

ANNOUNCEMENT OF FEDERAL FUNDING OPPORTUNITY

EXECUTIVE SUMMARY

Federal Agency Name(s): National Weather Service (NWS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce

Funding Opportunity Title: Hurricane Forecast Improvement Project

Announcement Type: Initial

Funding Opportunity Number: NOAA-NWS-NWSPO-2011-2002893

Catalog of Federal Domestic Assistance (CFDA) Number: 11.468, Applied Meteorological Research

Dates: Full proposals must be received and validated by Grants.gov, postmarked, or provided to a delivery service on or before 5:59 p.m. ET, March 4, 2011. Please note: Validation or rejection of your application by Grants.gov may take up to 2 business days after submission. Please consider this process in developing your submission timeline. Applications received after the deadline will be rejected/returned to the sender without further consideration. Use of U.S. mail or another delivery service must be documented with a receipt. No facsimile or electronic mail applications will be accepted.

Funding Opportunity Description: The Hurricane Forecast Improvement Project (HFIP) is a NOAA initiative to engage and coordinate hurricane research required to improve operational hurricane forecasts. HFIP is soliciting proposals to support academia for projects involving applied hurricane science and/or hurricane modeling that demonstrates potential to transition into operational hurricane systems with the goal of improving operational hurricane guidance. This notice provides guidelines for submission of proposals. This notice also describes opportunities and application procedures to facilitate the transfer of relevant applied science and technology advancements and hurricane model advancements into operational hurricane numerical weather prediction (NWP) analyses and forecasts. The HFIP Program addresses NOAA's Strategy Execution and Evaluation (SEE)/Weather Ready Nation.

FULL ANNOUNCEMENT TEXT

I. Funding Opportunity Description

A. Program Objective

The Hurricane Forecast Improvement Project (HFIP) provides the basis for NOAA and other agencies to coordinate hurricane research needed to significantly improve guidance for hurricane track, intensity and related coastal impact forecasts. It also engages and aligns the inter-agency and larger scientific community efforts towards addressing the challenges posed to improve hurricane forecasts. The goals of the HFIP are to improve the accuracy and reliability of hurricane forecasts, thereby increasing confidence in NOAA's hurricane forecast.

The specific goals of the HFIP are to reduce the average errors of hurricane track and intensity forecasts by 20% within five years and 50% in ten years with a forecast period out to 7 days. The benefits of HFIP will significantly improve NOAA's forecasts services through improved hurricane forecast science and technology. Forecasts of high accuracy and greater reliability (i.e., user confidence) are expected to improve public response, and save lives and property.

The goal of this notice is to promote and enhance NOAA's collaboration with PIs at academic institutions and private industry, and offer support of their expertise and experience to contribute towards the advancement of hurricane science and modeling to improve operational hurricane forecasts.

Improvements in tropical cyclone forecasting over the past two decades are largely attributed by both national and international communities, to a wide range of advancements in NWP. These improvements have mainly been achieved by advancements in observational platforms, data assimilation techniques, and higher resolution global and regional hurricane prediction systems with improved model physics. The forecast improvements also have resulted from development of ensemble based guidance. These achievements have been made largely through investments in both science and technology that have directly benefited forecasts over the large scale tropics, the hurricane environment, and more recently, on the hurricane vortex scale. The range of activities that HFIP seeks to support is identified within the following themes:

- * Increased usefulness of observations of large and vortex scale circulations in both global and high resolution (e.g., regional) hurricane modeling systems.

- * Advancement of data assimilation techniques for both large and vortex-scale circulations.

* Advancement of model development activities for both global- and high-resolution regional hurricane modeling systems.

* Enhanced development of high resolution ensemble based hurricane prediction systems to increase utility of numerical hurricane guidance for forecast applications.

Successful projects are expected to provide promising near term improvements to operational hurricane forecasts. This would be accomplished through transition of applicable and transferable research modeling applications into operational hurricane systems within two-three years after completion of the funding period.

