E-DECIDER: Experiences Developing Earthquake Disaster Decision Support and Response Tools

Margaret Glasscoe, Ronald Blom, Gerald Bawden, Geoffrey Fox, Marlon Pierce, John Rundle, Jun Wang, Robert Granat, Michael Burl, Yu Ma, Mark Yoder, Michael Sachs, Eric Fielding, Jay Parker, Charles Norton, Greg Lyzenga, Roland Bürgmann

Earthquake Data Enhanced Cyber-Infrastructure for Disaster Evaluation and Response (E-DECIDER) is developing new capabilities for decision-making utilizing remote sensing data and modeling software to provide decision support for earthquake disaster management and response. The overall goal of the project is to deliver these capabilities as standards-compliant Geographical Information System (GIS) data products through a web portal/web services infrastructure that will allow easy use by decision-makers; this design ensures that the system will be readily supportable and extensible in the future.

E-DECIDER is incorporating the earthquake forecasting methodology developed by Co-I Rundle through NASA's QuakeSim project, as well as other QuakeSim geophysical modeling tools. Remote sensing and geodetic data, in conjunction with modeling and forecasting tools will allow us to provide both long-term planning information for disaster management decision makers as well as short-term information following earthquake events (i.e. identifying areas where the greatest deformation and damage has occurred and emergency services may need to be focused). We are also working on providing a catalog of HAZUS input files and models for scenario earthquakes based on the Rundle forecast models, as well as designing an automated workflow for generating HAZUS models in the event of an earthquake (triggered from the USGS earthquake feed).

Our initial project focus had been to deliver rapid and readily accessible InSAR products following earthquake disasters. We have learned from recent events, such as the Baja Mexico earthquake and the Tohoku-oki Japan earthquake, that in many instances, radar data is not readily available following the event, whereas optical imagery can be provided fairly quickly as a result of the invocation of the International Charter. This led us to re-evaluate the type of data we would need to process and the products we could deliver. Our experiences with the recent Japan earthquake highlighted the lack of collaborative infrastructure as well. In addition, both earthquakes demonstrated the lack of world-wide hazard modeling services. These lessons and experiences will help us to evaluate the needs of end-users for decision support products and drive the development of our capabilities.