

**Minority University Research and Education Program (MUREP)  
NASA Innovations in Climate Education (NICE)  
FY 2012 Annual Report (10/1/2011 – 9/30/2012)**

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**Project Description**

**The NASA Innovations in Climate Education (NICE) project**, formerly Innovations in Global Climate Change Education (IGCCE), started FY2012 with its new name, continuing the activities that started under a Congressional directive in 2008. NICE is designed to meet 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 by 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.

**NICE is designed to strengthen the skills of teachers and provide innovative science research and learning opportunities for K-16 students.** NICE contributes to NASA's effort to utilize its unique mission, workforce, facilities, research, innovations and other assets to inspire interest in science, technology, engineering, and mathematics (STEM). All NICE projects (and those funded under IGCCE and the previous incarnation, GCCE) are required to make use of NASA's unique contributions to climate and Earth system science, including the use of NASA Earth observation data, basic to more complex interactive Earth system models, and/or simulations.

**FY 2012 represents the first full year of project activities after IGCCE's FY 2011 transition into the NASA Minority University Research and Education Program (MUREP) under the new alignment for the Office of Education.** Through competitive awards as well as strategic collaborations, NICE focuses on rapidly and significantly increasing the participation of underserved and underrepresented communities in STEM. In 2011, as IGCCE, NICE solicited proposals from US minority-serving higher education institutions, community colleges, public school districts with high underrepresented/underserved enrollment, and non-profit organizations with a demonstrated history of working with underrepresented communities. Cooperative agreements valued at \$7.2 million were awarded to 14 organizations. These innovative project activities support elementary, secondary, and undergraduate teaching and learning.

**As these project activities received funding very late in FY 2011, this FY 2012 report represents the first report that reflects their contribution to NICE, to NASA and MUREP's goals, and to the national landscape of climate-related STEM education.** Although no new awards were made in FY 2012, accomplishment of significant work continues through FY 2013 and is expected beyond FY 2014.

## **Project Goals**

The goals of NICE are to use NASA's unique contributions to climate and Earth system science, through collaborations with community colleges, minority-serving institutions, and school systems, to:

1. Increase the number of underrepresented/underserved students prepared to teach climate change content within STEM subjects.
2. Increase the number of underrepresented/underserved undergraduate students prepared for employment and/or to enter graduate school in technical fields relevant to global climate change; and
3. Advance the understanding of how to effectively teach global climate change concepts.

**Essentially, NICE seeks to improve the teaching and learning of global climate change in elementary and secondary schools, on college campuses, and throughout lifelong learning.**

## **Project Benefit to Outcomes 1 and 2**

NICE, and its portfolio of funded initiatives, directly support the NASA Strategic Plan and the Office of Education's Outcomes. Specifically, **NICE aligns with Outcome 1** to *"contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals through a portfolio of investments"* **and to Outcome 2** to *"attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty."*

Through a network of 71 project activities (57 funded under GCCE; 14 funded under IGCCE; 60 currently active and 11 recently completed and closed-out), significant strides are being made in strengthening the climate change education skills of teachers and providing innovative climate science research and learning opportunities for students. **As a higher education-focused activity within MUREP, NICE is responsible for reporting data from the previous year, FY 2011, during this reporting call. Data collection for the end of FY 2012 is ongoing and activities reported by our awardees for the last quarter of the fiscal year are continually**

**being added and reported within OEPM.** This report therefore reflects finalized data for FY 2011 and preliminary participant data for FY 2012. **In FY 2011 and FY 2012:**

