United States Geological Survey

Earthquake Hazards Program

External Research Support

http://earthquake.usgs.gov/research/external

Proposals for Grants – Fiscal Year 2010

Program Announcement 10HQPA0001

Closing Date: TBA

PAPERWORK REDUCTION ACT STATEMENT: The Paperwork Reduction Act says that the agency must tell you why we are collecting this information, how we will use it, and whether you have to give it to us. This information is being collected to determine the eligibility of the applicant and as a basis for approval or disapproval of the proposed work. The purpose of the funding is to support network operations related to the issuance of public earthquake warnings. Your response is required to receive funding. A Federal agency cannot conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Public report burden for this collection is estimated to average 45 hours per application and 9 hours to prepare a final technical report (OMB 1028-0051). Direct comments regarding this collection of information to the Bureau Clearance Officer, U.S. Geological Survey 2150-C Centre Avenue Fort Collins, CO 80525.

APPLICATIONS MUST BE SUBMITTED ELECTRONICALLY VIA

http://www.grants.gov
SEE INSTRUCTIONS

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Highlights

USGS Earthquake Hazards Program External Research Support Announcement for Fiscal Year 2010

Grants.gov Application Requirement & Related Issues

- **All applications shall be submitted electronically using Grants.gov: http://www.grants.gov.** Be sure to read the instructions carefully. **Paper copies will NOT be accepted.**
- **If problems are encountered when submitting to Grants.gov (such as Grants.gov being slow, not showing a confirmation screen, or not sending anticipated receipt and validation) it is imperative that applicants contact Grants.gov by phone or email as soon as the problem is encountered. Although neither the Contracting Officer nor the USGS has any affiliation with Grants.gov, it is also recommended that the Contracting Officer be contacted.**

Research Priorities for Fiscal Year 2010 (see Attachment A)

- Attachment A, Research Priorities has been revised--please read carefully.
- Regional and Topical research areas have been changed. Please choose the correct new category for your proposal.
- NOTE: All proposed work must indicate how the expected results could be applied to reducing losses from earthquakes in the United States. This application of the proposed research should be clearly stated in a separate paragraph of the proposal.

Collaborative Proposals

- Please read the instruction concerning what constitutes a collaborative proposal.
- Each collaborator must submit a complete proposal.

Application Preparation Instructions

- **All detailed budget components must be submitted.**
- **Page limit and type size limits WILL be enforced. These limits must be adhered to or the proposal will be rejected.**
- Lists of previously supported projects are located on the External Research Support web page http://earthquake.usgs.gov/research/external

Foreign Recipients

Please note new requirement on page 10

Award Terms and Conditions

- Final technical reports are required in digital form.
- It is the expectation of the USGS that Principal Investigators will publish the results of funded research in peer-reviewed scientific or technical journals. In addition, all data products and computer codes must be made readily available within the public domain.

Questions?

For Grants.gov issues, see:
http://www.grants.gov/applicants/app_help_reso.jsp
http://www.usgs.gov/contracts/grants/grantsgov.html

For Contracting Officer issues, contact Maggie Eastman, (703) 648-7366, mrussell@usgs.gov

For External Research Support Manager issues, contact Elizabeth Lemersal, (703) 648-6701,
gd-erp-coordinator@usgs.gov

Announcement 10HQPA0001

USGS Earthquake Hazards Program issues this annual Announcement for assistance to support research in earthquake hazards, the physics of earthquakes, earthquake occurrence, and earthquake safety policy. This activity is authorized by the Earthquake Hazards Reduction Act of 1977 (Public Law 95-124, 42 U.S.C. 7701 et. seq.), as amended by Public Laws 101-614, 105-47, 106-503, and 108-360

1. **Application Submission Closing Date: May 13, 2009, 9 pm Eastern Daylight Time**

2. **Electronic Application Requirement**

For the FY 2010 funding cycle all **proposals shall be submitted electronically via Grants.gov** (http://www.grants.gov). Hard/paper submissions will NOT be accepted. Electronic copies submitted via e-mail will NOT be accepted under any circumstances. All proposals must be submitted electronically through Grants.gov on or before:

May 13, 2009, at 9 pm, Eastern Daylight Time

Please be aware that the electronic submission process requires first time users to register using an e-Authentication process. This registration process can be somewhat complex and can take up to 3 weeks to complete. Be advised that it is virtually impossible to begin the process of electronic submission for the first time if you start just a few days before the due date. If you are from a university, contact your Office of Sponsored Programs. They may already have completed the registration process and should work with you to submit the application.

Once at the website, click "Get Registered" under the "For Applications" heading and follow the instructions provided. In order to complete the SF 424 forms, **everyone** must use the Adobe Reader version which is available for download from the grants.gov site at: http://www.grants.gov/help/download_software.jsp#adobe811. To ensure that you have the correct version of Adobe Reader, you can use the versioning test located at: http://www.grants.gov/applicants/AdobeVersioningTestOnly.jsp. Any and all edits made to the application package must be made with the Adobe Reader version specified on Grants.gov. Grants.gov does not guarantee to support other versions of Adobe Reader released prior to version 8.1.1. For more information on Adobe Reader, please see: http://www.grants.gov/applicants/applicant_faqs.jsp#adobe-reader-error. Please note that there is an underscore between "applicant" and "faqs" in the URL. If you have any questions regarding the registration process, please contact the Grants.gov help desk at 1-800-518-4726.

In the Grants.gov forms, floating your mouse over a field will provide instructions for completing that field. You can also click on the Check Package for Errors button to check the entire application for validation errors (incomplete fields, etc.)

For more information on the Grants.gov registration and submission process, please see http://www.usgs.gov/contracts/grants/grantsgov.html

During the application period an applicant may submit a revised or corrected proposal through grants.gov. Include a cover letter as the first page of the proposal stating that the proposal is revised and indicating that the previous submittal is to be withdrawn from consideration. Such submissions must be completed by May 13, 2009 at 9:00 pm Eastern Daylight Time.

See Section 11, Application Preparation Instructions, which describes requirements for the proposal and other application components.

Please allow sufficient time for the proposal to be submitted electronically through Grants.gov and allow time for possible computer delays. Applicants are strongly advised not to wait until the last minute for submission. A proposal received after the closing date and time will not be considered for award. If the USGS determines that a proposal will not be considered for award due to lateness, the applicant will be notified immediately.

3. Funds and Start Dates

Approximately $7 million will be available for support of research grants and cooperative agreements in FY2010. Based on awards in recent years, 70 to 100 new awards are made each fiscal year. It is uncommon for grants to exceed $100,000; the majority of grants are between $15,000 and $75,000. This estimate does not preclude the submission of larger proposals nor does it bind the USGS to a specified number of awards. All projects must propose start dates between December 1, 2009 and September 1, 2010.

4. Application Requirements

A. Proposals must be for a duration of either one or two years.
B. The majority, greater than 50 percent, of research activities must be conducted by the Applicant. The Applicant must retain administrative and technical control of project activities.
C. Proposals for geologic investigations shall be clearly oriented toward earthquake hazard research and assessment. Research Priorities are described in Attachment A.
D. USGS personnel are prohibited from assisting any organization in preparing its proposal for competitive funding under External Research Support.
E. Proposals to fund research in foreign countries will be considered when the research will provide knowledge or new techniques transferable to a U.S. seismogenic zone.
F. Proposals to fund research in foreign countries must be based on cooperation with scientific groups in the host countries, with host country personnel being used for operational functions, and host countries providing financial support for such personnel. Proposals for cooperative efforts with agencies of foreign governments may be subject to additional approvals within the U.S. Government.
G. Applications submitted by foreign organizations must be submitted in English and in U.S. dollars. Awards involving foreign governments may require additional coordination and approval by the U.S. Department of State.

5. Research Priorities

The Research Priorities presented in Attachment A reflect the mission of the USGS Earthquake Hazards Program (EHP) as an element of the four-agency National Earthquake Hazards Reduction Program (NEHRP), a partnership with the Federal Emergency Management Agency (FEMA), the National Institute of Standards and Technology (NIST), and the National Science Foundation (NSF) and authorized by the Earthquake Hazards Reduction Act of 1977 (Public Law 95-124, 42 U.S.C. 7701 et. seq.), as amended by Public Laws 101-614, 105-47, 106-503, and 108-360. Applicants are encouraged to review the high-priority targets listed in Attachment A for each region and topic in additional to the four major program elements described below as each is applicable for research done through external grants.

6. Collaborative Proposals

Two types of collaborative proposals are acceptable: Collaboration between two or more external organizations that are seeking funding from the USGS/EHP External Research Support and collaboration between an external organization seeking such funding and a USGS/EHP internal project. Collaborative proposals are **not** instances where persons from a second organization are hired as consultants or other contractual agreements to conduct work on behalf of the grant or cooperative agreement recipient.

Please note that collaborative research between a USGS internal project and external investigator(s) must be structured such that neither project could succeed without the other being funded. While many external research projects either directly or indirectly support or cooperate with ongoing internal USGS projects, these projects are **not** considered collaborative projects because their research objectives can be pursued with or without the existence of the internal USGS research.

A. For collaborative proposals that propose work by two or more separate institutions or organizations, each individual organization must accept responsibility for specific parts of the work proposed. A separate proposal must be submitted from each external organization involved in collaborative studies. Major sections of each proposal shall be **identical** and each proposal must clearly define the tasks to be performed by each organization, and each institution shall submit a **separate** budget, which clearly reflects their tasks and responsibilities.
B. Each Principal Investigator and his/her institution that is recommended for funding will receive a separate grant or cooperative agreement and shall accept financial responsibility for administering the grant and technical responsibility for submitted required technical reports.
C. Collaborative proposals must be clearly identified in the proposal title. The application title shall read "Proposal Title: Collaborative Research with First Institution name, and Second Institution name."
D. Recipient of collaborative awards must submit one Progress Report (for 2-year awards) and one Final Technical Report, incorporating the efforts of all collaborators.
E. USGS reserves the right to fund only some of the Applicants involved in a collaborative study.
F. In the case of collaborative proposals involving external organizations and USGS scientists, two separate proposals must be prepared. The external proposal must describe the degree of collaboration and **must include a letter of support** from the internal USGS collaborator(s), as the last page(s) of the external proposal (such letters do not count toward the 25-page limit). The USGS project chief will include the part of the proposed work being done by the USGS in his or her internal proposal for the appropriate fiscal year, and will include a description of the nature of the collaborative work being done with the external institution.

7. Two-year Proposals

Most proposals are funded for one year; all work that can be completed in one year should be proposed as a one-year project. However, if the proposed work is such that two years are required to complete the research, then a two-year proposal is appropriate and should be submitted. Applicants should carefully consider their time commitments and request the required grant duration and funding to accomplish the project goals. The peer review panel may recommend funding only the first year of a two-year proposal when the proposed research is easily divided into two, one-year projects or when they feel that results from the first year's proposed work will need to be evaluated before a second year of research can be considered.

The second year of funding of a two-year grant is contingent upon the availability of funds and satisfactory progress by the Recipient. Progress will be determined through technical review of a Progress Report by the External Research Support Manager and his or her agent. The Progress Report shall be submitted by the Recipient, in accordance with grant award Special Terms and Conditions (see Attachment D).

8. Out-of-Cycle Awards

The USGS may accept proposals outside of the normal competitive cycle under very limited circumstances:

A. Research proposals may be accepted and approved out-of-cycle (after the closing date) only in cases where there is compelling circumstance or emergency (*e.g.*, seismic event), which must be acted on before the next competitive review cycle. Proposers should contact the appropriate Regional or Topical Coordinator prior to submitting out-of-cycle proposals.
B. Congress mandates directed awards to support activities that evaluate earthquake hazards and losses. In this case, the USGS will solicit applications.

