
NUTRIENT AND SUSPENDED SEDIMENT TRANSPORTED IN THE SUSQUEHANNA RIVER BASIN, 2002, AND TRENDS, JANUARY 1985 THROUGH DECEMBER 2002

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ABSTRACT

Nutrient and suspended-sediment (SS) samples were collected under baseflow and stormflow conditions during calendar year 2002. The samples were collected from the Susquehanna River at Towanda, Danville, and Marietta; the West Branch Susquehanna River at Lewisburg; the Juniata River at Newport; and the Conestoga River at Conestoga, Pennsylvania, and analyzed for nitrogen and phosphorus species and SS.

Precipitation for 2002 was above average for all sites except Lewisburg. Highest departures from the long-term averages were recorded at Towanda and Danville leading to above average flow at these sites. Although precipitation was at or above the long-term means at all sites, water discharge levels for the year were below the long-term means at Lewisburg, Newport, Marietta, and Conestoga. Coupled with the previous drought years, this led to the detection of decreasing trends in flow for both Lewisburg and Conestoga. This was the first time that decreasing trends for flow were detected at any site.

This report has utilized four methods for determining whether nutrient and SS loads and yields were improving; comparison with similar water year 1992, comparison with baseline yields, comparison with the long-term means, and trend analysis through 2002. All four of these approaches agree that total nitrogen (TN) for all sites in 2002 was improving.

When comparing the 2002 loads of total phosphorus (TP) with the similar water year 1992, it was found that TP loads were higher at Towanda, Danville, Marietta, and Conestoga during 2002. Comparison of 2002 yields with the

baseline yields also indicated degrading TP conditions for Newport, Marietta, and Conestoga for 2002. TP loads for 2002 at Marietta were higher than the long-term mean, while no significant trend in TP was recorded. These three comparisons were a strong indication that although fluctuations in annual loads have not yielded significant trends, TP loads have not been improving at Marietta. Although this distinction was not as apparent with the other sites, an important trend was apparent with regards to dissolved orthophosphate (DOP). All sites except for Conestoga and Lewisburg have reported degrading trends in DOP for all three trend analyses, while having mixed trends results for dissolved phosphorous (DP) and TP. This suggests that the dissolved fraction of phosphorus is being dominated by DOP.

SS for 2002 showed increasing loads when compared with the 1992 annual loads for Towanda, Lewisburg, Marietta, and Conestoga. SS yields for 2002 showed increases in Newport only when compared to the baselines. SS trend results for 2002 showed decreasing trends at Danville, Lewisburg, and Conestoga. Loads for SS were lower than the long-term means at all sites for 2002. Due to the relationship between flow and constituent loads (Ott and others 1991, Takita and Edwards 1993, Takita 1998), the multiple-year drought that has affected the basin may prove to be the cause of the apparent decreasing trends and improving conditions. Whether or not the drought was the cause for the declining trends will be determined as the basin returns to normal conditions.