

MITIGATION IDEAS

MITIGATION MEASURES BY HAZARD TYPE

WHAT IS MITIGATION?

Hazard mitigation refers to any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazardous conditions. The following is a list of possible hazard mitigation measures for communities. As extensive as this list is, it does not preclude other ideas for activities to save lives and prevent or reduce damages in the future. Many of the ideas are developed in other FEMA publications, including www.fema.gov, as well as in publications of other federal and state agencies.

WHY MITIGATE?

- Mitigation can save lives
- Reduces public and private damages from natural hazards and associated costs
- Facilitates community recovery and resilience post-disaster
- Breaks the cycle of disaster-repair-disaster at the community level
- Each *dollar* spent on mitigation *saves* society an average of *four dollars*!

A WORD ABOUT PLANNING

Mitigation planning is best accomplished from a multi-hazard perspective. Reducing the level of risk involving one natural or technological hazard may increase the risk of damage from another hazard. Consequently, it is important to consider that some mitigation alternatives may not be viable given a particular set of hazard conditions. For example, elevating a home on stilts to allow for water flow in a floodplain can be a good thing, but it becomes a problem if the home is in an earthquake zone and the ground starts shaking.

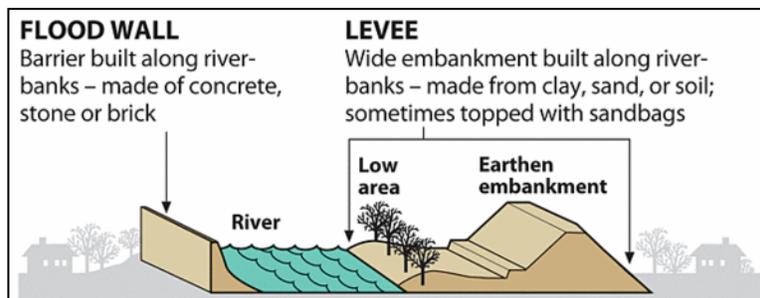
PREPAREDNESS RESOURCES FOR ALL TYPES OF HAZARDS

- County Emergency Management
- State Emergency Management
- American Red Cross
- Salvation Army
- United Way
- 9-1-1 or 2-1-1
- NOAA Weather Radio
- Emergency Alert System (EAS)
- Public Information Phone System (PIPS)
- Storm Ready Communities



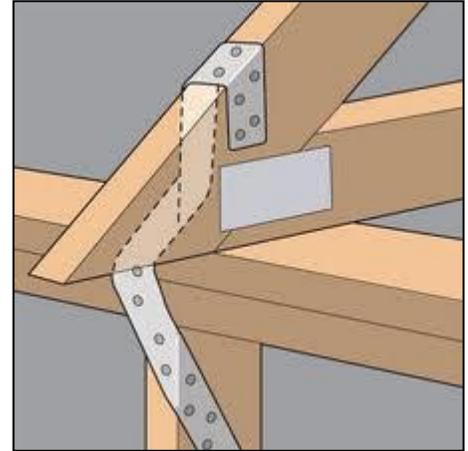
FLOOD MITIGATION IDEAS

- Since standard homeowners insurance does not cover flood losses, purchase Flood Insurance through the National Flood Insurance Program. Insurance is a citizen's first defense against flooding.
- Establish adequate building codes. Building codes are standards for building construction and other structures. If enforced, codes can reduce damages to buildings in flood-prone areas. Examples include:
 - Establish base elevations and first flood elevations consistent with potential flood levels
 - Strengthen structural codes to withstand water pressure or high velocity of flowing water
 - Prevent flotation of buildings by requiring proper anchorage
- Enforce appropriate zoning laws. Zoning is a legal tool used by governments to control development in hazardous areas. Jurisdictions can designate floodways and encroachment lines where no construction or land filling should be permitted.
- Flood proof homes and businesses. Flood proofing is any combination of changes to a structure or property using berms, floodwalls, closures or sealants, which reduces or eliminates flood damage.
- Raise utilities and appliances. Electrical panel boxes, furnaces, water heaters, and appliances such as washers and dryers should be elevated out of the base flood height.
- Buyout and/or acquire homes, businesses, and property in the floodplain to prevent future losses.
- Elevate homes and businesses in the floodplain above the base flood elevation.
- Perform channel improvements. Examples include: Straighten undesirable bend ways; Deepen and widen stream beds to increase size of waterways; Remove brush, trees and other obstructions; etc.
- Construct and maintain dams and reservoirs built on mainstems or tributaries that store excessive water and release it gradually after the threat has passed. Build levees or floodwalls to confine flood waters to a floodway, thereby reducing flood damage.
- Explore watershed treatment ideas to render the soil more absorbent of excessive water. Measures include: crop rotation; terrace construction; contour strip cropping; and selective planting and reforestation.
- Utilize GIS to determine which homes in your community are in the floodplain or at risk to flooding. Alert residents and provide information about how they can mitigate their property and homes.