9. Unsuitable Proposals

The following proposals are ineligible for consideration under this Announcement:

A. Proposals for regional seismic monitoring or establishing Data Centers.
B. Proposals for long-term operation of geodetic networks or instruments.
C. Proposals from U.S. Government agencies or U.S. Government employees.
D. Proposals from Federally Funded Research and Development Centers (FFRDC).
E. Proposals in which there is a real or apparent conflict of interest.
F. Proposals principally involving the direct procurement of a product, equipment, or service.
G. Proposals having subcontracts for 50 percent or greater of total direct costs.

10. External Research Projects Previously Supported by the USGS Earthquake Hazards Program

Lists of currently supported projects may be obtained from the External Research Support web site: http://earthquake.usgs.gov/research/external

11. Application Preparation Instructions

Your electronic submission shall consist of forms SF-424, SF-424a, and SF-424b, plus the items described below. No additional documents or materials may be submitted. Failure to comply with the required application components listed below may result in the proposal being rejected. To view complete forms instructions, please visit the Grants.gov Forms Repository at http://www.grants.gov/agencies/aapproved_standard_forms.jsp#1

Items A through F as described below shall be combined together, in the order noted below, and submitted through Grants.gov in either MS Word or PDF format. **The application shall not exceed 25 single-spaced pages** (including figures, tables, references, appendices, curriculum vitae, etc.), and the **type size shall not be smaller than 11 point**. All pages of the application shall be numbered. All text, figures, and tables shall be sized to fit on 8½" by 11" paper. The SF forms and letters of support do **not** count toward the 25-page limit. The application shall be in color as needed for review by peer review panel members.

In the Grants.gov forms, floating your mouse over a field will provide instructions for completing that field. You can also click on the Check Package for Errors button to check the entire application for validation errors (incomplete fields, etc.)

The application submitted through grants.gov as the Project Narrative Attachment Form (in MS Word or PDF format) shall be **assembled in the following order:**

A. Proposal Information Summary. This summary is mandatory for all proposals and shall follow the same format as shown in Attachment B. The two- or three-letter panel designation shall be indicated in Item 1.
B. Abstract. The abstract shall be no longer than one single-spaced page. It shall include identification of the problem, a summary of the approach, project objectives, anticipated results, and the implications of the project results.
C. Budget Summary. The proposed budget shall be presented in two parts: a one-page summary, which shall be in the format shown in Attachment C. The detailed budget is described item E below.
D. Table of Contents.
E. Detailed Budget. The detailed proposed budget shall be keyed to the Budget Summary. Non-federal funds available to support the project may be reflected in the detailed budget or the SF 424, as appropriate. The detailed budget must include the amount proposed for each of the following items in this order:

1) Salaries and wages. Identify individuals or categories of salaries and wages, estimated hours or percent of time, and the rate of compensation proposed shall be identified for each person or category. Include an explanation of the amounts included for projected increases if the rate of pay shown is higher than the current rate of pay. Identify each person with a task in the project. Principal Investigator time should be limited with majority of salary for students. Tuition remission and other forms of compensation paid as, or in lieu of, wages to students performing necessary work are allowable; provided that the tuition or other payments are reasonable compensation for the work performed and are conditioned explicitly upon the performance of the work.
2) Fringe benefits/labor overhead. Indicate the rates/amounts in conformance with normal accounting procedures. Explain what costs are covered in this category and the basis of the rate computations. Indicate whether rates are used for proposal purposes only or whether they are also fixed or provisional rates for billing purposes.
3) Equipment. Show the cost of all special-purpose equipment necessary for achieving the objectives of the project. "Special-purpose equipment" means scientific equipment having a useful life of more than 1 year and having an acquisition cost of $5,000 or more per item. Each item should be itemized and include a full justification and a dealer or manufacturer quote, if available. General-purpose equipment must be purchased from the applicant's operating funds. Title to non-expendable personal property shall be vested solely with the Recipient. Under **no** circumstances shall property title be vested in a sub-tier recipient.
4) Supplies. Enter the cost for all tangible property. Include the cost of office, laboratory, computing, and field supplies separately. Provide detail on any specific item, which represents a significant portion of the proposed amount. If fabrication of equipment is proposed, list parts and materials required for each and show costs separately from the other items.
5) Services or consultants. Identify the tasks or problems for which such services would be used. List the contemplated sub-recipients by name (including consultants), the estimated amount of time required, and the quoted rate per day or hour. If known, state whether the consultant's rate is the same as she/he has received for similar services or under Government contracts or assistance awards.
6) Radiocarbon or other dating. Include number of samples, cost per sample, and facility likely to perform the analyses.
7) Travel. State the purpose of the trip and itemize the estimated travel costs to show the number of trips required, the destinations, the number of people traveling, the per diem rates, the cost of transportation, and any miscellaneous expenses for each trip. Calculations of other special transportation costs (such as charges for use of applicant-owned vehicles or vehicle rental costs) should also be shown.
8) Publication costs. Show the estimated cost of publishing the results of the research. Include costs of drafting or graphics, reproduction, page or illustration charges
9) Other direct costs. Itemize the different types of costs not included elsewhere; such as, shipping, telemetry, computing, equipment-use charges, age dating, or other services. Provide breakdowns showing how the cost was estimated; for example, computer time should show the type of computer, estimated time of use, and the established rates.
10) Total direct costs. Total items 1 through 9.
11) Indirect cost/general and administrative (G&A) cost. Show the proposed rate, cost base, and proposed amount for allowable indirect costs based on the cost principles applicable to the Applicant's organization. G&A should not be calculated for any tuition remission. If the Applicant has separate rates for recovery of labor overhead and G&A costs, each charge should be shown. Explain the distinction between items included in the two cost pools. The Applicant should propose rates for evaluation purposes, which they are also willing to establish as fixed or ceiling rates in any resulting award. NOTE: A copy of the indirect negotiated cost agreement with the Federal Government will be requested from all applicants recommended for an award. This request will be made at the time of recommendation notification.
12) Amount proposed. Total items 10 and 11.
13) Total project cost. Total Federal and non-Federal amounts, if any.

14) Two-year projects. The Applicant shall provide summary information (see Attachment C) as well as a detailed budget for the second year. The SF 424, however, shall reflect support for the one year only.

F. Proposal: The description of the proposed research shall consist of the following parts:
   1) Significance of the project. Discuss the specific problem addressed and its importance. Include a discussion of the significant contribution the project will make to the USGS/EHP goals. Each proposal **must** include a description of how the expected results could be applied to reducing losses from earthquakes in the U.S.; this description **must** be included in a separate paragraph of the proposal.
   2) Project plan. Discuss the specific hypotheses or research questions, the conceptual framework or model to be used, as well as the data collection and analysis plans, and continuing efforts. Plans should also include procedures to be used to insure objectivity and balance in the project. Include project milestones and related due dates for the proposed work and required reports (See Attachment D, Sections 3 and 4). Time allocations, responsibilities for the project staff members, and level of effort for personnel **must** also be described for the one or two year term of the proposal.
   3) Final report and dissemination. The USGS considers dissemination of research data and results to potential users of those results to be an integral and crucial aspect of projects it funds. Beyond the requirements for a final technical report, describe your plan for dissemination of project data and results and the planned users of those results that will result in the greatest possible benefit to earthquake hazards reduction.
   4) Related efforts. Describe significant, related studies conducted by members of the research team and discuss any planned coordination with other workers in the field. Include descriptions of current and recent USGS/EHP External Research Support grants or cooperative agreements, the relationship of those to this proposal (if any), and relevant results from previous grants or cooperative agreements.
   5) Project personnel and bibliography of directly related work. Provide one-page curriculum vitae for the professional staff, summarizing education, experience, and the last five years' bibliographic information related to the proposed work; a length of one-page is recommended. Curriculum vitae for post-doctoral researchers, who contribute significantly to the project, must also be included.
   6) Institutional qualifications. State the resources available at, and the relevant experience of, the institution. Resources include personnel, computer and library facilities, and ties to both sources of data and potential users of the results.
   7) Current support and pending applications. List all sources of support (in addition to the proposed effort) to which the senior research members have committed a portion of their time for the period covered by the proposal. The information should account for 100 percent of the work time of each investigator and include titles, annual budget levels, period of the awards, and the person-months committed in each case. This section must also list research being considered by, or that will be submitted to, other possible sponsors. This information will not affect the evaluation of the proposal; however, if identical or similar work is also proposed to another institution (e.g., National Science Foundation), an explanation of the relationship of such work to this proposal should be provided.
   8) Continuation projects. List the total amount of funding per year for which support was provided by the USGS, as well as the duration of each increment (including no-cost extensions), and the total number of person-months committed by each Principal Investigator each year.
   9) References.

12. Evaluation of Applications

A. Proposals pertinent to one of the eight research areas will be evaluated by multi-disciplinary peer review panels. The panelists read all the proposals assigned to their panel prior to their meeting and at the panel meeting discuss each proposal according to the evaluation criteria. The four to seven panel members are scientists and engineers drawn from academia, Federal, State, local, and regional agencies, non-profit organizations, and private industry. In addition, one USGS member is often chosen for each panel. The panels will evaluate the technical merit of the proposals especially in the context of development of an integrated program of investigations for that region with attention to the research priorities (see Attachment A). The peer review panel votes on each proposal based on the criteria below; panel rankings are the principal

determination of proposal success pending available funds. The panels include five regional panels (including international proposals) and panel for earthquake effects, earthquake physics, and the National panel focused on Research activities specific to the National Seismic Hazards Maps and to the National Earthquake Information Center (NEIC). Applicants **shall indicate in the Proposal Information Summary** the panel that is most appropriate for their proposal. The USGS will reassign proposals to a more appropriate panel if necessary.

The panels and their designations are as follows:

Designation	**Panel Name**
CEU	Central and Eastern United States
EE	Earthquake Effects Research
EP	Earthquake Physics Research
IMW	Intermountain West
NAT	National
NC	Northern California
PNA	Pacific Northwest and Alaska
SC	Southern California

Applications can be directed to only one panel. If unsure of which panel is most appropriate, contact the External Research Support Manager or applicable Regional or Topical coordinator (see Attachment A).

B. Following the peer panel reviews, the USGS will make funding decisions and will notify applicants of one of three possible decisions: the proposal has been recommended for funding in FY2009, subject to appropriations; the proposal is being declined and will not be funded in FY2009; or the proposal is on hold, and may be funded in FY2009 if sufficient funds become available. The USGS intends to provide these notifications by the end of October 2008. For proposals that are placed on hold, secondary notification regarding funding will be provided in or before February 2009.

C. All proposals are considered in accordance with the criteria set forth below:

1) Relevance and timeliness. This factor considers the relevance and timeliness of the proposed research activities as they relate to the USGS Earthquake Hazards Program goals, including regional emphasis where appropriate (see Attachment A).
2) Technical quality of the proposal. This factor considers the scientific merit of the proposed approach and the probability of achieving positive results within the designated period.
3) Competence and recent research performance of Principal Investigator (PI) and research team. This factor considers experience and competence of the PI and coworkers and the promptness with which the research results were disseminated to the scientific community from previous funding. This factor includes performance records and capability to provide the necessary facilities and support that will ensure satisfactory completion of the proposed work. This factor includes the timely publication of project results and data in peer-reviewed scientific and technical journals, the impact of the results, and whether reporting requirements from previous USGS awards have been satisfied.
4) Appropriateness and reasonableness of the budget. This factor considers whether the proposed budget is commensurate with the level of effort needed to accomplish the project objectives and whether the cost of the project is reasonable relative to the value of the anticipated results.

D. The peer review panels make recommendations and provide advice by ranking proposals into priority groupings based on the scores related to the criteria described above. The results of the peer review will assist the USGS in making final award determinations under this Announcement.

13. Rejection of Applications after Initial Review

If an application does not meet all requirements specified in the Announcement, as determined by the Contracting Officer in consultation with the External Research Support Manager, the institution and principal investigator will be promptly notified that the proposal will not be reviewed indicating the reason for its rejection.

