



# **Santa Clara County Disaster Preparedness**

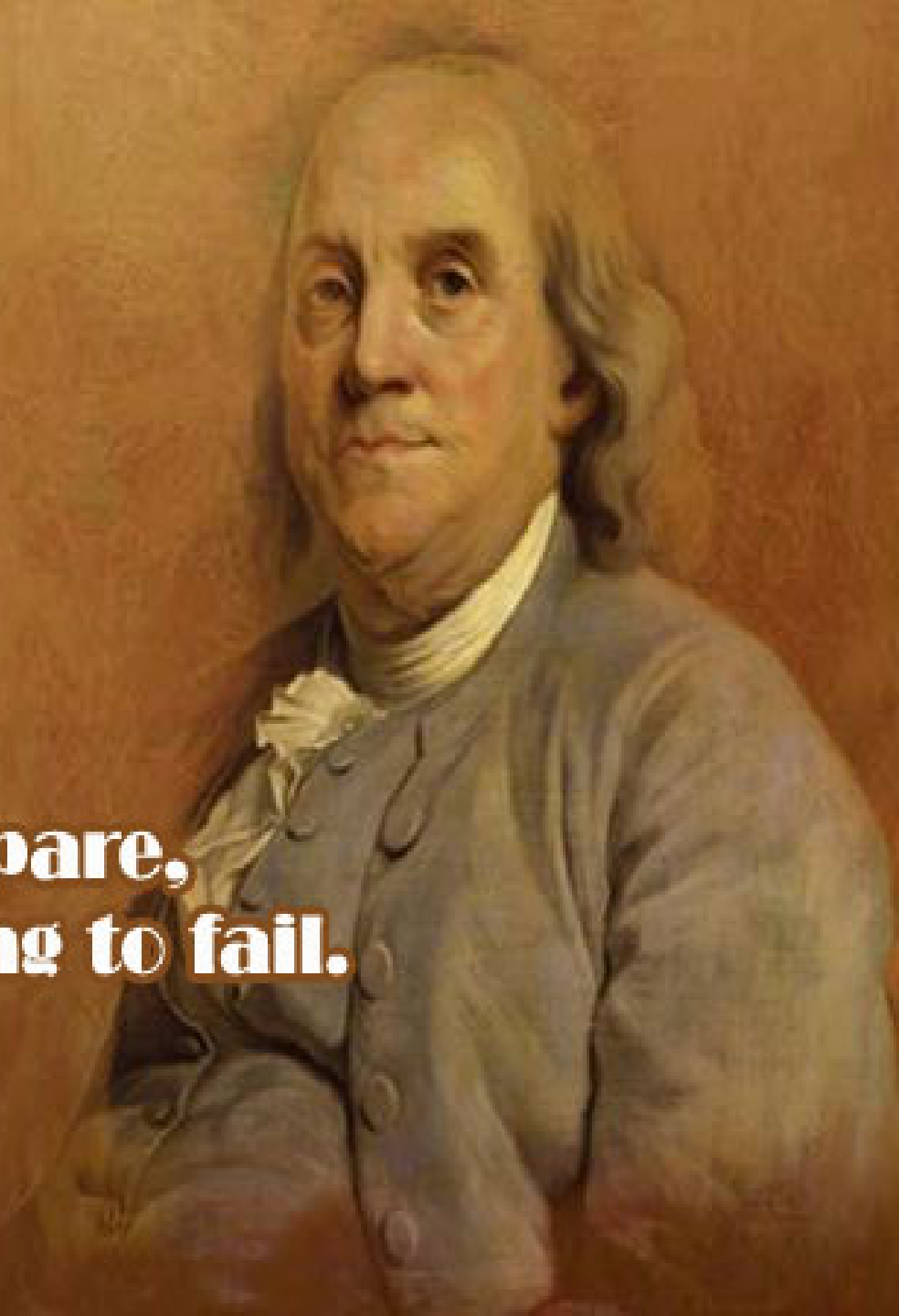


Presented by: Sean Halpin



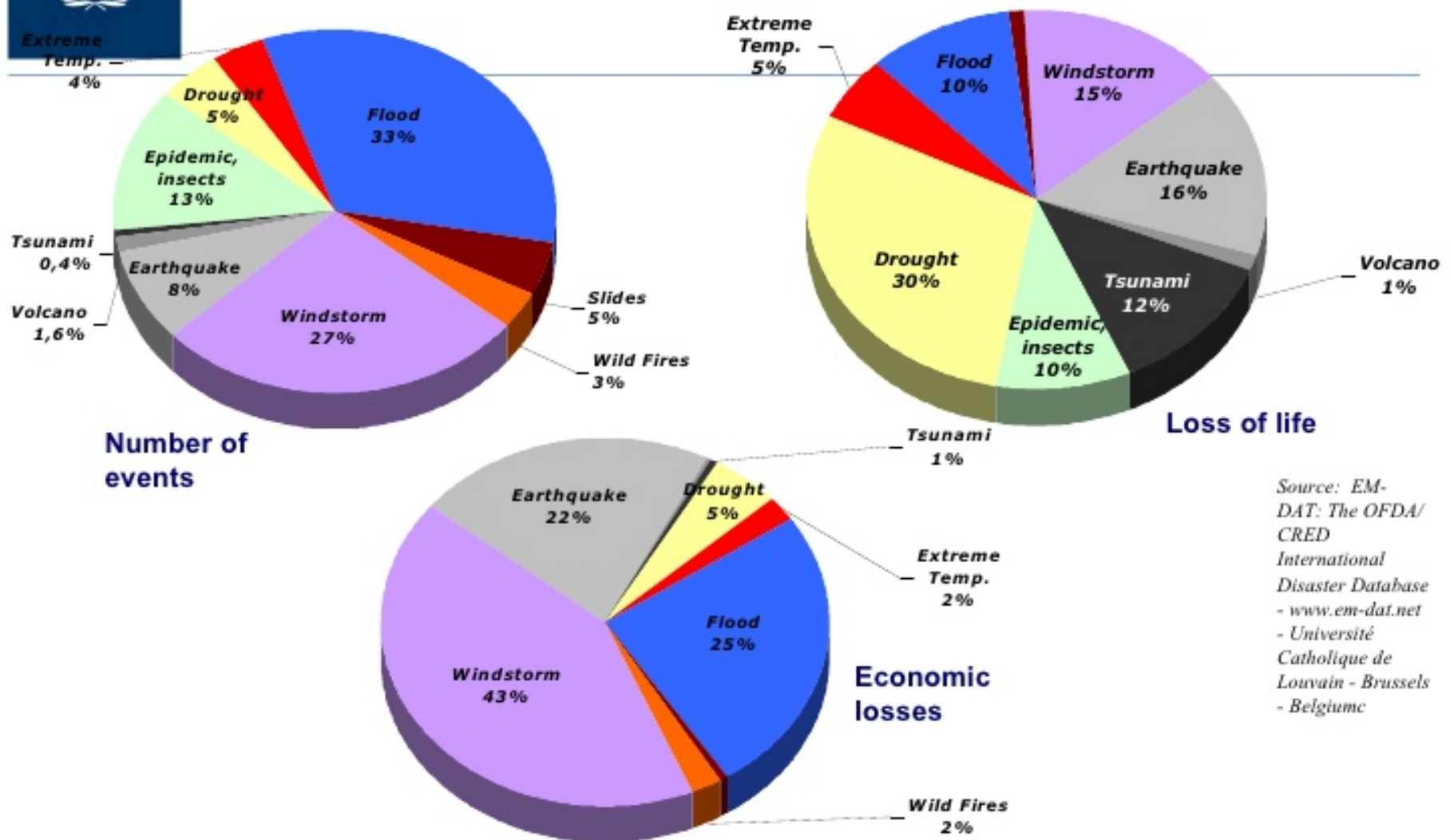
**By failing to prepare,  
you are preparing to fail.**

