

**Program Announcement
To DOE National Laboratories
LAB 03-22**

***AmeriFlux Research
In Support of
North American Carbon Program (NACP)***

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 proposals for enhancement of the AmeriFlux Research Program.

DATES: The deadline for receipt of formal proposals is 4:30 p.m., E.D.T., May 5, 2003, to be accepted for merit review and to permit timely consideration for award in Fiscal Year 2003.

ADDRESSES: Formal proposals in response to Program Announcement LAB 03-22 are to be submitted as 2 paper copies of the proposal and one CD containing the proposal in PDF format. Color images should be submitted as a separate file in PDF format and identified as such. These images should be kept to a minimum due to the limitations of reproducing hardcopies. They should be numbered and referred to in the body of the technical scientific proposal as Color image 1, Color image 2, etc.

The 2 copies of the proposal and the CD, referencing Program Announcement LAB 03-22, should be sent to: Climate Change Research Division, SC-74/Germantown Building, Office of Biological and Environmental Research, Office of Science, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, D.C. 20585-1290, ATTN: Program Announcement LAB 03-22.

When submitting by U.S. Postal Service Express Mail, any commercial mail delivery service, or when hand carried by the researcher, the following address must be used: Climate Change Research 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 03-22.

FOR FURTHER INFORMATION CONTACT: Dr. Roger C. Dahlman, Program Manager, SC-74, OBER/Germantown Bldg, U.S. Dept of Energy, 1000 Independence Ave SW, Washington, DC 20585-1290 (301) 903-4951, E-mail: roger.dahlman@science.doe.gov, fax: (301) 903-8519.

Researchers are strongly encouraged to match their research proposals to the terms of scope for this announcement, and therefore preproposals are not required. Brief questions for clarification can be addressed to Dr. Dahlman, by e-mail, roger.dahlman@science.doe.gov.

SUPPLEMENTARY INFORMATION: The North American Carbon Program (NACP) is a framework for providing scientific information on sources and sinks of CO₂, CH₄ and CO for North America. It is a planned field program of experiments, flux measurements, data analysis, and modeling that will be implemented by various Federal Agencies. The NACP is discussed briefly as an element of Carbon Cycle Chapter of the Climate Change Research Program Strategic Plan posted on the web site, <http://www.climate-science.gov/Library/stratplan2003/ccspstratplan2003-11nov2002.pdf> (pp 100-111), and reviewed by the December 2002 Workshop in Washington D.C. A discussion of NACP is available from the U.S. Global Change Research Office (see reference below). The initial phase of NACP will start in the 2003-2006 time frame, and will include measurement and modeling of carbon sources and sinks of North America. The NACP is an important component of U. S. Federal Agencies' research on carbon cycle science.

Carbon dioxide flux measurement is one key approach for estimating net carbon gain or loss by terrestrial ecosystems of North America. Such measurements are currently carried out at a network of AmeriFlux sites that are partially representative of different ecosystems of North America. As described in the NACP Report (2002), AmeriFlux measurements are expected to contribute significantly to the goals of NACP, and a "high priority enabling development" calls for the "transformation of the AmeriFlux network into an integrated, near-real time network" that will support goals of the NACP. With upgraded instrumentation and advanced measurement technology, it is anticipated that atmospheric CO₂ concentration can also be determined at an accuracy and precision that can augment real-time and flask sampling networks. Augmented measurement capability offers the potential of substantially increasing knowledge of terrestrial carbon budgets and atmospheric CO₂ concentration for important regions of North America.

The intent of this solicitation therefore is to augment the AmeriFlux network and enhance CO₂ and carbon measurement capacities in support of the NACP. This solicitation requests proposals that will address the following technical requirements:

1) Creation of selected new AmeriFlux sites for obtaining micrometeorological data on the exchanges of CO₂ and energy using the eddy covariance technique, where it is determined that new sites would provide essential and critical support for initial field program(s) of NACP. New AmeriFlux sites must be compatible with observation and intensive field programs of NACP, which are designed to measure and understand sources and sinks of CO₂ and CH₄ in North America. Expanded AmeriFlux research will also support development and testing of intensive field program methodologies, and will participate in different approaches for estimating CO₂ and fluxes and carbon sinks. An initial phase of NACP intensive research is planned for the upper Midwest region of the USA, which is approximately bounded by Minnesota/Wisconsin on the north, Missouri/Oklahoma on the south, Indiana on the east and Nebraska on the west. It is possible that NACP field programs may be restricted to only a portion of this region. This solicitation is requesting proposals for new AmeriFlux research in the Midwest region.

The NACP envisions a number of intensive field studies possibly at other geographical locations in the South East, North East, and Western United States, and ultimately decisions on location and phasing of future intensives will guide the selection of new

AmeriFlux sites. Strong consideration in the selection of new sites will be based on potential contributions to NACP priorities, particularly those that fill geographical or biogeographical gaps within the region of the first intensive field program, and with critical biomes and/or climatic zones that currently lack coverage. Pending availability of funds, proposals for creating new sites at other geographical locations of the U.S. may be supported in Fiscal Year 2004 or later.

