Surface Water, Drinking Water

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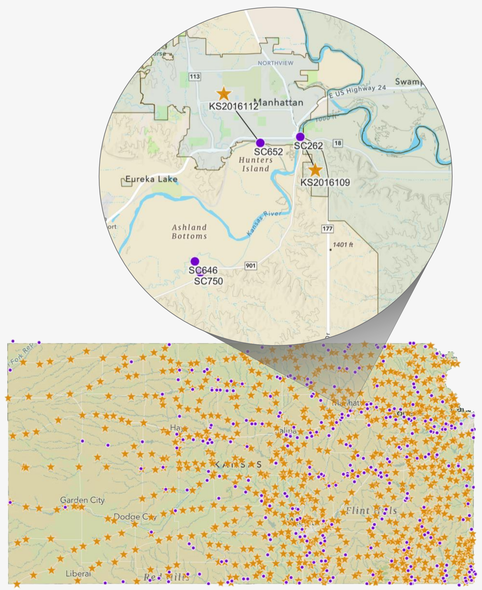
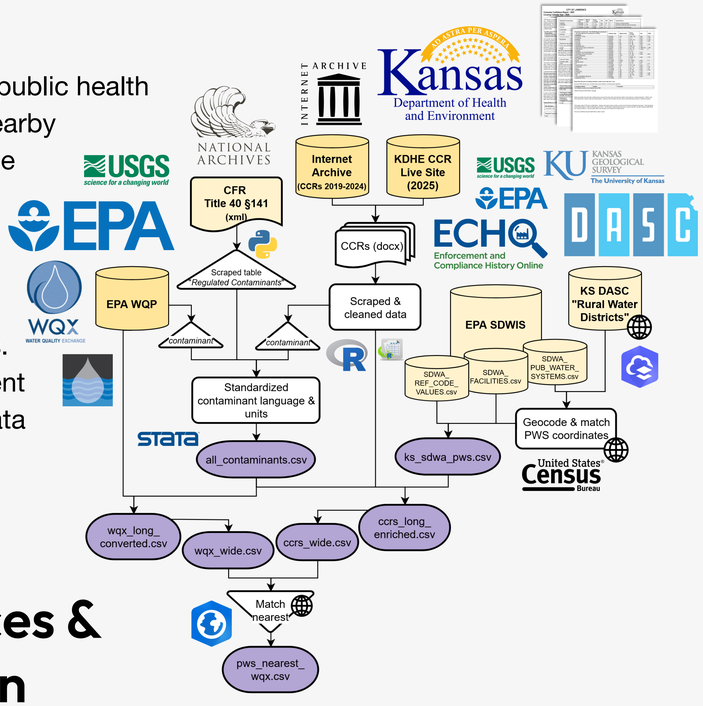
Introduction

Assessing water purification performance is crucial from both a public health and environmental standpoint. As many municipalities rely on nearby lakes & rivers as sources of drinking water, we sought to evaluate Kansas water systems by characterizing the content and travel of **contaminants** between **surface water** and **drinking water**. The Environmental Protection Agency (**EPA**) requires Public Water Systems (**PWS**) to release annual drinking water quality data via Consumer Confidence Report (**CCR**) documents. Kansas CCRs are available online through the Kansas Department of Health & Environment (**KDHE**), but for only up to a year, so data archival and consolidation has been a secondary goal.





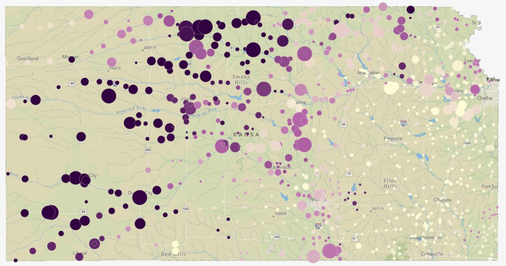
Data Sources & Preparation

Surface water quality data is easily accessible through the EPA Water Quality Portal (**WQP**). Tables contained in Kansas CCR docx files from 2019-2025 were scraped and combined. Due to variation within and between the CCR & WQP datasets on contaminant names, units, etc., these two sets were compared alongside the Code of Federal Regulations (**CFR**) to create a standardized list. To connect each PWS to the nearest surface water test site, PWS locations were identified using several additional federal data sources. This also brought in a wealth of other useful information about each PWS, including the type of source, area & population served, and water purchasing relationships.

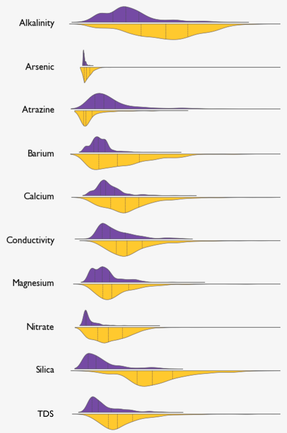
Results

As a result of this work, we now have several comprehensive datasets relevant to municipal and surface water quality analysis. These include an extensive list of contaminants, allowable levels, health effects language, etc., as well as PWS coordinates, water sources, nearby surface water contaminant levels, and more. These data allow for all kinds of spatial and temporal analysis, and offer many features for model development and risk assessment.

Selenium in 2019:
PWS vs. Nearest Surface Test Site



PWS Water Source:
Surface vs. Groundwater



Discussion

The hope is to next utilize the EPA's Drinking Water Treatment Technology Cost Models to estimate yearly water treatment spending by PWS. Future work should also include more robust matching of PWS to surface water test sites, based on collected names of water sources. Access to more historical CCR data would also allow for greater accuracy and temporal analysis.