

Global Climate Change Education Project

FY 2009 Annual Report



Project Manager:

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Project Description

The Global Climate Change Education (GCCE) project is a Congressionally-directed project with a broad focus of improving research and education in global climate change through competitive awards that improve global climate change and Earth system science education at the elementary, secondary, and undergraduate levels. The project was first directed in the FY08 appropriation at approximately \$8.5M; the FY 09 budget was \$10M. GCCE has been designed to be consistent with the recommendations of the National Research Council's report *Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond* and the report of the National Academies, *Rising Above the Gathering Storm*. These reports highlight the need to continually advance our understanding of our Earth system, utilizing Earth observation data when available, and to enhance our science and technology capabilities through research and K-12 science and mathematics education, respectively.

The GCCE project will meet these needs by awarding education grants or co-operative agreements and working with the awardees, or principal investigators, to ensure that their work is well integrated with other relevant Earth System science education and research efforts within the NASA Science Mission Directorate. The project will award approximately 24 grants per year, based on available funding and satisfactory proposals, through a competitive NASA Research Announcement (NRA) or Co-operative Agreement Notice (CAN). Each proposal funded through the GCCE NRA is expected to take advantage of NASA's unique contributions in climate science to enhance students' academic experiences and/or to improve educators' abilities to engage and stimulate their students.

Project Goals

The goals of the GCCE project are to use NASA's unique contributions to climate and Earth system science to:

- Goal 1: Improve the teaching and learning about global climate change in elementary and secondary schools, on college campuses, and through lifelong learning;
- Goal 2: Increase the number of people, particularly high school and undergraduate students, using NASA Earth observation data/NASA Earth system models to investigate and analyze global climate change issues;
- Goal 3: Increase the number of undergraduate students prepared for employment and/or to enter graduate school in technical fields relevant to global climate change

Project Benefit to Outcome 1, 2, or 3

The GCCE project directly supports the goals of the NASA Office of Education and Outcomes 1 and 2 of the NASA Education Strategic Portfolio by contributing to the accomplishment of the following:

- Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA’s strategic goals through a portfolio of investments.
 - 1.2 Student Support: Provide NASA competency-building education and research opportunities to individuals to develop qualified undergraduate and graduate students who are prepared for employment in STEM disciplines at NASA, industry, and higher education
 - 1.3 Student Involvement Higher Education: Provide opportunities for groups or teams of post-secondary students to engage in authentic NASA-related, mission-based research and development opportunities
 - 1.4 Course Development: Develop NASA-related course resources for integration into STEM disciplines

- Outcome 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.
 - 2.2 Educator Professional Development –Long Duration: Provide long-duration and/or sustained professional development training opportunities to educators that result in deeper content understanding and/or competence and confidence in teaching STEM disciplines
 - 2.4 Student Involvement K-12: Provide K-12 students with authentic first-hand opportunities to participate in NASA mission activities, thus inspiring interest in STEM disciplines and careers; and/or provide opportunities for family involvement in K-12 student learning in STEM areas

Project Accomplishments

Significant progress has been made since the project’s formulation in FY 2008. The project management team has been established, including the award of a cooperative agreement to the Virginia Space Grant Consortium (VSGC) for educational and outreach support to the project.

Project Team:

Dr. Lin Chambers – Project Scientist
 Dr. Margaret Pippin – Deputy Project Scientist
 Sharon Welch – Project Manager
 Kate Spruill – Deputy Project Manager
 Dr. Leslie McCarthy – Goddard Space Studies Institute (TM)
 Project Integration Support
 Mary Sandy – VSGC Director
 Barbara Mann – VSGC Project Manager
 Stephanie Atienza – VSGC Project Assistant

Andi Geyer – VSGC Education Specialist
GCCE Web Site Content Management
Steve Campbell – Tessada

Twenty-two grants were awarded as a result of the 2008 solicitation, and an additional award augmentation process was successfully executed. A 2009 solicitation was released in June, and the project office is in the process of reviewing over 150 proposals submitted in response to this solicitation. It is expected that the 2009 proposal review will be completed in October 2009. In addition, the interactive web site capability, key to fostering collaboration among awardees as well as implementing project control, is currently being developed with an expected release date of December 2009.

