

# Meeting Minutes of the Subcommittee on Disaster Reduction

1 September 2011, 10:00 a.m. to 12:00 p.m., White House Conference Center Lincoln Room

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Italics indicate absent members. "T" indicate members participating via teleconference.

## Co-Chairs

David Applegate (USGS) (T)  
Margaret Davidson (NOAA) (T)  
Dennis Wenger (NSF)

## NSTC Liaison

Tamara Dickinson (OSTP)

## Designated Representatives

**BLM** *Edwin Roberson*

*Daniel Lechefsky*

**CDC** Mark Keim (T)

**DHS** Bruce Davis (T)

**DHS/FEMA** Sandra Knight

**DHS/USCG** *Austin Gould*

**DOD** *Al Johnson*

**DOT** *Kelly Leone*

Sheila Duwadi

**EOP/OSTP** Tamara Dickinson

**EDA** *Audrey Clarke*

**EPA** Peter Jutro

Stephen Clark

**FERC** Pamela Romano (T)

**HUD** *David Engel*

**NASA** Craig Dobson

**NGA** Paul Lewis

**NGB** *Daniel Bochicchio*

**NIH** Allen Dearry (T)

**NIST** *William Grosshandler*

**NOAA** Margaret Davidson (T)

Laura Furgione

**NSF** Dennis Wenger

**OPHS** Sven Rodenbeck (T)

**State** Nicholas Suntzeff (T)

Fernando Echavarria

**USACE** *Steven Cary*

*Dimitra Syriopoulou*

**USAID** *Sezin Tokar*

**USDA** *TBD*

**USFS** *Carlos Rodriguez-*

*Franco*

**USGS** David Applegate (T)

**USNRC** Brian Sheron

## Other Attendees

**DHS** Mary Ellen Hynes

**EPA** Ed Washburn

**FEMA** Rachel Sears

**Homeland Security Inst.**

Stacy Okutani

**NASA** Michael Goodman

Paul Rosen

**NOAA** Nell Codner (T)

Margaret McCalla

Tracy Rouleau

**NSF** Gregory Anderson

Kishor Mehta

Jacqueline Meszaros

Eva Zankerka

**State** Keri Holland

**USGS** Mike Blanpied

Bill Leith

Brian McCallum

**USNRC** Bret Rini

**Secretariat** Ross Faith

Bret Schothorst

## Agenda

10:00 Welcome and Introductions

10:05 Discussion on East Coast Earthquake and Hurricane Irene

10:30 Presentation: Disaster Management Considerations in Planning for the Rio +20 UN Conference on Sustainable Development

10:50 Presentation: L-Band SAR/InSAR Capability for Hazards

11:20 Report from the Co-Chairs and Approval of Minutes

11:45 Report from the NSTC Liaison

11:55 Close and Next Actions

## Handouts

- Agenda
- East Coast Earthquake Handout
- Rio +20 Fact Sheet
- Greening Disaster Response Paper
- Draft July Meeting Minutes
- Invitation to NLE 2011 National Recovery Tabletop Exercise
- Presidential Proclamation on National Disaster Preparedness Month

## **I. Welcome and Introductions**

Subcommittee on Disaster Reduction (SDR) Co-Chair Dennis Wenger (NSF) called the meeting to order at 10:00 a.m., and participants introduced themselves. Wenger introduced two new SDR members.

- The U.S. Nuclear Regulatory Commission (USNRC) recently joined the SDR as a new member agency, represented by Dr. Brian Sheron, Director of the Office of Nuclear Regulatory Research.
- Paul Lewis, who has approximately a decade of airborne emergency response experience and in December 2008 presented to the SDR on NGA support to EPA's ASPECT Program, has taken over as the National Geospatial-Intelligence Agency's representative to the SDR.

## **II. Presentation: Virginia 5.8 Earthquake**

Bill Leith is the Acting Senior Advisor for Earthquake and Geologic Hazards at the U.S. Geological Survey (USGS). He spoke to the SDR about the magnitude 5.8 earthquake that on August 23<sup>rd</sup> strongly shook Virginia, Washington, DC, and Maryland, and that was felt over a broad swath of the U.S. – from Florida to Maine and as far west as Missouri – and was also felt in Canada.

