Discussion Draft

Meeting Minutes of the Subcommittee on Disaster Reduction

7 May 2009, 10:00 a.m. to 12:00 p.m., Department of Commerce, Room 1414

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

Officers

David Applegate (USGS), Chair
Dennis Wenger (NSF), Vice-Chair
Margaret Davidson (NOAA)

NSTC Liaison

Jonathan Kolak (OSTP)

Designated Representatives

BLM *Edwin Roberson*
Ronald Huntsinger
CDC *Mark Keim*
DHS Bruce Davis
DHS/FEMA Deborah Ingram
DHS/USCG *Steven Cohen*
DOD *Al Johnson*
DOE *Patricia Hoffman*
DOT Kelly Leone
Sheila Duwadi
Tim Schmidt
EOP/OSTP Jonathan Kolak
EDA *Audrey Clarke*
EPA *Peter Jutro*
Stephen Clark
FERC *Berne Mosley*
HUD *David Engel*
NASA *Andrea Donnellan*
NGA *Stephen Homeyer*
NGB *Daniel Bochicchio*
NIH Allen Dearry
NIST William Grosshandler
Jack Hayes
NOAA John Gaynor
NSF Dennis Wenger
OPHS *Sven Rodenbeck*
State Cari Enav
Fernando Echavarria
USACE *Barbara J. Sotirin*
Dimitra Syriopoulou
USAID Sezin Tokar
USDA TBD
USFS *Carlos Rodriguez-Franco*
USGS David Applegate
Paula Gori

Other Attendees

DHS/FEMA Candice Abinanti
EPA Brendan Doyle
NGA Dana Miller
NGB Lisa Burg
NOAA Tom Graziano
Maria Honeycutt
Mike Hudson
Secretariat Ross Faith
Barbara Haines-Parmele
State Nellie Moore
USGS John Eichelberger

Agenda

10:00 Welcome and Introductions
10:05 Approval of March 31st Meeting Minutes
10:10 Report from the Chair
10:25 Report from the Vice-Chairs
10:40 Report from the NSTC Liaison
10:55 Presentation: Red River Flood
11:25 Presentation: Mount Redoubt Eruption
11:55 Close and Next Actions

Handouts

- Agenda
- March 31st Meeting Minutes
- Coastal Group Kickoff Meeting Announcement
- Opportunity to Support SDR FY2010 Letter
- Red River Flood Presentation Handout

Discussion Draft

I. Call to Order and Introductions

Subcommittee on Disaster Reduction (SDR) Chair David Applegate (USGS) called the meeting to order at 10:04 a.m.

II. Approval of Meeting Minutes

The March 31st Meeting Minutes were approved with no abstentions or oppositions.

III. Report from the Chair

Applegate opened his report by stating that an ad hoc team of experts will begin drafting a storm surge/coastal inundation working group Terms of Reference on Thursday, May 14th. He welcomed participation from all SDR agencies.

A Delegation has been assembled to represent the United States at the UN International Strategy for Disaster Reduction (ISDR) Global Platform on Disaster Risk Reduction, which is scheduled to convene June 16th—19th in Geneva. The SDR is the National Platform for Disaster Risk Reduction, and accepting a request from the Department of State, Applegate will serve as Head of Delegation. Nine others will participate as Delegation Members, including Mark Keim and Mollie Mahany (CDC); David Passey (FEMA detailed to State); Paul Scholz (NOAA); Dennis Wenger (NSF); Lisa Brodey, Cari Enav, and Nance Kyloh (State); and Peter Morris (USAID). The Delegation held a quick tag up on May 7th (prior to the SDR Meeting) and plans to meet again in the near future to further prepare. Dennis Wenger also will be attending the Global Platform as a member of the ISDR Science and Technology Advisory Panel.

In autumn, 2008, the SDR tapped experts to answer an ISDR Joint Early Warning Questionnaire. The task was completed but the survey has not been transmitted to the ISDR Secretariat. The decision of whether to do so currently rests with Office of Science and Technology Policy (OSTP). Jon Kolak (OSTP) stated that he will look into the matter.

