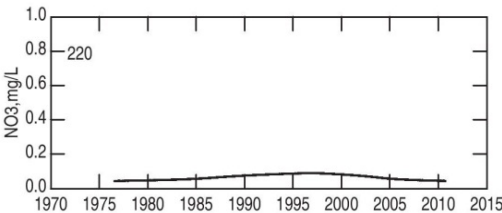
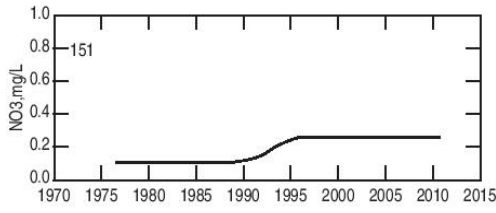


Mississippi River Basin results

Upper Mississippi River main stem (Blackberry to Fridley)

The general patterns in the Upper Mississippi River Basin are long-term increases in nitrate concentrations, with flow-adjusted concentrations often more than doubling over the three and a half decades of measurement (Table 2). The only exception to the long-term increase is the upstream-most Mississippi River site at Blackberry, which showed a decrease between 1997 and 2010. Recent period average annual increases range between 2% and 4% at all Mississippi River sites from Camp Ripley southward to Fridley. At the four most downstream sites, at Sauk Rapids, Monticello, Anoka, and Fridley, the trends were continuously upward since 1976.

Table 2. Trends in flow-adjusted nitrate concentrations in the Upper Mississippi River between the most upstream site at Blackberry to the most downstream site at Fridley. A positive change in nitrate concentration represents a statistically significant ($p < 0.1$) upward trend, and a negative change represents a statistically significant downward trend. "NT" (no trend) indicates that the trend was not statistically significant ($p < 0.1$). Site No. refers to site location on Figure 1 and Table 1. A 0% change is a change which rounded off to 0% overall change (the increase during the first 22 years is nearly balanced by the decrease in the last 14 years; yet the increase and decrease were each statistically significant).

Site No.	Upper Mississippi River Site Location / Trend Analysis Periods	% Change in Nitrate Concentration	Ending Concentration, mg/l
220	Mississippi River – Blackberry		0.05
	Overall change 1976-2010	*0%	
	1976 - 1997	+106%	
	1997 – 2010	-51%	
			
151	Mississippi River – Camp Ripley		0.26
	Overall change 1976-2010	+139%	
	1976-1988	NT	
	1989-1995	+139%	
	1996-2010	NT	
			

Site No.	Upper Mississippi River Site Location / Trend Analysis Periods	% Change in Nitrate Concentration	Ending Concentration, mg/l
026	Mississippi River – Sauk Rapids		0.23
	Overall change 1976-2010	+104%	
221	Mississippi River – Monticello		0.58
	Overall change 1976-2010	+268%	
994(871.6)	Mississippi River – Anoka		0.88
	Overall change 1976-2010	+134%	
024	Mississippi River – Fridley		0.49
	Overall change 1976-2010	+87%	