

Disaster Preparedness



*Cascadia EarthScope Earthquake & Tsunami
Education Program*

Sue Graves ~ August 2013

Objectives

Distant Event

Understand
Distant Tsunami

Plan for Before,
During & After

Local Event

Survive a Cascadia
Earthquake

Escape a
Local Tsunami

Prepare for
Island Life

Distant Tsunami

Earthquake Far Away

You won't feel the ground shake

4+ hours before waves arrive

Limited Inundation

Know the “Distant” Zone

- Beaches
- Harbors
- Rivers, Inlets
- Other low-lying areas



Tsunami Alert Messages

West Coast & Alaska Tsunami Warning Center

Alert Level	Threat	Action
Information Statement	Minor waves at most	No action suggested
Watch	Danger level not yet known	Stay alert for more info
Advisory	Strong currents likely	Stay away from the shore
Warning	Inundating waves possible	Full evacuation suggested



Distant Tsunami Notification



Evacuation Before a Distant Tsunami



- **WHO:** Only those in the distant tsunami zone
- **HOW:** Probably by car
- **WHERE:** ???

Re-entry After a Distant Tsunami

- Cancellation Message
- Re-enter with Caution
- Damage
 - Harbors
 - Beaches
 - Low-lying areas
 - Roads, Bridges
- Clean up

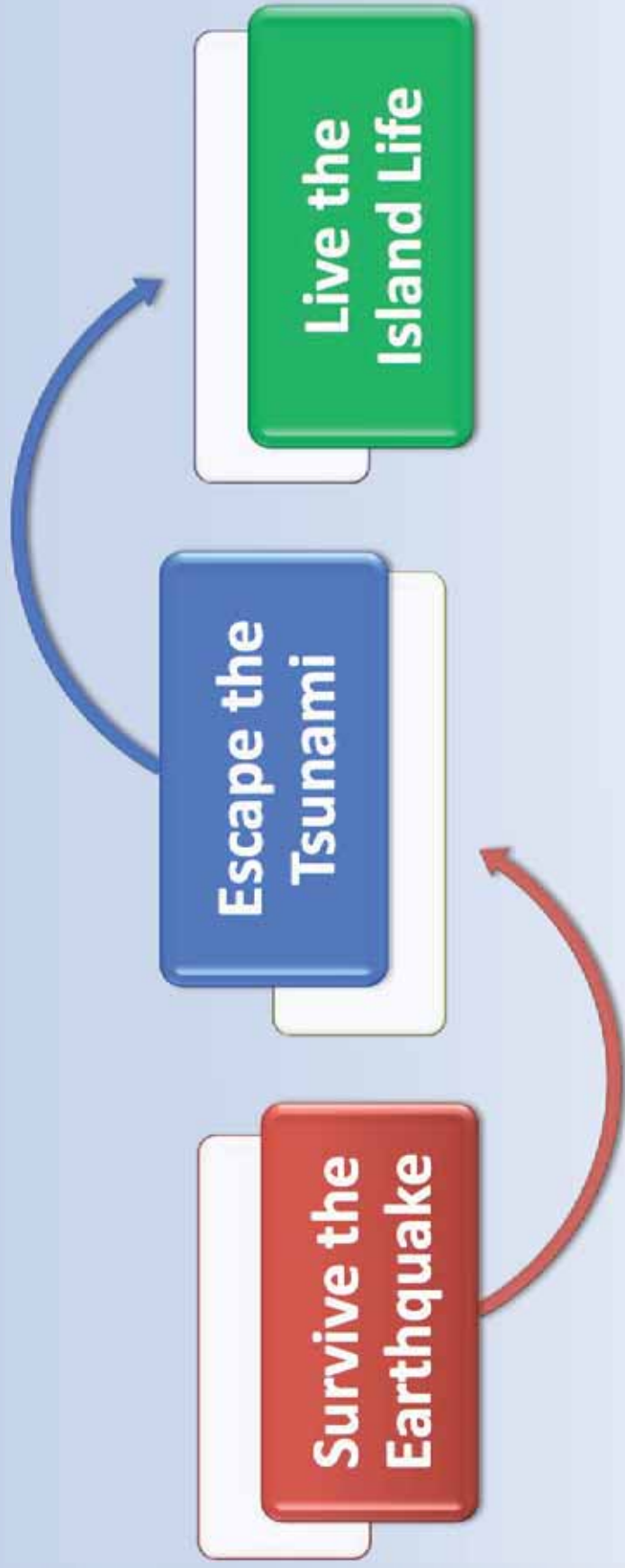




**SHOULD ANYONE DIE
FROM A DISTANT TSUNAMI?**

NO

Local Event



Local (Cascadia) Earthquake

- Cascadia Subduction Zone
- Magnitude 8 to 9.0+ Earthquake
- **4-6 minutes of intense shaking**



2011 Japan Earthquake

- Magnitude 9.0
- Shaking lasted 6 minutes
- 250 mile stretch of coastline dropped 2 feet



Damage to Homes



Damage to Schools



Damage to Businesses



Roads Damaged



Landslides – Roads Blocked



Yaquina Bay Mudslide March 2012

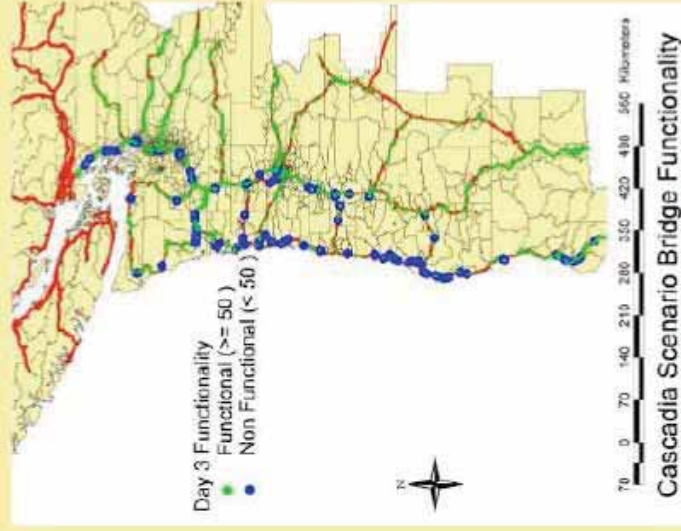
Landslides – Damage Homes



Waldport, OR

Bridges will Collapse

What are the risks & impacts based on our assumptions?



- Infrastructure and lifelines will be seriously damaged
- In Oregon, 399 bridges would have totally or partially collapsed under an M 9.0 Cascadia Subduction Zone earthquake, and 621 bridges would have been heavily damaged.
- Most state routes connecting Interstate I-5 with the Oregon Coast Highway would be closed. The estimated time of closure could be 3 to 12 months.
- The restoration of the entire transportation network could take 3 to 5 years, and would require a nationwide effort.



