Climate Change Education (CCE): Climate Change Education Partnership (CCEP) Program, Phase I (CCEP-I)

PROGRAM SOLICITATION
NSF 10-542

National Science Foundation

Directorate for Education & Human Resources

Directorate for Geosciences

Directorate for Biological Sciences

Office of Polar Programs

Letter of Intent Due Date(s) ***(required)*** (due by 5 p.m. proposer's local time):

April 23, 2010

Phase I Partnership Proposals

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

May 24, 2010

Phase I Partnership Proposals

March 15, 2011

Phase I Supplement Proposals

IMPORTANT INFORMATION AND REVISION NOTES

The solicitation has been revised to clarify eligibility requirements for Supplemental Funding in FY 2011.

Please be advised that the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) includes revised guidelines to implement the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II for further information about the implementation of this new requirement).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Climate Change Education (CCE): Climate Change Education Partnership (CCEP) Program, Phase I (CCEP-I)

Synopsis of Program:

The Climate Change Education Partnership (CCEP) program seeks to establish a coordinated national network of regionally- or thematically-based partnerships devoted to increasing the adoption of effective, high quality educational programs and resources related to the science of climate change and its impacts. Each CCEP is required to be of a large enough scale that they will have catalytic or transformative impact that cannot be achieved through other core NSF program awards. The CCEP program is one facet of a larger NSF collection of awards related to Climate Change Education (CCE) that has two goals: (1) preparing a new generation of climate scientists, engineers, and technicians equipped to provide innovative and creative approaches to understanding global climate change and to mitigate its impact; and, (2) preparing today's U.S. citizens to understand global climate change and its implications in ways that can lead to informed, evidence-based responses and solutions. Each CCEP must include representation from at least each of the following communities: climate scientists, experts in the learning sciences, and practitioners from within formal or informal education venues. This combined expertise will insure that educational programs and resources developed through the activities of each CCEP reflects current understanding about climate science, the best theoretical approaches for teaching such a complex topic, and the practical means necessary to reach the intended learner audience(s). Each CCEP should be organized around either geographic regions that share similar climate change impacts, or major climate impact themes (e.g., sea-level rise).

The CCEP program is a two-phase program. **This solicitation seeks proposals for development of Phase I Partnerships (CCEP-I).** CCEP-I grantees will receive up to 2 years of funding to support synthesis, network-building, and strategic planning activities leading toward potential Phase II Partnerships (CCEP-II). Each CCEP-I

awardee is expected to: (1) conduct an inventory of existing climate change education resources and identify educational needs and opportunities relevant to their particular region or theme; (2) identify key players from relevant stakeholder communities and initiate network development; (3) convene community workshops and other community-building activities that lead toward development of a comprehensive climate change education strategic plan for that Partnership; and, (4) begin to serve as a test-bed for development, customization and scaling up of standards-based instructional materials, professional development and training models, and other appropriate activities tailored to the Partnership's goals. External evaluation activities (formative and summative) are required during Phase I efforts (and will be required during Phase II). In FY 2011, CCEP-I awardees will be able to request supplemental funding in order to support: (1) early implementation of meritorious programs or activities identified during the planning effort; and/or (2) expansion of the initial Partnership through addition of other investigators seeking to collaborate with a specific CCEP-I awardee. A future program solicitation will invite proposals for Phase II Partnerships, which are expected to receive 5 years of support for full-scale implementation of mature strategic plans serving the goals of the CCE program. Eligible institutions for the CCEP-II competition will include the CCEP-I awardees and equivalent partnerships established through other funding mechanisms that have met the CCEP-I strategic planning criteria and objectives described in this solicitation. Phase II of the CCEP program is expected to begin in FY 2012, depending on the availability of funding.

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Jill Karsten, GEO/OAD, 705, telephone: (703) 292-8500, email: jkarsten@nsf.gov
- Peter Lea, 835, telephone: (703) 292-4643, email: plea@nsf.gov
- David Campbell, 885, telephone: (703) 292-5093, email: dcampbel@nsf.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.050 --- Geosciences
- 47.074 --- Biological Sciences
- 47.076 --- Education and Human Resources
- 47.078 --- Office of Polar Programs

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 10 to 15

NSF anticipates making 10-15 awards to establish Phase I Partnerships in FY 2010. In FY 2011, NSF anticipates support for 15-18 supplemental funding requests.

Anticipated Funding Amount: $20,000,000

NSF anticipates having up to $20 million ($10 million in both FY 2010 and FY 2011) to support CCEP Phase I activities, subject to the availability of funds. For Phase I Partnerships, awards are expected to be between $750,000 and $1,000,000 total for two years. Supplemental funding requests will be supported at up to $250,000 total for one year in FY 2011.

Eligibility Information

Organization Limit:

None Specified

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

Collaborative Proposals submitted as separate submissions from multiple organizations are NOT allowed for this competition. Instead, any proposal to the CCEP program should be a single submission that includes sub-award support for all other partner organizations that are requesting funding from NSF.

An institution may submit only one CCEP-I proposal as Lead institution. Institutions may be a non-Lead partner on more than one proposal.

A central organization that acts as fiscal agent for multiple institutions in a university system is not considered to be the same as the individual colleges and universities that are part of the system, and may act as fiscal agent for one or more proposals submitted in response to this solicitation.

Supplemental funding requests in FY 2011 may only be submitted by CCEP-I awardees and awardees funded in FY 2009 through the Climate Change Education (CCE) program. CCEP-I awardees are eligible to submit more than 1 supplemental funding request.

Limit on Number of Proposals per PI:

An individual is allowed to serve as Lead PI on only one proposal, due to the institution limit. However, an individual may participate in more than one partnership proposal as a Co-Investigator supported through a sub-award from the Lead institution.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Letter of Intent Due Date(s) *(required)*** (due by 5 p.m. proposer's local time):

  April 23, 2010

  Phase I Partnership Proposals

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

  May 24, 2010

  Phase I Partnership Proposals

  March 15, 2011

  Phase I Supplement Proposals

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions: Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

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I. INTRODUCTION

The impacts of climate variability and change on Earth and its life systems, and the responses taken by individuals and societies to them, pose one of the most pressing challenges of our time. The vision of the Climate Change Education (CCE) program is a society that can effectively weigh the scientific evidence as it confronts the challenges ahead, while developing an innovative scientific and technical workforce that can advance our knowledge of human-climate interactions and develop solutions for a sustainable, prosperous future. To achieve this vision, NSF supports activities to develop more effective models and resources for formal and informal climate change education and training that integrate interdisciplinary climate research and current understanding of how people learn. NSF also supports efforts to establish or enhance mechanisms that help to disseminate, scale-up, or increase utilization of effective practices for climate change education.

