Advancing Digitization of Biodiversity Collections (ADBC)

PROGRAM SOLICITATION
NSF 12-565

REPLACES DOCUMENT(S):
NSF 11-567

National Science Foundation

Directorate for Biological Sciences
    Emerging Frontiers

Directorate for Geosciences
    Division of Earth Sciences

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

    October 19, 2012

    Third Friday in October, Annually Thereafter

        Third Friday in October

IMPORTANT INFORMATION AND REVISION NOTES

Revision Summary

This solicitation is the successor to solicitation, NSF 11-567 and differs from NSF 11-567 in the following ways:

1. It includes the updated Directorate for Geosciences Earth Cube goals and web links

2. It provides additional guidance for proposals from collections to become partners to existing networks.

3. Other revisions change language to clarify the intent.

4. The name of the program is modified from Biological to Biodiversity to indicate more clearly the joint goals of BIO and GEO.

Important Reminders

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), NSF 11-1, was issued on October 1, 2010 and is effective for proposals submitted, or due, on or after January 18, 2011. Please be advised that the guidelines contained in NSF 11-1 apply to proposals submitted in response to this funding opportunity.

Cost Sharing: The PAPPG has been revised to implement the National Science Board's recommendations regarding cost sharing. Inclusion of voluntary committed cost sharing is prohibited. In order to assess the scope of the project, all organizational resources necessary for the project must be described in the Facilities, Equipment and Other Resources section of the proposal. The description should be narrative in nature and must not include any quantifiable financial information. Mandatory cost sharing will only be required when explicitly authorized by the NSF Director. See the PAPP Guide Part I: *Grant Proposal Guide (GPG)* Chapter II.C.2.g(xi) for further information about the implementation of these recommendations.

Data Management Plan: The PAPPG contains a clarification of NSF's long standing data policy. All proposals must describe plans for data management and sharing of the products of research, or assert the absence of the need for such plans. FastLane will not permit submission of a proposal that is missing a Data Management Plan. The Data Management Plan will be reviewed as part of the intellectual merit or broader impacts of the proposal, or both, as appropriate. Links to data management requirements and plans relevant to specific Directorates, Offices, Divisions, Programs, or other NSF units are available on the NSF website at: http://www.nsf.gov/bfa/dias/policy/dmp.jsp. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

Postdoctoral Researcher Mentoring Plan: As a reminder, each proposal that requests funding to support postdoctoral researchers must include, as a supplementary document, a description of the mentoring activities that will be provided for such individuals. Please be advised that if required, FastLane will not permit submission of a proposal that is missing a Postdoctoral Researcher Mentoring Plan. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Advancing Digitization of Biodiversity Collections (ADBC)

Synopsis of Program:

This program seeks to enhance and expand the national resource of digital data documenting existing vouchered biological and paleontological collections and to advance scientific knowledge by improving access to digitized information (including images) residing in vouchered scientific collections across the United States. The information associated with various collections of organisms, such as geographic, paleogeographic and stratigraphic distribution, environmental habitat data, phenology, information about associated organisms, collector field notes, and tissues and molecular data extracted from the specimens, is a rich resource providing the baseline from which to further biodiversity research and provide critical information about existing gaps in our knowledge of life on earth. The national resource is structured at three levels: a central coordinating organization, a series of thematic networks based on an important research theme, and the physical collections. The national resource builds upon a sizable existing national investment in curation of the physical objects in scientific collections and contributes vitally to scientific research and technology interests in the United States. It will become an invaluable tool in understanding contemporary biological issues and challenges.

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.

- Anne M. Maglia, telephone: (703) 292-8470, email: biodigit@nsf.gov

- Lisa E. Park Boush, telephone: (703) 292-4724, email: biodigit@nsf.gov

- Maureen Kearney, telephone: (703) 292-7187, email: biodigit@nsf.gov

- H. Richard Lane, telephone: 703-292-4730, email: biodigit@nsf.gov

- Judith E. Skog, telephone: (703) 292-7909, email: biodigit@nsf.gov

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

- 47.050 --- Geosciences
- 47.074 --- Biological Sciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 4 to 12 [4-12 Thematic Collections Networks (TCN) and Partners to Existing Networks (PEN)]

Anticipated Funding Amount: $10,000,000 Total amount available across all awards in this program for FY2013, pending availability of funds.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- State and Local Governments: State educational offices or organizations and local school districts.

