

**Program Announcement
To DOE National Laboratories
LAB 09-06**

Climate Change Modeling

ATTENTION

**Changes have been made to this Program Announcement;
changes are notated in RED within the document.
Please take careful note of these changes as they effect the Preproposal and
Proposal due dates
as well as Program Funding.**

SUMMARY: The Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving peer-reviewable Field Work Proposals (FWPs) for several topics in climate change modeling.

During the past decade, considerable advances have been made in the understanding, detection and attribution of past climate change, and in projecting future changes in climate using state-of-the-art climate models. However, uncertainties due to climate forcings and feedbacks have not yet been resolved, e.g., current coupled atmosphere-ocean-land-sea ice models that simulate climate variability and change over decadal to centennial time scales still have systematic precipitation biases in the equatorial regions. Improvements are needed before models can simulate regional climate variability and change with greater fidelity.

In FY 2009 BER will address several topics in climate change modeling. It is anticipated that successful PIs will garner computing resources at various national laboratories to achieve the proposed scientific objectives, e.g. through proposals to the National Energy Research Scientific Computing (NERSC), and Leadership Computing Facility.

PREPROPOSALS: Potential applicants are **required** to submit a brief preproposal, referencing Program Announcement LAB 09-06 for receipt by DOE by 4:30 p.m., Eastern Time, December 8, 2008. **THE DEADLINE FOR PREPROPOSALS HAS BEEN EXTENDED TO DECEMBER 22, 2008.** [Added November 18, 2008]

Preproposals will be reviewed for conformance with the guidelines presented in this Announcement and suitability in the technical areas specified in this Announcement. A response to the preproposals encouraging or discouraging formal proposals will be communicated to the applicants by December 15, 2008. **THE RESPONSE TO PREPROPOSALS HAS BEEN EXTENDED TO DECEMBER 29, 2008.** [Added November 18, 2008]

Applicants who have not received a response regarding the status of their preproposal by this date are responsible for contacting the program to confirm this status.

Only those preproposals that receive notification from DOE encouraging a formal proposal may submit full proposals. **No other formal proposals will be considered.** Preproposals referencing Program Announcement LAB 09-06 should be sent as PDF file attachments via e-mail to: Anjuli.Bamzai@science.doe.gov with "Preproposal 09-06 Climate Change Modeling" as the subject. **No FAX or mail submission of preproposals will be accepted.**

Potential applicants must submit a brief preproposal that consists of two to three pages of narrative describing the research objectives, the technical approach(s), and the proposed team members and their expertise. The intent in requesting a preproposal is to save the time and effort of applicants in preparing and submitting a formal project proposal that may be inappropriate for the program. Preproposals will be reviewed relative to the scope and research needs as outlined in the summary paragraph and in the SUPPLEMENTARY INFORMATION. The preproposal should identify, on the cover sheet, the title of the project, the institution or organization, principal investigator name, telephone number, fax number, and e-mail address. No budget information or biographical data need be included, nor is an institutional endorsement necessary.

DATES: Full proposals submitted in response to this Announcement must be received no later than January 26, 2009, 8:00 p.m., Eastern Time, to be accepted for merit review and to permit timely consideration for award in Fiscal Year 2009. **THE DEADLINE FOR FORMAL PROPOSALS HAS BEEN EXTENDED TO FEBRUARY 9, 2009.** [Added November 18, 2008]

Please see the "Addresses" section below for further instructions on the method of submission for the proposal.

ADDRESSES:

Please submit, via federal express, a single PDF file of the entire LAB proposal and FWP on a CD along with two hard copies to the address below. This will assist in expediting the review process.

Please send the CD and 2 hard copies via Federal Express to:

Karen Carlson-Brown
Climate and Environmental Sciences Division, SC-23.1
Office of Biological and Environmental Research
Office of Science
19901 Germantown Road
Germantown, MD 20874-1290
ATTN: Program Announcement LAB 09-06

FOR FURTHER INFORMATION CONTACT:

Dr. Anjuli S. Bamzai
Program Manager
Climate Change Prediction Program
Climate and Environmental Sciences Division

Tel: (301) 903 0294
Email: Anjuli.Bamzai@science.doe.gov

The full text of Program Announcement LAB 09-06 is available via the Internet using the following web site address:

http://www.sc.doe.gov/grants/LAB09_06.html

SUPPLEMENTARY INFORMATION:

In FY 2009 BER will address the following topics in climate change modeling:

- **Incorporation and testing of various cloud and aerosol schemes, convection schemes, and land surface schemes in coupled general circulation models.** The spread in climate change projections has been identified as largely due to the way clouds feedbacks are represented in general circulation models, and it has been noted that atmospheric aerosols are the largest source of uncertainty in radiative forcing. To advance the field, systematic and thorough testing of various cloud and aerosol schemes incorporated in state-of-the-science U.S. climate models is needed.

