"The Big One" by sea and not by land

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Surfer Lee Johnson emerges from the water at San Onofre State Beach, Calif., with the twin domes from the San Onofre Nuclear Generating Station in the distance. Officials have said the plant can sustain a 7.0 quake but not the 9.0 that struck Japan in 2011. Mark Boster/Los Angeles Times/MCT

LOS ANGELES — Scientists worry that a strong earthquake off the coast of California could do major damage to the West Coast.

Earthquakes on land can cause a lot of damage. But earthquakes in the ocean have their own dangers. These earthquakes can cause a tsunami, a huge wave that rushes into coastal cities.

The Cascadia fault line, 700 miles off the coast of Northern California, could produce a tsunami that would heavily damage the West Coast, scientists say.

A giant tsunami along the West Coast would wash away towns, destroy U.S. Highway 101 and cause $70 billion in damage. The wave could destroy bridges, knock down power lines, and cut communication systems like phones or Internet.

It's possible that people would only have 15 minutes to escape. As many as 10,000 people could die.

Early Warning System

Officials in California, Oregon and Washington are now making plans to prepare for an earthquake and tsunami. They hope to learn lessons from a 2011 disaster in Japan. A 9.0 earthquake there created a huge tsunami that flooded coastal areas.

That tsunami took people by surprise. It killed more than 10,000 and left more than 300,000 homeless. It also damaged a nuclear power plant. A meltdown at the plant spread dangerous radiation in the area.

Researchers on the West Coast hope to save lives by quickly spotting a tsunami and warning local citizens. They hope that new tsunami detectors deep under the ocean can provide early warnings.

Predicting a tsunami's strength is important to saving lives. Japanese scientists did not realize how big their tsunami was. Local people were not prepared, and many lost their lives.

It's very important to have correct information, said Vasily Titov, head of the U.S. National Oceanic and Atmospheric Administration's (NOAA) Center for Tsunami Research.

Escape To High Ground

To escape a tsunami, people must get to high ground such as a hill or mountain. But in flat areas, there is nowhere to go. Safety officials must build high ground.

One idea is buildings with roofs that can protect people from a tsunami. One of these at a school in Washington will protect 1,000 people with a high wall.

Officials have also discussed building man-made hills. Each hill could hold as many as 800 people.

California is famous for the San Andreas fault. This fault runs through the heart of the state. It produced the famously scary 1906 San Francisco earthquake. The 1906 quake killed more than 3,000 people.

Scientists now think that the Cascadia fault is more dangerous than they thought.

The Cascadia fault is made up of three tectonic plates that are pushing against each other. The most powerful earthquakes in the last 10 years in California were caused by Cascadia.

Scientists had believed that the Cascadia fault could only produce a 7.5 earthquake. But they now believe that it could create an enormous 9.0 quake.

Like A Rubber Band

The Cascadia fault is dangerous for two reasons. First, it is very long.

Second, it is an area where two huge tectonic plates are being pushed under the even-larger North American plate. The smaller plates push under little by little, dragging the North American plate down with them.

But the North American plate is old and strong, and it won't be pulled down forever.

Once every couple hundred years, the North American plate snaps back upward like a rubber band, creating a strong earthquake.

On March 16, a small earthquake caused by the Cascadia fault erupted 50 miles off the coast, causing light shaking. No injuries or damages were reported.

The West Coast was spared this time, but scientists still wonder when “The Big One” will hit.

“It could be today. It could be 100 years from now,” U.S. Geological Survey seismologist David Oppenheimer said.

Quiz

1 What are two MAIN ideas of the article? Fill in the blank.

Scientists are worried that a strong tsunami on the ..... fault line will cause a serious tsunami; we can prepare by .....

(A) Cascadia; setting up tsunami warning systems and and building on high ground.

(B) San Andreas; moving people to different cities that are safer and less prone to earthquakes.

(C) Japanese; setting up sensors underwater to detect earthquakes and tsunamis.

(D) Oregon; fundraising to pay for protective barriers and also to pay for rebuilding destroyed areas.

2 Which of the following accurately summarizes the section "Like A Rubber Band"?

(A) The San Andreas fault is like a rubber band because the North American plate gets pushed down and snaps back up every couple hundred years.

(B) The Cascadia fault is like a rubber band because the North American plate gets pushed down and snaps back up every couple hundred years.

(C) The Cascadia fault is like a rubber band because there are a bunch of tectonic plates knocking into one another constantly like bumper cars.

(D) The Cascadia fault is like a rubber band because it always produces the world's largest earthquakes every 1,000 years.

3 According to the article, what is the relationship between earthquakes and tsunamis?

(A) Tsunamis typically occur in costal areas, and earthquakes occur in land-filled areas.

(B) Earthquakes only occur in where there are mountains, and tsunamis occur where warm water and air mix.

(C) An earthquake that occurs in the ocean may cause a huge wave, called a tsunami, that can destroy coastal cities.

(D) An earthquake that occurs on land may cause a huge tsunami that can destroy marine life far away from the shore.

4 Why are officials in California, Oregon and Washington interested in a 2011 disaster in Japan?

(A) The Japanese experienced a tsunami caused by an earthquake, which is precisely what the West Coast is preparing for.

(B) Researchers on the West Coast hope to avoid what happened to the Japanese by installing tsunami detectors.

(C) Both option A and B.

(D) Natural disasters that happen in Japan are always used by scientists to predict natural disasters in other countries.

Answer Key

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