*Benjamin Franklin*





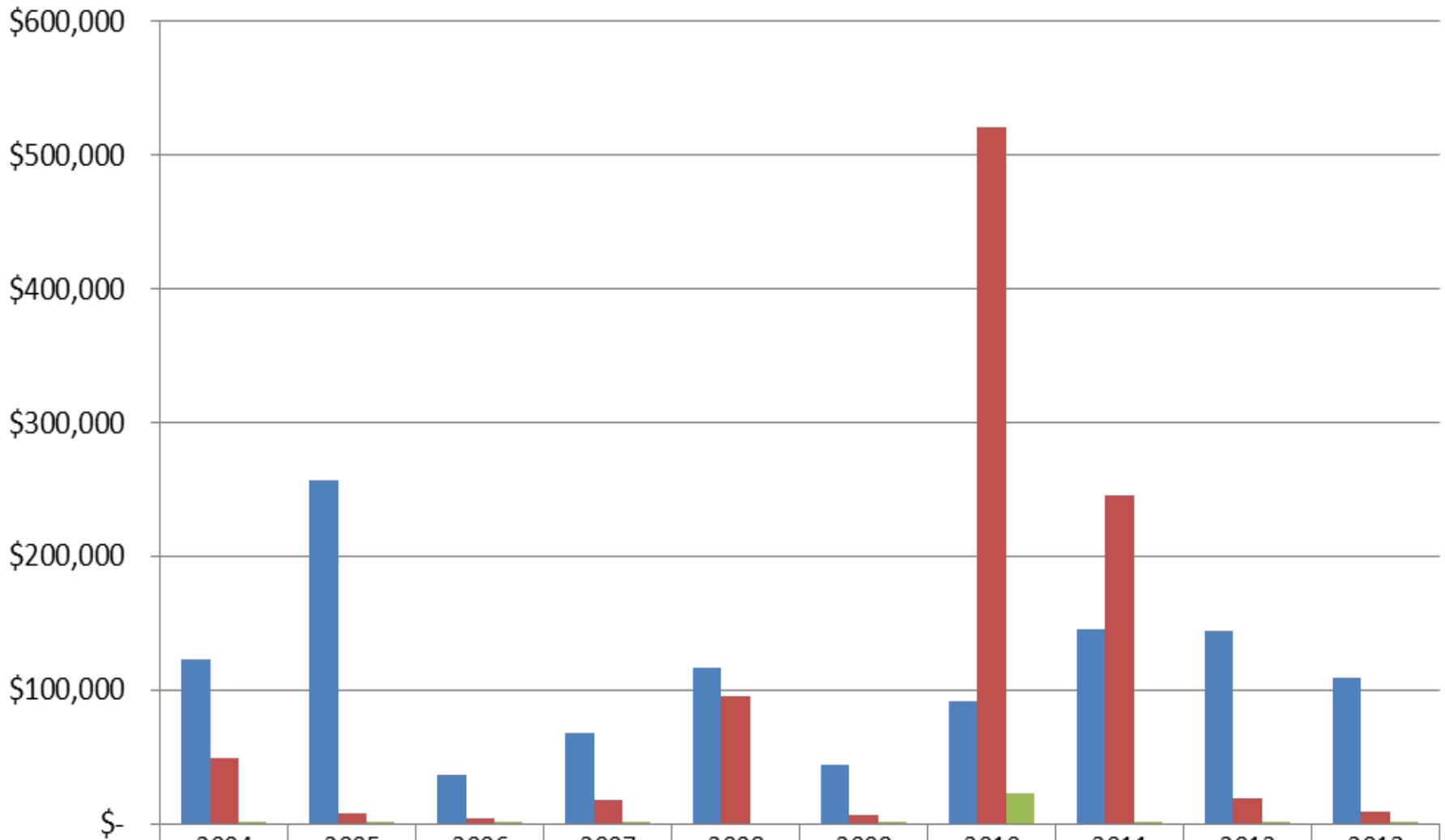
# Global Distribution of Disasters Caused by Natural Hazards and their Impacts (1980-2007)



Source: EM-DAT: The OFDA/CRED International Disaster Database - [www.em-dat.net](http://www.em-dat.net) - Université Catholique de Louvain - Brussels - Belgique

**90% of events, 70% of casualties and 75% of economic losses are related to hydro-meteorological hazards.**

# Estimated Damage (\$US)



■ Weather	\$122,402	\$256,306	\$36,909	\$67,895	\$117,087	\$43,551	\$91,196	\$145,553	\$143,600	\$109,556
■ Geophysical	\$49,234	\$8,242	\$4,264	\$17,332	\$95,640	\$6,774	\$520,514	\$245,676	\$19,373	\$9,083
■ Technological	\$1,661	\$516	\$1	\$1,006		\$1,707	\$22,397	\$3	\$32	\$578