Applegate reminded Members about the 2009 Annual Hazards Research and Applications Workshop, July 15th—18th, 2009, at the Omni Interlocken Resort, just outside Boulder, Colorado. Members should inform Dave or the Secretariat (ewallace@grs-solutions.com) if they are interested in attending.

IV. Report from the Vice-Chairs

Vice-Chair Dennis Wenger (NOAA) decided to forgo his report to allow more time for presentations on the Red River Flood and Mount Redoubt Eruption, scheduled for the second hour of the meeting.

V. Report from the NSTC Liaison

NSTC Liaison Jon Kolak (OSTP) reported that representatives from FEMA, FHWA, NIST, NOAA, and the NSF had diligently labored over the past few months to draft a "National Windstorm Impact Reduction Program (NWIRP) Biennial Report to Congress for Fiscal Years 2007 and 2008." Kolak thanked those involved and stated that the report will soon be circulated to the SDR for clearance, which will constitute official agency review. The period for consideration is expected to last roughly two weeks, and Kolak asked Members to send their concurrence and/or comments to the SDR Secretariat within the specified timeframe. He noted that Members could expect to receive an email with more details next week.

Applegate also thanked the agencies involved and reinforced the need for SDR Members to move quickly in clearing/commenting on the document.

Maria Honeycutt (NOAA) stated that there has been talk in Congress of bringing hurricane legislation in line with NWIRP. She stated that she will continue to follow developments on Capitol Hill and is interested to see what happens.

Kolak announced that OSTP has established an interim NSTC clearance process to work through the backlog of documents and reports which piled up during the transition. He expected to have a status update on the *Grand Challenges for Disaster Reduction Implementation Plan: Space Weather* at the June 4th SDR meeting.

On April 29th the Senate confirmed Sherburne (Shere) Abbott as OSTP Associate Director for Environment. Abbott comes to the Administration from the University of Texas at Austin, where she served as a faculty member and Director of the Center for Science and Practice of Sustainability in the Office of the Executive Vice President and Provost. Previously, she served as Chief International Officer of the American Association for the Advancement of Science (AAAS), where she also established and directed the Center for Science, Innovation and Sustainable Development. Prior to her work at with AAAS, she consulted on environmental science and sustainable development for private foundations, the World Bank and Brookings Institution, and other non-governmental organizations. Until 2001, Abbott worked at the National Academies' National Research Council for 17 years, serving in several capacities.

Kolak reported that John Holdren (OSTP Director and the President's Science Advisor) has held recent media interviews in which he stated that the NSTC will handle energy as a cross-cutting issue requiring attention from both the Committee on Environment and Natural Resources (CENR) and the Committee on Technology. A full transcript of Holdren's April 8th interview with *Science Insider* is available at http://blogs.sciencemag.org/scienceinsider/2009/04/in-full-intervi.html.

Turning to developments in Earthquake research, Kolak asked about progress in the San Andreas Fault Observatory at Depth (SAFOD) program.

SAFOD is funded by the National Science Foundation (NSF) as part of an ambitious, multi-faceted initiative called EarthScope. Building on more than 15 years of experience from the Parkfield Earthquake Experiment, as well as data gleaned from a previous pilot project, in 2004 the NSF and U.S. Geological Survey (USGS) began drilling a deep hole into the San Andreas Fault in order to install scientific instruments two to three kilometers beneath the Earth's surface. The SAFOD borehole starts west of the San Andreas Fault and then angles into and across the fault using advanced directional-drilling technology developed by the petroleum industry. The goal is to reach the fault's east side in order to retrieve relatively undisturbed rock and fluid for laboratory analyses and to install seismic instruments. It is hoped that SAFOD's long-term monitoring activities will include detailed seismological observations of small to moderate earthquakes and continuous measurements of earthquake cycle parameters (i.e., rock deformation).

Applegate relayed his understanding that the SAFOD's goal of drilling across this major, active fault continues to be a challenge. He indicated that he would provide a future update.