The USGS rapid estimator of earthquake losses, known as PAGER, estimated damage from the quake at more than \$100 million. The epicenter was located near the town of Mineral in Louisa County, Virginia, a rural area that lies between the cities of Charlottesville, Richmond, and Fredericksburg. The damage to the rural area was quite extensive and included houses knocked off foundations, chimney collapses, significant damage to contents of houses and other damage. Yet, had the earthquake struck closer to one of the larger cities, all of which have a significant stock of unreinforced masonry buildings, the economic losses would have been far greater.

The earthquake occurred as a reverse thrust fault in the Central Virginia Seismic Zone, an area of elevated seismic hazard as mapped by the USGS. The Central Virginia Seismic Zone has produced small and moderate earthquakes since at least the 18<sup>th</sup> century. The previous largest historical shock from the Central Virginia Seismic Zone occurred in 1875. That shock occurred before the invention of effective seismographs, but felt reports suggest that it had a magnitude of about 4.8. Seismic areas in Virginia west of the Blue Ridge Mountains have also produced notable earthquakes. The August 23<sup>rd</sup> quake was the strongest to hit Virginia proper since 1897, when an earthquake of similar intensity hit near Blacksburg.

A remarkable characteristic of earthquakes in the Eastern U.S. is the great distances over which they are felt. East of the Rocky Mountains, the Earth's crust is "older and colder" than to the west, allowing for the energy generated by earthquakes to travel over longer distances with less interference. One of the implications of this "low attenuating" geology is that seemingly distant regions may nevertheless bear significant economic losses. Although roughly 85 miles removed from the earthquake's epicenter, the National Cathedral and Washington Monument suffered considerable damage from the August 23<sup>rd</sup> quake. Widespread evacuations of buildings in the Washington, DC region also resulted in lost economic productivity. Perhaps even more striking, the control tower at JFK International Airport near New York City was evacuated as a result of the shaking. At the very least, these episodes underscore the need for continuing to incorporate the seismic hazard into building design when constructing and retrofitting in the Mid-Atlantic Region and beyond, as well as promoting earthquake safety throughout the Eastern U.S.

Closer to the epicenter, roughly 10 miles away, the North Anna Nuclear Power Plant shut down as the August 23<sup>rd</sup> earthquake unfolded due to a loss of external power resulting from a damaged transformer. The shake threshold at which the plant is designed to shut down, referred to as the "design basis", is .12G; the USGS shaking model estimated approximately .2G from the earthquake.

Leith noted that unlike in the Western U.S., where earthquake monitoring stations are relatively dense, the network in the Eastern states is sparse by comparison, leading to limitations in measuring earthquakes and locating exact epicenters. The closest permanent monitoring station to the August 23<sup>rd</sup> quake epicenter

was located at a NOAA facility in Corbin, VA, near Fredericksburg. Since the earthquake, the USGS has deployed more than 40 portable sensors. More than half of those sensors are providing data in real time and the others are recording data locally. These additional sensors will be left out in the field over the next few months to collect data on the aftershocks, which will aid in understanding the orientation of the fault, the motion on the fault, the extent of the rupture, and also the ground motion.

Mary Ellen Hynes (DHS) pointed out that the acceleration from the quake had been estimated at .2 G, while critical infrastructure is being designed for .12 G. She noted her interest in accessing additional data recorded by the USGS monitoring stations, including metadata, such as information on the structural geology and soil composition where the stations are located. She also suggested improving the navigability of the USGS website to make finding such information easier.

### **III. Presentation: Hurricane Irene**

Laura Furgione is the Deputy Assistant Administrator for NOAA's National Weather Service (NWS). She spoke to the SDR on the forecasting and impacts of Hurricane Irene as well as the response effort.