The focus of this Announcement is on the following research areas: (1) Incorporation of various state-of-the art stratus and convection schemes in community coupled models suitable for climate projections and a rigorous systematic evaluation of climate change simulations. Usage of DOE Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF) and other special measurements to identify/evaluate the appropriateness of various assumptions, global constants, and approximations used in current parameterizations is encouraged; (2) Systematic model-observation intercomparison of candidate aerosol schemes for representing aerosol populations, direct radiative effects, and aerosol indirect effects e.g., cloud nucleation, droplet growth, aerosol scavenging.

For both the above science areas, the use of observations from either the fixed and mobile ACRF and/or Atmospheric Science Program (ASP) field campaigns, that represent critical atmospheric, land and other processes, is particularly encouraged. In order to make these cloud and aerosol formulations viable for use in global coupled climate models, it may be necessary to develop advanced data analysis and software tools for testing the formulations as well as incorporate improved/new time-integration techniques that preserve solution accuracy and overcome the bottleneck to desired throughput of climate simulations.

- **Exploring Decadal Predictability of the Climate System.** Understanding and realizing potential climate change prediction at decadal time scale, using improved initialization of the ocean and/or other components of the coupled climate system that may contribute to the long-term memory in the climate system. Coordinated experiments to study decadal prediction using multiple high-end models and state-of-the art data assimilation, are encouraged.

- **Understanding Cryospheric Processes and their role in the Climate System.** The cryosphere is an integral part of the global climate system with important linkages and feedbacks generated through its influence on surface energy and moisture fluxes, clouds, precipitation, hydrology, and atmospheric and oceanic circulation. This effort will be aimed at improved representation of cryospheric processes in coupled climate models. E.g., Arctic sea ice declined rapidly in the summers of 2007 and 2008, raising concerns that the Arctic may be on the verge of a fundamental transition toward ice-free summers. Models significantly under-represent the observed trend; the reasons for this under-representation remain to be fully resolved.
- **Understanding Climate Extremes in a Changing Climate.** Extreme events have certain important meteorological impacts: large amounts of precipitation may lead to floods; high wind speeds may lead to cyclones; high temperatures may lead to heat waves. Extreme events have attributes such as rate of occurrence, magnitude, temporal duration and timing, spatial scale and multivariate dependencies. The statistics of extreme events are likely to change in the twenty-first century. Proposals that use innovative advanced mathematical techniques to understand and attribute climate extremes over the recent instrumental period as well as in climate change projections, are encouraged.
- **Development of metrics for evaluation of climate models.** There is no single set of universal metrics for climate model evaluation and diagnostics; rather it depends on the scientific question being addressed. For each of the above-mentioned themes (incorporation of improved schemes, decadal prediction, cryospheric processes, climate extremes) there is an associated need of metrics to evaluate the climate simulations. Metrics for ocean model evaluation and diagnostics as well as innovative ways to analyze information in multi-model ensemble simulations are also encouraged.
- **Strengthening the coupling between climate and Earth System Models (ESM) and Integrated Assessment Models (IAM).** Climate change information is being increasingly sought for impact studies and national and international assessments. Proposals that strengthen the connections and understanding of the modeling paradigms between the climate modeling and integrated assessment modeling research communities are encouraged. A specific goal is to improve our understanding of the human-earth system dynamics such as the interactions and feedbacks leading to the timing, scale, and geographic distribution of emissions trajectories and other human influences, corresponding climate effects, and the subsequent impacts of a changing climate on human and natural systems. Projects should seek to strengthen critical areas of mutual interest between climate modeling and complementary research in the DOE Integrated Assessment Research Program. The following topics are encouraged: (1) interdependencies between ESMs and IAMs in modeling future scenarios of land use land cover change; (2) differences/similarities in representations of earth system processes in ESMs and IAMs , e.g. carbon cycle processes, with the goal of improving both class of models for their intended applications. Proposals that have broad applicability or that otherwise seek proof of concept are particularly encouraged. Collaborations between the ESM and IAM research community are highly encouraged.

Program Funding

It is anticipated that up to \$12 million will be available for approximately 3 large multi-institutional awards in Fiscal Year 2009, contingent on the availability of appropriated funds. DOE places a cap of \$6 million on the total annual funding that can be requested in a single proposal. In addition, any proposal requesting more than \$4 million per year needs to include a substantive Management Plan outlining how the work will be coordinated among the various participating labs, the overall chain of command, the communication plan, the leads for each area, the overall allocation of resources among the various partners, etc.'