- FY 2011: **42 new or revised higher education courses** targeted at climate change-related STEM skills were offered to students at four-year institutions and community college.
  - Preliminary FY 2012 data indicates a significant increase in the number of higher education courses offered through NICE funding, **totaling 70 such courses.**
- FY 2011: **1,405 higher education students** (four-year and community college undergraduates) participated in the above courses.
  - Preliminary FY 2012 data indicates that **NICE has more than doubled participation of higher education students**, with **3,116 undergraduate students** participating in NICE educational opportunities. These opportunities include higher education courses as well as research experiences and outreach opportunities. The majority of these participants were students at four-year colleges and universities. Additionally, **287 post-graduate trainees** (graduate students and postdoctoral researchers) participated in NICE activities in FY 2012.
- FY 2011: **3,953 elementary and secondary educators participated** in long and short duration NICE professional development (PD) opportunities. Specifically, **3,031 participated in short duration activities**, and **922 participated in long duration activities.** These educators will play a significant role in increasing climate literacy of thousands of students across the nation, and in preparing the 21<sup>st</sup> century workforce in climate-related sciences. Teachers benefiting from NICE professional development will also share with their own professional communities, extending the reach of NICE projects, as many of these PD workshops are conducted in a train-the-trainer format.
  - Preliminary FY 2012 data indicates that **2,486 K-12 educators participated** in NICE professional development activities, of which 38% were middle school teachers and 55% were high school teachers (remainder taught K-4). **1,489 of these educators participated in long duration activities, a significant increase** compared to FY 2011. Long duration professional development activities have a greater likelihood of resulting in increased teacher content knowledge and enhanced pedagogical practice. 1,028 K-12 educators participated in short duration professional development. Additionally, in FY 2012, NICE project activities reached **175 informal educators.** Given the **increased focus of NICE on partnering with minority-serving higher education institutions** and in developing the capability of institutions to prepare undergraduate students for the STEM workforce, it is also notable that **project activities reached**

**999 higher education faculty.** These faculty teach primarily at four-year institutions and participated in faculty development, research, and teaching opportunities through NICE.

- In FY 2011: **Over 4,000 elementary and secondary students** participated in NASA climate-related educational activities.
  - Preliminary FY 2012 data indicates that **4,686 elementary and secondary students** participated in NICE project activities (50% middle school, 44% high school, 6% elementary school). This represents an increase compared to the FY 2011 level.
- From 2008 through the 2011 awards, a total of 11 projects have been awarded to institutions in Experimental Program to Stimulate Competitive Research (EPSCoR) states.

## **Project Accomplishments**

**As an activity within MUREP, a key priority of NICE is collaborating with Minority-Serving Institutions (MSIs) to improve the quality of the Nation's STEM education.**

All FY 2011 awardees were located at minority-serving institutions, non-profit organizations with a strong record of serving underrepresented populations, or high-need school districts. In October 2011, the NICE management team hosted an orientation meeting for the new awardees, giving them the opportunity to meet and collaborate with each other while also having face time with the NICE project management team and our partners at the Virginia Space Grant Consortium (VSGC). **Awardees were from the states of California, Colorado, Delaware, Louisiana, Massachusetts, North Carolina, New York, Texas, Virginia, Washington D.C., and Wisconsin.** Throughout FY 2012, NICE focused on integrating these new awardees with earlier IGCCE/GCCE funded projects, as well as on developing stronger collaborations within the Native American/Tribal K-12 and higher education communities.

**With this strategic focus, NICE has had a strong presence at conferences and workshops relevant to these communities.** In March 2012, NICE offered a two-day climate education strand, **in partnership with the American Indian Higher Education Consortium (AIHEC)**, at AIHEC's annual meeting in Rapid City, South Dakota (over 1,100 participants). Additionally, **NICE representatives attended the March 2012 Geoscience Alliance meeting** in Pablo, Montana (150 participants engaged specifically in Earth science higher education opportunities for Native American students). At the Geoscience Alliance, the NICE team offered two workshops highlighting opportunities and resources relevant to Tribal colleges/universities and their students. To extend and continue this work in the future, NICE will collaborate with the

Tribal College and University Program (TCUP) and has initiated conversations with TCUP Manager Torry Johnson from Goddard Space Flight Center (GSFC) on this topic.