NSF invests substantially in a variety of climate change education projects through its core research and education programs within individual directorates and offices. The CCE program, established in FY 2009, is being used to focus NSF support toward important, cross-directorate activities that are less readily achieved through these core program investments. CCE projects are expected to fully incorporate current understanding of how people learn, integrate multidisciplinary climate science and education, and help to synergize and scale up effective climate education projects developed elsewhere. In FY 2009, the CCE program was managed entirely through the Directorate for Education and Human Resources (EHR), which issued a July 2009 Dear Colleague Letter (NSF 09-058) identifying the following program priorities:

- preparation of a climate science professional workforce;
- public understanding and engagement;
- resources for learning;
- changes in local and national STEM education policy that enable increased access to climate education resources; and,
- establishment of foundations for sound public-policy decision making at all levels (local to national).

Beginning in FY 2010, the CCE program is a joint effort among EHR, the Directorates for Geosciences (GEO) and Biological Sciences (BIO), and the Office of Polar Programs (OPP). This solicitation announces a new multi-directorate Climate Change Education Partnership (CCEP) program, as one component in NSF's larger collection of climate change education investments. The CCEP program seeks to establish a coordinated national network of robust, regionally- or thematically-based partnerships that are focused around common climate change impacts. Required core participants in these partnerships include climate scientists, researchers with expertise in the learning sciences, and practitioners from the formal or informal education communities. A major focus of these partnerships is integration across the various scientific disciplines relevant to climate change and its impacts, as well as between formal and informal learning environments. These partnerships are expected to be catalytic agents in efforts to increase the development, evaluation, dissemination, and adoption of effective, high quality educational programs and resources related to the science of climate change and its impacts.

II. PROGRAM DESCRIPTION

A. Background

Research is rapidly advancing our knowledge of climate change and adaptation science, in particular, regarding changes on the global, regional and decadal scales. Those results make it increasingly clear that it is essential for learners and the public to understand fundamental concepts about climate change and its impacts. Climate models predict that continued global warming will profoundly affect water, energy, transportation, agriculture, ecosystems, and health in the coming decades (e.g., IPCC, 2007). Mankind's solutions for adaptation to and mitigation of climate change effects are likely to have consequences for the very fabric of human society, from the global economy and energy infrastructure, to personal lifestyles. There is an urgent need to prepare an innovative scientific and technical workforce that can advance our knowledge of human-climate interactions and develop solutions for a sustainable, prosperous future. Equally important is the need to prepare a society that can effectively weigh scientific evidence as it confronts the challenges ahead. Broad public education and engagement can serve both needs, but evidence of important differences in the severity of climate change effects at regional and local scales (e.g., USGCRP, 2009a) suggests that a one-size-fits-all educational approach will be less meaningful.

Substantial challenges exist in trying to achieve the broad goals of developing a climate literate society and a creative climate workforce. Climate science is a highly interdisciplinary, pedagogically challenging subject that does not fit easily into discipline-based science curricula or assessments. However, a variety of factors - chief among them being barriers introduced by local STEM education policies and inadequate teacher preparation in this subject matter - prevent widespread exposure of learners to effective instruction on climate, or engagement of the most talented minds in climate-related education and career paths (e.g., Hoffman and Barstow, 2007). Educational reform and dissemination of effective curricular resources that build on current knowledge of how people learn (e.g., NRC, 1999, 2002, 2007, 2009) can address many of these obstacles for future generations of students. Moreover, as the boundaries between climate science, engineering, psychology, and socio-economics continue to blur, the education and training programs that prepare the future scientific and technical workforce must evolve to better confront climate change and its impacts, and serve the needs of the nation (e.g., AC-GEO, 2009). The urgency of the situation and the variety of stakeholders who need to understand climate change - ranging from scientists and engineers, educators, policymakers, corporate leaders, and local resource management decision makers, to individual consumers - argues for implementation of new and innovative educational strategies that have been tuned specifically for these different audiences.

NSF plays two important roles in advancing climate change education. As one of the primary agencies investing in fundamental climate research, NSF has the responsibility to foster development of appropriate interdisciplinary strategies for educating the scientists, technicians, and engineers who can advance our understanding of climate change and pursue new approaches for

tackling its impacts. NSF also has an important role in preparing the general public to translate an understanding of climate change into solution-oriented action, which requires more than just knowledge of the current climate science. Basic research into effective education and training programs that operate at the intersection of social/behavioral/economic sciences, global Earth system science, and educational research are needed. NSF is uniquely positioned to make important progress in addressing these combined scientific and societal challenges. Given these mandates, NSF has made substantial investments through its core programs in all aspects of climate change education - from developing model curricula and major museum exhibits, to teacher professional development and graduate student training in interdisciplinary programs.

NSF established a dedicated Climate Change Education (CCE) program in FY 2009 and began efforts to define a more cohesive portfolio of investments serving the larger goals and objectives described above. Ten CCE awards were made in FY 2009 (abstracts are available at: http://nsf.gov/awardsearch/tab.do?dispatch=2 by searching on Program Reference Code 6891). Among the awards made is support for a "Roundtable on Climate Change Education" that is being convened by the National Research Council (NRC) Board on Science Education. The goal of the NRC Roundtable is to foster ongoing discussion of the challenges to, and strategies for, improving understanding of climate science and climate change among federal officials, the business community, policy makers, educators, and scientists. Over the next year and half, the NRC Roundtable is expected to focus on four critical areas and the challenges, opportunities, evidence, and stakeholder groups related to each: public literacy and action; formal education; the scientific, technical and educational workforce; and decision makers.

Success in advancing national climate change education ultimately requires a cohesive effort among federal and local governments, academic institutions, the private sector, and other formal and informal education organizations. Opportunities to leverage educational opportunities provided by ongoing scientific research, as well as broader efforts to reform STEM education, must also be exploited. Coordination of the federal climate change research and education investment is being managed through the U.S. Global Change Research Program (USGCRP), representing 13 Federal agencies involved with climate research (see http://www.globalchange.gov/). Recently, the USGCRP Education Interagency Working Group issued a framework identifying the big ideas all citizens should know about climate in a document entitled, "*Climate Literacy: The Essential Principles of Climate Science*" (USGCRP, 2009b). The USGCRP is also responsible for conducting national assessments of climate change impacts; activities leading up to the next National Climate Assessment, due in 2013, have just gotten underway. Such assessments provide important resources for educating stakeholders on the regional and local consequences of climate change, as well as opportunities for community engagement in learning about the climate.