PI Limit:

None Specified

Limit on Number of Proposals per Organization: 1

Only one TCN proposal may be submitted by any one organization as the lead organization. Organizations may be involved in more than one collaborative effort as a non-lead proposal.

Limit on Number of Proposals per PI: 1

An individual may appear as PI or co-PI on no more than one ADBC proposal submitted to any annual ADBC competition.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable

- **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

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

    October 19, 2012

    Third Friday in October, Annually Thereafter

    Third Friday in October

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: Standard NSF award conditions apply.

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

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I. INTRODUCTION

An estimated 1.8 million named species of organisms exist on Earth today and many more are now extinct. This rich diversity is documented through research collections of fossil and extant organisms housed in natural history museums, universities, field facilities, botanical gardens, state surveys, and other institutions maintaining collection facilities. These vouchered collections provide validation for species names and identifications along with a wealth of ancillary data such as DNA sequences, field notes, stratigraphic position, environment/habitat information, time of collection, audio recordings, and the condition of the specimen at the time of collection. Paleontological collections provide time of existence, evolutionary history, proxy data, and past distribution information in space and time.

Collections data reveal gaps in our knowledge of biodiversity and provide the baseline from which to continue biodiversity studies. Filling these gaps is crucial to a complete understanding of the biodiversity of the planet, both in space and time. Specimens and their associated data allow us to reconstruct the history of climate and plate tectonic changes as reflected in a validated record of life on earth. Having this baseline information allows efficiency of effort in biodiversity exploration. Gaps in specimen collections and associated natural history data can be used to strategically target further research and field exploration. The effort to digitize, image, and provide online accessibility to these data is critical for understanding biological knowledge in space and time, and underpins how we address contemporary scientific and societal issues, including planetary biogeography and climate change.

Knowledge of the planet's biodiversity documented in vouchered scientific collections represents an area of exploration and discovery carried out over the entire course of scientific history, yet the extent of life on earth is still not known definitively. New efforts and approaches to understanding biodiversity and advancing our knowledge are represented by several NSF programs (e.g., Dimensions of Biodiversity, Systematics and Biodiversity Science, Sedimentary Geology and Paleobiology). However, there is a digitization bottleneck that effectively limits access to information residing in the various existing vouchered collections across the U.S. and the world. It is estimated that U.S. collections contain one billion specimens, but only 10% of these are accessible online. As a consequence, the critical information in the physical collections is underutilized, the usefulness of scientific collections data in research remains limited, and the importance of the collections is not appreciated.

The Interagency Working Group on Scientific Collections developed a comprehensive report on the current status of federally owned collections (http://nscalliance.org/wordpress/wp-content/uploads/2009/11/iwgsc-report.pdf), and NSF, as part of that working group, surveyed federally supported collections (http://www.nsf.gov/bio/pubs/reports/prelim_findings_sc_2008.pdf and a summary of the findings at http://www.nsf.gov/pubs/2009/nsf09044/nsf09044.pdf). Both reports emphasized the importance of leveraging past investments by digitizing collections and making them available and searchable online to researchers worldwide.

Responding to concerns expressed in these reports, members of the biological and paleontological collections community developed a ten-year strategic plan to digitize, image and mobilize biological collections data (http://digbiocol.files.wordpress.com/2010/08/niba_brochure.pdf). The goal of the digitization effort is "to produce a resource of lasting value for answering major research questions." The plan stated the following key objectives: "digitize data from all U.S. biological collections, large and small, and integrate these in a web accessible interface using shared standards and formats, develop new web interfaces, visualization and analysis tools, data mining, georeferencing processes and make all available for using and improving the collections resource, create real-time upgrades of biological data and prevent the future occurrence of non-accessible collection data through the use of tools, training, and infrastructure."

