Not My Fault: Libya, Morocco seeing thousands die following quake, flood
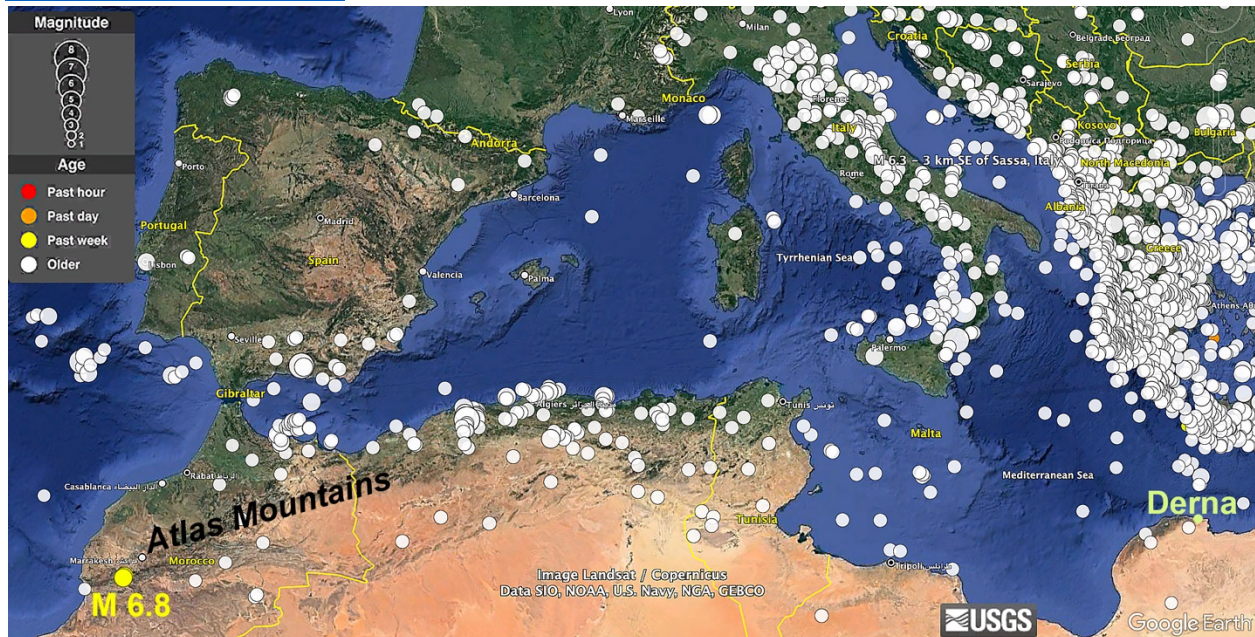
Lori Dengler for the Times-Standard
Posted September 16, 2023
https://www.times-standard.com/2023/09/16/lori-dengler-libya-morocco-seeing-thousands-die-followng-quake-flood/

USGS earthquakes in N Africa and the Mediterranean from 1900 to present showing locations of Morocco earthquake, Atlas Mountains, and Derna flooding.

Nature has been unkind the past ten days. Upwards of 15,000 people died in an earthquake in Morocco and catastrophic flooding in Libya. Response and recovery efforts are still underway in both areas, and it will be weeks before the full scope of impacts are known. Some estimate that over 20,000 perished in Libya alone.

First the earthquake. On September 8th at 11:11 PM local time in Morocco, a magnitude 6.8 earthquake struck the rugged Atlas Mountain region. The earthquake was relatively shallow about 11 miles beneath the surface. Over 4 million people felt strong to severe ground shaking.

Unfortunately, many of the structures in the region are built of stone and not reinforced to resist shaking. It's an ancient area; the United Nations recognizes nine locations in Morocco as World Heritage sites. The ancient area Medina of Marakesh, was only 45 miles away from the epicenter. Medina and many other areas are culturally rich but fragile in earthquakes. As I write, the death toll is nearing 3000.

Numbers are numbing. For most of us, Morocco seems far away and foreign. It's natural to stash the numbers and horror into the category of 'very sad but not related to my life and my community'.   There are a number of reasons to pay more than a passing glance.

• Strong earthquakes don't always happen on plate boundaries. The Morocco earthquake was 300 miles south of the closest plate boundary. That's Central Nevada relative to the San Andreas transform boundary. While school children may learn that earthquakes occur on plate boundary lines, that's an oversimplification.

As the African plate moves north towards Europe, the stresses are immense. The Mediterranean is slowly closing, compression pushing up the Alps and Caucasus mountains. Morocco is not nearly as seismically active as Italy, Greece, and Turkey but is affected as well. Most Moroccan earthquakes are concentrated near the Mediterranean closer to the plate interface, but not all.

