U.S. Case Study - June 14, 2005 and Role of the Media

Ted Buehner,
Warning Coordination Meteorologist
National Weather Service
Seattle, Washington, USA
National Weather Service
Mission
Serving America Since 1870

Provide Weather, Hydrologic, and Climate Forecasts and Warnings for the United States, its Territories, Adjacent Waters and Ocean Areas, for the Protection of Life and Property and Enhancement of the National Economy.
The Warning System

- Detection / Warning
- Dissemination
- Response
Warning System Goal: To maximize the number of people who take appropriate and timely action to minimize injury, death, and property damage due to hazardous weather and flooding.
The Weather Warning Partnership:

In Washington during the 1990s
- Nearly 100 Fatalities,
- Hundreds Injured,
- Over $1 Billion in Property Damage
NWS Warning Product

NOAA Port

Internet

NWR / EAS

Private Vendors

Associated Press

EMWIN

NOAA Weather Wire

ACCESS

Government Agencies

General Public

Emergency Mgmt

Media

Multiple Paths

Multiple Paths

General Public

Emergency Mgmt

Media

Associated Press

Private Vendors

Internet

NWR / EAS

NOAA Port

Government Agencies
The Tsunami Warning System

- Major Undersea Earthquake/Landslide (magnitude 7.0 or greater)
- Seismic Measuring Equipment
- NOAA Tsunami Detection Buoys
- Tide – Sea-Level Instruments
- Tsunami Warning Centers
  - West Coast/Alaska (Palmer, AK)
  - Pacific (Ewa Beach, HI)
- Issue Tsunami Warning for Areas Close to Earthquake
- Tsunami Generated?
  - Yes
  - Continue/Expand Tsunami Information Bulletins, Tsunami Advisories, Watches and Warnings for Respective Areas
  - National Weather Service Coastal Offices activate EAS for Tsunami Watches and Warnings via NOAA Weather Radio
- No
  - Tsunami Information Bulletin – No Tsunami Generated, Cancel Tsunami Warning for Areas Close to Earthquake
  - State and Local Emergency Management Officials
  - Activate EAS for Evacuation of Low-Lying Coastal Areas
  - TV, Radio, Cable TV
  - General Public

Weather Radio Receiver

NOAA Tsunami “DART” Buoy

The Tsunami Warning System – A Flow Chart

Tsunami Warning Center
Palmer, Alaska
The Tsunami Warning System

Major Undersea Earthquake/Landslide (magnitude 7.0 or greater)

Seismic Measuring Equipment

NOAA Tsunami Detection Buoys

Tide – Sea-Level Instruments

Tsunami Warning Centers
- West Coast/Alaska (Palmer, AK)
- Pacific (Ewa Beach, HI)

Tsunami Generated?

Yes

Issue Tsunami Warning for Areas Close to Earthquake

(Only for Locations Close to Earthquake)

Continue/Expand Tsunami Information Bulletins, Tsunami Advisories, Watches and Warnings for Respective Areas

National Weather Service Coastal Offices activate EAS for Tsunami Watches and Warnings via NOAA Weather Radio

Those with NOAA Weather Radio Receivers (homes, businesses, schools, etc)

All-Hazard Alert Broadcast (AHABs)

General Public

State and Local Emergency Management Officials

Activate EAS for Evacuation of Low-Lying Coastal Areas

TV, Radio, Cable TV
Who Receives EAS Messages via NOAA Weather Radio

- All Broadcasters
  - TV
  - Radio
  - Cable TV

- Weather Radio Receivers
  - Homes
  - Businesses
  - Schools
  - Health Care Facilities
  - All-Hazards Alert Broadcast (AHAB) Units
  - Any With Receivers

Ocean Shores
“AHAB”
Emergency Alert System (EAS) Message Elements

- **Header Code**
  - Who – Originator Code
  - What – Event Code
  - Where – Location Code
  - When – Duration Time and Issuance Time
  - Who – Station Identification
  - Takes About One Second – Repeated 3 Times

- **NOAA Weather Radio Warning Alarm**
- **Voice Message (Up to 2 minutes)**
- **End of Message Tones/Codes**
- **EAS Tones Are Digital**
June 14, 2005

- 751 PM - 7.4 Magnitude Earthquake about 160 km off the Northern California Coast
- 756 PM – Tsunami Warning issued by West Coast/Alaska Tsunami Warning Center for Washington, Oregon, California
  - Within 2 hours travel time
- 800 PM – No Tsunami Generated Message issued by the Pacific Tsunami Warning Center in Hawaii for rest of Pacific basin beyond the U.S. west coast
  - Both messages are disseminated to all mediums (media, emergency management, et al)
June 14, 2005

