Meeting Minutes of the Subcommittee on Disaster Reduction

3 June 2010, 10:00 a.m. to 12:00 p.m., White House Conference Center Lincoln Room

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

Officers

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

NSTC Liaison

Sarah Stewart Johnson (OSTP)

Designated Representatives

BLM *Edwin Roberson*
Daniel Lechefsky
CDC *Mark Keim*
DHS Bruce Davis (T)
DHS/FEMA *Deborah Ingram*
DHS/USCG *Steven Cohen*
DOD *Al Johnson*
DOE *Patricia Hoffman*
DOT *Kelly Leone*
Sheila Duwadi
Tim Schmidt
EOP/OSTP Sarah Stewart Johnson
EDA *Audrey Clarke*
EPA Peter Jutro
Stephen Clark
FERC *Pamela Romano*
HUD *David Engel*
NASA *Andrea Donnellan*
NGA *Stephen Homeyer*
Christy Crosiar
NGB *Daniel Bochicchio*
NIH *Allen Dearry*
NIST William Grosshandler
NOAA *Margaret Davidson*
Roger Pierce
NSF Dennis Wenger
OPHS Sven Rodenbeck (T)
State *Cari Enav*
Fernando Echavarria
USACE Steven Cary
Dimitra Syriopoulou
USAID *Sezin Tokar*
USDA *TBD*
USFS *Carlos Rodriguez-Franco*
USGS Paula Gori (T)

Other Attendees

BLM Nora Devoe
EPA Marcy Rockman (AAAS)
FEMA Stephen Carruth
NASA Michael Goodman
NOAA Nell Codner
Maria Honeycutt
NSF Robert O'Connor
OSTP Kate Moran (T)
State Nina Rosenberg
Secretariat Kate Cantrell
Ross Faith

Agenda

10:00 Welcome and Introductions
10:05 Approval of May Meeting Minutes
10:10 Report from the Chair
10:20 Report from the Vice-Chairs
10:30 Report from the NSTC Liaison
10:40 Agency Briefings on the Oil Spill Response
11:55 Close and Next Actions

Handouts

- Agenda
- May Meeting Minutes
- Disasters Roundtable Workshop Announcement
- Deepwater Integrated Service Team Mission Overview
- SDR Calling Card

I. Call to Order and Introductions

Subcommittee on Disaster Reduction (SDR) Chair David Applegate (USGS) called the meeting to order at 10:03 a.m. and the participants introduced themselves.

II. Approval of May Meeting Minutes

The April Meeting Minutes were approved with no changes.

III. Report from the Chair

Applegate began the Report from the Chair by recapping the Understanding Risk conference, which began on Tuesday and was wrapping up at the World Bank as he spoke. The conference was being closed by Margareta Wahlstrom of the UN International Strategy for Disaster Reduction (ISDR), which was sponsoring the event along with the Global Facility for Disaster Reduction and Recovery (GFDRR) and other international organizations. Applegate noted that a related meeting on the Global Earthquake Model (GEM) was scheduled to start that afternoon. GEM was established through the Organization for Economic Cooperation and Development (OECD) Global Science Forum to update the decade-old global earthquake hazards assessment and assess risk as well.

The Disasters Roundtable Workshop "From Reality 2010 to Vision 2020: Translating Remotely Sensed Data to Assets, Exposure, Damage, and Losses" is scheduled to be held on July 8 at the Keck Center (500 Fifth Street, NW – Room 100). The workshop will seek to identify ways to improve the flow, understanding, and utility of remotely sensed images and data before, during, and after disasters occur. Those interested can register at http://dels-old.nas.edu/dr/remotesensing.shtml.

Filling in for SDR Vice-Chair Margaret Davidson (NOAA), Ross Faith (SDR Secretariat) reported that the ad hoc SDR Coastal Inundation Working Group had been working diligently over the last two weeks to draft a short document outlining opportunities and gaps regarding federal capabilities in coastal inundation modeling. The working group had also compiled an inventory of the models currently used by the agencies to forecast inundation hazards and determine related risks. This effort has identified over 40 models, including federally funded university models, which are currently in use by federal agencies. The effort also led to recognition of a substantial need for better alignment of modeling activities among the involved agencies and for a federal clearinghouse for coastal inundation models and data. The document and the inventory will be sent to the Office of Science and Technology Policy (OSTP) on Friday. Applegate noted that whereas the original driver for the group was not the need for oil spill-oriented models, the current crisis underscores the need to see where the gaps stand.

Applegate drew Members' attention to the SDR calling card document in their meeting packets. The document will be put on the SDR website so Members can download, print and distribute it to raise awareness of the SDR's work.

Applegate stated that he would be meeting with Wahlstrom tomorrow. The ISDR has asked the U.S. to host a regional North American meeting on a mid-term regional assessment of implementation of the Hyogo Framework for Action. The Department of State is determining feasibility and timing.

IV. Report from the Vice-Chairs

SDR Vice-Chair Dennis Wenger (NSF) reported that Reid Basher recently retired from the ISDR due to the UN's mandatory retirement age of 62. Andrew Maskrey has assumed Basher's former portfolio, which includes coordinating the Global Assessment Report (GAR) and the Science and Technical Committee. Wenger stated that the GAR is somewhat independent of the regional review process noted above. Every two years ISDR puts out a GAR, released in conjunction with the

biennial global platform meeting. The GAR supposedly assesses vulnerability of every nation, but the required metrics are not in place. Studies have shown that this type of assessment is very difficult to accurately accomplish.

