

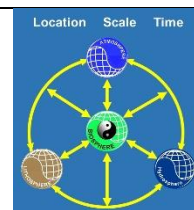


Applied Geography for Sustainable Living

Eye on the World

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Applied Geography Education: the path to a more sustainable future.

CA Wildfires: It's Not Nice to Ignore Mother Nature



Moderate Resolution Imaging Spectrometer, NASA Terra satellite, natural-color image, of CA wildfires, 9 Nov 2018.

As a geographer, the tragedy of the recent and past major CA wildfires begs the question: Why do people choose to live in such dangerous places? As a geographer and an educator, I wonder if this tragedy is a sign too many people being disconnected from Nature. Being unfamiliar with Nature, they may lack the environmental awareness to recognize potential dangers or geo-hazards. Situational awareness is being cognizant of your surroundings. Deciding where to live involves many tangible and intangible factors. Many decisions are a chaotic mix of perceptions, hopes, dreams and realities. No doubt some people consciously choose to live in these places. Some may be unaware of the hazards and associated risks for living in those areas. Avoiding geo-hazards is my top priority when planning trips and selecting a place to live.

In This Issue

CA Wildfires: It's Not Nice to Ignore Mother Nature

1-2

Geography for Safety: Know Your Geo-Hazards

3-7

SCIENCE

A Disaster of Our Own Making

California was always going to burn—but it should have happened differently.

CHARLIE LOYD NOV 20, 2018



JOHN LOCHER / AP

<https://www.theatlantic.com/science/archive/2018/11/californias-disaster-is-of-our-own-making/576241/>

the east and descending from the mountains. The multi-year drought (arid regions are characteristically prone to drought) dried out the vegetation. The Santa Ana winds remove any remaining moisture. And if the dry vegetation ignites, the winds can fan the flames sometimes in excess of 70 mph. It's a recipe for disaster.

Deregulation of the power industry allowed power companies to split off power generation from distribution capabilities. This contributed to split revenue streams which adversely affected budgets for maintaining distribution lines. Several major fires have been ignited by power line failures.

Increased development in and adjacent to wildlands creates potential disaster zones. The photo on the right shows a typical Californian urban-wildland interface (UWI) zone. Notice the houses are not surrounded by forest. The hills are covered with low, dry scrub brush. This type of vegetation has a natural fire cycle to burn 15 years or so.

As with many natural cycles, it lacks clockwork precision.



Atlantic published Charlie Loyd's article about the recent CA fires. The tag line says a lot. Anyone familiar with California recognizes the geography makes fires inevitable. Located in the Subtropical High-Pressure Zone, the climate tends to be dry (i.e. evaporation exceeds precipitation). The miracle of irrigation saw agricultural production soar. The long-term reality is unsustainable. Adding more water to a region where the evaporation is higher than the precipitation means the natural system tends to evaporate water. While irrigation lets you grow more crops, the fact is much of the water is being evaporated.

California is in the Westerly Wind Belt. The winds carry the evaporated moisture out of the region. Some precipitates as snow in the Sierra Nevada. Some ends up as snow in the Rockies.

The Santa Ana winds are a fact of life in California. These are warm dry winds from

A common lament of American geographers is the poor performance of American students regarding geographic knowledge. Most embarrassing is their inability to find states in their own country. Many cannot even find the U.S. on a world map! One study showed 93% of Swedes could find the United States on a world map. Only 16% of Americans could find Sweden.

Most people think geography is little more than memorizing the states and capitals of the U.S. and nations and capitals of the world. They have no idea of the wide scope and utility of geography for their daily lives. During my 27 years in education, I can attest to the agonizingly slow pace of education reform.

Applied Geography for Sustainable Living is a grassroots community-based education program working to give people a chance to learn about geography outside the education bureaucracy. Environmental awareness can create opportunities for different choices. These could lead to avoiding potential disasters. 🌐

Geography for Safety: Know Your Geo-Hazards

I use geography to systematically observe Nature with an eye on assessing local/regional geo-hazards. I try to train others to do this. I use approach when buying a home. I applied it to sustainable agriculture plans for the farm in Thailand. I also use it for emergency preparedness and emergency communications planning.

