

**Promoting Risk-Wise Behavior:
An Integrated Strategy for Reducing
Vulnerability and Improving Resiliency**

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Cooperation for Reducing Vulnerability and Improving Resiliency

- The *Grand Challenges for Disaster Reduction* presents a U.S. perspective on role of science and technology in disaster reduction and early warning.
- Hazards do not respect political boundaries; accordingly, all conclusions must be more broadly applicable.
- International efforts to reduce hazard threats must promote cooperation in all areas of disaster management including capacity building, education and training, and real-time interoperability.
- International efforts to develop monitoring and warning systems should build on existing programs like GEOSS and the UNESCO/IOC, taking an all-hazards approach.

Framing the Grand Challenges for Disaster Reduction

Objective: To enhance disaster resilience by composing 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.



Subcommittee on Disaster Reduction

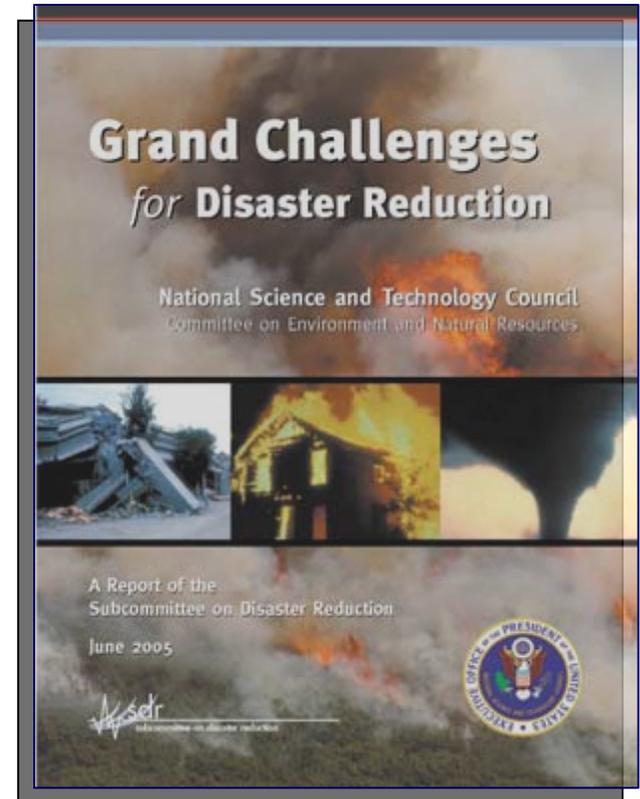
- The Subcommittee on Disaster Reduction (SDR) is charged with establishing clear national goals for Federal science and technology investments in disaster reduction by:
 - Promoting interagency cooperation for natural and technological hazards and disaster planning;
 - Facilitating interagency approaches to identification and assessment of risk, and to disaster reduction; and,
 - Advising the Administration about relevant resources and the work of SDR member agencies.



Grand Challenges

(published by the SDR in June 2005
and available at www.sdr.gov)

1. Provide hazard and disaster information where and when it is needed.
2. Understand the natural processes that produce hazards.
3. Develop hazard mitigation strategies and technologies.
4. Recognize and reduce vulnerability of interdependent critical infrastructure.
5. Assess disaster resilience using standard methods.
6. Promote risk-wise behavior.



Grand Challenge #6

Promote Risk-Wise Behavior.

- Raise public awareness of local hazards.
- Warn people with consistent, accessible, and actionable messages and a national all-hazards emergency communication system.
- Develop policies that promote risk-wise behavior and that are based in social science research.

Grand Challenges for Disaster Reduction

Grand Challenge 6

Promote Risk-Wise Behavior.
Develop and apply principles of economics and human behavior to enhance communications, trust, and understanding within the community to promote "risk-wise" behavior. To be effective, hazard information (e.g., forecasts and warnings) must be communicated to a population that understands and trusts the messages. The at-risk population must then respond appropriately to the information. Significant progress is being made, but this is an ongoing challenge that can only be met by effectively leveraging the findings from social science research.

