USDA Northeast Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

UNIVERSITY OF MARYLAND

GRADUATE STUDENT CLIMATE ADAPTATION PARTNERS (GRADCAP) WEBINAR SERIES

HOW TO DEAL WITH CLIMATE VARIABILITY: SUSTAINABLE WATER REUSE IN WATER-STRESSED WATERSHEDS

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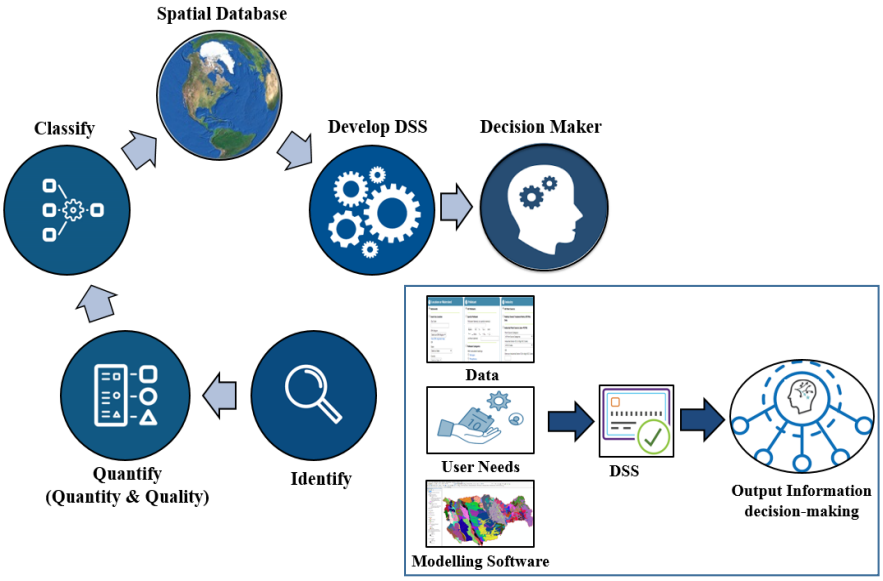
Developing a decision-making system integrated with hydrologic modeling for sustainable water reuse to help reduce farm water and energy needs is important for our food security.

Intensified climate variability, depleting groundwater, and escalating water demand create severe stress on high quality water sources used for agricultural irrigation. Water scarcity requires exploration of nontraditional water sources to sustain food production.

There are significant knowledge gaps concerning the availability (quantity and quality) of nontraditional water sources for crop irrigation. To start promoting nontraditional water use for irrigation, we need to identify and classify potential water sources that best meet local or regional water management needs. In this research, we compile local and regional data of the sources and quantities of reusable water such as wastewater treatment facilities in the study regions. Then we link the sources to agricultural point-of-use sites, factoring in proximity and ease of access. We also classify them based on quantity as well as chemical, microbial,and physical quality of water and make these data accessible via user-friendly spatial databases. The platform will lead to future optimization, matching the appropriateness of reusable water sources for different crop types. Results from this research not only inform water managers, producers, educators, and policymakers about nontraditional water sources for irrigation, but also provide a systematic approach for the development of similar platforms for other usages.



Conceptual Framework for the Decision Making Systems: This figure describes an effective way to describe the research approach stepwise. We identify (1), quantity (2), and classify (3) the recycled wastewater source and organize them into a spatial database (4) and to develop the DSS for the reclaimed water use in agricultural irrigation. In the box, it is showing that how we incorporate the hydrologic model to provide the complete information in the DSS. Figure by Manashi Paul.

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Photo: Spray irrigation system in farm field in Maryland by Abu Sufian Mohammad Asib, used with permission | USDA is an equal opportunity provider, employer, and lender