**We have also strengthened a collaboration with the Digital Learning Network (DLN) in order to extend our virtual presence and digital reach, while significantly reducing both travel costs and NICE's carbon footprint.** A major focus of the DLN project will involve working more closely with AIHEC, Native American undergraduate students, the Tribal community, and the Hispanic community. Bonnie Murray is the DLN Coordinator for NICE and is a new addition to the team this year.

**NICE has continued to strengthen its strategic partnership with the NASA Science Mission Directorate (SMD) and its cross-agency collaboration with sister projects at the National Science Foundation (NSF) and the National Oceanic and Atmospheric Administration (NOAA).** NSF's Climate Change Education Partnerships (CCEP) Phase I and Phase II, and NOAA's Environmental Literacy Grants (ELG), when combined with the 71 NICE projects, comprise an extensive national network of climate change educators. The goals of this tri-agency partnership are to leverage existing resources, develop common evaluation frameworks, minimize duplication of effort in the portfolios, and facilitate communications among this emergent community of scientists and educators. **In FY 2012, this collaborative effort saw many major accomplishments in supporting this community and climate-related STEM education initiatives nationwide:**

- **In April 2012, the 3<sup>rd</sup> Annual NASA, NOAA & NSF Climate Change Education Principal Investigators (PI) Meeting was held in Arlington, VA.** Over 250 people attended, representing more than 120 projects, and including a significant number of project evaluators. Attendees showcased their project activities, participated in a variety of breakout groups, conversations, and sessions related to effective communication and successful project management. They also had the opportunity to exchange ideas and best practices. Plans are ongoing for a 4<sup>th</sup> PI meeting, to be held Fall 2013 and a Webinar Series offered in Spring 2013.
- Prior to this meeting, the **NICE team took a leadership role in the formation of a tri-agency working group focused on the development of a common evaluation framework.** This group of more than 40 agency representatives, project PIs, and project evaluators met virtually in advance of the 3<sup>rd</sup> Annual PI Meeting and then gathered face-to-face during the meeting itself. Over two days of intense working sessions, this cross-section of climate change educators and evaluators **completed a draft logic model that can be applied across the NASA, NOAA & NSF portfolio.** Subgroups are currently working to move this draft into adoption by the tri-agency community, and to solicit feedback

specifically from the environmental education community at the 2012 American Evaluation Association meeting.

- **The NICE team also led the development of the Tri-Agency Climate Education (TrACE) catalog, a comprehensive online catalog of educational resources developed by members of the tri-agency community.** TrACE, based on a “matrix” of data originally gathered at the 2<sup>nd</sup> Annual Tri-Agency PI Meeting, is an interactive, searchable web interface that contains a wide spectrum of project information to help users find relevant resources. The dataset includes, but is not limited to, target audience, grade level, type of resource (e.g., curriculum modules, museum exhibits, etc.) and geographic location. TrACE was beta-tested with NOAA and NSF staff and tri-agency PIs in September 2012, and **launched with a public release on October 1, 2012.** Currently, **the TrACE catalog contains over 200 climate education resources, submitted by over 80 tri-agency funded projects.** TrACE can be viewed at [https://nice.larc.nasa.gov/trace/trace\\_catalog.php](https://nice.larc.nasa.gov/trace/trace_catalog.php).

