

Mississippi River below Grafton, Illinois

Flow-Normalized Nitrate Concentration and Flux

FN nitrate concentration and flux increased slightly from 1980 to 2010 (17 and 11 percent, respectively) at Mississippi River below Grafton, Illinois (MSSP-GR) (table 2). This site has the highest FN nitrate concentration of any of the study sites located on the Mississippi River (approximately 2.5 mg/L in 1980 and approximately 3 mg/L in 2010; fig. 8), reflective of upstream contributions from intensely farmed subbasins with high nitrate concentrations, such as the subbasins of the Iowa (IOWA-WAP) and Illinois (ILLI-VC) Rivers. Nitrate changed little at MSSP-GR from 2000 onward, possibly reflecting the integration of increasing nitrate from some portions of the basin, such as the upper Mississippi River (MSSP-CL) and the intervening subbasin above MSSP-GR, and decreasing nitrate in others, such as the Iowa and Illinois River Basins.

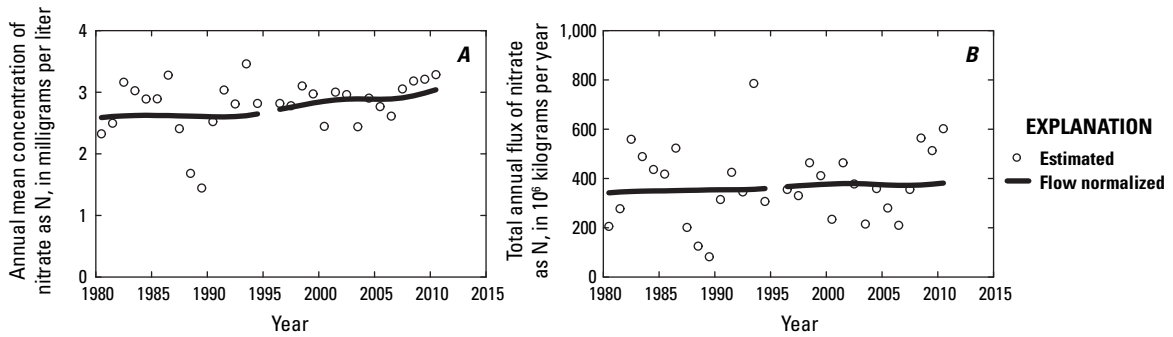


Figure 8. (A) Annual mean estimated concentration (circles) and flow-normalized concentration (solid line) and (B) total annual estimated flux (circles) and flow-normalized flux (solid line) from 1980 through 2010 for the Mississippi River below Grafton, Illinois (MSSP-GR).

Comparison of Nitrate Concentrations over Time and with Streamflow

Mississippi River below Grafton, Illinois (MSSP-GR) had minimal change in nitrate concentration from 2000 through 2010 (fig. 9). Each year, two pulses of elevated nitrate concentration at moderate and high streamflows, centered around the months of January and May, continued to occur. There is evidence for a slight decrease in nitrate during high streamflows, particularly during the summer and fall, but this decrease is offset by increases at moderate and low streamflows primarily during the winter and spring (fig. 9).

Figure 9. Expected nitrate concentrations at Mississippi River below Grafton, Illinois (MSSP-GR) from 2000 through 2010. Thin black lines show smoothed estimates of the 5th and 95th percentiles of streamflow. Vertical gray lines indicate January 1 of each year.

