

Program Announcement To DOE National Laboratories LAB 01-26

Program for Ecosystem Research (PER)

The Office of Biological and Environmental Research (OBER) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving peer-reviewable Field Work Proposals (FWPs) for research in the Program for Ecosystem Research (PER). Proposals should describe research projects that address the scientific aims of PER. Proposals for research on carbon sequestration in terrestrial ecosystems were solicited under an earlier announcement ([Carbon Sequestration Research Program; Program Announcement LAB 00-09](#)), and proposals for research on terrestrial ecosystem carbon cycle and carbon balance were solicited under another earlier announcement ([Terrestrial Carbon Processes \(TCP\) Program Announcement LAB 00-12](#)). Proposals for research on those topics will not be considered by PER.

SUPPLEMENTARY INFORMATION:

DOE has responsibility for developing energy resources, technologies, and policies to provide for the nation's energy needs in a manner that will maintain, protect, and enhance environmental quality. Complementary to this commitment, and as part of the U.S. Global Change Research Program, DOE also addresses the question of how ecosystems respond and adjust to global and regional changes in atmospheric composition and related climate changes associated with energy production and use.

The mission of PER is to improve the scientific basis for predicting or detecting effects of simultaneous changes in climate and atmospheric composition on terrestrial ecosystems and their component organisms and processes. Ecosystem processes and components of importance to humanity are of special concern. Climatic and atmospheric changes of key interest include (but need not be limited to): warming (and changes in diurnal, seasonal, and interannual temperature cycles), changes in precipitation and evapotranspiration (e.g., intensification of the hydrologic cycle), changes in frequency and/or magnitude of extreme weather events and patterns, and rising atmospheric carbon dioxide and ozone concentrations. (Hereafter, these climate and atmospheric changes are referred to as "environmental changes"). Effects of factors such as human land use and introduction and spread of invasive species on ecosystem structure and function are of programmatic interest only to the extent that they interact with (modify impacts of) environmental changes on terrestrial

ecosystems, not as stand-alone factors influencing ecosystems and their component processes. Study of coastal ecosystems is presently outside the purview of PER.

Program objectives are to improve scientific understanding of how and why (or if):

(1) Terrestrial ecosystems and their component organisms are affected by and respond to multiple environmental changes; and

(2) Underlying biological and/or ecological processes in terrestrial ecosystems are controlled or modified by multiple environmental changes.

PER is interested in both experimental research (in the laboratory or field as appropriate to the research objectives) and modeling that considers both (either) direct and indirect effects of environmental changes on terrestrial ecosystems, their components, their processes, and their structures. Experimental research based on underlying theory, and modeling that considers ecological hierarchies (i.e., multi-level or mechanistic modeling), are most relevant, as are considerations of multiple environmental changes. Ecosystem responses to environmental changes of special interest include: (1) adjustments at the ecosystem scale, such as changes in the organized hierarchy of ecosystem processes, structures, biological diversity, and/or succession, and (2) adjustments at the organismal scale that are manifested at the ecosystem scale, including physiological, biochemical, and/or genetic changes that may facilitate (or hinder) ecosystem homeostasis.

Goals of PER research are to (1) determine and quantify cause-and-effect relationships between environmental changes and the structure and functioning of terrestrial ecosystems, including adjustments at the ecosystem level and the biological/ecological controls on the cause-and-effect relationships, and (2) develop and test methods of integrating biotic responses to environmental changes up to levels of organization as high as whole ecosystems. Mathematical modeling can play an important role in attaining these goals, but such modeling must involve new empirically based science. Modeling projects must either introduce new theories into existing models, and/or critically evaluate and improve existing models with independent experimental data. PER modeling must go beyond simply making predictions of ecosystem responses to environmental change scenarios; it must develop and/or test hypotheses concerning cause-and-effect relationships between environmental changes and terrestrial ecosystem structure and functioning. The main theme defining PER goals is the mechanistic understanding and quantification of ecosystem-scale responses to ongoing and potential future environmental changes, with an emphasis on multiple changes.

Proposals should succinctly articulate the choice of environmental factors to be studied and the magnitude of changes considered. Those choices might be related to physically based models of the future climate system and/or models and projections of the chemical characteristics of the future atmosphere. Time scales of decades to a century are appropriate.

