Possible EcoREU 2021 Projects

****Possible projects will depend on whether the EcoREU is on-site or virtual. Additional projects may become available as we become more confident in the status of the COVID-19 epidemic.**

Dr. Michelle Evans-White
Department of Biological Sciences

Project title: Status of Arkansas winter stoneflies

The proposed project addresses the need to obtain baseline information on the current distribution, habitat requirements, life history, and population status of the winter stonefly (*Allocapnia*) species of greatest conservation need (SGCN) in Arkansas. *Objective 1* proposes to construct maps of actual and potential distributions for stoneflies with an emphasis on *Allocapnia* SGCN. *Objective 2* proposes to extract DNA from confirmed adult specimens that will allow development of a genetic barcode that can identify the aquatic nymphal stage, will assess gene flow and dispersal between sites, and will evaluate overall genetic health of sampled populations. REU students will work on measuring and linking habitat variables collected from online geospatial databases, such as natural flow regime category (water quantity), land use (percent urban, row-crop agricultural, forested, pasture) and channel stability index to the stonefly community sampled from the previous two winter collection periods.

Project title: Unconventional Natural Gas Activity Impacts on Water Quantity and Quality:

The Evans-White laboratory has a significant dataset examining landscape measures of unconventional natural gas activity relationships to water quality, quantity, and aquatic life during the build out in the Fayetteville Shale between 2005-2012. REU students can survey existing study sites to assess the potential for long-term impacts of energy development within the Fayetteville Shale streams.

Dr. Halvor Halvorson
Department of Biological Sciences, University of Central Arkansas*
***The project will take place at University of Arkansas**

Project title: Water quality, nutrient cycling, and ecology in Arkansas reservoirs

This project will involve collecting data on water quality (dissolved oxygen, temperature, algae, conductivity) and nutrient levels in reservoirs in Central Arkansas, principally focusing on Brewer Lake, a mid-sized reservoir which is the drinking water source for Conway, Arkansas. The student will work with a team of researchers studying how algae and other indicators of lake water quality respond to nutrient inputs from the watershed, and will have the opportunity to work with a large, long-term monitoring dataset to help predict future changes in the water quality of the reservoir.

Dr. Kent Kovacs

Department of Agricultural Economics and Agribusiness

Project title: Groundwater effects on agricultural property values

This project looks at how the saturated thickness of groundwater affects land values. Statistical techniques will analyze how much land values go up as the saturated thickness beneath an agricultural property rises. This provides an estimate of the value of groundwater that is useful for determining whether the economic cost of policies to conserve groundwater are worthwhile.

Project title: Do existing groundwater well metrics predict new well creation?

Another project considers what motivates groundwater well creation in Eastern Arkansas. We will consider how much the proximity and number of groundwater wells determines the creation of a new well. We hypothesize that observing many nearby peers developing irrigation infrastructure encourages agricultural producers to develop irrigation capacity themselves.

Dr. John D. Wilson

Department of Biological Sciences

Project title: Effects of solar power infrastructure on habitat suitability for reptiles in restored prairies

The development of land for renewable energy production is proceeding rapidly, necessitating research focused on its ecological effects. Solar farms in Northwest Arkansas primarily occupy historic tallgrass prairie and could potentially serve as viable habitat for many prairie-associated wildlife species. We aim to determine whether solar infrastructure influences the thermal environment or predator assemblages in ways that affect prairie-associated reptile populations.