II. PROGRAM DESCRIPTION

Digitizing and mobilizing the Nation's biological and paleontological collections represents a grand challenge and will require development of both technical and human resources to support the creation of an enduring digital alliance of collections and institutions. In 2011 Integrated Digitized Biocollections (iDigBio) at the University of Florida was established as a national resource to integrate the digitization data and make it widely accessible. Collections digitization is defined broadly for the purpose of this solicitation to include the capture of digital images of specimens, transcription into electronic format of various types of data associated with specimens, linking ancillary data already stored in an electronic format apart from the voucher specimens, the georeferencing of specimen-collection localities, and mobilization of all the data together online. In all cases the primary focus of the digitization effort should be the **physical specimens** owned by the collection. Ancillary material may be included as appropriate through links to the specimen. Paleontological collections are included and may be integrated with biological collections if relevant to a research theme, or may be digitized around a research theme unique to the past. This program will create an organizational structure and processes inclusive of the broad biological and paleontological collections community, provide open data access, and empower biological and paleobiological researchers.

Proposals that address the goals of specimen digitization through innovative plans, strong collaborations among large and small institutions, and mechanisms to build upon existing digitization projects are strongly encouraged. Proposals that increase efficiency and numbers of specimens digitized will have a stronger priority for funding (e.g. by reducing the time and cost per specimen, or by developing new workflows). Current practices cannot achieve a goal of digitizing the existing collections within a ten year period and if this goal of the community strategic plan is to be achieved, there must be new approaches applied to the effort.

The Directorate for Geosciences under the EarthCube vision seeks to support community driven efforts in cyberinfrastructure to integrate data and information for knowledge management. See http://www.nsf.gov/geo/earthcube/index.jsp and http://earthcube.ning.com/ for further information on this activity. Paleontological ADBC proposals should indicate their relevance to Earth Cube goals.

Collaboration with federally held collections is encouraged, but digitization of federally held and owned collections cannot be supported with NSF funds. However, specimens owned by federal institutions may be pertinent for a research theme and in those cases integration of the existing data from all specimens should be considered. The federal agencies are developing guidelines for federally owned collections through the Interagency Working Group on Scientific Collections and, where partnerships are formed with Federal collections, coordination with the federal collections' data should be consistent with the standards and policies being developed by the Interagency Working Group. The proposal should articulate a plan to accomplish this integration.

Research on the collections themselves or on the research theme itself is not supported under this solicitation, but is supported in related programs such as Dimensions of Biodiversity, etc. Also supplements for research activities are not supported under this program.

Digitization of *existing* biological collections/specimens that are vouchered, curated and owned by U.S. institutions is supported. To clarify the meaning of what specimens are supported through this program: *existing* specimens are defined under this program as specimens which have been prepared, curated, placed into organized storage units and under the ownership of the institution in which they reside. Backlogs of specimens in boxes, jars, buckets, or like containers following collection but pre-curation activities are not included. Nor are collections which are not actually owned by the institution seeking funds for digitizing. Ownership is generally determined by or located through information associated with labels, accession numbers, catalogues or other identifying items that

indicate the specimen has been incorporated into the institution's property. For information about ownership of specimens collected through NSF research activities, see the GPG under the category of Tangible Property. It should be noted here that federal collections are being asked to account for specimens under their ownership through activities of the Office of Science and Technology Policy and the Interagency Working Group on Scientific Collections, and in situations where the institution finds specimens actually owned by federal agencies or other institutions, tagging those specimens and providing the information about them back to the agency or institution which owns the specimens is encouraged. If institutions housing these collections decide to digitize these specimens, funds external of NSF funds should be utilized for the activity.

Biomedical/medical collections are not supported. International Institutions collections are not eligible for direct digitization funding but their value to certain research themes is recognized and partnerships for integration of data are encouraged. This solicitation does not support new collecting efforts, nor does it support collections that are not yet curated. Improvements to research collections, individual institution projects or collaborative projects which are regional or taxon based are supported under the Collections in Support of Biological Research (CSBR) program in the Division of Biological Infrastructure.

This solicitation focuses on proposals for Thematic Collections Networks (TCN) and proposals for Partners to Existing Networks (PEN) to link with existing TCNs, outlined below. Improvements to individual collections are supported through CSBR.

