

Meeting Notes of the Special Focus Meeting on Grand Challenges

Subcommittee on Disaster Reduction

27 February 2004, 1:00 p.m. to 5:00 p.m., National Science Foundation

Attendees

NIST

Noel Raufaste (Co-Chair)

NOAA

Nathalie Valette-Silver (by telephone)

Dori Akerman (SDR Secretariat)

Claudia Nunes (SDR Secretariat)

USACE

Andy Bruzewicz

NGA

Peter Rinkleff

NSF

Priscilla Nelson (Co-Chair)

OSTP

Gene Whitney

USGS

Tim Cohn

NASA

Shahid Habib

Handouts

Grand Challenges Task Force Meeting Agenda

Grand Challenges: Outcomes and Timeline

Grand Challenges Working Document

Summary of all Grand Challenges submitted

Rand Report, "Assessing Federal Research and Development for Hazard Loss Reduction"

SDR Report, "Reducing Disaster Vulnerability Through Science and Technology"

Meeting Notes

Noel Raufaste began by presenting the scope of the Grand Challenges initiative. Referring to the timeline, he announced that the next six months are critical to the development of the final forty page document summarizing the Grand Challenges for Disaster Reduction.

Toward this end, Noel reiterated the importance of:

- SDR member agencies' contribution to the Grand Challenges initiative.
- Drawing on reports and clusters of networks for information.
- Distribution of the document to decision makers in the Administration.

Shahid Habib asked whether implementation strategies will be addressed in the final document. Noel assured him that they are a critical element of the final product.

Referring to a diagram on the white board (see Attachment), Noel addressed the role of the Grand Challenges document within the larger SDR effort:

- The SDR has a 15 year history that must be leveraged and respected.

- Research, literature, and information on these topics exist and must be brought together.
- National Priorities will anchor the effort and form a basis for the ten-year outlook.
- This is an iterative effort. Bill Hooke, Bob Hamilton, and Bill Anderson will visit the March 9th meeting of the SDR.
- The Grand Challenges offsite is key to formulating the final report.
- The final report is an implementation at both the strategic and tactical level. The product and process will result in a technology road map for the White House.

II. Grand Challenges Exercise

Dori Akerman began the next phase of the meeting by presenting an overview of existing literature on disaster and vulnerability reduction since 1996. She summarized by saying a quick review of literature shows no need to re-invent existing work and that this Grand Challenges effort must look forward.

Dori added that the interim SDR report, entitled “Reducing Disaster Vulnerability Through Science and Technology”, primarily described current US Government efforts to reduce vulnerability through science and technology. The Grand Challenges team is charged with identifying recommendations for future science and technology initiatives designed to create a disaster resistant America.

Gene Whitney remarked that existing reports are all pre-9/11 and philosophical. The final Grand Challenges report is a White House document intended to make specific recommendations for action. The report should not hand agencies unfunded mandates. Instead, the report must identify proposals that they can fund. The goal is to take the report to Office of Management and Budget and say this is what we think is important.

Grand Challenges Discussion

The nine-stage disaster management cycle was proposed as a framework for discussion of long-term challenges across hazards. For each disaster management phase the questions were as follows: 1) What societal benefits exist in 2015? and, 2) What science and technology tools are needed to achieve these benefits? The conversation was not comprehensive in nature, and the information that follows summarizes the ideas that emerged in the three-hour discussion. Many gaps and opportunities still must be identified.

1) Disaster Process Research and Development

Model the physical, chemical, and biological processes and interconnections for greater comprehension of disasters.

- Models are only as good as the inputs (data and observations). Therefore, comprehensive and accurate observations are needed.

- Models should focus on predicting ranges of possible outcomes, rather than pinpointing specific outcomes.

Constraints: Quality of the inputs.

2) Hazard Identification

Build geo-spatial and temporal maps of hazards. Develop early warning methodologies and tools unique to each hazard for improved hazard identification.

- Characterize hazards for all areas, though the extent and accuracy for each area should be prioritized based on cost-effectiveness.
- Observe and define unique signatures for each hazard. Suppress a fire, for example, based on observations of early identification of the specific fire signature.
- Develop an ideal timeframe for hazard identification.
- Identify and recognize patterns in observations.