VI. Presentation: Red River Flood

Applegate introduced Mike Hudson (NOAA/NWS), who was in Fargo, North Dakota, from March 26th – April 2nd to provide information and expertise to local officials during the first crest of the Red River Flood. Hudson and colleague Greg Gust (NOAA/NWS) worked with and briefed several key players, including Fargo Mayor Dennis Walaker and Moorhead Mayor Mark Voxland; North Dakota and Minnesota Senators and Representatives; the National Guard, FEMA, DHS, and the Salvation

Army; and numerous national media outlets which were in town to cover the story. During his 13 year career at the National Weather Service (NWS), Hudson has been involved in numerous strategic planning and service evolution concepts. He currently serves as the Chief Operating Officer for the National Weather Service Office/Central Region Headquarters in Kansas City, MO.

Hudson thanked Members for the opportunity to speak to them about the 2009 Red River Flood. He noted that NOAA and the National Weather Service knew as earlier as September to expect major spring flooding in the Midwest. On March 11th the NWS issued a forecast which emphasized a 100 percent chance of major flooding along the Red River and a 25 percent chance that the river would set a record height at Fargo. On March 28th the Red River in fact reached a height of 40.82 feet at Fargo, surpassing the previous record of 40.1 feet, set in 1897.

The city of Fargo is home to 15 to 20 percent of North Dakota residents, and by extension, serious flooding of the city implies major social and economic disruptions to the State. Fargo residents produce some 30 percent of the State's gross domestic product (GDP); the city itself hosts vital telecommunications infrastructure for the region and serves as a major transportation thoroughfare for both automotive and rail traffic. Record spring flooding did occur in rural areas along the Sheyenne River to the south and west of the Fargo, and the NWS was able to provide assistance to these areas remotely. However, the heightened vulnerability of infrastructure, commerce and concentrated population bases in Fargo and Moorhead (Minnesota) led the NWS to focus attention and resources on these and other Midwestern cities.

The Fargo/Cass County Emergency Operations Center (EOC) was located on the west side of Fargo. Routine meetings and press conferences for Fargo were held in City Hall, which was near the Red River and about 8 miles from the EOC. Moorhead, Fargo's sister city (just across the river in Minnesota), held its own flood response coordination meetings. Hudson noted that geopolitical boundaries made the NWS effort more complicated and challenging. In working to reduce flood impacts in the greater Fargo-Moorhead metropolitan area, Hudson stated that he and NWS colleagues had to coordinate with two separate municipalities, two FEMA regions, two National Guards, and two states.

All together, NOAA employees staffed 8 locations over 36 days, including 3 State Emergency Operations Centers, the FEMA Region VIII central office in Denver, and 4 local EOC's in the Fargo-Moorhead area.

Hudson reported that the NWS is guided by a strategic vision to provide Federal expertise and decision support services in forecasting and analysis of weather, water and climate events. By extension and in step with *Grand Challenge #1*, the NWS works to "provide hazard and disaster information where and when it is needed."

As part of his presentation, Hudson showed Members a graphic from the March 11th flood forecast for Fargo to underscore both the complexity of conveying flood probabilities to city officials as well as the value of employing NWS personnel to translate this information into layman's terms. The graphic showed that in a "typical" year there is a 2 percent chance the Red River will reach 38 feet at Fargo (the height of the city's permanent levies). However, on March 11th the NWS determined there was a *60 percent* chance that the river would reach this mark within a few weeks. To impress this significant increase in risk upon city officials, NWS personnel conveyed the chance of major flooding as 30 times higher than what Fargo residents had come to expect over the years. More than a mere issue of semantics, Hudson stated that altering the way risk is portrayed can paint a more realistic, appropriately grimmer picture and thereby compel city officials to act. Hudson identified

communication of message as an area for improvement, noting that terminology (i.e., outlook vs. forecast; probabilistic vs. deterministic) can create confusion.

Roughly one week after the NWS issued its March 11th probabilistic forecast, it delivered a "deterministic" forecast warning Fargo residents that the Red River would in all certainty reach heights of 37 to 40 feet sometime between March 28th and April 1st. These deterministic figures corresponded to the 50th percentile of the probabilistic forecast from the week before, underscoring the accuracy of the initial computations. However, Hudson noted that in the final days before the first crest, there was some uncertainty over just how high the river would ultimately rise. To decision makers in Fargo and Moorhead, every foot counted. Hudson found that his role became "purveyor of the uncertain," as the river rose beyond its previous record, modeling accuracy decreased, and forecasters found themselves in "uncharted territory." From his experience in Fargo, Hudson observed that especially in times of increased uncertainty, face-to-face communication is critical in projecting confidence (or lack thereof) in forecasts, generating understanding on all sides, and keeping a team together.

