

**Office of Science  
Notice 01-26**

*Program for Ecosystem Research (PER)*

**Department of Energy  
Office of Science**

**Office of Science Financial Assistance Program Notice 01-26: Program for Ecosystem Research (PER)**

**AGENCY:** U.S. Department of Energy (DOE)

**ACTION:** Notice inviting grant applications

**SUMMARY:** 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 applications for research grants in the Program for Ecosystem Research (PER). Applications should describe research projects that address the scientific aims of PER. Applications for research on carbon sequestration in terrestrial ecosystems were solicited under an earlier announcement ([Carbon Sequestration Research Program; Notice 00-09](#)), and applications for research on terrestrial ecosystem carbon cycle and carbon balance were solicited under another earlier announcement ([Terrestrial Carbon Processes \(TCP\) Notice 00-12](#)). Applications for research on those topics will not be considered by PER.

**DATES:** Potential applicants are strongly encouraged (but not required) to submit a preapplication for programmatic review. The deadline for preapplications is July 2, 2001. A response to the preapplications will be communicated to the principal investigators by July 9, 2001.

**THE DEADLINE FOR PREAPPLICATIONS HAS BEEN EXTENDED TO AUGUST 2, 2001.** [Added June 18, 2001]

**THE DEADLINE FOR FORMAL APPLICATIONS HAS BEEN EXTENDED TO SEPTEMBER 13, 2001.** [Added June 18, 2001]

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

The deadline for receipt of formal applications is 4:30 p.m., EST, August 13, 2001, to be accepted for merit review and to permit timely consideration for award in early Fiscal Year 2002. An original and seven copies of the application must be submitted. Applicants are requested not to submit multiple applications using more than one delivery or mail service.

**ADDRESSES:** If submitting a preapplication, it should be sent as ASCII text attached to an e-mail to [Karen.Carlson@science.doe.gov](mailto:Karen.Carlson@science.doe.gov), using an e-mail subject line of "PER preapplication."

Formal applications, referencing Program Notice 01-26, should be sent to: U.S. Department of Energy, Office of Science, Grants and Contracts Division, SC-64, 19901 Germantown Road, Germantown, MD 20874-1290, ATTN: Program Notice 01-26. This address must also be used when submitting applications by U.S. Postal Service Express Mail or any other commercial overnight delivery service, or when hand-carried by the applicant.

**FOR FURTHER INFORMATION CONTACT:** Dr. Jeffrey S. Amthor, Environmental Sciences Division, SC-74, Office of Biological and Environmental Research, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, telephone (301) 903-2507, e-mail: [Jeff.Amthor@science.doe.gov](mailto:Jeff.Amthor@science.doe.gov), fax: (301) 903-8519. The full text of Program Notice 01-26, is available via the Internet at the following URL: <http://www.science.doe.gov/production/grants/grants.html>.

**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.

Applications 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 CO<sub>2</sub> 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/>).

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

Concise applications will aid the evaluation process. The technical portion of each application 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 application 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 application 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 application. Applications exceeding these limits may be returned with a request for compliance to these standards, but the deadline will not be extended.

Applications submitted to continue existing PER-sponsored research should devote one to one and a half pages of the technical portion of the application 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, applications 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 application 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 application 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 application 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.

Applications 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 application.

### **Program Funding**

It is anticipated that approximately \$1.8 million will be available for multiple awards to be made in early FY 2002, contingent on availability of funds. Applications 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 applications or joint research projects by using information obtained in the preapplications or other forms of communication.

### **Preapplication**

A preapplication is strongly encouraged. The preapplication should contain a title, address, telephone, fax and e-mail address of the Principal Investigator, and consist of 500 words or less of narrative outlining the proposed research objectives and methods. Include a list of proposed principal investigators and their institutions at the end of the narrative. Responses to preapplications, encouraging or discouraging formal applications, will generally be communicated within 7 days of receipt. Notification of a successful preapplication is not an indication that an award will be made in response to the formal application.

## **Merit Review**

Applications 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 codified at 10 CFR 605.10(d):

1. Scientific and/or Technical Merit of the Project;
2. Appropriateness of the Proposed Method or Approach;
3. Competency of Applicant's Personnel and Adequacy of Proposed Resources; and
4. 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 and the agency's programmatic needs. Note, external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Non-federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

## **Submission Information**

Information about the development and submission of applications, eligibility, limitations, evaluation, selection process, and other policies and procedures may be found in 10 CFR Part 605, and in the Application Guide for the Office of Science Financial Assistance Program. Electronic access to the Guide and required forms is made available via the World Wide Web at:

<http://www.sc.doe.gov/production/grants/grants.html>. DOE is under no obligation to pay for any costs associated with the preparation or submission of applications if an award is not made.

In addition, for this notice, 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 SC grant face page, form DOE F 4650.2, in block 15, 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>.

For researchers who do not have access to the World Wide Web, please contact Karen Carlson, Environmental Sciences Division, SC-74, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, phone: (301) 903-3338, fax:

(301) 903-8519, e-mail: [Karen.Carlson@science.doe.gov](mailto:Karen.Carlson@science.doe.gov); for hard copies of background material mentioned in this solicitation.

The Catalog of Federal Domestic Assistance Number for this program is 81.049, and the solicitation control number is ERFAP 10 CFR Part 605.

John Rodney Clark  
Associate Director of Science  
for Resource Management

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