When appropriate, use of existing DOE facilities and sites for ecosystem research is encouraged. Such facilities/sites include the National Environmental Research Parks (NERPs) located at DOE facilities throughout the country (see <http://www.pnl.gov/nerp/nerpmap.gif>), free-air CO₂ enrichment (FACE) sites (see <http://cdiac.esd.ornl.gov/programs/FACE/face.html>), and DOE's Atmospheric Radiation Measurement (ARM) Program site in Oklahoma (see <http://www.arm.gov/>).

Proposals focusing primarily on ecosystem carbon exchange or carbon balance, or directed at carbon sequestration in terrestrial ecosystems, are not appropriate for PER. Such Proposals should be directed to the DOE OBER Terrestrial Carbon Processes (TCP) and the Carbon Sequestration Research programs, respectively.

Concise proposals will aid the evaluation process. The technical portion of each proposal should clearly state links between proposed research and the PER mission, objectives, and goals. Background material (e.g., literature review) in the technical portion of each proposal should be only long enough to demonstrate familiarity with the subject and to critically define the need for the proposed research. The complete technical portion of each proposal should not exceed 20 double-spaced pages with at least 1-inch margins using a 10-point (or larger) font. Figures and tables are included in this page limit, though the font size in tables and figures may be smaller, as long as all material is fully legible. A one-page, single-spaced summary should precede the technical portion of the proposal. Proposals exceeding these limits may be returned with a request for compliance to these standards, but the deadline will not be extended.

Proposals submitted to continue existing PER-sponsored research should devote one to one and a half pages of the technical portion of the proposal to a succinct description of the earlier/ongoing research and results, including a statement of the project funding start date. An appendix must be included listing all refereed publications from the project, papers accepted for publication, and papers submitted for publication (not draft manuscripts). This appendix (which will not count against the 20-page limit) may take the form of an annotated bibliography, with a one or two sentence description of the significance of each paper listed after each citation. Similarly, proposals for new research from principal investigators previously supported by PER (or by TECO through DOE) may devote one to one and a half pages of the technical portion of the proposal to a succinct description of the earlier

research and results, including a statement of the project(s) funding start and end dates. An appendix (which will not count against the 20-page limit) listing all refereed publications (published, accepted for publication, and submitted for publication) from the earlier project(s) may be included.

The technical portion of each proposal should end with a brief, clear time line of proposed work and a concise listing of responsibilities of each investigator.

The technical portion of the proposal should be followed by a list of scientific references cited in the technical portion. The references-cited section will not count against the 20-page limit.

Proposals must include a curriculum vita for each principal and co-principal investigator (two pages maximum per investigator). The vitae should specify previous research and publications (if any) related to the proposed research. The vitae are not part of the technical portion of the proposal.

DATES: Potential proposers should submit a one page preproposal referencing Program Announcement LAB 01-26 by 4:30 P.M. E.S.T., July 2, 2001. Receipt of preproposals sent by email will be acknowledged by a return message. An E-mail response to preproposals discussing the potential program relevance of a formal proposal generally will be communicated by July 9, 2001.

The deadline for receipt of formal proposals is 4:30 P.M., E.D.T., August 13, 2001, in order to be accepted for merit review and to permit timely consideration for award in early FY 2002.

THE DEADLINE FOR PREPROPOSALS HAS BEEN EXTENDED TO AUGUST 2, 2001. [Added June 21, 2001]

THE DEADLINE FOR FORMAL PROPOSALS HAS BEEN EXTENDED TO SEPTEMBER 13, 2001. [Added June 21, 2001]

DUE TO INTERRUPTIONS IN MAIL SERVICE AND OTHER CIRCUMSTANCES CAUSED BY THE TERRORIST ATTACKS ON SEPTEMBER 11TH, THE DEADLINE FOR FORMAL PROPOSALS HAS BEEN EXTENDED TO SEPTEMBER 25, 2001. [Added September 12, 2001]

ADDRESS: Preproposals referencing Program Announcement LAB 01-26, should be sent by E-mail to Karen.Carlson@science.doe.gov.

