

# Farmland's Effect on Local Water Quality

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## INTRODUCTION

### History

There has been concern over farm runoff leaking into the Gulf of Mexico and causing unprecedented algae bloom. As a primary contributor, Illinois makes an excellent analysis state for the local effects of farm land runoff on water quality. Spring Creek is a good specific case as it can clearly show some negative effects of agricultural runoff on water quality and the river structure.

### Questions

How does farm runoff affects rivers and lakes in Illinois?

How does farm runoff cause the drop in water quality?

## SCOPE

### Spatial Scope

Illinois is the only state used to examine this data for purposes of readability and data consistency. The Spring Creek river in Morgan County was used to examine potential results from runoff.

### Temporal Scope

Data used for mapping water quality came from an EPA report in 2015 and data on Spring Creek comes from a plan created in 2012.

## METHOD

In order to examine if farmland has an effect on water quality in rivers in Illinois, rivers will be mapped over existing farmland in Illinois. These rivers will then be shaded if there is evidence that their pollution is influenced by agricultural runoff. The analysis information comes from the EPA's report of water impairment.

## ISSUES

The purpose of water data supplied by the EPA is to combine many factors in determining water quality. This makes it difficult to understand if the farmland specifically is the cause of quality drop or some other cause

## RESULTS

This map of Illinois while showing how main drainage rivers are impaired also shows how toward Chicago and towards the deeper south of Illinois the rivers tend to be more polluted. In addition The rivers that lead out of impaired water basins tend to also be impaired.



A map of Illinois water bodies and their observed quality by the EPA.



Invasive shrubs and reed canary grass along Spring Creek. (EPA Spring Creek Plan)

While not listed as primarily impaired by agriculture, Spring Creek represents a river that has been affected by agricultural runoff. The invasive shrubs found in the above picture are one of the results of excess nutrient that has runoff into the river

## CONCLUSIONS

- The map shows not all rivers are primarily affected by agricultural runoff.
- The map also shows that there are multiple rivers that are still impaired due to agricultural runoff.
- Rivers that are affected by agricultural runoff can show symptoms such as oxygen depletion, algae growth, excess nutrients, or toxic chemicals.
- The information does not indicated specific concentrations, of different chemicals which could provide a more complex answer to how runoff is affecting rivers.
- Information in the map only shows rivers that have been evaluated as primarily caused by agriculture.

## SOURCES

Illinois Department of Agriculture  
<https://www.agr.state.il.us/gis2/landcover99-00.html>

EPA  
<https://www.epa.gov/waterdata/waters-geospatial-data-downloads#ImpairedWatersWithTMDLs>

Illinois Geospatial Data Clearinghouse  
<https://clearinghouse.isgs.illinois.edu/data/elevation/illinois-height-modernization-ilhmp-lidar-data>

"Spring Creek Water-shed-Based Plan", EPA, September 2012, <http://flintcreekspringcreekwatersheds.org/wp-content/uploads/springcrwbp-1.pdf>