14. Involvement of Federal Employees

Federal employees, including USGS employees, are prohibited from serving in any capacity (paid or unpaid) on any application submitted under this Announcement. Proposals that have a real or apparent conflict of interest related to Federal employees will not be processed for evaluation. This does not prohibit cooperation or collaboration between USGS and non-USGS scientists once a grant or cooperative agreement is in place. Section 6 describes collaborative proposals.

15. Award Terms and Conditions

Award Recipients must comply with grant award Special Terms and Conditions (Attachment D) and Cost Principals, Audit, and Administrative Requirements (Attachment E). Submittal of an application constitutes the applicant's acceptance of the terms and conditions for inclusion in any award resulting from their application. Any concerns with the requirements of the Special Terms and Conditions shall be presented to the Contracting Officer at least three (3) days prior to the closing date of the Announcement.

A. No pre-award costs are authorized.
B. No-Cost Extensions to the Project Period: No-cost extensions are discouraged. The USGS/EHP awards grants and cooperative agreements for research that extends or supplements the ongoing research within the USGS. The timely conduct of funded projects is of great importance to the achievement of the goals of the program. Applicants should consider their time commitments at the time of applying for a grant. Requests for no-cost extensions will be considered on a case-by-case basis. Applicants should supply documentation supporting their request for an extension, as described in Attachment D, Section 5.
C. Supplemental Funds: Increases in funds beyond the amount awarded are also discouraged. The peer review panels recommend funding at a rate commensurate with their judgment of the scientific merit of a proposal and their expert knowledge of the expenses likely to be incurred in the conduct of the research. The USGS is aware that the course of any research cannot always be predicted. However, the bulk of the funds available for grants and cooperative agreements are expended early in the fiscal year and little is retained for expenses beyond emergencies or special opportunities for the program. Requests for increased funding will be considered on a case-by-case basis. Applicants should supply documentation supporting their request for increased funding.
D. Dissemination of Results: When award recipients have completed their studies, a Final Technical Report must be submitted within 90 days; these reports will be posted at http://earthquake.usgs.gov/research/external. It is the expectation of the USGS that Principal Investigators will publish the results of funded research in peer-reviewed scientific or technical journals. In addition, all data products and computer codes must be made readily available within the public domain.

16. Paperwork Reduction Act Statement

This information is being collected to determine the eligibility of the applicant and as a basis for approval or disapproval of the proposed research. The purpose of the program is to support research in earthquake hazards and earthquake prediction to provide earth science data and information essential to mitigate earthquake losses. Response to this request is required to obtain and retain a grant, under the Earthquake Hazards Reduction Act of 1977, Public Law 95-124. Public report burden for this collection is estimated to average 30 hours per grant application and 40 hours to prepare a final technical report (OMB No. 1028-0051) Direct comments regarding the burden estimate or any other aspect of this collection to: Bureau Clearance Officer, USGS, 807 National Center, Reston, VA 20192.

17. Payment to Foreign Recipients

The USGS requires that all financial assistance payments be made using the Department of Health and Human Services (DHHS) Payment Management System (PMS). Paper based claims for reimbursement are no longer acceptable. In order to receive payment, Recipients will be required to establish an account with PMS. With the award of each grant, a sub-account will be set up from which the Recipient can draw down funds. It should be noted that foreign recipients will only be permitted to draw down funds if a U.S. corresponding bank is linked to their account (i.e., the recipient must bank directly with a US bank or their foreign bank must have a corresponding US bank). It is the responsibility of the applicant to verify that, in the event they receive a grant, they can meet this condition of the award. It is strongly recommended that foreign applicants make any necessary banking arrangements prior to submitting their applications. Applicants who are recommended for funding who cannot meet this condition may not receive an award.

Research Priorities: FY2010

The Research Priorities presented here reflect the mission of the USGS Earthquake Hazards Program (EHP) as an element of the four-agency National Earthquake Hazards Reduction Program (NEHRP), a congressionally authorized partnership of the Federal Emergency Management Agency (FEMA), the National Institute of Standards and Technology (NIST), and the National Science Foundation (NSF) and the USGS. Applicants are encouraged to review the high-priority targets listed below for each region and topic in addition to the four major program elements described below as each is applicable for research done through external grants.

Element I. **National and regional earthquake hazards assessments.** The EHP prepares national and regional assessments, digital maps of the expected degree of ground shaking over various exposure times. These studies are the basis of the seismic safety elements of the model building codes upon which most local codes are based. The EHP also prepares long-term forecasts of future earthquake occurrences, and the shaking and ground deformation they may cause. These products are essential for development of cost-effective mitigation measures and practices in structure design, construction, and planning. The USGS is particularly interested in supporting research that contributes to improvements in the national seismic hazards maps and to assessing earthquake hazards and reducing losses in urban areas. Other things being equal, preference will be given to qualified proposals addressing these interests.

Element II. Earthquake information, monitoring, and notification. The EHP supports efforts to improve algorithms and processes to provide information about earthquakes in near real time, including early warning, estimation of fault rupture extent, and refined seismic moment determinations. Please note that all other monitoring and notification activities are evaluated and funded under a separate solicitation for seismic and geodetic network operations.

Element III. **Research on earthquake occurrence, physics, and effects.** With the goal of improving hazard assessments, earthquake forecasts, and earthquake monitoring products, the EHP supports research on earthquake processes and effects. This work is focused on observations, theory, experiments, and developing testable models of earthquake and tectonic processes and of earthquake effects. Because large earthquakes occur infrequently, coordination between disciplines plays a central role in allowing lessons from one area to be applied in other areas and time frames, particularly in the development of a comprehensive understanding of tectonic and earthquake processes and of the effects of earthquakes, *e.g.*, ground shaking (linear and non-linear), ground failure, and structural response.

Element IV. Earthquake safety policy. The EHP produces a significant quantity of data and information on earthquakes and related hazards. Experience has shown that production of data and reports is not enough, and that the Program must take an active role with the "user community" in the application and interpretation of Program results. Additionally, active engagement with our user community provides opportunities for dialogue on modifications to our existing products and new products that make our work and results more relevant and applicable. Opportunities for engaging the user community take place at both the national and regional levels.

These Elements are cast in eight areas: five regional and three topical areas, listed below. The EHP places high priority on investigations in the five geographic areas where large populations are exposed to significant seismic risk: Southern California, Northern California, the Pacific Northwest and Alaska, the Intermountain West, and the Central and Eastern United States.

The eight Research Areas are:

1. Central and Eastern United States (CEU): The United States east of the Rocky Mountains, including Puerto Rico and the U.S. Virgin Islands
2. Earthquake Effects (EE): Basic and applied geographically broad research on the effects of earthquakes
3. Earthquake Physics (EP): Basic and applied geographically broad research on the physics of earthquakes
4. Intermountain West (IMW): Seismically active regions of the Intermountain West

5. National (NAT): Research applicable nationally, especially activities related to the National Seismic Hazards

Maps and to the National Earthquake Information Center (NEIC)

6. Northern California (NC): From Cape Mendocino to the central creeping section of the San Andreas fault and the adjacent Coast Ranges, with particular emphasis on the greater San Francisco Bay Area
7. Pacific Northwest and Alaska (PNA): Washington, Oregon, Idaho, California north of Cape Mendocino (Cascadia), and Alaska
8. Southern California (SC): From the Carrizo Plain south to the international border with Mexico.

Proposals for research on earthquake occurrence and effects applicable to a specific region should be directed to the relevant regional panel. Proposals for research on generic earthquake occurrence and for research related to the experiments at Parkfield, California should be directed to the EP panel. Proposals for short-term geodetic research or for research using the data from long-term studies should be submitted to the appropriate regional or topical panel. Proposals addressing earthquake research that is national in scope or in support of the National Seismic Hazard Maps should be directed to the National (NAT) panel. Proposals for research to improve algorithms and processes to provide information about earthquakes in near real time should be directed to the National (NAT) panel. Proposals for research on foreign earthquakes should be directed to the regional panel for the U.S. seismogenic zone that will most benefit from the study's knowledge or where new techniques would be most transferable. Applicants are encouraged to discuss such proposals with the relevant regional coordinator in advance of submission.

Proposals submitted in response to this Program Announcement must indicate both the program elements and the regional or topical area the proposed research addresses. Regional and topical coordinators are available to assist applicants by describing related work being done internally within the USGS, identifying existing relevant data sets, and helping applicants establish contacts with USGS researchers working in similar areas. Coordinators are listed below.

Descriptions of USGS internal projects can be found at: http://earthquake.usgs.gov/research
It is strongly recommended that the applicant contact the appropriate regional or topical coordinator and other USGS points of contact noted below to ascertain how their proposed work can complement and help support the goals and objectives of these projects and efforts.

Applicants are encouraged to use seismic monitoring data, including structural monitoring data, from the Advanced National Seismic System (ANSS). Specific ANSS coordination needs are included in several of the regional or topical priority areas, below. Proposals for research using ANSS data should explicitly state data needs and uses. For example, within the area of earthquake effects research, the mission of earthquake response monitoring within the ANSS is to provide data and information products that will contribute to earthquake safety through improved understanding and predictive modeling of the earthquake response of engineered civil systems, or to aid in post-earthquake response and recovery.

The EHP strongly encourages proposals for collaborative research making use of the National Science Foundation's (NSF) EarthScope and the George E. Brown Network for Earthquake Engineering Simulation (NEES), as long as these proposals address EHP goals and objectives. This is particularly true for proposals addressing structural engineering topics. Such proposals should address specific Program Elements and the appropriate regional or topical area. Proposals for EarthScope- or NEES-related projects that are not directly related to EHP goals and objectives should be directed to NSF.

Following are priority tasks for the EHP Program Elements for each geographical and topical area. We emphasize that

this listing of Priority Tasks is not intended to discourage submission of proposals to accomplish other important tasks.

1. Priorities in the Central and Eastern U.S. (CEU)
Coordinator: Martitia Tuttle, mptuttle@usgs.gov

- Projects that will directly improve the quality and extend the usefulness of newly completed (Memphis and Evansville, IN) and developing urban seismic hazard maps for the St. Louis, MO-IL, regions are encouraged. Studies involving the USGS, working groups, professional organizations, and regional consortia are especially encouraged that:
  - Develop region–specific relationships for inferring seismic wave velocities from lithologic and other types of data.
  - In St. Louis, improve spatial resolution of shallow geotechnical properties and significant geophysical impedance boundaries, especially the top of Paleozoic rock. Conduct research into understanding the effects on ground motions from these soil properties and impedance boundaries; use of recordings of the 2008 Mt. Carmel earthquake at St. Louis area ANSS stations is especially encouraged.
  - Continue liquefaction susceptibility mapping and probabilistic and deterministic ground motion mapping in the St. Louis metropolitan area.
  - Utilize the results of recently completed urban hazard maps for Memphis and Evansville. These studies may involve, but not be limited to, research assessing social and structural vulnerability, cost-benefit analysis of adopting various levels of seismic provisions within building codes, earthquake scenarios, and loss estimation.
- Efforts supporting development of scenario impacts for the New Madrid Earthquake 1811-1812 Bicentennial are encouraged and may include earthquake time histories, risk analysis, and earthquake ground motion simulations using regional velocity models, such as the one currently under development at the USGS in Golden, CO.
- Geological, paleoseismological, seismological, and geophysical studies aimed at identifying, and assessing the seismic potential of, sources of M 5-6 historic earthquakes near eastern cities.
- Paleoseismological, including paleotsunami, investigations to estimate the timing, locations, ground motion characteristics, and recurrence times of large prehistoric earthquakes in the CEUS.
- Studies to infer source characteristics, characterize regional wave propagation, and estimate site response of damaging CEUS earthquakes using instrumental recordings of large intraplate earthquakes in analog regions and local earthquakes in the CEUS. Use of seismic data from ANSS stations is encouraged.
- Analysis of seismograms from CEUS earthquakes to determine geometrical spreading (especially within 100 km of the source), Q, and stress drop, as well as assessing the effects of radiation pattern and depth of faulting on ground motions.
- Laboratory and field experiments to provide ground motion, geophysical, and geotechnical data to investigate site response, including non-linear behavior of sedimentary basin deposits.
- Development of synoptic, physical models of long-term deformation in intraplate areas including both on- and offshore areas of the CEUS. Proposals may seek to address topics such as the cause of large earthquakes, regional migration of seismicity and earthquake clustering as suggested by paleoseismological results, and interaction of known geological structures within the tectonic stress field. Proposals for such development should include strategies for using existing or collecting new data to constrain and validate models. Coordination with EarthScope research projects is particularly encouraged.
- Systematic evaluation of the temporal and spatial distributions of foreshocks and aftershocks of intraplate earthquakes to improve, for example, declustering of seismic catalogs, estimates of short term earthquake probabilities, and understanding of earthquake processes.

