

## It's Not All Easy

Do you ever turn on the TV and hear that there will be an earthquake in one minute and 20 seconds? Later they start counting 5... 4... 3... 2... 1... and the ground shakes violently while the power goes out. No, that has never happened. Some people who live in the danger area of a type of natural disaster expect scientists to tell them exactly when, where, and the severity of a disaster. Well, a lot of the time, that is impossible. There are special ways to predict natural disasters. Some ways are hard and some are simpler. A tornado is one of the easiest storms to predict, but it is certainly not a piece of cake. Hurricanes are also predictable. Scientists are on to something with volcanoes. They can be predicted, just not very clearly. Earthquakes are almost impossible to predict except that we know that there will be an earthquake somewhere in this world every single day. New technology is helping research progress.

Tornadoes are definitely predictable and are fairly easy, not that regular people of the street can do it successfully. There are several conditions that can cause a tornado. When these conditions exist, meteorologists can predict tornados for a certain area or along a line in front of a cold or warm front. Often, a jet stream lying above and to an angle to the wind direction on the ground, plus a large difference in water vapor in the air on the two sides of a front are contributing factors. Using modern Doppler radars, there are signs of spinning that can be seen in a thunderstorm before a tornado actually forms. These are looked for very closely by meteorologists to try to detect precise locations where a tornado may form. After a tornado forms, they can tell the severity. Although tornadoes are easier to predict than other disasters, they can be just as violent.

Hurricanes are predicted as we see on the news every hurricane season. They are also done fairly well. Scientists look for two major factors when they are predicting overall Atlantic hurricane activity; the speed of the trade winds plying between West Africa and the Caribbean, and how warm the sea waters are in this same region during August and September. "Hurricanes are linked to weaker than normal trade winds and warmer than normal sea temperatures in the tropical north Atlantic," says Dr. Mark Saunders. When hurricanes come closer to the Gulf of Mexico, the scientists know the severity and can predict the time of landfall and where it will occur. Scientists can get amazingly close. In hurricane Charlie, they were one mile off! Hurricane prediction is good now, but hopefully it will get better so that people can evacuate in time.

Can volcanoes be predicted? In one word, yes. But that is a vague answer. They can be predicted by a very smart and volcano knowledgeable person. The exact time or severity can not be predicted. Volcano prediction would be impossible without seismographs. Seismographs record waves in the earth's crust. There are two types that have been used and studied to predict volcanoes. An A-type wave is very sudden and sharp. It is the sound of rock breaking so that magma can keep moving. A B-type is a long period wave. It is still rock breaking. When the eruption comes nearer, A-types cease and B-types occur more often. It shows that the magma is coming to the surface. This was figured out by a seismologist named Bernard Chouet. It was tested and it worked. So, yes volcanoes can be predicted.

Earthquakes, can they be predicted? No. As of now, it is impossible to accomplish. Scientists use data from a network of seismographs connected to each other to gather sophisticated data, measurements of earthquakes around the world. However these networks help very little with earthquake predictions, since they only measure quakes that happened already. Modern day scientists are using such sophisticated devices as lasers and satellite systems to predict how faults are moving. But it still does not solve the mystery. Predicting earthquakes is not yet possible for scientists to do, but they hope that they will one day find a way.

It still may seem easy to predict some natural disasters, but it is definitely tough work. As a meteorologist, scientist, seismologist, or researcher there is a lot of pressure when predicting. A few minor miscalculations can kill many people. Also, predictors get help from past disasters. We know that tornadoes are one of the easiest natural disasters to be predicted, although they are still devastating and deadly. Hurricanes are one of the simpler ones also. Volcanoes are much harder and unsuccessful. And, hopefully, earthquake prediction will be possible one day. Many new devices are being invented. As technology advances, hopefully predictions of natural disasters will too, which can save millions of lives in the future.