Tsunami Alert Rapid Notification System (TARNS)

Partnership Program

Government of Thailand - National Disaster Warning Center

U.S. Department of Agriculture Forest Service

National Oceanic and Atmospheric Administration

Presentation Topics

- What is Tsunami Alert Rapid Notification System (TARNS)

- Why Thailand?

- TARNS program activities and timeline

U.S. Initiative: Indian Ocean Tsunami Warning System

Vision:
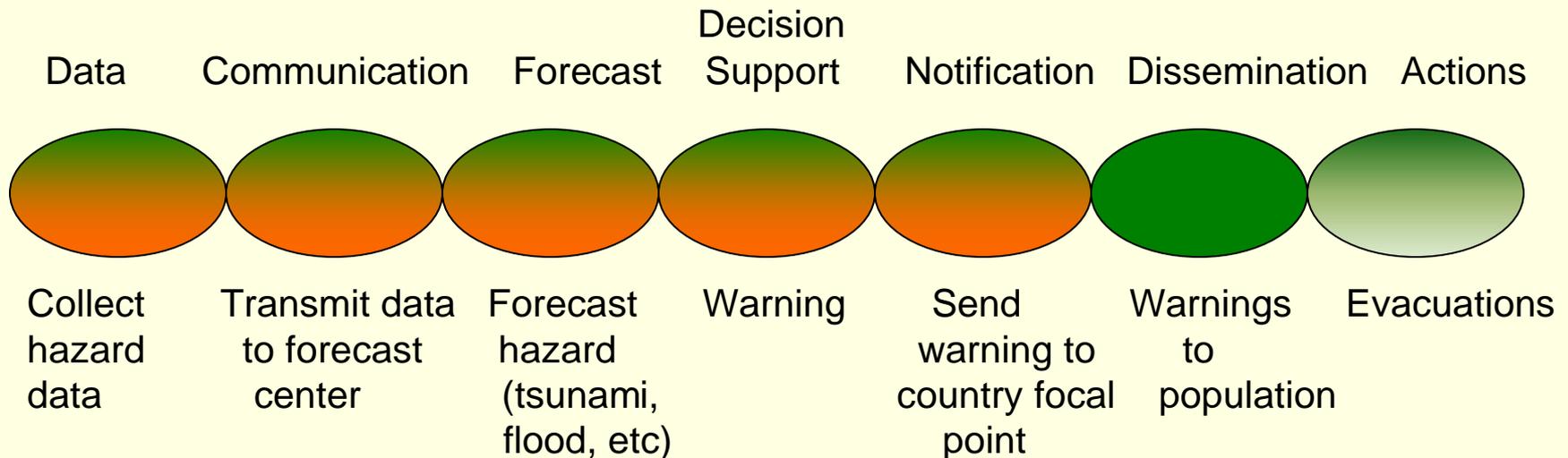
To provide strategic support towards the development of an operational "end-to-end" tsunami warning system for the Indian Ocean within a multi-hazard framework

TSUNAMI
December 26, 2004

Countries most affected by the Tsunami

©GraphicMaps.com

What is TARNS? Where does it fit in end-to-end system?

■ Regional

■ National

■ National / Tsunami Resilient Communities

Data	Communication	Forecast	Decision Support	Notification	Dissemination	Actions
Collect hazard data	Transmit data to forecast center	Forecast hazard (tsunami, flood, etc)	Warning	Send warning to country focal point	Warnings to population	Evacuations

