





◦ Avalanche

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⚙️ Status	Done
📅 Due	@May 9, 2024
➡️ Parent-task	 <u>1. Natural Disasters:</u>
📌 Priority	Medium
🏷️ Tags	

Avalanche

1. Overview of Avalanches:

- **Definition:** An avalanche is a rapid flow of snow down a slope, often triggered by various factors such as weather conditions, terrain, or human activity.
- **Types:** Avalanches can be categorized into different types based on the characteristics of the snow and the terrain, such as slab avalanches, loose snow avalanches, and powder snow avalanches.
- **Frequency and Distribution:** Avalanches occur in mountainous regions worldwide, with varying frequency and severity depending on factors like climate, terrain, and snowpack stability.

2. Causes of Avalanches:

- **Snowpack Instability:** Changes in temperature, wind, and precipitation can create weak layers within the snowpack, increasing the likelihood of avalanches.

- **Human Triggers:** Activities such as skiing, snowboarding, snowmobiling, and even hiking can trigger avalanches, particularly when individuals venture into steep, avalanche-prone terrain.
- **Natural Triggers:** Natural events such as heavy snowfall, rapid temperature changes, or earthquakes can also trigger avalanches by destabilizing the snowpack.

3. Effects of Avalanches:

- **Loss of Life and Injury:** Avalanches pose a significant risk to human life and can cause severe injuries or fatalities to those caught in their path.
- **Property Damage:** Avalanches can damage or destroy buildings, infrastructure, and transportation routes, particularly in communities located in avalanche-prone areas.
- **Economic Impact:** The disruption caused by avalanches can have significant economic consequences for local communities, including loss of revenue from tourism and costs associated with rescue and recovery efforts.
- **Environmental Impact:** Avalanches can have both immediate and long-term effects on the environment, including altering landscapes, affecting vegetation, and contributing to erosion and sedimentation in waterways.

Preparedness

1. Education and Awareness:

- **Understanding Avalanche Basics:** Educate yourself and others about the different types of avalanches, their causes, and how they behave. This knowledge forms the foundation for making informed decisions in avalanche terrain.
- **Avalanche Forecasting:** Stay informed about avalanche conditions by checking local avalanche forecasts provided by organizations like the Avalanche Center or national park services. These forecasts assess snowpack stability and avalanche risk levels in specific regions.
- **Training:** Consider taking avalanche safety courses to learn essential skills such as recognizing avalanche terrain, performing avalanche

rescue techniques, and using avalanche safety equipment like beacons, probes, and shovels.

2. Risk Management and Decision Making:

- **Terrain Management:** Identify and avoid avalanche terrain whenever possible. Learn to recognize signs of potential avalanche risk, such as steep slopes, convexities, and areas with recent avalanche activity.
- **Trip Planning:** Plan your outdoor activities with avalanche safety in mind. Check avalanche forecasts, assess the terrain, and select routes that minimize exposure to avalanche hazards.
- **Group Dynamics:** Communicate openly with your companions about avalanche safety and decision-making processes. Establish clear communication protocols, set objectives together, and be willing to modify plans based on changing conditions.

3. Avalanche Safety Equipment:

- **Avalanche Transceiver (Beacon):** Carry and know how to use an avalanche transceiver to aid in locating buried victims in the event of an avalanche. Practice using your transceiver regularly to maintain proficiency.
- **Avalanche Probe:** Carry a collapsible avalanche probe to quickly pinpoint the location of buried victims beneath the snow surface.
- **Shovel:** Carry a sturdy shovel designed for avalanche rescue to efficiently dig out buried victims. Ensure it is easily accessible and in good working condition.

4. Emergency Response:

- **Rescue Preparedness:** Be prepared to respond quickly and effectively in the event of an avalanche incident. Practice avalanche rescue drills with your companions to improve response times and coordination.
- **Emergency Communication:** Carry communication devices such as cell phones, radios, or satellite messengers to call for help if needed. Ensure that someone outside your group knows your planned itinerary and can initiate a search and rescue operation if you do not return as scheduled.

Places information

1. Vulnerable Areas:

- **Steep Slopes:** Avalanches are most likely to occur on slopes between 30 and 45 degrees. Steeper slopes increase the likelihood of snow instability and failure.
- **Convex Terrain:** Features such as convex rolls or slopes can store extra snow and increase stress on weak layers, making them more prone to avalanches.
- **Gullies and Couloirs:** These features can act as natural terrain traps, channeling and concentrating avalanche debris. Avoid traveling through or below them when avalanche conditions are present.
- **Cornices:** Overhanging snow formations along ridgelines are prone to collapse, triggering avalanches on slopes below. Exercise caution and avoid traveling on or beneath cornices.