B. The Climate Change Education Partnership (CCEP) Program

As part of its broader efforts to improve national climate change education, NSF announces a new multi-directorate Climate Change Education Partnership (CCEP) program. The CCEP program seeks to establish a coordinated national network of regionally- or thematically-based Partnerships devoted to increasing the adoption of effective, high quality educational programs and resources related to the science of climate change and its impacts. The program is designed to address fundamental needs related to identifying, developing, implementing, and disseminating effective education strategies that serve the literacy and workforce goals of the CCE program. Partnership activities must reflect current scientific understanding about climate systems and be informed by the learning sciences. To that end, a Partnership must have at least three core elements, each represented by at least one appropriate institutional partner. The elements are: expertise in climate science; expertise in the learning sciences; and education practitioners directly engaged in implementation or STEM education policy development. Inclusion of disciplinary STEM education experts is encouraged. Partnerships are likely to benefit from the participation of experts from the social, behavioral, and economic sciences, as well as those with expertise in communications or public policy. ***The key expectation is that the Partnership's activities will be grounded in comparable levels of expertise in climate science and understanding of learning, and will go beyond commonplace methods of dissemination or outreach to provide transformative implementation on a significant scale.*** The CCEP program is expected to have two phases: Phase I (FY 2010 & 2011) and Phase II (FY 2012 and beyond).

Phase I (FY 2010 & 2011)

In FY 2010, NSF will provide funding to support 2-year synthesis, network-building, and strategic planning efforts as a precursor to development of full, networked CCEP Partnerships. Through this solicitation, NSF expects to make ~10-15 awards to Phase I Partnerships (CCEP-I). Funding up to $1 million (total for 2 years) will enable Phase I Partnerships to undertake the following activities:

- Conduct an inventory of current scientific and education resources, organizations, and practices, that identifies needs and opportunities related to climate change education for the chosen climate impact region or theme.
- Identify areas where additional learning science research is needed to further advance the effectiveness of climate change education.
- Identify additional key players from relevant stakeholder communities, with particular attention to the end users or implementers of planned materials or approaches.
- Establish an external advisory board for the Partnership, with representation from key stakeholder communities.
- Convene community workshops and other community-building activities that engage relevant stakeholders in planning for the Phase II Partnership.
- Develop a comprehensive climate change education strategic plan for a Phase II Partnership that integrates education and climate research.
- Develop a comprehensive formative and summative evaluation plan for the Phase II Partnership that has clearly defined metrics which are linked to the strategic plan goals and objectives.
- Begin to serve as a test-bed for developing, customizing, and scaling up standards-based instructional materials, professional development and training models, and other appropriate activities that are tailored to the Partnership's goals.
- Conduct formative evaluation and assessment activities within Phase I to gauge the potential capacity of the Partnership to achieve its long term goals.

In FY 2011, proposals for supplemental CCE funding will be accepted from each CCEP-I awardee and awardees funded in FY 2009 through the Climate Change Education (CCE) program to support the following types of activities:

- Network Expansion Awards. These Supplements will support requests to create new sub-awards to increase the Partnership by addition of institutions/co-PIs that were not part of the original Phase I Partnership.
- Early Implementation Awards. These Supplements will support execution of specific project activities identified through the planning processes that are sufficiently meritorious to warrant early implementation prior to large scale implementation

during the Phase II Partnerships.

Phase II (FY 2012 and beyond)

NSF plans to issue a separate program solicitation seeking proposals in FY 2012 to establish Phase II Partnerships (CCEP-II), depending upon the availability of funding. Some of the details in this new solicitation will reflect strategic recommendations that arise during the NRC Roundtable process, particularly with regard to priority needs or actions. CCEP Partnerships are expected to serve as a resource for implementing the Roundtable recommendations. At this time, NSF anticipates supporting 7-10 Phase II Partnerships. Phase II Partnerships are expected to receive up to 5 years of funding and $1-2 million per year (or $5-10 million total funding). This funding will be used for full-scale implementation of mature strategic plans that serve the larger goals of the CCE program. Eligible institutions for the CCEP-II competition will include both awardees supported through CCEP Phase I funding and equivalent partnerships established through other funding mechanisms that can demonstrate they have met the CCEP Phase I strategic planning criteria. The program also expects to eventually support a centralized resource activity that facilitates synergy among the efforts of the individual partnerships and coordinates network-wide evaluation efforts.

C. Climate Change Education Partnerships - Expectations and Key Features

This solicitation only invites proposals to initiate CCEP Phase I Partnerships (CCEP-I) in FY 2010 and support an expansion of the CCEP-I awards through supplemental funding in FY 2011. CCEP-I projects will undertake the precursor activities (e.g., synthesis, network building, and strategic planning) that are needed in advance of establishing full CCEP Phase II Partnerships (CCEP-II). However, successful Phase I proposals will be expected to demonstrate an understanding of NSF's goals and requirements for the Phase II Partnerships. To assist in developing Phase I proposals that establish the foundation for success in Phase II partnerships, this section of the solicitation describes the essential elements that will be required for Phase II Partnerships. It also identifies the following Key Features that must be already present in the Phase I proposal, and which are intended to guide or be outcomes of the Phase I work.

Key Features required by a Phase I Partnership include:

- A regional or thematic project focus justified on the basis of motivation or need.
- Demonstrated collaboration between climate scientists, experts in the learning sciences, and practitioners within formal or informal education venues.
- A demonstrated focus on developing innovative and transformative approaches for improving the availability and impact of climate change education efforts, particularly those that integrate climate science and education and the formal (K-16) and informal learning environments.
- Strategies to incorporate national, state, and local STEM education standards and assessment requirements, if focused on K-12 education.
- Clearly stated goals and anticipated outcomes of how the project will improve the quality of climate change education practice, and increase adoption of effective practices that result from the project, and prepare a new generation of climate scientists, engineers and technicians equipped to provide creative approaches to understanding global climate change and to mitigate its impact.
- Identification of a Lead Partner who has the demonstrated capacity and vision to develop, manage, and lead the team.
- Identification of an external Partnership evaluator with demonstrated qualifications to develop a comprehensive evaluation plan.
- Demonstrated potential of the Partnership to coordinate efforts in the future with other Partnerships.

Partnership Structure and Scope

Focus: Each Partnership should be organized around either geographic regions that share similar climate change impacts (current or projected) or major climate impact themes. National climate impact assessment reports, available through the USGCRP web site (http://www.globalchange.gov/), provide information that can help to define relevant regions and themes. A **Regional Partnership** would focus on a specific geographic region (e.g., Southwest USA; the Arctic region; coastal states). A **Thematic Partnership** would focus its efforts on a set of common climate system attributes (e.g. biodiversity within specific biomes; sea-level change; changes in global precipitation and drought patterns), or, possibly, on a set of analytical approaches to improving public or individual understanding of climate change.