What is TARNS? Where does it link with the system as a whole?
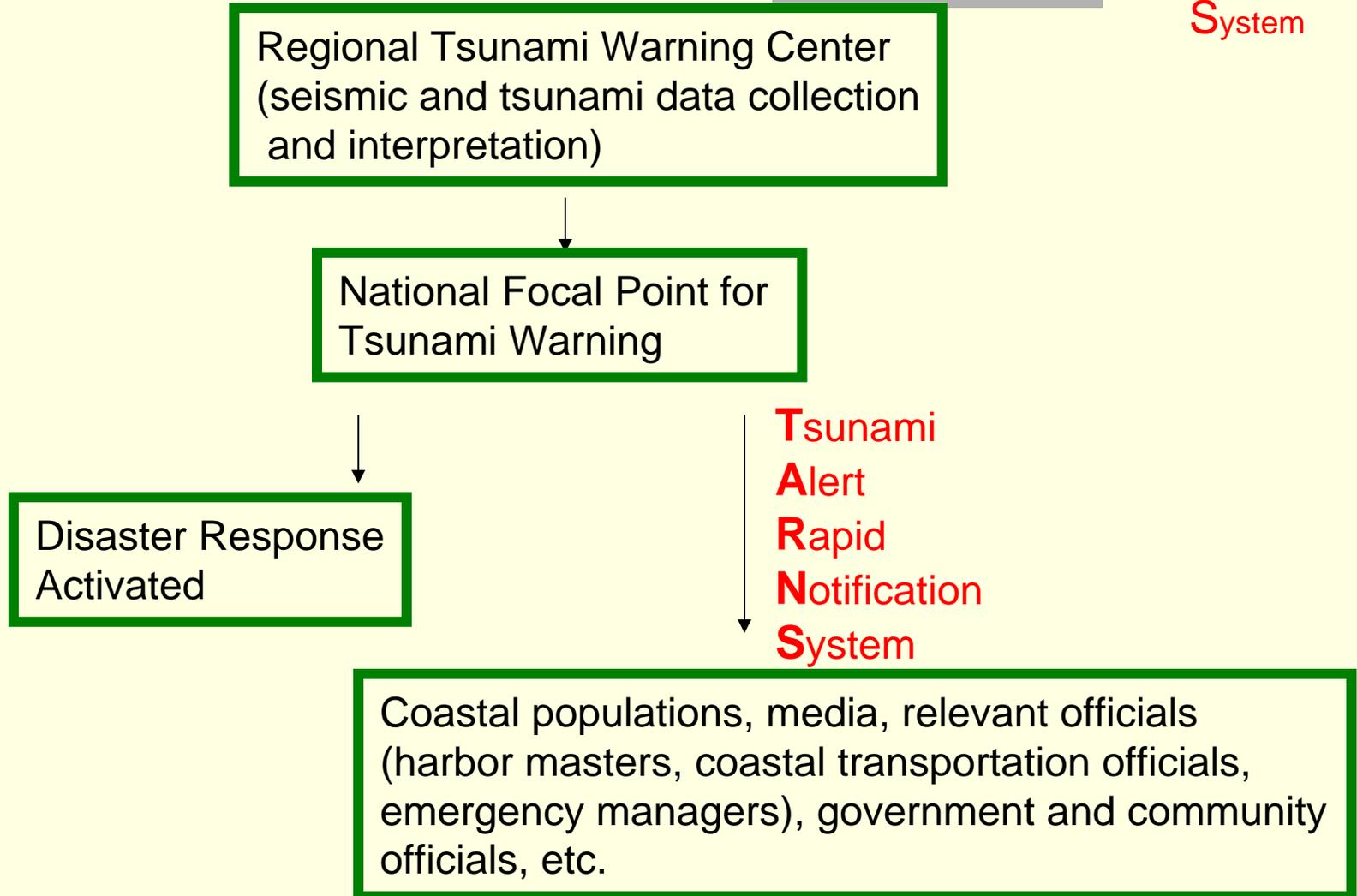
- Regional Warning Network to National Focal Point to formulate forecast/warning

- **TARNS – all national activities including the "last mile" warning dissemination**

- Community preparedness to respond to warnings
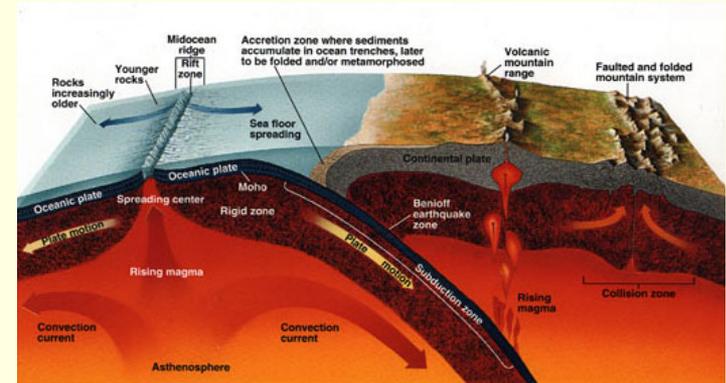
What is TARNS? How does it fit in national system?

Regional Tsunami Warning Center
(seismic and tsunami data collection
 and interpretation)

National Focal Point for
Tsunami Warning

Disaster Response
Activated

Tsunami
Alert
Rapid
Notification
System

Coastal populations, media, relevant officials
(harbor masters, coastal transportation officials,
emergency managers), government and community
officials, etc.

Why TARNS in Thailand ?

