

National Science Foundation (NSF)
Research Experiences for Undergraduates (REU) Site
Integrating Research in Sustainable Energy and the Environment across Disciplines (IR

Project #2:

ii. Project Description: This project will use satellite Earth observations, computer simulations, and Geographical Information System (GIS) under three thematic areas: Theme 1 Discovery, processing, and analysis of satellite Earth observations; Theme 2 Integration of Earth observations in a hydrological model to simulate how numerous small surface waterbodies can reduce future climate change impacts; and Theme 3 Use of GIS to create dynamic maps demonstrating the scientific findings of the project via userfriendly interactive online platforms

iii. Undergraduate Research Opportunity: Two undergraduate students will work together in this project. One student will work independently on Theme 1 (Earth observations) while maintaining close collaboration with the other student who will be working on Theme 2 (Computer simulations). Both students will work collaboratively on Theme 3. Such a collaborative effort will be logical because the proposed task under Theme 3 is partially dependent on those under Themes 1 and 2. The technical learning outcomes include managing "big data", state-of-the-art science hydrological model, and GIS-based online data visualization. The conceptual learning outcomes include the applications of Earth observations to estimate surface water storage, value of surface waterbodies in sustaining the Earth's resilience to climate change, and depth understanding of the hydrologic cycle.

Project #6: Role of Soil Moisture and its Assimilation on Streamflow Forecasting using Hydrologic Modeling and Remote Sensing