National Science & Technology Council Subcommittee on Disaster Reduction Grand Challenges for Disaster Reduction

-- an Overview --

U.S. Subcommittee on Disaster Reduction

- The U.S. Subcommittee on Disaster Reduction (SDR) is part of the President's National Science & Technology Council charged with establishing national goals for Federal science and technology investments in disaster reduction.
- Promotes interagency cooperation for natural and technological hazards and disaster planning.
- Facilitates interagency approaches to identification and assessment of risk, and to disaster reduction.
- Advises the Administration about resources and the work of SDR member agencies.
- Provides policy recommendations to the President and Congress about disaster reduction approaches.

SDR Member Agencies

- Centers for Disease Control and Prevention
- Department of Defense
- Department of Energy
- Department of Homeland Security
- Department of Housing & Urban Development
- Department of the Interior
- Department of State
- Department of Transportation
- Environmental Protection Agency
- Federal Emergency Management Agency
- National Aeronautics & Space Administration
- National Geospatial-Information Agency

- National Guard Bureau
- National Institute of Standards and Technology
- National Oceanic & Atmospheric Administration
- National Science Foundation
- U.S. Agency for International Development
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Department of Agriculture
- U.S. Forest Service
- U.S. Geological Survey
- U.S. Public Health Commissioned Corps





Some SDR Reports

Effective Disaster Warnings (November 2000)





Living with Earth's Extremes (September 2001)

Reducing Disaster Vulnerability Through Science and Technology (July 2003)



SDR Reports (continued)

Grand Challenges for Disaster Reduction (June 2005)





Tsunami Risk Reduction for the United States (December 2005)

Windstorm Impact Reduction Implementation Program (April 2006)



The Grand Challenges for Disaster Reduction

Objective: To enhance disaster resilience by developing a ten-year agenda for science and technology activities that will produce a dramatic reduction in the loss of life and property from natural and technological disasters.



A framework for prioritizing disaster-related Federal investments in science and technology

Published by the SDR in June 2005 and available at <u>www.sdr.gov</u>

Grand Challenges for Disaster Reduction

National Science and Technology Council Committee on Environment and Natural Resources



A Report of the Subcommittee on Disaster Reduction

June 2005

Grand Challenge #1 Provide Hazard and Disaster Information Where and When It Is Needed (identify and anticipate the hazards that threaten communities, develop methods to collect data and interpret information and data in real-time for scientists/engineers, emergency managers, first responders, policy makers, general public)



Grand Challenge #2 Understand the Natural Processes That Produce Hazards (improve forecasting and predictions, pursue basic research on the natural processes that produce hazards and understand how and when natural processes become hazardous).



Grand Challenge #3 Develop Hazard Mitigation Strategies and Technologies (develop and implement cost effective hazard mitigation strategies including land-use planning and zoning laws that recognize the risks of natural hazards and disaster-resilient design and materials and smartstructures that respond to changing conditions).



Grand Challenge #4 Recognize and Reduce Vulnerability of Interdependent Critical Infrastructure (identify and address the interdependencies of lifelines at a systems level, develop risk assessment tools to determine impacts of planned developments, rapidly assess public health conditions to minimize impact on the community).



Grand Challenge #5 Assess Disaster Resilience (collaborate with Federal, State, local agencies, academia, and the private sector to develop effective standards and metrics that assess disaster resilience, perform risk assessments for decision tools, develop 'Report Cards', assess impact of natural and technological hazards on the environment).



Grand Challenge #6 Promote Risk-Wise Behavior (effect communications, trust, and understanding within the community, bring about emergency communication systems, seek public response to hazards, facilitate research in social sciences to promote individual mitigation actions).



Implementing the Grand Challenges

The implementation strategy for the Grand Challenges are outlined in a series of documents describing the science and technology agenda for 15 hazards and cross-cutting topics:

- Coastal Inundation
- Drought •
- Earthquake •
- Environmental/Public Health Hazards
- Fire
- Flood
- Hurricane
- Infrastructure •
- Landslide •
- Natural Resource Impacts •
- **Space Weather**
- **Technological Hazards**
- Tornado
- Volcano
- Winter Storms

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The Grand Challenger for Disaster Endustion is a ten year strategy developed by the SDR. It sets forth six Grand Challenges for disaster reduction that, when addressed, will enhance community regilience to disasters and thus create a more disaster resilient Nation. These Grand Challenges require. statained Poderal investment as well as collaborations with state and local governments, professional societies and trade

associations, the private sector, academia and the international nety to successfully transfer disaster reduction science and technology into

To meet these Challenges, the SDR has identified implementation actions by hanard. Addressing these implementation actions will improve America's capacity to prevent and recover from diaasters, thus fulfilling our Nation's commitment to reducing the impacts of all hazards and enhancing the safety and economic well-being of every individual and community.