2. Priority Topics for Research on Earthquake Effects (EE)
Coordinator: Art Frankel, afrankel@usgs.gov

- Develop and improve methods for producing broadband (0.1-20 Hz) synthetic seismograms for large earthquakes, including near-source directivity pulses, fault fling, 3D basin effects, nonlinear soil response, scattering, and frequency-dependent radiation pattern. Develop and apply methods of combining dynamic simulations of complex rupture with wave propagation in 3D heterogeneous crustal models. These methods should be developed for

crustal and subduction zone earthquakes. These methods should be validated in the time and frequency (spectral response) domains by comparison with observed strong-motion records.

- As a focus topic for the priority above, improve the estimation of long-period (2-6 sec period) ground motions for large crustal earthquakes and great subduction-zone earthquakes. Develop long-period synthetic seismograms that accurately model the effects of sedimentary basins, rupture incoherence, realistic fault geometry, and propagation through a realistically-complex crustal structure.
- Improve observations relevant to the shaking behavior of near-surface materials in high-risk urban areas. Characterize relevant soil parameters, conduct observational experiments to provide ground motion data, and study non-linear processes relevant to the behavior of thick sediments.
- Improve site characterization for building code and other applications. In particular, develop recommendations for improving soil classification methods and code site amplification factors; revise ground-motion prediction equations for use in engineering design and probabilistic seismic hazard analysis; and develop regional ground motion attenuation models and investigate the causes of regional variations. Develop quick and inexpensive methods to determine the shear-wave velocity profile at a site to a depth of about 200m.
- Improve relationships between ground shaking and damage in buildings and other structures. Assess the effects of basin surface waves, soil nonlinearity, and forward directivity pulses on building response and damage for various types of structures, using observed and/or synthetic seismograms. Develop tools and design guidelines to account for the effects of soil-structure interaction, low-frequency long-duration surface waves, and near-field and impulsive ground motions; develop tools to use data from instrumented structures to predict earthquake response, monitor structural health, and assess level of damage. Develop probabilistic methods to describe building performance in response to strong shaking. We encourage the use of data from ANSS instrumented structures.
- Document the occurrence, research the process, and determine the cause of earthquake-triggered ground failures including landslides and liquefaction, and improve techniques for ground-failure susceptibility and hazard assessment. Develop and apply methods for probabilistic mapping of liquefaction and other types of failure, using the results of probabilistic ground-motion mapping.
- Develop and test computer programs for calculating nonlinear response of soils, by comparing predicted seismograms with recorded data. Develop and test computer programs three-dimensional nonlinear wave propagation in soils. Apply such codes to the propagation of basin surface waves and S-waves in soft-soil deposits (fill and young alluvium).
- Evaluate the variability and upper-bound limit of ground-motion distributions used in probabilistic seismic hazard assessment.
- Investigate the coherence and variability of earthquake ground motions over distances of about 500 meters and less using observations from seismic arrays. Analysis of data from various geologic conditions is encouraged, including sites on hard rock in the eastern U.S., soft-rock in the western U.S., and soil sites. Use this information to develop models of the spatial variation of seismic velocity. Quantify the effects of spatial variations in ground motions on the performance of structures.

3. Priority Topics for Research on Earthquake Physics and Occurrence (EP)
Coordinator: Nicholas Beeler, nbeeler@usgs.gov

As described in the 2003 National Research Council report *Living on an Active Earth: Perspectives on Earthquake Science,* continued progress toward understanding earthquake phenomena and evaluating earthquake hazards will increasingly require integrative, physics-based research involving theoretical studies of processes controlling earthquake phenomena, sophisticated numerical modeling, field observations, and laboratory studies. The EHP will pursue such research on earthquake processes for application to improved hazard assessment and risk-mitigation products throughout the Nation. Of particular interest are studies that make use of data collected by USGS and its partner organizations, including the ANSS, geodetic networks, surface and borehole instruments in the San Andreas fault system in central California, and the USArray, the Plate Boundary Observatory (PBO) and the San Andreas Fault Observatory at Depth (SAFOD) components of the EarthScope facility (see www.earthscope.org). Current funding levels permit a small number of efforts to be supported across the many priority topic areas described below.

- Refine and evaluate existing models, compile observational data to test models, or develop and test new predictive models for earthquake occurrence, failure, time to failure, and clustering, including models for fault segmentation, the characteristic earthquake hypothesis, fault to fault jumps, and recurrence probability density.

- Develop and test methods for evaluating the likelihood that subduction zones produce giant (magnitude 8.5 or greater) interplate thrust earthquakes that have the potential for launching trans-oceanic tsunamis. Emphasis is placed on using physics-based criteria for evaluating such hazard.
- Develop strategies for estimating time-dependent earthquake probabilities and the likelihood of strong shaking, to include the time of the last earthquake on a fault, and reflecting complex phenomena such as non-uniform earthquake slip, fault interactions, transient deformation, cascading ruptures, and changeable or non-existent fault segment boundaries. Investigators are encouraged to contact Ned Field (field@usgs.gov) of the USGS Pasadena office, chair of the Working Group on California Earthquake Probabilities (WGCEP), a group exploring research on these topics.
- Quantify processes controlling fault stress and strain accumulation, transfer, and release. Apply findings to reconcile deformation rates inferred from geodetic, geologic, and seismicity observations.
- Refine and test fault constitutive laws, both at quasi-static and rapid fault slip rates, through laboratory, field, and seismic observations, heat flow studies, and numerical modeling. Use samples, core cutting analyses, downhole measurements and monitoring results from SAFOD and other fault-zone drilling projects, where possible.
- Develop improved data sets on past earthquakes and test frequency-magnitude relationships with respect to empirical models and data. Improve methods for combining instrumental, historical and paleoseismic catalog data, and for assessing the quality, completeness, accuracy and magnitude completeness of earthquake catalogs.
- Assess the predictability of large earthquakes by focusing on the underlying physical processes and continue fault-monitoring experiments in search of possible earthquake precursors. Develop reliable time-dependent, intermediate-term earthquake forecasting techniques; where possible, validate and test such techniques in coordination with the Collaboratory for the Study of Earthquake Predictability (CSEP) http://scecdata.usc.edu/csep.
- Develop and test models of large or small earthquake occurrence at Parkfield using monitoring data, laboratory measurements on fault samples, and crustal property observations from SAFOD, borehole seismic networks, and other geophysical techniques. Proposals for geophysical monitoring in central California should be justified in light of the 2004 M6 Parkfield earthquake.
- Conduct field and laboratory studies to ascertain the mechanisms (e.g., fluid flow or fault rheology) responsible for episodic tremor and slip (ETS) as observed in subduction zones and on the San Andreas fault. Determine whether such phenomena may act as triggers for large earthquakes.
- Develop and test theory and hypothesis relating properties of the earthquake source to potentially damaging earthquake effects.

4. Priorities for the Intermountain West (IMW)
Coordinator: Mark Petersen, mpetersen@usgs.gov

- Convene multi-institutional workshops to organize sub-discipline working groups or to obtain consensus information that validates or reevaluates fault slip-rate and/or recurrence-interval distributions and ground motion characterization for different regions of the Intermountain West for use in future updates of the U.S. National Seismic Hazard Maps (NHSM) and Urban Seismic Hazard Maps.
- Collect shear- and compressional-wave velocity, density, attenuation, geotechnical, and geologic data for inclusion in community velocity models. We encourage use of ANSS data to calibrate the relationship of these velocity models to site response. As we continue to construct the Wasatch urban hazard maps we will give high priority to proposals for utilizing the Wasatch Community Velocity Model as well as developing site-amplification and basin-effects models for use in preparing urban seismic hazards maps. In the Reno/Carson City corridor, we encourage proposals: a) directed towards development of a database of existing geologic/geophysical/geotechnical information in preparation for a Community Velocity Model, and b) targeting shear-wave velocities in the 30-to 500-m depth range.
- Conduct Quaternary geologic, geomorphic, and paleoseismic investigations to characterize the segmentation and to estimate the fault geometry, recurrence, rupture locations, and magnitudes of large prehistoric earthquakes. Uncertainties of these parameters should be defined. Faults should generally have slip rates of at least 0.1 mm/yr near urban areas or 0.2 mm/yr in other areas.

- In Utah, priority will be given to structures that have been identified by the Utah Quaternary Fault Parameters Working Group as priority features that need study to better characterize Utah's seismic hazard (document available at: http://earthquake.usgs.gov/research/external/reports/03hqgr0033.pdf).
- In Nevada, the level of geoscience information regarding seismic hazards is relatively immature. A short-term goal of the External Grants Program is to support efforts that will enhance our knowledge about parameters of active faults and ground motions that directly contribute to hazards assessments. These types of studies are most important in the major urban areas of Nevada, specifically the Carson Range fault system adjacent to the Reno/Carson City corridor and structures in the Las Vegas Valley urban area.
- In other regions of the Intermountain West we seek proposals that will enhance our knowledge about parameters of active faults and ground motions that directly contribute to hazards assessments in other major urban areas.
- Priority research activities have been developed by the states of Nevada (Bureau of Mines and Geology, University of Nevada), Utah (Utah Geological Survey and University of Utah), and for other states in the Intermountain West region (USGS coordination workshop in June 2008). These priorities offer guidance in the preparation and evaluation of the proposals and may be viewed at the following web sites (these may be updated to list more current priorities):
  Priorities for Nevada: http://www.nbmg.unr.edu/eq/priorities.pdf (currently for 2007)
  Priorities for Utah: http://geology.utah.gov/ghp/workgroups/pdf/priorities2010.pdf (to be provided in March 2009)
  Priorities for other Intermountain West states: http://earthquake.usgs.gov/regional/imw/priorities.php (from June 2008 workshop)

5. Priorities for National Research (NAT)

Coordinator: Mark Petersen, mpetersen@usgs.gov

Research activities related to the National Seismic Hazards Maps and to the National Earthquake Information Center (NEIC).