The process of drafting the GAR is now starting. It will be released at the Global Platform meeting in June 2011. In a departure from the past, the current GAR will shift away from science and focus more on policy and case studies (i.e., capacity building and effectiveness). It is expected to be more of a manual of how to reduce disaster risk. Sixteen consultants have been hired from about 11 nations to draft the report's chapters and case studies. Wenger is serving on the advisory board that will approve the report.

Applegate stated that there was a presentation at the Understanding Risk conference on the GAR. He noted that one of the challenges to accurately assessing risk reduction is the uptick in disasters reporting due partly to the internet, which needs to be factored out. He noted that the overall conclusion being reported is that there has been progress in reducing vulnerability, but exposure is increasing faster leading to an overall rise in risk.

V. Report from the NSTC Liaison

Sarah Stewart Johnson (OSTP) stated that the Office of Science and Technology Policy (OSTP) had approved the *Grand Challenges for Disaster Reduction Space Weather Implementation Plan.* The document will be printed and distributed on June 8th at the 2010 Space Weather Enterprise Forum.

The 2010 National Climate Adaptation Summit took place May 25-27. The current issue of *Nature* features an article on the summit (http://www.nature.com/news/2010/100602/full/465535a.html). The summit speeches are available at http://www.joss.ucar.edu/events/2010/ncas/webcast.html, and transcript of John Holdren's keynote address is located at: http://www.climatesciencewatch.org/index.php/csw/details/holdren-climate-adaptation-summit-remarks/.

The goal of the summit was to bring together experts for a discussion of needs, knowledge and roles. Local, state and regional stakeholders have been overshadowing federal efforts to date. Key successes and challenges were presented, and recommendations will be put into a report that is expected to come out in the coming weeks. It was articulated at the event that there is a need for dissemination of best practices as well as a one-stop clearinghouse for climate information. Another theme was that federal efforts on adaptation should be done in an integrated manner.

Applegate stated that Margaret Davidson was able to represent the SDR at the summit. In thinking about next steps, he suggested that the SDR's Coastal Inundation Working Group could be tapped to look at long-term research issues and linked up with JSOST.

Johnson reported that Kate Moran, who is heading up OSTP's involvement in the oil spill response, would join the meeting via telephone to be part of the presentations. Jerry Miller and Associate Director for Environment Shere Abbott are also actively involved. Johnson stated that the oil spill updates from agencies had been very helpful. OSTP will be looping up with OMB and discuss sharing the information. A key need for agency coordination is on baseline measurements of pre-oil infiltrated wetlands and other areas at risk. Johnson stated that more information would be helpful on the predictions for an especially strong hurricane season. Johnson will be meeting with Moran tomorrow to see what is the best way forward.

Micheal Goodman (NASA) commented that the NASA GRIP, NOAA IFEX, and NSF Predict hurricane field experiments will be taking place between August 15 and September 30. The experiments are separate but are being coordinated. Goodman noted that the experiments would be including the effects of the oil.

Johnson stated that suggestions for improving the deepwater horizon website were welcome (http://www.deepwaterhorizonresponse.com).

VI. Agency Briefings on Response to the Deepwater Horizon Oil Spill

Applegate thanked Members for providing information on their agencies' science and technology responses to the Deepwater Horizon oil spill in order to keep OSTP updated. He stated that in listening to recent presentations from scientists involved in the Exxon Valdez oil spill response, key lessons conveyed included the importance of recognizing and tracking impacts on multiple food chains, the need to think and plan in terms of decades, and the importance of obtaining baseline conditions and data, especially for the legal process.

National Oceanic and Atmospheric Administration Briefing

Nell Codner (NOAA) gave a status report on NOAA's response to the oil spill. (The following information was updated on June 8).

- Tar balls washing up on Petit Bois Island at MS/AL state line.
- 32% of the Gulf of Mexico EEZ closed for fishing
    - Decrease from 33% on June 5
- AL closed oyster beds in state waters from Dauphin Island to MS state line
- Models show alongshore currents becoming more westward over the next few days, inhibiting further eastward movement. However, coastal regions between Dauphin Island, AL and Freeport, FL may continue to experience shoreline contacts throughout this forecast period (until noon, June 10). To the west of the Delta, any remaining floating oil in this region could come ashore between Timbalier Bay and SW Pass, LA.
- Hurricane Season officially began June 1. Information on how hurricanes could affect the oil spill impacts and response efforts is at http://www.noaanews.noaa.gov/stories2010/PDFs/hurricanes_oil_factsheet.pdf.
- 93 NOAA staff deployed to the Gulf
- Providing scientific support to U.S. Coast Guard and Unified Command
- Predict oil fates and effects
- Identifying resources at risk
- Recommend appropriate clean-up methods.
- Oceanographic and atmospheric modeling and data support
- Marine & aviation incident weather forecasts
- Dr. Lubchenco spoke at June 3 Science Summit at Louisiana State University
- Subsurface oil plume monitoring
    - NOAA's independent analysis of water samples provided from the May 22-28 research mission of the University of South Florida's R/V *Weatherbird II* confirmed the presence of very low concentrations of sub-surface oil and PAHs (polycyclic aromatic hydrocarbons) at sampling depths ranging from 50 meters to 1,400 meters.
    - NOAA ships engaged
- Satellite imagery
    - Experimental imagery for spill trajectory forecasts
    - Data visualization
- Loop Current overflight surveys
- Coastal photography and mapping missions

