

# CDI FY17 Request for Proposals

## An Interactive Web-based Application for Earthquake-triggered Ground Failure Inventories

**Submission Title:** An Interactive Web-based Application for Earthquake-triggered Ground Failure Inventories

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**Science Support Framework Element 1:** Communities of Practice

**Science Support Framework Element 2:** Applications

**Science Support Framework Element 3:** Science Data Lifecycle - Publishing/Sharing

**In-Kind Match:** \$15,001.00

**List of anticipated deliverables from the project:** 1) Set of openly available earthquake-triggered liquefaction and landslide inventories from USGS and non-USGS authors (with permission) in consistent formats and complete metadata archived at ScienceBase 2) A web-based application for visualizing, filtering, and searching through the available datasets, including tools for visualizing inventory statistics

**Lead Cost Center:** Geologic Hazards Science Center

**Notes, Comments:**

**Project Description:** We seek to eliminate redundant effort among scientists who study seismically triggered landsliding and liquefaction and encourage attitudes to shift toward open-data in this community by making as many earthquake-triggered ground failure inventories, a key research tool, openly available as possible in consistent formats along with necessary metadata (e.g., mapping methods, extent, feature type, quality of shaking estimates, level of completeness) via an interactive, searchable GIS web application.

**Total Budget:** \$47,275.00

**CDI Statement of Interest**

Project title: **An Interactive Web-based Application for Earthquake-triggered Ground Failure Inventories**

USGS Lead Principal Investigator: Kate Allstadt

**SECTION 1: PROJECT SUMMARY**

*Background:* Earthquake-triggered ground failures (EQGF), including landslides and liquefaction, have caused tens of thousands of deaths over the past century with losses sometimes exceeding those from shaking alone. Yet EQGF are often left out of earthquake hazard analyses because of our limited ability to accurately estimate the resulting hazard. The key to making progress on this front is to learn from the past, ideally by having access to numerous inventories of past EQGF spanning the broad range of terrains, shaking characteristics, and climates where EQGF occur worldwide. These can be used to improve our understanding of EQGF hazard and allow us to produce EQGF models for probabilistic, scenario, and real-time hazard assessments. The USGS has been a leader in producing such inventories but does not have the resources to map all events so we rely on the broader scientific community to fill in the gaps.

*Problem statement:* Unfortunately, no centralized open database of EQGF inventories currently exists. It has not been the norm to release the digital GIS files with publications on EQGF inventories so most researchers who work on this topic, including co-PI's Jesse, Tanyas and Zhu, independently spend excruciating amounts of time gathering inventories with the characteristics they need for their specific study by contacting the original authors (if still around) or even digitizing inventories from old figures.

*Proposed solution:* We seek to eliminate this redundant effort and encourage attitudes to shift toward open-data in this community by making as many EQGF inventories openly available as possible in consistent formats along with necessary metadata (e.g., mapping methods, extent, feature type, quality of shaking estimates, level of completeness) via an interactive, searchable GIS web application. We are already making progress toward compiling the core datasets and author permissions required, with about 60 landslide and 10 liquefaction inventories collected already. We propose to create an interactive web-based GIS application using Carto (<https://carto.com/>) that would call the shapefiles and metadata for the inventories stored in ScienceBase using ScienceBase web services. This is an approach inspired by a past successful CDI proposal ([National Dam Removal Database: A living database for information on dying dams](#)). We envision the app will allow researchers to easily visualize and search through the datasets that are available, filtering them based on their specific desired criteria, and allowing them to display statistics for one or more of the selected inventories simultaneously. By making this data easy to visualize, filter, analyze, and access, the application has the potential become a go-to repository for EQGF inventories and to accelerate scientific progress on the topic by removing barriers to progress.

This proposal fits into the CDI Science Support Framework well because 1) it will promote open-data sharing within a community of both earthquake and landslide scientists 2) it provides an easy tool for accessing and visualizing the newly open data. The base data will be available in a persistent archive (ScienceBase) and 3) by reporting and allowing filtering of inventories based on mapping practices that were used, it will help promote good data standards for future scientists as they create new inventories.

**SECTION 2: ESTIMATED BUDGET**

Budget Category	Federal Funding “Requested”	Matching Funds “Proposed”
<b>1. PERSONNEL (SALARIES including benefits):</b>		
Federal Personnel Total:	\$25,931 <sup>1</sup>	\$9,988 <sup>2</sup>
Contract/Collaborator Personnel Total:	0	0
<b>Total Salaries:</b>	\$25,931	\$9,988
<b>2. TRAVEL EXPENSES:</b>		
Travel Total (Per Diem, Airfare, Mileage/Shuttle) x # of Trips <sup>3</sup> :	\$14,000	\$0
<b>Total Travel Expenses:</b>	\$14,000	\$0
<b>3. OTHER DIRECT COSTS:</b>		
Equipment (including software, hardware, purchases/rentals):	\$1,000	\$0
Publication Costs:	\$0	\$3,000
<b>Total Other Direct Costs:</b>	\$1,000	\$3,000
<b>Total Direct Costs:</b>	\$40,931	\$12,988
<b>Indirect Costs (15.5%):</b>	\$6,344	\$2,013
<b>GRAND TOTAL:</b>	\$47,275	\$15,001

- 1) 12 pp of GS-7 (student hire) and 2 pp of GS13 from GIS and/or Development group to guide student  
2) 2 pp of Kate Allstadt (GS-12, step 3) and 1 pp of Eric Thompson (GS-13, step 3)  
3) Two people to Reston (\$2000 each) for 2017 CDI event and one trip to Golden, CO each for collaborators/co-PI’s Jesse, Zhu, and Tanyas (\$2500 each for Jesse and Zhu who would travel domestically, \$5000 for Tanyas coming from The Netherlands) to design the application and ensure data consistency.