Althea Rizzo, Ph. D.
Geologic Hazards Program Coordinator

What are the Implications?



Gas Lines Ruptured



Water Supply Damage



Estimated Water Infrastructure Damage



Is this Realistic?



Aftershocks



Injuries



Hypothermia

- Hypothermia is a significant risk
- Rainy Coastal Environment

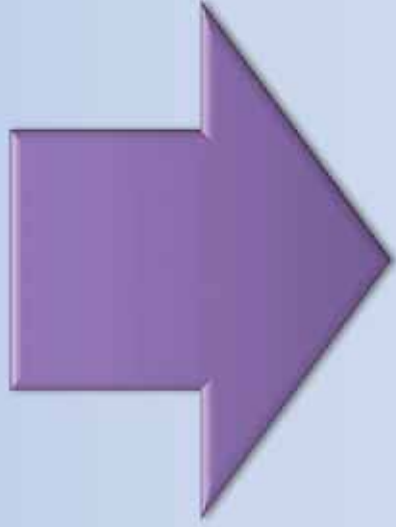




What if we only had the

EARTHQUAKE

Survive the Earthquake



Prevention

- Modify Your Environment



Protection

- Modify Your Behavior

Secure Heavy Furniture

- *Velcro straps*
- *L brackets*



Nothing Above Bed



CAM 06

10:20:08 A



Tie Supplies to Bed

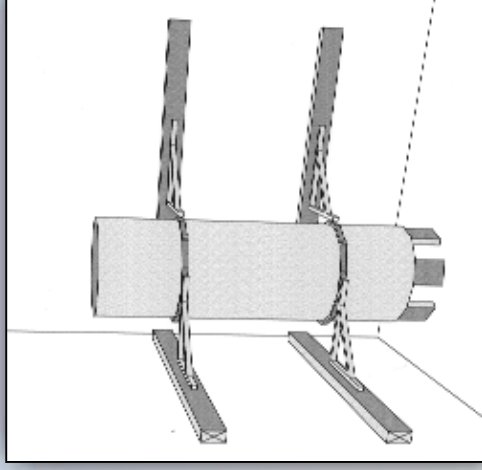
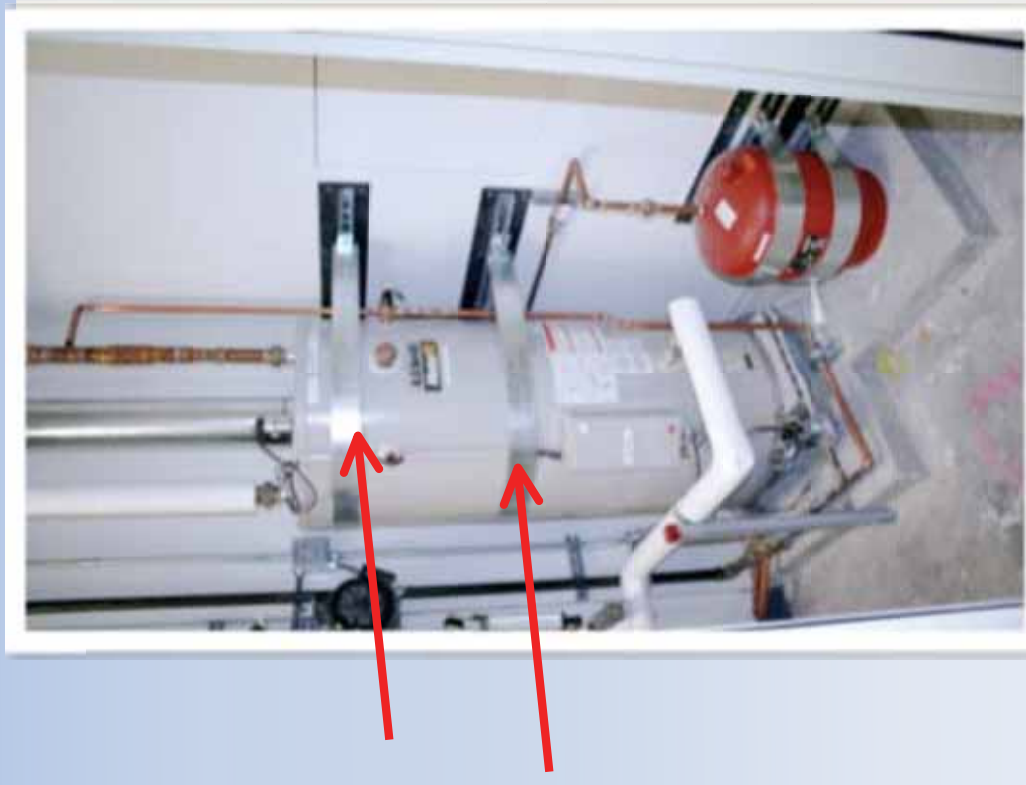
- *Flashlight/Head-Lamp*
- *Sturdy Shoes*
- *Leather Gloves*



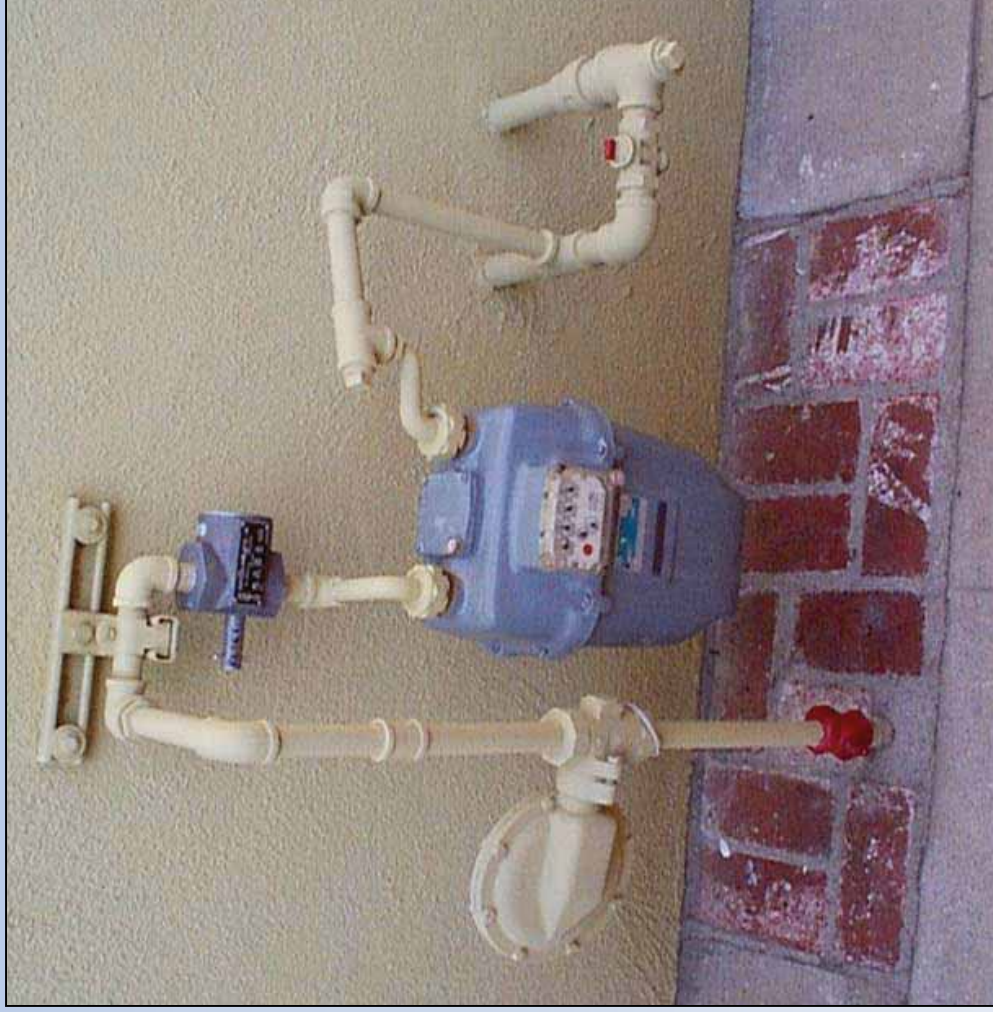
What if you're in bed when the ground shakes?