- NOAA Seafood Inspection Program has been monitoring the safety of seafood from the Gulf.
- Marine mammals overflight surveys, beach strandings
- Sea turtle on-water surveys. NOAA is finding more strandings and more turtles affected with the oil. 300 verified, 248 dead, 22 stranded alive. It was noted that the higher numbers could be partially due to the efforts of looking more carefully.
- Shoreline Cleanup Assessment Teams. The need for specific expertise in science, geology and ecology has been communicated to national response teams. Help is needed with this. Contact Ken Barton(ken.barton@noaa.gov) if interested.
- Up-to-date information may be found each day at: http://response.restoration.noaa.gov.

Codner reported that oil plumes had been found at 2 of 5 sampled stations. She also reported that models forecasting whether the Loop Current would move the oil plumes varied. At present, NOAA has assessed the risk as minimal.

William Grosshandler (NIST) asked how the plumes form and what they consist of. Peter Jutro (EPA) asked if the risk estimate was public, how it had been created, and what kind of algorithms, assumptions and allowances were being used. Codner stated that she would find out the answers for the group.

Bruce Davis (DHS) stated that it would be helpful to know whether the oil slick was projected to hit land near Chandelier Sound since a field team was working in the area and that information would be helpful to optimize resources. Codner suggested calling onsite NOAA personnel who were creating the forecasts. Fernando Echevarria (State) asked whether NOAA's PowerPoint presentation was available for circulation. All presentations cleared for U.S. government distribution will be posted to the password-protected SDR Member website: http://www.sdr/formembers.html.

Environmental Protection Agency Briefing

Environmental Protection Agency Briefing Peter Jutro (EPA) gave an overview of EPA's current science and technology actions taken in response to the oil spill. The following information was updated subsequent to the meeting and is current as of June 8.

- EPA continues involvement through the Unified Command (UC) in Robert and Houma, Louisiana and Mobile, Alabama. EPA is also represented at the staging area in Venice, LA.
- EPA has more than 115 personnel (including contractor staff) deployed in the Gulf Region from EPA Regions and several other EPA components. EPA's Washington, D.C. headquarters Emergency Operation Center (EOC) is open at least 12 hours a day with over 25 personnel coordinating Agency oil spill response and research activities. A science cell has been set up within the EOC and is staffed whenever the Center is active in order to help coordinate the scientific component of EPA's oil-spill related activities.
- EPA is currently providing technical assistance; monitoring and sampling air quality in several venues in Louisiana, Mississippi, and Alabama; and sampling water quality and sediment nearshore and shoreline areas.
- The results and the interpretation of all data collected by EPA are being posted to www.epa.gov/bpspill as often as they are available.
- EPA worked with the states of LA, AL, MS and FL to develop a waste management program to address waste from the BP spill response. The USCG, in consultation with EPA and the states has approved the waste management plans. The waste management plans can be found on the EPA spill website and are updated as necessary.
- EPA is monitoring air quality for specific chemicals or compounds that may be in the air as a result of the oil spill or from the controlled burn to manage the spill at designated locations along the Gulf. EPA is monitoring the air in real-time for particulate matter and ozone as

well as taking more specific chemical measurements for volatile organic compounds that require lab analysis. Real-time monitoring lets EPA know of any immediate risks to human health and the environment, and tells us where the Agency needs to focus sampling efforts.

- EPA is utilizing its Trace Atmospheric Gas Analyzer (TAGA) buses and its Airborne Spectral Photometric Environmental Collection Technology (ASPECT) aircraft to provide air monitoring. The TAGA buses are capable of real-time sampling and analysis. They can detect chemicals at very low levels. TAGA also has specialized sampling equipment to use at remote locations and to measure air quality.
- Several portable air monitoring stations have been and continue to be used in the field; equipment includes but is not limited to: SUMMA canisters, Area RAE, and DataRAM.
- EPA selected three potential areas of impact and will conduct sampling and monitoring in these three areas. The areas, relative to the Gulf shoreline, are far off-shore (3 – 50 miles from shoreline), nearshore (1 - 3 miles of shoreline), and shoreline (due to variances along the Gulf Coast this includes beaches, bays, estuaries, and nearby populated areas, up to 1 mile of shoreline). To evaluate the large quantities of dispersants used, this sampling plan is designed to provide EPA with information on the effects of both crude oil and chemical dispersants on air, water and sediment quality.
- EPA provides the opportunity to subscribe to its oil spill updates at: http://service.govdelivery.com/service/subscribe.html?code=USAEPA_389
- 20 EPA emergency responders have been deployed to the field in MS, AL, and FL as Federal On-Scene Coordinator representatives to provide oversight of beach cleanup activities. In addition, 2 personnel have been deployed specifically to support shoreline cleanup and assessment efforts. In the meantime, EPA continues to be prepared for additional mission(s) in support of such shoreline cleanup and assessment efforts.