- Develop methods that use geodetic data for estimating slip rates along faults or across regions and recurrence of earthquakes that can be applied to seismic hazard analysis.
- Develop or improve attenuation relations that are needed for the U.S. National Seismic Hazard map and ShakeMaps. Priority will be given to attenuation relations and strong ground motion analyses for the Central and Eastern U.S. and subduction zones.
- Define uncertainties of parameters and equations used in developing the U.S. National Seismic Hazard map. Construct models to integrate seismic, geologic and geodetic measures of deformation in kinematically self-consistent models of crustal deformation from which hazard estimates can be derived. Develop procedures for testing the hazard maps.
- Perform research on earthquake sources or ground motions that can be used for updating the seismic hazard maps for Hawaii or the U.S. territories.
- Develop methods to improve the accuracy of initial estimates of seismic magnitude using data acquired at local and regional distances and available before the standard moment tensor is available. The magnitude range of interest is from 4.5 to 6.5. Regional-specific methods are encouraged, as well as methods that can be applied to multiple regions.
- Develop and implement practical methods for improving global earthquake location accuracy and integrate with routine National Earthquake Information Center (NEIC) operations. In consultation with NEIC personnel, develop creative data processing to improve NEIC¹s global detection and association algorithms, including detection and identification of important secondary phases like pP and sP, and recovery and relative relocation of early aftershock distributions for major earthquakes.
- Develop practical methods for rapid source characterization for major earthquakes, including robust magnitude determination, source finiteness, and slip distribution that can be readily implemented and integrated into NEIC operations. Research on accurate early magnitude/moment/energy determinations is encouraged.
- Develop new products and procedures allowing USGS to deliver rapid and/or more accurate post-earthquake information for emergency response purposes. Desired focus is on global earthquake shaking-induced casualty and losses for events, as well as impacts from secondary effects (including landslide, liquefaction, and likelihood of surface rupture potential).

6. Priorities for Northern California (NC)

Regional Coordinator: Jack Boatwright, boat@usgs.gov

Emphasis in the Northern California hazards program will be on the urbanized and rapidly developing greater San Francisco Bay region, extending from Monterey on the south to Willits on the north, and from the Coast Range-Central Valley boundary on the east to the Pacific coast on the west. Seismic hazard assessments in the rapidly urbanizing San Joaquin-Sacramento delta region and for the Sacramento River Delta levee system is also a priority. The NC region constitutes the greatest population density in Northern California and more than 25% of the nation's annualized risk (FEMA-366, April 2008: HAZUS-MH Estimated Annualized Earthquake Loss for the United States, http://www.fema.gov/library/viewRecord.do?id=3265). In addition, new research that addresses aspects of seismic hazards in northern California that may fall outside of the priorities specified below will be evaluated for funding. Please contact either the Regional Coordinator or the individuals cited below to learn more about the status of internally supported projects.

- Integrate seismic monitoring efforts in northern California. Contact: David Oppenheimer (oppen@usgs.gov). Research priorities: develop methods to access and present historical seismicity and repeating earthquakes in northern California to enable recognition of anomalous or precursory seismic behavior; and deploy seismic instruments to discern 3D propagation effects, refine 3D velocity models using ajoint methods, and map ground motion amplification along critical lifelines.
- Validate and improve community regional 3D geologic and seismic velocity models for northern California, with particular concern for the east Bay and Livermore Valley. Contact: Brad Aagaard (baagaard@usgs.gov) or Bob Jachens jachens@usgs.gov). Research priorities: quantitative assessment of model accuracy with determination of corrections to model parameters; and development of a regional attenuation model.
- Conduct paleoseismic and other geological investigations of the behavior and source characteristics of active faults in northern California. Contact: Carol Prentice (cprentice@usgs.gov). Research priorities: improve earthquake recurrence and slip per event history of active faults in northern California, especially the main plate boundary faults and faults proximal to the San Joaquin-Sacramento delta; develop new Holocene and Neogene geologic slip rates to integrate with geodetic slip rates and improve regional deformation models; and utilize available LiDAR datasets (www.OpenTopography.org) in quantitative and creative ways to improve understanding of active faulting processes.
- Use crustal deformation measurements to constrain regional deformation rate, fault slip rates, role of fault creep, fault mechanics, strain transients, and models of stress evolution for northern California. Contact: Jessica Murray-Moraleda (jrmurray@usgs.gov). Research priorities: refine deformation rates in the San Joaquin-Sacramento delta region, the East Bay region containing the Greenville-Mt. Diablo-Green Valley fault system, the Coast Range-West Great Valley boundary, and the North Bay region; integrate geodetic data with other datasets (geologic, paleoseismic, 3D fault maps); improve measurements and models of vertical deformation in the Bay; and assess the prevalence and frequency of aseismic transient events and their contribution to the regional slip budget.
- Develop and disseminate NEHRP hazard products for Northern California. Contact: Jack Boatwright (boat@usgs.gov). Research priorities: develop and validate methodology to produce probabilistic hazard maps that include source directivity, 3D velocity effects, and soil non-linearity; develop seismic velocity models sufficient for simulations of ground motion within the San Joaquin-Sacramento Delta; and organize collaborative and educational workshops, and improve web-sites as educational tools for disseminating NEHRP hazard products and seismic mitigation information to northern California user-groups.

7. Priorities in the Pacific Northwest and Alaska (PNA)

Priorities in the Pacific Northwest
Coordinators: Craig Weaver, craig@usgs.gov
Thomas Pratt, tpratt@usgs.gov

Evaluating earthquake hazards

- Better understand the frequency and magnitude of great Cascadia earthquakes, and the resulting tsunamis. This topic includes studies to better characterize the locked portions of the plate interface, including the spatial extent, degree of coupling, failure strength, and the temporal stability of the interface.
- Study or model the relationship between ETS and seismic hazards. Observations from Earthscope seismometers, strainmeters, tiltmeters, and GPS stations have documented and characterized the recently discovered phenomena of non-volcanic tremor and aseismic slip (ETS), but its influence on earthquake hazards is unknown.
- Improve our understanding of seismic hazards posed by Benioff-zone earthquakes beneath Washington and Oregon, examine the absence of significant aftershocks and/or the possibility of triggering activity in the overlying crust, and study the effects of the thermal structure and bending stresses of the subducted slabs on seismogenesis.
- Conduct paleoseismic field work to constrain the recurrence of late Holocene earthquakes on faults throughout the Puget Sound region. Studies that seek to examine the possible extension of known fault systems are particularly encouraged. The use of existing lidar data to help guide field studies is encouraged.
- Use geologic, topographic, or geophysical data to identify and characterize major faults that pose a significant earthquake hazard in eastern Washington, particularly in the Columbia basin and along the eastern flanks of the Cascade Range. Determine the relationship, if any, between faults on the east and west sides of the Cascade Range.
- Conduct geological field studies that will help define the regional tectonic framework of the Portland and Tualatin basins, particularly with respect to the presence of the Columbia River basalts. The relation of the Portland Hills to the Portland and Tualatin basins is one topic of interest.

Earthquake effects and monitoring

- Improve models of strong ground motions in western Oregon and Washington, particularly including the effects of long duration codas and long periods expected from plate-boundary earthquakes in Cascadia.
- Characterize site conditions at stations of the Advanced National Seismic System (ANSS), the National Strong Motion Program, and the National Tsunami Hazard Mitigation Program in Oregon and Washington. Coordination with the Pacific Northwest ANSS region must be shown.
- Use geologic, geodetic and seismicity data to develop or test regional models of fault geometries, slip partitioning, fault interactions, the relationship of seismicity to faults, or the probability of aftershocks. Models may also include interactions between subduction-zone, Benioff-zone, and crustal-zone faults to evaluate the potential coupling between these.
- Develop new metrics and tools for conveying seismic hazard to the general public and new targeted user groups, such as emergency responders, public utilities, risk managers, etc. This may involve generation of derivative maps and products from existing ground motion maps developed largely for the engineering community.

Priorities in Alaska
Coordinator: Peter Haeussler, pheuslr@usgs.gov

Evaluating earthquake hazards

- Improve the paleoseismic record of large to great earthquakes and related tsunamis on the Alaska-Aleutian megathrust, including determining whether segment boundaries control large ruptures. Also, improve our understanding of historical earthquakes in this region.
- Conduct geodetic field studies and/or modeling of geodetic data aimed at resolving the amount of aseismic slip occurring as a function of position along the Alaska-Aleutian megathrust and the affect of aseismic slip on the potential for, and/or recurrence time, of large earthquakes and tsunamis.
- Use GPS and seismic data to determine if Episodic Tremor and Slip (ETS), as found in other subduction zone regions, is a recurring phenomenon beneath Alaska.
- Improve the understanding of active faulting and the paleoseismic record of large earthquakes on major crustal faults in Alaska, including the Denali, Totschunda, Fairweather, Queen Charlotte, Castle Mountain, Tintina, and

Kaltag faults, and on subsidiary and related faults such as the Northern Foothills Fold and Thrust Belt. Improve understanding of the relation of recorded earthquakes and zones of high earthquake activity (such as the Fairbanks and Salcha seismic zones) to geologic structure and active faulting.

- Conduct geophysical studies to understand the active faults, earthquake history and seismic potential on and near major crustal faults in Alaska.

Earthquake effects and monitoring

- Conduct studies of earthquakes utilizing data from the Advanced National Seismic System, the National Strong Motion Project, regional networks, and other data sources to improve the characterization of strong ground motion at free-field sites and within buildings and other structures in Alaska, including the phenomena of source effects, attenuation, site effects, soil-structure interaction, and structural response.
- Evaluate the potential for improving seismic monitoring in Alaska through the use of seismic array data, focusing on accuracy in location, depth and magnitude estimates.
- Evaluate and map earthquake-induced ground-failure potential (liquefaction, landslides, etc.) in urban areas and along the principal transportation corridors.

8. Priorities in Southern California (SC)
Coordinator: Ken Hudnut, hudnut@usgs.gov

Improve our estimates of fault characteristics, including:

- Determine the activity of faults in southern California using paleoseismology, geomorphology, geologic mapping, and new dating techniques to develop long chronologies of past earthquakes and fault slip rates. Of particular interest are investigation of the San Andreas and San Jacinto faults, fault zones in the Transverse ranges, and fault zones whose role in regional tectonics is not well understood or that could host earthquakes large enough to contribute to hazard in urban regions. Establish baselines for post-earthquake investigations. Investigate evolution of faults in space and time. We encourage proposals that synthesize field observations with remote sensing data such as Lidar. We also encourage proposals focused on a synoptic understanding of the San Andreas-San Jacinto fault system and its associated hazard.
- Characterize the behavior of fault segments and clarify the roles of seismic and aseismic processes; evaluate seismogenic thickness and/or the percentage of aseismic slip. The Los Angeles, San Bernardino, and Ventura basins are of particular interest.
- Improve our understanding of fault properties and/or earthquake processes by developing models that can be tested with geological or seismological observations.
- Explore, via modeling or other approaches, the prospect for earthquake ruptures that involve multiple distinct faults.

Improved characterization of the earthquake source and wave propagation that will lead to improve predictions of ground shaking from future earthquakes in southern California. Such investigations include:

- Use of seismic data to determine earthquake source parameters and crustal structure and the state of stress in the crust, including further development and testing of 2- and 3-D structural models.
- Compilation of seismic, structural, geotechnical, and geologic data from surface and drill-hole observations necessary to predict regional ground motions and development of models to estimate variations in expected ground motions, accounting for bedrock excitation, local geological structure, topography, and soil-structure interaction.
- Development of credible earthquake scenarios for the Los Angeles and San Bernardino regions.
- Utilization of data from recent large earthquakes in Alaska and foreign countries to improve our understanding of the earthquake source and wave propagation, and other issues relevant to quantification of hazards in southern California.
- Development of methods to calculate time histories of strong ground motion, with close attention to the quantification and propagation of both modeling and parametric uncertainties.

Develop regional models of velocity structures and improve our understanding of fault and earthquake interactions:

- Use crustal deformation measurements to constrain the regional deformation rates, fault slip rates, role of fault creep, fault mechanics, strain transients, and models of stress evolution for southern California.
- Improve statistical quantification of earthquake sequences and regional seismicity.
- Develop regional models of active deformation and fault and earthquake interactions.
- Contribute to the development of regional likelihood models.
- Develop methods for improved analysis and modeling of precise geodetic data such as continuous GPS data, InSAR data, and airborne laser swath mapping data.

Develop tools to translate research products into tools to help emergency managers, planners, and the public prepare for future earthquakes.