Secure Water Heater

- *Source of Drinking Water*
- *Prevent Damage*
- *Gas leaks - fire*



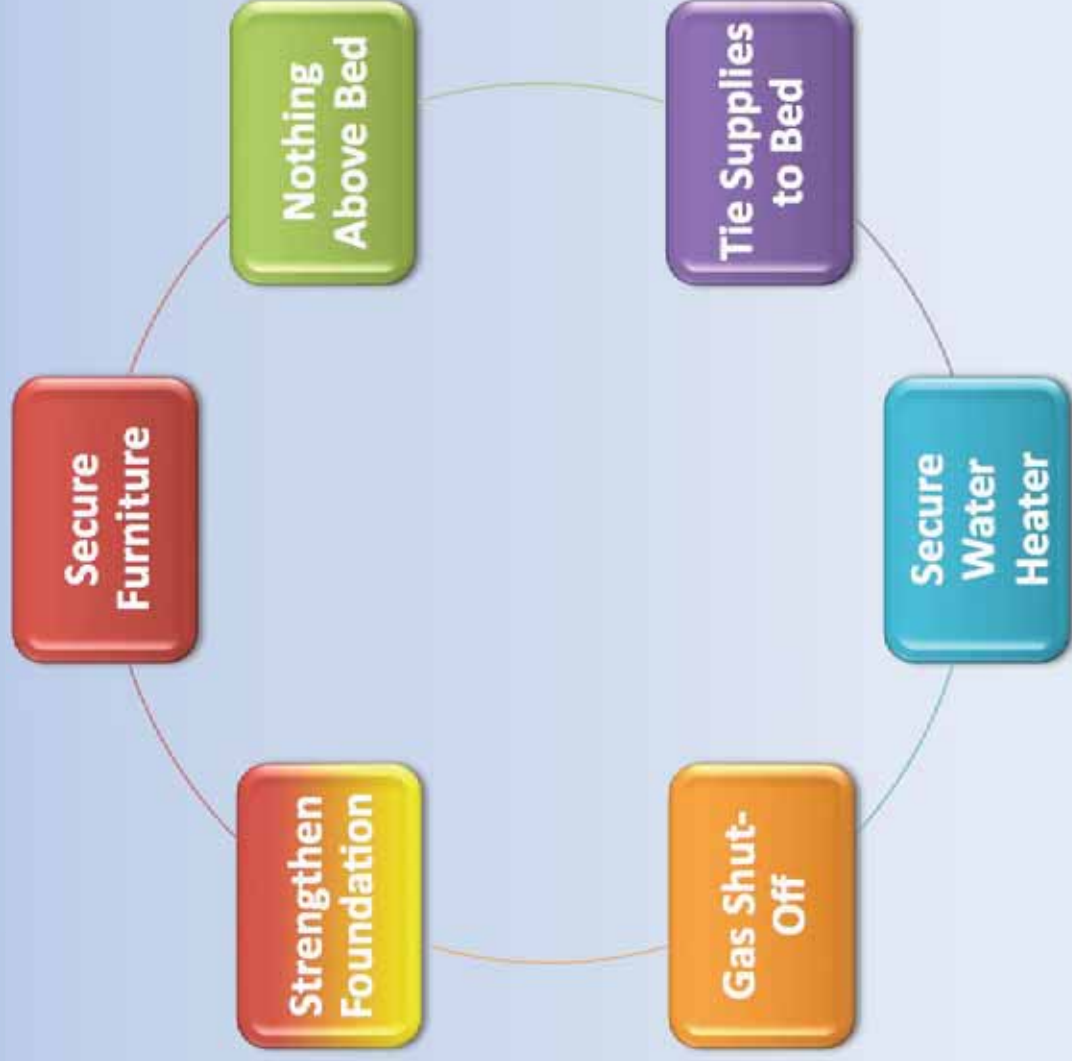
Gas Shut-Off



Secure House to Foundation



Take Action!



Duck, Cover & Hold



LCSD Earthquake/Tsunami Video



http://lincoln.k12.or.us/dept_programs/safety_videos.php



Be a small Target

Body Position

- On knees
- Protecting neck/head
- Hold onto furniture
- Curl into a ball



Face Position

- Turn away from windows
- Close eyes



Notice Anything?



During the Shaking

If Inside, Stay Inside

- Classroom
- Gymnasium
- Band Room

If Outside, Stay Outside

Get away from buildings, trees, light poles, power lines, utilities



In a Car or Bus

- Pull over to a safe location
- Stop & stay there
- Keep seat belt on
- After shaking stops, assess your situation



Wheel Chair Bound

- Roll into area with structural protection
- Apply brakes
- Cover head and eyes to best of ability
- **Be Advised:** rescuers need to drop, cover, and hold on, too!



What About Adults

- Staff should also Drop, Cover & Hold On during drills
- **Supplies under staff desk**
- Encourage staff to have a family emergency plan



The Great Oregon Shake Out

Get October 17, 2013
Ready to
Shake
Out.

The Great
Oregon
ShakeOutTM

shakeout.org/oregon

3 Common MISTAKES

- **DO NOT**
run out of
the building!

Run



- **DO NOT**
get in a
doorway!