Projects to be funded will involve both research and operational high-resolution regional hurricane models. Community support for the National Center for Atmospheric Research (NCAR) s Advanced Hurricane Research WRF (AHW) and the National Centers for Environmental Prediction (NCEP) operational Hurricane WRF (HWRF) can be obtained through NCAR Mesoscale and Microscale Meteorology division (NCAR/MMM), and the Development Testbed Center (DTC) by visiting <http://www.dtcenter.org/HurrWRF/users> . Developers of new capabilities are expected to conduct preliminary testing of their code based on case studies. Once the code is considered mature, and has demonstrated some potential to improve operational forecasts, arrangements can be made for the DTC to conduct more extensive testing and evaluation of the new capability.

B. Program Priorities

The following specific topics are the highest priorities related to the broader themes of HFIP. The areas for focused attention will be relevant to both coupled and uncoupled air-sea coupled hurricane prediction systems and will apply for use in global or regional modeling systems or both.

The following are listed in order of priority in descending order:

1. Advancement in data assimilation techniques for hurricane NWP: four dimensional variation (4-D var), Ensemble Kalman Filter (EnKF) and hybrid (4-D var + EnKF) techniques suitable for specifying large, environmental, and hurricane vortex-scales of motion. Priority work will focus on use of in-situ data (e.g., airborne Doppler radar data, lidar, SFMR, dropsonde) to supplement next-generation satellite data (e.g., NASA NPP, A-Train, CloudSat, AIRS, AMSU, AQUA MODIS, COSMIC, and NOAA JPSS and GOES-R, etc.) providing required three-dimensional description of the hurricane core circulation in advanced high-resolution hurricane initialization procedures.

2. Advancements in hurricane NWP to include: new and/or enhanced model physics suitable for (i) high resolution (e.g., scales less than 4 km) focused on microphysical improvements that can more accurately represent cloud processes in the hurricane core, air-sea processes, and boundary layer processes; and, (ii) high resolution vortex initialization techniques, and (iii) determination of model configuration for determining optimal horizontal and vertical resolution and complexity of needed coupling (e.g., air-sea, air-sea-wave, air-sea-land) to improve intensity forecasts.

3. Development of advanced model diagnostic techniques to support: model improvements in (i) the analyses and forecast of the evolution of large-scale, hurricane environment, and evolving storm-scale structure through the tropical cyclone life cycle; and, (ii) identification and analyses of sources of model errors (e.g., initialization, physics, lateral boundary conditions for regional models). Increase utility of global models for prediction of genesis.

4. Advancement in the development of high resolution ensembles to improve intensity guidance. This effort should demonstrate the value of high resolution single model or multi-model ensemble approaches or a combination of both techniques. The effort should also address questions regarding resolution and optimality of the number of ensemble members needed to meaningfully increase forecast accuracy. Development of post processing techniques that increase hurricane forecaster utility of intensity guidance is also encouraged.

5. Advancement in the development of techniques to maximize the usefulness of observations in analyses and prediction of hurricane track and intensity as measured by increased forecast accuracy. This includes development and optimization of observational strategies for hurricane environment- and hurricane core-scale circulations.

C. Program Authority

The program authority is: 15 U.S.C. 313; 49 U.S.C. 44720 (b); 33 U.S.C. 883d; 15 U.S.C. 2904; 15 U.S.C. 2934.

II. Award Information

A. Funding Availability

The total funding amount available for proposals is anticipated to be approximately \$1,000,000. The maximum award that can be requested is \$150,000 per proposal. Proposals over \$150,000 will be returned to the applicant and rejected. Individual award amounts are expected to range from \$50K to \$150K per year. About 6-10 awards are expected.

B. Project/Award Period

This program announcement is for projects to be conducted by university investigators for a 2-year period with an anticipated start date of Aug. 1, 2011 unless otherwise directed.