# Why Prepare?

Natural disasters are more frequent than 30 years ago - and are costing us more

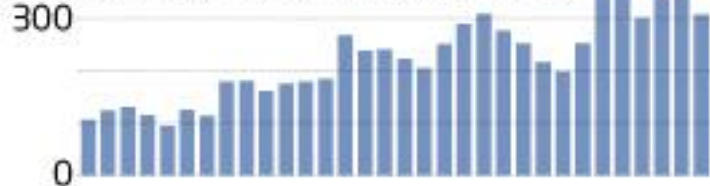
Earthquake, tsunami, volcano



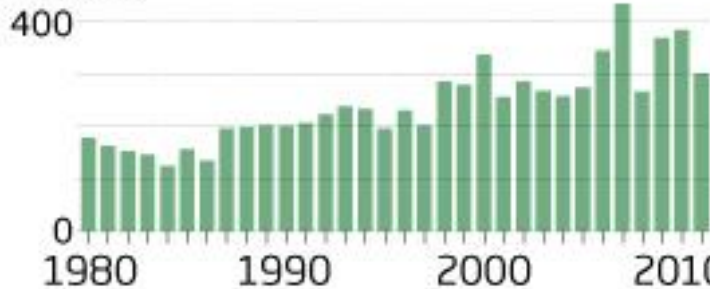
Extreme temperature, drought, fire



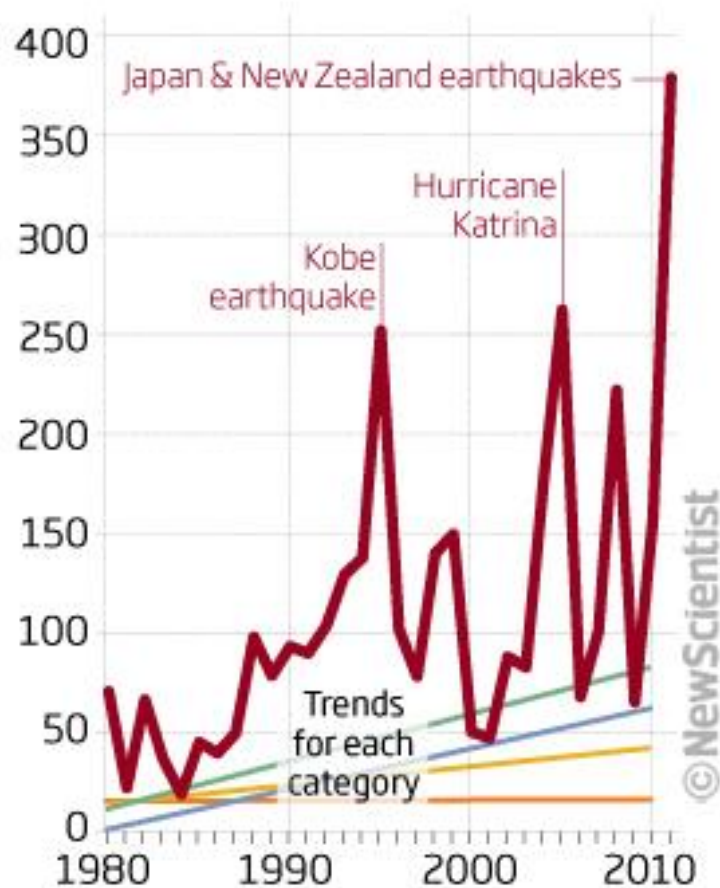
Flood, mass water movements



Storms

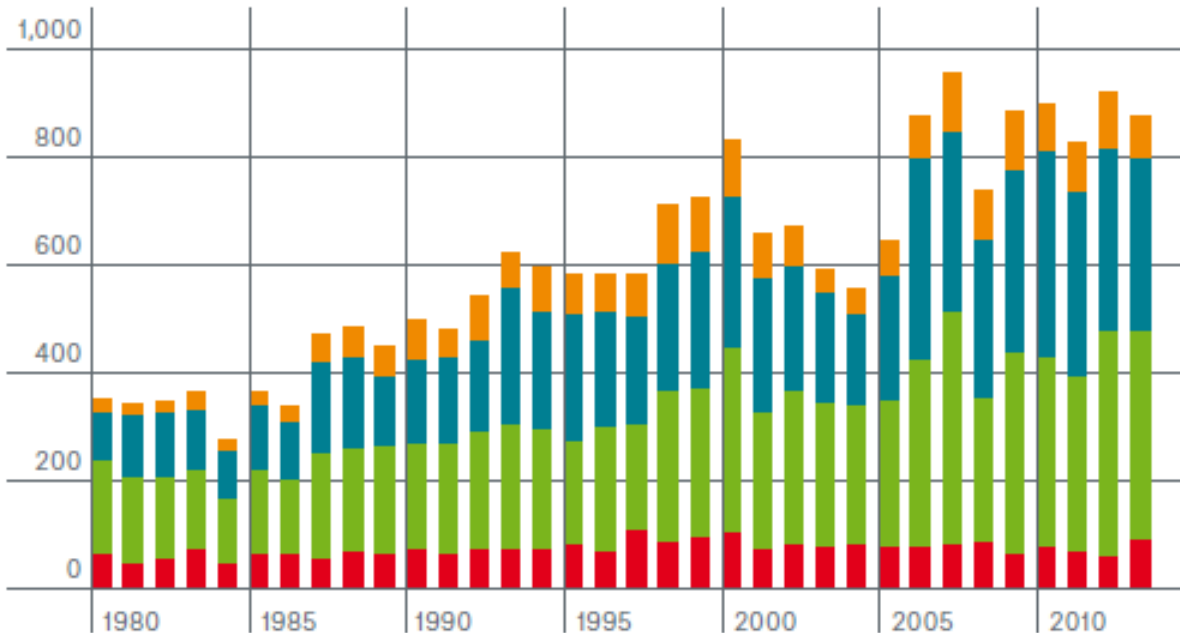


Global losses \$bn



# Why Prepare?

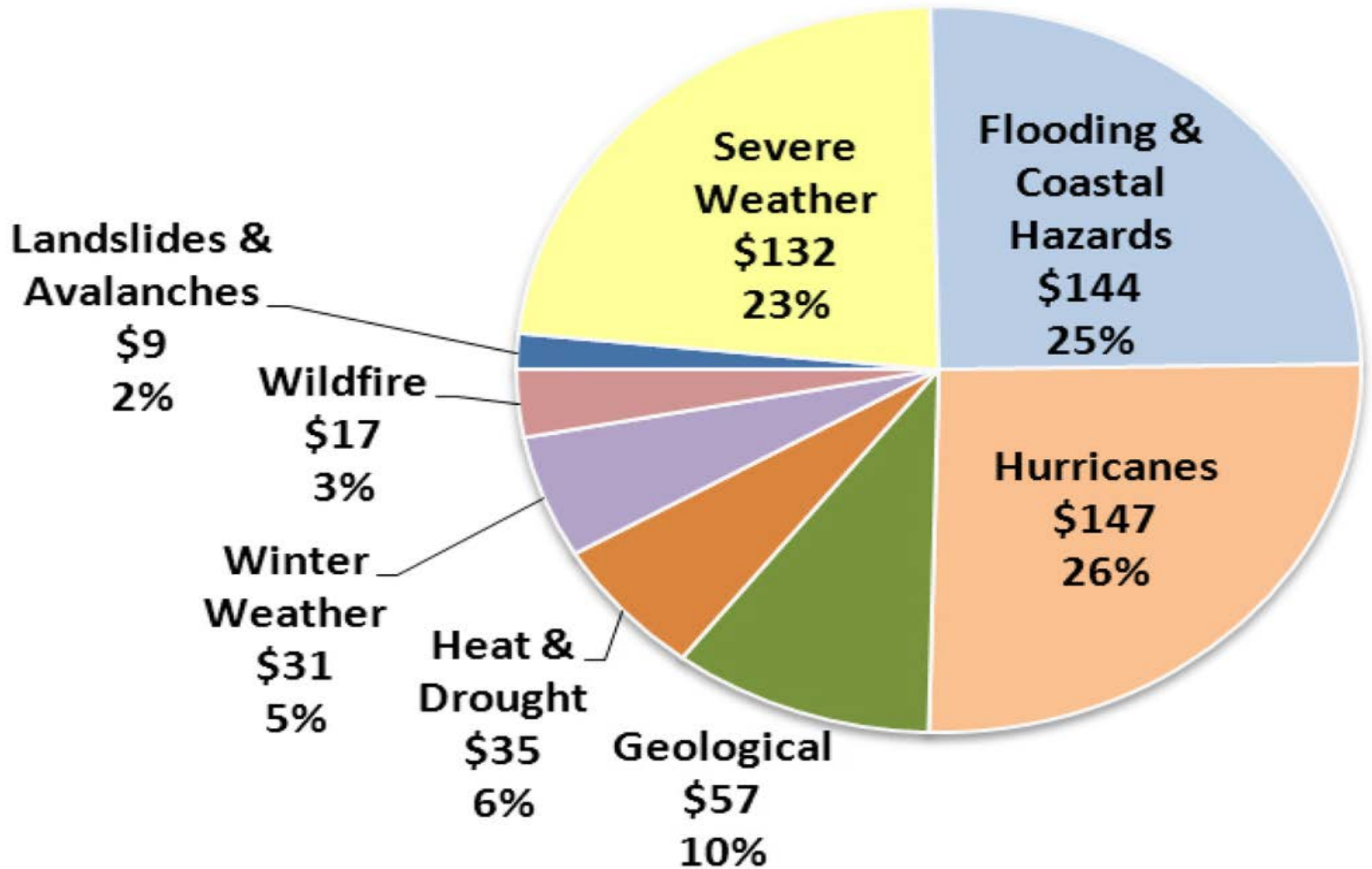
Number of loss events 1980-2013



- Geophysical events:  
Earthquake, tsunami,  
volcanic eruption
- Meteorological events:  
Tropical storm, extratropical  
storm, convective storm,  
local storm
- Hydrological events:  
Flooding, mass movement
- Climatological events:  
Extreme temperatures,  
drought, wildfire