Doorway



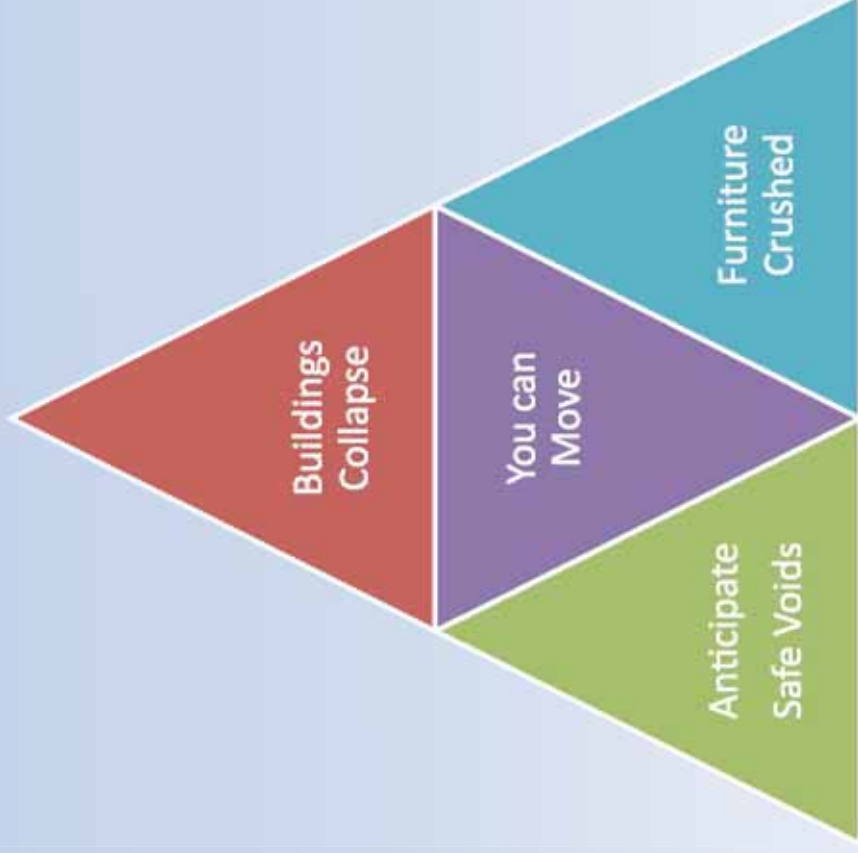
- **DO NOT**
believe the
triangle of life!

