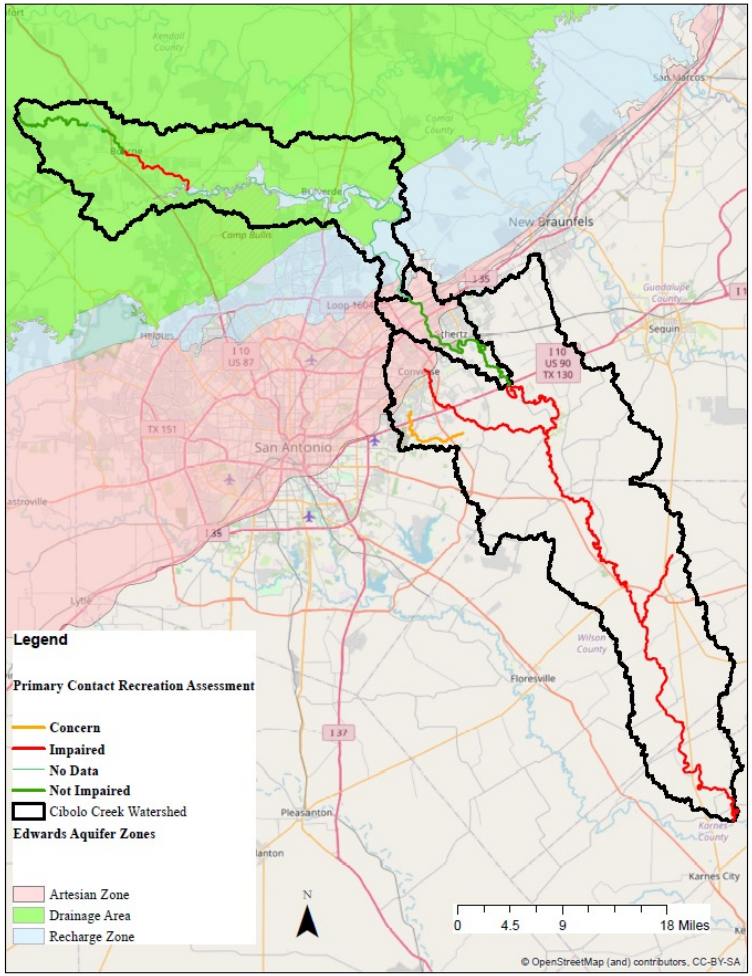
SAN ANTONIO RIVER AUTHORITY

Cibolo Creek Watershed Models Update

September 21, 2023

Cibolo Creek Watershed



Project Study Area

Objective

The project objectives are to identify locations and develop/quantify preservation/mitigation strategies for improvement of water quality in the Cibolo Creek Watershed

Tasks under Phase 1

Tasks	End Date
Data Collection and Analysis	1/30/24
Model Development (Hydrologic)	3/20/24
Calibration / Validation	6/20/24
Peer Review	7/20/24

Data

- DFIRM
  - Subbasin delineation
  - Stream shapefile
  - HEC-HMS
  - HEC-RAS
- Topography
  - DEM
  - Contours
- Aerial images
- SSURGO soil data
- Landuse & IC%
- Met data (NOAA)

- Rainfall
  - NOAA
  - EAA (gage, NEXRAD)
  - SARA
  - USGS
- Diversion
- Wastewater data
- USGS flow data
- Water Quality
  - SWQM
  - USGS
- Impaired waterbody
- Screening levels

- SSO
- OSSF (estimates)
- Dams/reservoirs
  - From HMS
- Groundwater recharge & spring flow
- Major development centers
- QUAL-TX models
- Atmospheric deposition*
- Relevant data
  - Agricultural data
  - SELECT or EC loading estimates

Other Related Efforts

- Grant application to N-EWN (full proposal due Jan 2024)

EWN®
Engineering With Nature

EWN Pre-Proposal Screening Form

The Mission: To develop innovative, adaptive, holistic, system-based solutions to the nation which intentionally align environmental processes with engineering practices. Engineering With Nature research and applications are collaborative efforts with inter-disciplinary focuses.

Evaluation of the impacts of development and land practices using a coupled groundwater-surface water model

PRINCIPLE INVESTIGATOR	
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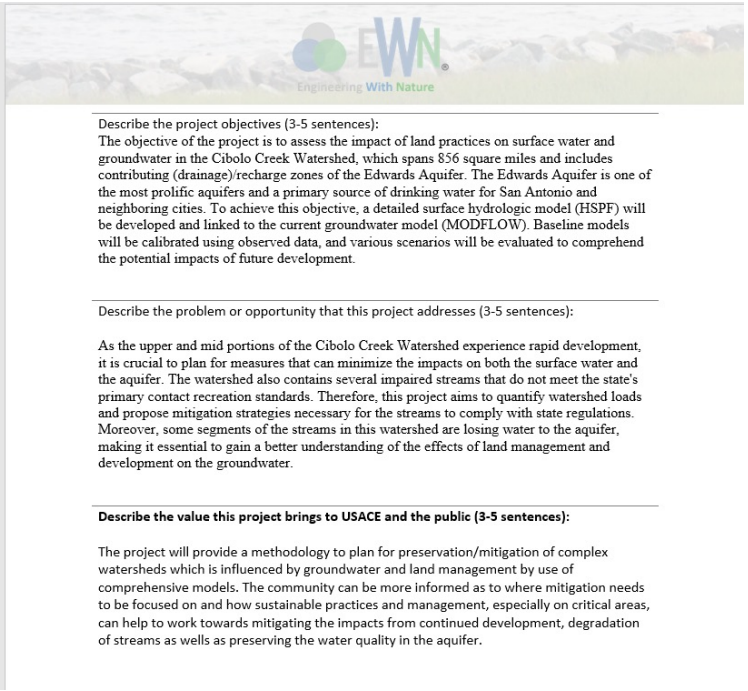

Engineering With Nature

Describe the project objectives (3-5 sentences):
The objective of the project is to assess the impact of land practices on surface water and groundwater in the Cibolo Creek Watershed, which spans 856 square miles and includes contributing (drainage)/recharge zones of the Edwards Aquifer. The Edwards Aquifer is one of the most prolific aquifers and a primary source of drinking water for San Antonio and neighboring cities. To achieve this objective, a detailed surface hydrologic model (HSPF) will be developed and linked to the current groundwater model (MODFLOW). Baseline models will be calibrated using observed data, and various scenarios will be evaluated to comprehend the potential impacts of future development.

Describe the problem or opportunity that this project addresses (3-5 sentences):

As the upper and mid portions of the Cibolo Creek Watershed experience rapid development, it is crucial to plan for measures that can minimize the impacts on both the surface water and the aquifer. The watershed also contains several impaired streams that do not meet the state's primary contact recreation standards. Therefore, this project aims to quantify watershed loads and propose mitigation strategies necessary for the streams to comply with state regulations. Moreover, some segments of the streams in this watershed are losing water to the aquifer, making it essential to gain a better understanding of the effects of land management and development on the groundwater.

Describe the value this project brings to USACE and the public (3-5 sentences):

The project will provide a methodology to plan for preservation/mitigation of complex watersheds which is influenced by groundwater and land management by use of comprehensive models. The community can be more informed as to where mitigation needs to be focused on and how sustainable practices and management, especially on critical areas, can help to work towards mitigating the impacts from continued development, degradation of streams as wells as preserving the water quality in the aquifer.

Questions?

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