When a proposal is approved, funding will initially be provided for only the first year of the program. If an application is selected for initial funding, the HFIP has no obligation to provide additional funding in connection with that award for the following year. Funding for the following year is at the discretion of the HFIP Program Manager. It will be also be contingent upon satisfactory progress in relation to the stated goals of the proposal to address specific science needs and priorities of the HFIP program and the availability of funds. Applications must include a sufficiently detailed scope of work and a detailed budget for the entire award period. Semi-annual progress reports will be required from the PIs. Projects will be reviewed by an HFIP panel for the initial selection process and yearly at the discretion of the Project Officer.

Renewal review is based are the following criteria: (1) degree of progress toward meeting the original milestones in the proposal time line; and, (2) the potential for completing testing and evaluation or of providing evidence of potential improvements to hurricane operational forecasting by the end of the second year,. Given a favorable review, each project may be funded for a second year.

An HFIP project reaches its completion in one of two ways. A two-year project may end after approximately one year if the HFIP Program Manager (with input from the HFIP review panel) decides, as described above, that insufficient progress has been made to justify continuation of the project into year two. An HFIP funded project would end successfully with the submission by the principal investigator(s) of a final report at the conclusion of the original agreed-upon project duration that convincingly shows the potential of research to favorably impact operational modeling system(s) hurricane forecasts within two-three years of the end of funding.

C. Type of Funding Instrument

The funding instrument for non-Federal applicants will be a Cooperative Agreement. NOAA cooperative research activities provide financial support to enhance the public benefits to be derived from these research activities. HFIP envisions that project testing and evaluation will involve close coordination with the DTC where applicable. This will likely necessitate support from the NCEP operational center modeling scientists, hurricane forecasters and any other suitable points of contact at NOAA. For example, operational forecasters may utilize output from the experimental technique(s), modeling advancements during their operational shifts or at other times, and may then provide direct feedback to the researchers for possible modifications.

III. Eligibility Information

A. Eligible Applicants

Eligible applicants include all but government laboratories and organizations. This restriction is needed because the results of the collaboration are to be incorporated in processes which ensure multidisciplinary peer review as well as Federal review of scientific validity for use in operational warning and forecasting of tropical cyclones.

B. Cost Sharing or Matching Requirement

No cost sharing is required under this announcement.

C. Other Criteria that Affect Eligibility

None listed in this announcement.

IV. Application and Submission Information

A. Address to Request Application Package

Applications for proposals are available through <http://grants.gov/Apply> . If an applicant does not have Internet access, hard copy applications can be requested by contacting Dr. Daniel Melendez, NOAA/NWS, 1325 East-West Highway, Room 15372, Silver Spring, MD 20910, phone: 301-713-3557 Ext. 181, e-mail: Daniel.Melendez@noaa.gov .

B. Content and Form of Application

Proposals should total no more than 25 pages in length, single spaced. The description of the project should total no more than 15 pages in length. Descriptions exceeding the 15 page limit will only be reviewed up to the page limit. Excess material will not be reviewed and may result in the proposal receiving a lower score. It is strongly recommended that Times New Roman 12 point font, or an equivalent, be used. Federally mandated forms, tables of contents, and any letters of support are not included within the page count, but all other information is. Each proposal must be dated and contain page numbers. Multi-year proposals up to a maximum of two years will be considered; however, funding beyond the first year will be dependent upon satisfactory performance and the availability of funds. Starting date is assumed to be Aug. 1, 2011, on all proposals unless otherwise directed by the HFIP Program Officer. The application elements listed below are required before an award can be made. Failure to submit elements 1, 4, and 5 by the deadline will result in the application not being reviewed if the omissions are not corrected prior to the deadline. The program office will make an effort to notify the applicant of any omissions, but there is no guarantee this can occur prior to the application deadline. The aforementioned application elements are as follows:

1. Title Page. The title page must be officially authorized by the institutional representative. The PIs and institutional representative should be identified by full name, title, organization, telephone number, and address. The title page should clearly indicate which project areas are being addressed and the total amount of requested. Federal funds should be listed for each budget period.

2. Abstract Page. An abstract should be included and should contain an introduction of the problem, rationale, and a brief summary of work to be completed. The abstract should appear on a separate page, headed with the proposal title, institution's investigators, total proposed cost, and budget period.