**Triangle
of Life**



The Triangle of Life MYTHS

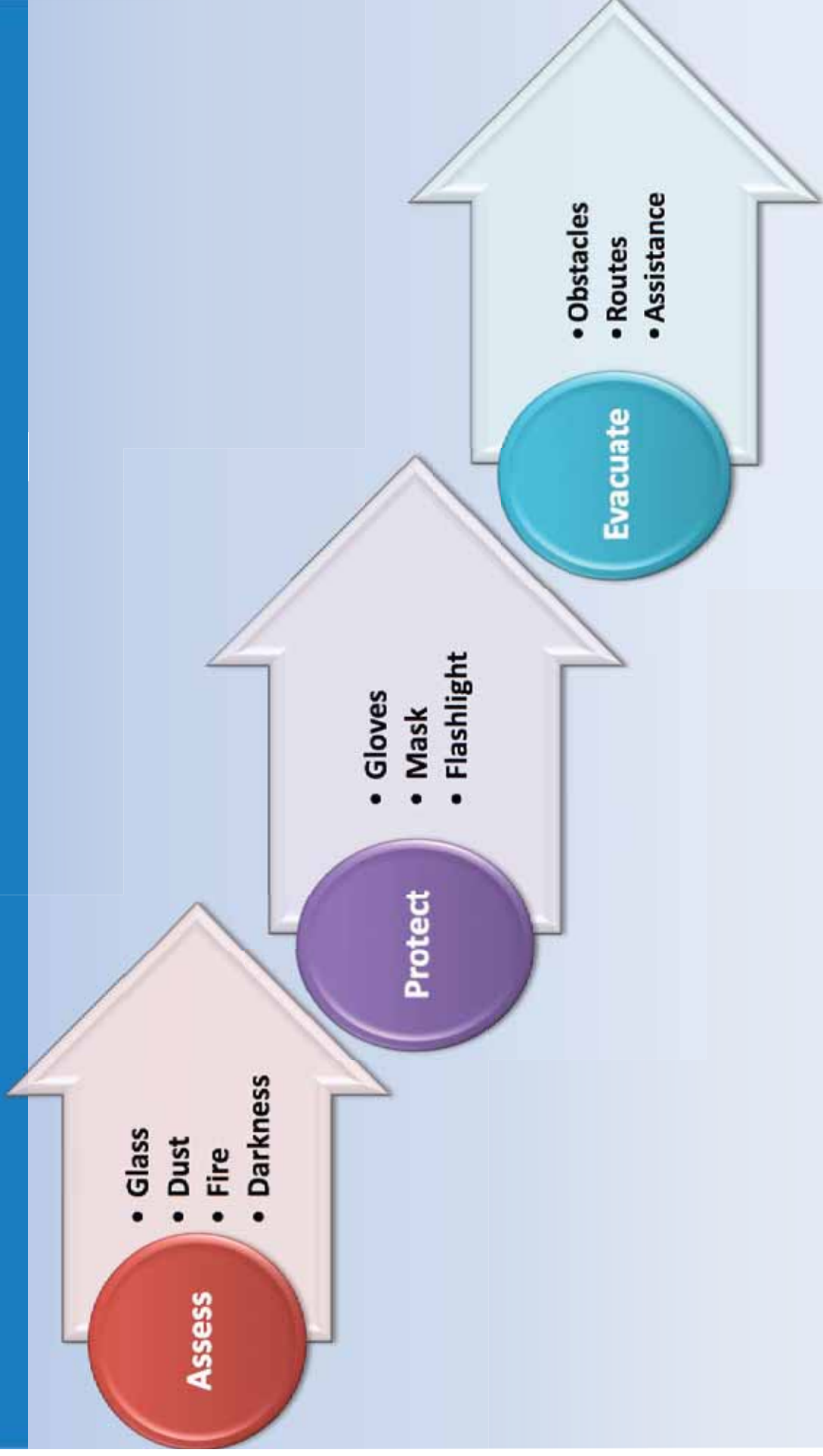
MYTHS



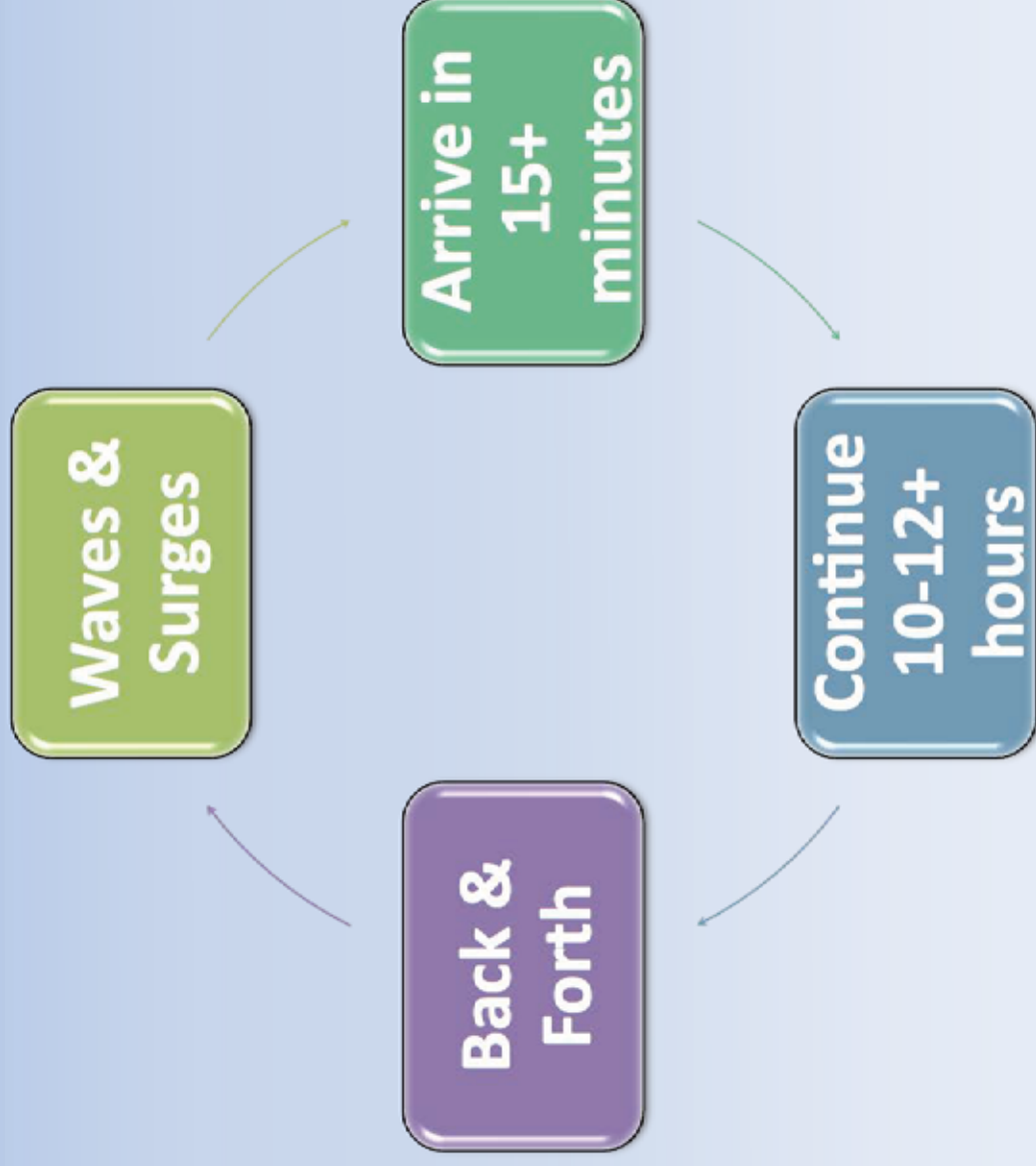
TRUTH

1. **Collapse:** Most buildings do not collapse
2. **Moving:** Strong shaking makes moving very difficult and dangerous
3. **Voids:** The direction of shaking and unique structural aspects of the building make this impossible.
4. **Furniture:** People DO survive under furniture or other shelters.