2. Safe Spots:

- **Ridge Lines:** When navigating avalanche terrain, staying along ridge lines can often provide safer travel routes. Ridge tops typically have thinner snow cover and less wind loading, reducing the risk of triggering avalanches.
- **Prominent Features:** Seek refuge behind large trees, rocks, or other stable objects that can provide protection from avalanches. Be mindful of potential overhead hazards such as cornices or falling debris.
- **Islands of Safety:** Identify and establish designated safe zones within avalanche terrain, where the risk of avalanche exposure is minimized. These areas should be strategically located away from avalanche paths and provide sufficient protection from avalanche debris.
- **Terrain Traps:** Identify features such as depressions, depressions, or areas with dense vegetation that can reduce the consequences of an avalanche burial. These terrain traps can help increase the chances of survival in the event of an avalanche.

3. Route Selection and Travel Techniques:

- **Avoidance:** Whenever possible, avoid traveling through or below avalanche terrain altogether. Plan your route to minimize exposure to

avalanche-prone slopes and choose alternative paths if necessary.

- **Safe Travel Protocol:** When traveling in avalanche terrain, use techniques such as traveling one at a time, spacing out group members to reduce group loading, and regrouping in safe zones away from avalanche paths.
- **Observation and Assessment:** Continuously assess snowpack stability and terrain hazards as you travel. Look for signs of recent avalanche activity, unstable snow layers, and changing weather conditions that could increase avalanche risk.

Earthquake

Overview:

An earthquake is the shaking of the Earth's surface resulting from a sudden release of energy in the Earth's lithosphere that creates seismic waves. Earthquakes can range in size from those that are so weak that they cannot be felt to those violent enough to propel objects and people into the air.

Causes:

- Earthquakes are primarily caused by the movement of tectonic plates beneath the Earth's surface.
- Fault lines, where two tectonic plates meet, are common sites for earthquakes.
- Other causes include volcanic activity, landslides, and human activities such as mining and reservoir-induced seismicity.

Effects:

- Earthquakes can cause ground shaking, ground rupture, landslides, tsunamis, and avalanches.
- They can lead to the collapse of buildings and infrastructure, resulting in casualties and widespread destruction.
- Secondary effects may include fires, liquefaction of soil, and disruption of essential services such as water, electricity, and communication.

Preparedness

1. Emergency Kit:

- **Water:** Ensure you have at least one gallon of water per person per day for drinking and sanitation purposes. Consider storing additional water for pets and hygiene needs.
- **Non-perishable Food:** Stock up on canned goods, dry fruits, nuts, and protein bars. Include a manual can opener in your emergency kit.
- **Flashlight and Batteries:** Have multiple flashlights available in case of power outages. Check and replace batteries regularly to ensure they are functional.
- **First Aid Supplies:** Include a variety of first aid items such as bandages, gauze pads, adhesive tape, antiseptic wipes, scissors, tweezers, pain relievers, and any necessary prescription medications.
- **Important Documents:** Keep copies of identification documents (e.g., passports, driver's licenses), insurance policies, medical records, birth certificates, and financial documents in a waterproof and fireproof container. Consider storing digital copies on a secure cloud-based platform.

1. **Family Emergency Plan:**

- **Evacuation Routes:** Identify multiple evacuation routes from your home, workplace, and community areas. Consider potential obstacles such as debris and road closures.
- **Meeting Points:** Designate primary and secondary meeting points where family members can reunite after an earthquake. Choose locations that are easily accessible and unlikely to be affected by the disaster.
- **Communication Methods:** Establish a communication plan with family members, including designated contacts outside the affected area. Agree on a communication method (e.g., text messaging, social media, walkie-talkies) and establish a check-in protocol to confirm everyone's safety.

1. **Securing Your Home:**

- **Furniture and Appliances:** Secure heavy furniture, appliances, and objects that could become hazards during an earthquake. Use earthquake-resistant straps, brackets, or anchors to fasten items to walls or floors.
- **Cabinet Latches:** Install safety latches on cabinets and drawers to prevent contents from falling out and causing injuries. Store heavy or breakable items on lower shelves to minimize the risk of injury.

- **Safe Spots:** Identify safe spots in each room where you can take cover during an earthquake. Choose sturdy furniture pieces such as tables, desks, or beds, and practice "Drop, Cover, and Hold On" drills regularly.