Through the U.S. Global Change Research Program (USGCRP) and the affiliated Interagency Communication and Education Team (ICE-T) focused on climate education and communication, this tri-agency collaboration currently has plans to extend to other relevant education programs at Federal agencies. **The tri-agency partnership was featured in the FY 2012 report of the USGCRP as an example of a successful cross-agency partnership.**

**The tri-agency climate change education partnership was highlighted through a poster and presentation at the 2011 American Geophysical Union (AGU) Annual Meeting,** along with many poster presentations and oral sessions affiliated with NICE and other tri-agency projects. Posters are a critical tool used in the scientific community to convey the relevance of the program in a simple, graphical format. **NICE will return to the 2012 AGU meeting to be held in San Francisco, California, which will draw over 20,000 participants.** Through the efforts of members of the tri-agency partnership, 8 oral and 6 poster presentation sessions focused on Climate Literacy will be highlighted at the 2012 AGU Meeting. This will include 6 oral and 4 poster sessions co-convened by NICE-funded initiatives and by the NICE management team, **for a total of 26 poster presentations and 17 oral presentations focused on NICE.** Additionally, the NICE team evaluator will present two posters focused on the evaluation of NICE and on the TrACE catalog. The TrACE catalog will also be the subject of an in-booth presentation at NASA’s AGU booth.

**The NICE team evaluator, added to the team in FY 2011 through the NASA Postdoctoral Program (NPP), continues to contribute to the team’s goal of understanding the effectiveness of NICE and its portfolio.** Each NICE-funded project activity has its own, unique evaluation component, and the evaluation thus

incorporates a “meta-evaluation” approach. The evaluator provides a “bird’s-eye” perspective on the implementation, outputs, and impact of NICE’s investments in climate education. **The evaluator continues to work with the individual project evaluators to build a community of practice** in the area of climate change education evaluation. Quarterly evaluation webinars are led by the NICE team at LaRC and focus on challenges, lessons learned, and best practices. NICE is also developing a library of evaluation and assessment tools and resources, to allow this community to adopt and respond to common measures and constructs in assessing student as well as educator learning. **In order to strengthen this community of practice focused on evaluation, NICE has had a presence at the 2011 and 2012 American Evaluation Association annual meetings** (drawing attendance of more than 2,500), **the Astronomical Society of the Pacific 2012 conference focused on science communication** (drawing attendance of more than 200), **and the 2012 Geological Society of America (GSA) Annual Meeting & Exposition** (drawing attendance around 7,000).

**To strategically meet the challenge of building a community of practice that stretches across the nation, NICE PI webinars are held monthly.** PIs use this opportunity to highlight their progress, solicit ideas from other projects, and share their lessons learned. Guest speakers are also invited on occasion to discuss related activities within or outside NASA that may be of interest to the PIs.

**In the area of project management, NICE has made significant progress in the deployment and use of a web-based quarterly and project activity reporting system that is now fully operational.** The PIs use this system to report on milestones, metrics, accomplishments/challenges, and publications. On the project management side, custom-built reports allow us to review and reconcile our data for further reporting within MUREP and the Office of Education. **This system also plays a critical role in the reporting process; as project activity forms (PAFs) are submitted, a member of the NICE team reviews each form and verifies participant information with the PI. This vetted and validated data is then transferred into OEPM.** The use of this web-based system has greatly improved the NICE Management Team’s ability to monitor the NICE portfolio and the ability of PIs to accurately report their activities in a timely fashion.

### **Project Contributions to Annual Performance Goal (APG) Measures**

**Data collection for the end of FY 2012 is ongoing and activities reported by awardees for the last quarter of the fiscal year are continually being added and reported within OEPM.** As a higher education-focused activity within MUREP, NICE reports data through OEPM one year behind the calendar year. **This report therefore reflects finalized data for FY 2011 and preliminary participant data for FY 2012.**

**APG 5.1.2.1: ED-12-1: Achieve 40% participation of underserved and underrepresented (in race and/or ethnicity) students in NASA higher education projects.**

Because of ethical and logistical restrictions in the collection of potentially sensitive student demographic data, NICE is limited in its ability to measure APG ED-12-1. In many cases, this data cannot be (or is not) collected, and in other cases, students may express confusion about the distinction between race and ethnicity. The quantities reported for this APG may not reflect the extent of NICE’s reach to students from underrepresented backgrounds. **The reported percentages are based only on the responses of students who provided this demographic information.**