- Compile and provide access to geotechnical, structural, and seismic databases that will provide useful information for mitigation and emergency response efforts
- Collaborate with the USGS and university-based seismic and geodetic networks to enhance tools needed for accurate and rapid portrayal of the severity and geographical distribution of strong ground shaking, surface rupture, and ground deformation. Develop software and pilot studies for early warning systems.

Attachment B

Proposal Information Summary

Use the format below for the required Proposal Information Summary

1.	Panel Designation:	Use two or three letter code as listed in Section 12 and in Attachment A
2.	Project Title:	If a collaborative proposal, the title of the proposal must appear as follows: **"Title of Proposal: Collaborative Research with First Institution Name, and Second Institution Name"**.
3.	Principal Investigator(s):	(Name) (Institute/Organization Name) (Street Address/P.O. Box) (City, State, Zip Code) (Telephone Number), (FAX Number), (E-mail Address)
4.	Authorized Institutional Representative:	(Name) (Institute/Organization Name) (Organizational Unit) (Street Address/P.O. Box) (City, State, Zip Code) (Telephone Number), (FAX Number), (E-mail Address*)
5.	Program Element Designation	Enter one of the 4 Program Elements listed in Attachment A
6.	Amount Requested:	(List amount requested for Fiscal Year 2010 support) (Two year projects: list requests for FY 2010 and 2011 separately)
7.	Proposed Start Date:	(The date you would like to start work; between December 1, 2009 and September 1, 2010)
8.	Proposed Duration:	(12 or 24 months, No awards are issued for less than 12 months)
9.	New Proposal Related to current award:	(If submitting a proposal for a project related to a current or recent USGS award, indicate the appropriate USGS award number and title)
10.	Has this proposal been submitted to any other agency for funding, if so, which?	(Note name(s) of agency, and program or division to which this proposal was submitted)

* Please provide an email address for an individual (not for an office)

BUDGET SUMMARY [1]

Project Title:_____

Principal Investigator(s): _____

Proposed Start Date: _____

Proposed Completion Date: _____

COST CATEGORY	Federal First Year	Federal Second Year[2]	TOTAL Both years[2]
1. Salaries and Wages	$	$	$
Total Salaries and Wages	**$**	**$**	**$**
2. Fringe Benefits/Labor Overhead	$	$	$
3. Equipment	$	$	$
4. Supplies	$	$	$
5. Services or Consultants	$	$	$
6. Radiocarbon or other Dating	$	$	$
7. Travel	$	$	$
8. Publication Costs	$	$	$
9. Other Direct Costs	$	$	$
10. **Total Direct Costs (items 1-9)**	**$**	**$**	**$**
11. Indirect cost/General and Administrative (G&A) cost	$	$	$
12. Amount Proposed (items 10&11)	$	$	$
13. Total Project Cost (Total of Federal and non-Federal amounts)	$	$	$

[1] **Use this format** for the required Budget Summary. The detailed budget **must** be keyed directly to the Budget Summary page.

[2] These Columns only for two-year projects

Special Terms and Conditions

1. Method of Payment

The U.S. Geological Survey (USGS) is using the Department of Health and Human Services (DHHS) Payment Management System (PMS) to provide electronic invoicing and payment for assistance award recipients. The Recipient has established or will establish an account with PMS. With the award of each grant/cooperative agreement, a sub-account will be set up from which the Recipient can draw down funds. The sub-account number will be shown in block 4 of the face page of each award or modification.

Payments will be made available through the PMS. The PMS is administered by the DHHS, Division of Payment Management of the Financial Management Service, Program Support Center. The DHHS will forward instructions for obtaining payments to the recipients. Inquiries regarding payment should be directed to:

Division of Payment Management
Department of Health and Human Services
P.O. Box 6021
Rockville, MD 20852

The Division of Payment Management web address is www.dpm.psc.gov. Problems or questions with electronic drawdown procedures should be directed to Raynette Robinson at (301) 443-9180 or the help desk at (877) 614-5533 or email to PMSSupport@psc.gov.

Payments may be drawn in advance only as needed to meet immediate cash disbursement needs.

2. Definitions

A. Grant Agreement

A grant agreement is the legal instrument reflecting a relationship between the Federal Government and a State or local government or other recipient whenever:

(1) the principal purpose of the relationship is the transfer of money, property, services, or anything of value to the State or local government or other recipient in order to accomplish a public purpose of support or stimulation authorized by Federal statute, rather than acquisition, by purchase, lease, or barter, of property or services for the direct benefit or use of the Federal Government; and

(2) no substantial involvement is anticipated between the executive agency, acting for the Federal Government, and the State or local government or other recipient during performance of the contemplated activity.

B. Cooperative Agreement

A cooperative agreement is the legal instrument reflecting a relationship between the Federal Government and a State or local government or other recipient whenever:

(1) the principal purpose of the relationship is the transfer of money, property, services, or anything of value to the State or local government or other recipient to accomplish a public purpose of support, or stimulation authorized by Federal statute, rather than acquisition, by purchase, lease, or barter, of

property or services for the direct benefit or use of the Federal Government; and

(2) substantial involvement is anticipated between the executive agency, acting for the Federal Government, and State or local government or other recipient during performance of the activity.

C. Grantee / Cooperator

Grantee or cooperator means the nonprofit corporation or other legal entity to which a grant or cooperative agreement is awarded and which is accountable to the Federal Government for the use of the funds provided. The grantee or cooperator is the entire legal entity even if only a particular component of the entity is designated in the award document. For example, a grant or cooperative agreement award document may name as the grantee one school or campus of a university. In this case, the granting agency usually intends, or actually requires, that the named component assume primary or sole responsibility for administering the grant-assisted project or program. Nevertheless, the naming of a component of a legal entity as the grantee or cooperator in a grant or cooperative agreement award document shall not be construed as relieving the whole legal entity from accountability to the Federal Government for the use of the funds provided.

The term “grantee” or “cooperator” does not include secondary recipients such as sub grantees, contractors, etc., who may receive funds from a grantee pursuant to a grant.

D. Recipient

Recipient means grantee or cooperator.

E. Principal Investigator

The Principal Investigator is the individual designated by the Recipient (and approved by the USGS) who is responsible for the technical direction of the research project. The Principal Investigator cannot be changed or become substantially less involved than was indicated in the Recipient's proposal, without the prior written approval of the Contracting Officer.

F. Grants Program Manager

(1) The Grants Program Manager will work closely with the Principal Investigator to ensure that all technical requirements are being met. The Grants Program Manager's responsibilities include, but are not limited to, providing technical advice on the accomplishment of the proposal's objectives; reviewing the technical content of reports and the other information delivered to the USGS; determining the adequacy of technical reports; and conducting site visits, in coordination with the Regional Coordinator and the Contracting Officer, as frequently as practicable.

(2) The Grants Program Manager is Elizabeth Lemersal, External Research Support Manager, U.S. Geological Survey, 905 National Center, 12201 Sunrise Valley Drive, Reston, VA 20192. The Grants Program Manager does not have the authority to issue any technical direction which constitutes an assignment of additional work outside the scope of the award; in any manner causes a change in the total cost or the time required for performance of the award; or change any of the terms, conditions, or general provisions of the award.

G. Regional Coordinator

(1) Regional Coordinators are in charge of conducting the peer review panels to evaluate both internal

USGS and external research proposals in their region or area of expertise. A Regional Coordinator will work closely with the Grants Program Manager and the Principal Investigator to ensure coordination with other appropriate Principal Investigators and appropriate USGS project scientists working in the same region for overall conformance with USGS program goals and objectives within that region. The Regional Coordinator's responsibilities include, but are not limited to, providing technical advice on the accomplishment of the proposal's objectives; reviewing the technical content of reports and other information delivered to the USGS; determining the adequacy of the technical reports; and conducting site visits, in coordination with the Grants Program Manager and contract personnel, as frequently as practicable.

(2) The Regional Coordinator does not have the authority to issue any technical direction which constitutes an assignment of additional work outside the scope of the award; in any manner causes a change in the total cost or the time required for performance of the award; or changes any of the terms, conditions, or general provisions of the award.

H. Contracting Officer (CO)

Contracting officers are individuals who have been delegated in writing by the USGS Office of Acquisition and Grants as the sole authority designated to obligate Federal funds and create terms and conditions of awards. They are the only individuals who have authority to negotiate, enter into, and administer awards resulting for this program. Contracting officers have responsibility to ensure the effective use of Federal funds.

Functions of the contracting officer include but are not limited to:

(1) Issuing the grant program announcement in coordination with the grants program manager.

(2) Receiving grant proposals and related documents in response to a grant program announcement. The contracting officer as receiving official shall mark all proposals with a control number and the date officially received. He shall notify each applicant of the receipt of its proposal.

(3) Approving the grant program manager’s Technical Evaluation Plan, which describes in detail the evaluation process for a competitive grant/cooperative agreement program. The contracting officer shall ensure the openness and fairness of the evaluation and selection process.

(4) Serving in an advisory capacity at peer review panel meetings. He shall interpret grant management policies to panel members.

(5) Notifying grant program applicants whether or not they were selected for funding or of any other disposition of their application.

(6) Negotiating, as necessary, the final grant/cooperative agreement budget.

(7) Issuing grant/cooperative agreement awards and revisions to awards.

(8) Approving invoice payments.

(9) Receiving all requests for changes to an award. The contracting officer shall serve as the mandatory control point for all official communications with the grantee which may result in changing the amount of the grant/cooperative agreement, the grant/cooperative agreement budget,

or any other terms and conditions of the grant.

(10) Receiving financial reports required by the terms and conditions of the award.

(11) Closing out grant/cooperative agreement awards when all applicable award requirements have been complied with.

3. <u>Dissemination of Results and Reporting Requirements</u>

The Principal Investigator is strongly encouraged to disseminate research results promptly to the scientific community and appropriate professional organizations; local, state, regional and federal agencies; and the general public. It is the expectation of the USGS that Principal Investigators will publish the results of funded research in peer-reviewed scientific or technical journals. In addition, all data products and computer codes must be made readily available within the public domain. The Government may publish, reproduce, and use all technical data developed as a result of this award in any manner and for any purpose, without limitation, and may authorize others to do the same.

Data generated as a part of work funded under this program must be made readily available; there is no provision for PIs to have exclusive access to data for a proprietary period of time. The USGS reserves a royalty-free, nonexclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use, the data for Government purposes. Any project funded under Earthquake Hazards Program External Research Support shall fall under this clause. Should any questions arise, both the USGS Contracting Officer and the Recipient will determine which data fall in this category.

A. **<u>Required reports/documents</u>**. The Principal Investigator or Director, Sponsored Research Office is required to submit the following reports or documents:

Report/ Document	**No. of Copies and Method of Transmittal**	**Submit To**	**When Due**
(1) Publication*	Adobe Acrobat PDF file as an email attachment (or 1 reprint if PDF not possible)	Grants Program Manager	Immediately following publication. **See Section B(1).**
(2) Final Technical Report **	Send Adobe Acrobat PDF file as an email attachment; Maximum size: 10 MB	Grants Program Manager	Within 90 calendar days after the end of the award project period **See details of formatting in section B(2) below.**
(3) SF 272 Federal Cash Transactions Report	Electronic submission	USGS via PMS Electronic 272 System [see Section 3.B(3)]	See Section 3.B(3)
(4) SF 269 Financial Status Report	See Section 3.B(4)	See Section 3.B(4)	See Section 3.B(4)
(5) Final SF	See Section 3.B(5)	See Section	See Section 3.B(5)

269 Financial Status Report		3.B(5)	

* Publication means any book, report, photograph, map, chart, or recording published or disseminated to the scientific community. Preprints of articles submitted for publications will be accepted as final reports.

** One Final Technical Report is to be submitted for each set of collaborative research grants with all PIs, Institutions, and grant numbers cited.