Hudson compared and contrasted Fargo's 2009 high water experience with the 1997 Red River Flood which devastated Grand Forks, North Dakota. In 1997, with the internet and digital data collection in their infancies, sophisticated information and options for communicating were quite limited by today's standards. Hudson laid out the following comparison:

1997 – Grand Forks	**2009 – Fargo**
River gage data latency ~ 12 minutes	River gage data latency ~ 2 seconds
Average DCP data refresh ~ 4 hours	Average DCP data refresh ~ 1 hour
National network ~ 6000 locations	National network ~ 13,800 locations
Daily data values processed ~ 400 KB	Daily data values processed ~ 2.5 MB
Slow, limited communications links	Multiple communications networks
Limited access to collaborating agencies	Extensive access to collaborating agencies

Dennis Wenger asked about the steps that the city of Grand Forks has taken over the intervening 12 years to protect itself.

Tom Graziano (NOAA/NWS) and others commented that the flood mitigation measures taken by Grand Forks since 1997 was an unsung success story. After the 1997 flood, Grand Forks erected permanent flood barriers, which protect the city up to 60 feet, and as a result, the city was in no real danger during the 2009 spring flood season. Grand Forks can now serve as a resource to the region during floods, rather than working day and night to protect its own residents.

Deborah Ingram (FEMA) stated that several Federal, State, and local stakeholders came together around the 2007 timeframe and produced a brochure identifying the mitigation efforts taken by cities in North Dakota since the 1997 Red River Flood. Members interested in receiving the FEMA brochure electronically should contact the SDR Secretariat (rfaith@grs-solutions.com).

Hudson noted that while challenging and sleep-depriving, responding to the 2009 Red River Flood had been one of the most rewarding experiences in his career to-date with the National Weather Service.

David Applegate thanked Mike Hudson for his interesting and timely presentation to the SDR.

VII. Presentation: Mount Redoubt Eruption

Applegate then introduced John Eichelberger to the group. Dr. Eichelberger is the USGS Volcano Hazards Program Coordinator and has more than 35 years of experience in the volcanology field. Before coming to the USGS, he was most recently chair of the University of Alaska Fairbanks Department of Geology and Geophysics as well as professor of volcanology and coordinating scientist with the Alaska Volcano Observatory. Eichelberger has led research and teaching projects on Russia's Kamchatka Peninsula and has helped bring roughly 200 American and Russian students together on the slopes of volcanoes in Alaska and Kamchatka. He graduated in 1974 from Stanford University with a doctorate in geology and in 1971 earned bachelor's and master's degrees in Earth sciences from the Massachusetts Institute of Technology.

Eichelberger began his presentation by comparing volcanic eruptions to floods. He noted that while scientists often predict eruptions in advance (despite false-positive signals), eruptions can nevertheless last for decades, unlike floods.

Mount Redoubt is an active and currently-erupting stratovolcano in Alaska's Aleutian Range. The Alaska Volcano Observatory currently rates Redoubt as Aviation Alert Level Orange and Volcano Alert Level Watch. It is located in the Chigmit Mountains (a subrange of the Aleutians), west of Cook Inlet, in the Kenai Peninsula Borough about 110 miles southwest of Anchorage. Active for millennia, Mount Redoubt has erupted five times since 1900: in 1902, 1922, 1966, 1989, and 2009. The ash fallout from the 1989 eruption covered an area of about 7,700 sq. miles, and the eruption itself is notable for being the first ever volcanic eruption to be successfully predicted by the method of long-period seismic events developed by Swiss/American volcanologist Bernard Chouet.

On January 30, 2009, scientists from the Alaska Volcano Observatory (AVO) warned that an eruption was imminent. By January 31, volcanic earthquakes increased to several per hour, and a large hole in the glacier on the side of the mountain was spotted. Scientists began to monitor seismic data from the mountain twenty-four hours a day in an effort to warn people in nearby communities.