Race and ethnicity data is reported below in Tables 1 and 2. In FY 2011, including only students who reported race and ethnicity data, NICE worked toward the goals of APG ED-12-1 but did not meet that performance goal. **Since FY 2011, the NICE management team and project activities have maintained a focus on students from underrepresented and/or underserved backgrounds.** Preliminary data indicates that in FY 2012, of students who reported race and ethnicity data, **NICE significantly exceeded the 40% goals of APG ED-12-1 as well as our performance in FY 2011.**

Year	Hispanic or Latino	Not Hispanic or Latino
FY 2011	18.6%	81.4%
FY 2012 (Preliminary)	72.6%	27.4

Table 1 - Participant Reported Ethnicity

Year	White	Black or African American	American Indian, Alaskan Native, or Native Hawaiian/Pacific Islander	Asian	Other
FY 2011	68.7%	20.2%	5.1%	4.1%	1.9%
FY 2012 (Preliminary)	23.5%	23.4%	43.4%	3.6%	6.1%

Table 2 - Participant Reported Race

**APG 5.1.2.1: ED-12-2: Achieve 45% participation of women in NASA higher education projects.**

As above, because of ethical and logistical restrictions in the collection of individual demographic data, NICE is limited in its ability to measure APG ED-12-2. The quantities reported for this APG may not reflect the extent of NICE's reach to female participants. **The reported percentages are based only on respondents who provided this demographic information.**

Gender data is reported below, in Table 3. In FY 2011, of the participants who reported gender data, **NICE exceeded the goals of APG ED-12-2.** Preliminary data indicates that in FY 2012, NICE **significantly exceeded the 45% goals of APG ED-12-2 as well as our performance in FY 2011.**

Year	Female	Male
FY 2011	49.5%	50.5%
FY 2012 (Preliminary)	54.7%	45.3%

Table 3 - Participant Reported Gender

**APG 6.1.2.1: ED-12-4: 20,000 undergraduate and graduate students participate in NASA education opportunities.**

In FY 2011, over 1,405 undergraduate students participated in NICE project activities.

In FY 2012, preliminary data indicates that 3,116 undergraduate students and 287 post-graduate trainees (graduate students and postdoctoral researchers) participated in NICE project activities.

**APG 6.1.1.1: ED-12-3: 35,000 educators participate in NASA education programs.**

In FY 2011, 3,953 elementary and secondary educators participated in NICE project activities.

In FY 2012, preliminary data indicates that 2,486 elementary and secondary and 175 informal educators participated in NICE project activities.

**APG 6.1.2.2: ED-12-5: 200,000 elementary and secondary students participate in NASA instructional and enrichment activities.**

In FY 2011, over 4,000 elementary and secondary students participated in NICE project activities.

In FY 2012, preliminary data indicates that 4,686 elementary and secondary students participated in NICE project activities.

**APG 6.1.2.2: ED-12-6: 85% of elementary and secondary students express interest in STEM careers following their involvement in NASA education programs.**

As above, because of ethical and logistical restrictions in the collection of relevant survey data, NICE is limited in its ability to measure APG ED-12-6. Because the OEPM survey instruments relevant to this APG have not been cleared by the Office of Management and Budget (OMB) in accordance with the Paperwork Reduction Act, NICE only collects this information from funded project activities on a voluntary basis. **The reported percentages are based only on the responses of students who completed the relevant OEPM surveys.**

**In FY 2011, students participated in surveys following both short and long term events.** The short term survey probes their interest in a career in STEM or at NASA, while the long term educational experience survey includes several separate items which ask about interest in careers at NASA, but also in science, technology, engineering, and mathematics as separate items. In FY 2012, no students completed surveys following a short term educational experience, but NICE did gather student responses to long term events.

