

Request For Proposal:
**Mapping Wastewater Pipelines Located within or adjacent to Streams
on the Recharge Zone of the Southern and Barton Springs Segments
of the Edwards Aquifer**

GIS Design & Implementation (GEOG 4427), Texas State University
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Project Overview:

A regional GIS is needed to assemble an aggregate layer of wastewater mains within or adjacent to streams crossing the Recharge Zone of the Southern (San Antonio) and Barton Springs Segments of the Edwards Aquifer (EA). During the past few years, the US Environmental Protection Agency and local community groups (see two attachments) have been increasingly concerned with the frequency of wastewater spills over the extremely sensitive recharge zone of Edwards Aquifer. However, no single GIS currently exists to delineate wastewater lines crossing this highly vulnerable karst system, whose groundwater is the sole source of water for approximately two million people within the region.

Objectives:

The primary goal of the proposed project is to implement the first comprehensive GIS analysis of wastewater lines within or adjacent to highly sensitive stream and riparian features within the EA Recharge Zone. Within an area already characterized by little of no soil filtration of surface contaminants, stream corridors are often the most rapid and direct conduit of unfiltered recharge to the underlying aquifer.

Posting of results to a public website is important for public education and outreach. If time allows, incorporation of wastewater spill data as part of a Web GIS interactive map would provide a valuable public service.

Data Sources:

- The locations of wastewater lines may be obtained from wastewater service providers (including Municipal Utility Districts) within the region.
- Service-area boundaries and provider contact information may be obtained from regional Council of Government (COG) sources (Alamo Area COG and Capitol Area COG), and city and county utility departments.
- Shapefiles for aquifer recharge-zone boundaries are available from the Edwards Aquifer Authority (EAA) and GEAA.
- Shapefiles for stream and water layers, including TCEQ/EPA impairment status, are available from USGS, TCEQ, TNRI, TWDB, GEAA, etc.

- Wastewater spill data (event dates and volumes) may be obtained from EAA, service providers, TCEQ, and utility departments.
- Shapefiles for urban areas and population data may be obtained from the US Census website.

Region of Primary Interest:

The Recharge Zone of the Southern and Barton Springs Segments of the Edwards Aquifer (http://www.edwardsaquifer.org/display_technical_m.php?pg=maps) encompasses relatively limited portions of seven counties.

Counties:

Priority 1: Hays, Comal, Bexar

Priority 2: Travis

Priority 3: Medina, Uvalde, Kinney

Products:

- County maps, shapefiles, and quantitative data, which depict locations and vulnerability rankings for wastewater lines in terms of proximity to streams and other sensitive recharge features. Surface water-quality criteria, such as TCEQ/EPA stream impairment status, may be incorporated into the vulnerability analysis.
- Available wastewater spills data may be incorporated to complete the vulnerability assessment.
- Interactive visualization of results would address underlying factors affecting stream vulnerability, by superimposing large-scale residential and commercial development, along with population growth trends.
- The connection between development and potential impact to sensitive recharge areas may be further demonstrated using high-resolution before-and-after overlays of selected areas undergoing development.