Furgione noted that the precision with which the NWS was able to forecast Irene's track allowed for substantial cost avoidance. As Irene approached the Continental U.S., confidence in the hurricane's forecasted track was high enough for officials to forego the evacuation of approximately 750 miles of coastline from Florida up to parts of the Carolinas, resulting in a cost avoidance of \$750 million (as each mile of coastline evacuated equates to a cost of roughly \$1 million). On Tuesday, August 23<sup>rd</sup>, the NWS issued a forecast that projected landfall within ten miles of where the hurricane's eye ultimately came ashore in North Carolina four days later on the morning of Saturday, August 27<sup>th</sup>. Underscoring the storm's size, that afternoon, 30 million people – a tenth of the U.S. population – were either under a hurricane or tropical storm warning.

The storm's size and slow progress northward translated into high rainfall totals over much of the affected area. In parts of the Mid-Atlantic and Northeast, particularly in Vermont, the combination of double digit rainfall totals and already saturated soil resulted in dangerously swollen rivers. On Monday, August 29<sup>th</sup>, 28 river gauges recorded major flood stages and 19 measured record water levels. As the threat of flooding increased, the NWS worked with the USGS and USACE to forecast water levels and flooding impacts, while continuing to coordinate with FEMA to make sure that emergency managers and local officials were informed and that appropriate evacuations were taking place.

The majority of the 41 deaths attributed to the storm as of September 1 resulted from fresh water drowning. Whereas public attention is often focused on the location of the eye, wind speed, and storm surge, Furgione pointed to fresh water drowning as an underestimated hazard of hurricanes, which, with the exception of Hurricane Katrina, has been most often the leading cause of deaths associated with hurricane strikes in the U.S. over at least the past few decades. As an example, she cited Hurricane Floyd, which in 1999 made landfall over the Outer Banks of North Carolina and resulted in 57 deaths with fresh water drowning as the most common cause.

Steve Clark (EPA) noted that in the wake of Irene, Vermont National Guard helicopters had been called upon to deliver water and food to six villages and towns in the state. He stated that the U.S. Environmental Protection Agency recently released a report providing guidance for planning for post-disaster emergency water supply at the local, state and federal levels. Interest in the topic has been high, as demonstrated by the participation of 3,000 people from all over the U.S. at a related webinar yesterday. The report will be circulated electronically to SDR members following the meeting.

Sheila Duwadi (FHWA) stated that the Federal Highway Administration was currently assisting the states in assessing damage to roads and bridges. She noted that one of the challenges in conducting assessments

of bridge damage was that storm runoff had created murky waters, and therefore low visibility for divers attempting to conduct visual underwater inspections of damage to bridge piers resulting from scour. She stated that the FHWA was still searching for a technological solution to improve sight and damage assessment in clouded waters.

Sandra Knight (FEMA) stated that the response to Irene was ongoing, but overall had been very successful to date. She underscored the strong relationships between federal, state, local, and other stakeholders that were built before the hurricane as a critically important factor contributing to that success.

#### **IV. Presentation: Disaster Management Considerations in Planning for the Rio +20 UN Conference on Sustainable Development**

Keri Holland and Fernando Echavarria (State) spoke to the SDR about the U.S. Government's preparations for the Rio+20 UN Conference on Sustainable Development (Rio de Janeiro, Brazil, June 4-6, 2012). In concert with the National Security Staff, the Department of State will be holding policy discussions in September to develop and refine ideas and proposals that the U.S. Government will bring to the conference table in Rio. To help inform the policy making process, the agencies that serve on the SDR were asked to contribute ideas and examples of programs, activities, capabilities, partnerships and materials that would allow the U.S. Government to showcase at the conference its work on disaster management, and to illustrate the importance of that work to sustainable development. Submitted ideas and examples would ideally highlight or inform opportunities for the U.S. Government to propose international partnerships and efforts for improved disaster mitigation, preparedness, response and recovery, both regionally and/or globally. During the SDR meeting, a fact sheet with more information on the conference was circulated, along with a draft paper on Greening Disaster Response, which is one possible focus area for the U.S. proposal(s). Ideas, examples, and/or comments on the paper should be emailed to the SDR Secretariat (ross.fairh@mantech.com) by COB Thursday, September 15<sup>th</sup>.

