OKLAHOMA EPSCoR UPDATE

Promoting Innovative Research

OK NSF Established Program to Stimulate Competitive Research | April 2022

OK NSF EPSCoR Awards Four Seed Grants through the S³OK Project

The Oklahoma NSF EPSCoR program through the NSF EPSCoR Research Infrastructure Improvement Track-1 project "Socially Sustainable Solutions for Water, Carbon, and Infrastructure Resilience in Oklahoma (S^3OK)" awards four seed grants up to $75,000 per award that aimed at developing and testing science-based solutions for complex "wicked" problems at the intersection of land use, water availability, and infrastructure in Oklahoma.

The Seed Grant recipients are:

Drs. Marimuthu Andiappan (OSU), Kaan Kalkan (OSU), and Christopher Burba (NSU)

Solar Desalination using Mie-Resonator Nanoparticles for Wastewater Reuse

This project aims to develop a sustainable, low-cost, and scalable solar water desalination technology. The research team will develop a novel approach using a high-photothermal-efficiency dielectric Mie-resonator nanoparticles to address water scarcity problem via desalination with minimal carbon emissions.

Dr. Mary Foltz (OSU)

Life Cycle Assessment to Inform Design and Target Monitoring of a Treatment Wetland in Oklahoma to Promote Wastewater Reuse.

The goal of this project is to guide decision-making regarding technologies for wastewater reuse in Oklahoma by applying, assessing, and promoting nature-based solutions to improve water quality. This project will address a critical barrier for passive treatment technologies: a lack of holistic understanding of environmental impacts, potential offsets, and associated tradeoffs of passive treatment technologies, like wetlands, compared to conventional wastewater treatment technologies.

Drs. Jia Yang (OSU), Chris Zou (OSU), and Chad King (UCO)

Assessment of Future Water Quantity and Quality in the Upper Little River Watershed Under Impacts of Changed Climate, Land Use, and Wildfire Regimes

The long-term goal of the study is to improve water resources sustainability and enhance ecosystem services in Oklahoma and the Southern Great Plains. Specifically, researchers aim to predict future river discharge and nutrient loadings in major rivers in the Upper Little River Watershed as climate, land use, and fire regimes change.

Dr. Tiantian Yang (OU)

A Machine Learning Approach in Linking Teleconnections and Climate Signals to Improve Subseasonal-To-Seasonal Precipitation Extreme Forecasts over the State of Oklahoma

This project aims to apply advanced machine learning algorithms to develop preventive measures to combat the impacts of climate extremes in terms of precipitation forecast improvement at the subseasonal-to-seasonal scale. In addition, this project will identify key predictors from the large-scale teleconnections and local hydrological factors to better predict the dry/wet patterns and frequency over the state of Oklahoma.

Funding for this project was provided by the National Science Foundation under Grant No. OIA-1946093 through OK NSF EPSCoR.

Upcoming Event: **OK NSF EPSCoR Professional Development Seminar Series**
May 11, 2022 @ 12 noon