New-site proposals must, of course, be based on representative vegetation, and demonstrate that sites possess appropriate physical attributes amenable to producing high-quality net ecosystem exchange (NEE) of CO₂ data. Diversity of regional ecosystem types and the inclusion of types that theoretically represent terrestrial carbon sinks are important considerations for new site selection. New-site selections that involve agricultural ecosystems will be coordinated with the U.S. Department of Agriculture (USDA) because a companion Agriflux intramural program has been proposed by USDA as another component of NACP. Researchers are strongly encouraged to review the current extant and properties of AmeriFlux sites, and propose new sites responsive to these criteria. Information about current research strategy of the AmeriFlux network can be obtained from the web site,

<http://public.ornl.gov/ameriflux/Participants/Sites/Map/index.cfm>.

2) Upgrading micrometeorological and biological measurements at existing AmeriFlux sites within the upper Midwest region that are currently co-located with planned field program(s) of NACP, as noted in item (1) above. Upgrades that will be considered include: Instrumentation for better quantifying CO₂ fluxes; Precise measurements of atmospheric CO₂; Enhanced measurement capacity to deliver the full suite of core measurements recommended in the AmeriFlux science plan, <http://public.ornl.gov/ameriflux/About/scif.cfm>; Improved availability, calibration, quality control and documentation of site data; Redundancy of equipment to minimize data gaps; and Systematic corresponding biological measurements for independent estimation of net ecosystem productivity (NEP). Priority will be given to requests that improve cohesion of network measurements. With improved precision and accuracy of atmospheric CO₂ concentration measurements, emphasis will be placed on sites that will augment initial phases of NACP intensive field programs and observing networks. In addition, since the overall value of the AmeriFlux network and its contribution to NACP depend on data sharing and data inter-comparison, only those existing AmeriFlux sites that have made NEE, biological and NEP data available to the science community through the AmeriFlux network data system (Carbon Dioxide Information Analysis Center) will be eligible for upgrade awards.

For both items (1) and (2) researchers are strongly encouraged to review NACP goals and major elements (NACP, 2002), and explain and justify how proposed research will likely contribute to the overall NACP research strategy, and specifically how the research will improve measurements of carbon flux measurements and estimates of carbon budgets and sinks. Importantly, the proposed research must demonstrate a capability to produce high-quality measurements and provide seasonal and annual estimates of net ecosystem exchange of CO₂. Additionally, best efforts of the proposed research are expected to

produce core AmeriFlux measurements (e.g., NEE, carbon budgets and fluxes of ecosystem components, including uncertainty estimates) in quantities and format that would be compatible with related NACP land-based carbon inventories and with atmospheric CO₂ concentration and profiling data. For item (1) upgraded capacity might include investments in instrumentation, reference gases, more systematic measurement protocols, for example.

3) Support of selected Science Team AmeriFlux activities that would contribute most effectively to science goals of NACP. This could include, for example, participation in priority field programs that require synthesis and integration using measurements and modeling of AmeriFlux results as part of intensive campaigns and NACP biological inventories. For reference, researchers may wish to review current AmeriFlux activities (<http://public.ornl.gov/ameriflux/Participants/Sites/Map/index.cfm>). Proposals addressing this technical requirement must identify how proposed augmentation of current research and analysis would contribute to the NACP.

NACP Reference: The North American Carbon Program (NACP), A Report of the NACP Committee of the U.S. Carbon Cycle Science Steering Group, Steven C. Wofsy and Robert C. Harriss, Co-chairs, 2002. Available from the USGCRP Office, 1717 Pennsylvania Avenue NW, Suite 250, Washington, DC 20006.

Program Funding

It is anticipated that approximately \$1.0 million will be available for awards in Fiscal Year 2003, contingent upon availability of appropriated funds. Previous awards for the creation and operation of a new site have ranged from \$100,000 up to \$300,000 per year, with most not exceeding \$200,000. Each site proposal must provide a "facility" budget and an "operational" budget. Proposals to create a new AmeriFlux site may be eligible for a multi-year award, where the first-year budget would include costs of site development and instrumentation, and successive-year budgets would include nominal operational costs. Proposals to upgrade measurement capacity at an existing AmeriFlux site would be limited to a one-year award because most of the investment is expected to be for equipment. Sustaining operational budgets would be reflected in existing awards or renewal proposals. Multi-year proposals may not exceed 3 years in duration. Most awards are expected to meet these criteria; however, researchers with exceptional budgeting circumstances should discuss them with the Program Manager for this announcement. Funding of multiple year awards is contingent upon availability of appropriated funds. DOE is under no obligation to pay for any costs associated with the preparation or submission of proposals if an award is not made.

The research project description must be 15 pages or less, exclusive of attachments and must contain an abstract or summary of the proposed research. Attachments include curriculum vitae, 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 to three pages). On the proposal cover page also provide the PI's phone number, fax number and E-mail address.

The researchers are asked to submit an electronic copy of the abstract in ASCII format to karen.carlson@science.doe.gov. The abstract should include the following information: PI and co-PI's, their institutions, brief summary of research, including identification of principal subcontractor/collaborators even if no funds are requested for their support.

The instructions and format described below should be followed. Reference Program Announcement LAB 03-22 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.

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
Budget and Budget Explanation
Project Description
Literature Cited
Other support of investigators
Biographical Sketches
Description of facilities and resources
Appendix

3. Detailed Contents of the Proposal

Proposals 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 Project Description

The narrative comprises the research plan for the project and is limited to 15 pages. **Please follow instructions for the Project Description found in the Supplementary Information above.**

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-E.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.