Dispersants

- When this crisis occurred, Coast Guard as the federal On-Scene Coordinator (FOSC) granted BP authorization to use a dispersant, from the NCP list, on oil present on the surface of the water in an effort to mitigate the impact of the spill. Use of the dispersant is part of a "pre-approval" process and plan for the Gulf of Mexico assembled by the Regional Response Team (RRT). This authorization included specific conditions to ensure the protection of the environment and the health of residents in affected areas. As of this time, BP is authorized to continue use of this dispersant on the surface of the water but at significantly reduced amounts. To ensure nearby residents are informed and protected, EPA is constantly monitoring air quality in the Gulf area using aircraft, as well as fixed and mobile air quality monitoring stations. Dispersant performance is also closely monitored through a detailed water sampling program.
- Through the RRT (co-chaired by the Coast Guard and EPA), BP was also authorized to conduct tests of a new approach to use this dispersant underwater, at the source of the leak. Tests were done to determine if the dispersant would be effective in breaking up the oil and helping to mitigate the surface impact of the oil leak. The effects of underwater dispersant use on the environment are still widely unknown, which is why EPA is monitoring the use of subsea dispersant application. EPA reserves the right to discontinue the use of this or any dispersant method if any negative impacts on the environment or public health outweigh the benefits.
- A monitoring and assessment directive issued to BP for subsea dispersant application was posted on the EPA BP oil spill website (see: www.epa.gov/bpspill).

Technology Data Calls

- EPA continues to maintain a website describing its role in the Spill (http://www.epa.gov/bpspill). The site includes links for submitting ideas and suggestions for containment and clean-up technology.
- Technology idea submissions are being received by EPA at: http://www.epa.gov/bpspill/techsolution.html. EPA is sharing submissions with the Coast Guard. Submissions concerning wellhead issues have been sent directly to BP.
- In addition, the Unified Command's website (www.deepwaterhorizonresponse.com) seeks suggestions from the public. EPA's oil spill website is linked to the Unified Command's website.
- EPA is also participating in the Interagency Alternative Technology Assessment Program – a cross government effort to more efficiently and responsively address and evaluate possible technology solutions for the oil spill response efforts.
- On Saturday, June 5, EPA Administrator Jackson and Deputy Administrator Perciasepe hosted an Alternative Coastal Protection and Cleanup Technology Forum in New Orleans. Discussion centered around prevention and containment, short-term approaches to oil systems, and bioremediation measures.

EPA Scientific Planning

Scientific actions that EPA is considering include:

- Identifying and evaluating likely exposure pathways of the oil, the dispersed oil, and dispersants for human and ecological receptors;
- Identifying immediate environmental and health hazards;
- Proposing actions to minimize acute exposures and effects;
- Evaluating the effectiveness of remediation approaches and alternatives;
- Monitoring for indications of endocrine system toxicity;
- Developing and implementing innovative restoration and remediation approaches for sustainable recovery;
- Developing and implementing systems to monitor human health effects;
- Designing and conducting monitoring studies on near-shore areas to evaluate long-term biodegradation of water-borne dispersants; and
- Monitoring the impacts of the spill on productivity, nutrient cycling and species composition of impacted ecosystems.

Jutro stated that EPA was in a similar situation as other agencies in terms of balancing oil-response research efforts with ongoing research responsibilities. Applegate stated that the fiscal issues and bookkeeping surrounding the oil spill response had posed challenges. In the absence of a FEMA disaster declaration with an Emergency Support Function (ESF) structure, there is a somewhat confusing mix of mechanisms, including the Pollution Removal Funding Authorization (PRFA), the Natural Resource Damage Assessment and Restoration (NRDAR) Program, and a possible supplemental budget request.

In response to a question by Stephen Carruth (FEMA) regarding whether the absence of a Stafford Act Declaration had created fiscal problems, Jutro and Applegate stated that as the responsible party, BP is required by the 1990 Oil Pollution Act to fund the cost of the response and cleanup operations. Applegate said that one of the challenges may be to determine which research costs will be paid for by BP and which will be funded by Congressional appropriations. He stated that there seems to be a shift now within the agencies to longer-term planning and that one of the obstacles is figuring out exactly when, how and if funding will be available.

With an eye toward the hurricane season, Carruth asked if there had been any discussions with FEMA response and recovery folks about responsibilities for responding to the hazards involved in handling the spilled petroleum and managing disposal and clean-up during a major storm.

Jutro answered that these discussions would not occur among research scientists, but that potential Gulf hurricane activity could raise a new set of technical issues for federal and state emergency responders.

National Aeronautics and Space Administration Briefing

Michael Goodman (NASA) reported that one of the most visible elements of NASA's response to the spill had been its use of MODIS (or Moderate Resolution Imaging Spectroradiometer) satellite instrument. Many media outlets published images (Google, AP, Reuters, etc) from the MODIS depicting the initial slick and the subsequent expansion and movement of the spill. There are two MODIS instruments, one each flying aboard the Terra (EOS AM) and Aqua (EOS PM) satellites. The satellites each make two passes every 24 hours for a total of four images per day providing a synoptic view of the spill. MODIS has a 250 kilometer horizontal resolution, which produces moderate resolution images but has a 2300 km swath width, which allows for coverage of the whole spill. The spectral range of the instrument covers the visible and infrared and thus the images can be taken day and night. The MODIS cannot see through clouds and thus is restricted by cloud cover. Goodman showed the group MODIS images from April 21 and 29, May 1, 9, and 31. The oil slick was clearly visible in the April 29 and subsequent images.