After the Earthquake



Local (Cascadia) Tsunami



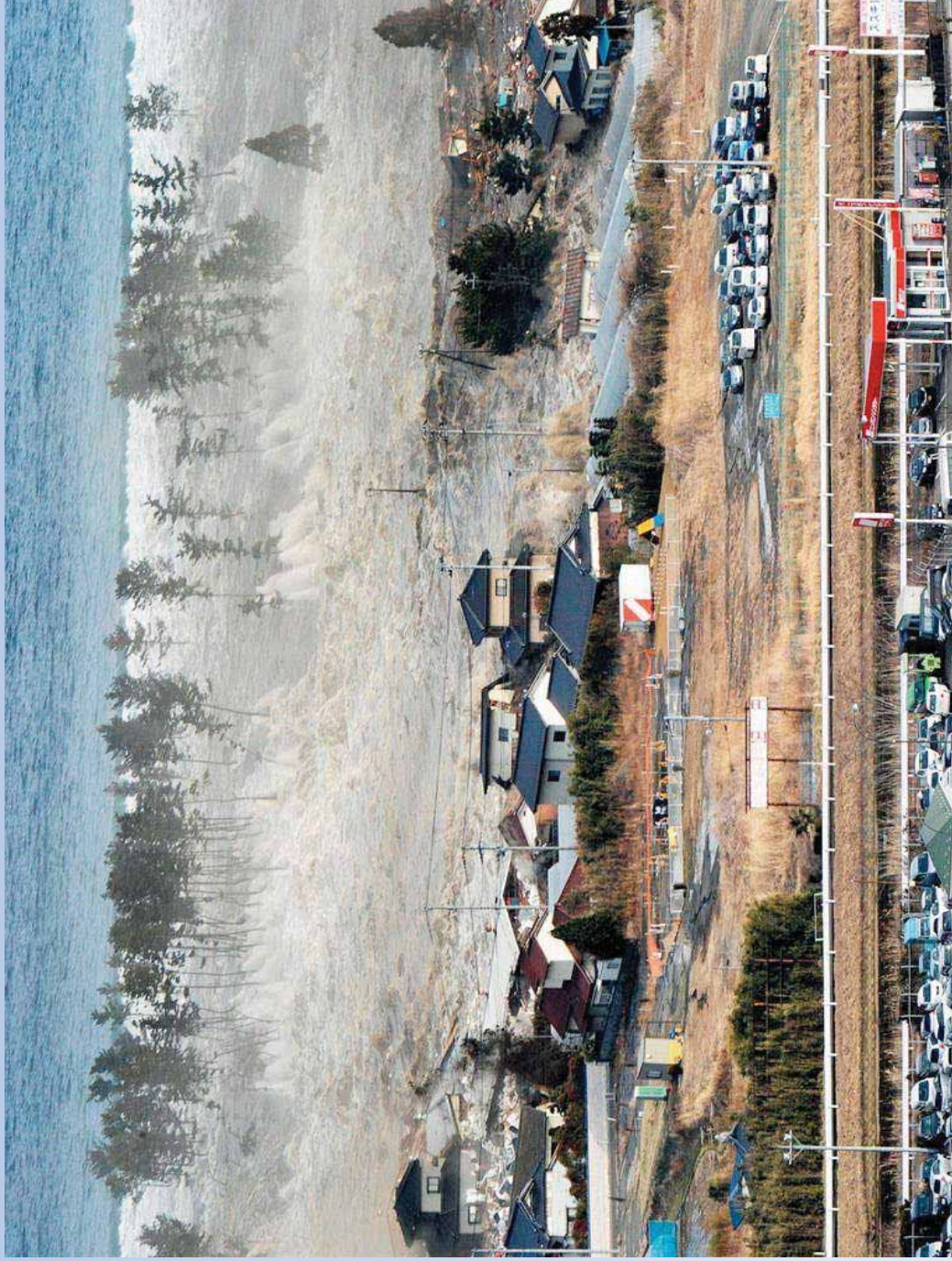
2011 Japan Tsunami

Heights up to 133 feet

Traveled up to 6 miles inland



Buildings Destroyed



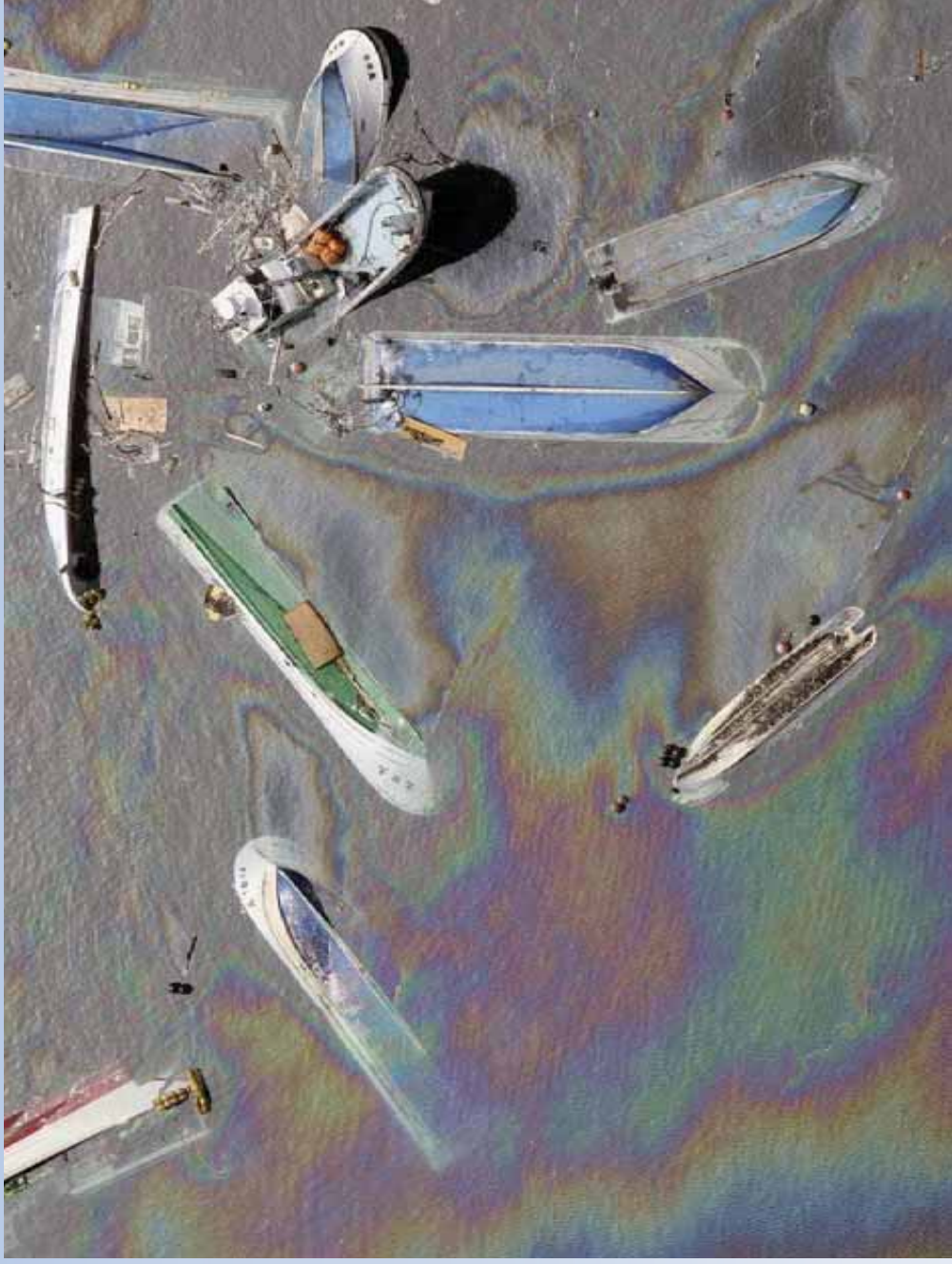
Fires



Fires



Harbors Destroyed



Aircraft & Airports Destroyed



Hazardous Materials



Debris



Roads Destroyed or Blocked



Injuries & Death



Rescues



Islands



Separated by...