[Added November 18, 2008]

Approximate funding level of specific areas is indicated below.

- Incorporation and testing of various aerosol schemes, convection schemes, ice sheets, and land surface schemes in the coupled models (~\$2million)
- Exploring Decadal Predictability of the Climate System (~\$3million)
- Understanding Cryospheric Processes and their role in the Climate System (~\$2 million)
- Understanding Climate Extremes in a Changing Climate (~\$2 million)
- Development of metrics for evaluation of climate models (~\$1million)
- Strengthening the coupling between climate and earth system models and Integrated Assessment Models (~\$2 million)

Proposals may request project support up to 5 years, with out-year support contingent on the availability of funds, progress of the research and programmatic needs. Annual budgets for each multi-institutional project proposal is expected to range from \$3 million to \$5 million total costs. Funds for this research will come from the Climate Change Prediction Program. DOE is under no obligation to pay for any costs associated with preparation or submission of proposals. DOE reserves the right to fund, in whole or in part, any, all, or none of the proposals submitted.

Long Term Measure

All proposals submitted in response to this Announcement must explicitly state how the proposed project will support accomplishment of the BER Climate Change Research Program's Long Term Measure which is to "Deliver improved scientific data and models about the potential response of the Earth's climate and terrestrial biosphere to increased greenhouse gas levels for policy makers to determine safe levels of greenhouse gases in the atmosphere."

Eligibility: This is a DOE LAB-Only Announcement. FFRDCs from other agencies are not eligible to submit in response to this Announcement. Partnerships between DOE LABs and with university researchers are encouraged, as appropriate. Proposals with all collaborating parts should be submitted by the lead LAB. No individual submissions through grants.gov should be sent at this stage.

Submission Information

The instructions and format described below must be followed. You must reference Program Announcement LAB 09-06 on all submissions and inquiries about this Program Announcement.

Formal Proposals

The research project description must be **20 pages or less**, exclusive of attachments and must contain an abstract or summary of the proposed research. All collaborators should be listed with the abstract or summary. 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 limited to no more than two pages per individual.

The following is a list of essential items that a proposal must contain:

1. Field Work Proposal (FWP) Format - Complete and signed by appropriate officials.

2. Proposal Cover Page

3. Table of Contents

4. Budget Page(s) (Form DOE F 4620.1) - Complete a separate Budget Page for the entire multi-year period for each separate participating institution. If more than one theme is being addressed in the proposal, a budget breakdown in terms of the themes, is also required.

5. Other Project Information

a. A one-page abstract (on a page by itself). The abstract should include: name of the laboratory; name of the principal investigator and the principal investigator's email address and phone number; name of the co-principal investigator (if any) and the co-principal investigator's email address and phone number; a summary of the project narrative, including the technical qualifications of the principal investigator.

b. Project Narrative: (limit 20 pages)

c. Biographical Sketches: Detailed information about the background and experience of the principal investigator and co-principal investigator (if any). Biographical sketches are limited to two pages for the principal investigator, and two pages for the co-principal investigator (if any).

d. Long Term Measure: BER Climate Change Research Program's Long Term Measure detailed above.

e. Facilities and Resources: Include information on the experience of the proposer's organization, its facilities, and resources that would be relevant to successful operation of the project.

f. Statement of all current and pending support for the principal investigator and co-principal investigator (if any), including the time devoted to each project by the principal investigator and co-principal investigator (if any).

The instructions and format described below should be followed. You must reference Program Announcement LAB 09-06 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

After an initial screening for eligibility and responsiveness to the solicitation, proposals will be subjected to scientific merit review (peer review). The proposals will be evaluated against the following criteria, which are listed in descending order of importance. Included with each criteria are the detailed questions that will be asked of the reviewers.

Scientific and/or Technical Merit of the Proposed Research

Appropriateness of the Proposed Method or Approach

Competency of Applicant's Personnel and Adequacy of Proposed Resources

Reasonableness and Appropriateness of the Proposed Budget

Other Appropriate Factors

The evaluation process will include program policy factors such as the relevance of the proposed research to the terms of the Announcement and the Department's programmatic needs. 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 a proposal constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

2. Summary of Proposal Contents

- Field Work Proposal (FWP) Format (Reference DOE Order 412.1A) (DOE ONLY)
- Proposal Cover Page
- Table of Contents
- Budget (DOE Form 4620.1) and Budget Explanation
- Abstract (one page)
- Narrative (main technical portion of the proposal, including background/introduction, proposed research and methods, timetable of activities, and responsibilities of key project personnel - 20-page limit)

- Literature Cited
- Biographical Sketch(es)
- Description of Facilities and Resources
- Other Support of Investigator(s)
- Appendix (optional)

2.1 Number of Copies to Submit

Please submit, via federal express, a single PDF file of the entire LAB proposal and FWP on a CD along with two hard copies to the address below. This will assist in expediting the review process.