Challenges:

- Raise public awareness of local hazards.** Reliable and integrated all-hazard data must be available to citizens and local decision makers to drive appropriate planning, mitigation, response and recovery decisions.
- Warn people with consistent, accessible, and actionable messages and a national all-hazards emergency communication system.** Comprehensive emergency communication systems are needed to warn people and to specify actions to be taken in the event of a hazard. Emergency communication systems should utilize all available media outlets including mobile phones, cable television, and the Internet. Technology should be in place to deliver the messages in all locations no matter how remote, and to provide location-specific information. Messages should be crafted based on knowledge of likely human responses and should be provided by a recognizable authority in the given field (i.e., public health officials should provide public health messages). The seriousness of the threat must be conveyed and real-time information must be provided as hazard scenarios evolve.

Develop policies that promote risk-wise behavior and that are based in social science research.
Effective communications for eliciting appropriate public response to hazards must be developed from behavioral, population, and other social science studies. Research should lead to public awareness of the effectiveness of individual and institutional mitigation actions. Research is needed to better understand why people might expose themselves to hazards and what would motivate people to avoid hazards or take mitigating actions before and during a disaster.

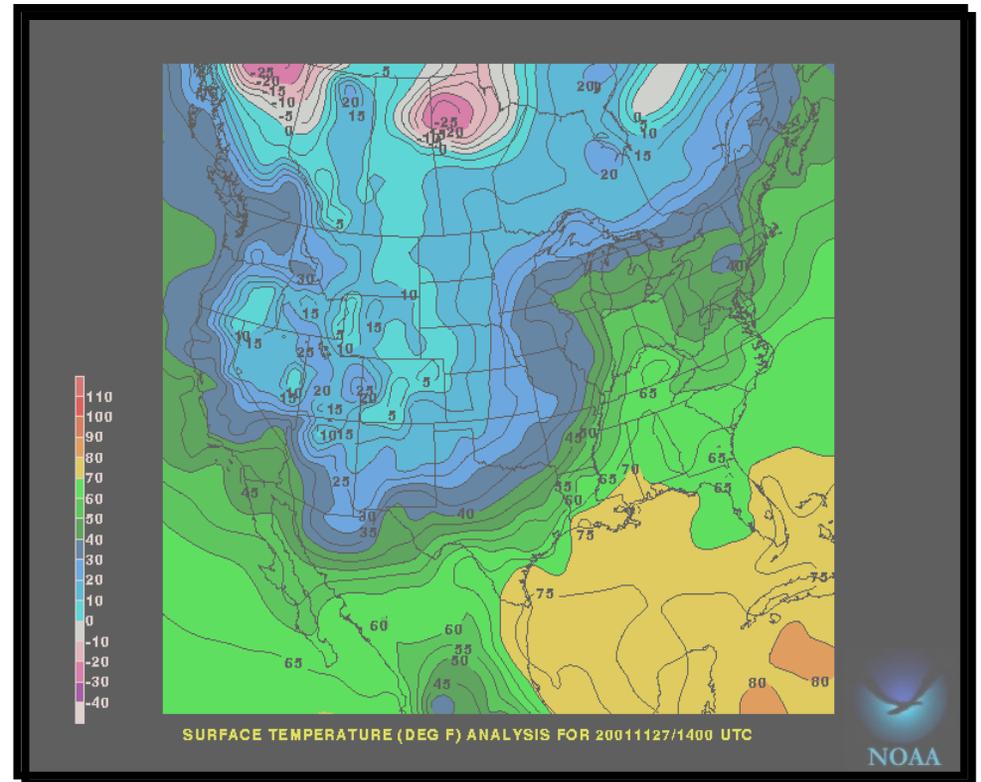
To meet this Grand Challenge the following key research requirements and major technology investments also must be addressed:

- Key research requirements:** Facilitate research in the social sciences to understand and promote individual and institutional mitigation actions in the face of hazards. • Develop an enhanced understanding of effective techniques for educating the public and gaining community support for preparedness and disaster prevention activities. • Research the effectiveness of, and human responses to, new communication technologies, including mobile phones, the Internet, and cable television on the delivery and successful use of public warnings.
- Major technology investments:** Design and implement a standardized messaging system for the general public and specific audiences. • Assemble and coordinate an integrated emergency communication system among response organizations at the federal, state, and local levels.