#### **V. Presentation: L-band SAR/InSAR Capability for Hazards**

Dr. Paul Rosen is Manager of the NASA Jet Propulsion Laboratory's Radar Science & Engineering Section, a group of nearly 100 scientists and engineers defining, designing, and building state-of-the-art radar instruments for NASA's Earth and planetary science missions. His assignments at JPL have centered on scientific and engineering research and development in methods and applications of Synthetic Aperture Radar (SAR) and Interferometric SAR (InSAR). Rosen has developed and promoted scientific applications of differential interferometry, including crustal deformation mapping and hazard assessment, and has led several proposals for surface deformation satellite missions.

Rosen spoke to the SDR about NASA's Deformation, Ecosystem Structure and Dynamics of Ice (DESDynI) Mission, and specifically about the benefits that a U.S. L-band InSAR capability would bring to hazard assessment and understanding. Craig Dobson (NASA) added additional context to the presentation by noting that the remarkably accurate forecast of Hurricane Irene had been largely enabled by advances in modeling efforts based on improvements in Earth observations over the last decade or so. He contrasted the forecasting for Irene with the magnitude 5.8 earthquake in Virginia that struck with some surprise, noting that, as a general rule, geohazard models are not necessarily well-informed by a host of Earth observations. He stated that the DESDynI mission was designed to help fill this observational void and advance the modeling and understanding of geohazards.

The U.S. pioneered synthetic aperture radar with the launch of Seasat in 1978, leading to the first topographically consistent map of the Earth, which now appears on iPhones and Google Maps, among other achievements. However, for the past 15-20 years, the federal science community has had to rely on U.S. intelligence assets, which are not ideally suited for geohazards mapping, and the assets of foreign countries, which do not share their data with regularity. While several industrialized nations are or will

be flying SAR and InSAR systems over the 2000-2020 time period, Rosen noted that the vast majority of them are not ideally configured for mapping hazards such as geohazards, oil spills, flooding, and coastal inundation. Some data is available commercially at costs of \$3-6,000 per scene. In contrast, DESDynI would have the capacity to produce roughly 1 million scenes per year.

DESDynI was one of the Tier 1 missions recommended by the National Research Council in the 2007 Decadal Survey Report “Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond”. The decadal survey report was just one report of many that over the last 15-20 years have advocated for a mission of this nature. Among those reports, the SDR *Grand Challenges for Disaster Reduction* implementation plans *Earthquake, Volcano, Landslide and Debris Flow* specifically identify the need for an InSAR capability. And in 2010, the OSTP report “Achieving and Sustaining Earth Observations: A Preliminary Plan” echoed earlier calls for DESDynI to be implemented.

To optimally meet all of the requirements that were specified by the reports over the years, DESDynI was originally designed as a broad mission to monitor change in three main areas: 1) ice sheets and sea level, 2) ecosystem structure and biomass, and 3) geohazards and solid earth deformation. To meet these objectives, both optical and radar measurements are needed. First, an L-band polarimetric synthetic aperture radar is needed to provide a dense, two-dimensional planometric grid image of the biomass/ecosystem structure. Second, a multi-beam profiling LiDAR (Light Detection And Ranging) is required to provide a vertical structure of the ecosystem canopy by looking at reflectivity as a function of height. And finally, a repeat-pass InSAR capability would allow for time-lapse measurements of ground motion with accuracies down to the centimeter and sometimes millimeter – essentially providing geodetic imaging from space. As originally designed, the SAR and InSAR instrumentation would fly on a Sun-synchronous, polar-orbiting satellite at 97 degree inclination with 6am and 6pm nodes, providing 220 kilometer-wide swath images per pass and complete imaging coverage of the Earth every 13 days.

Rosen explained that the design of DESDynI was very well suited for geohazards mapping, noting for example that the mission’s three-dimensional maps of ground motion would provide a unique tool to aid in the understanding of changes in fault stress and where future earthquakes might occur based on that information.