- 806 PM – NWS Seattle and Portland activated the Emergency Alert System (EAS) via NOAA Weather Radio (four stations serve the coast)
  - Phone line to two stations on north coast failed
    - EAS not activated on the north coast
  - Astoria weather radio station signal quality poor
    - EAS message reception was poor on south coast
  - Not transmitted on western interior stations
    - Seattle and Portland media did not get the EAS message
    - Coastal areas served by Seattle/Portland area TV stations
Communication Lines in Western Washington

- Phone Line
- Microwave
- UHF Link

Base map: Courtesy of UW Atmospheric Sciences K-12 Outreach Group (http://www-k12.atmos.washington.edu/)
June 14, 2005

- **811 PM** – Clallam County activated its local Emergency Alert System (EAS) for evacuation of low-lying coastal areas via local radio broadcasters
  - Broadcasters relayed EAS message
    - Quileute and Makah Tribes evacuated
    - Many beach areas evacuated

- **Rest of coastal counties** chose to wait and see what happened further south in Oregon and California
  - EAS not activated for evacuation
  - Hoh and Quinault Tribes evacuated anyway
  - Many beach areas had self-evacuation
June 14, 2005

911 PM (1 hour 20 min after earthquake) - Tsunami Warning cancelled by West Coast/Alaska Tsunami Warning Center for Washington, Oregon, California

- Cancellation message disseminated to all mediums (media, emergency management, et al)
- No tsunami was generated
  - Quake was horizontal – not vertical
  - Coastal tides gauges showed only a small tsunami
June 14, 2005 Issues

Confusion about the tsunami messages
- West Coast/Alaska Tsunami Warning Center
  - Tsunami Warning for Washington, Oregon, California
  - Within 2 hours tsunami travel time
- Pacific Tsunami Warning Center
  - No Tsunami Expected for rest of Pacific Ocean Basin
- Not Enough Updates – Only One Per Hour
- Media
- Emergency Management Community
- General Public
  - Mixed Response to the Warning
    - Some Evacuated.....Some Did Not
June 14, 2005 Issues

Confusion about whether to evacuate low-lying coastal areas

- Incomplete Information
  - Tsunami Warning in Effect – Yes or No?
  - Wait for Tsunami Confirmation Elsewhere
- Washington Emergency Management
  - Stood by to Send a Coastal EAS Evacuation Warning
    - None Received From Coastal Counties
June 14, 2005 Issues

Tsunami EAS Message Dissemination Problems

- Weather Radio Station Communications
  - Phone Line Link Serving Two North Coast Stations Went Down Earlier in the Day
  - Poor Signal Quality for the South Coast Station
  - EAS Message Effectively Aired by only One of Four Weather Radio Stations

- Lack of EAS Message Sent to Western Interior Areas
  - Seattle/Portland Broadcasters did not Receive the Tsunami Warning EAS Message
  - Broadcasters did not Air the Tsunami Warning EAS Message
    - Many Coastal Areas get Seattle/Portland TV/Radio Media
June 14, 2005 Lessons Learned

- **Confusion about the tsunami messages**
  - West Coast/Alaska Tsunami Warning Center
  - Pacific Tsunami Warning Center
    - Adjusted their statement wording to make them more clear
    - Develop a New Public Warning Message to Reduce Confusion
  - Not Enough Updates – Only One Per Hour
    - Now have staff for 24/7 operations
    - Update statements every 30 minutes
    - More tsunami detection buoys
    - More coastal tide gauges
June 14, 2005 Lessons Learned

- Confusion about whether to evacuate low-lying coastal areas
  - More Tsunami Message Updates
    - More Positive Media and Public Response
    - Includes More Supportive Data
  - Washington Emergency Management
    - Now have an Agreement with Coastal Counties for One ‘Move to Higher Ground’ EAS Message
    - To Follow Initial Tsunami Warning EAS Message issued by the National Weather Service
    - Coastal Counties can Still Issue their Own Local EAS Evacuation Message
    - Install More All-Hazard Alert Broadcasting (AHAB) Sirens along Coastal Beaches
June 14, 2005 Lessons Learned

Media

- Created a Tsunami Media Kit
  - Joint Effort Between Washington State Emergency Management, National Weather Service and Coastal Counties
    - Includes
      - Tsunami Fact Sheets
      - Local Subject Matter Experts
      - Local Coastal Area Tsunami Inundation Zone/Evacuation Maps
      - Tsunami Warning System Flow Chart
      - Tsunami Interviews and More