3. Results from Prior Research. The results of relevant projects supported by NOAA and other agencies should be described, including their relation to the currently proposed work. Prior research that demonstrated potential to favorably impact operational hurricane modeling system(s) and/or that successfully transitioned to operational modeling systems should be emphasized. Reference to each prior research award should include the title, agency, award number, PIs, period of award, and total award. The section should be a brief summary and should not exceed two pages total.

4. Project description. The proposed project must be completely described in a statement of work including identification of the problem; scientific objectives; proposed methodology that includes a testing and evaluation approach, metric(s) for success, project deliverables and a time line with key milestones. Statement of work should also include relevance to the priorities of HFIP; maturity of science and operational applicability as described Sections I, A and II. A.; scientific merit; proposed technology transfer if any and cost effectiveness of research. Benefits of the proposed project to improve hurricane forecasts should be discussed. A year-by-year summary of proposed work must be included. The project description should be no more than 15 pages in length. Descriptions exceeding the 15 page limit will only be reviewed up to the page limit. Excess material will not be reviewed and may result in the proposal receiving a lower score.

5. Budget and Proposed Budget Justification. Applicants must submit a Standard Form (SF) 424, Application for Federal Assistance, including a detailed budget using the SF 424A, Budget Information--Non-Construction Programs. (The forms are available on grants.gov.) Please pay careful attention to show the yearly budget breakout on the SF 424A for two year proposals. In addition, the body of the proposal should include a separate table showing total and annual budgets (if multi-year) corresponding with the project description. Additional text to justify expenses should be included as necessary. PIs are strongly encouraged to plan and budget during each year of the project to describe their work at the annual Interdepartmental Hurricane Conference (IHC), which occurs around early March,

sponsored by the Office of the Federal Coordinator for Meteorological Services and Supporting Research and also at the annual HFIP meeting usually held in November.

6. Vitae. Abbreviated curriculum vitae are sought with each proposal. Reference lists should be limited to all publications in the last three years with up to five other relevant papers.

7. Current and Pending Support. For each investigator, submit a list which includes project title, supporting agency with grant number, investigator months, dollar value, and duration. Requested values should be listed for pending support.

This program does not require any NEPA questions to be answered as part of the application.

C. Submission Dates and Times

Full proposals must be received and validated by Grants.gov, postmarked, or provided to a delivery service on or before 5:59 p.m. ET, March 4, 2011. Please note: Validation or rejection of your application by Grants.gov may take up to 2 business days after submission. Please consider this process in developing your submission timeline. Applications received after the deadline will be rejected/returned to the sender without further consideration. Use of U.S. mail or another delivery service must be documented with a receipt. No facsimile or electronic mail applications will be accepted.

D. Intergovernmental Review

Applications under this program are not subject to Executive Order 12372, Intergovernmental Review of Federal Programs.

E. Funding Restrictions

Funding beyond the first year will be dependent upon satisfactory performance and the continued availability of funds.

F. Other Submission Requirements

None.

Proposals should be submitted through www.grants.gov. For those organizations without internet access, proposals may be sent to: Dr. Daniel Meléndez, NOAA/NWS, 1325 East-West Highway, Room 15372, Silver Spring, MD 20910, phone: 301-713-3557 Ext. 181, e-mail: Daniel.Melendez@noaa.gov.

V. Application Review Information

A. Evaluation Criteria

The HFIP Review Committee, will base their recommendations regarding each proposal upon the extent to which the following criteria (listed with assigned weights) are satisfied:

1. Importance/relevance and applicability of proposed work (30 points). This criterion ascertains whether there is intrinsic value in the proposed work and/or relevance to operations. For HFIP, this includes the following questions:

What is the likelihood of the proposed science activities to improve operational hurricane analyses and/or forecasts?

Are proposed research activities easily transitioned to operational hurricane modeling forecast system(s) in a reasonable time frame, e.g., within two to three years upon completion of funding.

What is the degree of collaboration with NCEP (both the Environmental Modeling Center and National Hurricane Center), NOAA research labs throughout the project?