Formal proposals, referencing Program Announcement LAB 01-26, should be sent to: Environmental Sciences Division, SC-74, Office of Biological and Environmental Research, Office of Science, U.S. Department of Energy, 19901 Germantown Road,

Germantown, MD 20874-1290, ATTN: Program Announcement LAB 01-26. This address must be used when submitting proposals by U.S. Postal Service Express, commercial mail delivery service, or when hand carried by the proposer.

FOR FURTHER INFORMATION CONTACT: For general information, contact Dr. Jeffrey S. Amthor, telephone: (301) 903-2507, E-mail: Jeff.Amthor@science.doe.gov, Office of Biological and Environmental Research, SC-74, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290.

Program Funding

It is anticipated that approximately \$1.8 million will be available for multiple awards to be made in early FY 2002, contingent upon the availability of funds. Proposals may request project support for up to three years, with out-year support contingent on availability of funds, progress of the research, and programmatic needs. Previous awards have been in the range from \$80,000 to \$250,000 per year, with some larger awards made in exceptional cases, including coordinated multi-institutional projects. DOE may encourage collaboration among prospective investigators to promote joint proposals or joint research projects by using information obtained in the preproposals or other forms of communication.

Preproposal

A preproposal should be submitted. The Preproposal should contain a title, list of investigators, address, telephone, fax and E-mail address of the Principal Investigator, and no more than a one page summary of the proposed research, including project objectives and methods of accomplishment. Responses to the preproposals, encouraging or discouraging formal proposals, will generally be communicated within 7 days of receipt. Notification of a successful preproposal is not an indication that an award will be made in response to the formal proposal.

Submission Information

In addition, for this announcement, the research description should not exceed 20 pages, exclusive of attachments, must include detailed budgets, form DOE F 4620.1, for each year of support requested, and must contain a one-page abstract or summary of the proposed research. On the cover page, also provide the PI's phone number, fax number and e-mail address. Attachments should include curriculum vitae for all key personnel, a listing of all current and pending federal support, and letters of intent when collaborations are part of the proposed research. Curriculum vitae should be

submitted in a form similar to that of NIH or NSF (two pages maximum), see for example: <http://www.nsf.gov/bfa/cpo/gpg/fkit.htm#forms-9>.

The instructions and format described below should be followed. Reference Program Announcement LAB 01-26 on all submissions and inquiries about this program.

OFFICE OF SCIENCE GUIDE FOR PREPARATION OF SCIENTIFIC/TECHNICAL PROPOSALS TO BE SUBMITTED BY NATIONAL LABORATORIES

Proposals from National Laboratories submitted to the Office of Science (SC) as a result of this program announcement will follow the Department of Energy Field Work Proposal process with additional information requested to allow for scientific/technical merit review. The following guidelines for content and format are intended to facilitate an understanding of the requirements necessary for SC to conduct a merit review of a proposal. Please follow the guidelines carefully, as deviations could be cause for declination of a proposal without merit review.

1. Evaluation Criteria

Proposals will be subjected to formal merit review (peer review) and will be evaluated against the following criteria which are listed in descending order of importance:

Scientific and/or technical merit of the project

Appropriateness of the proposed method or approach

Competency of the personnel and adequacy of the proposed resources

Reasonableness and appropriateness of the proposed budget

The evaluation will include program policy factors such as the relevance of the proposed research to the terms of the announcement, the uniqueness of the proposer's capabilities, and demonstrated usefulness of the research for proposals in other DOE Program Offices as evidenced by a history of programmatic support directly related to the proposed work.

2. Summary of Proposal Contents

Field Work Proposal (FWP) Format (Reference DOE Order 5700.7C) (DOE ONLY)

Proposal Cover Page

Table of Contents
Abstract
Narrative
Literature Cited
Budget and Budget Explanation
Other support of investigators
Biographical Sketches
Description of facilities and resources
Appendix

2.1 Number of Copies to Submit

An original and seven copies of the formal proposal/FWP must be submitted.

3. Detailed Contents of the Proposal

Proposals must be readily legible, when photocopied, and must conform to the following three requirements: the height of the letters must be no smaller than 10 point with at least 2 points of spacing between lines (leading); the type density must average no more than 17 characters per inch; the margins must be at least one-half inch on all sides. Figures, charts, tables, figure legends, etc., may include type smaller than these requirements so long as they are still fully legible.

