

ArcGIS in Water Resources: Term Project Proposal  
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Traditional development of urban infrastructure has reduced the rate of infiltration by covering the soil with impermeable surfaces that get drained primarily through piping systems that discharge into natural waterways. The overflow of these basic piping systems causes problematic flooding of our urban infrastructure as well as the increase in polluted runoff into natural waterways. To prevent these problems, we can develop green storm water infrastructure (GSI) that sufficiently reduces urban runoff.

For this research project, I am proposing to investigate the impact that GSI would have on storm water in Austin, TX. The GSI methods that will be considered are bioretention swales for street runoff, permeable pavement and cisterns for roof runoff. The bioretention swales will slow the water down, allow for runoff to infiltrate the ground, and provide some level of water treatment. Similarly, permeable pavement will allow for runoff to infiltrate the ground while still providing a surface for sidewalks and streets. The cisterns will harvest the runoff on roofs to be stored and utilized for the buildings facilities.

In order to investigate the impacts of GSI, I will need to utilize various datasets through ArcGIS. Rainfall data will determine the amount of runoff that must be managed through GSI methods. Land cover maps will show what percentage of the land area is covered by impermeable surfaces. Soil property maps will determine the rate at which water can infiltrate into the ground. Building area and zoning maps will provide the amount of available commercial roof area that can collect runoff for storage. Utilizing these datasets, I can determine the feasibility and extent at which the different GSI methods must be implemented to have a significant reduction in storm water runoff.