

Market factor and Nitrogen Concentrations in the Mississippi River ---- Based on WRTDS Model

Author: Bingcai Liu

Co-Presenters:

Major: Agribusiness and Applied Economics

Research Advisor: Brent Sohngen

The main purpose of this research is to test whether or not there is a relationship between market factors, such as nitrogen fertilizer price and crop prices, and the concentration of nitrogen in the Mississippi River, and how variation in prices affects nitrogen concentrations.

This research hypothesizes that market factors also play an important role in affecting nitrogen concentration in the Mississippi River other than flow and seasonal fluctuation. Moreover, this effect may vary over time and space.

Using data from USGS measuring eight observation posts along the Mississippi River watershed, this research finds that the relationship between nitrogen prices and nitrogen concentration is negative. Moreover, the elasticity of price change to nitrogen concentration is -0.1 to -0.2, which means for every 10% increase on nitrogen fertilizer price, nitrogen concentration would decrease by 1% to 2%. This research also tested how market factors make an impact in different models, and found some limitations in previous models.

This research illustrates the important link between markets for nutrient inputs and nutrient outputs in watersheds, and the results suggest that policy makers can use price mechanisms to help reduce pollution.