- Failed Bridges
- Landslides
- Debris
- Hazardous Materials



Broken Communication



New Tidal Level



Escape the Tsunami

- Tsunami zones
- Evacuation Routes
- Safe Areas

Learn

Practice

- Go on Foot
- Assist Others
- Consider Options



Know the Zones

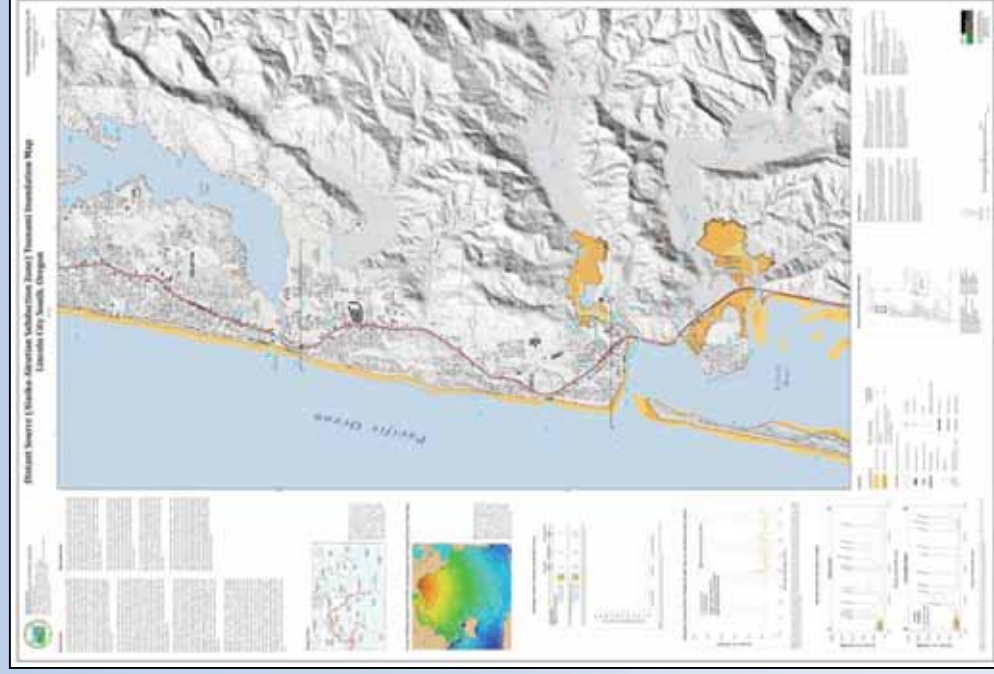
Tsunami Evacuation Maps



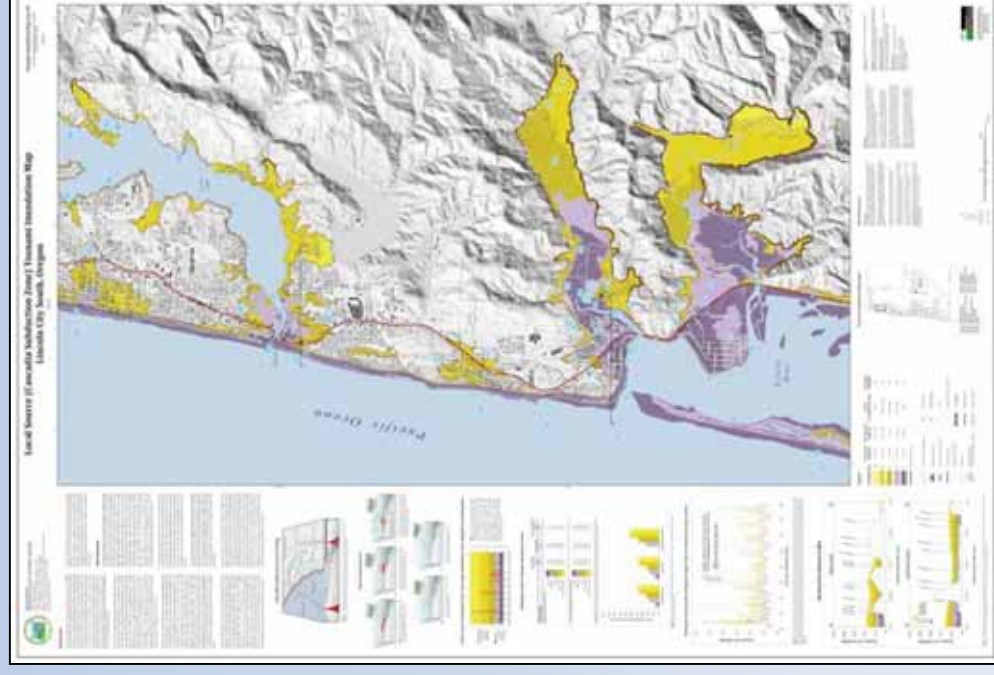
Know the Zones

Tsunami Inundation Maps

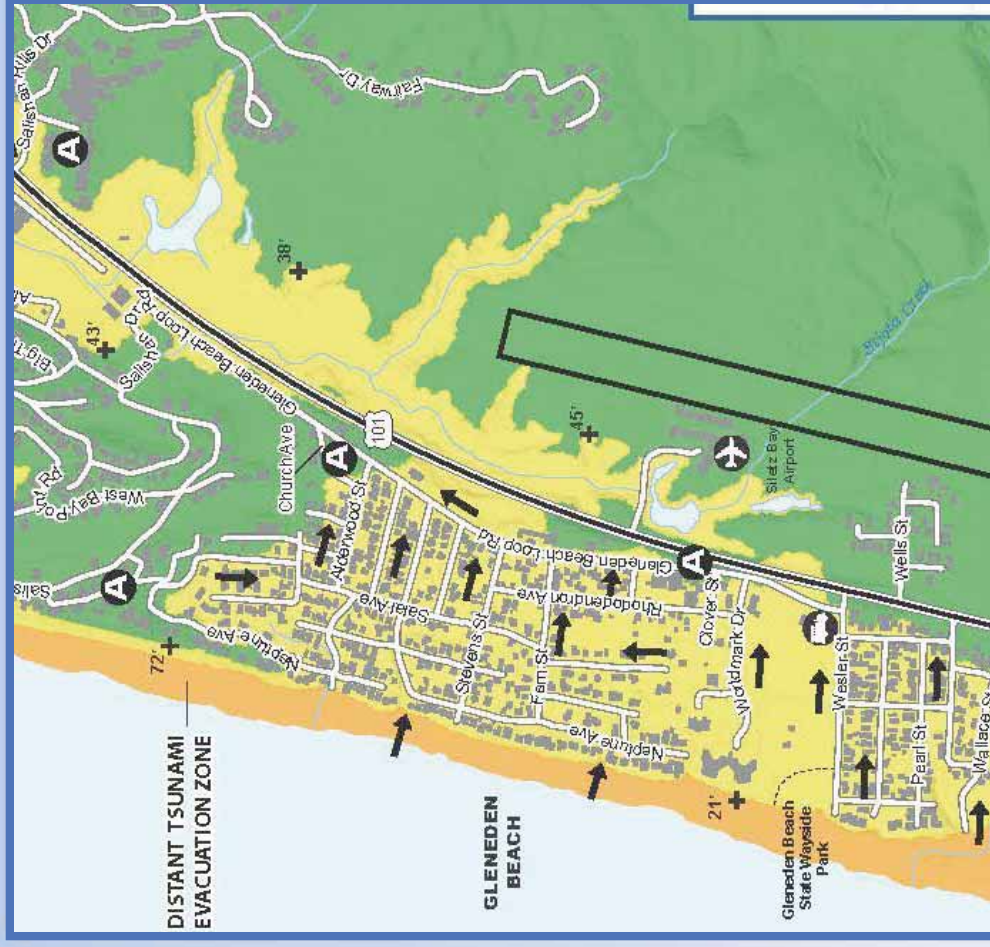
Distant



Local



Mobility Challenges?



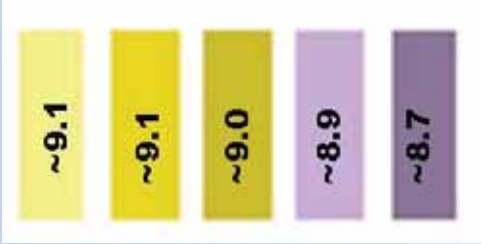


Vertical Evacuation

Watch FEMA
Tsunami Vertical Evacuation Video

http://www.fema.gov/mediaibrary/media_records/8086

Don't Give Up!