What's at Stake

Definition and Background, A heat wave is a prolonged period or wattr lemmon woods like trainterequiet notices for the area, othen accompanied by high humidity. Heat waves can persiat from a couple of days to several weeks and are often accomparied by periods of little or no rain and, in cities, by poor air quality. Heat waves are among the most deadly of all weather events.

Impacts. Although extreme events such as hurricanes, tornadoes, and floods make headlines for widespread physical occur, more than 8900 deaths were directly attributed to excessive heat from temperatures, led to farm net income 1979 to 2002 in the United States³ and Josses of approximately \$1.35 billion.⁵ thousands more died as a result of heatapproximately 1700 deaths were directly attributed to persistent and oppressive heat that affected the Bast and Midwest. The Midwest heat wave of 1995 hilled at failures to trucks and railroad least 465 people in Chicago alone.⁹

Hest wave impacts are widespread. While a large number of deaths may not occur in a single city every year, the cumulative impacts across broad regions over several days to weeks can result in heavy loss of

In an average year, 175 Americans die from the direct effects of extreme heat⁴ due to a combination of factors such as failure to take adequate precautions, high humidity, lack of adequate vertiliation or air conditioning, poor health and old age. Many more hundreds of deaths are associated with excessive heat attributed to heart attack, stroke, and also respiratory stress. Most deaths occur in urban areas where concrete, asphalt and physical structures case temperatures in urban heat islands, and rightime temperatures remain above average.

Hest waves also impact farming and ranching through loss of cattle other destruction and heavy loss of life that can livestock. The 1999 drought in the U.S., associated with unusually warm About 25 percent of United States' related causes.² In the summer of 1980, harvested cropland and 32 percent of the pastureland were affected. Transportation is impacted by highway and railway blockling, and mechanical

Incomptives. Heat waves also can lead to

water and electricity shortages.

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S & T Agenda (Proposed Format)

Vision **Benefits**



Grand Challenges

What's at Stake (definition, background, and impacts)

Implementation **Actions**



Vision and Benefits

- Defines enhancements to disaster resilience.
- Defines the hazard.
- Lists broad improvements in disaster reduction science and technology that will result from meeting the Grand Challenges for this hazard type.
- Describes major benefits.

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Vision

A more disaster resident America through reducing the impacts of throught on life; property, the economy and the environment by 2015.

Definition: Drought is a persistent and abnormal resisture deficiency, having adverse effects on vegetation, animals, or people.

Expected Benefits

Improved observational monitoring of drought conditions. Modernizing legacy observing systems, increasing the spatial density of key variables, and levenging off of newlyestablished state and local observing ristworks will greatly enhance drought monitoring.

Improved drought forecasting. Targeted advances in scientific research and forecast model development will provide decisionmakers with credible information that can be used in planning and preparation for future changes in drought expanse and seventy. Advancements in areas such as warm-searon, precipitation forecasting will greatly enhance drought forecasting.

Improved communication and public awareness of drought information. Mate centralized and direct access to available drought information will enable users to fully-capitalize on existing and needy developed drought products and information. Education of decision-makers will enhance the understanding and application of drought indicators.

Intproved assessments of societal, economic and environmental impacts of drought. Mitigation and response activities will be laded through improved understanding of the impacts of drought to the U.S. society, economy and environment. New research and assessment in this area will lead to a better understanding of drought-related impacts.

Improved coordination of Federal, state, and local activities for drought planning and response. The success of drought planning and response activities will be better assured through the fall integration across the many relevant federal agencies such as NOAA, USDA, DOI, DHS, and NASA as well as appropriate state and local agencier and Native American Thes.



DROUGHT



Grand Challenges for Disaster Reduction: Drought Risk Reduction Implementation Plan

A Report of the Subcommittee on Disaster Reduction

Background (What's at Stake)

 Background on impacts of the hazard including expected costs to the nation.