Mountains are always a sign of past or ongoing stress. The Atlas mountains first formed in a continent-to-continent plate collision roughly 300 million years ago. A hundred million years later, rifting hit the region producing extension. The table turned again in the Cenozoic with compression again becoming the norm. Each phase produced new faults and, in some cases, reactivated old ones. The September 8 earthquake was a consequence.

There is no place on the planet that doesn't have a long geologic past that could have impacts in the future. The New Madrid earthquakes in the early 1800s that struck Missouri and Arkansas may are related to deeply buried faults possibly dating back to the opening of the Atlantic Ocean more than 200 million years earlier. And yes, all of Nevada feels the influence of the San Andreas fault system. The bottom line? Earthquakes are more common near plate boundaries but can and will occur anywhere.

• Time of day/year matters. The Morocco earthquake struck near midnight when most people were indoors, and many were sleeping. Their stone and brick structures collapsed in the shaking. Had the earthquake occurred in daytime hours, much of the population would have been working outdoors. Nighttime earthquakes are worse in many parts of the world but a blessing in ours. Most of us live in wood frame buildings, far more resilient to shaking. Last December's earthquake demonstrated that being asleep in our beds was the safest place to be. No time to leap out the door where most injuries occur.

• Outside assistance always takes time. During the first hours or days after a major earthquake the only people available to help are those in the area that survived. Advance planning can improve response time, but it will never be instantaneous. There were many factors that slowed Moroccan response. Some, like damaged roads and infrastructure, could happen in our next earthquake. Others, like the lack of national response planning and restrictions on international aid groups are less likely.

There is something anyone can do to be useful in those first hours and days before outside relief can reach you. Become part of a Community Emergency Response Team (CERT). Recognized by the Federal Emergency Management Agency, CERT volunteers are usually from a specific area and trained to work together as a team.

Training takes 23 hours spread over evenings and weekends to learn safe search and rescue techniques, control of small fires, first aid/CPR, and how to give a preliminary situation assessment to the professionals when they arrive. CERT teams work closely with local

government and fire, medical, and public safety officials. An online McKinleyville class starts September 26, and a Trinidad class is scheduled for November. Check out https://www.humboldtcert.com/ for more information.

• Disasters can happen to tourists. Just because you are on vacation, does not make you immune to natural disasters. Thirty-nine Americans died in the Indian Ocean tsunami including a man from McKinleyville. Morocco is a major tourist destination and there are many popular hiking trails in the epicentral region. Several tourist injuries have been reported. No matter where you travel in the world, disaster may accompany you. Learn about hazards and keep a Grab and Go Bag at the ready should be tourist essentials.

Tourism is vital to Morocco's economy and to the recovery effort. If you have Moroccan travel plans coming up, check to make sure the places you are visiting are open and safe. And don't be a disaster tourist – avoid areas where rescue/recovery crews are working and never take selfies in front of crushed buildings.

• Running out of buildings is not the right thing to save yourself in California. I am concerned that images of collapsed buildings have ignited the 'take flight' response of many people. Our buildings don't pancake in disasters. The most likely cause of injury in a California earthquake is running outside. The less you move while the ground is shaking the safer you are. Drop to the ground, Cover your neck/head with an arm, and slide under a nearby table or desk if nearby and Hold On. And sign up to participate in next month's ShakeOut to develop the correct muscle memory.

Just a few lines about Libya, the worst weather-related disaster of 2023. Climate-change driven torrential rains played a role but the failure of two dams was the biggest factor. The ensuing floods sent tsunami-like torrents of water into the center of Derna, population 90,000. Derna, like all of Libya, has been caught for two decades in the clutches of incompetent/warring governments and failure to maintain infrastructure.

Many government functions aren't clear until disaster strikes. Establishing regulations for construction, monitoring compliance, Inspecting roads, bridges, and dams, and funding needed repairs or replacements might get low priority when wars are fought, or other politics seem more important. It's useful to remember as we dance on the edge of another government shutdown.

Lori Dengler is an emeritus professor of geology at Humboldt State University, an expert in tsunami and earthquake hazards. The opinions expressed are hers and not the Times--Standard's. All Not My Fault columns are archived online at https://kamome.humboldt.edu/taxonomy/term/5 and may be reused for educational purposes. Leave a message at (707) 826-6019 or email Kamome@humboldt.edu for questions and comments about this column. Downloadable copies of the North Coast preparedness magazine "Living on Shaky Ground" are posted at https://rctwg.humboldt.edu/prepare/shaky-ground.