This project is aimed at developing an accurate means to predict outcomes of given rainfall and manage runoff and water diversion improvements in line with those predictions. As the climate becomes increasingly less predictable, it is invaluable to understand the necessary improvements and changes to our water diversion system for maintaining a safe city, avoiding costly floodwaters and the damage they cause. I plan to create a simulation that can effectively recreate rainfall over the Albuquerque area, accounting for water soaking into the ground throughout its journey and differing permeabilities. I also plan to use the simulation to find solutions to maximize recharge of the aquifer which recedes every year. I am using Blender to create a model of the Albuquerque area to test on, and I plan to use Blender's simulation nodes to create and measure the rainfall and its travel. I have so far gathered data on the most prominent recharge zones from the *Geochemical Characterization of Ground-water Flow in the Santa Fe Group Aquifer System, Middle Rio Grande Basin*, New Mexico in US Geological Survey Water-Resources Investigations Report 03-4131 (1). I have also gathered information concerning the effects of the shrinking aquifer on water access in the Albuquerque area from *Digital hydrologic and geospatial data for the Rio Grande transboundary integrated hydrologic model and water-availability analysis, New Mexico and Texas, United States, and Northern Chihuahua, Mexico* (2). I obtained additional information on rainfall proportions (for a given total rainfall in Albuquerque, how much goes where typically) from the Pinyon Ecology Research Group's Colorado Plateau Precipitation Map (3). Another important section of research is in the water retention of typical Albuquerque soil. The article *Water regulation and soil retention services in semiarid ecosystems of southeastern Iran, 2018–2020* (4), provided a basic standard for water retention for areas with varying soil degradation and vegetation. To provide a final look into New Mexico's soil's potential for degradation and such linked negative water retention is NMSU's article, *Soil Health—Importance, Assessment, and Management* (5). I have already constructed and formatted a model of the Albuquerque area with elevations and buildings in Blender which I have prepared for physics and particle simulation. I plan to implement my research and other details into the model soon. However, due to various issues with incompatibility with Blender and BlenderGIS, the software I am using to download and construct the 3d model, I also plan, should cooperation with the physics engine of Blender and BlenderGIS prove infeasible, to take a lower tech approach and approximate the particle systems that Blender would have provided. I expect that this model should, once the less technical UI difficulties are worked out, be able to reach a solid level of accuracy and effectiveness.

(2) D, Tillman F, et al. "Digital hydrologic and geospatial data for the Rio Grande transboundary integrated hydrologic model and water-availability analysis, New Mexico and Texas, United States, and Northern Chihuahua, Mexico" *ScienceBase*, US Geological Survey, 27 Sept. 2018, www.sciencebase.gov/catalog/item/5aff0a45e4b0da30c1bfcf5b.

(5) Idowu, John, et al. "Soil Health-Importance, Assessment, and Management: New Mexico State University - Be Bold. Shape the Future." *Soil Health-Importance, Assessment, and Management | New Mexico State University - BE BOLD. Shape the Future.*, Dec. 2019, pubs.nmsu.edu/_circulars/CR694B/.

(3) “Interactive Colorado Plateau Precipitation Map - NW New Mexico.” *Interactive Precipitation Map Northwest New Mexico*, 2013, perg.nau.edu/datamap18.htm.

(1) L. Niel Plummer, Laura M. Bexfield, et al. “Geochemical Characterization of Ground-Water Flow in the Santa Fe Group Aquifer System, Middle Rio Grande Basin, New Mexico.” *USGS WRIR 03-4131: Geochemical Characterization of Ground-Water Flow in the Santa Fe Group Aquifer System, Middle Rio Grande Basin, New Mexico*, 20 Nov. 2012, pubs.usgs.gov/wri/wri034131/.

(4) Mashizi, A. Khosravi, and M. Sharafatmandrad. “Water Regulation and Soil Retention Services in Semiarid Ecosystems of Southeastern Iran, 2018–2020 - International Journal of Environmental Science and Technology.” *SpringerLink*, Springer Berlin Heidelberg, 10 Jan. 2021, link.springer.com/article/10.1007/s13762-020-03119-8.