Expertise: Each Partnership is required to explicitly incorporate a minimum of three collaborators, with representation from each of the following communities: climate scientists, experts in the learning sciences, and practitioners within formal or informal education venues. Partnerships may also benefit from inclusion of experts from the social, behavioral, economic, communications, and policy science fields. All core partners must be deeply engaged in the effort at both the individual and institutional level, and must provide evidence that they share goals, responsibilities, and accountability for the Partnership's success. All must commit to implementing institutional changes necessary to sustain the Partnership's successes for the long term.

The climate change science research partner may be any institution with a primary mission of conducting basic climate change research and/or graduate education in one or more of the biological, geological, atmospheric, oceanographic, or polar sciences, or other appropriate STEM fields, or in the science of risk analysis. University or college departments or programs, as well as autonomous research centers, would be appropriate. Expertise in the learning sciences may be represented by any of the following: education or cognitive science faculty; faculty with expertise in STEM disciplinary education; experts in the study of informal learning environments; or, professionals with expertise in assessment of learning. Practitioner partners could include formal or informal education institutions or structures (e.g., school districts; multi-state educational alliances), or professional groups that reach relevant audiences (e.g., professional societies). The emphasis of the practitioner partner is two-fold: in their ability to facilitate effective education as a result of creatively utilizing their situational awareness of existing challenges, and in their capacity to bring about widespread adoption of products and findings of the Partnership's work within their sector.

The capacity of the combined Partnership to integrate multidisciplinary climate science and education, blend formal and informal learning environments, facilitate transitions between K-12 and college levels, ground learning materials and practices in what is known about how people learn, and bring about significant and widespread adoption of the effective practices it develops, will be essential elements for determining its success.

The cohesive theme and the three essential core partners must be identified in the Phase I proposal. The commitment of all three core partners must be already evident by this stage, although previous collaborative work is not required. Additional partners are likely to be identified during Phase I planning activities; supplemental funding will be available in FY 2011 to expand the Partnership membership, where warranted.

Example Partnerships: The following examples are intended to illustrate the types of structures envisioned for CCEP Partnerships and the scope of activities they might undertake. This list is not intended to be limiting:

- A Partnership might consist of a climate research center, a group with expertise in developing learning progressions for K-12, and a collaborating set of regional K-12 school districts or state science supervisors. Its primary goal could be development of integrated, multi-grade-level curricular materials related to climate science that emphasize experiential learning, using data, and scientist-mentored student research. Its transformative impact could be achieved through full adoption of the materials across the participating school districts. A creative challenge for such a partnership could include working in concert with entities responsible for statewide science and mathematics standards, so that the materials developed leverage student interest in climate change to achieve learning across a spectrum of basic goals and standards.

- A Partnership might consist of a major museum with extensive online learning networks in urban communities, a national laboratory involved with climate modeling, and an education research group studying the efficacy of using virtual environments and simulations for learning. Its primary goal could be to develop or adapt relevant educational resources that incorporate future-cast simulations of climate change impacts and how they might be mitigated, particularly if focused on culturally-tailored strategies. Its transformative impact could be achieved through large scale dissemination of information to largely underrepresented or underserved communities via the museum's networks.

- A Partnership might consist of a non-profit educational organization with international research station scientist partners, university experts in public policy and cognition, and state resource managers. Its primary goal could be to develop and test model professional development programs integrating field-based experiences, hands-on practical exercises, and discussions with scientists and local land owners in ways that enable resource managers to better understand the scientific issues. Its transformative impact could be achieved by exploring model resource management programs being developed in other nations, to learn about the successes and shortfalls of such programs, and leading efforts to scale up implementation of effective programs in the U.S.

- A Partnership might consist of a research center focused on climate change mitigation or impact, a consortium of universities that offer undergraduate research experiences, specialists in communications and social policy research, and a scientific society. Its primary goal could be to develop and implement cyber-enabled crowd-sourcing competitions for undergraduates focused on solutions to climate-related grand challenge questions; participating student teams learn climate science and are mentored in effective strategies for science outreach for K-12 or policymaker audiences as part of their preparation. Its transformative impact could be achieved through development of a new generation of civically-engaged students that understand climate science and the impacts of climate change.

Partnership Activities

When fully implemented, the main thrust of each Phase II Partnership must be focused on development of innovative and transformative approaches for improving the availability and impact of climate change education efforts in formal (K-16) or informal learning environments. Each Partnership is expected to ultimately foster its own innovative and cohesive programs, and development and implementation of reliable, high-quality educational resources or practices. Each Partnership will be expected to conduct its own activities, but also participate in collaborative activities offered through the network of CCEP Partnerships. They will each build, coordinate and maintain an appropriate Regional or Thematic website that will be linked through the national network. Strategies to engage diverse and underrepresented communities will be an essential component of a successful Partnership.

Activities should seek to improve public climate literacy, as articulated in the "*Climate Literacy: The Essential Principles of Climate Science*" framework (USGCRP, 2009b) or advance preparation of the future climate research workforce. Support for activities that are considered programmatic with respect to climate science will be considered only to the extent that they provide a platform for connecting climate change researchers to formal and informal educators serving a variety of audiences, including decision and policy makers. In addition to the primary educational thrust for the Partnership, activities that provide background, pedagogical insights, community connections, and experiences that may be broadly used by the climate science community to develop excellent Broader Impacts efforts are also encouraged.

Although a Partnership may mount demonstration programs consistent with its goals, its primary role should be catalytic rather than programmatic. Plans for sustaining newly developed programs after Phase II CCEP funding ends must be addressed during the Phase I strategic planning process.

Example Activities: An important goal of the Phase I Partnerships is to identify the types of activities to be undertaken by a Phase II Partnership. The following examples illustrate the types of activities that Partnerships might engage in, but they are not intended to be comprehensive:

- Create new professional development opportunities for a variety of audiences, including teachers, other educators, scientists, and decision-makers. The goals of such professional development could include: help teachers and educators in informal science venues learn of recent developments in climate change science research and develop skills and tools to introduce climate change science topics in their particular environments; and, help scientists develop better teaching and communication skills, improve pedagogical understanding, and formulate effective, high-impact Broader Impacts activities in support of their funded research programs.