1. **Education and Training:**

- **Drop, Cover, and Hold On:** Teach family members the recommended safety technique for protecting themselves during an earthquake. Practice drills regularly to reinforce the actions needed to stay safe.
- **Practice Drills:** Conduct earthquake preparedness drills at home, school, and workplace settings. Simulate different scenarios and practice evacuation procedures to build confidence and readiness.
- **Community Resources:** Take advantage of community-based training programs, workshops, and resources offered by local emergency management agencies. Engage in discussions about earthquake safety and preparedness within your neighborhood or community.

1. **Building Safety:**

- **Retrofitting:** Consult with a professional engineer or contractor to assess the structural integrity of your home or building. Consider retrofitting older structures to meet current building codes and standards for earthquake resistance.
- **New Construction:** If building or renovating a property, prioritize earthquake-resistant design features and construction materials. Incorporate measures such as reinforced concrete, steel framing, and flexible building techniques to mitigate earthquake damage.

1. **Emergency Contacts:**

- **Local Authorities:** Compile a list of emergency contact numbers for local police, fire departments, medical facilities, and utility providers. Include non-emergency numbers for reporting hazards or seeking assistance during non-life-threatening situations.
- **Utility Companies:** Keep utility company contact information readily available to report gas leaks, electrical outages, or water main breaks. Familiarize yourself with the location of utility shut-off valves and meters to minimize risks during emergencies.

1. **Stay Informed:**

- **Emergency Alerts:** Sign up for local emergency alert systems to receive timely notifications about earthquake warnings, evacuation orders, and safety advisories. Ensure your contact information is up-to-date to receive alerts via phone, text message, email, or mobile app notifications.
- **Mobile Apps:** Download and install smartphone apps designed for earthquake monitoring, preparedness, and response. Explore features such as real-time seismic activity tracking, disaster preparedness tips, and interactive maps displaying evacuation routes and shelter locations.
- **Community Engagement:** Engage with local community organizations, neighborhood associations, and disaster response agencies to stay informed about earthquake preparedness initiatives, training opportunities, and volunteer opportunities. Participate in community events, workshops, and drills to enhance your knowledge and skills in earthquake safety and resilience.

Building Vulnerability During Earthquakes:

Building Collapse:

- During an earthquake, buildings may experience structural damage or collapse due to the intense shaking and ground movement.
- Older buildings constructed before modern seismic codes are particularly vulnerable to collapse, especially if they lack reinforcement or have weak foundations.
- Factors such as building materials, construction techniques, and soil conditions can influence the severity of damage.

Types of Structural Failure:

1. **Soft-Story Collapse:** In multi-story buildings with open ground floors (e.g., parking garages), the lack of lateral support can cause the upper stories to collapse onto the lower levels.
2. **Pounding:** Adjacent buildings may collide or "pound" against each other during an earthquake, leading to further structural damage.
3. **Cascading Failure:** Failure in one part of a building can trigger a chain reaction of structural collapse, compromising the integrity of the entire structure.

Safe Areas Within a Home:

1. Doorframes:

- Contrary to popular belief, doorframes are not necessarily the safest places to seek shelter during an earthquake. Modern building codes have improved doorframe stability, but they may still pose risks of injury from swinging doors or collapsing debris.

1. Under Sturdy Furniture:

- Seek shelter under sturdy furniture such as tables, desks, or beds. These items can provide protection from falling objects and collapsing ceilings.
- Position yourself next to a sturdy piece of furniture and hold onto it to prevent it from shifting during shaking.

1. Interior Walls:

- Move away from windows, exterior walls, and glass doors, which are more susceptible to damage during an earthquake.
- Seek refuge along interior walls, which are typically reinforced and less likely to collapse.

1. Supported Structures:

- Take cover near load-bearing walls, columns, or structural pillars, as these elements provide additional support and stability.
- Avoid standing near heavy objects or fixtures that may topple over during shaking.

1. Stay Low:

- Drop to the ground and cover your head and neck with your arms to protect against falling debris.
- Crawl to a safe area if possible, as lower levels of a building may experience less shaking and damage than upper floors.

1. Evacuation Routes:

- If safe to do so, move quickly to an open area away from buildings, trees, and utility poles.
- Use stairs rather than elevators to evacuate from multi-story buildings, as elevators may become inoperable or unsafe during an earthquake.

1. Post-Earthquake Safety:

- After the shaking stops, assess your surroundings for hazards such as gas leaks, fires, and structural damage.
- Exercise caution when exiting buildings, as aftershocks or additional structural damage may occur.
- Follow emergency evacuation procedures and seek medical attention for injuries if necessary.