3.1 Field Work Proposal Format (Reference DOE Order 5700.7C) (DOE ONLY)

The Field Work Proposal (FWP) is to be prepared and submitted consistent with policies of the investigator's laboratory and the local DOE Operations Office. Additional information is also requested to allow for scientific/technical merit review.

Laboratories may submit proposals directly to the SC Program office listed above. A copy should also be provided to the appropriate DOE operations office.

3.2 Proposal Cover Page

The following proposal cover page information may be placed on plain paper. No form is required.

Title of proposed project
SC Program announcement title
Name of laboratory
Name of principal investigator (PI)
Position title of PI

Mailing address of PI
Telephone of PI
Fax number of PI
Electronic mail address of PI
Name of official signing for laboratory*
Title of official
Fax number of official
Telephone of official
Electronic mail address of official
Requested funding for each year; total request
Use of human subjects in proposed project:

If activities involving human subjects are not planned at any time during the proposed project period, state "No"; otherwise state "Yes", provide the IRB Approval date and Assurance of Compliance Number and include all necessary information with the proposal should human subjects be involved.

Use of vertebrate animals in proposed project:

If activities involving vertebrate animals are not planned at any time during this project, state "No"; otherwise state "Yes" and provide the IACUC Approval date and Animal Welfare Assurance number from NIH and include all necessary information with the proposal.

Signature of PI, date of signature

Signature of official, date of signature*

*The signature certifies that personnel and facilities are available as stated in the proposal, if the project is funded.

3.3 Table of Contents

Provide the initial page number for each of the sections of the proposal. Number pages consecutively at the bottom of each page throughout the proposal. Start each major section at the top of a new page. Do not use unnumbered pages and do not use suffices, such as 5a, 5b.

3.4 Abstract

Provide an abstract of no more than 250 words. Give the broad, long-term objectives and what the specific research proposed is intended to accomplish. State the hypotheses to be tested. Indicate how the proposed research addresses the SC scientific/technical area specifically described in this announcement.

3.5 Narrative

The narrative comprises the research plan for the project and is limited to 25 pages. It should contain the following subsections:

Background and Significance: Briefly sketch the background leading to the present proposal, critically evaluate existing knowledge, and specifically identify the gaps which the project is intended to fill. State concisely the importance of the research described in the proposal. Explain the relevance of the project to the research needs identified by the Office of Science. Include references to relevant published literature, both to work of the investigators and to work done by other researchers.

Preliminary Studies: Use this section to provide an account of any preliminary studies that may be pertinent to the proposal. Include any other information that will help to establish the experience and competence of the investigators to pursue the proposed project. References to appropriate publications and manuscripts submitted or accepted for publication may be included.

Research Design and Methods: Describe the research design and the procedures to be used to accomplish the specific aims of the project. Describe new techniques and methodologies and explain the advantages over existing techniques and methodologies. As part of this section, provide a tentative sequence or timetable for the project.

Subcontract or Consortium Arrangements: If any portion of the project described under "Research Design and Methods" is to be done in collaboration with another institution, provide information on the institution and why it is to do the specific component of the project. Further information on any such arrangements is to be given in the sections "Budget and Budget Explanation", "Biographical Sketches", and "Description of Facilities and Resources".

3.6 Literature Cited

List all references cited in the narrative. Limit citations to current literature relevant to the proposed research. Information about each reference should be sufficient for it to be located by a reviewer of the proposal.

3.7 Budget and Budget Explanation

A detailed budget is required for the entire project period, which normally will be three years, and for each fiscal year. It is preferred that DOE's budget page, Form 4620.1 be used for providing budget information*. Modifications of categories are permissible to comply with institutional practices, for example with regard to overhead costs.

A written justification of each budget item is to follow the budget pages. For personnel this should take the form of a one-sentence statement of the role of the person in the project. Provide a detailed justification of the need for each item of permanent equipment. Explain each of the other direct costs in sufficient detail for reviewers to be able to judge the appropriateness of the amount requested.

Further instructions regarding the budget are given in section 4 of this guide.

* Form 4620.1 is available at web site:

<http://www.sc.doe.gov/production/grants/forms.html>

3.8 Other Support of Investigators

Other support is defined as all financial resources, whether Federal, non-Federal, commercial or institutional, available in direct support of an individual's research endeavors. Information on active and pending other support is required for all senior personnel, including investigators at collaborating institutions to be funded by a subcontract. For each item of other support, give the organization or agency, inclusive dates of the project or proposed project, annual funding, and level of effort devoted to the project.