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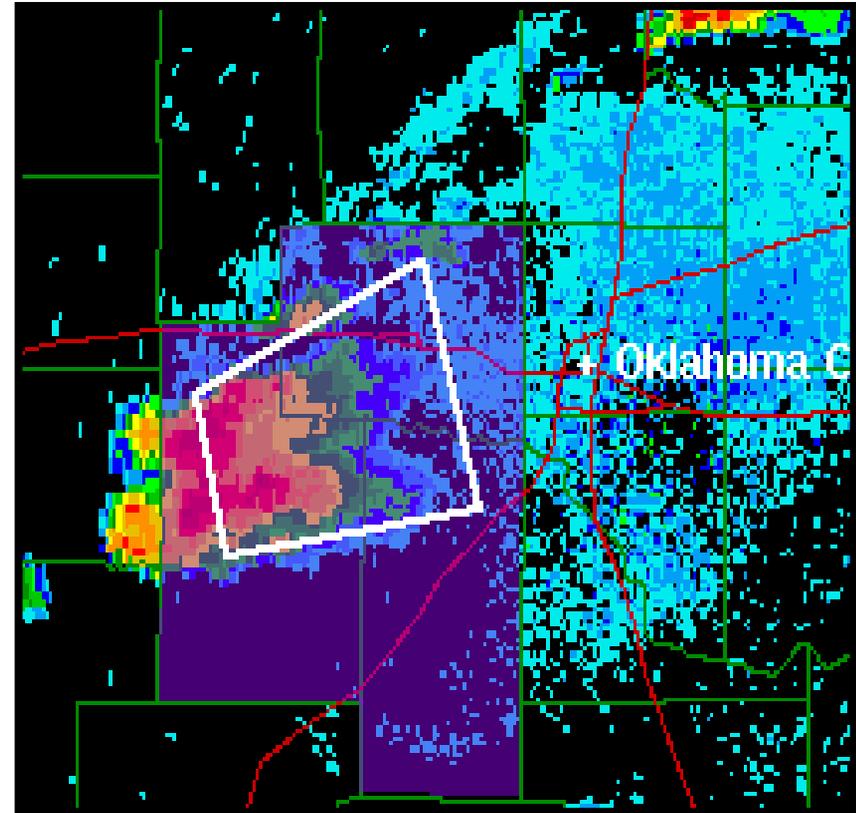
Raise Public Awareness

Reliable and integrated all-hazard data must be available to individuals and decision makers at all levels of government.