- Thailand can serve as a Indian Ocean Regional Model for TARNS Process

- The Thai environment embraces new technologies and systems easily

- NDWC has broad mandate of leadership and window of opportunity to create new systems

- Can increase confidence in government for warning

- Will complement USTDA and NOAA initiatives with NDWC and other IOTWS Programs in Thailand

Mandate of NDWC

Lead organization for receiving, monitoring, processing and disseminating critical information and official government warnings to involved officials, emergency response agencies as well as the general public on impending disasters around the clock

Linkage of PDC and TARNS

■ PDC focus on NDWC specific role in warning dissemination – technology of information coming into NDWC and out to Thai agencies/TV/SMS/sirens

■ TARNS focuses on holistic system; leadership role of NDWC in coordinating all levels of government and agencies for warning – regulatory framework, decision authorities, protocols, SOPS, training, evaluation and testing of entire system to the local level

Findings from site visits to Ranong and Phuket Provinces

Substantial recognition of progress in the form of visible indicators: siren towers, loudspeakers, cell-phone SMS, radio/TV intercept

- Provincial level: concerns regarding lack of overall framework plan, SOPs, decision authority protocols, training and maintenance plan

- Village level: no understanding of protocols on loudspeaker system – low trust in ability to maintain equipment

- Tourism Industry: association resources underutilized and concerns regarding system linkage with tourist facilities

TARNS U.S. Agency Implementing Roles

- USDA Forest Service
  - Design and process of activities
  - POC – Deanne Shulman dshulman@fs.fed.us
- NOAA
  - Technical Expertise Communications Designs
  - POC – Jennifer Lewis Jennifer.Lewis@noaa.gov

Proposed TARNS Program Activities - Overview

Program completed:
30 September, 2007

- Establishment of a Thai TARNS Interagency Workgroup – May, 2006
- Conduct of the First TARNS Workshop – May, 2006
- Conduct two additional TARNS workshops
- Identify technology gaps – explore enhancing through private sector or USTDA
- Conduct two simulation exercises

TARNS Interagency Workgroup

- Function of TARNS Interagency Workgroup: Provide leadership and coordination for early warning with ultimate objective to SAVE LIVES

- TARNS Interagency Workgroup created through Gov Thai/USAID MOA and by the authority of the National Disaster Warning Management Commission (under Deputy Prime Minster)

- NDWC will convene the TARNS Interagency Workgroup and TARNS Core Workgroup and track processes / outputs

- Workgroup member commit to all activities of the project
  - Attend three workshops
  - Participate in two simulation exercises

First Workshop : System Design and Plan

- Thailand and the U.S. share experiences and lessons learned from March 28 (Nias Earthquake) / July 24 and June 24, 2005 respectively

- Present U.S. TARNS templates, principles, SOPs and lessons learned from Pacific Ocean tsunamis

- Examine existing Thai TARNS

- Design improved Thai TARNS plan based on shared principles and lessons learned

First Workshop:
Issues for Discussion

- Regulatory framework
- Consistency of message
- Terminology and education: warning, watch, advisory, bulletin
- Importance of all-hazard system – tsunami as the "most demanding" hazard
- Multiple and redundant communication pathways
- Tsunami data vs seismic models: second guessing tsunami generation

First Workshop:
Issues for Discussion (cont.)

- Identification of mechanism of warning dissemination, and timeframes needed: emergency managers, media, government officials, organizations, citizens, visitors

