



Fault Displacement Hazards Analysis Workshop

9-10th December 2016*

(*Due to space issues and demand, this could be moved to December 10th and 11th)

U.S. Geological Survey Campus
Menlo Park, CA

Organizing Committee: Stéphane Baize (IRSN, France), Tim Dawson (CGS, USA), David Schwartz (USGS, USA), Francesca Cinti (INGV, Italy)

Purpose:

Fault Displacement Hazard Analysis (FDHA) plays an important role in the risk assessment and design of both new and existing infrastructure located across and near active and potentially active faults. The primary objective of FDHA is to quantify the spatial distribution and magnitude of surface displacements and deformation caused by tectonic faulting and the hazard to structures impacted by this deformation. Lessons learned from recent earthquakes, new research, and implementation of these FDHA methodologies in projects, as well as recent guidance documents (e.g. American Nuclear Society - *Criteria for Assessing Tectonic Surface Fault Rupture and Deformation at Nuclear Facilities*) demonstrate the practical applications of FDHA in the assessment of tectonic surface deformation of engineering concern. However, compared to other types of seismic hazard analysis (ground motion, liquefaction, slope failure), this field is still considered by many to be in its early stages of development.

The goal of this workshop is to bring together researchers, practitioners, and stakeholders interested in the topic of fault displacement and discuss issues pertaining to FDHA. Themes will include:

- **The Surface Rupture during Earthquakes Database (SURE):** One of the primary motivations of this workshop is to develop a community-sourced, worldwide, unified database of surface rupturing earthquakes with a rich list of parameters for the basis of empirical regressions used in FDHA. This database is currently in development (*with the support of International Union for Quaternary Research, INQUA*) and will be populated with several example earthquakes by the time of the workshop. We would like to solicit the user community for contributions to this database and to provide advice regarding the database structure to ensure maximum benefit to potential users.
- **Lessons learned from recent earthquakes:** Recent earthquakes and the use of new mapping technologies continue to provide better resolution and insights into the

distribution and magnitude of surface displacements and deformation. How to apply these observations to the issue of FDHA is a topic this workshop will explore.

- **Case studies:** The growing use of FDHA as applied to engineering practice is providing insights into the advantages and limitations of different analytical approaches. The workshop will explore how these case studies can guide the research priorities for current and future fault displacement research.
- **Advances in probabilistic and deterministic approaches and future research directions:** User needs are the principal driving force behind the research. What advances have been made and what focused research is needed to provide technically defensible approaches to FDHA? How do we develop an underlying physical model of the occurrence and magnitude of distributed faulting and deformation to test against the observational data? We would like to solicit contributions that address these fundamental questions.
- **Moving forward:** How does the fault hazard community advance its research and enable additional research on this topic? How do we build partnerships between researchers and stakeholders so that this field of research continues to provide its stakeholders with the tools it needs? A goal of this workshop is to bring together researchers, practitioners, and stakeholders to stimulate discussion, coordinate research, and develop collaborative partnerships in order to build on existing approaches, as well as focus future research where it will be most useful.

The workshop is timed to be held prior to the 2016 American Geophysical Union Fall Meeting in San Francisco. A special AGU session "*Towards a unified and worldwide database of earthquake surface ruptures*" is being convened and will offer additional opportunities to share research and continue discussion following the workshop. Please refer to the session announcement for additional details: <https://agu.confex.com/agu/fm16/preliminaryview.cgi/Session13523.html>

Please send an email to Tim Dawson (timothy.dawson@conservation.ca.gov), Stephane Baize (stephane.baize@irsn.fr) and Francesca Cinti (francesca.cinti@ingv.it) by 31 August 2016 if you plan to participate and so that we can anticipate attendance. If you have a potential contribution in mind for this workshop, please let us know so that we can consider it for the agenda. Thanks!

Feel free to distribute this announcement to interested colleagues.