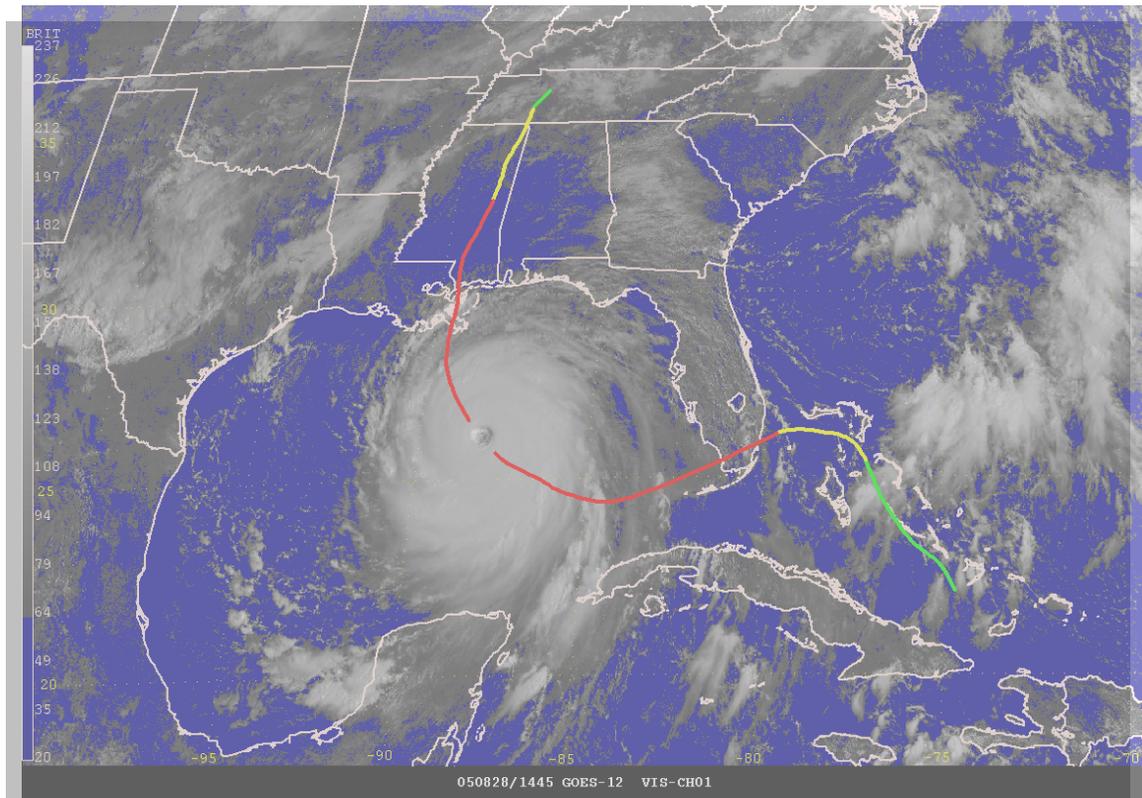
Provide Effective Warnings

- Emergency communications systems should utilize all available media outlets.
- Technology should be in place to deliver the messages in all locations no matter how remote.
- Messages should be crafted based on knowledge of likely human responses.
- The seriousness of the threat must be conveyed and real-time information must be provided as hazard scenarios evolve.



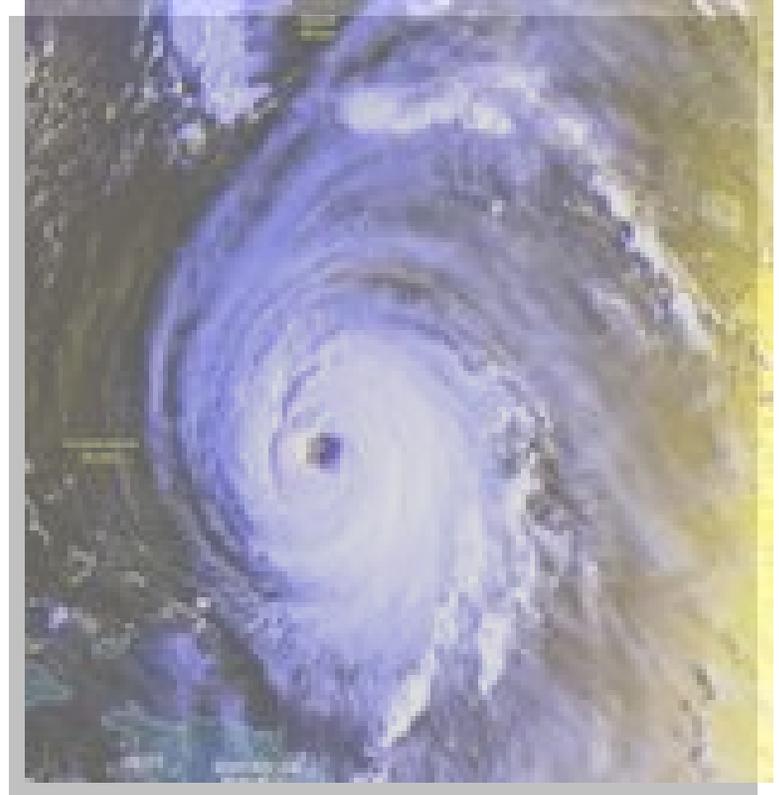
Earth Observations for Hazard Detection

- Earth observations facilitate more accurate forecasts and better warnings.
- Improved observations will allow for geographically targeted emergency warnings and faster dissemination of information.