What is the level of planning by researchers to test and evaluate proposed modeling advancements to meet operational hurricane model skill standards for potential transition into operations successfully and efficiently?

2. Technical/Scientific Merit (30 percent): This criterion assesses whether the approach is technically sound and innovative, if the methods are appropriate, and whether there are clear project goals and objectives. For HFIP competition this includes:

What is the intrinsic scientific value and maturity of the subject and the study proposed as they relate to the specific science priorities?

Were focused scientific objectives and strategies, including data management considerations, and project milestones used?

3. Overall Qualification of Applicants (25 percent): This criterion ascertains whether the applicant possesses the necessary expertise, experience, computing resources and administrative resources to accomplish the project. For the HFIP competition this includes:

a. Do PIs have required expertise and experience to carry out proposed work?

b. Do PIs clearly document past scientific collaborations with operational modeling scientists or operational hurricane forecasters that contained potential to improve operational forecasts?

c. Have past interactions been successful?

d. Are researchers likely to maintain effective and consistent interactions with either operational hurricane modeling scientists or operational hurricane forecasters throughout the course of the proposed research program?

e. Have researchers demonstrated the ability to conduct successful research?

4. Project Costs (15 percent): This criterion evaluates the budget to determine if it is realistic and commensurate with the project needs and time-frame. For the HFIP competition this includes:

Do researchers demonstrate the ability to leverage other resources?

Is there a high ratio of operationally useful results versus proposed costs?

5. Outreach and Education (0 percent):

This criterion assesses whether the project provides a focused and effective education and outreach strategy regarding NOAA's mission to protect the Nation's natural resources. The HFIP competition does not use this criterion.

B. Review and Selection Process

An initial administrative review/screening is conducted to determine compliance with requirements and for completeness. All proposals will be evaluated and individually ranked in accordance with the assigned weights of the above evaluation criteria by an independent peer panel review. Five to ten NOAA and other Federal Laboratories and Agency experts, primarily representing the hurricane research and operational modeling and forecast communities, may be used in this process. The merit reviewers' ratings are used to produce a rank order of the proposals. The Selection Official selects proposals after considering the peer panel reviews and selection factors listed below. In making the final selections, the Selecting Official will award in rank order unless the proposal is justified to be selected out of rank order based upon one or more of the selection factors.

C. Selection Factors

Merit review ratings shall provide a rank order to the Selecting Official for final funding recommendations. The Selecting Official shall award in the rank order unless the proposal is justified to be selected out of rank order based upon one or more of the following factors:

1. Availability of funding.

2. Balance/distribution of funds by (a) geographical balance, (b) type of institutions, (c) type of partners, (d) research areas, and (e) project types.

3. Duplication of other projects funded or considered for funding by NOAA/federal

agencies.

4. Program priorities and policy factors.
5. Applicant's prior award performance.
6. Partnerships with/Participation of targeted groups.
7. Adequacy of information necessary for NOAA staff to make a NEPA determination and draft necessary documentation before recommendations for funding are made to the Grants Officer.

Regarding Selection Factor 2(b), while an eligible organization may submit more than one application, the selecting official may limit the awards to only one per organization.

D. Anticipated Announcement and Award Dates

Subject to the availability of funds, review of proposals will occur during March-April 2011, and funding should begin during August 2011 for most approved projects. Assumed start date is August 1, 2011 on proposals, unless otherwise directed by the HFIP Program Manager.

VI. Award Administration Information

A. Award Notices

Successful applicants will receive notification that their application has been recommended for funding to the NOAA Grants Management Division. This notification is not an authorization to begin performance of the project. Official notification of funding from the NOAA grants officer is the authorization that allows the project to begin. Notification will be issued to the Authorizing Official and the PI of the project either electronically or in hard copy. Unsuccessful applicants will be notified that their proposals were not selected for recommendation.