Basically, there is no perfectly safe place to live on Earth. Every place has different hazards at different magnitudes, at different seasons. Each person has different ideas what is dangerous and what is safe. They each have a different tolerance for risks and different senses of rewards. We all go through some sort of juggling act to find an acceptable answer. Most of us accept we cannot have our cake and eat it, too. Life is about compromise. For whatever reason or twist of fate, we find ourselves at a place and time on Earth. For whatever span of time we chose to remain at a place, there will be natural hazards. They vary in kind, intensity, and immediacy.



Awareness is the starting point. This is true for any problem solving effort. If you are not aware a problem exists, you don't know a solution is needed. I use geography to systematically observe my surroundings to inventory the possible natural hazards. But possible and probable are different. The next step is to determine the frequency and magnitude of occurrence.

If you are new to an area, start with searching the Internet. Visit the local library and search the newspaper archives. Talk with local emergency service agencies (police, sheriff, fire department, etc.). Make note of the time needed for emergency relief to arrive.


Geography integrates all life, physical and social sciences to study and explain the distribution of phenomena on the surface of the Earth. The key is to make connections between things you already know. Geography is a way you seeing things relative to one another.

The table below summarizes selected general hazards relative to the source of the forces involved. The information in the table is not comprehensive. This is a hint of the complex relationships of these natural forces. This is the initial phase of awareness for those unfamiliar with the natural sciences. *You must know your local geo-hazards.*

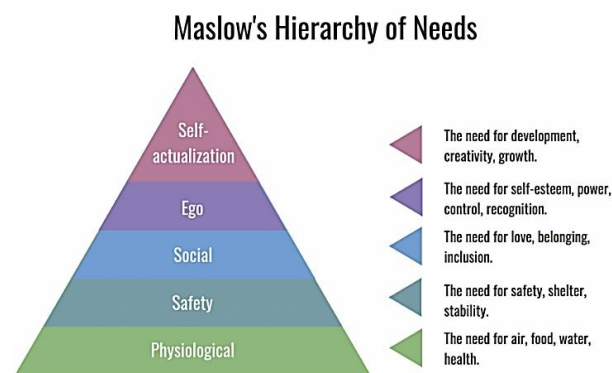
Natural Force		Possible Link to
Atmosphere	Wind/Severe Storms	Extreme tides, storm surges, downed trees, crop damage, structural damage, downed power lines, disrupted transportation and communications.
	Rain/Sleet/Ice/ Snow	Flooding, flash floods, downed trees, structural damage, downed powerlines, animal and human deaths, disrupted transportation and communications.
	Hail	Downed trees, structural damage, downed powerlines, crop damage, animal deaths, disrupted transportation and communications.
	Droughts	Water shortages, crop failures, animal deaths, famine.
	Heat waves	Deaths, power failures, animal deaths, crop failures.
Lithosphere	Earthquakes	Vulcanism, landslides, structural damage, fires, deaths, disrupted transportation and communications.
	Landslides/ Mudslides Avalanches	Erosion, structural damage, flooding due to blockage of rivers, vegetation destruction, deaths, disrupted transportation and communications.
	Volcanic eruptions	Lava flows, ejecta, toxic gases, structural damage, vegetation destruction, deaths, fires, acid rain, crop damage flooding due to blockage of rivers, disrupted transportation and communications.
Hydrosphere	Extreme Tides/Storm surges	Erosion, flooding, structural damage, death, disrupted transportation and communications.
	Tsunamis	Massive structural damage, severe erosion, flooding, burial by sedimentation, death, disrupted transportation and communications.
	Floods/Flashfloods	Erosion, structural damage, crop destruction, death disrupted transportation and communications.
Biosphere	Disease/Infection/ Plague	Death, crop destruction, animal deaths.
	Insect infestation	Crop destruction/failure, famine, forest destruction.
	Predation	Death, loss of livestock and other prey animals; indirectly impacts natural vegetation.
	Plant extinction/ crop failure	Ecological collapse, famine, death.
	Animal extinction/die off	Famine, death,

Consider Your Constraints:

Ancient philosophers said, "Know thyself." Everyone has different ideas of what they need and what they want to be content. The table on the left generalizes Maslow's hierarchy.

