



# Effective Disaster Warnings

Report by the Working Group on  
Natural Disaster Information Systems  
Subcommittee on Natural Disaster Reduction

National Science and Technology Council  
Committee on Environment and Natural Resources

November 2000



# Effective Disaster Warnings

Report by the Working Group on  
Natural Disaster Information Systems  
Subcommittee on Natural Disaster Reduction

National Science and Technology Council  
Committee on Environment and Natural Resources

November 2000

---

## TABLE OF CONTENTS

General Information .....	3
Transmittal Letter.....	4
Working Group On Natural Disaster Information Systems.....	5
Executive Summary and Recommendations.....	6
Disaster Warnings: Technologies And Systems.....	6
Recommendations.....	7
Scope Of This Report.....	8
1. Introduction.....	9
2. The Escalating Costs And Changing Nature Of Disasters.....	11
3. Increasing Capabilities To Provide Accurate Warnings.....	15
4. Issuing Effective Warnings.....	18
5. Warning Terminology.....	20
6. The Universal Digitally Coded Warning.....	23
7. Alternatives For Funneling Warnings Into Broadcast Systems.....	24
8. Alternatives For Focusing Warnings On The People At Risk.....	26
9. The Emergency Alert System (EAS).....	28
10. Radio Broadcast Data System (RBDS).....	30
11. Other Alternatives For Delivering Warnings.....	32
12. Preparedness And Response Plans.....	37
13. Alternatives For In-Depth Information.....	38
14. A Plan For Action.....	39
References	
Appendix 1: List Of Acronyms.....	43
Appendix 2: EAS Operations And Plans.....	45
Appendix 3: Existing Federal Warning Systems.....	49
Appendix 4: Primary Federal World-Wide-Web Sites	
For Disaster Information.....	55
Acknowledgements.....	56

## General Information

### About the National Science and Technology Council

President Clinton established the National Science and Technology Council (NSTC) by Executive Order on November 23, 1993. This cabinet-level council is the principal means for the President to coordinate science, space, and technology policies across the Federal Government. The NSTC acts as a virtual agency for science and technology to coordinate the diverse parts of the Federal research and development enterprise. The NSTC is chaired by the President. Membership consists of the Vice President, the Assistant to the President for Science and Technology, Cabinet Secretaries and Agency Heads with significant science and technology responsibilities, and other senior White House officials.

An important objective of the NSTC is the establishment of clear national goals for Federal science and technology investments in areas ranging from information technology and health research to improving transportation systems and strengthening fundamental research. The Council prepares research and development strategies that are coordinated across Federal agencies to form an investment package to accomplish multiple national goals.

To obtain additional information regarding the NSTC, contact the NSTC Executive Secretariat at (202) 456-6100.

### About the Office of Science and Technology Policy

The Office of Science and Technology Policy (OSTP) was established by the National Science and Technology Policy, Organization, and Priorities Act of 1976. OSTP's responsibilities include advising the President on policy formulation and budget development on all questions in which science and technology are important elements; articulating the President's science and technology policies and programs; and fostering strong partnerships among Federal, State, and local governments and the scientific communities in industry and academia.

To obtain additional information regarding the OSTP, contact the OSTP Administrative Office at (202) 395-7347

### About the Committee on Environment and Natural

The Committee on Environment and Natural Resources (CENR), one of five committees under the NSTC, is charged with improving coordination among Federal agencies involved in environmental and natural resources research and development; establishing a strong link between science and policy; and developing a Federal environment and natural resources research and development strategy that responds to national and international issues.

To obtain additional information about the CENR, contact the CENR Executive Secretary at (202) 482-5916.

THE WHITE HOUSE  
WASHINGTON

August 2000

Dear Colleague:

I am pleased to transmit the NSTC Report, Effective Disaster Warnings, which has been prepared by the Working Group on Natural Disaster Information Systems under the Committee on Environment and Natural Resources (CENR) Subcommittee on Natural Disaster Reduction. This document compiles into a single reference a wealth of information on public and private sector R&D capability to provide early warning of natural or technological hazards that threaten the safety and well-being of our citizens. It is designed to assist scientists, engineers, and emergency managers in developing more accurate and more numerous warnings as they deploy better sensors to measure key variables, employ better dynamic models, and expand their understanding of the causes of disasters. Warnings are becoming much more useful to society as lead-time and reliability are improved and as society devises ways to respond effectively.

The goal of this Report is to provide a broad overview of major issues related to warning the right people at the right time so that they can take appropriate action with respect to the disaster. It addresses the problems of delivering warnings reliably to only those people at risk and to systems that have been preprogrammed to respond to early warnings. Although the technology presently exists to build smart receivers to customize warnings to the users' local situation whether at home, at work, outdoors, or in their cars, substantial improvement can be made with better utilization of emerging opportunities provided by existing and new technologies. Current warnings can target those at risk at the county and sub-county levels and it should also be possible to customize the information for trucks, trains, boats, and airplanes. One high priority that needs to be addressed concerns agreeing on data/information standards and dissemination systems to be used.

This Report focuses on needs for improving delivery and effectiveness of warnings over the next 5 to 10 years. It recommends close collaboration between Federal, State, local, and private sector organizations to leverage government and industry capabilities and needs to deliver effective disaster warnings.

We hope that scientists, engineers, and emergency managers will find this Report to be a valuable reference on the policy issues of implementing advanced technologies for delivering warnings to people at risk.

Sincerely,

Neal Lane  
Assistant to the President  
for Science and Technology

## Working Group on Natural Disaster Information Systems

<b>Peter Ward</b>	<b>Chairman</b> , Seismologist and Volcanologist, U.S. Geological Survey
<b>Rodney Becker</b>	Dissemination Services Manager, National Weather Service
<b>Don Bennett</b>	Deputy Director for Emergency Planning, Office of the Secretary of Defense
<b>Andrew Bruzewich</b>	CRREL, U.S. Army Corps of Engineers
<b>Bob Everett</b>	Office of Engineering, Voice of America, International Broadcasting Bureau, U.S. Information Agency
<b>Michael Freitas</b>	Department of Transportation/Federal Highway Administration
<b>Karl Kensinger</b>	Federal Communications Commission, Satellite and Radio Communications Division
<b>Frank Lucia</b>	Director, Emergency Communications, Compliance and Information Bureau, Federal Communications Commission
<b>Josephine Malilay</b>	National Center for Environmental Health, Centers for Disease Control and Prevention
<b>John O'Connor</b>	National Communications System
<b>Elaine Padovani</b>	National Science and Technology Council, Office of Science and Technology Policy, Executive Office of the President
<b>John Porco</b>	Office of Emergency Transportation, Department of Transportation
<b>Ken Putkovich</b>	Chief, Dissemination Systems, National Weather Service
<b>Tim Putprush</b>	Federal Emergency Management Agency
<b>Carl P. Staton</b>	National Oceanic and Atmospheric Administration, NESDIS
<b>David Sturdivant</b>	Federal Communications Commission
<b>Jay Thietten</b>	Bureau of Land Management
<b>Bill Turnbull</b>	National Oceanic and Atmospheric Administration
<b>John Winston</b>	Federal Communications Commission

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.