- Provide incentives and assistance for school districts and teachers to integrate climate change science content into their curricula. For example, Partnership personnel could help school districts identify climate change-related curricula that would be appropriate for them and help align the curricula to state or national standards as necessary. To the extent that a Partnership proposes to develop new curricular materials, it is expected that the proponents will provide evidence that there is a *bona fide* demand for the proposed new materials, demonstrate an ability to develop the materials based on known best practices and relevant literature, describe how these materials are to be evaluated and tested, and provide a plan for dissemination of these materials once developed. Material development and testing efforts would need to be completed prior to the end of the 5-year CCEP-II funding.

- Develop creative interdisciplinary cross-campus programs for undergraduates that address climate mitigation and adaptation issues. For example, institutions might collaborate with private media companies to blend undergraduate instruction in science, science education, psychology, and media training to develop resources for communicating with public audiences through public marketing campaigns. If this were the major focus of a Partnership, the strategic plan for Phase II must include a credible strategy for bringing about implementation of its programs regionally or nationally, well beyond the campuses on which they were originally developed.

- Create on-going workshops or short-courses that facilitate interactions among researchers and decision makers, thereby enhancing fundamental research and increasing the speed with which new research findings are adopted and used by decision makers. For example, institutions might collaborate with scientific societies or trade associations to offer tutorials by appropriately trained climate scientists that are tailored to the end-user audience's need.

- Foster the effective use and application of climate change observational data and appropriate cyberinfrastructure tools for climate change science education and outreach. For example, institutions might collaborate with widely-available after-school or community-based programs to promote hands-on student or citizen climate research, with the data being shared through networked databases available to the scientific community.

- Support activities leading up to the next National Climate Assessment report (due in 2013) by serving as a conduit between local or regional stakeholders, Federal agencies, and the U.S. Global Change Research Program.

It is also expected that Partnerships will contribute to community and K-16 outreach programs that highlight information on climate-related careers, as well as fellowships or internship opportunities that provide exposure to climate-related careers. Partnerships with guidance counselors, vocational-technical programs, or associations serving community college faculty, to provide resources that outline the many pathways into a variety of climate-related careers are particularly encouraged.

Management and Evaluation Plans

Beginning with Phase I and continuing into Phase II, each Partnership will be required to identify and designate a Lead Partner who has the capacity and vision to develop, manage, and lead the team. In addition, each Partnership must have an internal management structure capable of supporting the research, education, and evaluation missions of the Partnership in a manner that balances the interests of the different institutions involved. Partnerships will support personnel having expertise to engage each of the communities at the core of the Partnership's work. The office(s) for each Partnership may be located at any of the partnering affiliates. Affiliates of a Partnership need not be in close proximity to each other, but all personnel associated with a Partnership must work together as a team and there must be evidence that the Lead Partner has the capacity to convene disparate members of the Partnership.

Each Partnership will be required to have an external Advisory Board composed of representatives of its core communities. The membership of this Advisory Board should be identified by the end of the first six months of the Phase I Partnership. The external Advisory Board will regularly provide advice to each Partnership on its operations, direction, priorities, and opportunities. NSF expects to attend selected Advisory Board meetings as part of its oversight of the Partnership's progress. During Phase II, the Partnerships will be required to provide regular reports of Advisory Board recommendations to the cognizant NSF Program Officer.

Each Partnership will be required to have an external Partnership evaluator for both the Phase I and Phase II activities. **The evaluator must be identified in the Phase I proposal.** A comprehensive evaluation plan must be developed during Phase I. NSF expects that 5-10% of the total budget should be allocated for this purpose. Evaluation activities should include both formative and summative components that measure, report on, and if appropriate, guide the project's progress toward realizing improved outcomes related to understanding and adapting to climate change. Additional guidance on the evaluation requirements for the CCEP projects is provided in section D below.

Synergistic Activities

NSF expects the CCEP awardees to serve as major avenues for synergy among the climate research and education communities. Large projects and centers supported through on-going NSF investments in climate research offer particularly important opportunities for such integration. Similarly, CCEP projects that leverage (but do not duplicate) efforts being supported by the climate change education programs at NOAA and NASA have potential for substantial impact. As new concepts and knowledge from the climate change sciences research community are developed, it will be important that innovative collaborations flourish in ways that disseminate knowledge, create broader public awareness of the role of scientific discovery in society, and enhance educational opportunities and content. The CCEP awardees are expected to provide agile structures that can respond rapidly to emerging opportunities and enhanced collaborations, as research on climate impact, mitigation, and adaptation continues to evolve. Collectively, they will define a CCEP network that can help with rapid dissemination of effective approaches and minimize duplication of effort.

Where appropriate, the Partnerships are expected to coordinate their efforts with those being undertaken by other awardees of the CCE program. Required annual meetings of the CCE Principal Investigators will help to foster this coordination. Partnerships are also encouraged to consider affiliation with other NSF-funded systemic science education reform efforts, including those funded through the following programs: Math and Science Partnership (MSP); Louis Stokes Alliances for Minority Participation (LSAMP); Tribal Colleges and Universities (TCUP); Advanced Technological Education (ATE); Alliances for Graduate Education Program (AGEP); Integrative Graduate Education and Research Traineeships (IGERT); and; the Graduate STEM Fellows in K-12 Education program (GK12). Information on these programs may be found via the NSF website at http://www.nsf.gov/dir/index.jsp?org=EHR. Projects proposing synergistic activities among large-scale climate-related NSF research programs (e.g., Arctic Observation Network) and major research facilities and centers that support the integration of climate research into effective and high impact education and outreach efforts are also encouraged.

Supplemental Funding in FY 2011

In FY 2011, Phase I Partnerships may submit supplemental funding requests for up to one year of additional funding and up to $250,000 to support two types of activities: preliminary implementation of promising projects that have been identified during Phase I planning activities as having potential for immediate benefit and impact; and, expansion of the Partnership through subawards to additional investigators and institutions not originally involved. Supplemental funding proposals may also be submitted by awardees funded in FY 2009 through the Climate Change Education (CCE) program, as long as the goals of the CCEP program described in this solicitation are being addressed. Supplemental funding requests should be prepared in accordance with the NSF Grant Proposal Guide. Supplements will be awarded on a competitive basis after merit review.

D. CCEP Phase I Partnerships - Requirements

This solicitation invites proposals to initiate CCEP Phase I Partnerships and augment their activities through supplements in the second year. The following section describes the required components of a successful Phase I Partnership proposal.