Other NASA spaceborne assets include the ASTER, MISR, Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations (CALIPSO), and Earth Observing-1 (EO-1) instruments and satellites. The Advanced Land Imager aboard the EO-1 has a 37 km spatial resolution and can therefore zoom in more closely than the MODIS. Its limitations are a narrow swath width and a 2-7 day return interval. Goodman showed side-by-side images of the oil spill taken by MODIS and the Advanced Land Imager on May 1. The MODIS is a very good instrument for seeing the evolution of the slick.

Goodman displayed MODIS, MISR and ASTER images that showed the oil slick encroaching on the Bird's Foot Delta, the youngest lobe of the evolving Mississippi River Delta. ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) is a high resolution imaging instrument that is flying on the Terra satellite. MISR (Multiangle Imaging SpectroRadiometer), also aboard the Terra satellite, is an instrument that images Earth's ecosystem simultaneously at nine different angles. All of the spaceborne data sets have been provided to the USGS Hazards Data Distribution System (HDDS) in Sioux Falls, South Dakota for use by the incident first responders and support teams.

Goodman stated that NASA had flown several aircraft observation missions since the oil rig blowout. Primarily at the request of NOAA, the AVIRIS (Airborne Visible/Infrared Imaging Spectrometer instrument) instrument was flown 11 times between May 6 and May 25. AVIRIS is a unique optical sensor that delivers calibrated images of the upwelling spectral radiance in 224 contiguous spectral channels (bands). It flies on the ER-2, which is a high altitude airplane capable of reaching 65,000 feet.

The use of AVIRIS to detect oil on a body of water was first used in the aftermath of Hurricane Katrina. Gregg Swayze and Roger Clark at USGS used AVIRIS to detect the presence of an oil signature in the polluted waters surrounding a flooded industrial area. Aware of this past work, Bill Lehr (NOAA National Ocean Service) contacted NASA and asked the agency to fly AVIRIS in response to the Deepwater Horizon oil spill. Swayze and Clark believed they could detect oil

volumes by analyzing the AVIRIS imagery. The AVIRIS calibrated radiances were provided to USGS-Denver Spectroscopy Laboratory for their application to derive Gulf of Mexico surface oil volume, estimated between 130,000 and 270,000 barrels as of May 17. The oil volume estimates are provided to NOAA/NOS/Office of Response and Restoration as input into ocean oil trajectory models. NASA also deployed the 1.5 meter resolution Cirrus Digital Camera System on the ER-2 alongside AVIRIS during the 11 flights, which covered the oil slick area as well as the entire Gulf coastline from Houston to the Florida Keys for baseline imagery.

NASA plans to fly the Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR, currently aboard a manned Gulfstream III jet) on June 22-24. Goodman expected UAVSAR to return seasonally thereafter – perhaps in the late summer, in the fall, and then one year from now. UAVSAR would be focused on collecting baseline information and change detection, particularly over the Mississippi River Bird's Foot Delta region. Outside the UAVSAR, there are currently no other airborne flights currently scheduled, but NASA will consider requests for the return of the ER-2, as needed.

Another airborne instrument, the High Spectral Resolution Lidar (HSRL) was flown May 10-11 on a NASA B-200 aircraft in flight of opportunity in conjunction with CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation) overpass. The B200/HSRL was en route to California to take part in an unrelated experiment and stopped in the Gulf region for the two-day period.

The AVIRIS data are public and being channeled to first responders through the HDDS at USGS and through Bill Lehr at NOAA. Goodman stated that there are internal discussions on making funding available for future long-term research with this data through the ROSES (Research Opportunities in Space and Earth Science) program but this decision will not be made until FY11.

Goodman showed AVIRIS images which were superimposed over MODIS data to extrapolate the surface spill estimate of 130,000 and 270,000 barrels (as of May 17). Jutro (EPA) asked what the maximum penetration of the AVIRIS instrument was. He was also interested to know what the algorithm was based on. Goodman stated that the maximum penetration was only a few centimeters. Applegate stated that in his understanding the process was one of estimating volume with respect to surface thickness. Goodman added that a number of different spectral band ratios are compared and extrapolated over Gulf Oil Spill area to derive the oil volume estimate.

Office of Science and Technology Policy: Update from the Gulf

Kate Moran (OSTP) called into the meeting from the Gulf Region, where she was attending a one-day Science Summit was currently underway at Louisiana State University. Moran's expertise is in ocean and Polar science, and she also has drilling experience and has been tasked with focusing on the oil spill. The goal of the Science Summit is to get input from the academic community on the assets and contributions it can bring to the table in responding to the oil spill.

Noting that the SDR has terrific experience in interagency coordination in response to disasters, Moran thanked the subcommittee for compiling the activities of the agencies, which had been extremely helpful. She recommended two areas where the SDR's assistance might also be helpful. First, she noted that it was clear to some that the parts of the agencies now working on this disaster have not been as coordinated as, for example, the parts of the agencies which are represented on the subcommittee. She recommended that someone from the SDR should sit in with the Joint Analytical Group (JAG), which will be trying to coordinate data exchange, data distribution, and decision-making about data collection. The JAG will also be talking about how to deliver data in a GIS

environment. She added that the SDR's experience was clearly needed in this group or in a group at a higher level. Specifically, Moran stated that the SDR's interagency coordination experience was needed to get that type of information out to stakeholders. She stated that she would talk to Johnson and Applegate when she returned to Washington.

Applegate stated that the subcommittee appreciated Moran's feedback and thinking on what kind of role it can play in assisting with the response.