- Role of media – educating the media

- Public and private sector roles in warning dissemination

- Special messaging needs

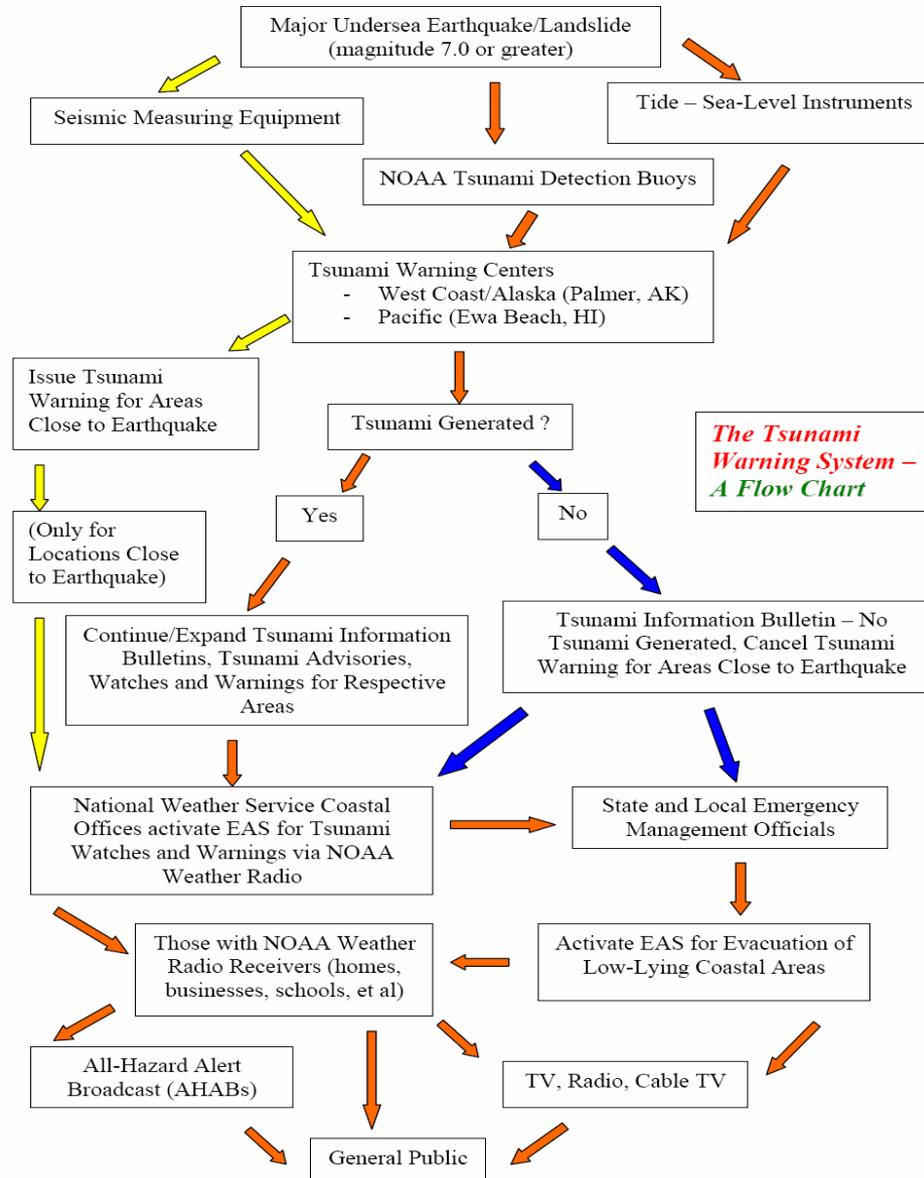- Maintenance of systems that are used infrequently

Sample Outputs from First Workshop

- Description of current Regulatory framework
- All-Hazard Warning System Plan showing all pathways of warning
  - Reflecting lessons learned from both Indian and Pacific Ocean experience
  - Linked Standard Operating Procedures for all levels of government
  - Checklists for control rooms at various levels of government
  - Protocols for siren and other emergency signaling devices

Sample Tsunami Warning System Decision Flow Chart

Major Undersea Earthquake/Landslide (magnitude 7.0 or greater)

Seismic Measuring Equipment

Tide – Sea-Level Instruments

NOAA Tsunami Detection Buoys

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

Issue Tsunami Warning for Areas Close to Earthquake

Tsunami Generated ?

The Tsunami Warning System – A Flow Chart

Yes

No

(Only for Locations Close to Earthquake)

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

Tsunami Information Bulletin – No Tsunami Generated, Cancel Tsunami Warning for Areas Close to Earthquake

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

State and Local Emergency Management Officials

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

Activate EAS for Evacuation of Low-Lying Coastal Areas

All-Hazard Alert Broadcast (AHABs)

TV, Radio, Cable TV

General Public

Siren Activation & Signaling Criteria FEMA CPG-15

- The Tillamook Tsunami Warning System is currently activated by our 9-1-1 or Public Safety Answering Point (PSAP).

- Tillamook County has 3 back-up transmitters at different locations including a mobile suitcase for activating system.

- Sirens sound a solid blast or warning tone for 3 minutes indicating impending natural hazard emergency

- When a Local Tsunami warning is received from NOAA the Sirens will sound every 15 minutes until arrival of first wave.

- When a Distant Tsunami Warning is received from NOAA the Sirens will sound every hour until the last hour when the sirens will sound every 15 minutes.

Second Workshop: Technology and Hardware

- Multiple Communication and Alert System Technologies

- Infrastructure and Legacy implications

- Technology gaps Identified

- Technologies available on the marketplace

- Maintenance and Routine Testing Requirements during "normal times"

Examples of Technology

- Satellite communications
- Radio systems
- Emergency Alert System
- Wire
- Data Systems
- Internet
- Telephone/Hotlines

Third Workshop:
Integrating and Refining Systems

- Putting it all together

- Testing Systems and Technology

- Training Requirements

- Enhancing Public Private Partnerships

- Preparing for Simulation Exercises

Simulation Exercises

Thai government conducts and self-evaluates

U.S. specialists assist to design and facilitate.

- Tabletop

- Actual Exercise

*Thank you
for your kind attention*