**Student responses to these items, indicating their interest in further pursuit of STEM, are tabulated below.** Table 4 summarizes student interest in STEM careers following a short-term educational experience, while Tables 5 and 6 summarize student interest in STEM careers and further STEM education following long-term educational experiences. **These results indicate that NICE project activities contribute to APG ED-12-6, but that many students are unsure about or are still considering their future career paths.**

<i>Statement: "As a result of this experience, I am more interested in a career at NASA or in science, technology, engineering or mathematics."</i>		
<b>Year</b>	<b>Strongly Agree/Agree</b>	<b>Neutral</b>
<b>FY 2011</b>	21%	35%
<b>FY 2012 (Preliminary)</b>	N/A	N/A

Table 4 - Interest in a NASA or STEM Career: Student Responses following a Short-Term Educational Experience

<i>Statement: "I am interested in careers . . ."</i>										
	<i>At NASA</i>		<i>In science</i>		<i>In technology</i>		<i>In engineering</i>		<i>In math</i>	
<b>Year</b>	Strongly Agree/Agree	Neutral	Strongly Agree/Agree	Neutral	Strongly Agree/Agree	Neutral	Strongly Agree/Agree	Neutral	Strongly Agree/Agree	Neutral
<b>FY 2011</b>	23%	35%	24%	34.4%	24%	34.3%	24%	34.3%	23.9%	34.3%
<b>FY 2012 (Preliminary)</b>	28%	36.1%	43%	31.5%	46.9%	30.5%	35.8%	31.7%	36.1%	31.8%

Table 5 - Interest in NASA or STEM Career: Student Responses Following a Long-Term Educational Experience

<i>Statement: "I want to take more courses in science, technology, engineering, or mathematics after learning with NASA."</i>	
<b>Year</b>	<b>Strongly Agree/Agree</b>
<b>FY 2011</b>	23%
<b>FY 2012 (Preliminary)</b>	50%

Table 6 - Interest in Pursuing STEM Education: Student Responses Following a Long-Term Educational Experience

**APG 6.2.1.1: ED-12-7: 50% of educators use NASA resources in their curricula after participating in NASA professional development as measured by survey responses.**

As above, because of ethical and logistical restrictions in the collection of relevant survey data, NICE is limited in its ability to measure APG ED-12-7. Because the OEPM survey instruments relevant to this APG have not been cleared by OMB in accordance with the Paperwork Reduction Act, NICE only collects this information from funded project activities on a voluntary basis. **The reported percentages are based only on the responses of educators who completed OEPM surveys.**

**In both FY 2011 and FY 2012, educators participated in surveys following both short and long term events.** Additionally, they completed surveys immediately following these events (end-of-event) and 120 days later (120 day follow-up). In all cases, fewer teachers responded to the 120 day follow-up survey than to the initial survey immediately following the research or professional development experience.

**Educator responses to relevant survey items, indicating their use of NASA materials in the classroom, are tabulated below.** Tables 7 and 8 summarize teacher intent to bring NASA curricular materials back to their classrooms, as measured immediately following short and long term events. Table 9 summarizes responses from the 120-day follow-up, which allows teachers who have participated in short or long term experiences to report whether they have actually used new NASA curricular materials once they have returned to the classroom. In each case, **NICE has exceeded the 50% goals of APG ED-12-7.** These results indicate that **teachers participating in NICE project activities, including professional development and research experiences, follow through on their intent to bring what they have learned back to their classrooms.**

<i>End-of-Event Statement: "This NASA experience has inspired me to bring NASA content into my classroom."</i>				
	Short Term Event		Long Term Event	
Year	Strongly Agree	Agree	Strongly Agree	Agree
FY 2011	69.0%	29.9%	47.8%	46.3%
FY 2012 (Preliminary)	61.6%	38.4%	64.5%	32.7%

Table 7 - Interest in Bringing NASA Materials into Classroom: Teacher End-of-Event Responses Following Both Short and Long Term Educational Experiences