Needs	Individual	Wants
<ul style="list-style-type: none"> • Air • Water • Food • Shelter • Space • Transportation 		<ul style="list-style-type: none"> • Self-actualization • Esteem • Social belonging • Safety

Your basic needs are what Maslow considered physiological needs. You need these to survive and live. Maslow's ideas can be debated, but I use them as my basic



planning guide. Once your biological needs are satisfied, Safety becomes a concern. In a stable situation, most people shift attention to social concerns (e.g. a sense of belonging). This sets the tone for wanting to develop a sense of control, power, recognition. Having achieved the lower levels of the hierarchy, you get to a point of seeking development, creativity and growth.

In my opinion, some people get derailed at the “Ego” level. This is where some folks get side-tracked by materialism, keeping up with the Jones, needing to feel superior to others, showing off, etc. Some people make choices to take more risks. Others who may be marginalized or feel marginalized have fewer choices and are relegated to less desirable options which may also be higher risk areas.

For example, coastal areas and places with a “view” tend to be more desirable and cost more. But those areas are at risk for tsunamis, coastal erosion, and storm damage. Mountain view areas are often more prone to landslides and wildfires. Home in earthquake fault zones or desert areas lacking water pose different risks. Those with limited finances and options have more limited choices. This often means living in less desirable conditions and areas.

Understand Yourself and Decision-making:

1. The Biology of Decision-making. When emotions run high, logic circuits in the brain diminish. When logic reigns, emotions are low. Knowing this, you need to avoid making major decisions when you are in an emotional state.
2. Needs are Biological Necessities: Your “Needs,” are required to sustain your body. If you are not well or alive, it will be hard to work toward any goal. Logic and reason must be dominant when making decisions on these matters. Back-up plans are also required to assure success because no plan is perfect. The future is NOT guaranteed. Anticipate the possibility of a down turn or set back. Back-up plans make you resilient.
3. Wants are Psychological Desires: Your wants are tied to your emotions. Logic maybe help to rationalize your desires. Take more time to consider decisions about these items. This can pose a major challenge for many people. Try to select items with multiple functions when it comes to your survival needs. In past disasters, some of the items many people found in short supply: light (flashlights, extra batteries, soap, toilet paper, toys and snacks for children). Think carefully about your wants especially in terms of the possible need to pack up and move on short notice.



Storytelling Patterns

1. Rags to Riches (rise)
2. Riches to Rags (fall)
3. Man in a Hole (fall then rise)
4. Icarus (rise then fall)
5. Cinderella (rise then fall then rise)
6. Oedipus (fall then rise then fall)

4. Know Your Pain Threshold: The bottom line for decision-making is the answer to a simple question: If things don’t go according to plan, can you live with the consequences? Consider two thoughts: A) No plan is perfect; B) Even the most perfect plan can out the window once the disaster starts.

The sidebar above shows storytelling patterns. Use this to get insight to the possible paths for your “story.” For success, stack the deck in your favor. Reality may be somewhere between “normal” and the worst-case scenario. Make alternate plans to back-up your emergency plan. Strive to have resilience (the ability to spring back from setbacks).

Make an Emergency Plan: [Note: This is Grassroots Emergency Operations Communications (GECO) approach of plan your own rescue (PYOR).] Once you know your local geo-hazards, you can begin to make your emergency plan. There are two basic emergency plans: Shelter in Place or Evacuate. We suggest you prepare both plans. A key GECO guide line is the idea of “Preparing for the worst; Hoping for the best.”

Shelter-In-Place: You stay put at your home or base. This may be easier to plan because you have what you need here. Have enough water, food, and supplies to support operations for at least 72-hours. [Note: GECO standard procedure is to operate all radios on 12 V battery power. This make it easy to move the radios if you must evacuate.]

Evacuation: This is option is challenging. You need to carry your radio equipment, batteries, and water, food, and supplies for 72-hours of operation. Ideally, your evacuation route and destination are known and clear of geo-hazards. You need to consider how to move and transport your equipment. It is especially important to be test radio performance from these sites before an emergency. The worst-case scenario is to backpack all your gear. You need to consider the pack weight, distance, and terrain for your evacuation.

