Municipal Wastewater Infrastructure Across Edwards Aquifer Recharge Zone

Research conducted for GEAA Greater Edwards Aquifer Alliance Courtesy of Creative Geospatial Solutions

An example of central Texas urban wastewater infrastructure in relation to the Edwards Aquifer

2010 NAIP Imagery TNRIS

Edwards Aquifer Zones

- Contributing Zone
- Recharge Zone
- Contributing Within Transition Zone
- Transition Zone

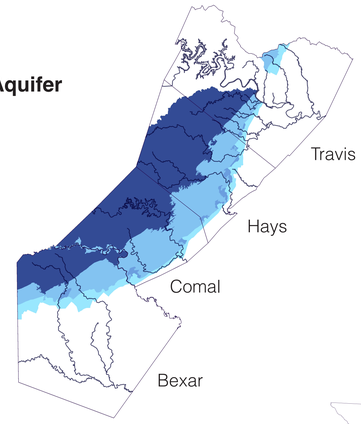
Geographic Boundaries

- County Boundaries
- City Boundaries
- Municipal Utility District Boundaries

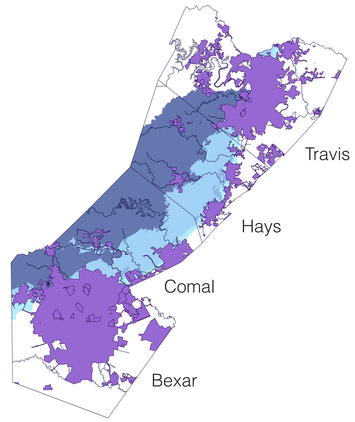
Wastewater Pipelines

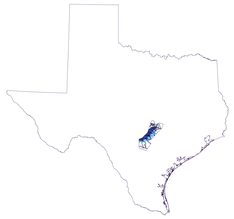
- Within Aquifer
- Outside Aquifer

Edwards Aquifer

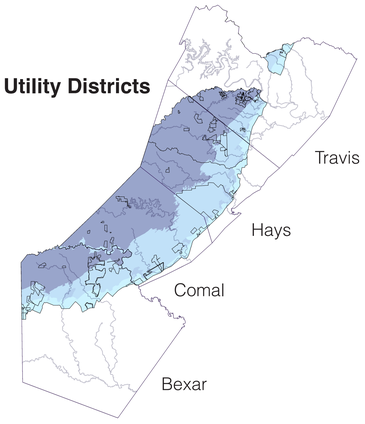


Urban Areas

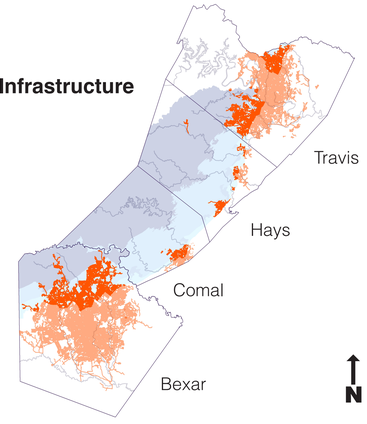




Municipal Utility Districts



Wastewater Infrastructure



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Background

Covering over ten counties, the Edwards Aquifer is a principle source of water for Central Texas. It serves nearly two million people and the natural environment including countless endangered and threatened species. In order to aid in the protection of the aquifer, this project, prepared for the Greater Edwards Aquifer Alliance (GEAA), has two main goals:

- Create a comprehensive map and data set of wastewater pipelines within the Edwards Aquifer Recharge and Transitions Zones
- Detect areas of future wastewater infrastructure development.

This information will be used to help improve connectivity between wastewater service providers within Municipal Utility Districts (MUD), and increase transparency of wastewater infrastructure.

Data Collection Process

- We came up with a detailed script describing our project, why we were doing it, and the entity we were working with.
- We decided that the location of the pipelines was most important, and that was all the data we were going to ask for.
- We found contact information for the different MUDs and made note of it on a spreadsheet.
- We called or emailed the person and or persons of contact in regards to our data requests and persistently kept in contact while also setting a specific date in which we wanted the data.
- We signed law abiding contracts and sent out a letter of support, provided by our professor, from the Department of Geography to help minimize the MUDs concerns for releasing the data.
- Over the course of the project, our goals had to be changed in order to accommodate the sensitivity of the data collection. We were able to successfully collect data from all counties within our adjusted scope.

Analysis

One aspect of the project focuses on both existing and future expansion of wastewater infrastructure across the Edwards Aquifer Recharge and Transition zones. The other aspect focuses on planning for growth as a crucial step in protecting the aquifer from contamination. This was done by identifying developing areas with which we estimated the expansion of the infrastructure. In order to identify urban areas that were not in our pipeline data set, we overlaid wastewater pipeline data with aerial imagery of Hays County acquired from the National Agriculture Imagery Program (NAIP). With these images, we were able to infer the wastewater pipelines will continue to follow development patterns, which may lead to a higher risk of potential accidents occurring, such as pipeline breaks.

Conclusion

In conclusion, there are many obstacles in creating a comprehensive map of wastewater infrastructure. Dealing with multiple MUDs and collecting sensitive data proved to be our biggest challenges. Overall the data collected will help aid in public awareness, bring connectivity between the MUDs, and reduce the response times to possible infrastructure problems.

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