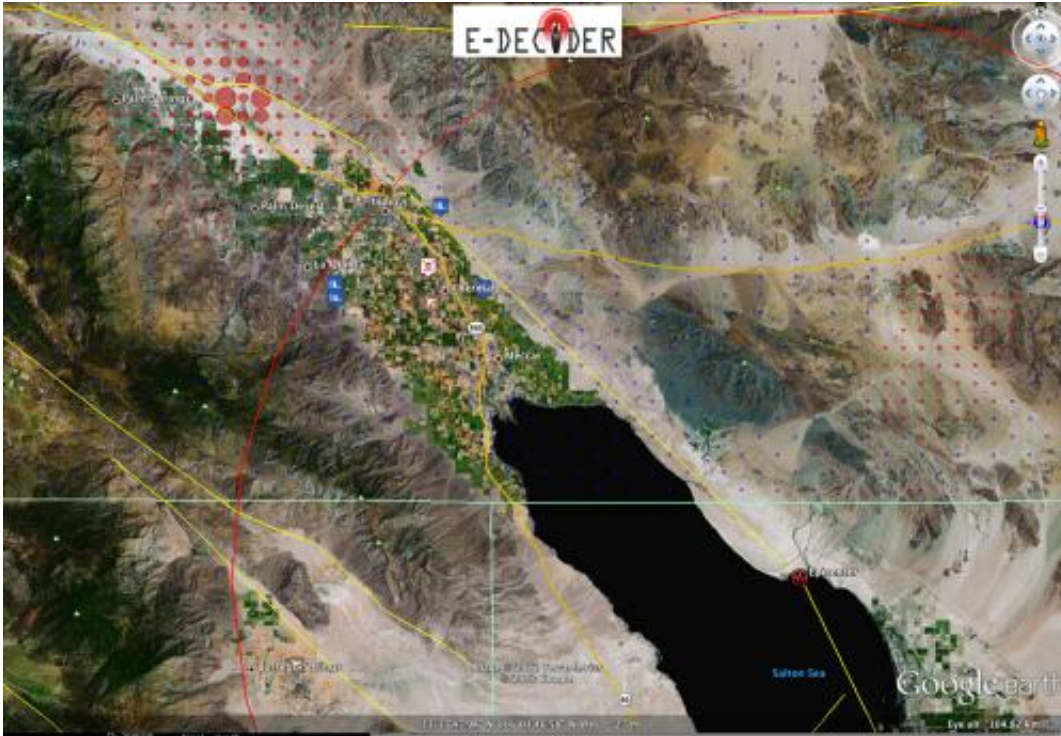


# Scientists participate in ShakeOut exercises

October 19 2012, by Alan Buis



Tilt maps, epicenter and HAZUS critical infrastructure information from E-DECIDER can be accessed via Google Earth and delivered to the Department of Homeland Security's Unified Incident Command and Decision Support tool in order to assess potential exposure and allow responders and decision makers to prioritize their efforts. Large changes in tilt (as shown by large red circles) can show where water or sewer conveyances may have been reversed and infrastructure such as dams, nuclear power plants, and airports within an area of interest of an epicenter can be flagged for investigation. Credit: NASA/JPL-Caltech

(Phys.org)—On Thursday, Oct. 18, at 10:18 a.m. PDT, more than 9.3 million Californians, including employees at NASA's Jet Propulsion Laboratory, Pasadena, Calif., "dropped, covered and held on" during the 5th annual Great California ShakeOut, the world's largest earthquake drill. The purpose of the ShakeOut is to encourage people and organizations to be prepared to survive and recover when the next big earthquake happens.

In conjunction with the ShakeOut, scientists from two JPL-developed projects participated in a supporting exercise by the California [Earthquake](#) Clearinghouse to provide disaster response data that will allow decision makers to best focus their response efforts immediately following an actual earthquake.

Here are some facts about the ShakeOut and the two JPL projects participating in the exercise:

## **What is the Great California ShakeOut and why is it important?**

The Great California ShakeOut is an annual earthquake response drill organized by the Southern California Earthquake Center, the U.S. Geological Survey, the National Science Foundation, the [Federal Emergency Management Agency](#), the California Emergency Management Agency and the California Earthquake Authority. It is designed to raise general public awareness of our ever-present [earthquake hazard](#) and allow emergency responders the opportunity to review and test their response plans.

## **What is the California Earthquake Clearinghouse?**

The California Earthquake Clearinghouse is a consortium of

organizations and individuals that meets in the event of a major earthquake to facilitate the collection and dissemination of information and best apply available expertise and resources. It also serves as a centralized location and information repository and as a temporary umbrella organization to facilitate disaster response.

