Investigating the Potential for Rainwater Harvesting to meet Residential Demand in Austin
Progress Report 1
GIS in Water Resources, Fall 2013
Gary Gold
10/28/13

Project Scope

I have modified the scope of my project to investigate the feasibility of rainwater harvesting to meet residential demand in Austin. To conduct this investigation, I have chosen a representative sample of 12 houses in my neighborhood as a case study. For each of these houses, I will calculate the required cistern volume to store collected rainwater and display these results on a map of my neighborhood. The feasibility of rainwater harvesting for each location will be determined by the required cistern volume.

Current Progress

I created a spreadsheet to calculate daily rainwater storage and collection potential. The system inputs site specifications including roof area and number of occupants and computes a daily water balance to estimate the amount of rainwater stored in a potential rainwater harvesting cistern. This spreadsheet uses daily rainfall data for Austin that I obtained from the Texas Water Development Board (TWDB) and includes the years 1978-1997.

I have experimented with this spreadsheet using parameters from my 5-occupant house. I measured my roof area using the ArcGIS measure tool and computed the cistern storage for each day from 1978-1997 assuming each occupant uses 45gal/day of water. The spreadsheet also assumes that the cistern is initially full and will be refilled on any time the water volume is less than 1.5 times the total daily use.

Table 1 displays the number of times the cistern will need to be refilled for the years 1978-1997 for various cistern volumes:

Cistern Volume (gal)	Number of Refills
15000	25
20000	19
30000	12
40000	9
50000	8

Table 1: Refill requirements for 1401 E. 13th Street for the 20-year period

Any of these cisterns sizes are reasonable for rainwater harvesting. If I choose to make the criteria that the cistern should be filled an average of once per year, the design value for the cistern will be 20000 gallons.

Future Intent

I plan to carry out these calculations for each of the 12 houses in my case study. I will estimate the required cistern volume of number of refills for each location. In order to do so, I need to calculate the roof area and find out the number of occupants for each house. Once I size a cistern for each house based on these criteria, I will create a map of for my neighborhood showing the required cistern volume for each site. The feasibility of rainwater harvesting will be determined by required cistern size, however, the criterion for this determination is not yet decided.