Global Climate Change Education Grant
January 2011 - 2013
Using NASA Data to Improve Young Adults' Climate and Science Literacy

Rationale
The project will develop a series of teaching modules that use NASA satellite and remote-sensing data, climate models, and simulations to help young adults (high school and first-year undergraduate students) investigate the fundamentals of global climate change (GCC) and address the public's questions and commonly held misconceptions about GCC. Our primary goals are to improve students' understanding of climate science and strengthen their scientific inquiry skills, which will be useful to them in STEM-related careers and as global citizens. Professional development for regional science teachers is another component of our project. Our project addresses funding category D/M (Goals 1 and 2): Using NASA Earth system data, interactive models and/or simulations to strengthen teaching and learning about global climate change.

Innovations and Distinguishing Features
Our approach is to create teaching modules that provide opportunities for high school and undergraduate students in southeast Florida, an area already experiencing impacts of GCC, to learn how to respond to questions that skeptics commonly pose about GCC. Key to the curriculum and pedagogy will be an exploration of the nature of scientific argument. Engaging students in real-world scientific debate provides a motivational foundation for teaching the scientific processes that underlie GCC. Module development and pedagogy will be based on constructivist learning theory. This theory posits that students will learn global climate science more effectively and be more likely to be able to transfer that learning to new problem areas if they are engaged in hands-on activities using real-world data (i.e., NASA data and GCC models). The modules will enable students to use NASA data and models to answer the questions for themselves, rather than simply reading other people’s conclusions. For example, in these modules, students would use NASA satellite and remote-sensing data and models to analyze the indicators of climate change (e.g., temperature, sea level, ice coverage, and precipitation). Next, they would investigate the drivers of climate change (e.g., climate forcings and feedbacks) and test the predictive value of GCC models and simulations.

Anticipated Outcomes
Our project addresses the goals of NASA’s Global Climate Change Education (GCCE) project by 1) improving the teaching and learning of GCC in high schools and on college campuses, 2) increasing the number of high school and undergraduate students using NASA Earth observation data to investigate and analyze GCC issues, and 3) encouraging students to pursue employment in fields relevant to GCC.

Metrics for Success
We will administer a project team-developed GCC assessment and attitudinal survey to the students at the beginning and end of instruction. We will conduct focus group interviews throughout the project with the teachers and students. An advisory group will review the modules and the Website that we will develop.

Management
Our team includes Julie Lambert, Associate Professor of Science Education at Florida Atlantic University, as PI; Brian Soden, Professor of Meteorology and Physical Oceanography at University of Miami, as Co-I; and Robert Bleicher, Associate Professor of Science Education, California State University Channel Islands, as Co-I and evaluator. Drs. Lambert and Bleicher will collaborate with Dr. Soden (who will serve as the team’s science expert) to develop and implement the modules and professional development.