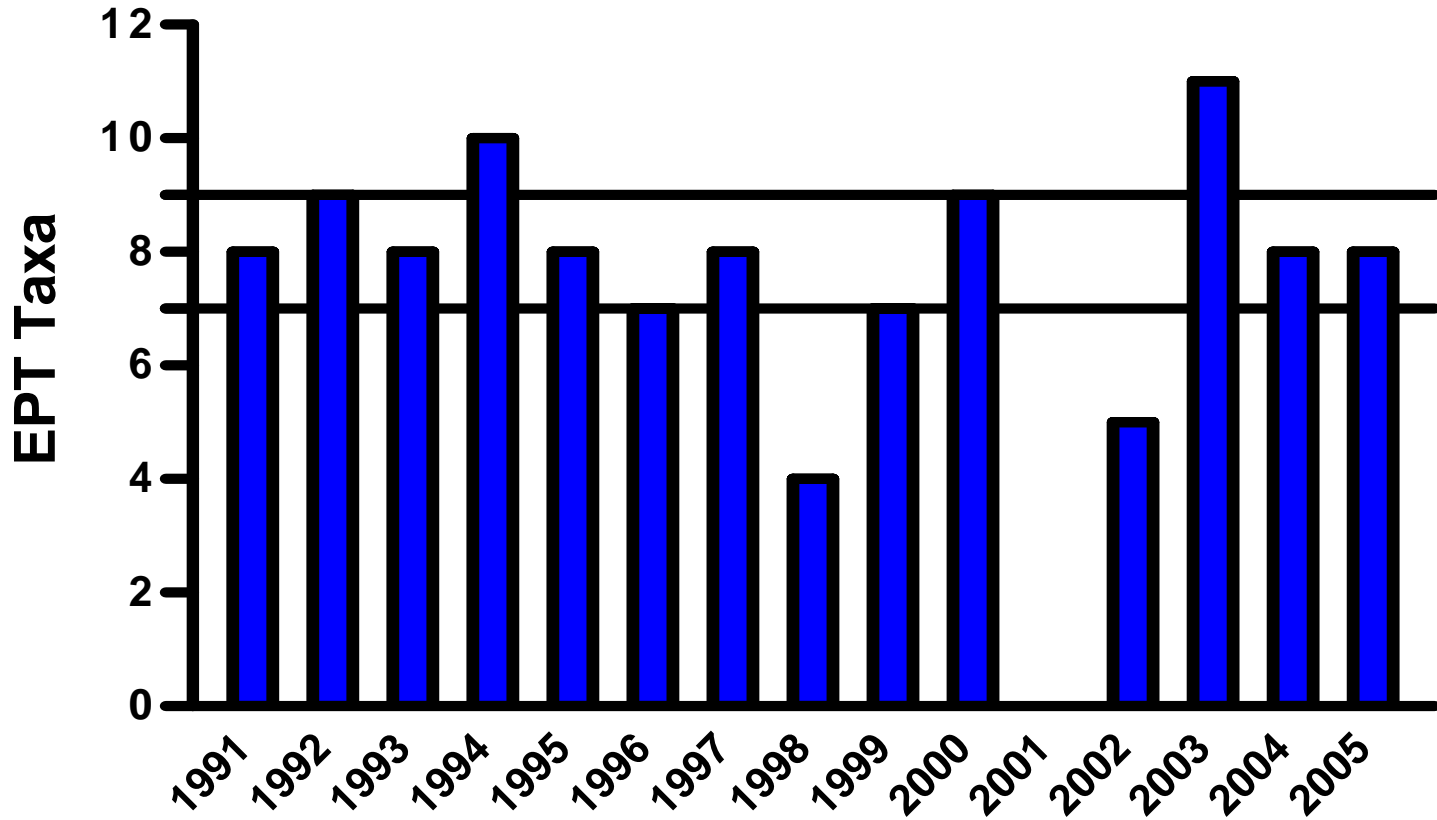
SUSQUEHANNA RIVER AT SUNBURY

WQN 203



JUNIATA RIVER AT NEWPORT

WQN 214



SUMMARY

- **Flows were near or below Q_{7-10} from July into September.**
- **River temperature was optimal for *Columnaris* growth but stressful for smallmouth bass.**
- **Overall, dissolved oxygen concentrations were at their lowest levels since 1998 therefore producing stressful conditions for smallmouth bass.**
- **Nitrogen and phosphorus levels have been decreasing since the 1980s.**
- **Macroinvertebrate community scores are within the 50th percentile and communities appear to be unaffected.**