Sample Emergency Plan

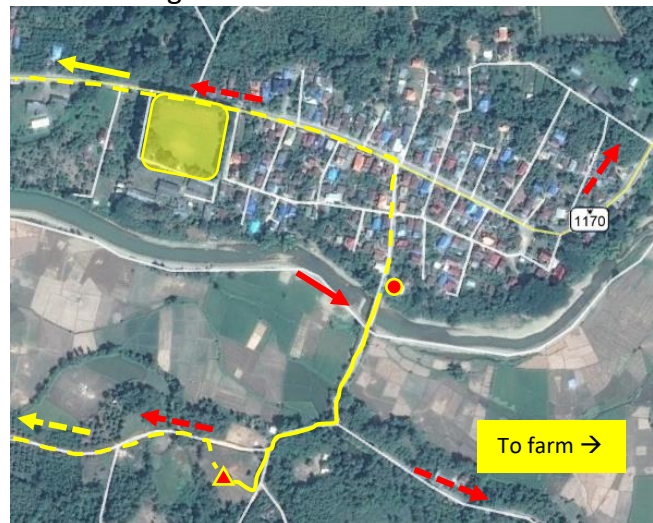
Here is an example of an emergency plan for sheltering-in-place and evacuating a radio base station (see map-diagram below). The base station is in a small rural village on the north bank of a river. The major geo-hazard was flooding. If the station had to be evacuated, an alternative operating site was on a nearby hilltop on the south side of the river. If the nearby bridge got washed out, there are other bridges east and west of this village. Alternative food and shelter were available on a farm on the south side of the river east of the hilltop station.

Area Access: You need to know how to get into and out from you operating location.

- It is best to have more than one entry or exit route.
- Know if routes are safe from geo-hazards. If not, find alternate routes.
- Know what vehicles can use the route (e.g. bikes, motorbikes, cars, light trucks, heavy trucks, etc.).
- Make note of bridges, stretches of road prone to flooding, landslide, etc.
- Identify any helicopter landing zones or possible landing zones.

The photo on the right is a sample map of an emergency operating plan. It includes both shelter in place and evacuation.:

- Red dot = base station.
- Red triangle = alternate hilltop station
- Yellow line = main evacuation route
- Yellow dashed line = alternate evacuation route.
- Yellow arrow = Main access via Hwy 170 to main town
- Dashed yellow arrow = Alternate route to main town
- Red arrow = Bridge
- Dashed red arrow = Routes to alternate bridges
- Yellow shaded area = Possible LZ



Endurance and Re-Supply:

The initial GECO emergency plan is to hold out for a minimum of 72-hours before needing to re-supply. The base station is a residence with both well-water and municipal water supply. Food supplies are 1-year rice supply and garden vegetables. The family farm is 1-km away with 3 fish ponds, gardens and orchards. If no vehicle is available, it is a 20 minute walk on-way from the base station to the farm.

The weak point is the bridge between the base station and hilltop alternative operating site and the farm. If the bridge is washed out, the back-up re-supply route for the hilltop station and farm is a bridge at the next village heading toward town on Hwy 1170. If no vehicle is available, re-supply is a 30-minute one-way walk (base to hilltop). With no vehicle, it is about a 1-hour walk one-way from base station to the farm.

No plan is perfect. In this case, the main re-supply after 72-hours is the family farm. 🌐

Free Emergency Preparedness Lessons

These free emergency preparedness lessons are available online for individual and educational use. [Note: This lesson series was started under the Rural Training Center-Thailand. Lessons 7, 8, 11, and 12 have not been completed. There are plans to try to complete these lessons by the community-based education group Applied Geography for Sustainable Living. Please watch for future news and announcements regarding these lessons.]

[EP-1 Preparing for](#)

[Emergencies](#)

[EP-2 Shelter](#)

[EP-3 Water](#)

[EP-4 Food](#)

[EP-5 Space](#)

[EP-6 Severe Storms](#)

[EP-9 Lightning](#)

[EP-10 Wildfires](#)



Geography may not change the world, but it will change the way you see it.

---Gregory Lee