Seismic activity at Redoubt intensified once more on March 15th. An AVO observation flight reported that a steam and ash plume rose as high as 15,000 feet above sea level and produced minor ash fall on the upper south flank of Redoubt. Later reports were that the plume was then mainly steam. Based on this change in activity, AVO increased the level of concern and alert level to ORANGE/WATCH.

Providing Members with a brief course in "Volcanology-101," Eichelberger explained that volcanoes erupt through a process of water melt, buoyant rise, and bubble growth (boiling). Erupting volcanoes are capable of emitting ash clouds that can reach 100,000 feet into the atmosphere, which can pose a threat to air travel depending on a volcano's location and which direction the wind pushes the ash cloud. Eichelberger explained that a volcanic plum is like a huge thundercloud, but laden with rock particles that can cripple a jet airplane. On December 1989, KLM Flight 867 (Boeing 747) flew into a 45,000 ft ash cloud emitted by Mount Redoubt, lost power to all 4 engines, and only narrowly escaped disaster when the pilot was able to restart the engines within a minute of impact.

When Redoubt began to stir again this year, air traffic over Alaska was significantly affected. As the North Pacific air corridor is one of the busiest in the world, thousands of flight paths have been rerouted to avoid the ash cloud. Before the eruption, Anchorage International Airport was a major way-point for FedEx aircraft and overall the 3rd busiest cargo hub in the world. On April 4th the town of Homer, AK was covered in a blanket of ash.

Active volcanoes can also threaten local area populations by unleashing pyroclastic flows and lahars (mud flows). On April 4th Redoubt generated a lahar that came perilously close to damaging/destroying the Drift River Oil Terminal. The oil has since been removed from the terminal. Eichelberger noted that while geologists cannot predict exactly how much longer Redoubt will continue to erupt, historical trends and data suggest that the eruption will likely go on for a half year. If the dome becomes large enough, it will become top-heavy, unstable, and collapse under its own weight, resulting in a pyroclastic flow. Pyroclastic flows are also capable of melting surrounding snow and ice to create lahars.

Eichelberger offered a brief synopsis of the anatomy and impact of this ongoing hazard:

- Unrest detected early; eruption warning issued 2 months prior to first event.
- Eruption onset was detected immediately.
- Anticipated scenario and impacts were correct.
- No encounters with ash clouds by aircraft.
- Several hundred flights cancelled or diverted.
- No oil spillage- tanks intact but dikes at design limit.
- Reduction in oil production in Cook Inlet; layoffs probable.
- Reduction in cargo flights; layoffs by air cargo industry; revenue loss to airport.

Eichelberger summarized the communications tools utilized by the USGS Volcano Hazards Program:
1. **Calldown:** Emergency response agencies are notified of unrest by telephone and electronically to mitigate hazards to communities at risk.
2. **Email reports and notifications:** Emergency notifications and daily-to-weekly status reports and activity updates are provided to all information public and private users who wish want it.
3. **Websites:** Each observatory, and the overall program, has a website. Observatory websites provide all warnings and updates together with real-time monitoring data, webcam views, and background information.
4. **Other communication techniques:** Eruption response plans, eruption scenario exercises, workshops, hazard maps, fact sheets.
5. **Scientific output:** To advance the field of volcanology and facilitate discussion within the broader scientific community, the program publishes about 75 peer-reviewed articles per year in internationally available journals.
6. **International outreach:** The Volcano Disaster Assistance Program (VDAP) responds to countries requesting help in dealing with volcanic crises. Notable responses have been undertaken in South and Central America, the Philippines, and Indonesia. The Alaska Volcano Observatory collaborates closely with volcanologists in the Russian Far East to mitigate the hazard of ash clouds to trans-Pacific flights.

More information on Mount Redoubt and the USGS Volcano Hazards Program is available from http://volcanoes.usgs.gov/. Also see the Alaska Volcano Observatory website http://www.avo.alaska.edu/.

David Applegate thanked Eichelberger for his expert briefing on Mount Redoubt. He then introduced Scott Deitchman, Assistant Secretary for Emergency Preparedness in the National Center for Environmental Health at the Centers for Disease Control (CDC).