Up until February, the mission was scheduled to launch in 2017 and operate for three years. The total lifecycle cost for both satellites (LiDAR and SAR/InSAR) was budgeted at \$1.3 billion. (Barring damage to the mission hardware and if approved by senior review, the mission also had the capacity to operate for an additional three to four more years). In mid-February 2011, the President’s FY2012 Budget proposal reduced the scope of the DESDynI mission. Further work by NASA on the LiDAR portion of the mission was cancelled, and NASA was directed to cut back the cost of the SAR/InSAR portion. Rosen stated that JPL is currently leading the effort at NASA to find less expensive alternatives for implementing the SAR/InSAR portion.

Cost-saving options for DESDynI include 1) reducing the SAR/InSAR mission scope, and 2) sharing costs through partnerships. Some of the science objectives could be eliminated or reduced. Reducing the size of the swath and/or imaging frequency would lower cost but also reduce the mission’s utility for hazards and response. NASA is also currently talking to potential international partners. Rosen stated that NASA would be interested in domestic partnerships as well, which he noted was part of his motivation for speaking with the SDR.

## **VI. Report from the Co-Chairs and Approval of Minutes**

The July meeting minutes were approved with no changes.

SDR Co-Chair Dennis Wenger (NSF) announced that there will be a “Showcase of NSF-funded Hazard Research” taking place from 10:30am-2:00pm on Wednesday, September 7, on Capitol Hill in the Hart Senate Office Building, Room 902. As an alternative option, the research will also be exhibited on the preceding afternoon, Tuesday, September 6, from 2:00pm-4:00pm at the National Science Foundation. Additional information about the events will be emailed to SDR members once it is received from NSF.

InterAction will be hosting an event on disaster risk reduction and famine in the Horn of Africa on morning of October 13<sup>th</sup> in Washington, DC. InterAction has also suggested that SDR members join InterAction for a luncheon on October 13<sup>th</sup> following the event. Additional information on these events will be emailed to SDR members as it becomes available.

The National Academy of Sciences will be holding “A Summit for Managing Extreme Events”, September 7-9, in Washington, DC. SDR Co-Chair David Applegate is scheduled to attend the event. The President’s Science Advisor, Dr. John Holdren, will be addressing attendees on the afternoon of September 7<sup>th</sup>.

The U.S. Global Change Research Program has reached out to the SDR to assist with the Final Government Distribution review of the International Panel on Climate Change (IPCC) Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX). The SDR will be assembling a small volunteer task force, led by SDR Co-Chair Margaret Davidson (NOAA), to review and provide comments on the report’s Summary for Policymakers by September 23<sup>rd</sup>. Specifically, the task force will review the Summary for Policymakers line-by-line for accuracy and reflection of the current state of knowledge and for how well it tracks the underlying chapters of the overall text. The overall text itself was reviewed during a separate process last spring, whereas the current effort represents an opportunity to ensure that the influential summary section is robust and accurate. To volunteer or to nominate an expert/experts from within you agency, contact the SDR Secretariat ([ross.faith@mantech.com](mailto:ross.faith@mantech.com)).

Applegate noted that on September 8<sup>th</sup> the House Science and Technology Committee will be holding a hearing on the potential interference to the GPS signal by the LightSquared wireless broadband effort. The Federal Communications Commission is currently considering a waiver that would allow LightSquared to operate in the part of the spectrum directly adjacent to the GPS. Initial tests indicate that there would be some significant impacts to the GPS signal with broadband operating in such close proximity on the spectrum. Several agencies are scheduled to testify at the hearings, including the USGS, NOAA, and others.

The National Level Exercise 2011 (NLE 2011) National Recovery Tabletop Exercise will be held September 27-29, in Washington, DC. Applegate encouraged agencies that were involved in the response portion of NLE 2011 to consider engaging in the recovery exercise as well. For more information, contact the SDR Secretariat ([ross.faith@mantech.com](mailto:ross.faith@mantech.com)).

