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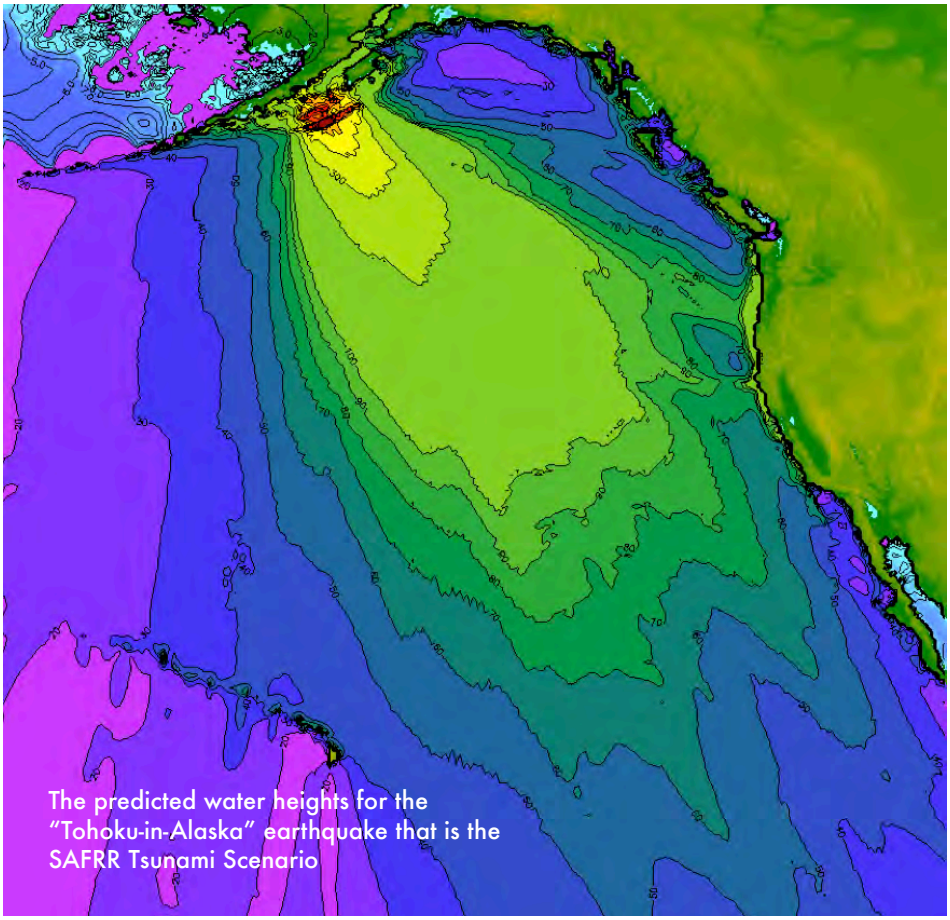
SCIENCE APPLICATION FOR RISK REDUCTION



The predicted water heights for the "Tohoku-in-Alaska" earthquake that is the SAFRR Tsunami Scenario

Greetings from the USGS SAFRR team!

This is our first quarterly SAFRR Newsletter to share information about our current projects.

The USGS Science Application for Risk Reduction (SAFRR) Project was created to innovate the application of hazard science for the safety, security, and economic well-being of the nation. SAFRR helps communities reduce their natural hazard threats by directing new and existing scientific research toward addressing gaps in vulnerability, producing innovative products, and connecting experts with users of their science. As an introduction to the ongoing efforts by the SAFRR team, we outline the present projects and include some News Highlights of efforts currently underway to help build resilience to natural hazards such as earthquakes, floods, wildfires, landslides, tsunamis, and coastal erosion.

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The mission of the USGS SAFRR (Science Application for Risk Reduction) Project is to innovate the application and development of hazards science to protect the safety, security and economic well-being of the Nation. SAFRR is available to work with interested USGS colleagues to enhance applications of their science. SAFRR offers a wide range of experience in user-focused research, targeted messaging, and partnerships with social and behavioral sciences relevant to hazards science.