Proposals for Thematic Collections Networks (TCNs):

Thematic Collections Network (TCN) proposals will be submissions for two-to-four year awards to digitize existing specimens based on a particular research theme. This research theme may be a grand challenge for biodiversity, a part of a grand challenge, or another important research theme requiring information from existing collections. Specimens to be digitized should be of critical importance to the research theme and the criteria for the specimen assessment should be indicated in the proposal. The collaborating institutions will conduct the actual digitization of the specimens (including imaging and mobilization of the data). The length of award and size of award will depend upon the number and size of the collections to be digitized. This solicitation encourages projects of various sizes and duration, although the expectation is that all projects will be collaborative efforts among several institutions. Integration across different types of collections is expected for broad research themes, and proposals should include a description of the metadata to be used to integrate these disparate collections. Integration of disparate collections is needed to provide research support to increasingly collaborative research projects and projects which approach this problem using new methods are encouraged. TCNs will share infrastructure among the collections involved in the project, identify deliverable goals (one of which should be how the data will add significantly to future research within the overall theme of the project) and metrics for assessment, identify specific needs for community support, and reach out to other collections for inclusion in the digitization effort. TCNs may request a maximum duration of 4 years; the budget should support the scope of work proposed.

Recipients will perform fundamental collections digitization but will also be engaged by collaboration with the National Resource for Digitization of Biological Collections: Integrated Digitized Biocollections at the University of Florida (iDigBio) in training activities and the development of appropriate technology and standards to produce an interoperable network. Priorities are given to proposals that approach the digitization problem in innovative ways, through integration of collections, application of techniques that are innovative, cost effective, and drive down the financial and personnel costs of digitization of specimens and/or speed up the process of digitization.

TCNs will partner with iDigBio, participate in iDigBio activities and conform to the standards and practices set through the coordinating groups of iDigBio. Outreach activities should also be coordinated with iDigBio. All data from the TCNs will be made available through iDigBio in a timely manner and projects will report to iDigBio on a regular cycle. TCNs will be required to participate in the development and/or adoption of strategies, standards, and interoperability infrastructure in cooperation with iDigBio and the advisory bodies of the overall national program. TCNs will be required to interact with iDigBio to promote a community of collections, not only through integration of collections data but also through social networking tools, coordination workshops, or synthesis meetings held by iDigBio when appropriate.

Proposals for Partners to Existing Networks (PENs):

Proposals to partner with and further the efforts of ongoing NSF-funded TCNs are encouraged. The new partners must increase the number of specimens digitized in the ongoing project and fill gaps not addressed by the specimens in the existing TCN. The existing TCNs are working to integrate data via the National Resource for Digitization of Biological Collections: Integrated Digitized Biocollections at the University of Florida (iDigBio). A list of those projects is available through iDigBio.

Collections seeking to digitize and integrate their data into the activities of existing TCNs may submit proposals. It is expected that PEN proposals will work with the TCN to develop a budget that is compatible with these collaborative projects. PEN awards will be for 1 to 3 years (may not exceed the duration of the existing TCN) with a maximum request of $150,000, and will adhere to the standards and processes established by the existing network. Recognizing that there will be some cost to the existing network, any single TCN may only incorporate a maximum of 4 PENs over the duration of its award.

The PEN proposals should adequately indicate how the partner collection will add information to the ongoing project, fill in gaps in digitized data and increase value to the efforts for the research theme. The broader impacts should be specific for the PEN institution, but also indicate how these impacts enhance the TCN. If the addition of fossil data is appropriate, proposals to address these collections relevant to the existing network are encouraged. These projects should contain most of the elements of other proposals, but the data management plan required (by the GPG) and project management plan must be developed through consultation with the existing network with an indication of how the PEN will contribute to project and data management of its own collection. To indicate that the PEN will appropriately integrate with the existing TCN, a form for commitment (found under Supplemental Documents, below) from the existing network should be uploaded in the Supplemental Documents section. It is expected that PEN proposals will utilize the infrastructure of the existing network, thus providing an efficient means to further the impact of the existing network. Priority will be given to proposals that improve efficiency of the digitization process. The length of a PEN proposal should be adequate to describe the activity and the integration into the existing network; a full 15 pages may not be necessary for these types of proposals.

General Items

For both TCN and PEN proposals, priority will be given to innovative projects that 1) fill gaps in the effort to provide online access to specimen data for existing biological and paleobiological collections, 2) integrate with other ongoing digitization activities and 3) increase the efficiency and lower the cost of digitization.

Both TCN and PEN proposals should include:

- a detailed management plan for accomplishing the project,
- training plan for participants and students,
- priorities for tasks,
- task analysis,
- a plan for sustaining the data, and

- plans for interacting and integrating with iDigBio.

