

Office of Science
Notice 00-12

Terrestrial Carbon Processes (TCP)

Department of Energy
Office of Science

Office of Science Financial Assistance Program Notice 00-12; Terrestrial Carbon Processes (TCP)

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 on Terrestrial Carbon Processes (TCP).

DATES: The deadline for receipt of formal applications is 4:30 p.m., E.D.T., April 27, 2000, to be accepted for merit review and to permit timely consideration for award in Fiscal Year 2000 and early Fiscal Year 2001.

ADDRESSES: Formal applications referencing Program Notice 00-12, 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 00-12. 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. Roger C. Dahlman, 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, telephone: (301) 903-4951, E-mail: roger.dahlman@science.doe.gov, fax: (301) 903-8519. The full text of Program Notice 00-12 is available via the Internet using the following web site address: <http://www.sc.doe.gov/production/grants/grants.html>.

Applicants are strongly encouraged to match their research applications to terms of announcement scope, and preapplications therefore are not required. Brief questions

for clarification can be addressed to Dr. Dahlman, Manager of Terrestrial Carbon Processes Research Program.

SUPPLEMENTARY INFORMATION: The general goal of TCP research is to advance the scientific understanding of terrestrial processes regulating carbon balance of ecosystems, and the role of ecosystems in the exchange of carbon dioxide (CO₂) between the atmosphere and terrestrial biosphere. Important endpoints of the research are to determine the capacity of ecosystems to store carbon, and estimate their influence on the rate of atmospheric CO₂ change. This research addresses the important global change issues of causes and rates of CO₂ change that may underlie climate change. In this context, the research is an important adjunct to policies and actions being considered for slowing the rise of greenhouse gases in the atmosphere. Interests and intents of TCP are to augment research on measurements, experiments and modeling of carbon processes. This Notice solicits research on “terrestrial carbon processes” with primary emphasis on measurements needed to derive or estimate the net exchanges of CO₂ between the atmosphere and the terrestrial biosphere, and the acquisition of new knowledge about fundamental processes that regulate exchanges.

The intent of this Notice is to strongly focus on field programs of measurement, experimental manipulation, and analysis of carbon processes; laboratory or controlled environment research is NOT encouraged. This is the third cycle of solicitations for refocused DOE research on terrestrial carbon that was formerly carried out on the global carbon cycle, and on the response of vegetation to CO₂. TCP is particularly interested in research activities that augment the existing AmeriFlux measurement program, including associated ecosystem level observations and experiments.

A central element of current TCP research is the AmeriFlux Program of measuring net CO₂ exchange, including the suite of core measurements that are needed for understanding intrinsic controls on carbon acquisition by ecosystems. The AmeriFlux Network of Sites and current Science Plan can be accessed from the web site: <http://cdiac.esd.ornl.gov/programs/ameriflux/>, which applicants are strongly advised to review. In general, the science questions of the current Science Plan continue to guide the AmeriFlux Program.

Progress of the AmeriFlux Program to date strongly suggests that the suites of CO₂ and biological measurements are providing unique estimates of Net Ecosystem Production (NEP), or the quantity of net annual carbon gain by the ecosystem. This is vital information for global carbon cycle analysis, and the results are providing important missing information needed to balance the global carbon budget. This solicitation seeks to continue and extend AmeriFlux research in the following ways:

1) By moderate expansion of the AmeriFlux Network to include additional geo-climatic zones, or ecological successional states, or biome types. If applicants are interested in forming new sites, the present distribution of research locations should be reviewed from the web sites, and then propose new locations that would significantly augment the existing Network. New sites will be considered only if they offer both compelling differences relative to existing ones in terms of unique geo-climatic zone or biome characteristics, and circumstances where NEP would be expected to be significant. New-site applications must, of course, be based on representative stands of vegetation, and possess appropriate physical attributes amenable to producing quality net CO₂ exchange data. Applications for new sites would identify the suite of measurements that would provide for a balance of CO₂ exchange data and independently derived estimates of NEP, that is by dimensional analysis, physiological measurements or other means. Either “natural” or “managed” ecosystems would be eligible sites.