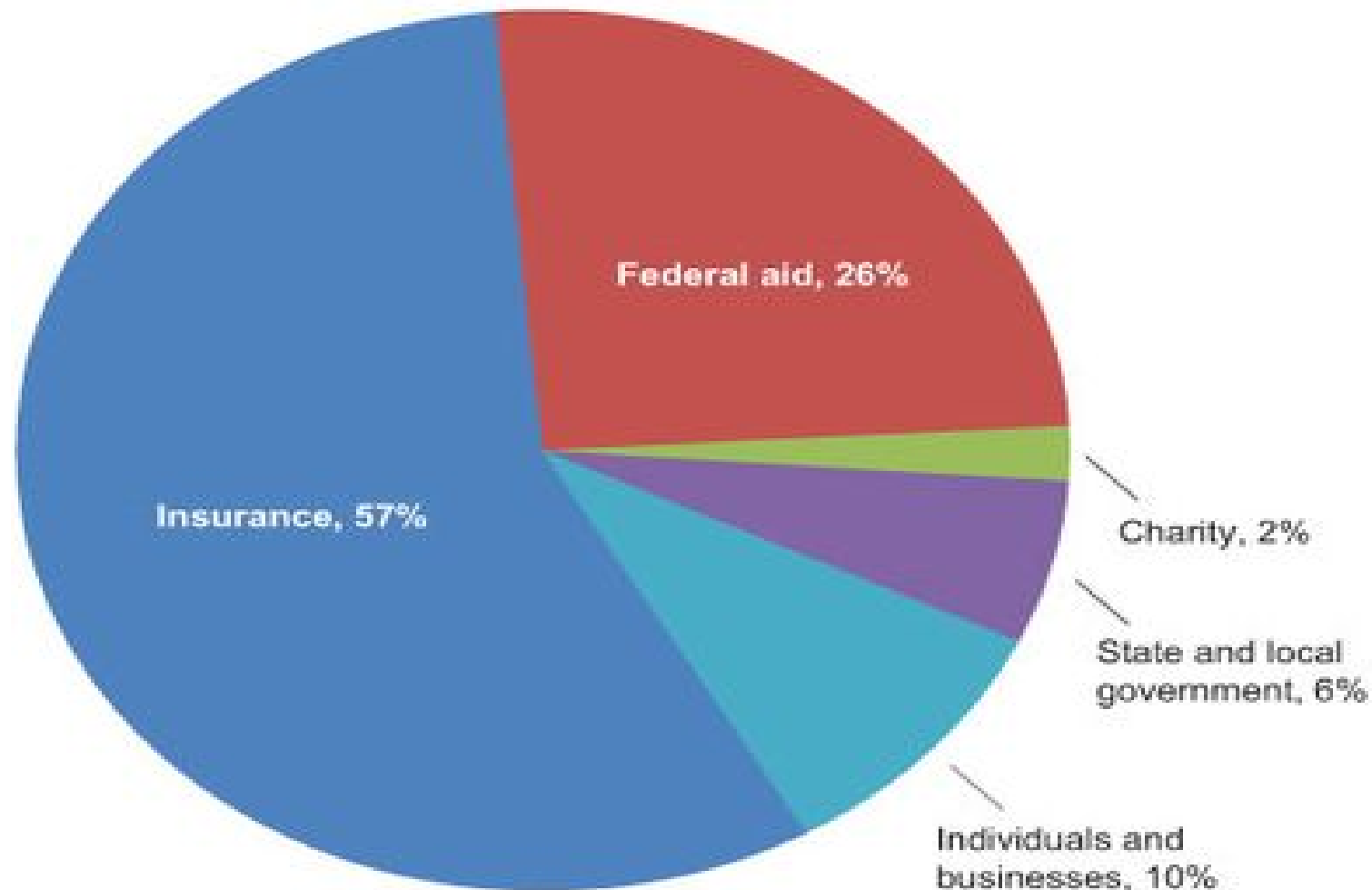
Source: Munich Re

# The cost of disasters 1960-2009

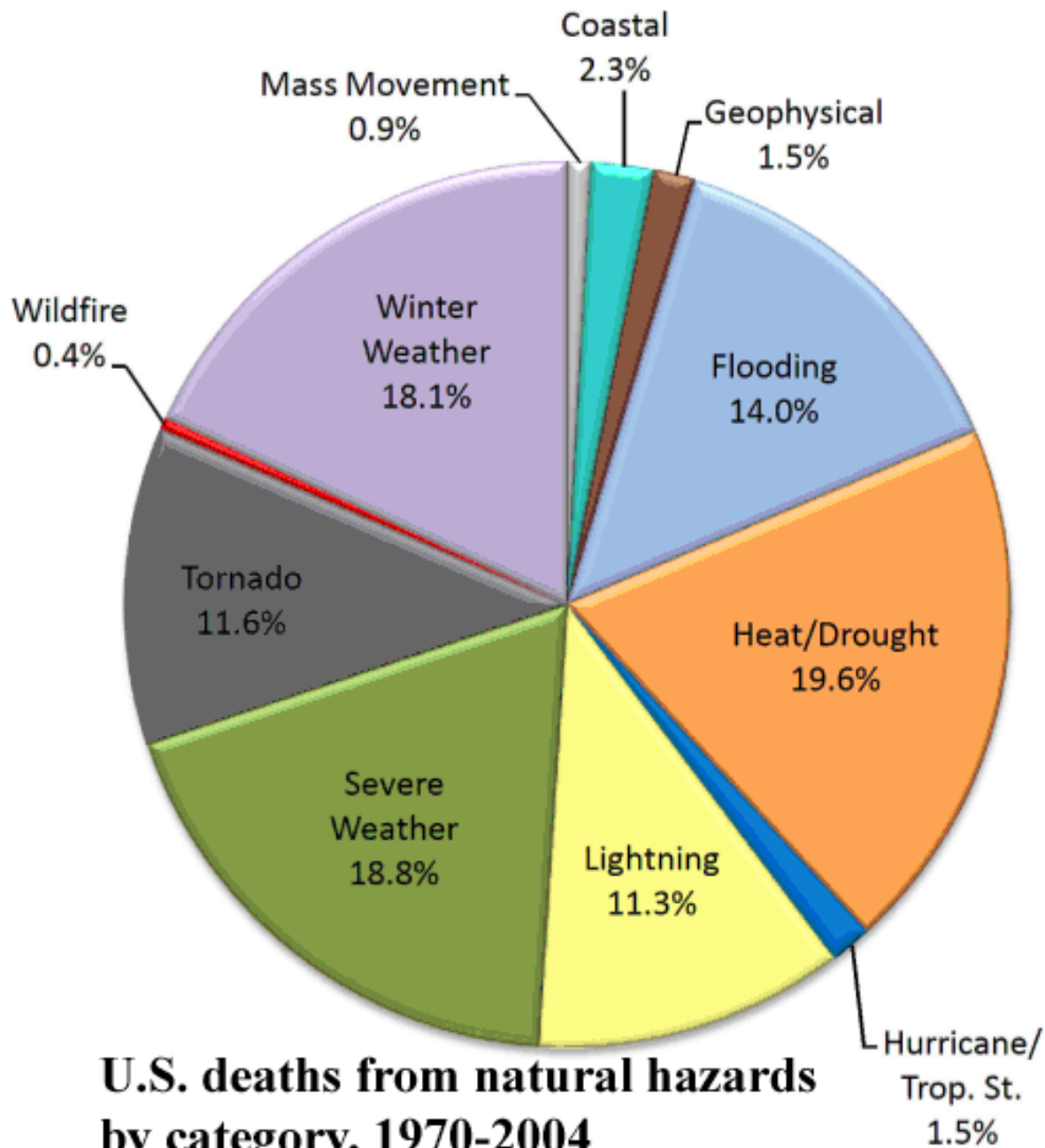




## Share of Costs Paid for Major U.S. Hurricane Events, 1989-2004



Source: Authors' calculations, based on "Federal Financial Exposure to Natural Catastrophe Risk," by J. David Cummins, Michael Suher, and George Zanjani, 2010. In *Measuring and Managing Federal Financial Risk*. NBER Conference Report. Chicago: University of Chicago Press.



**U.S. deaths from natural hazards  
by category, 1970-2004**

# How Can I Prepare?



**Access Alerts  
and Warnings**



**Test  
Communication Plans**



**Assemble or  
Update Supplies**



**Drill or Practice  
Emergency Response**



**Participate in a Class,  
Training, or Discussion**



**Plan with  
Neighbors**



**Conduct an  
Exercise**



**Make Property  
Safer**



**Document and  
Insure Property**



**Safeguard  
Documents**

# How Can I Prepare?

- Pick safe places in each room or your home or workplace.
- Keep a flashlight and sturdy shoes by your bed.
- Make sure your home is anchored to your foundation.
- Bolt and brace water heaters and gas appliances.
- Hang heavy items (mirrors, pictures, etc...) away from beds and couches.
- Bolt cabinets or bookshelves or heavy items > 5'.
- Learn how to shut off gas valves and water valves.
- Maintain emergency supplies.

# Food and Water in an Emergency

- Although unlikely, consider supplies for two weeks. Three days at a minimum.
- Familiar foods are important. They lift morale and give a feeling of security in times of stress.
- Foods that require no refrigeration, water, special preparation or cooking are best.
- Individuals with special diets and allergies need special attention, as well as babies, toddlers and the elderly.

# Storage Tips

- Keep food in a dry, cool spot – a dark area if possible.
- Open food boxes and resealable containers carefully so that they can be closed tightly.
- Inspect all food for signs of spoilage before use.
- Empty open packages of sugar, dried fruits and nuts into air tight canisters.
- Use food before they go bad and replace them with fresh supplies. Mark and date the supplies and put the newer items in the back and the older ones up front.



# Emergency Water Supplies

- An ample supply of clean water is a top priority. A normal active person needs to drink at least  $\frac{1}{2}$  gallon of water each day. The safest and most reliable source is commercially bottled water.
- Water is also necessary for food preparation and hygiene. Store at least 1 gallon/person/day.
- If supplies run low, never ration water. Drink the amount you need today and find more for tomorrow.
- If preparing your own containers – purchase food grade containers from camping supplies stores.

# Ways to Treat Water (of Uncertain Quality)

- Boiling is the safest method. Boil for 1 full minute. Boiled water tastes better by putting oxygen back into it: pour water back and forth between clean containers.
- Chlorination: Use household liquid bleach that contains 5.25 to 6.0% sodium hypochlorite. Do not use scented or colorsafe or added cleaners to the bleach.
- Add 1/8 teaspoon of bleach per 1 gallon of water. Stir and let stand for 30 minutes.

# Basic Disaster Supplies Kit - Home

- Portable, battery-powered radio and extra batteries
- Flashlight and extra batteries
- First aid kit and manual
- Sanitation and hygiene items (hand sanitizer, towelettes, toilet paper, dental hygiene)
- Matches
- Whistle
- Extra clothing and blankets
- Cooking utensils
- A deck of cards/board games

# Basic Disaster Supplies Kit - Home

- Cash
- Medications
- Extra eye glasses, hearing aid batteries
- Items for infants (diapers, formula, pacifiers, bottles)
- Cell phone charger for vehicle
- A map of the local area and other items to meet your family's specific needs

# Basic Disaster Supplies Kit - Car

- Toilet paper. Remove the cardboard tubes and flatten.
- Hand sanitizer.
- Dental hygiene – travel pack
- Trash bags.
- Baby wipes/extra diapers
- Bar of soap. Store in a zip-top bag or soap box.
- Emergency radio. Choose a model that is both solar- and battery-powered.
- High quality first-aid kit.
- Lip balm/sun block

# Basic Disaster Supplies Kit - Car

- Disinfecting wipes.
- Feminine protection.
- Zip-lock bags in different sizes. These come in handy for holding dirty laundry, dirty diapers or trash, and can even be used to hold water.
- Energy bars. Choose high-calorie options; they're lightweight but provide the calories you'll need in a small dose.
- Water and water filter
- Flashlights and/or headlamps.
- Rain poncho/sweater/jacket



# Basic Disaster Supplies Kit - Car

- Heavy-duty trash bags.
- Reflective emergency blanket/sleeping bag.
- Duct tape. (There's always a use for duct tape.)
- Fleece blankets. They can be used as a window shade, ground cover, changing pad and in so many other ways.
- Tarp.
- Multi-purpose knife/multi-tool/scissors
- Extra batteries. For everything in your kit that requires a battery.
- Book/journal/pens and pencils/deck of cards – for your sanity

# Basic Disaster Supplies Kit - Car

- Work gloves.
- Small shovel.
- Waterproof matches
- Binoculars.
- Light sticks. These are great to keep the kids entertained but also helpful for keeping track of them after dark.
- Maps.
- Collapsible nylon bag or small backpack. If you ever have to leave your vehicle for safer ground, this will enable you to take the most essential items with you.

# Basic Disaster Supplies Kit - Car

- Walking shoes
- Floppy cotton hat.
- Medications. Make sure you only pack those that aren't temperature-sensitive.
- Face mask. Even a simple dust mask comes in handy around a forest fire or high level of smog.
- Whistle.
- Cash, coins. Power outages also take out ATM machines.
- Disposable camera.
- Emergency phone numbers on a laminated card.

# Pets and Disaster Safety Checklist

- Know which hotels along your evacuation route take pets.
- Know which friends and relatives can care for your animals.
- Include your pets in evacuation drills so they become used to entering and traveling in their carriers.
- Make sure your pet's vaccination records are current and they are wearing up to date ID. Many pet shelters require current vaccinations.
- Keep items in an accessible place and store them in sturdy containers so they can be easily carried.

# Disaster Kit for Pets

- Sturdy leashes and carriers
- Food, drinking water, bowls, cat litter/pan
- Medications and copies of medical records in a waterproof container
- Current photos of you with your pet in case they get lost. This may help to eliminate mistaken identity and confusion.
- Pet bed and toys, if easily transportable

# Earthquakes - Before

- Prepare an [emergency plan](#) and conduct an emergency drill
- Prepare and maintain an [emergency preparedness kit](#) to be self-sufficient for at least 3 days, and preferably up to one week, following an earthquake.
- [Evaluate your home](#). Have your building and appliances inspected to assure that they are able to withstand a significant earthquake.
- Know the location of your gas service shutoff valve, and how to [shut off your gas](#) supply.
- Most gas appliances have a shutoff valve located near the appliance that lets you turn off the gas to that appliance only. Know which of your appliances uses gas, and where the appliance shutoff valves are located. In some cases, turning off the gas at the appliances shutoff valve will suffice.
- Know the location of the main electric switch and how to turn off your electric supply.



# Earthquakes - During

- If you are indoors, stay indoors and take cover under a sturdy desk or table, or stand in an interior doorway.
- Stay away from exterior walls and windows, masonry veneers (such as fireplaces), tall furniture, and hanging pictures or mirrors.
- If you are cooking in the kitchen, turn off the stove before you take cover.
- If you are outdoors, get into the open away from buildings and power lines.
- Be alert for falling debris.
- If you are driving, pull to the side of the road and stop if it is safe. Move your vehicle out of the normal traffic pattern as much as possible.
- Do not stop on or under overpasses, bridges, or tunnel. Do not stop under or near electrical power lines, light posts, trees, or signs.
- Stay in your car until the earthquake is over.