While many of these networks will be collaborative proposals, some may be from single institutions partnering with smaller collections to integrate those collections into the national resource. In all proposals, a gap analysis should be included to indicate how the proposed digitization of data contributes to increasing the accessibility of data on existing biological and paleobiological collections and the importance of this data for the research theme. The ADBC program recognizes the growing workforce needs for collection digitization and associated outreach activities. Proposals should include education and outreach components for training the next generation of collection-based researchers and educators, to be coordinated with iDigBio.

III. AWARD INFORMATION

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 4 to 12 [4-12 Thematic Collections Networks (TCN) and Partners to Existing Networks (PEN)]

Anticipated Funding Amount: approximately $10,000,000 total amount available across all awards in this program for FY2013, pending availability of funds.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- State and Local Governments: State educational offices or organizations and local school districts.

PI Limit:

None Specified

Limit on Number of Proposals per Organization: 1

Only one TCN proposal may be submitted by any one organization as the lead organization. Organizations may be involved in more than one collaborative effort as a non-lead proposal.

Limit on Number of Proposals per PI: 1

An individual may appear as PI or co-PI on no more than one ADBC proposal submitted to any annual ADBC competition.

Additional Eligibility Info:

It is expected that TCN projects will be collaborative efforts among several institutions. Please refer to Chapter II.D.4 of the Grant Proposal Guide for guidance about the submission of collaborative proposals.

Federally-owned collections are excluded from this solicitation. Partnerships with federal agencies are encouraged.

Eligibility criteria also apply to all subawards, i.e., organizations ineligible to submit to this program may not receive subawards.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.4 of the Grant Proposal Guide provides additional information on collaborative proposals.

The following instructions supplement those found in the GPG and NSF Grants.gov Application Guide.

Required Information for proposals:

Titles of Proposals: Titles of proposals should begin with "Digitization TCN:" or "Digitization PEN:" followed by the substantive title.

Project Summary: Note that proposals must address separately both of the merit review criteria approved by the National Science Board: what is the intellectual merit of the proposed activity and what are the broader impacts of the proposed activity.

Proposals that do not address both aspects in the project summary will be returned without review.

Project Description: In addition to the points noted in the program description above, the project description must also address the following:

- How the project will integrate newly digitized collections data with established standards and existing databases and the information gaps filled by the proposed project.

- Plan for assessment and evaluation.

- Detailed project management plan, including plans for integration with iDigBio.

- How training is integrated into the project.

- Plan to track use of the data produced by the project and integration of the project into the national resource.

- Results from Prior NSF Support. If any PI or co-PI on the project has received NSF funding in the past five years, information on prior award(s) is required. Each PI and co-PI who has received more than one prior award (excluding amendments) must report on the award most closely related to the proposal. The information required is described in the GPG. Reviewers will be asked to comment on the quality of the prior work described in this section of the proposal. Please note that the proposal may devote up to five pages to describe the results, within the maximum 15 pages of Project Description. Results may be summarized in fewer than five pages, which would leave the balance of the 15 pages for the Project Description.

Proposal Budget: Budgets for TCN proposals should reflect the scope of work proposed and should not exceed four years in duration. Budgets for PEN proposals may be up to $150,000 and may be from 1 to 3 years in duration. The budget justification for both TCN and PEN proposals should include an estimate of the cost per specimen for digitization. PEN proposals must include in their budget the costs of travel to PI meetings of the existing network and travel to iDigBio ONCE during the first year of the project.

Special Information and Supplementary Documentation: **Only** the supplemental documents listed below are allowed for this solicitation.