To identify that the FWP is responding to this Program Announcement, when sending your CD please identify the Program Announcement Title and Program Announcement number on the Federal Express package.

Please send the CD and 2 hard copies via Federal Express to:

Karen Carlson-Brown
Climate and Environmental Sciences Division, SC-23.1
Office of Biological and Environmental Research
Office of Science
19901 Germantown Road
Germantown, MD 20874-1290
ATTN: Program Announcement LAB 09-06

3. Detailed Contents of the Proposal

Adherence to type size and line spacing requirements is necessary for several reasons. No researcher should have the advantage, by using small type, of providing more text in their proposals. Small type may also make it difficult for reviewers to read the proposal. Proposals must have 1-inch margins at the top, bottom, and on each side. Type sizes must be at least 11 point. Line spacing is at the discretion of the researcher, but there must be no more than 6 lines per vertical inch of text. Pages should be standard 8 1/2" x 11" (or metric A4, i.e., 210 mm x 297 mm).

3.1 Field Work Proposal Format (Reference DOE Order 412.1A) (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 Budget and Budget Explanation

A detailed budget is required for the entire project period 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.science.doe.gov/grants/budgetform.pdf>

3.5 Abstract

Summarize the proposal in no more than two pages. Give the project objectives (in broad scientific terms), the approach to be used, and what the research is intended to accomplish. State the hypotheses to be tested (if any). At the top of the abstract give the project title, names of all the investigators and their institutions, and contact information for the principal investigator, including e-mail address.

3.6 Narrative (main technical portion of the proposal, including background/introduction, proposed research and methods, timetable of activities, and responsibilities of key project personnel).

The narrative comprises the research plan for the project and is limited to **20 pages (maximum)**. It should contain enough background material in the Introduction, including review of the relevant literature, to demonstrate sufficient knowledge of the state of the science. The major part of the narrative should be devoted to a description and justification of the proposed project, including details of the methods to be used. It should also include a timeline for the major activities of the proposed project, and should indicate which project personnel will be responsible for which activities.

If any portion of the project is to be done in **collaboration** with another institution (or institutions), provide information on the institution(s) and what part(s) of the project it will carry out. 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." Collaborative research projects with institutions that receive grants, such as universities, industry, and non-profit organizations, are allowed under this Announcement. See the section on Collaboration. Further information on collaboration may be accessed at <http://www.science.doe.gov/grants/Colab.html>.

3.7 Literature Cited

Give full bibliographic entries for each publication cited in the narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Principal investigators should be especially careful to follow

scholarly practices in providing citations for source materials relied upon when preparing any section of the proposal.

3.8 Biographical Sketches

This information is required for senior personnel at the institution submitting the proposal and at all subcontracting institutions (if any). The biographical sketch is limited to a maximum of two pages for each investigator and must include:

Education and Training. Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

Research and Professional Experience. Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications. Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically. Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities. List no more than 5 professional and scholarly activities related to the effort proposed.

To assist in the identification of potential conflicts of interest or bias in the selection of reviewers, the following information must also be provided in each biographical sketch.

Collaborators and Co-editors: A list of all persons in alphabetical order (including their current organizational affiliations) who are currently, or who have been, collaborators or co-authors with the investigator on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of the proposal. Also, include those individuals who are currently or have been co-editors of a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of the proposal. If there are no collaborators or co-editors to report, this should be so indicated.

Graduate and Postdoctoral Advisors and Advisees: A list of the names of the individual's own graduate advisor(s) and principal postdoctoral sponsor(s), and their current organizational affiliations. A list of the names of the individual's graduate students and postdoctoral associates during the past five years, and their current organizational affiliations.

3.9 Description of Facilities and Resources

Facilities to be used for the conduct of the proposed research should be briefly described. Indicate the pertinent capabilities of the institution, 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).

3.10 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 (months per year or percentage of the year) devoted to the project.

3.11 Appendix

Information not easily accessible to a reviewer may be included in an appendix, but do not use the appendix to circumvent the page limitations of the proposal. Reviewers are not required to consider information in an appendix, and reviewers may not have time to read extensive appendix materials with the same care they would use with 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 \$50,000 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.