<i>End-of-Event Statement: "I can immediately apply what I learned from this NASA experience to my teaching about STEM."</i>				
	Short Term Event		Long Term Event	
Year	Strongly Agree	Agree	Strongly Agree	Agree
FY 2011	50%	40.7%	50.8%	43.4%
FY 2012 (Preliminary)	59.7%	34.7%	59.4%	34.0%

Table 8 - Application of NASA Materials to STEM Teaching: Teacher End-of-Event Responses Following Both Short and Long Term Educational Experiences

<i>120-Day Follow-up Statement: "I have used these [NASA curricular] materials in my classroom."</i>				
	Short Term Event		Long Term Event	
Year	Strongly Agree	Agree	Strongly Agree	Agree
FY 2011	48.6%	34.3%	38.9%	44.4%
FY 2012 (Preliminary)	33.3%	33.3%	10%	70%

Table 9 - Educators Using NASA Materials in the Classroom: 120-Day Follow-up Following Both Short and Long Term Educational Experiences

**APG 6.4.1.1: ED-12-9: 420 museums and science centers across the country actively engage the public in major NASA events.**

APG ED-12-9 is not applicable to the goals and/or activities of NICE.

**Improvements Made in the Past Year**

In FY 2012, NICE made **significant improvements to the reporting and data reconciliation processes**, and made **major contributions to the successful mission accomplishment of the tri-agency collaboration** with NOAA and NSF. Other improvements include:

- **Inviting MSIs to participate in the tri-agency PI meetings**, expanding the breadth of the tri-agency community collaboration and its reach to students from underrepresented/underserved backgrounds. By cultivating diversity in our partnerships and community, NICE contributes to the Agency's core values.
- **Continuing to focus on higher education, particularly at minority serving institutions**, resulting in an increase in the number of climate-infused higher education courses added or improved through NICE funding. In FY 2011, 42 new or revised higher education courses were offered, with this number rising to 70 in FY 2012.
- **Strengthening the evaluation component of NICE**, to further ensure that activities and outcomes are strongly aligned to NICE objectives. Evaluation activities carried out in FY 2012 range from the development of a project logic model to our contributions in leading the tri-agency common evaluation working group.
- **Leveraging strategic collaborations**, including an ongoing collaboration with Virginia Space Grant Consortium, Digital Learning Network (DLN), AIHEC, and the Geoscience Alliance, in order to increase awareness of NICE activities and opportunities. These collaborations advance NICE's reach to MSIs and, in particular, to institutions that serve Native American/Tribal and Hispanic communities.
- **Deploying a quarterly reporting system and custom reports** for project management, along with a workflow process for verifying and validating all data in preparation for timely entry into OEPM.

- **Enhancing the NICE website** to include improved site navigation, modern interfaces, and a streamlined set of resources for PIs, evaluators, educators, and the general public.

## **Project Partners and Role of Partners in Project Execution**

The 71 awardees (including 60 currently-active projects) are partners in NICE. Under their grants and cooperative agreements, they create new courses, provide teacher professional development workshops and research internships, create new curricula and online courses for undergraduates and K-12 students, and provide research experiences for K-12 and undergraduate students.

Other NICE partners include the NASA Science Mission Directorate (SMD), and the NSF and NOAA climate change education programs. By leveraging and working with this vast community of climate scientists and educators, NICE and our awardees are connected into a national network.

Virginia Space Grant Consortium (VSGC), in partnership with NASA Langley Research Center, provides educational outreach and support to NICE and plays a key role in integrating the tri-agency PIs and the NICE evaluators into a community of practice.

The Digital Learning Network (DLN) has the potential of expanding to hundreds of thousands of students and educators throughout the nation. By collaborating and leveraging DLN's existing network of educators across the nation, NICE can expand its reach into classrooms in primary, secondary, and higher education institutions. Additionally, this relationship will enable NICE funded PIs to better carry out their activities, by allowing project activities to include teachers and students beyond their local area. Because DLN allows NICE and the PIs to overcome logistical difficulties associated with physical proximity, this ongoing partnership has great potential to create a major impact.