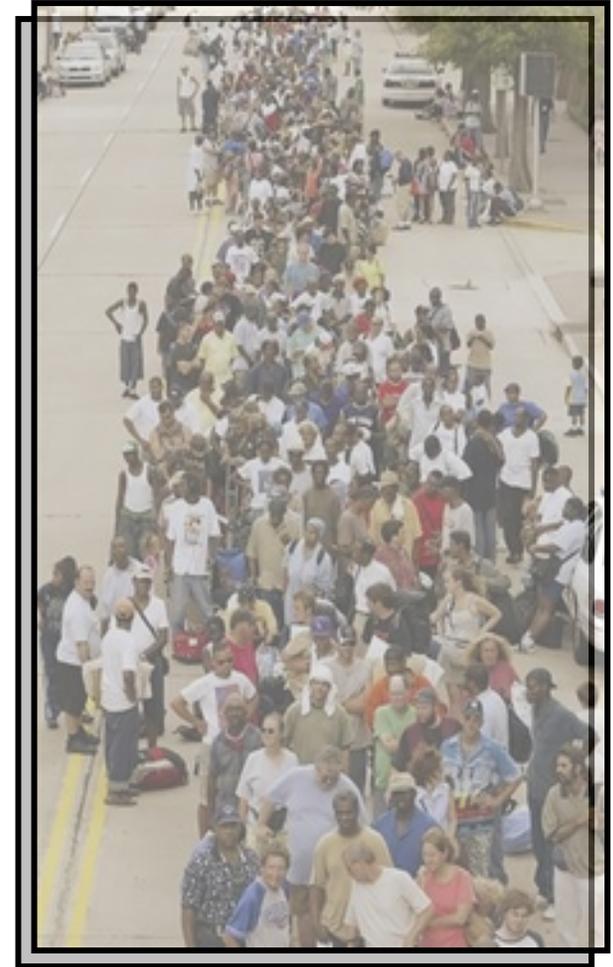
Global Earth Observations System of Systems (GEOSS)

- GEOSS: Global Earth Observation System of Systems
- Endorsed by nearly 60 governments and the European Commission on 16 February, 2005
- Developed to ensure comprehensive and sustained Earth observations
- Builds on and adds value to existing Earth-observation systems by coordinating their efforts
- Addresses critical gaps, supports interoperability and sharing of information
- Allows for a common understanding of user requirements and improved delivery of information to users.



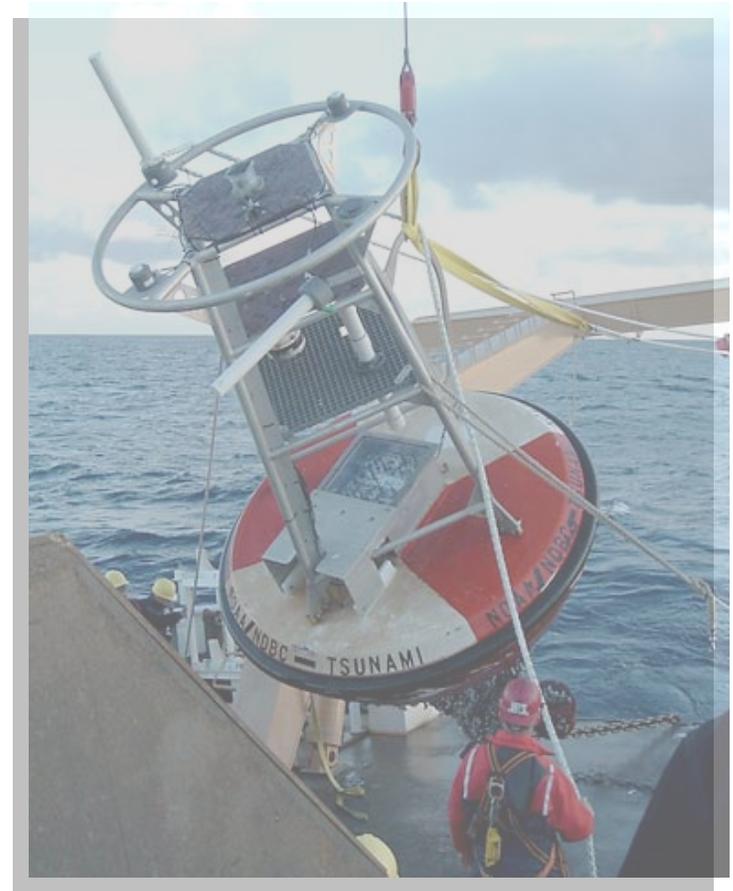
Social Science Research

- Effective communications for hazard warnings must be developed from behavioral, population, and other social science studies.
- Research should lead to public awareness of the effectiveness of individual and institutional mitigation actions.
- Research is needed to better understand why people might expose themselves to hazards and what would motivate people to avoid hazards or take mitigating actions before and during a disaster.



