

Fault *from A7*

the region with a magnitude 9 earthquake.

According to geologists at Oregon State University (OSU), there have been at least 41 major (magnitude 8 or greater) quakes along the Cascadia Subduction Zone in the past 10,000 years, making the average interval between the events 244 years.

Intervals differ depending on the fault segment, however. A 2016 analysis done with the help of researchers at OSU found a section of the zone in Oregon from Newport to Astoria to rupture an average of once every 350 years. The last documented major earthquake along the subduction zone was 319 years ago on January 26, 1700.

"There's no question that we're due for another megaquake," said Steve Robinson, president of Cascadia Prepared. "We know it's coming. The science is clear on that. We also know that we're not ready."

Cascadia Prepared is a Eugene-based nonprofit that has been working to increase personal, business and infrastructure readiness for the past three years.

"If the quake happened tomorrow, it would very likely be the worst natural disaster ever to hit North America," said Robinson.

By most state and federal estimates, thousands of Oregonians would likely die as a direct result of the quake and even more along the coastline as it is inundated with sea water. Total economic losses are estimated by the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) to be around \$32 billion.

A 13-year study from OSU concluded in 2012 that there is a 40 percent chance of a major earthquake in the Coos Bay region during the next 50 years. The earthquake may approach the intensity of the Tohoku quake that devastated Japan in March of 2011.

Robinson puts that number higher, citing an increased frequency of earthquakes in the past 5,000 or so years.

"I think based on those statistics that we have a 50 percent chance of a quake in the next 20 years," he said.

While Robinson said he supports individual and community resilience efforts, Cascadia Prepared's primary focus is mitigating the effects of a major earthquake by enhancing critical infrastructure lifelines.

"Our electrical systems, our transportation systems, our liquid fuel delivery, our communications, our water and wastewater — all those things are likely to be destroyed," he said. "We need to get to the point where we can get those systems back up in a couple weeks. But instead of a couple of weeks, we're looking at six months or a year."

In a 2013 resilience plan, OSSPAC stated that this infrastructure failure would likely cause most businesses to move or fail if services could not be restored within a month, causing decades of economic decline.

"You can be as resilient as you want personally, but if the electrical system isn't restored for a year or six months, most of the people

are going to have to move someplace else because there won't be any jobs," Robinson said.

Despite the grim forecast, Robinson is trying to paint the scenario optimistically.

"We have a motto at Cascadia Prepared: 'We built it and we can fix it,'" he said. "It's not rocket science. It's basically developing the will, the collaboration and support that's needed to make the investment in shoring up our infrastructure."

The nonprofit has developed "lifeline resilience teams" which have begun working with entities tied to major infrastructure points to establish risks specific to each area and develop readiness plans. Robinson recommends that cities have a comprehensive analysis of their infrastructure vulnerabilities.

"The ones that are the most important are the ones that, if they go down, make it impossible to fix the others," he said.

The geography of Cottage Grove poses a unique challenge in this regard. The Coast Fork Willamette River meanders through the city, threatening to cut people west of the river off should the bridges fall. In a Cascadia earthquake event,

the city's water system will surely break.

With this in mind, the city is courting the idea of establishing new reservoirs. Currently, Cottage Grove maintains two reservoirs — and one is likely not seismically sound. The city needs redundancies.

Public Works and Development Director Faye Stewart thinks more reservoirs would be a great asset to mitigating an earthquake event.

"And it doesn't have to be the 9," he said, referring to earthquake magnitude. "If we're hit with a 4, a 5 or a 6 we may suffer some pretty serious damage here. And being able to have water in multiple locations can help buy us time until we get infrastructure fixed."

Construction on one new reservoir may start on Sunrise Ridge as soon as this fall or next spring. Another two are early in the planning stage.

"Down the road, I envision seeing three new reservoirs in this community," said Stewart. "Two of them on the west side of the river and we'll still use the two existing ones, but we'll have a third one on the east side."

The redundancy of water

See **THREAT 11A**

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NATIONAL SMILE MONTH

Sensitive Teeth

Drinking hot tea or biting into an ice cream sandwich ought to be a pleasant experience, but that's not the case for people who suffer from sensitive teeth.

Experiencing pain when eating hot or cold foods — or while brushing or flossing your teeth — is a common but potentially serious problem that a dentist can help you address.

WHAT CAUSES IT?

According to the American Dental Association, sensitive teeth can be caused by a variety of conditions. Cavities, or tooth decay, are among the leading causes for sensitive teeth, but it could also be the result of a more serious problem.

Fractured teeth, gum disease, worn fillings, an exposed tooth root and worn tooth enamel are all potential causes for that uncomfortable, painful feeling.

A CLOSER LOOK

Where does the pain come from? It usually has to do with a problem in the structure of your tooth.

Deep inside your tooth is a layer of material called dentin that

helps to protect the tooth's root.

Dentin is usually covered by other layers on the outside of your tooth — enamel above the gums and cementum below them — that help to keep the dentin from being exposed.

Sometimes the outer layer of protection that surrounds the dentin can become damaged or wear away, which lets temperature changes or chemicals from food to touch the dentin and work their way directly to the nerve cells and roots of the tooth.

Treating Sensitive Teeth

Sensitive teeth can be treated. The type of treatment will depend on what is causing the sensitivity. Your dentist may suggest one of a variety of treatments:

Desensitizing toothpaste: This contains compounds that help block transmission of sensation from the tooth surface to the nerve, and usually requires several applications before the sensitivity is reduced.
Fluoride gel: An in-office technique which strengthens tooth enamel and reduces the transmission of sensations.

A crown, inlay or bonding: These may be used to correct a flaw or decay that results in sensitivity.

Surgical gum graft: If gum tissue has been lost from the root, this will protect the root and reduce sensitivity.

Root canal: If sensitivity is severe and persistent and cannot be treated by other means, your dentist may recommend this treatment to eliminate the problem.

— American Dental Association

Tooth sensitivity shouldn't be ignored because it's usually the symptom of your tooth's structure breaking down in some way. A dentist can uncover the root cause and recommend a solution to make your life more comfortable and keep your teeth healthier.



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