HURRICANE MITIGATION IDEAS

- Individuals should review their homeowners or renters insurance policy to ensure they have coverage for wind and/or hurricane damage. If not, purchase wind coverage for property in high wind zones.
- Create and enforce effective building codes to reduce losses from hurricane force wind and storm surge.
- Adjust local Zoning regulations to prevent construction in storm surge prone areas.
- Retrofit homes with storm shutters, laminated or impact-resistant glass, anchor bolts, hurricane straps and clips.
- Anchor manufactured homes and exterior attachments such as carports and porches.
- Trim back dead or weak branches from trees.
- Plan and publicize evacuation routes. Know your Zone.
- Raise utilities and appliances. Electrical panel boxes, furnaces, water heaters, and appliances such as washers and dryers should be elevated out of the base flood height or expected storm surge height.
- See *Flood Mitigation Ideas* for areas within the Storm Surge Zone.



TORNADO AND SEVERE WIND MITIGATION IDEAS

- Build residential or community safe rooms at mobile home parks, fairgrounds, shopping malls or other vulnerable public areas. Make sure these areas are accessible by the public at all times.
- Install tornado warning sirens in populated areas.
- Anchor manufactured homes and exterior attachments such as carports and porches.
- Utilize special roofing shingles and building materials designed to interlock and resist uplift.
- Know the difference between a tornado watch (issued when tornadoes are possible in your area) and a warning (tornadoes have been sighted by radar).
- Bury utility lines or trim trees near above-ground lines.



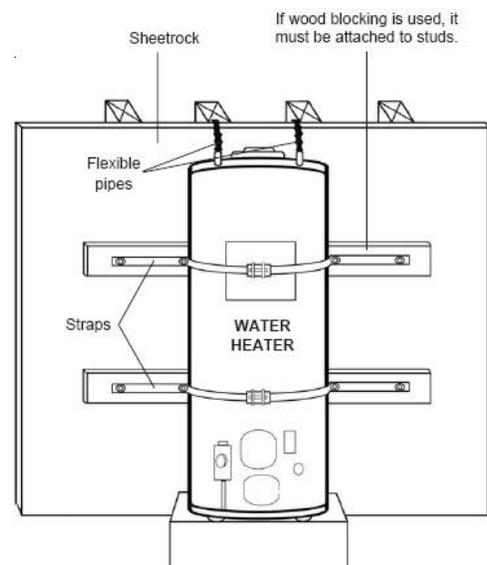
EXTREME HEAT & DROUGHT MITIGATION IDEAS

- Create a Water Supply Plan for the management of water conservation for rain water catchments and storage.
- Invest in Crop Insurance.
- Plant drought resistant crops.
- Enforce water restrictions for recreational and beautification purposes.
- Collect rainfall for domestic or irrigation purposes in times of severe drought.
- Construct aqueducts to transport water and store for livestock and agricultural use.
- Implement tillage practices which include: strip cropping, contour farming, and mulch tilling practices.
- Establish community cooling centers for vulnerable populations.



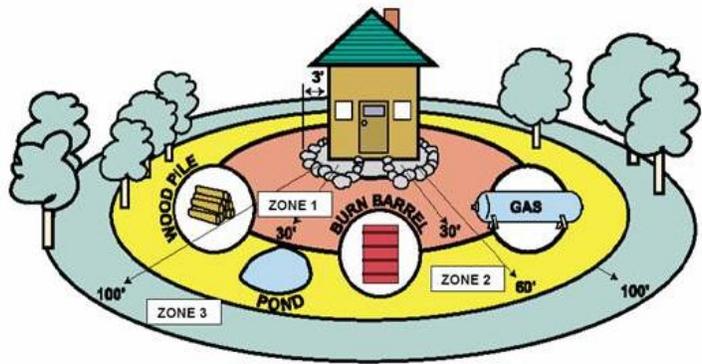
EARTHQUAKE MITIGATION IDEAS

- Consider adding earthquake coverage to your homeowner's insurance policy.
- Strengthen building codes and zoning ordinances.
- Strengthen and retrofit transportation infrastructure.
- Brace walls and bolt sill plates to the foundation of homes and businesses.
- Retrofit critical facilities to ensure they remain operational post-earthquake, i.e., schools, local governments and corporations.
- Anchor tall bookcases and file cabinets, install latches on drawers and cabinet doors, secure appliances, use flexible connections on gas and water lines, and anchor and brace propane tanks and gas cylinders.
- Establish a Seismic Safety Committee to provide policy recommendations, recommend changes in state and local seismic safety standards, and perform annual assessments of seismic safety improvements.