## **Presentations & Dissemination**

(MUREP-NICE team members are listed in **bold** print.)

Kelly, K., **Martin, A.M.**, Smith, C., Baek, J., Farr, B., & Fraser, J. (2012), *Tri-agency efforts toward a common evaluation framework for climate change education projects: Discussion in the context of 2012 recommendations for the evaluation of federally funded STEM education initiatives*. Oral. Abstract 63 presented at Evaluation 2012, American Evaluation Association, Minneapolis, MN, 24-27 Oct.

**Martin, A.M.** (2012), *Dipping your toes into evaluation in 5 easy steps: Tips, tricks & lessons learned*. Oral. Presented at Communicating Science: A National Conference on Science Education & Public Outreach, Astronomical Society of the Pacific, Tucson, AZ, 4-8 Aug.

**Martin, A.M., Chambers, L.H., Pippin, M.R., & Spruill, K.** (2012), *NASA Innovations in Climate Education (NICE): Maximizing and measuring impact*. Poster. Presented at Communicating Science: A National Conference on Science Education & Public Outreach, Astronomical Society of the Pacific, Tucson, AZ, 4-8 Aug.

**Martin, A.M., Chambers, L.H., Pippin, M.R., & Spruill, K.** (2012), *Balancing evaluation ideals against government agency realities: Internally evaluating a multi-site, NASA-funded climate education initiative*. Poster. Abstract P110 presented at Evaluation 2012, American Evaluation Association, Minneapolis, MN, 24-27 Oct.

**Martin, A.M., Chambers, L.H., Pippin, M.R., Geyer, A., Karsten, J., Baek, J., & Yue, S.** (2012), *Measuring and maximizing the impact of a federally-funded climate education portfolio via strategic partnerships and collaborations*. **Invited Oral**. Abstract T71.196-3 presented at 2012 Annual Meeting and Exposition, Geological Society of America, Charlotte, NC, 4-7 November.

**Martin, A.M., Chambers, L.H., Pippin, M.R., & Spruill, K.** (2012), *Maximizing the impact of the NASA Innovations in Climate Education (NICE) project: Building a community of project evaluators, collaborating across agencies, and evaluating a 71-project portfolio*. Poster. Abstract ED13C-0790 presented at 2012 Fall Meeting, American Geophysical Union, San Francisco, CA, 3-7 Dec.

McDougall, C., Wilson, C., **Martin, A.M.** & Knippenberg, L. (2011), *The Matrix: Facilitating collaboration, sharing effective practice, and assessing the portfolio diversity across 120 federally funded climate change education projects*. Poster. Abstract ED21B-0583 presented at 2011 Fall Meeting, American Geophysical Union, San Francisco, CA, 5-9 Dec.

McDougall, C., **Martin, A.M., Givens, S.M., Yue, S., Wilson, C., & Karsten, J.L.** (2012). *The Tri-Agency Climate Education (TrACE) Catalog: Promoting collaboration, effective practice, and a robust portfolio by sharing educational resources developed across NASA, NOAA & NSF climate education initiatives*. Poster. Abstract ED21B-0795 presented at 2012 Fall Meeting, American Geophysical Union, San Francisco, CA, 3-7 Dec.

Schoedinger, S.E., **Chambers, L.H.**, Karsten, J.L., McDougall, C., & Campbell, D. (2011), *Interagency collaboration in support of climate change education*. **Invited Oral**. Abstract ED42A-02 presented at 2011 Fall Meeting, American Geophysical Union, San Francisco, CA, 5-9 Dec.

Wilson, C., **Chambers, L.H.**, & Schoedinger, S.E. *Tri-agency collaboration for the advancement of climate change education*. *Eos: Transactions of the American Geophysical Union*, Vol. 92, No. 24, 14 June 2011.