

AND NOW TO YOUR LOCAL EARTHQUAKE FORECAST...



For at least the last century scientists have toiled with the almost enigmatic occurrence of earthquakes. We have learned the driving mechanisms behind them and where they are most likely to occur. However, *when* they occur is the question which drives our study of earthquakes the most. In the U.S. alone, earthquakes cause over \$1 billion in damages annually. What's worse, this value does not consider the potential thousands of landslides, debris flows, etc. triggered by earthquakes nor loss of life. In other earthquake-prone regions of the world, such as Haiti, where infrastructure is not nearly as equipped to stand up to earthquake forces, the resulting loss of property and life could be all the more crippling.

It is no wonder we are so driven to find a way to predict when major earthquakes may strike.

Most major earthquakes occur along fault lines, usually associated with tectonic plate boundaries. As the rock on either side of the fault tries to slide past each other, frictional forces are acting on the surfaces which oppose this movement. These forces are usually high enough to prevent movement along the fault. However, as long as these opposing forces are present, stress continues to build up along the fault plane. Once this stress becomes greater than frictional forces, the fault “ruptures”, releasing a pulse of energy and resulting in movement along the fault as each side slides past one another. It is this pulse of energy that we recognize as an earthquake. There are several components to this energy pulse, which separates out into compressional, shear, and surface waves, causing different reactions to objects at the surface...but we won't get into that here.

Instead, we will go back to our unanswered question: when will the next earthquake happen? Thanks to a team of Spanish researchers, we may now be closer than ever to answering that question. Based on mathematical patterns recognized on over 4,000 separate earthquakes, the team of scientists have developed an earthquake forecast model which can predict earthquake occurrence to an accuracy of over 80%. This prediction involves “site-specific” information.

In other words, the current model is applicable only to the Iberian peninsula, but could easily be tailored to any region. Additional work on the subject continues, as they hope to increase prediction accuracy as much as possible.

However, as Francisco Martínez Álvarez, co-author of the study commented: “I doubt we will ever be able to say that we are capable of forecasting an earthquake 100% accurately.” While it may still be a while before you see a seismologist added to your local news team giving you earthquake forecasts in the morning (right after the weather and before the sports updates), 80% accuracy isn’t bad and is a vast improvement over previous methods of prediction.

Source: <http://adventuresingeology.com/2010/12/08/and-now-to-your-local-earthquake-forecast/>