Identify High Ground

- Signs
- Evacuation Routes
- Safe Areas
 - Temporary Assembly Areas
 - Vertical Evacuation Options



Practice



Go On Foot



**Assist
Others**



**Consider
Options**

To Carry or Not To Carry Supplies



Situation

Ability

Time

Distance



The Discipline to STAY PUT!

WHEN DO YOU RETURN
to the
Tsunami Hazard Zone?

Prepare for Island Life

Psychological

Communication Plan

Meeting Place

Emotional Recovery

Physical

Shelter & Warmth

Water & Food

Medical & Sanitation

Family Plan

- Communication Plan
 - Out of State Contact
 - Photo
 - Insurance Info
- Update School Info
- Identify Meeting Places

NAMES OF FAMILY MEMBERS Address Phone # Phone # Phone #		FAMILY PHOTO
LOCAL EMERGENCY CONTACTS Name Address Phone #		
OUT OF STATE EMERGENCY CONTACT Name Physical Address Phone # Phone #		

MEDICAL INSURANCE
DENTAL/VISION INSURANCE
HOME INSURANCE
AUTO INSURANCE
LIFE INSURANCE
OTHER:

Emotional Recovery

Imagine Extended Camp Life
without infrastructure



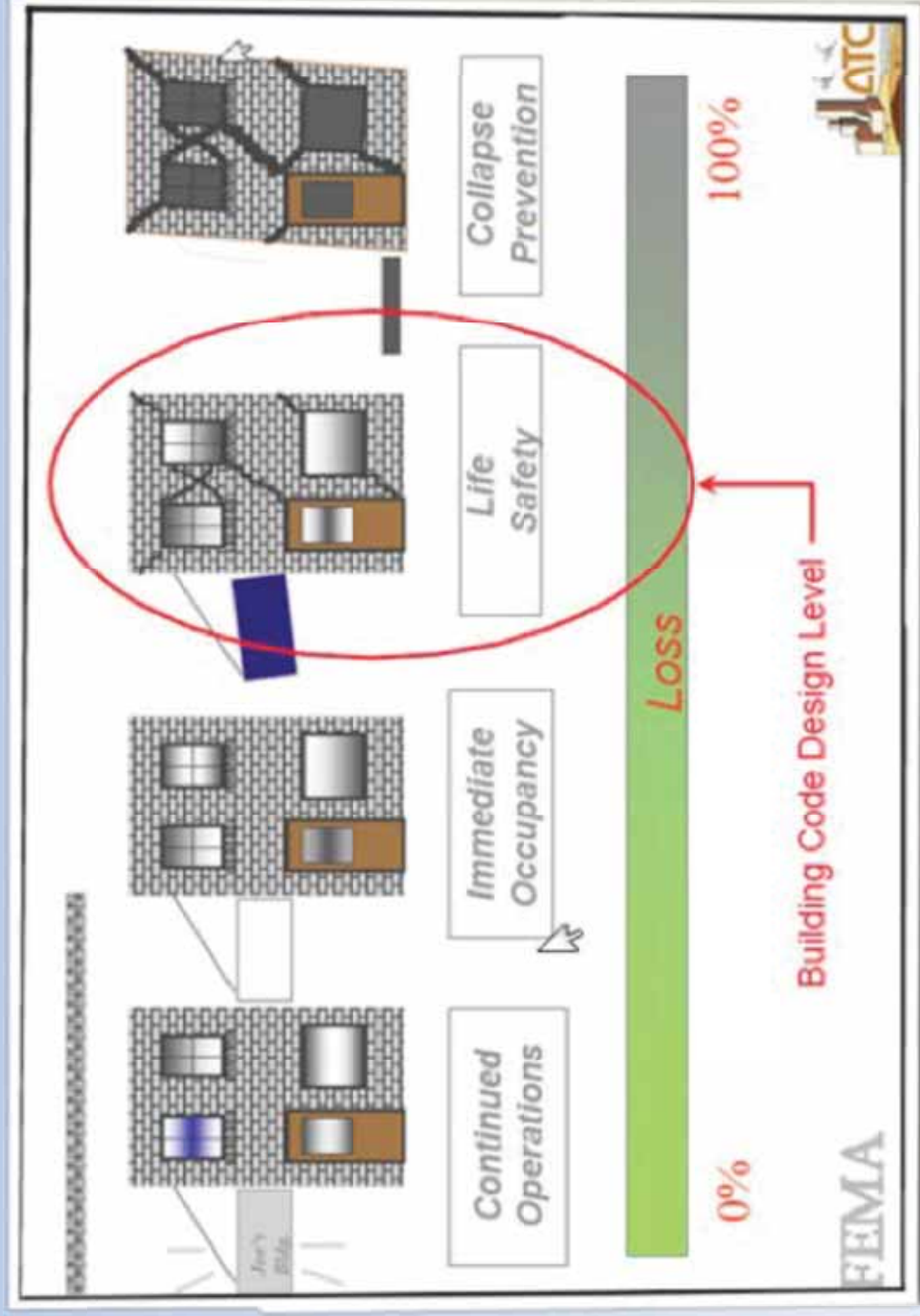
Give Everyone a Job!

Without Utilities



- No Running Water
- No Electricity
- No Communications
- No Sewer System
- No Garbage Pick-up
- No Fuel
- No Groceries in the Store
- No Pharmacy

Living Outside



Protection from the Rain



Make-shift Shelter



This is not a viable solution on the Oregon Coast – WIND!

Shelter & Warmth

Tube Tent



High Occupancy Tent



Water

Water Filter Straw



55-Gallon Barrel of Water



Food



Sanitation



First Aid & Medications



Expect Broken Windows

- *Plastic Sheeting*
- *Duct Tape*



Emergency Kits

- Backpack
- Roller Bag
- Car
- Home
- Friends
- School



Strengthen Your Community

- Map Your Neighborhood
- Cache of Supplies
 - Neighborhood Caches
 - School Caches
- Vertical Evacuation Options
- Drills
- Seismic Strengthening



Build Response Capacity

- Community Emergency Response Team
 - Shelter Ops & Management
 - First Aid
- Amateur Radio Operator
- Post-Earthquake Building Evaluations
- Animals in Disasters



Summary

Distant Event

Understand
Distant Tsunami

Plan for Before,
During & After

Local Event

Survive a Cascadia
Earthquake

Escape a
Local Tsunami

Prepare for
Island Life

Will Your Behavior Change?

Mass Notification Systems

Prevention & Mitigation Actions

Duck, Cover, Hold

Practice Evacuation Routes

Communication Plan

Gather Supplies

Build Community Capacity

Thank you!



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