

David Sang

# They're getting ready for a Zombie invasion

*A character from the TV series The Living Dead.*

*Tins and packets of food, bottles of water, blankets and medicines ... many Californians are storing these items, ready for the zombies to arrive. And they are doing this under government advice. What's going on? Are the zombies – the living dead – really on their way? Or has everyone gone mad?*

## Key words

earthquake  
prediction  
tectonic plates  
seismologist

The true reason is neither of these. California is in an active earthquake zone. The US Government wants people to be ready for the next big shock, but few people have followed the official advice to be prepared for a major quake. So scientists at the Centers for Disease Control, the body responsible for ensuring public health in the US, came up with a new approach.

They devised a website warning the citizens of California that a zombie invasion was possible. They recommended preparing a survival kit – food, water, bedding etc. – and many people have followed their advice.

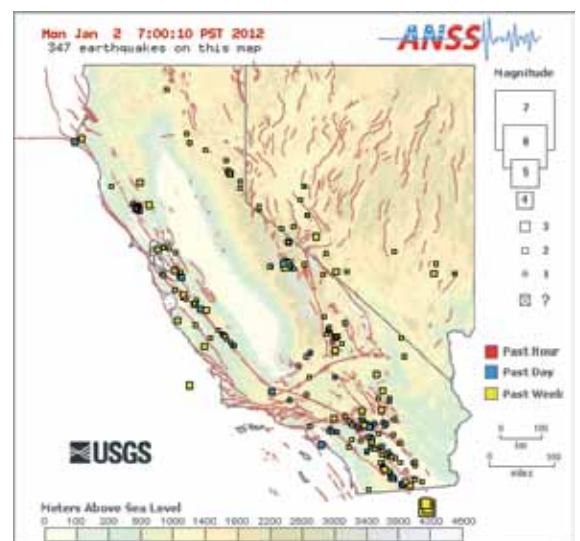
Of course, the survival kit is just what you need if an earthquake strikes, and many more people have now prepared their kit. Of course, most of these people know that there won't be a zombie invasion, but the idea was enough to get them motivated.

## Earthquakes in California

California is well-known as a site of earthquakes. The map shows the sites of recent quakes in the state.



An emergency survival kit, useful in the even of an earthquake, a hurricane or an attack by zombies.



Earthquakes recorded in California and (upper right) Nevada during the last week of 2011. The magnitude of each quake is indicated by the size of the square.

Earthquakes are measured on the the Moment magnitude scale; magnitude 4 is a minor quake while 8 or 9 can be devastating. San Francisco was badly hit by an earthquake in 1906. Its magnitude has been estimated as around 8.0, but modern measuring instruments were not available at that time.

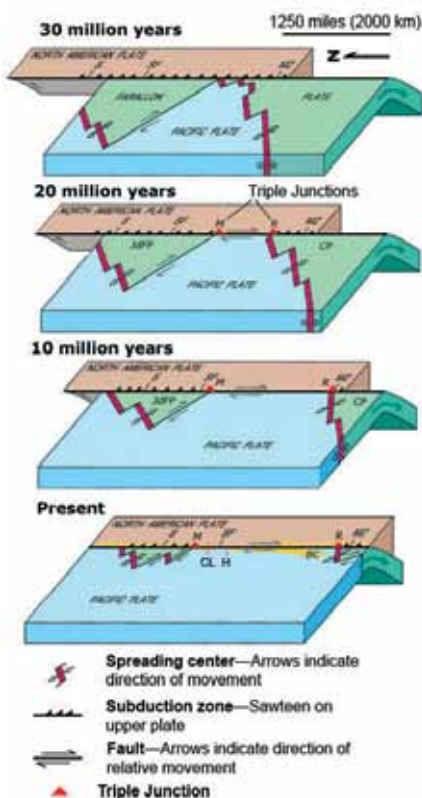


Soldiers among the ruins of San Francisco after the 1906 earthquake. Much of the damage was done by fires which broke out afterwards.

### Fault lines

Why does California experience such frequent earthquakes? The answer lies in its situation at a point where tectonic plates meet. The Pacific Plate is pushing towards the northwest so that it is sliding past the North American Plate. At the same time, it is pushing two minor plates down under the North American Plate.