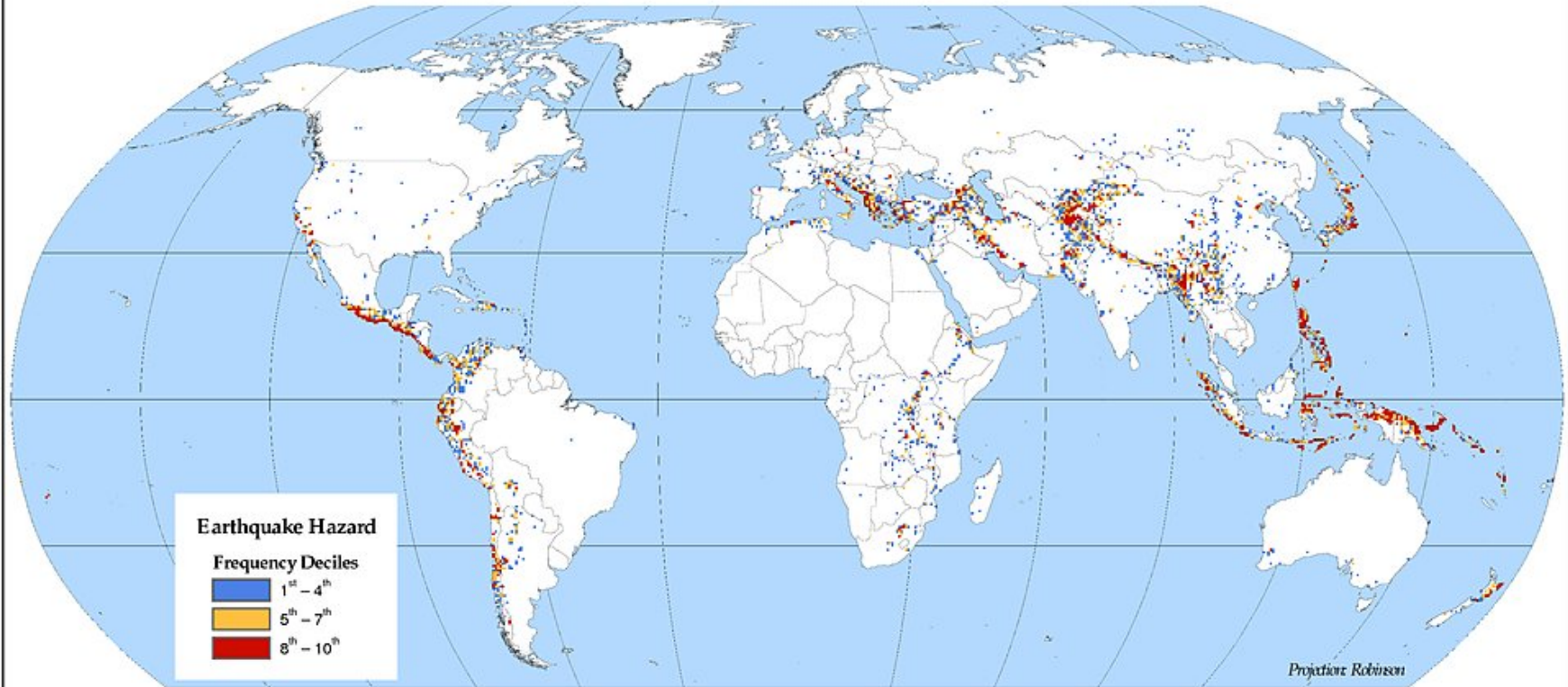
# Earthquakes - After

- Ensure that everyone is safe.
- Inspect your building for damage. Do not use electrical switches, appliances, telephones or any flame if you suspect a gas leak, because sparks can ignite gas.
- If you smell gas, hear gas escaping, see a broken gas line, or suspect a broken gas line, evacuate the building. Find a phone away from the building and call PG&E or 9-1-1 immediately. If it is safe to do so, turn off the gas service shutoff valve normally located near the gas meter. Do not shut off the gas service shutoff valve unless you find the presence of any one of these conditions because there may be a considerable delay before PG&E can turn your service back on.
- If leaking gas starts to burn, do not try to put the flame out. Evacuate the building. Call 9-1-1 and PG&E immediately. If it is safe to do so, turn off the gas service shutoff valve normally located near the gas meter.
- Once the gas is shut off at the meter, do not try to turn it back on yourself. Only PG&E or another qualified professional should turn the gas back on.

# Earthquakes

- The US Geological Survey has increased the probability of the likelihood of a [magnitude 8.0 or larger earthquake](#) hitting California within the next few decades.
- The “Big One” refers to the earthquake that many Californians have been waiting for with bated breath for years.
- The USGS’s [Third Uniform California Rupture Forecast \(UCERF3\)](#) predicts earthquake eruptions and states that a magnitude 8.0 earthquake or larger quake has a 7 percent chance of occurring in the next 30 years, at present.
- The odds of a magnitude 6.5–7.0 earthquake hitting went up 30 percent.

# Global Earthquake Hazard Distribution



The data set comes from both the Global Seismic Hazard Program and a database of earthquake events greater than 4.5 on the Richter Scale for the 27-year period from 1976 – 2002. Approximately 7.5% of global land area is estimated to have a 10% probability of earthquake activity in a 50-year period.

Source:

Dilley, Maxx, Robert S. Chen, Uwe Deichmann, Arthur L. Lerner-Lam, and Margaret Arnold. 2005. *Natural Disaster Hotspots: A Global Risk Analysis*. Washington, D.C.: World Bank.

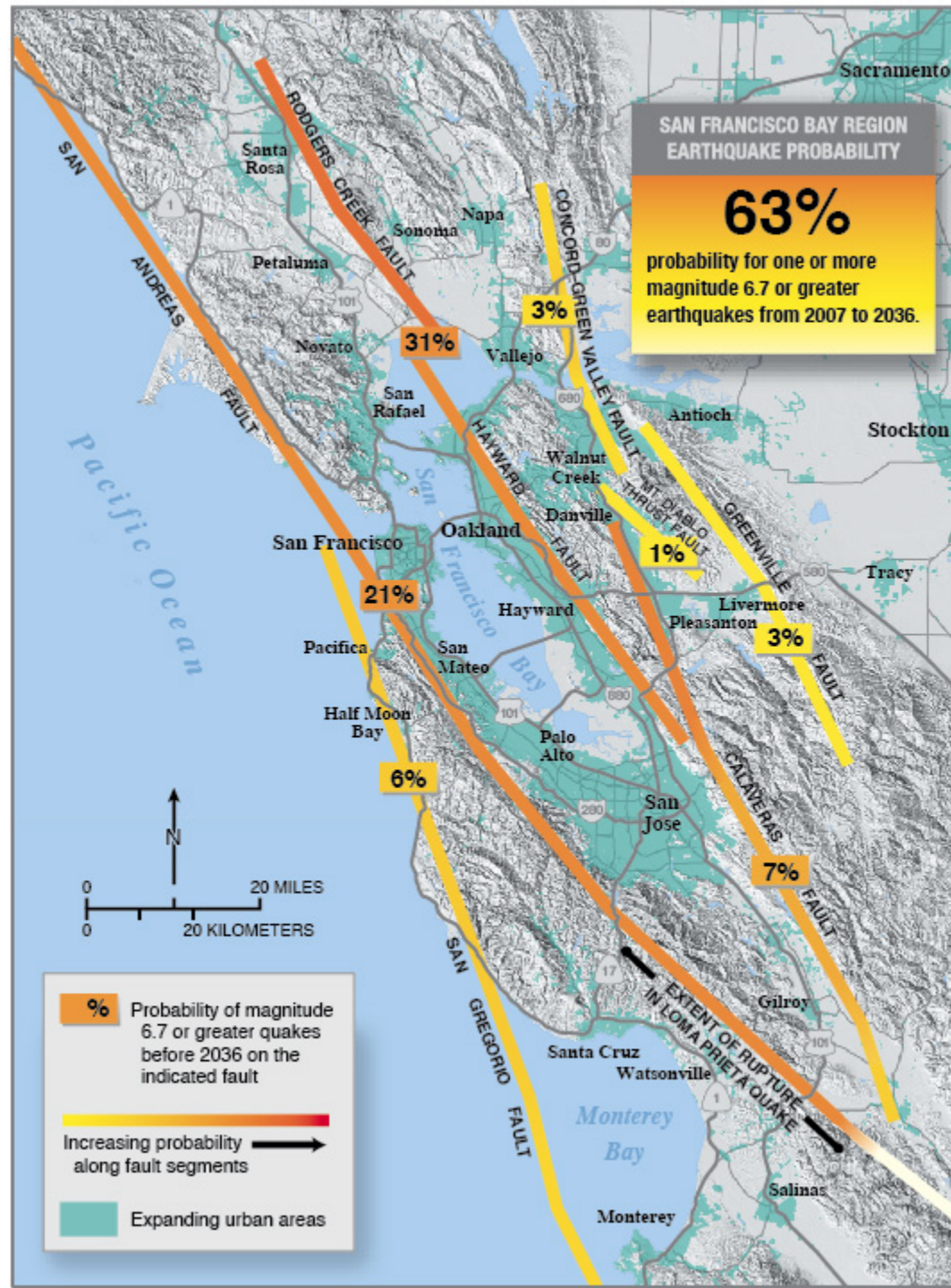
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# Earthquakes

- If it were to hit, it would most likely come from the [breaking of the San Andreas Fault](#), spanning the distance in southern California inland from Los Angeles, but there is some speculation as to which fault will be the origin point.
- Some reports specify that the Big One will originate from the [Hayward Fault](#) near the Bay Area and San Francisco.