Tsunami Lessons Learned: Effective Detection, Forecast and Warning

- Advanced sensing equipment, rapid data analysis, and effective warning broadcast systems should be in place and functional for all oceans.
- All data must be available in real time and to all stakeholders.



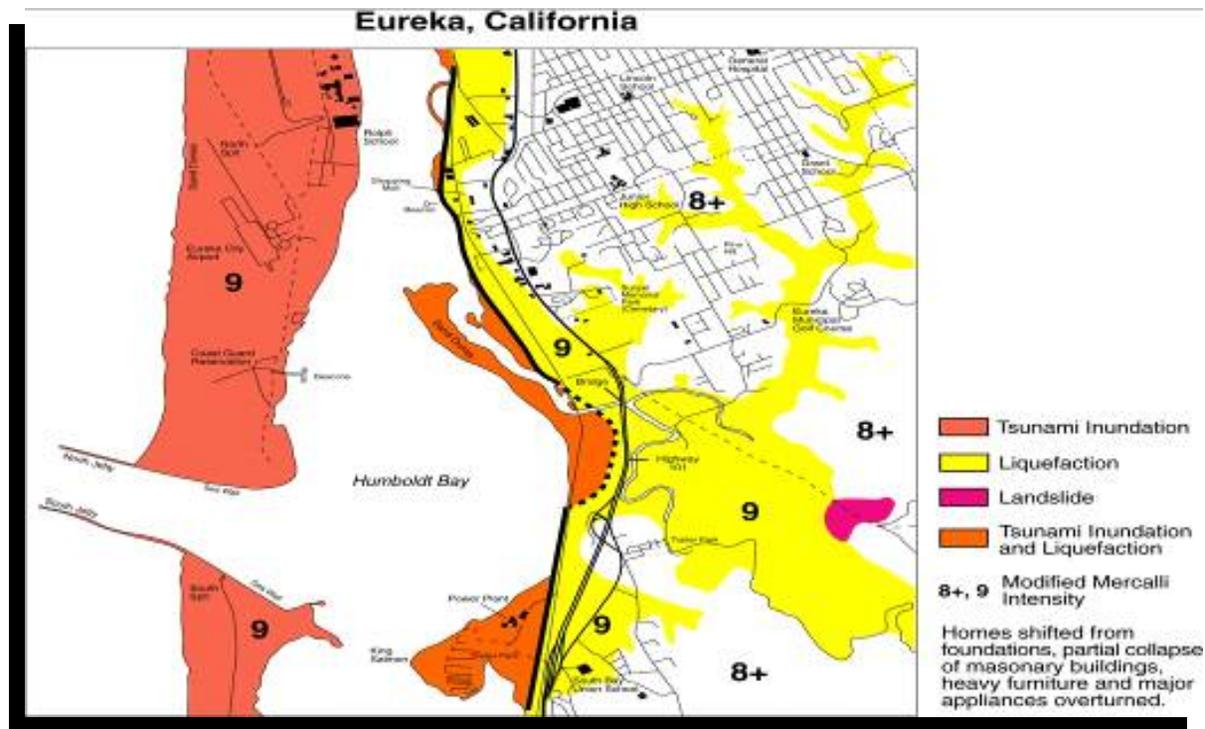
Tsunami Lessons Learned: Warnings Must Provide Clear Instruction

- Emergency communication systems and programs to educate and inform the public of the threat of tsunami hazards need to be in place for all at-risk communities, not just those that have experienced tsunami threats in the past.