As her second recommendation, Moran cited the need to set up a GIS-based website for hosting robust, scientifically-based information for the broad range of both applied and long-term research needs. She stated that such a product was not currently being delivered. She stated that it would be helpful if the SDR knew of a model that it could help roll out to focus this community.

Applegate thanked Moran for the good input. He stated that the SDR had stood up a working group for improving interagency efforts on coastal inundation modeling. He noted that the group may be a platform for pursuing the activity.

Moran also stated that it had been a challenge to track vessels outside the immediate 5 mile zone around the well-head. Outside this radius there are a lot of research vessels, overflights, divers in the water, mooring being put out, etc. Knowing where all these are would be helpful too.

Applegate noted that it might be something along the lines of the Hazards Data Distribution System (HDDS), except expanded to all activities and not just geospatial products. He added that these kinds of data compilation sites are critical in this type of response.

The question was asked whether JAG is an OSTP group. Moran stated that it was not. It is an interagency group, composed of DOI, NOAA, PPA (Plant Products in Aquaculture), and possibly NSF, among others. A question was asked whether JAG was connected to or working with the Interagency Remote Sensing Coordination Cell (IRSCC). Moran stated that OSTP needs to start making these connections to prevent the creation of orphan groups which should be learning from groups like the SDR.

Applegate stated that there existed a whole other set of coordination entities connected to the DOI-led National Resources Damage Assessment and Restoration (NRDAR) Program. He added that there was a proliferation of working groups within that effort. He had counted 14 technical working groups, including ones working on near shore fish, offshore fish, oysters, sediments, deepwater corals, cultural resources, chemistry, birds, areal imagery, etc. Trying to identify productive connections among the working groups and making sure this is all linked in and linked back is a real challenge.

U.S. Geological Survey Briefing

Applegate stated that all the activities USGS is doing in response to the oil spill can be found just off its homepage at http://www.usgs.gov/deepwater_horizon/. The USGS is engaged across the whole breadth of the agency because USGS brings together a wildlife and wetland biological group, geospatial expertise, geologists working with remote sensing in terms of oil spill estimates, and hydrologists doing water and sediment sampling in conjunction with NOAA and EPA.

Applegate stated that the USGS Director Marcia McNutt was embedded along with the Secretary of Energy down at BP headquarters and has been in the Gulf Region for over a month. Following up on Goodman's presentation, he noted that NASA's AVIRIS data has played an increasingly important

role in estimating the volume of the spill. A great deal of the initial effort focused on getting an estimate of the oil spill volume from the source, but as problems with that approach arose, the attention shifted towards trying to find other methods to make estimates. The USGS researchers using AVIRIS data started out doing research as a side effort and instead found that given the other challenges the AVIRIS approach was becoming a primary tool for estimating the spill volume. The USGS Director is in charge of the National Incident Command Flow Rate Technical Group, which is composed of federal and university scientists and engineers. There is a press release on the USGS website: http://www.doi.gov/news/pressreleases/Flow-Rate-Group-Provides-Preliminary-Best-Estimate-Of-Oil-Flowing-from-BP-Oil-Well.cfm. The group went at the flow rate issue three different ways: one was the flow rate estimate coming from the pipe itself using video; the second method was getting at it from a mass balance standpoint; and the third was using estimates from the riser insertion tool. The group put all this together to try to get at a mean estimate, which is where the figure of 12,000 to 19,000 barrels a day comes from. Applegate stated that the figures represent the lower bound, adding that it was difficult to come up with an upper bound.

Echavarria asked for further explanation of the flow rate estimate. Applegate and Goodman explained that the spill figure of 130,000 to 270,000 barrels (as of May 17) cited in the previous NASA presentation was only an estimate of oil on the surface. Subsurface plumes and the amount of oil that was burned and skimmed have to be added in to arrive at the total figure for all the oil that had leaked from the well since April 20. Applegate stated that it was certainly a challenge to produce such an estimate since several different computations need to be added and each of the numbers has a significant amount of uncertainty.

In activities on baseline water/sediment/flora sampling, the USGS has completed water and sediment sampling on the coast and barrier islands in Texas, Grand Isle, LA, coastal Alabama, Mississippi and the Florida Panhandle to capture baseline conditions. The USGS is working work with the National Park Service (NPS) in South Florida to coordinate collection of water-quality samples, conduct sea-grass bed surveys, and deploy semi-permeable membrane devices to sample lipids or fat-soluble semi-volatile compounds. There is a Google Earth file on the USGS website which has the sampling site locations of all the work that had been done so far. USGS's primary focus is on DOI lands, multiple fish and wildlife preserves and parkland units. Nora Devoe (BLM) stated that the Bureau of Land Management has some lands in Mississippi. Applegate did not know if there had been USGS sampling done on Department of Defense (DOD) lands and stated that he would try to get an answer on that.

On the geospatial side, the International Charter for Space and Major Disasters has been activated at the request of NOAA and the U.S. Coast Guard. Imagery and geospatial products are available on the Hazards Data Distribution System (HDDS) web portal (http://hdds.usgs.gov/hdds/). The USGS Earth Resources Observation and Science (EROS) Center, located in Sioux Falls, SD, is coordinating the daily data calls for this effort. The data center's staff facilitates the interagency Remote Sensing Working Group, which coordinates requirements and products.