B. **Report preparation instructions**. The Recipient shall prepare the reports/documents in accordance with the following instructions:

(1) **Publications**. All publications that contain work performed during the project period shall include the following statement:

"Research supported by the U.S. Geological Survey (USGS), Department of the Interior, under USGS award number (*Recipient, insert award number*). The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government."

Submit an Adobe Acrobat PDF file of publications to:

gd-erp-coordinator@usgs.gov

If PDF is not possible, send one (1) reprint to:

External Research Support
U.S. Geological Survey
905 National Center
12201 Sunrise Valley Drive
Reston, VA 20192

(2) **Final Technical Report.** Final Technical Reports shall describe in detail the work performed and results obtained during the grant period. Final Technical Reports are due 90 days after the conclusion of the project period. Any information contained in a previously submitted progress report shall be repeated or restated in the Final Technical Report. Please note that one Final Technical Report is to be submitted for each set of collaborative research grants.

(a) Submit the Final Technical Report as an Adobe Acrobat PDF file with all figures, photographs, maps, and illustrations embedded, and all pages numbered. Submit the report as an e-mail attachment in PDF format to:

gd-erp-coordinator@usgs.gov

Maximum size; 10 MB

(b) Final Technical reports shall consist of the following sections:

(1) **Cover page** with the following information:
Award Number
Title. For collaborative projects the title should be in the form "Title: Collaborative Research with First Institution name, and Second Institution name."

Author(s) and Affiliation(s) with Address and zip code
Author's Telephone numbers, fax numbers and E-mail address
Term covered by the award (start and end dates)

(2) **Abstract**

(3) **Main body of the report**. The main body of the report and all illustrations and figures shall be single-spaced on 8 ½" x 11" paper.

(4) **Bibliography** of all publications resulting from the work performed under the award. One copy of each publication is required if the Recipient has not previously submitted them to the Grants Program Manager.

(3) **SF 272, Federal Cast Transactions Report** is required quarterly for each PMS sub-account. Quarterly reports are due 45 working days after the end of each fiscal quarter until Financial Status Report is submitted. Instructions for submitting the SF272 can be found at the following website:

http://www.dpm.psc.gov/grant_recipient/psc_272_reports/psc_272_reports.aspx?explorer.event=true

If after 45 days, recipient has not submitted a report, the account will be placed in a manual review status. Funds may be withheld for accounts with delinquent reports.

(4) **SF 269, Financial Status Report (original)** is required annually and is due 90 calendar days after the end of the annual budget period. Reports will be submitted to the Contracting Officer at the address shown in Block 5 of the award form.

(5) **Final SF 269, Financial Status Report**.

(a) The recipient will liquidate all obligations incurred under the award and submit a final SF 269 Financial Status Report due no later than 90 calendar days after the grant completion date. Recipient will promptly return any unexpended federal cash advances or will complete a final draw from PMS to obtain any remaining amounts due. Once 120 days has passed since the grant completion date, the PMS subaccount for this award may be closed by USGS at any time.

(b) Subsequent revision to the final SF269, Financial Report, will be considered only as follows:

(1) When the revision results in a balance due to the Government, the recipient must submit a revised SF 269 and refund the excess payment whenever the overcharge is discovered, no matter how long the lapse of time since the original due date of the report.

(2) When the revision represents additional reimbursement costs claimed by the recipient, a revised SF 269 may be submitted to the Contracting Officer with an explanation. If approved, the USGS will either request and pay a final invoice or re-establish the PMS subaccount to permit the recipient to make a revised final draw. Any revised final report representing additional reimbursable amounts must be submitted no later than 1 year from the due date of the original report, i.e., 15 months following the agreement completion date. USGS will not accept any revised SF 269 report covering additional expenditures after that date and will return any late request for additional payment to the recipient.

C. **Adherence to reporting requirements**. **A Recipient's failure to submit the required Final Technical Report and final financial report, generally within 6 months of the end date of the award, will likely**

result in delay or non-issuance of new awards. Failure to submit a Progress Report for multi-year awards will likely result in delayed renewal of funds.

4. Continuation Proposal for Second-Year Funding

Required Continuation proposal documents. The Recipient, approved for two-year funding, shall submit the following documents for continued funding in year 2:

Document	No. of Copies	Submit To	Due Date
Progress Report	Send Adobe Acrobat PDF file as an email attachment	Grants Program Manager	At least 60 calendar days prior to the end of the budget period.

Progress Report. Recipients of two-year awards shall submit a report that summarizes the progress of the project during the first funding period. Collaborative awardees should submit one report for all collaborators. Work that was proposed for the first year should have been completed in that year. **Please note** that Progress Report will not be published on the USGS website, so all research data described in a Progress Report must be repeated or restated in the Final Technical Report. Submit a Word or PDF file (maximum size: 10 MB) with embedded graphics as an E-mail attachment to:

gd-erp-coordinator@usgs.gov.

The subject of your email should be "**Progress Report - *insert your grant / project number here"***.

Format the Progress Report as follows:

- Single spaced and formatted for 8 ½ x 11" paper
- Number all pages
- Embed figures in the Word or PDF file
- Figure captions directly under figures
- 2 to 5 pages**.**

At the top of the first page the heading should be centered and include:

- Title of the project, as stated on the original proposal
- External Grant award number (see your award documents)
- Investigator(s) name(s)
- Institution
- Address
- Telephone number, FAX number, E-mail address, and website
- Term covered by the report.

The body of the report should consist of the following:

- Investigations undertaken
- Accomplishments to date
- Problems encountered
- Reports published
- Funding expended for the term covered by the report.

5. Adherence to Original Research Objective and Budget Estimate

A. Any commitments or expenditures incurred by the Recipient in excess of the funds provided by this award shall be the responsibility of the Recipient. Expenditures incurred prior to the effective date of this award cannot be charged against award funds.

B. The following requests for change **require advance written approval by the Contracting Officer shown on your award. Your request must be submitted to the Contracting Officer <u>at least 45 calendar days</u> prior to the requested effective date of the change:**

(1) Changes in the scope, objective, or key personnel referenced in the Recipient's proposal.

(2) Request for supplemental funds.

(3) Transfer of funds between direct cost categories when the cumulative amount of transfers during the project period exceeds 10 percent of the total award.

(4) Foreign travel not approved at time of award.

(5) Acquisition of nonexpendable personal property (equipment) not approved at time of award.

(6) Creation of any direct cost line item not approved at time of award.

(7) Any other significant change to the award.

(8) <u>No-cost Extensions to the Project Period</u>. **No cost extensions are discouraged**. The Earthquake Hazards Program (EHP) awards grants and cooperative agreements for research that extends or supplements ongoing research within the USGS. The timely conduct of funded projects is of great importance to the achievement of EHP goals. Applicants should consider their time commitments at the time of application for a grant. Requests for no cost extensions will be considered on a case-by-case basis. The USGS reserves the right to limit the length of time and number of no-cost extensions. Please note that no-cost extensions are not intended to be used merely for the purpose of expending unobligated balances. Applicants must supply documentation supporting their request for an extension.

The Recipient **shall include** in the request:

- the cause of the needed extension,
- a description of the remaining work to be completed,
- the proposed new end date, and
- the amount of funds remaining.

A request for an extension that is received by the Contracting Officer after the expration date shall **not** be honored. Requests for no-cost extensions shall be submitted to the Contracting Officer **at least 45 days** before the grant end date.

C. The Contracting Officer will notify the Recipient in writing within 30 calendar days after receipt of the request for revision or adjustment whether the request has been approved.

6. <u>Nonexpendable Personal Property</u>

The recipient shall comply with 2 CFR Part 215, Section 215.34. Title to nonexpendable personal property

acquired wholly or in part with Federal funds shall be vested in the Recipient unless otherwise specified in the award document. The Recipient shall retain control and maintain a property inventory of such property as long as there is a need for such property to accomplish the purpose of the project, whether or not the project continues to be supported by Federal funds. When there is no longer a need for such property to accomplish the purpose of the project, the Recipient shall use the property in connection with other Federal awards the Recipient has received. Under no circumstances shall title to such property be vested in a sub-tier recipient. Disposal of nonexpendable personal property shall be in accordance with the applicable OMB circular.

The following equipment shall be vested: N/A

7. Record Retention Period

Unless a longer period is requested by the award, a Recipient shall retain all records for 3 years after the end of the project period for which it uses USGS award funds.

8. Pre-agreement Costs

Pre-agreement costs are not authorized under this program. Costs must be obligated during the project period.

9. Site Visits

Site visits may be made by USGS representatives to review program accomplishments and management control systems and to provide technical assistance, as required.

10. Metric Conversion (43CFR Sec 12.915)

All progress and final reports, other reports, or publications produced under this award shall employ the metric system of measurements to the maximum extent practicable. Both metric and inch-pound unit (dual units) may be used if necessary during any transition period(s). However, the recipient may use non-metric measurements to the extent the recipient has supporting documentation that the use of metric measurements is impracticable or is likely to cause significant inefficiencies or loss of markets to the recipient, such as when foreign competitors are producing competing products in non-metric units.

11. Violation of Award Terms

If a Recipient materially fails to comply with the terms of the award, the Contracting Officer may suspend, terminate, or take such other remedies as may be legally available and appropriate in the circumstances.

12. Award Closeout

Awards will be closed out once all requirements have been met. Technical and financial reports must be submitted on time as specified in section 3, above. Failure to adhere to the reporting requirements may result in no future awards.

13. Partnership with Grantees/Cooperators

The USGS, through its federal grant/cooperative agreement awards, will collaborate with universities, federal state, local and tribal governments, and private organizations and businesses to provide relevant, timely, objective knowledge and information on natural resources, hazards, and the environment.

14. Buy American Act Notice (43 CFR Sec. 12.710(c))

Pursuant to Section 307(b) of the Department of the Interior (DOI) and Related Agencies Appropriations Act, FY 2000, Public Law 106-113, please be advised on the following:

In the case of any equipment or product that may be authorized to be purchased with financial assistance provided using funds made available in this Act, it is the sense of the Congress that entities receiving the assistance should, in expending the assistance, purchase only American-made equipment and products.

15. Anti-Lobbying (43 CFR Part 18)

The Recipient shall not use any part of the appropriated funds from the Department of the Interior for any activity or the publication or distribution of literature that in any way tends to promote public support or opposition to any legislative proposal on which Congressional action is not complete.

16. Seat Belt Provision (43 CFR Sec. 12.2(e))

Recipients of grants/cooperative agreements and/or sub-awards are encouraged to adopt and enforce on-the-job seat belt use policies and programs for their employees when operating company-owned, rented, or personally owned vehicles. These measures include, but are not limited to, conducing education, awareness, and other appropriated programs for their employees about the importance of wearing seat belts and the consequences of not wearing them.

17. No Endorsement Provision (43 CFR 12.2(d))

[Paragraph (B) applies to all awards. The remainder of this provision applies only when:

(1) the principal purpose of the agreement is a partnership where the recipient/partner contributes resources to promote agency programs or publicize agency activities, assists in fundraising, or provides assistance to the agency; and

(2) the agreement authorizes joint dissemination of information and promotion of activities being supported; and

(3) the recipient is not a State government, a local government, or a Federally-recognized Indian tribal government.]

(A) Recipient shall not publicize or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts or other publications) which states or implies governmental, Departmental, bureau, or government employee endorsement of a product, service, or position which the recipient represents. No release of information relating to this award may state or imply that the Government approves of the recipient's work products, or considers the recipient's work product to be superior to other products or services.

(B) All information submitted for publication or other public releases of information regarding this project shall carry the following disclaimer:

The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.

(C) Recipient must obtain prior Government approval for any public information releases concerning this award which refer to the Department of the Interior or any bureau or employee (by name or title). The

specific text, layout photographs, etc. of the proposed release must be submitted with the request for approval.

(D) A recipient further agrees to include this provision in a subaward to any subrecipient, except for a subaward to a State government, a local government, or to a Federally-recognized Indian tribal government.