3.9 Biographical Sketches

This information is required for senior personnel at the laboratory submitting the proposal and at all subcontracting institutions. The biographical sketch is limited to a maximum of two pages for each investigator.

3.10 Description of Facilities and Resources

Describe briefly the facilities to be used for the conduct of the proposed research. Indicate the performance sites and describe pertinent capabilities, including support facilities (such as machine shops) that will be used during the project. List the most important equipment items already available for the project and their pertinent capabilities. Include this information for each subcontracting institution, if any.

3.11 Appendix

Include collated sets of all appendix materials with each copy of the proposal. Do not use the appendix to circumvent the page limitations of the proposal. Information should be included that may not be easily accessible to a reviewer.

Reviewers are not required to consider information in the Appendix, only that in the body of the proposal. Reviewers may not have time to read extensive appendix materials with the same care as they will read the proposal proper.

The appendix may contain the following items: up to five publications, manuscripts (accepted for publication), abstracts, patents, or other printed materials directly relevant to this project, but not generally available to the scientific community; and letters from investigators at other institutions stating their agreement to participate in the project (do not include letters of endorsement of the project).

4. Detailed Instructions for the Budget

(DOE Form 4620.1 "Budget Page" may be used)

4.1 Salaries and Wages

List the names of the principal investigator and other key personnel and the estimated number of person-months for which DOE funding is requested. Proposers should list the number of postdoctoral associates and other professional positions included in the proposal and indicate the number of full-time-equivalent (FTE) person-months and rate of pay (hourly, monthly or annually). For graduate and undergraduate students and all other personnel categories such as secretarial, clerical, technical, etc., show the total number of people needed in each job title and total salaries needed. Salaries requested must be consistent with the institution's regular practices. The budget explanation should define concisely the role of each position in the overall project.

4.2 Equipment

DOE defines equipment as "an item of tangible personal property that has a useful life of more than two years and an acquisition cost of \$25,000 or more." Special purpose equipment means equipment which is used only for research, scientific or other technical activities. Items of needed equipment should be individually listed by description and estimated cost, including tax, and adequately justified. Allowable items ordinarily will be limited to scientific equipment that is not already available for the conduct of the work. General purpose office equipment normally will not be considered eligible for support.

4.3 Domestic Travel

The type and extent of travel and its relation to the research should be specified. Funds may be requested for attendance at meetings and conferences, other travel associated with the work and subsistence. In order to qualify for support, attendance at meetings or conferences must enhance the investigator's capability to perform the

research, plan extensions of it, or disseminate its results. Consultant's travel costs also may be requested.

4.4 Foreign Travel

Foreign travel is any travel outside Canada and the United States and its territories and possessions. Foreign travel may be approved only if it is directly related to project objectives.

4.5 Other Direct Costs

The budget should itemize other anticipated direct costs not included under the headings above, including materials and supplies, publication costs, computer services, and consultant services (which are discussed below). Other examples are: aircraft rental, space rental at research establishments away from the institution, minor building alterations, service charges, and fabrication of equipment or systems not available off-the-shelf. Reference books and periodicals may be charged to the project only if they are specifically related to the research.

a. Materials and Supplies

The budget should indicate in general terms the type of required expendable materials and supplies with their estimated costs. The breakdown should be more detailed when the cost is substantial.

b. Publication Costs/Page Charges

The budget may request funds for the costs of preparing and publishing the results of research, including costs of reports, reprints page charges, or other journal costs (except costs for prior or early publication), and necessary illustrations.

c. Consultant Services

Anticipated consultant services should be justified and information furnished on each individual's expertise, primary organizational affiliation, daily compensation rate and number of days expected service. Consultant's travel costs should be listed separately under travel in the budget.

d. Computer Services

The cost of computer services, including computer-based retrieval of scientific and technical information, may be requested. A justification based on the established computer service rates should be included.

e. Subcontracts

Subcontracts should be listed so that they can be properly evaluated. There should be an anticipated cost and an explanation of that cost for each subcontract. The total amount of each subcontract should also appear as a budget item.

4.6 Indirect Costs

Explain the basis for each overhead and indirect cost. Include the current rates.