The USGS is constructing detailed maps depicting habitats, topography, and bathymetry that cover NPS and U.S. Fish and Wildlife Service (USFWS) protected areas along Gulf Coast. USGS coastal and marine experts have been using lidar to provide predictions of overwash for barrier islands within NPS and USFWS protected areas for guidance on the locations of probable oil deposition on beaches and how extensive the oiling is likely to be for various beaches. The USGS National Wetlands Research Center in Lafayette, LA, maintains a science response vehicle -- a converted RV equipped with computers, satellite downlinks, and printers -- that is providing geospatial support for the U.S. Fish & Wildlife Service command center in Houma, LA.

In its biological response, the USGS is creating map products of sensitive species in the affected region, and compiling a list of all Threatened and Endangered Species and Species of Special Concern for the Gulf coast states and Atlantic states through the Carolinas. Applegate noted that this was a collaborative effort with the USFWS onshore. The USGS National Wildlife Health Center (NWHC) is providing USFWS and NOAA with gross external and internal examinations of carcasses and documentation of oiling via photographs for assessment of impact to waterfowl, sea turtles, pelicans, and marine mammals. The NWHC up in Wisconsin had been getting a lot of interesting packages of oiled wildlife delivered to them from the Gulf Coast, which is a very good example of the kinds of work where these legal factors are really coming into play. Because all these samples are potential evidence requiring a chain of custody, the NWHC staff has needed lawyers present to determine how they can handle the samples, what samples they can actually touch, and what they simply have to do visual inspections of. Furthermore, the USGS is using low-level aerial surveys and oblique photography to determine damage to the mangroves from the 2010 winter freeze and under pre-oil conditions.

Applegate stated that the USGS was working with NASA and NOAA to improve its Digital Evaluation Models (DEMs) in the affected areas, making sure we have the most up-to-date information as possible.

It was noted by several of the department and agency representatives that their efforts had come up against several legal and political challenges, obstacles, and frustrations.

In response to a question whether a FEMA Disaster Declaration should be expected, Stephen Carruth (FEMA) answered that a disaster declaration was not expected. Any kind of mobilization would be for emergency services. The 1989 Exxon Valdez Oil Spill was not declared a disaster. The operative phrase being used to describe the current spill in the Gulf is a "spill of national significance." The Office of Management and Budget (OMB) has been heavily engaged.

Department of Energy Briefing

Patrick Willging (DOE) briefed SDR Members on the Department of Energy's response to the oil spill. He noted that all the information he would provide was available through the DOE website at: (http://www.energy.gov/open/oil_spill_updates.htm). Willging stated that he made several phone calls prior to the meeting to various individuals throughout the department and then cross-referenced the information he gleaned with what was posted on the department's website. He stated that the information cross-referenced very well.

Willging reported that the oil spill response is a very high level effort at DOE, involving Secretary Chu, who was in the Gulf Region. Willging believed that the Secretary may have recently cancelled a high level trip to China to maintain his engagement in the response. He stated that coordination of the response had been a bit of a challenge at DOE because the department's representation to the National Response Team is through the National Nuclear Security Administration (NNSA), lending expertise on the radiological impacts. Willging stated that the Office of Electricity Delivery and Energy Reliability (OE) is also involved under the National Response Framework, but neither the NNSA nor the OE fits very well for this particular response.

Willging stated that it had been challenging getting all the offices to talk to one another, but in the end, Secretary Chu was running the effort himself with a team of handpicked scientists, whose names are listed on DOE's website. The scientists are from academia, the private sector, and the national

labs. In addition to these individuals, there are about 150 people, mostly in the national lab complex providing support.

One of DOE's efforts involved gamma radiography of the blowout preventer (BOP). There are a couple of reasons why DOE did this. One was to figure out what was wrong with it. Another was to see if anything could be done to get it operating the way it should. The labs are looking at hydrodynamic and two-phased computer models of essentially everything from the reservoir to the riser. They have been involved with assisting with sampling of the seafloor. Willging stated that he did not have much additional information on the sampling in particular, but that if anyone had questions, he would see if he could get more information.

The primary effort of the Secretary and his team in the Gulf involves working with BP to look at what options are being proposed, whether they are possible, and whether they would have a good chance of working or of potentially making matters worse. Therefore, a lot of what is going on is basically risk assessment. There is some concern that the flow out of this well is currently being partially blocked. From conversations with others in the department, Willging understood that some of the efforts that had been proposed, including the top kill, were no longer being pursued partly due to concern of dislodging the blockage and actually making the flow worse. He stated that based on the characteristics of this well, there should apparently be more oil leaking out. Therefore the efforts are proceeding cautiously.

Willging stated that the National Energy Technology Laboratory (NETL) in Pittsburgh is spearheading flow modeling activities related to the spill response. NETL is developing an end-to-end model that characterizes what is known about the entire system, from the reservoir all the way up to the riser in its current condition. The difficulty in doing that is that there is no real data on the flows and pressures. We have to use secondary indicators to try to figure out what is going on and try to tune that model. And they have been using some acoustic methods and everyone is looking at the visual pictures to try to make assessments based on that to tune the model.

A question was asked if anyone was trying to tie the acoustic model into the submarine detection sonar system, SOSUS.
Willging offered to try to get the answer. He went on to state that the NETL out in Pittsburgh has for a number of years been looking at the issue of methane hydrate formation particularly with respect to deep water because it is a topic in the industry producing concern but also optimism that the methane hydrates could be a valuable resource in the future.