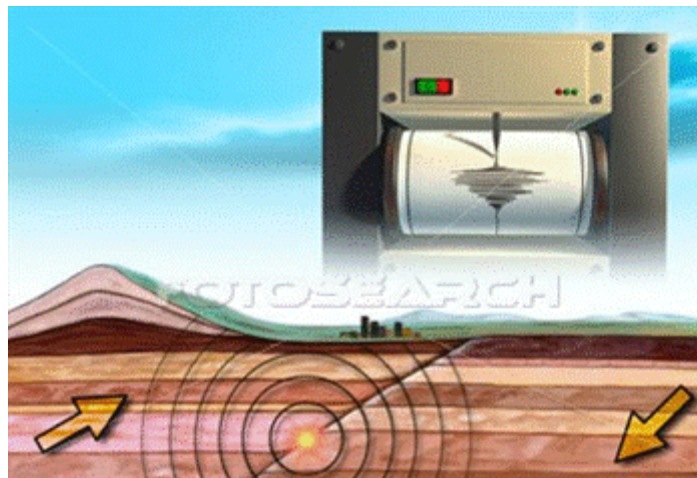
# Earthquakes

- No matter where the earthquake comes from, it is predicted to devastate all of California and other parts of the West Coast.
- A “realistic crisis scenario” to be used for emergency planning was created by 300 scientists and details the earthquake’s occurrence and damage through historical data–based computer projections.
- The computer predicts that the earthquake will produce shock waves that travel 11,600 kilometers per hour (7,200 mph), causing severe damage to major freeways and buildings.
- Overall, the biggest concern for any major earthquake is fires, due to the amount of dry brush that could turn any small blaze into a raging inferno.

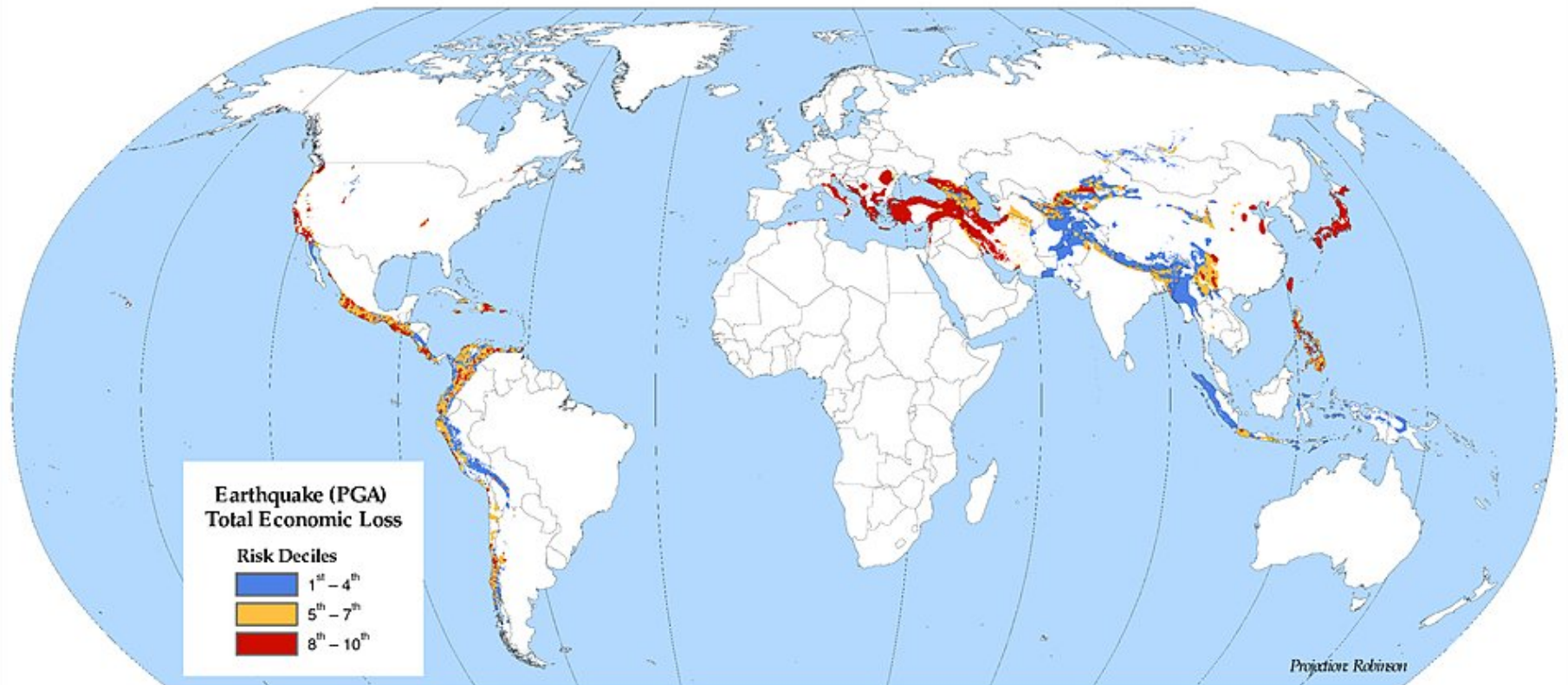


# Earthquakes

- The White House granted \$5 million to a team from Caltech, UC Berkeley, and the University of Washington, that is developing the Earthquake Early Warning system to alert people one minute in advance of an earthquake hitting.
- The system is currently only able to release an alert 10 seconds prior to the beginning of an earthquake.



# Global Earthquake Total Economic Loss Risk Distribution



Total Economic Loss is found by weighting the value of GDP exposure to earthquakes for each grid cell by a vulnerability coefficient to obtain an estimate of risk. The vulnerability weights are based on historical economic losses in previous disasters. The economic loss risks are applied to GDP per unit area exposure to obtain economic loss risks. The weights are an aggregate index relative to losses within each region and country wealth class (classifications based on 2000 GDP) over the 20-year period from 1981 - 2000.

Source:

Dilley, Maxx, Robert S. Chen, Uwe Deichmann, Arthur L. Lerner-Lam, and Margaret Arnold. 2005. *Natural Disaster Hotspots: A Global Risk Analysis*. Washington, D.C.: World Bank.