The SAFRR Tsunami Scenario

The US Geological Survey, National Oceanic and Atmospheric Administration, California Geological Survey, and other entities have developed a California Tsunami Scenario, a document that depicts in granular detail a single realistic outcome of a hypothetical but likely large tsunami affecting the west coast of the United States, including Alaska and Hawaii. The scenario includes modeling of the earthquake source and the tsunami waves, damage and restoration of the built environment, and social and economic impacts. It employs the state of the art in many of the relevant disciplines. Like the earlier ShakeOut and ARkStorm disaster scenarios, the purpose of the Tsunami Scenario is to apply science to explain and understand the impacts of natural disasters.

The Tsunami Scenario development began in 2011 and is entering the publication phase now. Most of the thirteen chapters are in review or have completed the review process. The scenario will be released in the early fall. SAFRR is partnering with the National Tsunami Hazard Mitigation Program's representatives at the California Emergency Management Agency (CalEMA), the U. S. Coast Guard and other partners to hold five workshops in coastal communities to present the results of the study.

Partnering for Community Disaster Resilience

SAFRR is working with the Los Angeles County Community Disaster Resilience Project (LACCDR), a 3 year pilot collaboration sponsored by the Centers for Disease Control and Prevention and the National Institute of Mental Health, to engage community-based organizations in providing leadership and partnership to promote community resilience in the face of a wide range of public health emergencies, from pandemics to gang violence to earthquakes. Sue Perry is providing each of the pilot communities with information about their natural hazards and advice when requested about mitigation. Sue is now on the Board overseeing the whole project which is looking to expand to another region in the next couple of years. See www.laresilience.org

Volcano Safety Plan for CA

The State of California is developing a volcano safety plan, like the plans they already have for earthquakes and tsunamis. Both the USGS California Volcano Observatory and CalEMA asked SAFRR's help in making the connections to integrate the capabilities of USGS science in the State plan. After two initial meetings with SAFRR participation, the State and the Volcano Program are now completing the safety plan.

Risk Communication for Earthquake Early Warning

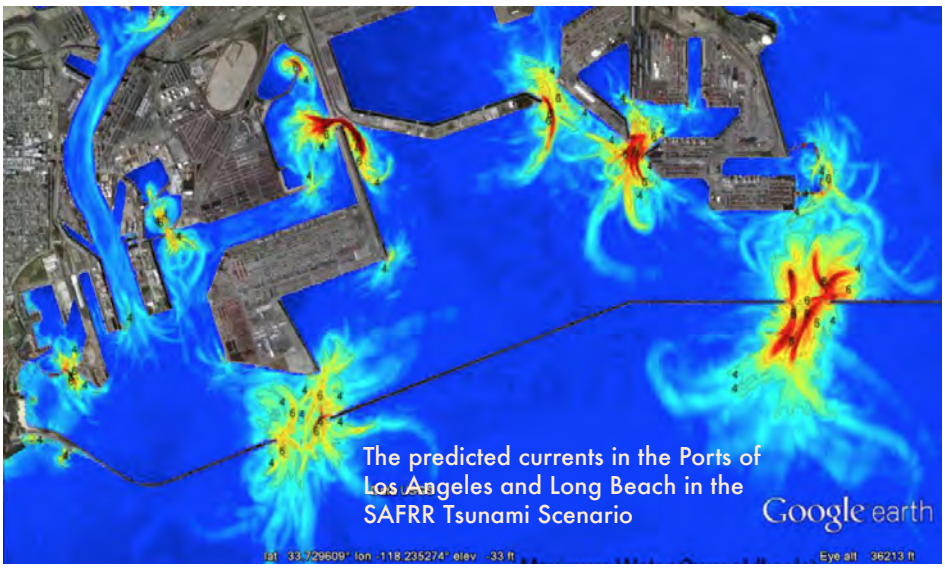
SAFRR has brought together a team of risk communication specialists, designers, seismologists and emergency managers to create a system of message templates for both earthquake early warning and aftershock probabilities.

Although an earthquake can strike at any time, there are some times when an earthquake becomes more likely. The most common is because of earthquake clustering – one earthquake has happened that can trigger aftershocks and other earthquakes – and seismologists can determine the probability of a large earthquake during this time. Usually the probability is low in absolute terms, but much higher than it was.