Willging stated that there had been a lot of analysis done on this over the past few years, and he understood that NETL was trying to play in some of the potential solutions as well as some of the causes for this event through their previous research.

The question was asked if the company had flow tested this well. How much was it supposed to be producing? What was its potential?

Willging stated that he did not know the exact number and could try to get it. He said that he had heard as of late that this particular field and this particular well was considered the motherload for BP. There was a lot of effort and optimism that this was going to be very big.

A question was asked if BP had a good timeline of what they actually heard from the first rumblings, the first indications that something was wrong, to the actual collapse of the platform. He also asked what would have been the scenario in the case of a blowout during which the platform did not

collapse. For the future, for mitigation, was there something that we could have done to the platform to make it more robust?

Willging answered that because he was not directly involved that he could only speculate, but he believed there were people looking into that.

It was asked if the actual collapse of the platform caused the pipe to break. Is anyone actually investigating what caused the platform to break?

It was stated that the Deepwater Horizon was a registered vessel and perhaps the incident would fall under the jurisdiction of the National Transportation Safety Board.
MMS may have a regulatory interest as well.

Federal Emergency Management Agency Briefing

Stephen Carruth (FEMA) stated that Deb Ingram (FEMA) was not able to attend the meeting because she had been detailed to the Deepwater Integrated Service Team (DIST), which has been established to provide one-stop assistance to guide the response process. A one-page overview of the team's efforts was provided in the meeting packet. As an agency, FEMA is not deeply involved in the response at this point. The Response Directorate is monitoring events and providing some logistical and communications support. Operationally, both in terms of response and recovery, FEMA is starting to look into how a hurricane would affect response in the Gulf Coast area.

National Science Foundation Briefing

Dennis Wenger (NSF) stated that NSF had responded to the spill with RAPID awards. These grants do not go through the typical NSF peer review system in order to expedite the grants and get the researchers into the field quickly to gather ephemeral data. As of June 2, NSF had made 23 RAPID awards. Of these 23 awards, 20 came out of the Division of Ocean Sciences. The other 3 came out of either the Engineering Directorate or Engineering matched up with another program. The NSF also this week on Tuesday put out a "dear colleague letter" announcing the RAPID awards for the oil spill response. Typically the "dear colleague letters" name 6 or 7 program officers as points of contact. The letter allows those seeking the RAPID grants to contact any program officer at the foundation.

Codner stated NOAA's desire to have academic scientists who are applying and offering proposals fully aware of the other science that is going on in the Gulf and asked if there was a good way to tell people what science is going on and what science is needed so that research could be better coordinated. Wenger would look into whether someone from the NSF's Division of Ocean Sciences is sitting on the Joint Analytical Group (JAG).

Bob O'Connor (NSF) added that while the RAPID awards are rolled out quickly and do not go through the usual peer review process, they do indeed need to be very good science to receive approval.

National Geospatial-Intelligence Agency Briefing

Chris Crosiar (NGA) stated that NGA has a staff member assisting with algorithms and data quality on the ASPECT team.

Public Health Service Briefing

Sven Rodenbeck (OPHS) gave an update on how the Department of Health and Human Services (HHS) is responding. In terms of medical support, the department has put on alert its National

Disaster Medical System (NDMS) and deployed a small medical team to help with evaluations of occupational health outcomes. On environmental sampling and analysis, the Agency for Toxic Substances and Disease Registry (ATSDR) is working closely with EPA and actually has staff embedded with their data analysis activities. The National Institute for Occupational Safety and Health (NIOSH), out of the Centers for Disease Control and Prevention (CDC), has deployed people to help with activities regarding occupational safety. Rodenbeck assumed that the Food and Drug Administration (FDA) was involved with NOAA regarding food issues, which is normal procedure for ensuring seafood safety. CDC has been working with its state health department partners to lay the groundwork for an epidemiological response if needed.

Applegate thanked all the agencies for their briefings. He stated that the information would be compiled and sent to OSTP as an update.

VII. Adjournment

The meeting adjourned at 12:13 p.m.

VIII. Future Meetings

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

*Note: The SDR's 2010 meetings are scheduled to be held at the White House Conference Center.

July 1, 2010	September 2, 2010	November 4, 2010
August 5, 2010	October 7, 2010	December 2, 2010

IX. 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).

X. Contact Information

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XI. Summary of June Actions

Action	Lead	By When
Send Ross (ross.faith@mantech.com) updated summaries of your agency's response to the oil spill.	SDR Members	Tuesday, June 8
Let Ross (ross.faith@mantech.com) know if you are interested in participating in an ad hoc Haiti-Chile Lessons Learned Working Group.	SDR Members	ASAP

Action	Lead	By When
Let Ross (ross.faith@mantech.com) know if you are interested in participating in an ad hoc SDR International Working Group.	SDR Members	ASAP
Email Glenn Bethel (Glenn.Bethel@fas.usda.gov) if you would like to receive updates on sources providing data on the BP Oil Spill.	SDR Members	Standing
Send Sezin Tokar your ".gov" e-mail address to receive USG-only updates from USAID on global disaster response activities. (*stokar@usaid.gov*)	SDR Members	Standing
Contact Ross to receive copies of the Grand Challenges for Disaster Reduction Implementation Plan packets or CD. (*ross.faith@mantech.com*)	SDR Members	Standing
Let Dave or Ross 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. (*ross.faith@mantech.com*)	SDR Members	Standing