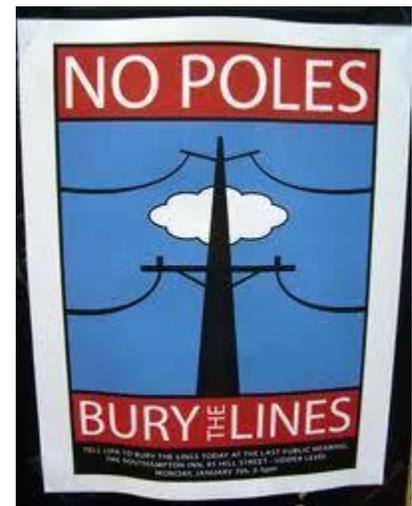
WILDFIRE MITIGATION IDEAS

- Establish local building codes or development ordinances to regulate construction in wooded areas.
- Use fire-resistant materials when building or renovating structures. Avoid using wooden shakes and shingles for roofing.
- Create a safety zone to separate homes from combustible vegetation. Prune all branches around residences to a height of 8-10 feet. Keep trees adjacent to buildings free of dead or dying wood and moss.
- Implement property maintenance procedures such as the removal of all dead limbs, needles, and debris from rain gutters and keep fireplaces/chimneys clean and clear.
- Avoid open burning, especially during dryer seasons.
- Bury electrical lines.
- Store combustible/flammable materials in approved safety containers kept at a safe distance from the home.
- Practice safe landscaping techniques such as using fire-resistant plants and non-flammable design features.



WINTER WEATHER MITIGATION IDEAS

- Bury electrical lines where possible to resist damage from heavy snow, ice, sleet, and other hazards.
- Salt major roadways to improve drivability and reduce traffic accidents.
- Identify locations for heating centers or shelters for vulnerable populations and stranded motorists.
- Build or establish snow fences or “living snow fences” (rows of trees or other vegetation) to limit blowing and drifting of snow over critical roadway segments.
- Coordinate with local utility organizations to increase homeowner and community education about potential storm effects and possible mitigation activities.



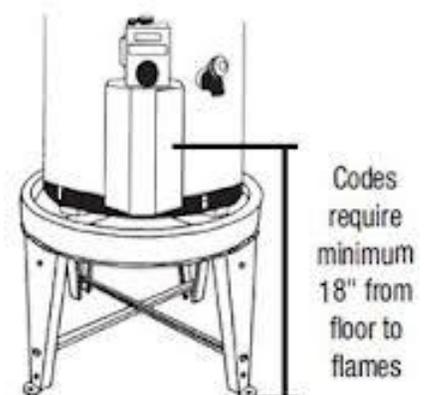
HAZARDOUS MATERIALS MITIGATION IDEAS

- Strengthen and enforce safety procedures and policies. Require training in and compliance with all safety procedures and systems related to the manufacture, storage, transport, use, and disposal of hazardous materials.
- Develop and maintain Emergency Plans and Risk Management Plans as required by U.S. Environmental Protection Agency.
- Comply with and enforce USDOT and state regulations regarding hazardous material and hazardous waste transportation.
- Create Industrial Site Buffers between industrial areas and other land uses.
- Cleanup of brownfields. Cleanup activities are expensive, but they are recommended for preventing exposure to harmful substances.
- Maintain sufficient security. Security considerations should include preparedness for terrorism, sabotage, or civil disturbance.



UTILITY FAILURE MITIGATION IDEAS

- Insulate critical utility and pipeline components to prevent damage from ground freeze.
- Bury electrical lines where possible to resist damage from severe winds, lightning, ice, and other hazards.
- Install backup power systems, such as generators, at critical facilities.
- Ensure redundant systems are in place at critical facilities.
- Elevate utilities (water heaters, heating & air units, water & sewer pump stations, etc) in flood-prone areas.
- Implement lightning protection practices for electrical and communication systems.
- Trim trees near utility lines.
- Establish digging hotlines for the public to call before they dig.



PUBLIC HEALTH EMERGENCY MITIGATION IDEAS

- Develop and implement pandemic preparedness and response plans.
- Improve surveillance and monitoring capabilities to detect the emergence of a flu strain with pandemic potential immediately.
- Protect the public through the development, production and distribution of an effective vaccine. Citizens should be sure to get vaccinated on an annual basis.
- Plan ahead for a pandemic by stockpiling antiviral, vaccines and other essential medications and supplies.
- Strengthen the public health infrastructure.
- Increase awareness and education about pandemic flu.