In a separate scientific development, the technology exists to recognize that an earthquake is underway and communicate this information to more distant sites before the shaking arrives, thus providing a few seconds warning for the event, called earthquake early warning. This is a similar message to the earthquake clustering – there is a greater chance of earthquake shaking in a very short time frame – but for early warning the probabilities are higher and the time is shorter. The need to develop messages that will communicate effectively in seconds (we are planning a training program as well) and not be confused with the aftershock messages.

The field of risk communication provides insights about how people respond to different types of messages in crisis situations. For instance, research has shown that the most effective messages include three components – 1) information that communicates why the situation applies to the hearer, 2) an explanation of why the information is known (the science behind it), and 3) the action that should be taken to be safer.

The project will begin with a "Design Storm," facilitated by the Art Center College of Design in Pasadena, that will bring together seismologists, emergency



The predicted currents in the Ports of Los Angeles and Long Beach in the SAFRR Tsunami Scenario

mangers, risk communication researchers, and design professionals to develop a framework for earthquake probability messages for both emergency managers and the general public. The outcome will be three sets of possible messages and approaches. After the Design Storm, the candidate messages will be tested with focus groups by the researchers at the Division of Risk Communication at the University of Kentucky. The results of the testing will be given to a design studio at Art Center to create the final message system. The project should be completed in mid-2014.

SAFRR Partners with Hawaiian Civil Defense to Assist Tsunami Messaging Efforts

Over the next several months, the State of Hawaii will decide on changes to its tsunami messaging. To ensure that the new messages strengthen existing education, Hawaiian Civil Defense has requested assistance from SAFRR to connect with researchers in risk communication and risk perception. Thus Sue Perry assembled a group of partners to serve as advisors to the State of Hawaii. The group's expertise comprises sociolinguistics, psychology, anthropology, marketing, design, public health, and health policy, and includes Columbia's Center for Research on Environmental Decisions, Art Center College of Design, School of Public Health at Hunter College, UC Los Angeles Center for Public Health and Disasters, and the Rand Corporation. The group has participated in phone and email discussions to draft an informal set of best practices and recommendations which Hawaiian Civil Defense has requested that SAFRR co-author as a white paper. The results will also help to inform future outreach within SAFRR. This is a pilot effort in SAFRR to explore new ways to share expertise with partners inside and outside the USGS.

$5 Million in UASI Funding for Earthquake Early Warning in southern California

Los Angeles Mayor Antonio Villaragosa on April 13 announced $5 million in funding from the Urban Areas Security Initiative (UASI) to ANSS partner institution Caltech for Earthquake Early Warning (EEW) system development (see LA Times article). The decision to grant the money came after many years of partnership for the USGS with many public safety entities in southern California.

Website Coming Soon!

The design for the SAFRR website and it is being created by the Geologic Science Center's web team. When it is completed, the news items in this newsletter will link to updated items on the website.

ARkStorm in Tahoe

Dale Cox, the hazards coordinator for the Pacific Region is leading an effort to take the MHDP's ARkStorm Scenario for California across the state lines. The State of Nevada and the Tahoe Science Consortium are using the USGS work as the basis for creating a partner scenario for Nevada and will use it for a public safety exercise in 2015.

Staff changes

SAFRR hired Dr. Erin Burkett to foster community engagement with USGS science. In addition to working on various SAFRR projects, Dr. Burkett will work with the Earthquake Program to instruct beta-users of the ShakeAlert early warning system. Before coming to the USGS, Dr. Burkett received her Ph.D. in geodynamics from UC Davis, and held a postdoctoral appointment at Caltech.

John Bwarie, the SAFRR Strategy and Communication Officer, will be leaving us on June 30. John came to us on an Inter-Agency Personnel Agreement from the Los Angeles City Council and has been supporting partnership development for three years. John has been extraordinarily effective in positioning the USGS hazards work with many entities from local government, to national organizations and multi-national corporations. He is irreplaceable.He is leaving to begin his own consulting company.

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