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# Wildfires



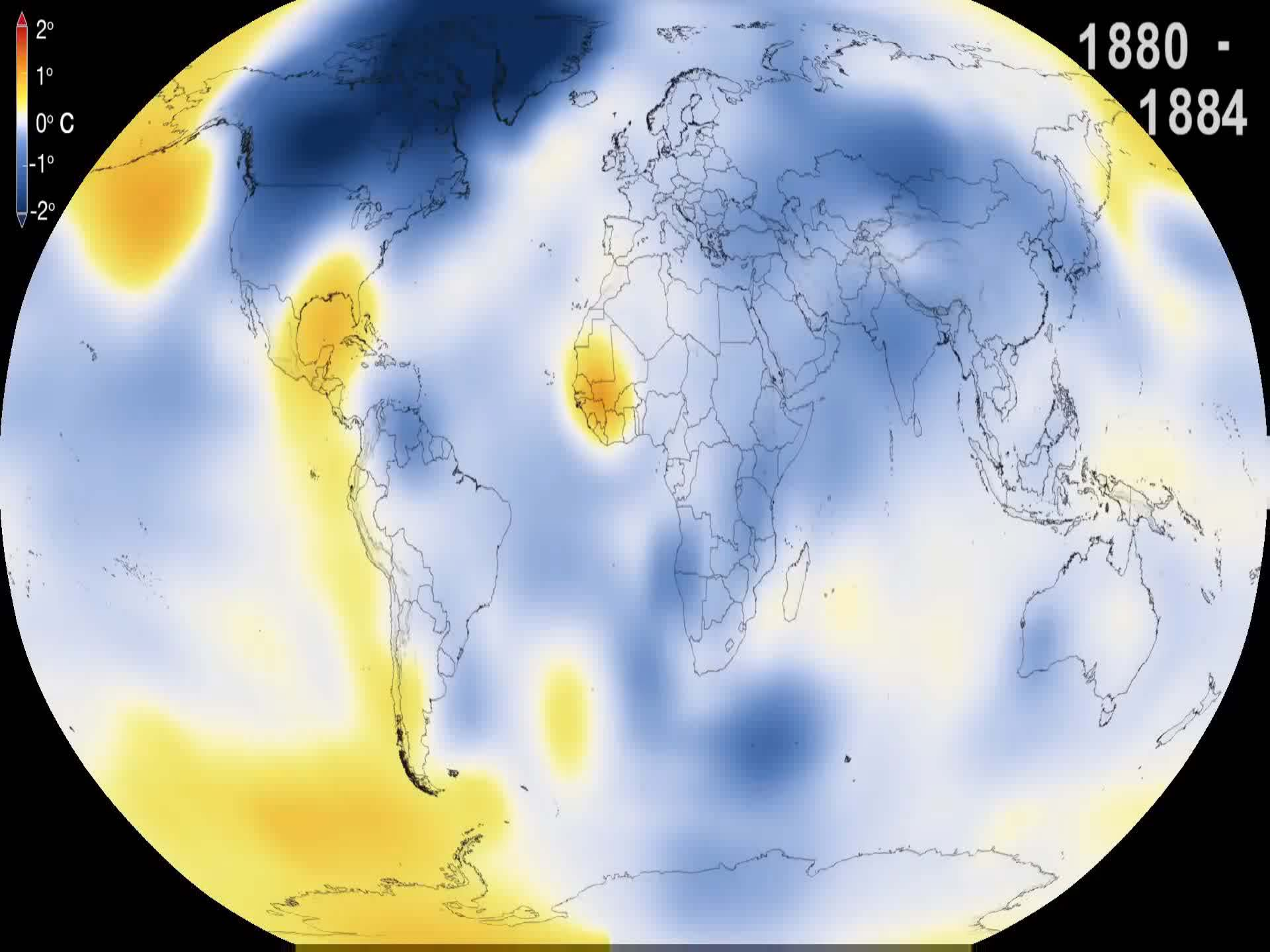
# Wildfires

- Environmental scientists from the Harvard School of Engineering and Applied Sciences (SEAS) predict that by 2050, wildfire seasons in the US will be three weeks longer, twice as smoky, and will burn a [larger portion of the West](#) per year.
- Concurrently, the US Geological Survey and the Forest Service have recorded that since 1999, the acreage burned by wildfires in the US [has tripled](#) from 2.2 million to 6.4 million annually, meaning that much more of the US will be up in flames in the near future.



# Wildfires

- What has led to this dramatic increase in the US wildfire risk? The answer, according to SEAS, is gradual climate change, which has raised the Earth's temperature, creating conditions that spawn bigger and fiercer wildfires. Dr. Loretta J. Mickley, a senior research fellow in atmospheric chemistry at SEAS, stated that temperature will be the biggest determiner of future fires.
- The hotter it is, the more likely it is that a fire will start.
- Ironically, the problem has been exacerbated by the “Smokey the Bear” and Park and Forest Services campaigns to stop all forest fires, halting the natural fire cycle that clears the underbrush out of the forests.
- With 30,000–50,000 wildfires predicted to occur annually, the US might soon be experiencing its own version of Hell on Earth.



# Wildfire Safety

- If you see a wildfire and haven't received evacuation orders yet, call 9-1-1. Don't assume that someone else has already called.
- If ordered to evacuate during a wildfire, do it immediately- make sure and tell someone where you are going and when you have arrived.
- Many communities have text or email alerting systems for emergency notifications. To find out what alerts are available in your area, search the Internet with your town, city, or county name and the word “alerts.”
- If you or someone you are with has been burned, call 9-1-1 or seek help immediately; cool and cover burns to reduce chance of further injury or infection.

# Wildfire Safety

**Fire weather watch** = dangerous fire weather conditions are possible over the next 12 to 72 hours

## Steps to Take

- Turn on your TV/radio. You'll get the latest weather updates and emergency instructions.
- Know where to go. If you are ordered to evacuate, know the route to take and have plan of where you will go. Check-in with your friends and family.
- Keep your car fueled, in good condition, and stocked with emergency supplies and a change of clothes.



# Wildfire Safety – At Home

- Regularly clean the roof and gutters.
- Maintain an area approximately 30' away from you home that is free of anything that will burn, such as wood piles, dried leaves, newspapers and other brush.
- Connect garden hoses long enough to reach any area of the home and fill garbage cans, tubs, or other large containers with water.
- Review your homeowner's insurance policy and also prepare/update a list of your home's contents.

# Wildfire Safety – At Home

## Returning Home

- Return home only when authorities say it is safe.
- For several hours after the fire, maintain a "fire watch." Check and re-check for smoke, sparks or hidden embers throughout the house, including the roof and the attic.
- Use caution when entering burned areas as hazards may still exist, including hot spots, which can flare up without warning. Evacuate immediately if you smell smoke.

## Cleaning Your Home

- Wear a NIOSH certified-respirator (dust mask) and wet debris down to minimize breathing dust particles.
- Discard any food that has been exposed to heat, smoke or soot.
- Do NOT use water that you think may be contaminated to wash dishes, brush teeth, prepare food, wash hands, or to make ice or baby formula.
- Photograph damage to your property for insurance purposes.

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- Photograph damage to your property for insurance purposes.

# If the Electricity goes off...

- First – Use perishable food from refrigerator, pantry, garden.
- Then – Use foods from freezer. In a well-filled, well-insulated freezer, foods will usually have ice crystals in their centers for at least two days.
- Finally – Begin to use non-perishable food and staples

# Landslides and Mudslides



# Landslides and Mudslides

Landslides occur when masses of rock, earth or debris move down a slope. Mudslides, also known as debris flows or mudflows, are a common type of fast-moving landslide that tends to flow in channels.

## What Causes Landslides and Mudslides?

- Landslides are caused by disturbances in the natural stability of a slope. They can happen after heavy rains, droughts, earthquakes or volcanic eruptions.
- Mudslides develop when water rapidly collects in the ground and results in a surge of water-soaked rock, earth and debris. Mudslides usually begin on steep slopes and can be triggered by natural disasters. Areas where wildfires or construction have destroyed vegetation on slopes are at high-risk landslides during and after heavy rains.

## Health Threats from Landslides and Mudslides

- In the United States, landslides and mudslides result in 25 to 50 deaths each year. The health hazards associated with landslides and mudslides include:
- Rapidly moving water and debris that can lead to trauma.
- Broken electrical, water, gas and sewage lines that can result in injury or illness.
- Disrupted roadways and railways that can endanger motorists and disrupt transport and access to health care.

# Landslides and Mudslides

## **What Areas Are at Risk?**

- Some areas are more likely to experience landslides or mudslides, including:
- Areas where wildfires or construction have destroyed vegetation.
- Areas where landslides have occurred before.
- Steep slopes and areas at the bottom of slopes or canyons.
- Slopes that have been altered for construction of buildings and roads.
- Channels along a stream or river.
- Areas where surface runoff is directed.

## **Before Intense Storms and Rainfall**

- Assume that steep slopes and areas burned by wildfires are vulnerable to landslides and mudslides.
- Learn whether landslides or mudslides have occurred previously in your area by contacting local authorities, a county geologist or the county planning department, state geological surveys or departments of natural resources or university departments of geology.
- Contact local authorities about emergency and evacuation plans.
- Develop emergency and evacuation plans for your family and business.
- Develop an emergency communication plan in case family members are separated.
- If you live in an area vulnerable to landslides, consider leaving it.

# Landslides and Mudslides

## **During Intense Storms and Rainfall**

- Listen to the radio or watch TV for warnings about intense rainfall or for information and instructions from local officials.
- Be aware of any sudden increase or decrease in water level on a stream or creek that might indicate debris flow upstream. A trickle of flowing mud may precede a larger flow.
- Look for tilted trees, telephone poles, fences or walls, and for new holes or bare spots on hillsides.
- Listen for rumbling sounds that might indicate an approaching landslide or mudslide.
- Be alert when driving. Roads may become blocked or closed due to collapsed pavement or debris.
- If you see a landslide or mudslide starting, quickly move away from the path of the slide. Getting out of the path of a mudslide is your best protection. Move to the nearest high ground in a direction away from the path. If rocks and debris are approaching, run for the nearest shelter and take cover (under a desk, table or other piece of sturdy furniture).

## **After a Landslide or Mudslide**

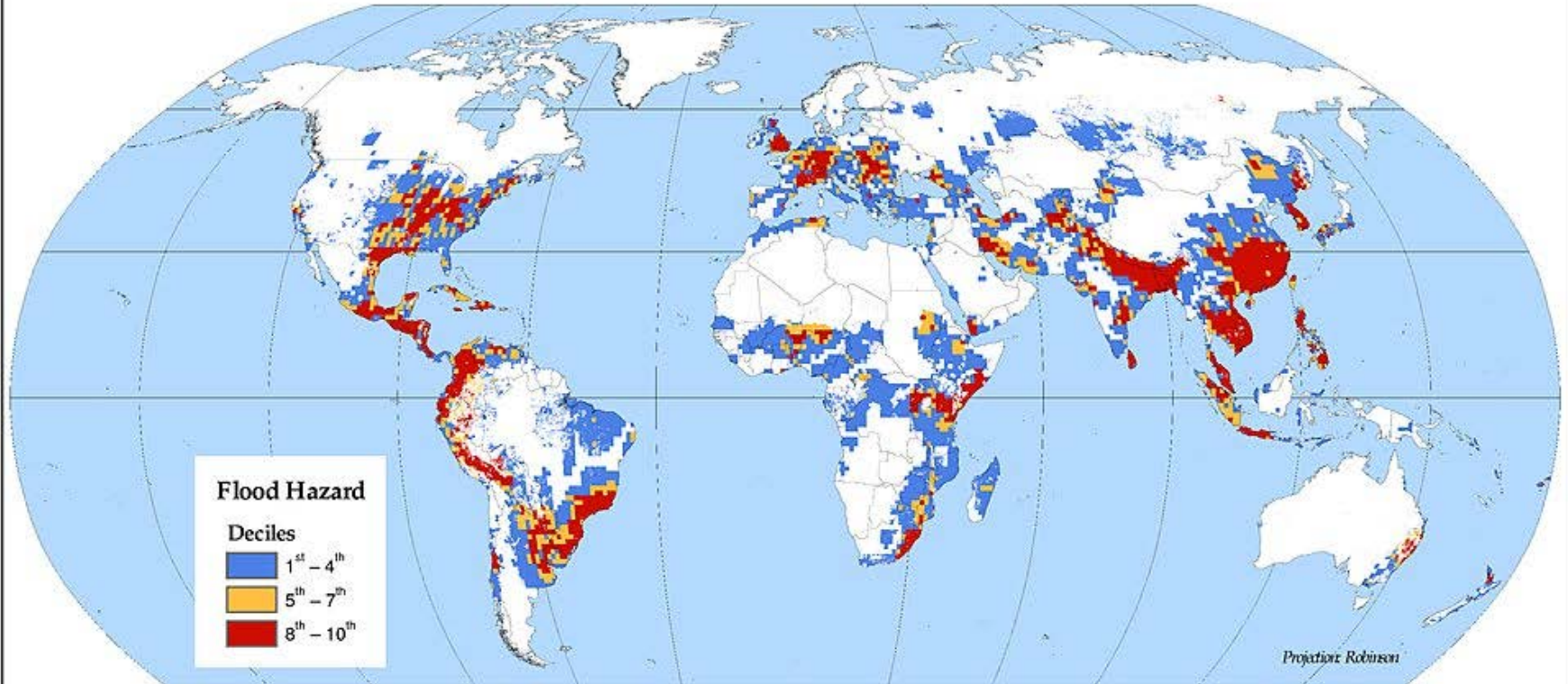
- Stay away from the site. Flooding or additional slides may occur after a landslide or mudslide.
- Check for injured or trapped people near the affected area, if it is possible to do so without entering the path of the landslide or mudslide.
- Listen to the radio or TV for emergency information.
- Report broken utility lines to the appropriate authorities.
- Consult a geotechnical expert (a registered professional engineer with soils engineering expertise) for advice on reducing additional landslide problems and risks. Local authorities should be able to tell you how to contact a geotechnical expert.