Deitchman updated Members about recent developments related to the H1N1 “Swine Flu” outbreak. He stated that according to the World Health Organization (WHO) 2,033 cases had been reported in 23 countries. In the U.S., 896 cases and two deaths had been confirmed in 41 States as of May 7th.

Deitchman reported that daily counts of new Swine Flu cases seemed to be going down and that the virus seemed to be loosing steam. He noted that there is a risk that the virus could return in the fall in conjunction with the regular seasonal flu. Deitchman stated that people make excellent mixing bowls for viruses and noted that interaction between H1N1 and the seasonal flu could result in a more infectious and dangerous strain of the flu.

Deitchman raised the issue of pandemics coinciding with other hazards and suggested that the need to prepare for this type of cascading disaster. If people follow guidelines for responding to natural hazards (i.e., hurricane), their movement and congregation at shelters, motels, etc. may promote the spread of an ongoing pandemic.

Sezin Tokar informed members that the USAID Response Management Team (RMT) for Pandemic Influenza issues two daily products: 1) USAID Pandemic Influenza Humanitarian Update (for U.S. Government only), 2) Pandemic Influenza Fact Sheet (for the public). To receive the government only update, please send a request to rmtpi_inc@ofda.gov and provide a ".gov" e-mail address. (The public fact sheet may also be requested at this time). The fact sheet is also available online through http://www.usaid.gov.

Tokar also asked that Members please inform her about any other international activities and/or collaborations by Federal agencies which are not captured by the fact sheet or update. Please contact RMT External Liaison Coordinator at 202-712-0031 to provide USAID with any information you have. (Remember that USAID only coordinates USG response internationally and these products are not intended for domestic pandemic influenza response). Members are invited to contact Sezin Tokar (stokar@usaid.gov) with any question.

VIII. Adjournment
The meeting adjourned at 12:01 p.m.

IX. Future Meetings
The SDR meets on the first or second Thursday of every month from 10 a.m. to 12 p.m. unless otherwise noted.

June 4, 2009	September 3, 2009	November 5, 2009
July 2, 2009	October 1, 2009	December 3, 2009
August 6, 2009		

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 Emily Wallace (ewallace@grs-solutions.com).

XI. Contact Information SDR Leadership
David Applegate, Chair, 703-648-6714, applegate@usgs.gov
Margaret Davidson, Vice Chair, 843-740-1220, Margaret.davidson@noaa.gov
Dennis Wenger, Vice Chair, 703-292-8606, dwenger@nsf.gov
Jon Kolak, NSTC Liaison, 202-456-6081, jkolak@ostp.eop.gov

Secretariat
Emily Wallace, 703-560-7448, ewallace@grs-solutions.com

XII. Summary of March Actions

Action	Lead	By When
Email rmtpi_inc@ofda.gov to receive government-only USAID Influenza updates and/or public fact sheets.	SDR Members	Standing
Call the RMT External Liaison Coordinator (202-712-0031) to advise USAID of any Influenza-related, Federal international activity not captured by the updates or fact sheets.	SDR Members	Standing
Members interested in receiving an electronic copy of the FEMA Red River mitigation brochure should contact the SDR Secretariat (rfaith@grs-solutions.com).	SDR Members	Standing
Let Emily know if you are interested in attending the Annual Hazards Workshop in Boulder (ewallace@grs-solutions.com).	SDR Members	ASAP
Send a summary of any agency activity related to ISDR to Dennis Wenger (dwenger@nsf.gov).	SDR Members	Standing
SDR financial support: Contact Dave (applegate@usgs.gov) if you would like a personalized support request letter to your agency.	SDR Members	Standing
Contact Emily (ewallace@grs-solutions.com) to receive copies of the Grand Challenges for Disaster Reduction Implementation Plan packets or CD.	SDR Members	Standing
Let Emily or Dave know how you use the implementation plans, including when you link to the plans from your agency websites.	SDR Members	Standing
Send Emily or Dave additional distribution suggestions, including relevant contact information.	SDR Members	Standing
Coordinate a CODE briefing to the SDR.	Secretariat	Spring 2009