UNESCO/IOC – NOAA ITIC Training Program in Hawaii (ITP-Hawaii)
TSUNAMI EARLY WARNING SYSTEMS
AND THE PACIFIC TSUNAMI WARNING CENTER (PTWC) ENHANCED PRODUCTS
TSUNAMI EVACUATION PLANNING AND UNESCO IOC TSUNAMI READY PROGRAMME
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# Emergency Communications – 3 Rs, 1T

## Reliable, Robust, Redundant, Tested

Dr. Laura Kong
Director, ITIC

* Presented by Ardito Kodijat
IOTIC

# 3Rs Required for Tsunami Warning

- **Robust** - capable of **performing without failure under a wide range of conditions** *(Miriam-Webster)*; persistence of a system's characteristic behavior under perturbations or unusual or conditions of uncertainty *(Wikipedia)*
- **Reliable** – giving the **same result on successive trials, dependable** *(Miriam-Webster)*; ability of a system to perform and maintain its functions in routine circumstances, as well as hostile or unexpected circumstances *(Wikipedia)*
- **Redundant** - serving as **duplicate for preventing failure of an entire system** upon failure of single component *(Miriam-Webster)*; duplication of critical components or functions of system with intention of increasing reliability of system, usually as backup or fail-safe *(Wikipedia)*

# Warning Communications Are:

- Focused on the people at risk
- Ubiquitous - same message everywhere
- Reaches all people irrespective of what they are doing & where they are
- Easy to access and use
- Do not create added risk
- Reliable
- Issued with appropriate lead time
- Authenticated, authoritative

# An Effective Warning Message Is:

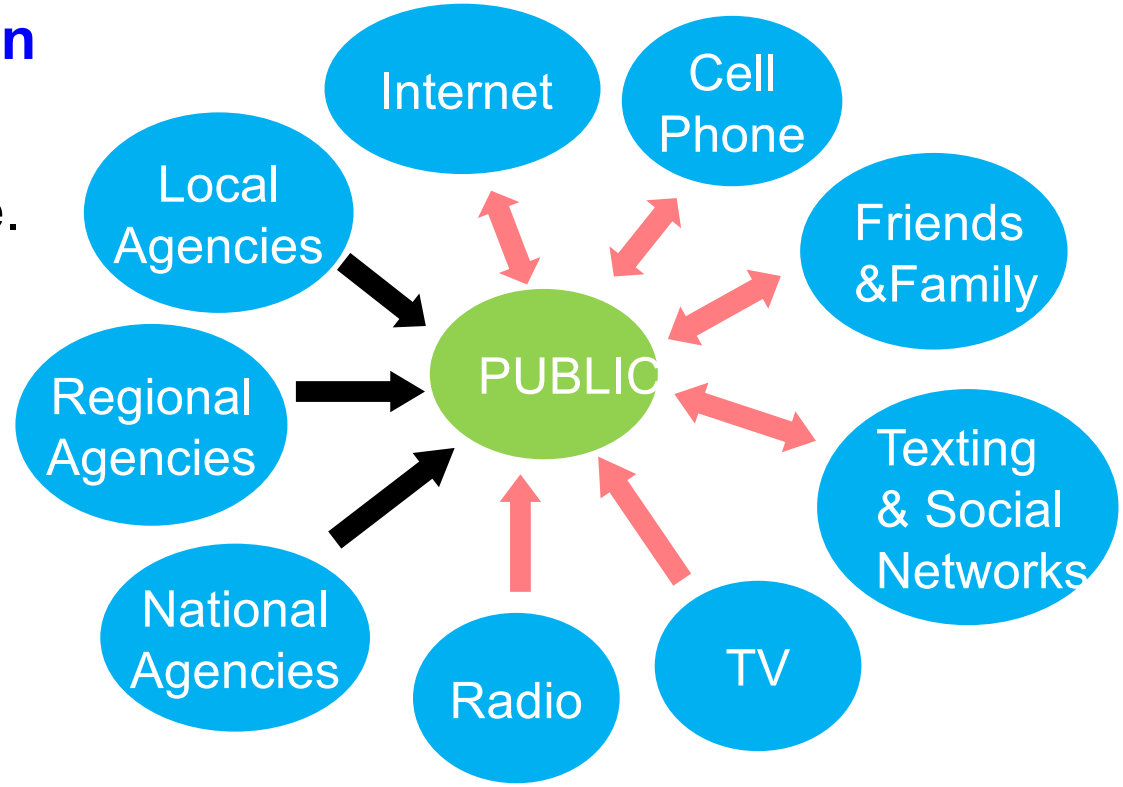
- Clear & understandable
- Accurate
- Frequent
- Credible
- Specific to the situation
- Gives Action - specific advice

***Effective warnings should reach 95% of the at-risk population***

# How public gets warning: Reality

## Need to Manage Information

- Information flows from many sources at same time.
- Some are official. Many are unofficial
- Need to actively work to minimize confusion and convey consistent information



# Educate Public Before

- What communication systems/media will be used to issue warnings?
- Who will issue the warnings?
- How will the warnings be issued?
- When will the warnings be issued?
- What will the warning messages say?

# What Public Needs to Know

- Official sources of tsunami information
- Evacuation maps & routes
- Local / Distant tsu response differences
- Natural Warning signs
- Warning systems for your community
- What sirens sound like and verbal message (regular testing)
- How to respond to siren sounding
- Community support network / orgs

# Human Response to Warning

**People response differently. Considerations are:**

- **Ages**
- **Ethnicities**
- **Genders**
- **Social status**
- **Previous experience of hazards**
- **Proximity to hazard**
- **Responses of others**

# Using Existing Infrastructures

- Radio
- TV
- Fire Service- Local sirens
- Police - PA loud-speaker, door-to-door notification
- Coast Guard & Port
- Lifeguards
- Schools, hospitals, retirement homes

# Using Technology

## Sound Alert

- Sirens
- Church Bells

## Voice Alert

- Fixed PA loud-speakers
- Mobile PA loud-speakers
- Telephone auto dialler; telephone trees
- Tone-activated alert radio
- Cell Broadcast
- Aircraft (loud-speakers)

## Visual Alert

- SMS text messaging
- Aircraft (Banners)

# Assessing Technology

- **Availability, serviceability**
- **Cost: now & on-going**
- **Time to reach target audience**
- **Start-up Training/institutional effort**
- **Recurring Training/institutional effort**
- **Based on examples of best practice**
- **Easy to understand/interpret**
- **Withstand**
  - beach erosion, coastal instability
  - weather, sea level rise, criminal acts, fire, computer systems failure

# 3Rs, 1T Required for Tsunami Warning

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- **Reliable** – giving the **same result on successive trials, dependable**
- **Redundant** - serving as **duplicate for preventing failure of an entire system** upon failure of single component
- **Tested regularly** – so that system works during real events

# FINAL CONSIDERATIONS

**Effective Comms must be**
**Robust, Reliable, Redundant, and Tested**

- **For effectiveness, system must be robust, reliable**
- **For planning for system failure, system must be redundant, tested**
- **For sustainability, system ongoing costs and commitment must be realistic**

# Thank You

Dr. Laura Kong
Director, ITIC

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IOTIC