To enable the use of a universal identifier and to enhance the quality of information available to the public as required by the Federal Funding Accountability and Transparency Act of 2006, to the extent applicable, any proposal awarded in response to this announcement will be required to use the Central Contractor Registration and Dun and Bradstreet Universal Numbering System and be subject to reporting requirements, as identified in OMB guidance published at 2 CFR Parts 25, 170 (2010), http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title02/2cfr25_main_02.tpl , http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title02/2cfr170_main_02.tpl .

B. Administrative and National Policy Requirements

1. The Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements: Administrative and national policy requirements for all Department of Commerce awards are contained in the Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements contained in the Federal Register notice of February 11, 2008 (73 FR 7696). A copy of the notice may be obtained at <http://www.gpoaccess.gov/fr/search.html> .

2. Limitation of Liability: In no event will NOAA or the Department of Commerce be responsible for application preparation costs if these programs fail to receive funding or are canceled because of other agency priorities. Publication of this announcement does not oblige NOAA to award any specific project or to obligate any available funds.

3. National Environmental Policy Act (NEPA): NOAA must analyze the potential environmental impacts, as required by the National Environmental Policy Act (NEPA), for applicant projects or proposals which are seeking NOAA federal funding opportunities. Detailed information on NOAA compliance with NEPA can be found at the following NOAA NEPA website: <http://www.nepa.noaa.gov/> , including our NOAA Administrative Order 216-6 for NEPA, <http://www.osc.doc.gov/bmi/daos/216-6.htm> , and the Council on Environmental Quality implementation regulations, http://ceq.eh.doe.gov/nepa/regs/ceq/toc_ceq.htm . Consequently, as part of an applicant's package, and under their description of their program activities, applicants are required to provide detailed information on the activities to be conducted, locations, sites, species and habitat to be affected, possible construction activities, and any environmental concerns that may exist (e.g., the use and disposal of hazardous or toxic chemicals, introduction of non-indigenous species, impacts to endangered and threatened species, aquaculture projects, and impacts to coral reef systems). In addition to providing specific information that will serve as the basis for any required impact analyses, applicants may also be requested to assist NOAA in drafting of an environmental assessment, if NOAA determines an assessment is required. Applicants will also be required to cooperate with NOAA in identifying feasible measures to reduce or avoid any identified adverse environmental impacts of their proposal. The failure to do so shall be grounds for not selecting an application. In some cases if additional information is required after an application is selected, funds can be withheld by the Grants Officer under a special award condition requiring the recipient to submit additional environmental compliance information sufficient to enable NOAA to make an assessment on any impacts that a project may have on the environment.

C. Reporting

Award recipients will be required to submit financial and performance (technical) reports. These reports are to be submitted electronically through the NOAA Grants Online

system on a semi-annual basis unless the recipient does not have internet access, in which case hard copy submissions will be accepted. All financial reports are routed directly to the NOAA Grants Officer via grants.gov on line (<https://grantsonline.rdc.noaa.gov>). Performance reports are routed to the NOAA Program Officer via grants on line.

The Federal Funding Accountability and Transparency Act of 2006 includes a requirement for awardees of applicable Federal grants to report information about first-tier subawards and executive compensation under Federal assistance awards issued in FY 2011 or later. All awardees of applicable grants and cooperative agreements are required to report to the Federal Subaward Reporting System (FSRS) available at www.FSRS.gov on all subawards over \$25,000.

VII. Agency Contacts

The point of contact is: Dr. Daniel Melendez, NOAA/NWS, 1325 East-West Highway, Room 15372, Silver Spring, MD 20910, phone: 301-713-3557 Ext. 181, or via e-mail to: Daniel.Melendez@noaa.gov . Questions concerning this announcement must be made via email to Daniel.Melendez@noaa.gov . Questions and NOAA responses will be made public via the web at: <http://www.hfip.org> .

VIII. Other Information

To use grants.gov, applicants must have a Dun and Bradstreet Data Universal Numbering System (DUNS) number and be registered in the Central Contractor Registry (CCR). Allow a minimum of five days to complete the CCR registration. [Note: Your organization's Employer Identification Number (EIN) will be needed on the application form.] Applicants are strongly encouraged not to wait until the application deadline date to begin the application process through grants.gov.