Increasing Public Awareness of NPDES Locations and Water Quality in the State of Illinois and Sangamon County



Overview

Water is a non-renewable resource that can be easily polluted due to anthropogenic factors, some of them include treated municipal effluent, treated industrial effluent, coal and non-coal mining discharges, Concentrated Animal Feeding Operations (CAFOS's), public water supply treatment plants discharges, pesticide discharges, and stormwater (IL EPA, 2019).

In order to treat those discharges that go into the water, the National Pollutant Discharge Elimination System (NPDES) was created. This system has its origin in the Federal Clean Water Act that seeks to protect the water that all the residents in the U.S. drink. For that reason, I would like to increase public awareness of water contamination sites in Sangamon county and the state of Illinois by creating maps that include NPDES permits entities' locations, community water supply wells, noncommunity water supply wells, surface water intakes, and the potential for aquifer recharge.

Methodology

Maps were created and data was analyzed using ArcGIS 10.7 version Software.

2

The first step was to clean the data, select by attributes the desired data, then classify the data as a unique values map with different gradient colors. The map includes a class value that is divided in 9 categories for aquifer recharge. Then a spatial join was performed and lastly, the correct symbology was assigned, including legend, north arrow, scale bar, and title.

In order to identify potential water wells and water intakes at risk of being polluted, the first step was to clean the data, select by attributes the desired data, apply buffer of 1000ft from the NPDES locations and assign the correct symbology to the map, including legend, north arrow, scale bar, and title.



Figure 2. NPDES Locations in Sangamon County

For the NPDES locations map in Sangamon county, there were a total of two water wells, a community water supply (CWS) well and a surface water intake that were within the 1000ft buffer from the NPDES locations.

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Figure 1. Potential for Aquifer Recharge in Illinois

For the map of NPDES locations and aquifer recharge, the results include a total of 120 NPDES entities that are in the class area very high to high.

Total Percentage Area







Conclusions

The findings of this research include:

1 Based on the results, the water quality in Sangamon county is not at high risk of being polluted due to most the NPDES entities are located outside of the 1000ft buffer except for two wells in the entire county.

The following Pie Chart shows the percentage of area that is more likely to be affected by NPDES entities in



The Aquifer recharge map shows that Illinois has 120 NPDES entities in the very high to High permeability area. This meaning that a 0.7% of land area is being exposed to high potential risk of contamination.

Future Research

There are many factors other than aquifer recharge and NPDES locations influencing the water quality of the state of Illinois and its counties. Some of them include population density in a specific area, water treatment facilities operations, and environmental factors. Collecting information on these topics will give a better understanding of the water quality in the Illinois area.

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