- Distributed in Person to TV/Radio Broadcasters via a Tsunami Media Tour
- Plan to Update Kit Each Year
- Plan to Conduct Tsunami Media Tour Each Year
Washington Faces Many Non-Weather Hazards

Earthquakes

Tsunamis

Terrorism

Major Chemical Spills
Proclamation

WHEREAS, the state of Washington has experienced natural and man-made disasters in the past, and scientific evidence indicates Washington remains vulnerable to natural and man-made disasters in the future; and

WHEREAS, the loss of life and property can be greatly reduced if citizens have available information provided over the National Oceanic and Atmospheric Association (NOAA) weather radio; and

WHEREAS, state agencies, schools, hospitals, businesses and the general public should have weather radios equipped with a special alarm tone feature that can sound an alert and give immediate information about a life threatening situation; and

WHEREAS, the importance of listening to the NOAA Weather Radio will be highlighted during the month of September by NOAA, the city, county and state emergency management agencies, and schools, hospitals and businesses throughout the state; and

WHEREAS, the citizens of Washington need to prepare themselves to be self-sufficient for at least three days following a natural or man-made disaster;

NOW, THEREFORE, I, Gary Locke, governor of the state of Washington, do hereby proclaim September, 2001, as

NOAA Weather Radio Month

in Washington State, and I encourage all citizens to increase their knowledge and awareness of the benefit and use of the NOAA weather radio before, during and after a natural or man-made disaster.

Signed this 21st day of June, 2001

[Signature]
Governor Gary Locke
EAS Message Originating Sources

National
White House

State
Governor
Emergency Management

Local
Emergency Officials

Weather
National Weather Service

NOAA Weather Radio

Electronic Media
Cable Television
Radio
Television

The General Public

[Diagram showing the flow of information from sources to the general public through electronic media and NOAA weather radios.]
NOAA Weather Radio
A Life Saver for the Cost of a Pair of Shoes

Direct from the NWS 24 hours a day
NOAA Weather Radio
A Life Saver for the Cost of a Pair of Shoes

Latest Area Forecasts and Conditions
NOAA Weather Radio
A Life Saver for the Cost of a Pair of Shoes

Over 900 Stations Across the U.S.
NOAA Weather Radio
A Life Saver for the Cost of a Pair of Shoes

Has a Warning Alarm Feature
NOAA Weather Radio
A Life Saver for the Cost of a Pair of Shoes

Flood and Weather Warnings as Needed
NOAA Weather Radio
A Life Saver for the Cost of a Pair of Shoes

Key Element in Emergency Alert System (EAS)
NOAA Weather Radio
A Life Saver for the Cost of a Pair of Shoes

“All-Hazards” Warning System
NOAA Weather Radio
A Life Saver for the Cost of a Pair of Shoes

 Receivers Available at Most Radio Electronic Retailers and via the Internet
NWS Messages to EAS

* Tornado Watch or Warning
* Severe Thunderstorm Watch or Warning
* Flash Flood Watch or Warning
* Flood Warning
* High Wind Warning
* Winter Storm / Heavy Snow / Blizzard Warning
* Tsunami Watch or Warning
* Civil Emergency Message
Examples include:

* Civil Emergency Warning
* Evacuation Immediate
* Shelter in Place Warning
* Volcano Warning
* Child Abduction Emergency (AMBER)
Not All Weather Radios Receivers Are Alike

Key Features To Have
- Warning Alarm
- SAME (Specific Area Message Encoding)
- Event Selection
- External Antenna Jack
- Others

Best Reception

Programming Capabilities and Ease

Terrain Challenges
StormReady / TsunamiReady
Working Together to Save Lives

Ocean Shores
Long Beach
What is Storm/TsunamiReady?

- A voluntary community preparedness program that promotes weather and tsunami hazard readiness.
- Primary goal to improve public safety during emergencies.
- A collaborative effort between federal, state, and local agencies, and the public.
TsunamiReady Community Components

StormReady Elements
- Emergency Operations Center
- Multiple Ways to Receive NWS Warnings
- Multiple Ways to Disseminate Warnings
- Multiple Ways to Monitor Conditions
- Hazardous Weather Plan
- Community Preparedness Education

TsunamiReady Elements
- Identify Hazard Zones
- Map Evacuation Routes and Assembly Areas
- Install Evacuation and Assembly Signage
- Educate Community on Tsunami Hazard and Safety Plans
StormReady / TsunamiReady

Who
- Counties
- Communities
- Cities
- Indian Nations
- Supporters
  - Businesses
  - Schools

How To Apply
- Visit www.stormready.noaa.gov and Click on how to apply

Recommend Printing out the Word Document for a Worksheet
Work with Your Warning Coordination Meteorologist
Questions ??