## **How did JPL scientists participate in the California Earthquake Clearinghouse's ShakeOut exercise on Oct. 17, and how was that exercise related to the larger Oct. 18 ShakeOut exercise?**

Two JPL projects participated in the ShakeOut exercise on Oct 17. E-DECIDER (Earthquake Data Enhanced Cyber-Infrastructure for Disaster Evaluation and Response) and ARIA (Advanced Rapid Imaging and Analysis) are partnering with the California Earthquake Clearinghouse to provide [disaster response](#) data to decision makers to help them focus response efforts immediately following an earthquake. Personnel from both projects participated in a tabletop demonstration of a simulated earthquake. Clearinghouse participants used various decision-making tools and data products developed by projects like E-DECIDER and ARIA in real-time to test their capabilities in preparation for an actual earthquake. Although this exercise was part of the overall Oct. 18 ShakeOut activity, it was a separate tabletop exercise/demonstration.

## **What is E-DECIDER, how does it work and who would use it?**

E-DECIDER (Earthquake Data Enhanced Cyber-Infrastructure for Disaster Evaluation and Response) is a NASA Applied Sciences-funded project developed by JPL in partnership with the U.S. Geological Survey, Indiana University and UC Davis. It provides tools for

earthquake disaster management and response using remote sensing data and NASA earthquake modeling software. The project delivers mapped data products through Web and mobile applications for ease-of-use by decision makers, providing information for both long-term planning and identification of areas where emergency response should be focused in the event of an earthquake disaster.

E-DECIDER tools and products help facilitate coordination of decision making and planning for emergency managers and responders by transforming and distributing NASA Earth science data, modeling results and other remote sensing data into a standardized, easy-to-use format.

E-DECIDER has a co-investigator at the U.S. Geological Survey, and the project is partnering with the California Earthquake Clearinghouse. In the future, the project envisions that agencies such as the Department of Homeland Security, Federal Emergency Management Agency, California Emergency Management Agency, California Geological Survey and other decision-making agencies and responders may use E-DECIDER tools and products.

## **What is ARIA, how does it work and who would use it?**

ARIA (Advanced Rapid Imaging and Analysis) is a JPL- and NASA-funded project under development by JPL and Caltech in partnership with the U.S. Geological Survey. It is building an automated system for providing rapid and reliable GPS and satellite data to support the local, national and international hazard monitoring and response communities. By imaging disasters from space, ARIA data products can provide rapid assessments of the geographic region impacted by a disaster, as well as detailed imaging of the locations where damage occurs.

ARIA will provide space-based imagery data products that can help with pre-disaster event monitoring and post-disaster event situational awareness. ARIA will also integrate these space-based products with ground-based seismic data and modeling to deliver science products for earthquakes and other natural hazards, such as volcanoes.

ARIA is currently developing systems to deliver data products to the U.S. Geological Survey's earthquake and volcano hazard programs. The project foresees agencies such as the California Geological Survey, the Office of Foreign Disaster Assistance at USAID, the World Bank and the Department of Homeland Security using ARIA data products in the future.

## **What information did JPL provide for the exercise?**

E-DECIDER and ARIA provided numerous information products to the California Earthquake Clearinghouse through the Department of Homeland Security Unified Incident Command and Decision Support system and its Web and mobile interfaces. E-DECIDER products included results from models of anticipated ground deformation that show the amount of displacement expected to occur as a result of the simulated earthquake. The model results are presented in KML (Google Earth) format, allowing the data to be overlaid on maps of critical infrastructure and census information that allow responders to quickly identify who and what might have been affected by the simulated earthquake. Additionally, E-DECIDER provided an aftershock forecast that displayed areas with high likelihoods of aftershocks.

ARIA products include radar imagery of damage caused by the simulated earthquake, called a damage proxy map. This map was annotated by experts to identify locations for follow-up visits by responders in the field. ARIA also provided simulated GPS movement data from the simulated earthquake to improve the E-DECIDER model.

## What are NASA's future plans for E-DECIDER and ARIA?

NASA plans to make E-DECIDER available for operational use by its partners, hopefully within the next year. Its decision support products and mobile and Web interfaces would be used by organizations such as the California Geological Survey, California Emergency Management Agency, Federal Emergency Management Agency, the U.S. [Geological Survey](#) and other decision making agencies in the event of an earthquake disaster.

ARIA is currently building a prototype data system and plans to provide earthquake response-related data products routinely within two years. Upcoming plans include adding data products for monitoring ground movements and for responding to volcanic eruptions.

Provided by JPL/NASA

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