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Background

Drought is a persistent and abnormal moisture deficiency, having adverse effects on vegetation, animals, or people. Slow-onset, nonstructural impacts and lack of a uniform definition make. drought a unique natural hazard. Compared to all natural hazarda droughts are; on average, the leading cause of economic losses -Societal, environmental and economic impacts of drought are enormous, Annual direct losses to the U.S. due to drought are estimated at \$5-SB, making it on average the most costly of . natural disasters affecting our nation (FIRMA, 1995), Since 1988, Congress has appropriated more than \$30B in agaiculture disaste assistance in response to droughts: The slow onset of drought over space and time can only be identified through the continue collection of climate and hyrodologic data. To enhance decision and minimizé costs, drought warning systems must provide. credible and timely drought risk information including drought prioritoping and prediction products. Traditional management approaches to drought have been largely crisis-driven, ad hoc, and mefficient: To enable a more drought-realient society requires a fundamental shift from crisis management to risk management.



Grand Challenges

- Applies the six Grand Challenges published in June 2005 to the specific hazard described in the plan.
- Describes broad task areas included in each Challenge and products/technologies expected to result from meeting each Challenge. Includes a list of agencies responsible (primary and contributing).



Implementation Actions

- Identifies Short (1-2 years), Medium (2-5) and Long Term (5+ years) actions.
- Brief description of actions needed to be performed by Federal, State, and local governments, the private sector, and academia to implement the Grand Challenges described in the plan.

DRAFT - DO NOT DISTRIBUTE Implementation Actions Collaborations with federal, state, and local governments; professional societies and trade associations; the design and successful development and transfer of disaster reduction technologies and practices into common use. Short Term (1-2 years) Develop an implementation plan for the 1Jabonal Integrated Drought Information System (NIDIS) amongst the relevant federal spencies, states, Native American Tribes and universities. Imprové coordination of Federal, staté, local and international activities for drought planning and emergency response." Develop an implementation plan for a science and technology strategy to support drought mitigation. Develop meaningful socio-economic and environmental impacts drought indices for use by decision trakers and the general public including research into human actions that promote drought . Develop, expand and link information systems tracking impact A and losses related to hydro-meteorological events and seasonal fluctuations and for associated drought effects, including fire and invasive species. Medium Term (2-5 years) Address gaps in drought data.collection, analysis, prediction, and, integration tools for decision makers. Develop interagency coordinates and integrated national drought programs for observations; research, and the delivery of product and information services. Assess science, and technology needs for introved drought, planning, mitigation, and response, including decision support bools, community involvement, drought response triggers, insurance and financial strategies, and demand efficiencies. Identify and track the metrics of observable drought impacts. Long Term (54, years). Develop improved capabilities at the states and local level for drought préparédness planning . . Develop and improve drought monitoring capabilities at the state and local level, including improved impact assessment . technology. Imprové state and local capabilities for reposting drought hazards and sharing data. Grand Develop sophisticated decision-support tools so drought-monitoring and prediction products can be effectively incorporated into decisions to mitigate the impacts on public Challenges for Disaster health, critical infrastructure, and the provision of public utilities and services. Reduction: Improve understanding of major climate processes related to Drought Risk drought through satellife and meteorological data and model Reduction this tublished publicle and Technology Codecid district, a calculative council, is the precise heads for the Pael 5 constraint science and incontrology policies across the Paeland Generatore (Paritica activate and agency fric science and lectioning to concomment the develop action of othe Federation insearch and development enterprise Implementation rtant explortion of the NST C is the establishment or clear hational galaxies for if advise science and for inits is averas ranging from information rectinologies and neath research to improving theospectates reing fundamental measure. This council programs unseenth and development information that was Plan àgericies to têm la priventinent parkagê truk je simek et acceimptimoù maltipe nat paten regerising toe hitit (°, cottectine bitit): Everuine Geomanye et (201) 455-810 Anut the Subcommittee on Disaster Reduction. The SDR is a subcommittee of the Committee on Envir A Report of the cos (CENE) under the National Drivers and Technology Council. Chartered in 1900, the BCR is cititating and incruiting delates retricultion, preparingtment, reparents, and increment. The SDR age call and technology at least the United in contractics of foreign in artigs. To accorrectly this emission, incruing agreement leaders to be retract excertion. Informations making in artigs and the technology of the second second and the second second second second and the second second second and the second sec Subcommittee on Disaster 61 Reduction Vice Chair, David Applegate (USOS Secretariat, Dict Akarimani@ndaa.gov, 703-559-744

US Government Approval

GCs Implementation Strategies approval process (fall 2006 through spring 2007):

- 23 SDR Federal Member Agencies
- National Science and Technology Council
- Office of Science and Technology Policy
- Office of Management and Budget
- Other reviewers selected by the White House

More Information



http://www.sdr.gov