# Floods



# Global Flood Hazard Distribution



The data set comes from the Dartmouth Flood Observatory's global listing of extreme flood events compiled from various sources for the 19-year period from 1985 - 2003. Some flooding is evident in more than one-third of the world's land area.

Source:

Dilley, Maxx, Robert S. Chen, Uwe Deichmann, Arthur L. Lerner-Lam, and Margaret Arnold. 2005. *Natural Disaster Hotspots: A Global Risk Analysis*. Washington, D.C.: World Bank.

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# Floods - Before

- [Build an emergency kit](#) and make a [family communications plan](#).
- Avoid building in a floodplain unless you elevate and reinforce your home.
- Elevate the furnace, water heater and electric panel in your home if you live in an area that has a high flood risk.
- Consider installing "check valves" to prevent flood water from backing up into the drains of your home.
- If feasible, construct barriers to stop floodwater from entering the building and seal walls in basements with waterproofing compounds.

# Floods - During

- Listen to the radio or television for information.
- Be aware that flash flooding can occur. If there is any possibility of a flash flood, move immediately to higher ground. Do not wait for instructions to move.
- Be aware of stream, drainage channels, canyons and other areas known to flood suddenly. Flash floods can occur in these areas with or without typical warnings such as rain clouds or heavy rain.

## **If you must prepare to evacuate, you should do the following:**

- Secure your home. If you have time, bring in outdoor furniture. Move essential items to an upper floor.
- [Turn off utilities](#) at the main switches or valves if instructed to do so. Disconnect electrical appliances. Do not touch electrical equipment if you are wet or standing in water.

## **If you have to leave your home, remember these evacuation tips:**

- Do not walk through moving water. Six inches of moving water can make you fall. If you have to walk in water, walk where the water is not moving. Use a stick to check the firmness of the ground in front of you.
- Do not drive into flooded areas. If floodwaters rise around your car, abandon the car and move to higher ground, when water is not moving or not more than a few inches deep. You and the vehicle can be swept away quickly. If your vehicle is trapped in rapidly moving water, stay in the vehicle. If the water is rising inside the vehicle, seek refuge on the roof.
- Do not camp or park your vehicle along streams, rivers or creeks, particularly during threatening conditions.

# Floods - After

- Use local alerts and warning systems to get information and expert informed advice as soon as available.
- Avoid moving water.
- Stay away from damaged areas unless your assistance has been specifically requested by police, fire, or relief organization.
- Emergency workers will be assisting people in flooded areas. You can help them by staying off the roads and out of the way.
- Play it safe. Additional flooding or flash floods can occur. Listen for local warnings and information. If your car stalls in rapidly rising waters, get out immediately and climb to higher ground.
- Return home only when authorities indicate it is safe.
- Roads may still be closed because they have been damaged or are covered by water. Barricades have been placed for your protection. If you come upon a barricade or a flooded road, go another way.
- If you must walk or drive in areas that have been flooded.
  - Stay on firm ground. Moving water only 6 inches deep can sweep you off your feet. Standing water may be electrically charged from underground or downed power lines.
  - Flooding may have caused familiar places to change. Floodwaters often erode roads and walkways. Flood debris may hide animals and broken bottles, and it's also slippery. Avoid walking or driving through it.

# Floods - After

- Be aware of areas where floodwaters have receded. Roads may have weakened and could collapse under the weight of a car.
- Stay out of any building if it is surrounded by floodwaters.
- Use extreme caution when entering buildings; there may be hidden damage, particularly in foundations.

## **STAYING HEALTHY**

- A flood can cause physical hazards and emotional stress. You need to look after yourself and your family as you focus on cleanup and repair.
- Avoid floodwaters; water may be contaminated by oil, gasoline or raw sewage.
- Service damaged septic tanks, cesspools, pits and leaching systems as soon as possible. Damaged sewer systems are serious health hazards.
- Listen for news reports to learn whether the community's water supply is safe to drink
- Clean and disinfect everything that got wet. Mud left from floodwaters can contain sewage and chemicals.
- Rest often and eat well.
- Keep a manageable schedule. Make a list and do jobs one at a time.
- Discuss your concerns with others and seek help. Contact Red Cross for information on emotional support available in your area.



# Tsunami



# Tsunami

- A tsunami is a series of waves that happens when water in a lake or sea is quickly displaced on a large scale.
- Disturbances such as earthquakes, volcanic eruptions, landslides or meteorite impacts can cause tsunamis.
- Because the most common cause is an undersea earthquake, there is potential for coastal areas in California to be impacted by a tsunami.
- According to researchers at the University of Southern California, a 7.6 magnitude earthquake under the seafloor near Catalina Island could cause a tsunami to hit the Southern California coast.



# Tsunami -Before

- Talk to everyone in your household about what to do if a tsunami occurs. Create and practice an evacuation plan for your family. Familiarity may save your life. Be able to follow your escape route at night and during inclement weather. You should be able to reach your safe location on foot within 15 minutes. Practicing your plan makes the appropriate response more of a reaction, requiring less thinking during an actual emergency.
- If the school [evacuation plan](#) requires you to pick your children up from school or from another location. Be aware telephone lines during a tsunami watch or warning may be overloaded and routes to and from schools may be jammed.
- Knowing your community's warning systems and disaster plans, including evacuation routes.
- Know the height of your street above sea level and the distance of your street from the coast or other high-risk waters. Evacuation orders may be based on these numbers.
- If you are a tourist, familiarize yourself with local tsunami evacuation protocols. You may be able to safely evacuate to the third floor and higher in reinforced concrete hotel structures.
- If an earthquake occurs and you are in a coastal area, turn on your radio to learn if there is a tsunami warning.

# Tsunami - During

- Follow the evacuation order issued by authorities and evacuate immediately. Take your animals with you.
- Move inland to higher ground immediately. Pick areas 100 feet (30 meters) above sea level or go as far as 2 miles (3 kilometers) inland, away from the coastline. If you cannot get this high or far, go as high or far as you can. Every foot inland or upward may make a difference.
- Stay away from the beach. Never go down to the beach to watch a tsunami come in. If you can see the wave you are too close to escape it. CAUTION - If there is noticeable recession in water away from the shoreline this is nature's tsunami warning and it should be heeded. You should move away immediately.
- Save yourself - not your possessions.
- Remember to help your neighbors who may require special assistance - infants, elderly people, and individuals with access or functional needs.

# Tsunami - After

- Return home only after local officials tell you it is safe. A tsunami is a series of waves that may continue for hours. Do not assume that after one wave the danger is over. The next wave may be larger than the first one.
- Go to a designated public shelter if you have been told to evacuate or you feel it is unsafe to remain in your home. Text **SHELTER** + your ZIP code to **43362** (4FEMA) to find the nearest shelter in your area (example: *shelter 12345*).
- Avoid disaster areas. Your presence might interfere with emergency response operations and put you at further risk from the residual effects of [floods](#).
- Stay away from debris in the water; it may pose a safety hazard to people or pets.
- Check yourself for injuries and get first aid as needed before helping injured or trapped persons.

# Tsunami - After

- If someone needs to be rescued, call professionals with the right equipment to help. Many people have been killed or injured trying to rescue others.
- Help people who require special assistance—infants, elderly people, those without transportation, people with access and functional needs and large families who may need additional help in an emergency situation.
- Continue using a [NOAA Weather Radio](#) or tuning to a Coast Guard station or a local radio or television station for the latest updates.
- Stay out of any building that has water around it. Tsunami water can cause floors to crack or walls to collapse.
- Use caution when re-entering buildings or homes. Tsunami-driven floodwater may have damaged buildings where you least expect it. Carefully watch every step you take.
- To avoid injury, wear protective clothing and be cautious when cleaning up.