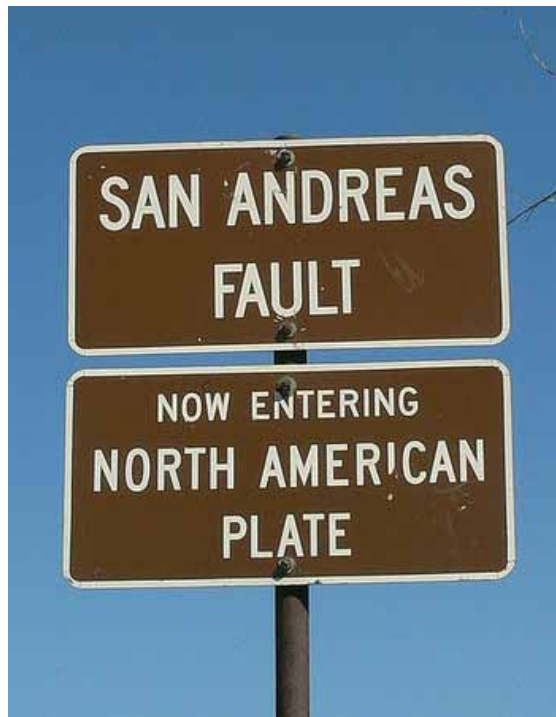
This is a process that takes millions of years. The diagram shows how the plates have moved over a period of 30 million years. You can see that two small plates, the Juan de Fuca and Cocos plates (JdFP and CP), have largely disappeared in this time.



30 million years of Californian plate tectonics.

The San Andreas fault lies along the line where the two large plates meet. As the two plates slide past each other, there are periodic slips along the fault line. Each accompanied by an earthquake. You can see the line of the San Andreas fault on the map; it is shown as a red line running parallel to the coast along the length of California. You can also see that there are many other fault lines in the area.

California is unusual in that it is one of the few places where major fault lines like this can be seen on the earth's surface; most are under the sea. The roadsign shows that, by crossing the fault line, you are travelling from one tectonic plate to another.



A roadsign indicating that you are leaving the Pacific Tectonic Plate.

### Predicting earthquakes

In 1989, a segment of the San Andreas fault ruptured, causing major damage in northern California. The magnitude was 6.9 on the the Moment magnitude scale; 63 people were killed and thousands injured. It occurred in a region of the San Andreas fault where pressure was known to be building up. However, it wasn't possible to predict when the quake would happen.

Seismologists (scientists who study earthquakes) are sure that one day, before too long, another major quake will strike California. Unfortunately, it is unlikely that they will be able to give much warning, if any.

As the two tectonic plates rub past one another, pressure builds up in the rocks deep underground. This pressure may be released in a number of small shocks or in one single, giant release of energy, but it is impossible to predict which of these will happen. Often there is no advance warning that a shock is about to occur. That's why it is desirable to be prepared, with a kit of emergency supplies kept in an accessible place in the home.





An official of the US Centers for Disease Control gives out information, encouraging people to be ready for the next big earthquake.

Some psychics claim to be able to predict earthquakes; usually, they announce afterwards that they saw it coming. The US National Earthquake Prediction Evaluation Council asks those who claim to be able to predict earthquakes to give full details, including where, when, how big and how probable the event is. So far, no-one has convinced the council that they have found a reliable way of making such predictions.

## Are the zombies coming?

The word zombie comes from a southern African language, and refers to a dead person who has been brought back to life by witchcraft. A zombie has no consciousness but can respond to instructions.

In popular western culture, the idea of the zombie has been popularised by the film *Night of the Living Dead* (1968). Many people have taken part in 'zombie marches' where everyone dresses up as a zombie and parades around town.



A poster for the cult film

Although the idea of the zombie is still an active part of some people's religious lives, no scientist would accept it as an idea worth studying. However, the popular appeal of the zombie is something which might be studied.

*David Sang is Physics editor of CATALYST.*



Cracks in the Earth's surface in Baja California, part of Mexico, caused by earthquake activity along a fault line.

### Look here!

The British Geological Survey ([www.bgs.ac.uk](http://www.bgs.ac.uk)) has useful information about earthquakes and how they are detected; look at their Discovering Geology pages.