General Requirements

Phase I Partnership proposals are expected to articulate a strategic vision and action agenda for developing a Phase II Partnership and provide a rationale for how it would improve the quality of climate change education practice, and increase adoption of effective practice, across the Partnership. The proposal should identify clear goals and anticipated outcomes for both the Partnership and the Phase I activities. Phase I proposals should describe the motivation or need for selecting the regional or thematic focus of the Partnership, identify key stakeholders in the planning process and why they were chosen, and describe activities that will be used to recruit additional relevant partners. The expertise of the core team of the Partnership, their roles in Phase I, and a plan for managing team efforts should be clearly described. The proposal should indicate the specific activities that will be undertaken during the Phase I project and provide a timeline for their execution.

Each Partnership is expected to use Phase I funding to:

- Conduct an inventory of current scientific and education resources, organizations, and practice, that identifies needs and opportunities related to climate change education for the chosen climate impact region or theme.
- Identify areas where additional learning science research may be needed for making progress in achieving specific Partnership goals during Phase II.
- Identify key players from relevant stakeholder communities, with particular attention to the end users or implementers of planned materials or approaches.
- Establish an external advisory board for the Partnership, with representation from key stakeholder communities.
- Convene community workshops and other community-building activities that engage relevant stakeholders in planning for the Phase II partnership.
- Develop a comprehensive climate change education strategic plan for a Phase II Partnership that integrates education and climate research.
- Develop a comprehensive formative and summative evaluation plan for the Phase II Partnership that has clearly defined metrics which are linked to the strategic plan goals and objectives.
- Begin to serve as a test-bed for instructional materials, professional development and training models, and other appropriate activities that are tailored to the Partnership's goals.
- Conduct formative evaluation and assessment activities within Phase I to gauge the potential capacity of the Partnership to achieve its long term goals.

Evaluation and Assessment

Phase I Partnership proposals are required to include an external Evaluator and detailed evaluation plan. Formative assessment during Phase I of the program will provide a gauge of the robustness, capability, and potential success of individual Partnerships and the CCEP program to address the needs and opportunities facing climate change education. Documentation gathered through systematic and rigorous assessment and evaluation: (1) contributes to the realization of the goals of the CCEP program and the goals of the individual partnerships; (2) points to areas for improvement; and, (3) demonstrates to stakeholders the merit and worth of this effort. An additional area of interest is the development and testing of approaches and tools that are sensitive to educational efforts addressing climate change, such as issues concerning the educational context, cultural responsiveness, key concepts, new cyber-based instrumentation, and workforce/learning environments.

The CCEP-I program will institute program monitoring and formative program evaluation efforts to document the development of Phase I Partnerships. Outputs and outcomes of CCEP-I will inform the CCEP Program about the effectiveness of the Phase I planning process and readiness for Phase II. In addition to producing an inventory of existing resources, an assessment of needs and opportunities, and a detailed strategic plan, successful CCEP-I projects will be expected to generate the following outcomes:

- Indication that the Partnership has representation and commitment of relevant stakeholder communities with processes in place to ensure on-going engagement.
- Evidence of the potential efficacy of supported activities (e.g., instructional materials, professional development and training models) and other activities tailored to the Partnership's goals.
- Indication of the robustness of the Partnership to sustain the work.
- Evidence of the effectiveness of or potential for leveraging of efforts and/or resources.
- Evidence of the potential of the Partnership for full-scale implementation.

Each year, CCEP-I awardees will be required to provide qualitative and quantitative data for the following performance metrics common across all projects:

- Description of the types of CCEP-I supported activities, their objectives, and expected outcomes, such as increased awareness of climate change, increased knowledge of climate change, increased understanding of STEM concepts, processes and/or careers in STEM and outcomes unique to the individual Partnership.
- Documentation of stage of development of Partnership activities and, if implemented or tested, the results of the implementation and/or testing.
- Documentation of the number and demographics of people involved in the development and implementation of CCEP-I supported activities (information to include gender, race and ethnicity, profession).
- The number and demographics of participants actively participating in activities developed for the Phase I Partnership and supported by CCEP-I funds (information to include gender, race and ethnicity, grade level, and profession).

All funded projects will be expected to cooperate with third-party monitoring and formative program evaluation and respond to inquiries that could include requests to participate in surveys, interviews and other approaches for collecting data needed to monitor and evaluate the CCEP-I or the CCE Program.

E. REFERENCES

AC-ERE (2009) *Transitions and Tipping Points in Complex Environmental Systems,* A Report by the NSF Advisory Committee for Environmental Research and Education. 56 pp. http://www.nsf.gov/geo/ere/ereweb/ac-ere/nsf6895_ere_report_090809.pdf

AC-GEO (2009) GEO Vision Report, NSF Advisory Committee for Geosciences, 39 pp. http://www.nsf.gov/geo/acgeo/geovision/start.jsp

Hoffman, M. and D. Barstow (2007) *Revolutionizing Earth System Science Education for the 21st Century, Report and Recommendations from a 50-State Analysis of Earth Science Education Standards*, TERC, Cambridge MA, 59 pp.

IPCC (2007) *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 996 pp.

National Research Council. (1999). *How people learn*: *Brain, mind, experience, and school*. Washington, DC: National Academy Press.

National Research Council. (2002). *Scientific research in education.* Washington, DC: National Academy Press.

National Research Council (2007). *Taking science to school: Learning and teaching science in grades K-8.* Washington, DC: National Academy Press.

National Research Council (2009). *Learning science in informal environments: People, places, and pursuits.* Washington, DC: National Academy Press.

USGCRP (2009a) *Global Climate Change Impacts in the United States* [Eds. T R Karl, J M Melillo; T C Peterson; and S J Hassol], Cambridge University Press, New York, 188 pp.

USGCRP (2009b) *Climate Literacy: The Essential Principles of Climate Science, A Guide for Individuals and Communities*, US Global Change Research Program, Washington, DC.

III. AWARD INFORMATION

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. Anticipated funding amount is $20 million (FY 2010 and FY 2011 combined).

Funding in FY 2010 will support creation of Phase I Partnerships (CCEP-I). Award amounts are expected to be $750,000 to $1,000,000 total funding for up to 24 months of support. Subject to availability of resources, 10-15 Phase I Partnership awards are expected to be funded in FY10, through standard or continuing grants.

Funding in FY 2011 will support supplemental funding requests by the CCEP-I awardees that enable expansion of the Phase I Partnerships through subawards to new partner institutions and/or early implementation of projects that have been determined as meritorious during the Phase I planning effort. Supplemental funding requests are allowed up to a maximum of $250,000 for 12 months. NSF anticipates funding 15-18 supplemental funding requests in FY 2011.

IV. ELIGIBILITY INFORMATION

Organization Limit:

None Specified

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

Collaborative Proposals submitted as separate submissions from multiple organizations are NOT allowed for this competition. Instead, any proposal to the CCEP program should be a single submission that includes sub-award support for all other partner organizations that are requesting funding from NSF.