- **List of Participants**. List each participating institution, and each participant (faculty level or equivalent), by full name, and indicate his or her institutional and departmental affiliation. Names should be grouped by institution, and listed alphabetically within each group.
- **Postdoc Mentoring Plan**. Each project that requests funding to support postdoctoral researchers must include, as a supplementary document, a description of the mentoring activities that will be provided for such individuals. This plan should indicate training activities for both informatics and collections issues. The mentoring plan must not exceed one page and only one plan may be submitted for collaborative projects and all postdocs must be covered by this single one-page document. Different institutions on the same project may not submit different mentoring plans.
- **Data Management Plan**. A separate data management plan (DMP) limited to two pages is required for all proposals submitted to NSF. The DMP should include specific details of data standards, accessibility, electronic dissemination, and sustainability. For guidance, see http://www.nsf.gov/bio/pubs/BIODMP061511.pdf. In addition to the basic BIO requirements for a DMP, ADBC proposals should provide a clear statement of how the project will manage data, software tools and other digital resources that result from the activities supported by the NSF award. The potential for re-use and adoption of these resources as sustainable cyberinfrastructure to other digitization projects, resource providers, and communities of use should also be addressed. The DMP should address long-term archiving, intellectual property rights and means of dissemination. A strategy should be outlined that will support sustainable engagement of cyberinfrastructure resources for data storage, maintenance, and access. Proposals should also include plans and contingencies for adoption of standards, best practices, interoperability and needed infrastructure. The plan should clearly detail integration of these activities with the national resource (iDigBio).
- **Integrated summary budget (for collaborative proposals only):** Organize a summary budget by the tasks to be accomplished under all collaborative proposals and the total amount devoted to each task (including all subawards). Cost per specimen for the digitization should be included.
- **Form for commitment letter for PEN proposals ONLY, signed by the TCN lead PI.**

  To: ADBC Program Director

  By signing below, as principal investigator of an ongoing digitization project, I acknowledge the appropriateness of the collections to be digitized as indicated in the proposal, entitled "PEN: Digitization:_____" with "_____" as the Principal Investigator to become part of the ongoing digitization project entitled "TCN: Digitization: _____". The appropriate resources and activities will be made available to this new partner in the network and the budget items in the proposal have been reviewed for fit with the ongoing project.

Signed: _____

Print Name:_____

Date: _____   Institution:_____

Single Copy Documents:

Integrated Conflicts of Interests List for Applicants: Provide a list, in a single alphabetized table or spreadsheet of the full names and institutional affiliations of all people with **conflicts of interest** for the PI, any senior personnel, and any named personnel whose salary is requested in the project budget. The table should specify the nature of the conflict including: (1) PhD thesis advisors or advisees; (2) collaborator or co-authors, including postdocs, for the past 48 months; and (3) any other individuals or institutions with which the PI or Co-PIs have financial ties.

For example: a table with the name of the conflict and the institution where that person works, the name(s) of the person(s) on the proposal who has the conflict, and the nature of the conflict (i.e. major advisor, collaborator, grant support). The table should be alphabetized by the name of the conflicts, not by the names of the personnel on the proposal.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Other Budgetary Limitations:

Partners to Existing Networks (PEN) proposals may request up to $150,000 for a maximum of 3 years.

C. Due Dates

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

  October 19, 2012

  Third Friday in October, Annually Thereafter

  Third Friday in October

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 judgments.

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

For TCN proposals the following items will be important, as well as the items in the project description:

- data sustainability
- efficiency of digitization
- integration of pertinent collections
- lack of overlap with other efforts
- importance of the collections to be digitized to the research theme
- integration of the project with the national resource (iDigBio)

For PEN proposals the following criteria will be important:

- integration and enhancement of the existing network by this project
- importance of the data for filling a gap in the existing network
- data sustainability
- efficiency of digitization

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 Ad hoc Review and/or Panel Review.

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.

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.

The TCN awards may be collaborative projects, and in those cases the annual reports should be an integrated report from all partners which is submitted by the lead in the TCN and each collaborator should submit a report indicating what their individual contribution has been to the network, attaching a pdf of the lead integrated report. In addition, all TCN reports should include statements from iDigBio indicating that the data are now a part of the national resource and adding such information about the utilization of the data and conformity to the standards for integration of the data. During the first year of the award, TCNs will report to iDigBio at months 4 and 8 in order to initiate proper integration of data. PENs will join existing networks and report to iDigBio through the existing network reports; however, PENs will need to submit separate annual reports to NSF.

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:

- Anne M. Maglia, telephone: (703) 292-8470, email: biodigit@nsf.gov

- Lisa E. Park Boush, telephone: (703) 292-4724, email: biodigit@nsf.gov

- Maureen Kearney, telephone: (703) 292-7187, email: biodigit@nsf.gov

- H. Richard Lane, telephone: 703-292-4730, email: biodigit@nsf.gov

- Judith E. Skog, telephone: (703) 292-7909, email: biodigit@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.

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.

Related Programs:

Related programs are the Collections in Support of Biological Research and Advances in Biological Informatics, Dimensions of Biodiversity, Systematic Biology Program, and Sedimentary Geology and Paleobiology Program.

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 55,000 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

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