Natural Hazards General Information

Exploring occurrences of severe weather by state
https://maps.ngdc.noaa.gov/viewers/hazards/

Hazard		Causes	How to predict	Technology for mitigation	Case Study	Link to hazard map
Earthquakes/ Liquefaction		Movement along faults, plate boundaries, or movement of magma beneath the surface of the earth	You can predict *where* an earthquake is likely to occur but it is impossible to predict *when* an earthquake will occur. Once a major earthquake has occurred it is usually followed by many smaller earthquakes (aftershocks). Rarely some earthquakes are preceded by foreshocks.	Building design Seismographs 3D Models Simulations	Utah's potential for a large earthquake http://www.sltrib.com/home/3791904-155/new-earthquake-study-says-utah-is 1989 Loma Prieta earthquake https://en.wikipedia.org/wiki/1989_Loma_Prieta_earthquake	USGS map of damaging earthquakes in the US https://earthquake.usgs.gov/earthquakes/states/us_damage_eq.php US earthquake hazard map https://earthquake.usgs.gov/hazards/hazmaps/
Volcanoes		Magma under the earth's crust reaches the surface.	Volcanoes are often preceded by an increase of earthquake activity or a change in the surface of the earth. Sometimes inflation of a mountain is detected before it erupts. Hot springs often form where magma is close to the surface.	Seismographs GPS/tiltmeters GIS 3D Models Topo maps Heat maps	Utah's volcanoes http://www.deseretnews.com/article/883126/Story-of-Utah-volcanoes-may-still-be-unfolding.html Mt. St. Helen's https://en.wikipedia.org/wiki/Mount_St._Helens	Map of volcanoes in the US http://www.americangeosciences.org/critical-issues/maps/volcano-activity-alerts Volcano hazard map: http://dphhs.mt.gov/publichealth/PHEP/YourPreparedness/BeInformed/VolcanicEruptions
Severe Weather	Tornadoes	Cold air colliding with warm moist air. Generated during severe thunderstorms.	Look at tracks of previous tornadoes and seasons of the year when tornadoes are most common. Most common in the spring. Look for favorable geography such as flat areas. Mountains disrupt rotating wind patterns and often prevent tornadoes from forming. Mountains also block moist air coming from coastal areas that is needed to generate severe thunderstorms.	Warning Systems Storm shelters Building designs/safe rooms Levees Drones Doppler Radar Animated Weather Maps Barometers Satellite images Water gauges	Tornado: Salt Lake tornado https://www.ksl.com/?nid=148&sid=31088995 Hurricane: Hurricane Katrina http://www.nytimes.com/interactive/2015/08/26/us/ten-years-after-katrina.html Floods: Utah 1983 http://www.deseretnews.com/top/142/0/Salt-Lake-flood-of-1983.html Flash Floods: https://weather.com/news/news/utah-flash-floods Severe Thunderstorms: http://fox13now.com/2016/09/22/severe-storms-leave-damage-across-layton/	Tornado: Map of tornado tracks http://www.spc.noaa.gov/gis/svrgis/ Tornado hazard map https://weather.com/storms/tornado/news/tornado-odds-of-being-hit Or http://strangesounds.org/2014/04/us-tornado-map-these-twister-risk-maps-show-where-you-can-get-killed-by-a-tornado.html Hurricane: Historical hurricane tracks https://coast.noaa.gov/digitalcoast/tools/hurricanes Hurricane hazard map https://community.fema.gov/hazard/hurricane-en_us/be-smart?lang=en_US Floods: Flood events map https://commons.wikimedia.org/wiki/File:US_flood_map_2008-06-10.jpg
	Hurricanes	Development of extreme low pressure areas over warm ocean surfaces in the tropics.	Tracks of previous hurricanes. Geography. Hurricane season is generally from late summer to early fall. Low-lying coastal areas nearest tropical oceans are affected most often. Hurricanes quickly lose fuel (heat and moisture) and die over land.			
	Floods	More rain falls than the soil can absorb	Geography: gullies, canyons, floodplains, low areas next to lakes. Recent heavy rains.			
	Severe Thunderstorms/	Rising of moist warm air. Cold fronts, monsoons	Very widespread. More common on humid, warm summer afternoons.			