An institution may submit only one CCEP-I proposal as Lead institution. Institutions may be a non-Lead partner on more than one proposal.

A central organization that acts as fiscal agent for multiple institutions in a university system is not considered to be the same as the individual colleges and universities that are part of the system, and may act as fiscal agent for one or more proposals submitted in response to this solicitation.

Supplemental funding requests in FY 2011 may only be submitted by CCEP-I awardees and awardees funded in FY 2009 through the Climate Change Education (CCE) program. CCEP-I awardees are eligible to submit more than 1 supplemental funding request.

Limit on Number of Proposals per PI:

An individual is allowed to serve as Lead PI on only one proposal, due to the institution limit. However, an individual may participate in more than one partnership proposal as a Co-Investigator supported through a sub-award from the Lead institution.

Additional Eligibility Info:

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent*(required)*:A Letter of Intent must be submitted prior to the April 23, 2010 deadline and it must be submitted

through the NSF FastLane system. All Letters of Intent will be submitted through the EHR/DUE program, which is serving as the lead organization within NSF for the CCEP program. These Letters of Intent will be used to facilitate timely identification of reviewers for the proposals who do not have conflicts of interest. The Letter of Intent should identify all core participating organizations and primary representatives of those organizations. Phase I Partnerships require at least these three types of expertise: climate scientists; experts in the learning sciences; and practitioners (either educators or administrators) from formal (K-16), informal, or other learning environments. The Letter of Intent must identify participants who will be providing these three areas of expertise. Letters should briefly outline the rationale for establishing a CCEP Partnership, the major goals and objectives of a 2-year Phase I Partnership, and anticipated outcomes or impact of the Partnership.

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent
- A Minimum of 3 and Maximum of 4 Other Senior Project Personnel are allowed
- List of Additional Partner Organizations and their Representatives is required when submitting Letters of Intent
- Submission of multiple Letters of Intent is not allowed

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

The following instructions for preparing proposals to establish Phase I Partnerships supercede or supplement the formatting guidelines identified in the NSF Grant Proposal Guide (GPG) or NSF Grants.gov Application Guide. Unless otherwise indicated, the GPG or NSF Grants.gov Application Guide requirements should be followed. Proposals to request supplemental funding requests in FY 2011 should follow the GPG guidelines.

All Phase I Partnership proposals must contain the following information:

1. NSF Cover Page

In completing the NSF Cover Page, proposers should be sure to select a Unit of Consideration from among the participating Directorates (EHR, BIO, GEO) or Office of Polar Programs. There is no advantage to selecting a particular Unit of Consideration, but it does help NSF with identification of appropriate reviewers. If the proposed activity does not easily fit within one of the Units of Consideration, proposers should select the default of EHR/DUE. All proposals submitted in response to this solicitation will be reviewed by a Working Group comprised of representatives from all four participating Directorates/Office.

2. Project Summary

Provide a one-page summary that briefly describes the project vision, goals and work to be undertaken in Phase I. The Project Summary should begin by listing the following: the title of the proposed project; the name of the lead partner; and, the name(s) of any additional core and supporting partners. Note that for all proposals the Project Summary MUST address both NSB-approved merit review criteria in separate statements. NSF will return without review proposals that do not address both merit review criteria in separate statements.

3. Project Description

The Project Description should address ALL of the Key Features described in Sections C and D of the Program Description section in this solicitation, within the following elements.

Vision, Goals and Outcomes

A proposal must clearly describe the Partnership's vision, goals and anticipated outcomes with respect to all of the CCEP Key Features. The Partnership's vision and goals for the project are informed by relevant baseline K-16 student and teacher data, relevant State mathematics or science student academic achievement standards, and the formal or informal education context within which the proposed work will occur, including curricular, instructional, and technological initiatives within which this STEM effort would sit. Any policy endeavors that would be supportive of this proposed effort should also be included. The proposal should provide evidence of: (a) an effective partnership among core and supporting organizations that will work together to realize the project's vision and goals; (b) the participation of all key stakeholders in project planning and design; and, (c) sufficient capacity in and key partners to support the scale and scope of the project should it develop into a full CCEP Partnership. The proposal should also clearly indicate how the intended work differs from, builds on or is otherwise informed by prior efforts, especially those supported by NSF.

Developing the Partnership

Identify the initial core institutions and organizations - and their personnel - who will be engaged in the Phase I Partnership. The three areas of required expertise must be identified in the proposal. Describe why these organizations are coming together at this time and the process by which they will advance and strengthen the Partnership. Identify the disciplinary faculty to be involved, their titles and departments, and the roles they will take within the Partnership; other faculty to be involved may also be listed. Address the process by which the Phase I Partnership will conduct an analysis of stakeholder needs that will provide a framework for future

work, engage relevant stakeholders in the work, and address the Key Features for CCEP Partnerships. Demonstrate how the work will build on the literature about STEM teaching and learning as well as funding from other NSF and related projects. It is recognized that additional institutions and organizations are likely to be identified and added as appropriate during the award period. Where appropriate, identify in the proposal prospective partners who will be sought and the rationale for their inclusion.

Research and Implementation Framework

Describe in detail the plan by which the Partnership will achieve the project vision, goals and anticipated quantitative outcomes by means of a coherent research and implementation plan. This description should include the research or evidence base that constitutes the foundation on which the proposed work rests. The proposal should offer a clear rationale for the strategies being proposed, including theoretical foundations that are tied to the appropriate research and literature in mathematics and science education. Describe the creative, strategic actions that extend beyond common approaches to climate change education that promise significant improvements in public climate literacy and climate workforce development, as a result of the work of the Partnership. Describe how each partner will contribute to the proposed work, with particular emphasis on the contributions that climate scientists and learning science experts will make. Provide a project timeline that correlates with the proposed action plan.

Evaluation and Management Plans

Include plans for formative and summative evaluation of the CCEP-I award. Additionally, outline the process for developing a comprehensive evaluation of the impact of a potential full CCEP Partnership. Although the Evaluation Plan will be developed with input from the Partnership, objective analyses and findings require either an external evaluator or an objective evaluator within a partner institution who is clearly separate and distinct from the partnership participants and their departments/units (e.g., in a department/unit within a university that is not part of the Partnership itself). The qualifications of the evaluator(s) must be provided in the proposal. A management plan and timeline for activities should be included in the proposal. Describe the management and administrative structure, including identification of the members of a Partnership Leadership Team, demonstrating the capability for conducting the proposed work.