18. Use of U.S. Flag Air Carriers

Any air transportation to, from, between or within a country other than the U.S. of persons or property, the expense of which will be paid in whole or in part by U.S Government funding, must be performed by, or under a code-sharing arrangement with, a U.S. flag air carrier if service provided by such a carrier is "available" (49 U.S.C. 40118, commonly referred to as the Fly America Act). Tickets (or documentation for electronic tickets) must identify the U.S. flag air carrier's designator code and flight number. See the Federal Travel Regulation §301-10.131 - §301-10.143 for definitions, exceptions, and documentation requirements. (See also Comp. Gen. Decision B-240956, dated September 25, 1991.)

19. Activities on Private and Other Non-Federal Lands

[Paragraph B applies to all awards. The remainder of this provision applies only when the award involves funds appropriated to the biological research activity of the USGS.]

A. Funds provided for the biological research activity in USGS annual appropriations may not be used to conduct surveys on private property, unless specifically authorized in writing by the property owner.

(i) Accordingly, the recipient shall not enter non-Federal real property for the purpose of collecting information regarding the property, unless the owner of the property has –

- consented in writing to the entry;
- been provided notice of that entry; and
- been notified that any raw data collected from the property must be made available at no costs, if requested by the land owner.

(ii) In this provision, the term "recipient" includes any person that is an officer, employee, or agent of the recipient, including a person acting pursuant to a contract or sub-agreement.

B. The recipient shall comply with applicable State, local, and Tribal government laws, including laws relating to private property rights.

The Recipient shall comply with applicable State, local, and Tribal government laws, including laws relating to private property rights.

20. Access to Research Data

A. By regulation (43 CFR 12.936), recipients that are institutions of higher education, hospitals, or non-profit organizations are required to release research data first produced in a project supported with Federal funds that are cited publicly and officially by a Federal agency in support of an action that has the force and effect of law (e.g., regulations and administrative orders). "Research data" is defined as the recorded factual material commonly accepted in the scientific community as necessary to validate research

findings. It does not include preliminary analyses; drafts of scientific papers; plans for future research; peer reviews; communications with colleagues; physical objects (e.g., laboratory samples, audio or video tapes); trade secrets; commercial information; materials necessary to be held confidential by a researcher until publication in a peer-reviewed journal; information that is protected under the law (e.g., intellectual property); personnel and medical files and similar files, the disclosure of which would constitute an unwarranted invasion of personal privacy; or information that could be used to identify a particular person in a research study.

B. These requirements do not apply to commercial organizations or to research data produced by State or local governments. However, if a State or local governmental grantee contracts with an educational institution, hospital, or non-profit organization, and the contract results in covered research data, those data are subject to these disclosure requirements.

C. Requests for the release of research data subject to this policy are required to be made to USGS, which will handle them as FOIA requests under 43 CFR 2.25. If the data are publicly available, the requestor will be directed to the public source. Otherwise, the USGS Contracting Officer/Grants Officer, in consultation with the affected recipient and the PI, will handle the request. This policy also provides for assessment of a reasonable fee to cover recipient costs as well as (separately) the USGS costs of responding.

20. Trafficking in Persons (22 U.S.C. § 7104(g))

A. Provisions applicable to a recipient that is a private entity.

(i) You as the recipient, your employees, subrecipients under this award, and subrecipients' employees may not--

(a) Engage in severe forms of trafficking in persons during the period of time that the award is in effect;
(b) Procure a commercial sex act during the period of time that the award is in effect; or
(c) Use forced labor in the performance of the award or subawards under the award.

(ii) We as the Federal awarding agency may unilaterally terminate this award, without penalty, if you or a subrecipient that is a private entity --

(a) Is determined to have violated a prohibition in paragraph a.1 of this award term; or
(b) Has an employee who is determined by the agency official authorized to terminate the award to have violated a prohibition in paragraph a.1 of this award term through conduct that is either—
1. Associated with performance under this award; or
2. Imputed to you or the subrecipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 CFR part 180, "OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," as implemented by our agency at 43 CFR Part 42.

B. Provisions applicable to a recipient other than a private entitye. We as the Federal awarding agency may unilaterally terminate this award, without penalty, if a

subrecipient that is a private entity --

(i) Is determined to have violated a prohibition in paragraph a.1 of this award term; or

(ii) Has an employee who is determined by the agency official authorized to terminate the award to have violated a prohibition in paragraph a.1 of this award term through conduct that is either—

(a) Associated with performance under this award; or
(b) Imputed to you or the subrecipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 CFR part 180, "OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," as implemented by our agency at 43 CFR Part 42.

C. Provisions applicable to any recipient.

(i) You must inform us immediately of any information you receive from any source alleging a violation of a prohibition in paragraph a.1 of this award term.

(ii) Our right to terminate unilaterally that is described in paragraph a.2 or b of this section:

(a) Implements section 106(g) of the Trafficking Victims Protection Act of 2000 (TVPA), as amended (22 U.S.C. 7104(g)), and
(b) Is in addition to all other remedies for noncompliance that are available to us under this award.

(iii) You must include the requirements of paragraph a.1 of this award term in any subaward you make to a private entity.

D. Definitions. For purposes of this award term:

(i) "Employee" means either:

(a) An individual employed by you or a subrecipient who is engaged in the performance of the project or program under this award; or
(b) Another person engaged in the performance of the project or program under this award and not compensated by you including, but not limited to, a volunteer or individual whose services are contributed by a third party as an in-kind contribution toward cost sharing or matching requirements.

(ii) "Forced labor" means labor obtained by any of the following methods: the recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.

(iii) "Private entity":

(a) Means any entity other than a State, local government, Indian tribe, or foreign public entity, as those terms are defined in 2 CFR 175.25.
(b) Includes:
1. A nonprofit organization, including any nonprofit institution of higher education, hospital, or tribal organization other than one included in the definition of Indian tribe at 2 CFR 175.25(b).

2. A for-profit organization.

(iv) Severe forms of trafficking in persons," "commercial sex act," and "coercion" have the meanings given at section 103 of the TVPA, as amended (22 U.S.C. 7102).

22. Research Integrity

A. USGS requires that all grant or cooperative agreement recipient organizations adhere to the Federal Policy on Research Misconduct, Office of Science and Technology Policy, December 6, 2001, 65 Federal Register (FR) 76260, http://www.ostp.gov/html/001207_3.html. The Federal Policy on Research Misconduct outlines requirements for addressing allegations of research misconduct, including the investigation, adjudication, and appeal of allegations of research misconduct and the implementation of appropriate administrative actions.

B. The recipient must promptly notify the USGS Project Office when research misconduct that warrants an investigation pursuant to the Federal Policy on Research Misconduct is alleged.

23. Fiscal Integrity

The recipient will notify the USGS Contracting Officer/Grants officer of any significant problems relating to the administrative or financial aspects of the award, such as misappropriation of Federal funds.

24. Program Income

A. The recipient will have no obligation to the Federal Government for program income earned from license fees and royalties for copyrighted material, in accordance with 43 CFR 12.924(h) (for A-110 recipients) or 43 CFR 12.65(e) (for A-102 recipients).

B. If a purpose of this award is to support a conference, symposium, or similar event, income related to that event will be deducted from total allowable costs to determine the net allowable costs before calculating the Government's share of reimbursable costs, as provided in 3 CFR 12.65(g)(1) (for A-102 recipients) or 43 CFR 12.924(b)(3) (for A-110 recipients).

C. If the recipient is an educational institution or nonprofit research organization, any other program income will be added to funds committed to the project by the Federal awarding agency and recipient and be used to further eligible project or program objectives, as described in 43 CFR 12.924(b)(1).

D. For all other types of recipients, any other program income will be deducted from total allowable costs to determine the net allowable costs before calculating the Government's share of reimbursable costs, as provided in 3 CFR 12.65(g)(1) (for A-102 recipients) or 43 CFR 12.924(b)(3) (for A-110 recipients).

End of Special Terms and Conditions

COST PRINCIPLES, AUDIT, AND ADMINISTRATIVE REQUIREMENTS

The Recipient shall be subject to the following OMB circulars and regulations, which are incorporated herein by reference. Copies of these Circulars can be obtained from the Internet at: *http://www.whitehouse.gov/omb/circulars/index.html*.

I. OMB Circulars and Regulations

A. Educational Institutions

- 2 CFR 220, Cost Principles for Educational Institutions (OMB Circular No. A-21)
- OMB Circular No. A-110, Uniform Administrative Requirements for Grants and Other Agreements with Institutions of Higher Education, hospitals, and Other Non-profit Organizations, as implemented in 2 CFR 215 and 43 CFR Part 12, Subpart F.
- OMB Circular No. A-133, Audits of States, Local Governments and Non-Profit Organizations, as implemented in 43 CFR Part 12, Subpart A: Administrative and Audit Requirements and Cost Principles for Assistance Programs

B. State and Local Governments

- 2 CFR 225, Cost Principles for State, Local, and Indian Tribal Governments (OMB Circular A-87)
- OMB Circular A-102, Grants and Cooperative Agreements with State and Local Governments; as implemented in 43 CFR Part 12, Subpart C
- OMB Circular No. A-133, Audits of States, Local Governments and Non-Profit Organizations, as implemented in 43 CFR Part 12, Subpart A: Administrative and Audit Requirements and Cost Principles for Assistance Programs

C. Non-Profit Organizations

- 2 CFR Part 230, Cost Principles for Non-Profit Organizations (OMB Circular A-122), except recipients listed in Appendix C to Part 230 are subject to Federal Acquisition Regulation (FAR) Subpart 31.2, Contracts with Commercial Organizations (Contract Cost Principles and Procedures)
- OMB Circular No. A-110, Uniform Administrative Requirements for Grants and Other Agreements with Institutions of Higher Education, hospitals, and Other Non-profit Organizations, as implemented in 2 CFR 215 and 43 CFR Part 12, Subpart F.
- OMB Circular No. A-133, Audits of States, Local Governments and Non-Profit Organizations, as implemented in 43 CFR Part 12, Subpart A: Administrative and Audit Requirements and Cost Principles for Assistance Programs

D. Organizations for Profit, Individuals, and Others Not Covered Above

- Federal Acquisition Regulation (FAR) Subpart 31.2, Contracts with Commercial Organizations (Contract Cost Principles and Procedures)

- OMB Circular No. A-110, Uniform Administrative Requirements for Grants and Other Agreements with Institutions of Higher Education, hospitals, and Other Non-Profit Organizations, as implemented in 2 CFR 215 and 43 CFR Part 12, Subpart F,
- FAR Subpart 42.1, Contract Audit Services; FAR Subpart 42.7, Indirect Cost Rates; FAR Subpart 42.8, Disallowance of Costs

II. ADDITIONAL REGULATIONS

This award is subject to the following additional Government-wide regulations:

(1) 2 CFR 180, Government Debarment and Suspension (Nonprocurement)
(2) 2 CFR 1400, Department of the Interior Nonprocurement Debarment and Suspension

This award is subject to the following additional regulations of the U.S. Department of the Interior:

(3) 43 CFR Part 12, Subpart E: Buy American Requirements for Assistance Programs
(4) 43 CFR Part 17, Subpart A: Nondiscrimination on the Basis of Race, Color, or National Origin
(5) 43 CFR Part 17, Subpart B: Nondiscrimination on the Basis of Handicap
(6) 43 CFR Part 17, Subpart C: Nondiscrimination on the Basis of Age
(7) 43 CFR Part 17, Subpart E: Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities Conducted by the Department of the Interior
(8) 43 CFR Part 18, New Restrictions on Lobbying
(9) 43 CFR Part 41, Nondiscrimination on the basis of sex in education programs or activities receiving Federal financial assistance *[Applies only if this award provides assistance to an education program or student(s).]*
(10) 43 CFR Part 43, Governmentwide Requirements for Drug Free Workplace