

Ecologists to study freshwater sustainability across the Sun Belt

September 28 2012, by Beth Gavrilles

(Phys.org)—Researchers in the University of Georgia Odum School of Ecology will work with colleagues from universities across the U.S. Sun Belt on a study of water sustainability in the face of climate change and population growth. The four-year project, to be led by North Carolina State University, is supported by a grant from the National Science Foundation. Arizona State University and Florida International University also are participating in the study.

Ecologist John Kominoski, currently a postdoctoral associate in the Odum School, said the researchers will be using historical data to determine how factors such as population, [water](#) use and climate have affected the sustainability of freshwater resources—both in terms of [ecosystem health](#) and availability for human use.

"We have some 40 years of population figures from the U.S. census, as well as climate and hydrology data and per capita water use rates for the entire region," said Kominoski, who will join the faculty of Florida International University next year. "Through extensive collaborative agreements, we also have 10-20 years of fish data for five southern U.S. river basins."

The fish data, he said, serve as a measure of ecosystem health and resilience, providing information about the biodiversity supported by these river basins over time.

Kominoski and colleagues at UGA along with researchers from Arizona

State will focus on biodiversity and ecosystem health in terms of fish community resilience and persistence using data from river basins in Georgia, North Carolina, Texas and Arizona.

Data about [fish communities](#) in Georgia will be contributed by Byron Freeman, a senior public service associate in the Odum School and director of the Georgia Museum of Natural History. Freeman along with Mary Freeman, a U.S. Geological Survey assistant research ecologist, and Megan Hagler, a research professional with the UGA River Basin Center, have compiled comprehensive long-term datasets about fish communities in the Flint and Conasauga river basins.

The team will use this information to hindcast—to create a model that looks back in time and pieces together the relationships between all the variables to assess how changes in human water use could have led to different environmental outcomes. Hindcast models will then be used to forecast the state of freshwater resources in the South over the next 10-30 years.

Other members of the research team, which includes hydrologists, climatologists and sociologists, will study how—or whether—human decisions about water consumption are influenced by water scarcity or availability.

The researchers will then incorporate population and climate projections into their model to make predictions about future water availability for human and environmental needs. Those predictions can inform water resource management policies across the Sunbelt.

"This research will provide information to enable more effective water resource management in the near term," Kominoski said. "It will enhance predictability of water availability for human and natural systems based on climate and human decisions about water use."

Provided by University of Georgia

Citation: Ecologists to study freshwater sustainability across the Sun Belt (2012, September 28)
retrieved 26 April 2024 from

<https://phys.org/news/2012-09-ecologists-freshwater-sustainability-sun-belt.html>

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