4. Results from Prior NSF Support

If any Principal or co-Principal Investigator has received funding from NSF in the last five years, information on the prior award is required if it is relevant to the proposed scope of work. The results of any prior NSF investment(s) should be clearly demonstrated and supported by data. A discussion of both successes and lessons learned from previous support MUST be included. The proposal should also clearly indicate how the intended work differs from, builds on or is otherwise informed by prior efforts.

5. Special Information and Supplementary Documentation

Proposers were required to submit Letters of Intent prior to submission of the proposal. Proposers must include a copy of the acknowledgment received from NSF in response to the Letter of Intent in the Supplementary Documentation section of the proposal.

Letters of commitment/collaboration for all key organizations and institutions engaged in the Partnership planning effort should be submitted in the Supplementary Documents Section. This section should also be used to identify in a table the additional personnel who will participate in the Phase I activities who will not be receiving compensation in the form of salary through the project. For each, briefly describe their specific roles and responsibilities and indicate the time committed.

A curriculum vita (or equivalent) for the external evaluator can be included in the Supplementary Documents section, as needed.

6. Budget Requirements

Proposers are required to include a request for funds to support participation of up to 3 project personnel in annual Principal Investigator (PI) meetings, including travel, lodging, and per diem. Funds should be requested for a 2-day PI meeting each budget year.

Collaboration with international partners who bring relevant expertise to the project is allowed, provided support is requested only for the U.S. portion of the collaborative effort.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Other Budgetary Limitations: Proposals to establish Phase I Partnerships may request up to $1 million (total) in funding and up to 2 years of support. Proposals requesting supplemental funding may request up to a maximum of $250,000 for one year.

Budget Preparation Instructions: Phase I Partnership proposers should request funding to support participation in required Principal Investigator meetings each year for up to 3 project personnel; eligible costs include travel, lodging, and per diem.

C. Due Dates

- **Letter of Intent Due Date(s)** ***(required)*** (due by 5 p.m. proposer's local time):

  April 23, 2010

  Phase I Partnership Proposals

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

  May 24, 2010

  Phase I Partnership Proposals

  March 15, 2011

  Phase I Supplement Proposals

D. FastLane / Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

  Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: https://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

  Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: https://www.fastlane.nsf.gov/fastlane.jsp.

- **For Proposals Submitted Via Grants.gov:**

  Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www07.grants.gov/applicants/app_help_reso.jsp. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

  Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

A. NSF Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgements.

What is the intellectual merit of the proposed activity?
How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?
How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf.

Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one-page supplementary document, will be evaluated under the Broader Impacts criterion.

Additional Solicitation Specific Review Criteria

In addition to the standard NSF review criteria of Intellectual Merit and Broader Impacts identified in the Grant Proposal Guide, proposals submitted in response to this solicitation will be evaluated on the following additional criteria:

- Potential for Impact - Does the proposed Partnership have the appropriate scope of activity to have the potential for catalytic or transformative impact on climate change education related to the region or theme chosen? Is the scope of audience of the proposed Partnership substantial; is there potential for widespread adoption of materials and resources?
- The Partnership - How well does the proposal address the Key Features for CCEP Partnerships outlined in the solicitation? Are all three types of core expertise represented in the membership? Are the Phase I roles and contributions of the individual partners clearly articulated and justified?
- Phase I Activities - Do project activities show a clear path toward creation of a full CCEP Partnership? Is the proposed work strategic and innovative, and informed by current research on learning? Is the timeline of proposed activities appropriate with regard to the balance between development and testing versus implementation? To what extent will the Partnership leverage other NSF or Federal investments related to climate change research and STEM education?
- Management Plan - Is there an appropriate and robust management plan? Has the proposal provided sufficient detail regarding the roles and responsibilities of individual partners and mechanisms to coordinate these efforts?
- Evaluation Plan - Is the evaluation plan comprehensive in nature, linked to project goals and outcomes, and conducted by independent, objective, experts external to the project?

NSF staff also will give careful consideration to the following in making funding decisions:

Integration of Research and Education
One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities
Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Panel Review and/or Virtual Site Visit.

Proposals will be reviewed by a review panel first. The top 10-15 highest ranked proposals will be further reviewed through a virtual site visit, conducted by video-conferencing. Participants in the virtual site visit will include members of the CCE Working Group and key personnel from the proposed Phase I Partnership.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); * or Research Terms and Conditions *

and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

Special Award Conditions:

Each Partnership will be required to have an external Advisory Board composed of representatives of its core communities. The membership of this Advisory Board should be identified by the end of the first six months of the Phase I Partnership.

Each Partnership will be required to have an external Partnership evaluator for both the Phase I and Phase II activities. The evaluator must be identified in the Phase I proposal.

Representatives from each Partnership are required to attend annual Principal Investigator meetings during the Phase I awards.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through FastLane, for preparation and submission of annual and final project reports. Such reports provide information on activities and findings, project participants (individual and organizational), publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

All funded projects will be expected to cooperate with third-party monitoring and formative program evaluation and respond to inquiries that could include requests to participate in surveys, interviews and other approaches for collecting data needed to monitor and evaluate the CCEP-I or the CCE Program.

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Jill Karsten, GEO/OAD, 705, telephone: (703) 292-8500, email: jkarsten@nsf.gov
- Peter Lea, 835, telephone: (703) 292-4643, email: plea@nsf.gov
- David Campbell, 885, telephone: (703) 292-5093, email: dcampbel@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

Phase I of the CCEP program is no longer accepting proposals. A new solicitation for Phase II CCEP proposals will be issued in Fall 2011.

Now Available: Frequently Asked Questions (FAQs) for the CCEP-I solicitation

For additional information in these program areas, please contact one of the following Program Officers:

Education and Human Resources

David Campbell	dcampbel@nsf.gov	(703) 292-5093
Ed Geary	egeary@nsf.gov	(703) 292-4960
Peter Lea	plea@nsf.gov	(703) 292-4643

Biological Sciences

Elizabeth Friar	efriar@nsf.gov	(703) 292-7135
Sally O'Connor	soconnor@nsf.gov	(703) 292-8470

Geosciences

Jill Karsten	jkarsten@nsf.gov	(703) 292-8500
Lina Patino	lpatino@nsf.gov	(703) 292-5047

Office of Polar Programs

Peter West	pwest@nsf.gov	(703) 292-7530

IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, National Science Foundation Update is a free e-mail subscription service designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the NSF web site.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at http://www.grants.gov.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at http://www.nsf.gov

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center)**:** (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**

  Send an e-mail to: nsfpubs@nsf.gov

  or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Division of Administrative Services
National Science Foundation
Arlington, VA 22230

The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749