Project Contributions to PART Measures

The GCCE contributes to accomplishment of the following NASA Office of Education's Program Assessment Rating Tool (PART) measures:

- HE Obj 1.2.1, 1.3.1, 1.4.1: Number of under-represented and under-served students participating in NASA higher education programs
- HE Obj 1.2.2: Percentage of NASA higher education program student participants employed by NASA, aerospace contractors, universities, and other educational institutions
- HE 1.2.3: Percentage of undergraduate students who move on to advanced education in NASA-related disciplines
- ES&E Obj 2.1.1: Percentage of elementary and secondary educators who either obtain NASA content-based education resources or participate in short-duration NASA education activities and use NASA resources in their classroom instruction
- ES&E Obj 2.4.2(f): Percentage of students expressing interest in science, technology, engineering, and math (STEM) careers following their involvement in NASA elementary and secondary education programs

Improvements Made in the Past Year

Significant improvement was made in the timeline of the second solicitation with the process being reduced to only five months. The GCCE NASA Cooperative Agreement Notice was released on June 5, 2009, and it is expected that the awards will be made by the end of October 2009. This accelerated timeline is a marked improvement over the 10-month timeline associated with the first solicitation.

Project Partners and Role of Partners in Project Execution

Each organization to which GCCE has awarded a cooperative agreement or grant is considered to be a key partner in the project's success. The awards made in 2009 focus on two areas: Teacher Education and Teaching and Learning. Below are the partners, the title of their grant, and the area of focus.

Teacher Education

Cryospheric Connection to Understanding

Climate Change (Elem, MS, HS)

Kathryn Berry Bertram / *University of Alaska*

The Science and Policy of Global Climate Change (Elem, MS, HS)

Pamela Matson / *Stanford University*

Global Climate Change Education Exchange (Elem, MS, HS)

Bob Myers / *Institute for Global Environmental Strategies*

Global Climate Change Institute for Teachers (GccIFT) (Elem, MS)

William Schoenfeld / *Western Oregon University*

Rice/HARC Initiative for Climate Education (Elem)

Wallace Dominey / *Rice University*

Climate Change Education Project (MS, HS)

Jennifer / *Chicago Botanic Garden*

Climate Change Educator Professional Development Network (MS, HS)

Roberta Johnson / *UCAR*

Inspiring Climate Education Excellence

(MS, HS)

Susan Buhr / *University of Colorado*

Teaching About Global Climate Change

(MS, HS)

Susan Gallagher / *Association of American Geographers*

Integrated Media and Teacher Professional Development Program (MS, HS)

James Short / *American Museum of Natural History*

Global Climate Change Literacy for Educators

(MS, HS)

David Gosselin / *University of Nebraska*

Teaching Climate Change (MS, HS)

Melinda George / *PBS*

Teaching and Learning

Creating an Enduring Legacy of Exemplary Global Climate Change Education for Secondary Teachers and Underserved Students in Georgia (Elem, MS, HS)

Cherilynn Morrow / *Georgia State University*

Bringing Global Climate Change Education to Alabama Classrooms (HS)

Marie Wooten / *Auburn University*

Earth System Science – A Key to Climate Literacy (HS)

Tamara Ledley / *TERC*

NASA Data Resources for Climate and Weather Education (MS)

Jo Ellen Roseman / *AAAS*

Climate, Technology and Culture: Providing a Content and Context in UG Global Climate Change Education (UG)

Naomi Oreskes / *University California San Diego*

NASA-North Dakota Association of Tribal Colleges Climate Change Education Initiative (UG)

Bull Bennett / *ND Association of Tribal Colleges*

SUNY Sustainability: A Climate Change Solution Curriculum (UG)

David Johnson / *SUNY ESF*

From Earth to the Sky: Student Experiential Learning in Global Climate Change (UG)

James Spotila / *Drexel University*

Creation and Dissemination of an Interdisciplinary UG General Education Course on Climate (UG)

David Blockstein / *NCSE*

Online Interactive Models of Climate System Dynamics to Expand the Reach and Effectiveness of Climate Change Education (UG)

David Bice / *Pennsylvania State University*