## **VII. Report from the NSTC Liaison**

OSTP Liaison Tammy Dickinson encouraged SDR members to pass along issues, concerns, and information from their agency to OSTP.

Dickinson announced that yesterday the President issued a proclamation declaring September as National Preparedness Month. Sandra Knight (DHS) stated that the Department of Homeland Security is currently planning several activities surrounding National Preparedness Month. More information can be found at [Ready.gov](http://Ready.gov).

## VIII. Adjournment

The meeting adjourned at 11:57 a.m.

## IX. Future Meetings

In 2011, the SDR will meet from 10:00 a.m. to 12:00 p.m. on the first Thursday of each month in the Lincoln Room of the White House Conference Center. The meeting dates are:

Thursday, October 6, 2011

Thursday, November 3, 2011

Thursday, December 1, 2011

## X. Agenda Items and Other Communications with the Subcommittee

Please send proposed agenda items and any other items intended for distribution to the full Subcommittee to Ross Faith (ross.faith@mantech.com).

## XI. Contact Information

### SDR Leadership

David Applegate	Co-Chair	703-648-6714	applegate@usgs.gov
Margaret Davidson	Co-Chair	843-740-1220	margaret.davidson@noaa.gov
Dennis Wenger	Co-Chair	703-292-8606	dwenger@nsf.gov
Tamara Dickinson	NSTC Liaison	202-456-6105	tdickinson@ostp.eop.gov

### Secretariat

Ross Faith	703-388-0308	Ross.Faith@ManTech.com
Barbara Haines-Parmelee	703-388-0309	Barbara.Haines-Parmelee@ManTech.com

## XII. Summary of September Actions

Action	Lead	By When
Contact the Secretariat (ross.faith@mantech.com) to volunteer or nominate agency colleagues to review the IPCC SREX Summary for Policy Makers.	SDR Members and Federal Colleagues	September 12, 2011
Send the Secretariat (ross.faith@mantech.com) ideas and examples of agency programs, activities, capabilities, partnerships and materials that would allow the U.S. Government to showcase its work on disaster management, and to illustrate the importance of that work for sustainable development at the Rio+20 Sustainability Conference.	SDR Members and Federal Colleagues	September 15, 2011
Contact Tammy Dickinson (tdickinson@ostp.eop.gov) to pass along issues, concerns, and information from your agency to the White House Office of Science and Technology Policy	SDR Members	Standing
Let Tammy Dickinson (tdickinson@ostp.eop.gov) know if it would be helpful for OSTP to issue a letter to your Department requesting new (or re-affirmed) designation of representatives. Ideas for other entities that should be represented on the SDR are also welcome.	SDR Members	ASAP
Contact Dennis Wenger (dwenger@nsf.gov) if your agency is able to provide funding support to the University of Colorado-Boulder's Natural Hazards Center.	SDR Members and Federal colleagues	ASAP

Action	Lead	By When
Contact the Secretariat (ross.faith@mantech.com) if you are interested in participating in a working group that will be drafting a lessons learned report covering the earthquakes and tsunami in Japan, New Zealand, Chile, and Haiti.	SDR Members and Federal colleagues	ASAP
Contact Dave (applegate@usgs.gov) or Ross (ross.faith@mantech.com) for information on how to tie into the National Level Exercise 2011 calendar of events.	SDR Members and Federal colleagues	ASAP
Let the Secretariat (ross.faith@mantech.com) know if you are interested in participating in an ad hoc SDR International Working Group.	SDR Members and Federal colleagues	Standing
Send Sezin Tokar (stokar@usaid.gov) your ".gov" e-mail address to receive USG-only updates from USAID on global disaster response activities.	SDR Members and Federal colleagues	Standing
Contact Ross (ross.faith@mantech.com) to receive copies of the Grand Challenges for Disaster Reduction Implementation Plan packets or CD.	SDR Members	Standing
Let Dave (applegate@usgs.gov) or Ross (ross.faith@mantech.com) know how you use the implementation plans, including when you link to the plans from your agency websites. Send Ross or Dave additional distribution suggestions, including relevant contact information.	SDR Members	Standing