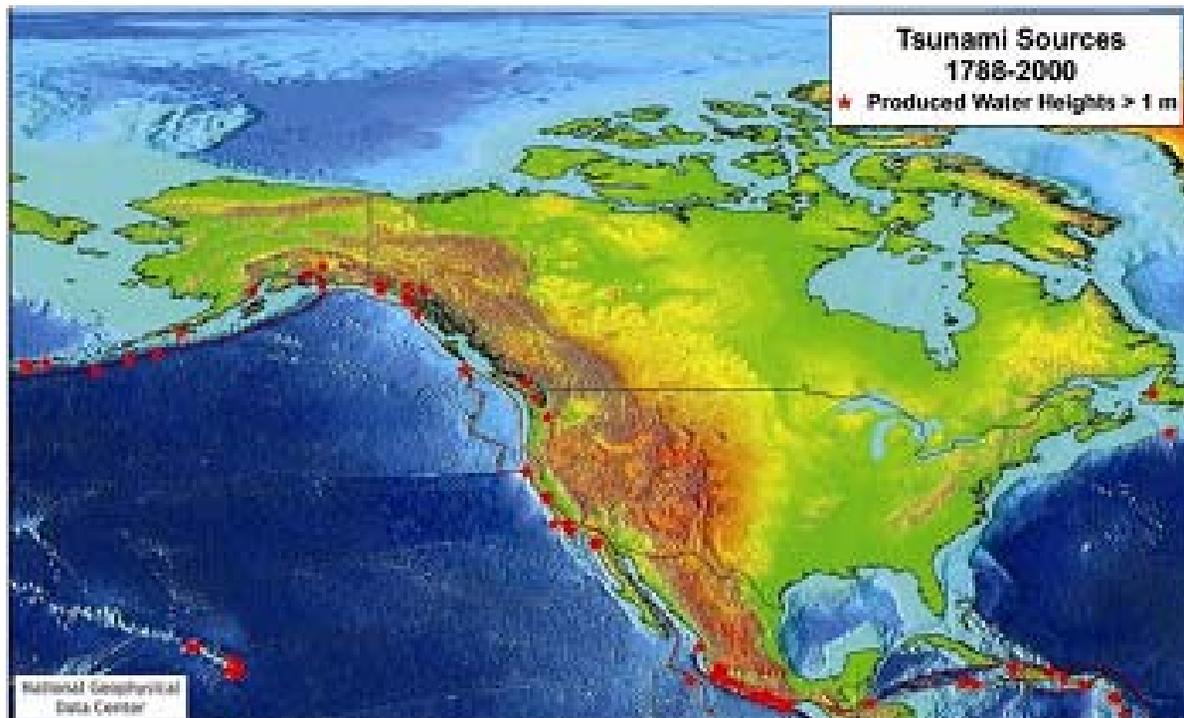
Tsunami Lessons Learned: Comprehensive All-Hazards Plans

- All systems designed for tsunami preparedness, response and recovery should be integrated into a comprehensive action-based plan for addressing all types of hazards and vulnerabilities.



Tsunami Lessons Learned: National and Regional Challenges

- It is vital that all programs designed to aid in the warning, detection and response to tsunamis and other hazards promote international, national and regional cooperation and the interoperability of all systems and infrastructures.



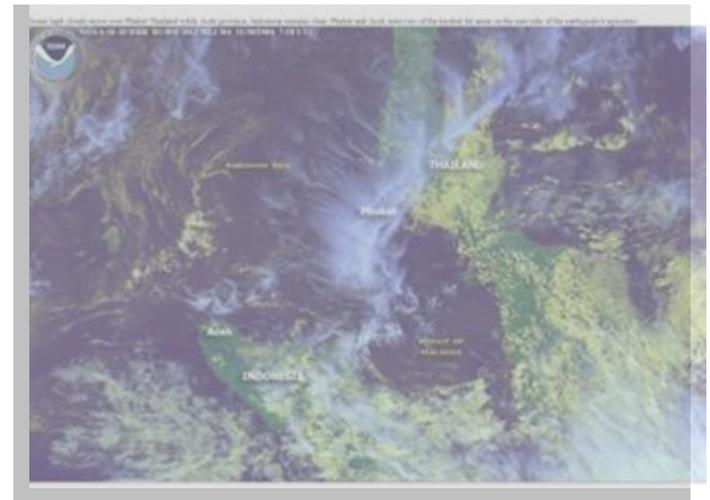
Tsunami Lessons Learned: Organization and Preparation

- From a science and technology perspective, it should be a priority to understand the decisions that lead to investments, or lack thereof.
- After all, actions communities can take to be more prepared are well-known and yet communities are not prepared or organized appropriately.



Conclusions

- Most communities face the threat of multiple hazards.
- Development of an integrated, all-hazards warning system is important.
- Systems must leverage multiple information sources, including Earth observations, to deliver messages to all individuals at risk.



MORE INFORMATION

<http://earthobservations.org>

<http://www.sdr.gov>