Constraints: Stove piping and data exchange issues affect the ability to identify patterns.

Questions: How soon do we need to know about each event? What is the ideal window of time by hazard and by community?

3) Risk Assessment

Develop a knowledge base of the natural and built environment to describe economic, ecological, and technological consequences of disasters.

- Create a national database available to each community that includes tools for risk assessment.
- Apply rational cost-analysis tools to assessments.

Questions: What do we actually need to know? What data is relevant? What tools and techniques are available? Who keeps, maintains, and distributes the data?

4) Risk Communication

Deploy a public communication system that provides real-time messaging and is accessible by all citizens.

- National system must incorporate command and control capabilities.
- Message content and communications should be addressed by social and behavioral scientists to ensure appropriate response by public.
- Invent and deploy multiple devices for message acquisition.

5) Mitigation

Develop effective and consistent mitigation strategies by hazard and location to reduce or eliminate hazard impact.

- Prioritize mitigation activity types and areas of focus based on probability assessments.
- Prioritize efforts based on cost-effectiveness.

Constraints: We currently lack consistent hazard mitigation methodologies. A rational mitigation strategy by 2015 also requires an accounting methodology that includes the human value component.

Questions: What are the direct and indirect effects of mitigation? How are critical facilities factored into the mitigation process?

6. Prediction

Predict hazards with greater accuracy and timeliness to assist preparedness and reduce disaster impact.

- Develop chemical, biological, and physical models to assist in prediction.
- Acknowledge that disasters occur on a probabilistic basis. Unknown events and risks exist.

7. Preparedness

Provide communities and individuals with appropriate hazard education, kits, and drills.

- Delineate responsibilities at individual, community, and state levels.
- Educate individuals and communities to respond and prepare for disasters.

8. Response

Create near-real-time knowledge victim identity and location of victim to improve and expedite disaster response. Also create near-real-time knowledge of the post-disaster characteristics of the structure(s).

- Sensing devices are needed to locate people within structures.
- Inverse modeling required to comprehend current site condition in order to plan appropriate response.
- Invent technologies that enable rapid transfer of information to end-users in the crisis zone and adapt to user knowledge and mindset.

9. Recovery

Develop a prioritized, rational recovery process that includes mitigation, thus decreasing recovery time and reducing future disaster risks.

- Information about the event must be quickly assimilated to shorten time to recovery.
- Codes and standards for community must be applied during recovery phase.
- Recovery must happen as part of a rational decision based process. A prioritized recovery process is needed that includes tools that integrate geo-social knowledge. The result is decreased risk and decreased time it takes to respond.

III. Framework Discussion and Outcome

Noel and Priscilla led discussions on the Grand Challenges exercise and options for presenting the work accomplished to date in the SDR March meeting. Priscilla stated that SDR members would like to see an understanding of the framework with clear statements of how society benefits. Shahid suggested that if feedback is needed, the Grand Challenges work thus far should be presented in PowerPoint format.

Noel then led a broad discussion on the disaster management cycle as a framework for analyzing long-term vulnerability reduction strategies. Members offered comments, including the following:

- The framework created in today's discussion is one way to engage in the Grand Challenges process.
- Phases one through nine are interdependent. Perhaps the first phase, Disaster Process Research and Development, cuts across all other steps.
- It is important to establish a link to the SDR interim report. Use graphical links and charts to draw connections between that report and the current Grand Challenges effort.
- Focus simply on challenges. The 'Grand' aspect will become evident.
- Different elements and attributes will cut across each disaster management phase. Integrated problems are themes that cut across each problem.
- Be open to the possibility that the framework will not work at the end of the process. This framework is a starting point and a more comprehensive framework will emerge over time. Ultimately, this process is about reduced impact and shortened recovery time.
- The current framework gives us traction. A way to think across hazards.

National Priorities Discussion

Noel discussed national priorities and the relationship to the SDR and Grand Challenges effort. All members concurred with the national priorities as currently stated and agreed that these are desired outcomes that the final Grand Challenges will promote.



Grand Challenges Roadmap