2) By augmenting research at existing sites. Assistance will be provided to current Network sites to upgrade core measurement capabilities, with emphasis on acquisition of basic biological data needed to explain net CO₂ exchange results. It would be expected that augmented resources would provide improved measures of both CO₂ flux and associated biological processes. These applications would be expected to describe current observations, explain what augmentations are needed in terms of either CO₂ flux or biological process measures that will significantly upgrade site core data bases, and explain the value the additional measurement capability would provide to the site and to the Network. Since the overall value of the AmeriFlux Network depends on data sharing and data inter-comparison, only those sites that have made data available to the AmeriFlux community through the network data system (CDIAC) will be eligible for augmentation awards.

3) By supporting supplemental research at existing sites. Purpose is to enhance overall quality of carbon process information at individual sites or for the AmeriFlux Network -- in contrast to item (2) above which simply upgrades core capabilities. Requests for support would be considered, for example, to: (a) improve micrometeorological characterization of the CO₂ exchange “footprint;” (b) obtain data that extend results from ecosystem to biome or regional scales (this could include aircraft flux measurements and limited support for modeling, for example;) (c) obtain isotopic data that pinpoints source and seasonality of CO₂ fluxes; (d) enhance data processing and prompt delivery of data to users; and (e) the analysis of exchanges and terrestrial carbon processes at larger scale.

Foci of these components of the solicitation are to enhance AmeriFlux science with emphasis on measurements, the development of comprehensive data sets for AmeriFlux sites, and the analysis of collateral results throughout the Network. Limited support of modeling for these purposes will be considered to the extent that analysis focuses on site and Network data sets.

Innovative applications that develop new and cost effective research approaches which can be shown to clearly contribute to understanding terrestrial carbon processes, especially the quantification of NEP, and the scientific understanding of carbon sequestration by terrestrial ecosystems, will also be considered. Examples of innovative or exploratory ideas might include, among other things, unique field experiments or manipulations of variables that regulate carbon balance, or the analysis of unique sets of data. Interest is in non-conventional approaches that offer potential for advancing both estimating carbon quantities and the scientific understanding of processes and controls. While these types of scientific studies may be linked to other on-going CO₂ carbon sequestration and carbon cycle research, they should clearly identify distinct and unique contributions – beyond already defined research of existing programs like AmeriFlux, Free Air CO₂ Enrichment (FACE) Experiments (<http://cdiac.esd.ornl.gov/programs/FACE/face.html>), and Carbon Sequestration (Program Notice 00-09, which closed March 2, 2000, http://www.sc.doe.gov/production/grants/fr00_09.html).

Program Funding

It is anticipated that approximately \$2 million will be available for grant awards in Fiscal Year 2000, contingent upon availability of appropriated funds. Previous awards for this type of research have ranged from \$100,000 up to \$300,000 per year, with most not exceeding \$200,000. While most awards are expected to fall within this range, a few larger awards may be granted for coordinated activities across the Network, or that have requirements for unique field investigation. Any anticipated budgets exceeding \$300,000 per year per application should be discussed with the Program Manager. Funding of multiple year grant awards is expected, and is also contingent upon availability of appropriated funds.

Merit Review

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following evaluation criteria listed in descending order of importance as 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,
4. Reasonableness and Appropriateness of the Proposed Budget.

The evaluation process will include program policy factors such as the relevance of the proposed research to the terms of the announcement and an 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.

The research project description must be 15 pages or less, exclusive of attachments and must contain an 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 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), see for example: <http://www.nsf.gov:80/bfa/cpo/gpg/fkit.htm#forms-9>.

In addition to the original and seven copies of the application that must be submitted, the applicants 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 technical portion of the application should not exceed 20 double-spaced pages plus 5 pages for curriculum vitae and all other data, and should include a short one-half page abstract. Applications that deviate from the terms of this Notice will be returned, and will not be considered for support in the third cycle of TCP.

Applications received after the deadline will not be eligible for award in Fiscal Year 2000.

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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