

SECTION 1. PROJECT ADMINISTRATIVE INFORMATIONCDI SSF Elements:

1. Knowledge Management
2. Science Data Lifecycle (Preservation, Publishing/Sharing)
3. Applications

Title: A data management and visualization framework for community vulnerability to hazards

Lead USGS cost center: Western Geographic Science Center

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Project Description:

Analytical data from tsunami evacuation modeling projects exists but needs additional management to fulfill its science data life cycle. This data will be integrated into web services for use by partner agencies (California Office of Emergency Services, California Earthquake Clearinghouse). Additionally, a web application will be created to present project results in conjunction with contextual data to improve public risk awareness and provide access to USGS-derived information.

Anticipated Deliverables:

- GIS web services of tsunami modeling analysis results, metadata, documentation of processes
- Web application for exploration and interpretation of results, with participatory base data collection for improving future modeling and scalable design for future expansion.

SECTION 2. ESTIMATED BUDGET

Budget Category	Federal Funding	Matching Funds
1. PERSONNEL (SALARIES including benefits):		
Federal Personnel Total:	\$25,389.00	\$13,825.00
Student Contract Personnel :	\$12,072.00	\$4,829.00
Total Salaries:	\$37,461.00	\$18,654.00
2. TRAVEL EXPENSES:		
Travel Total (Per Diem, Airfare, Mileage/Shuttle) x # of Trips:	\$1,522.00	\$1,522.00
Other Expenses (e.g. Registration Fees):	\$0.00	\$0.00
Total Travel Expenses:	\$1,522.00	\$1,522.00
3. OTHER DIRECT COSTS:		
Equipment (including software, hardware, purchases/rentals):	\$0.00	\$0.00
Publication Costs:	\$0.00	\$0.00
Office Supplies, Training, Other Expenses:	\$0.00	\$0.00
Total Other Direct Costs:	\$0.00	\$0.00
Total Direct Costs:	\$38,983.00	\$20,176.00
Indirect Cost (23%):	\$8,966.09	\$0.00
GRAND TOTAL:	\$47,949.09	\$20,176.00

SECTION 3. PROJECT SUMMARY

Scope: Published research by the Western Geographic Science Center on variations in community vulnerability to tsunami hazards has resulted in a large amount of spatial data. Reports for Oregon, Washington, California, and Hawaii provide information on the number and type of people in tsunami-hazard zones. Evacuation modeling has also been completed for communities along the Pacific Northwest coast and in Alameda County, CA, to provide estimates of time required to reach safety before tsunami-wave arrival. Although data are critical for risk-reduction planning and outreach efforts, they are currently only available in static reports. To complete the data lifecycle, they must be preserved and published. Under this project, data will be published in two forms: (1) web services, to provide access for partner agencies and for future, and (2) a web mapping application, where data is presented with extra contextual information for better interpretation. The web services will benefit internal communities of practice by sharing project results and innovative modeling techniques. The web mapping application will benefit the public by presenting information derived from USGS scientific modeling, allowing diffusion of knowledge of tsunami threats to reduce potential loss of life from future events. Additionally, data from similar research related to volcano, earthquake, hurricane, sea level rise, and coastal change hazards exists, indicating that products developed within this tsunami-focused project will have impact on other USGS hazard projects across the nation with regard to characterizing and communicating societal exposure to and impacts from natural hazards.

Technical Approach: Numerous agencies use USGS research on community vulnerability for mitigation, preparedness, outreach, and exercise planning. The current practice is to create and distribute reports with static maps of analytical and modeling results. However, using web services to host research results allows partner agencies to use the data for further analysis to improve knowledge of variations in vulnerability to hazards. This project aims to establish a new model for this hazard data dissemination using web technologies, both to partner agencies and USGS-wide, and will prototype and document the process with a case study of community vulnerability to tsunami hazards in California. Web-mapping allows understanding of the impact of various tsunami scenarios through interactivity and additional narratives not available in static reports, and using underlying web services expands the reach and extends the life of the data. This approach would also increase the use of USGS results in planning exercises and in post-disaster response and could set a new precedent for sharing authoritative research results.

Project Experience and Collaboration: The principal investigator has led and successfully completed multiple software projects at the USGS, including database and website development. Collaborator #1 has experience in web service GIS data management, and custom web-mapping application development. Collaborator #2 has expertise in website development using the Drupal content management system, the future platform for USGS websites. Collaborator #3 has expertise in hazard vulnerability science to provide guidance on emergency manager needs and in geospatial analytical and modeling methods. He represents the USGS for the National Tsunami Hazards Mitigation Program and therefore is well-connected to state and federal emergency managers. For this project, the California Geological Survey and California Office of Emergency Services will be consulted to meet their needs.

Sustainability: Data management practices will use web service hosting with metadata through ScienceBase to carry out the end of the science data lifecycle. The web application will be maintained in a USGS Stash Repository, providing access to techniques and code useful to internal sources performing related work. A user's guide will be included to expand the site's utility to other hazards and datasets.

Budget Justification: Budgeting accounts for salary for the PI and collaborators' time. Additional costs cover travel to 2016 CDI Workshop.

Timeline:

Mar.	Apr. - May	June	July	Aug.	Sept.
Project planning	Web-service management on ScienceBase	Draft web application schema/begin coding	Alpha testing	Beta testing	Publish to live server