Contribution ID: **26** Type: **Undergraduate Student Poster Competition**

Geospatial Analysis of water retention and soil type to develop an Irrigation System Adaptable to Its Environment

Thursday, October 23, 2025 2:00 PM (20 minutes)

Water scarcity has long been a concern due to increased demand for food for increasing populations. Urban agriculture is made up of community rooftops, backyard gardens and small commercial farms which serve a vital resource of food in urban areas especially for those communities living in food deserts. ArcGIS was used to correlate soil type and water retention capability using SSURGO data. Vegetative health was hypothesized as an indicator of soil moisture holding capacity and maps showing soil drainage, available water storage and soil hydrologic group were analyzed across the United States and variables such as soil type were found to be predictive of the available water storage of the soil. This exploratory analysis was used as a basis for obtaining ground truth data in a greenhouse setting. Based on the SSURGO explorative data, sunflowers were grown in two groups of pots. The pots were split into two separate groups, one with an automated watering system with computer vision, the other, watered manually. The pots were monitored for the water they received. The experiment was conducted over 8 weeks and results show that the automated watering system triggered watering more frequently compared to manual watering in response to wilting. While comparing data mid-way through, it was found that the threshold for the automated system was too high and that it could be lowered while maintaining the current health of the plant. Different compositions of soil such as those indicated by the SSURGO data are the next step in this research.

Is there a SINGLE day you are unavailable to present?

October 23, 2025

Is there a time of day you are unavailable to present?

Organized Session Details

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