	Hailstorms				Blizzards: http://www.deseretnews.com/article/575039707/Heavy-snow-breaks-records-as-it-snarls-roads-business.html Freezing Rain: http://archive.sltrib.com/story.php?ref=/sltrib/news/55691572-78/utah-salt-lake-rain.html.csp Drought: http://www.sltrib.com/home/3962296-155/utahs-drought-is-over-sort	Flood hazard map https://community.fema.gov/hazard/flood-en_us/be-smart?lang=en_US Severe Thunderstorms: http://www.spc.noaa.gov/wcm/ scroll almost all the way to the bottom of the page for the severe thunderstorm map. http://www.spc.noaa.gov/wcm/20ysvra.png Blizzards: https://community.fema.gov/hazard/winter-storm-en_us/be-smart?lang=en_US Freezing Rain: http://mcc.sws.uiuc.edu/living_wx/icestorms/index.html Drought: https://www.climate.gov/maps-data/dataset/drought-risk-atlas-maps-and-station-data
	Blizzards	Strong winter storm systems combined with high wind.	High elevations, extensive flat areas, areas prone to high winds and cold temperatures.			
	Freezing Rain	Supercooled rain freezes on impact with the ground	Difficult to forecast. Requires a very precise temperature range. Look for storms where a shallow layer of cold air lies below warmer air.			
	Drought	Below normal precipitation over an extended period of time.	Look at long term weather patterns. Multiple years with below average precipitation.			
Rockfalls and landslides		Steep slopes. Excessive moisture in the soil. Geological weaknesses.	Look for favorable topography, geology, soil, and wet weather conditions.	Hazard maps GPS	Thistle slide http://www.ksl.com/?nid=148&sid=31045269	http://geology.com/usgs/landslides/
Wildfires		Lack of rain. High temperatures. Poor forest management. Humans.	Wet spring followed by dry hot summer.	Satellite images Prescribed burns	Utah 2012 wildfire season http://www.deseretnews.com/article/865581710/2012-wildfire-season-a-destructive-one-in-Utah-will-2013-be-as-bad.html	https://community.fema.gov/hazard/wildfire-en_us/be-smart?lang=en_US
Tsunami		Underwater earthquakes displace the water above them.	See earthquakes. Topography. Low lying coastal areas in ocean basins with subduction zones.	DART system Tsunami barriers and doors	Tsunami gate saves Japanese city http://www.nola.com/politics/index.ssf/2011/05/how_one_japanese_village_defie.html	http://www.wilderness-survival.net/natural-hazards/tsunamis/
Avalanche		Topography: steep slopes in areas that receive significant snowfalls.	Warmer temperatures allow for slipping of snowpack. During or immediately after snowstorms, esp. with a buildup of one or more feet. Accumulation of snow due to cornices. Steeper slopes, north facing slopes, lack of vegetation	Avalanche airbags Avalanche emergency beacons Avalanche control - mortars	http://www.nytimes.com/2005/01/17/us/searchers-find-body-of-skier-in-utah-snow.html	http://voices.nationalgeographic.com/2014/01/25/geography-in-the-news-avalanche-warnings/
Sinkholes		Underground water dissolves limestone to make cave systems. Ceilings of caverns too close to the surface fail.	Areas with high water table and limestone bedrock. Look for other sinkholes in the area.	Seismic refraction Ground penetrating RADAR http://inspectapedia.com/vision/Sink_hole_Detection.php	Corvette museum http://news.nationalgeographic.com/news/2014/02/140213-corvette-sinkhole-kentucky-museum-science/	http://karstwaters.org/educational-resources/what-is-karst-and-why-is-it-important/