

May 11, 2012

Whatcom County Planning and Development Services
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Bellingham, WA 98226

*Copy for Resubmittal to:
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Re: Coal Terminal at Cherry Point in Whatcom County – Earthquake Concerns

The Bellingham Herald posted an article (copy attached) on April 22, 2012 which stated that about “1,200 years ago, a powerful earthquake lifted up Birch Bay tide flats and turned them into freshwater marshes beyond the reach of saltwater.” Impressive.

While future earthquake events, precise locations, and their magnitude may not be predicted with accuracy, people along and near the fault lines have been warned that earthquakes, and tsunamis, will indeed happen and will undoubtedly cause severe damages.

The coal trains heading to Cherry Point would be traveling through Washington from the Columbia River. This route follows along/near an active fault that has long been acknowledged. It extends south to California. The Pacific Rim is seismically active and most of us here know it. The April, 2012 earthquakes in Whatcom County led researchers to speculate that active fault zones extend north into the Vancouver, B.C., area.

Could a terminal be built to withstand significant seismic events?

And, what would happen in a such an event, where a track is severely damaged – say, in a town - and over 100 loaded coal cars are tossed over – with coal spilled everywhere, on a rainy day, and the polluted runoff goes to Bellingham Bay or Chuckanut Bay?

Andrea Xaver
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(360-422-8922)

By the way, I hear that some of the coal mines are owned by foreign interests, such as a company in Australia. A company there now owns Puget Sound Energy, as you may recall. And, we know the coal is being sold to China. There will be some jobs for “us,” while building the terminal - and a few to linger after it’s completed. But, once again, the U.S. is taken for a ride – train or no train – and will suffer the long-term consequences through the loss of quality of life (human and animal), as well as “our” resources.

The Bellingham Herald

New seismic research reveals more quake hazards in Whatcom County

By JOHN STARK — THE BELLINGHAM HERALD

Posted: 1:01am on Apr 22, 2012

About 1,200 years ago, a powerful earthquake lifted up Birch Bay tide flats and turned them into freshwater marshes beyond the reach of saltwater.

If the fault near the mouth of Terrell Creek experienced a similar event today, the damage could be significant as far south as Bellingham.

"It would be a pretty ugly event," said Brian Sherrod, U.S. Geological Survey research geologist and faculty member in the earth and space sciences department at the University of Washington.

In the Sandy Point area, the team found evidence of three past earthquakes, each powerful enough to raise the elevation of areas near the shoreline.

Sherrod is one of a team of four geologists who recently published their research on that fault and nearby faults near Sandy Point and Drayton Harbor. He added that the team's findings need not generate alarm.

"We don't know when or if these things are going to pop off another big one," Sherrod said. "We just know that they have. ... It reinforces the idea that we live in an area that has earthquakes."

While the highest magnitude of these quakes likely would be in the 6 to 6.5 range - much less than the 2010 Japan quake - they would be shallow enough to cause a lot of mayhem.

"You're going to feel it many, many, many times larger than Nisqually," Sherrod said, referring to the 2001 quake that vibrated Bellingham and damaged the state capitol dome in Olympia.

Similar-sized shallow quakes toppled buildings and killed 185 people in Christchurch, New Zealand, in 2011, Sherrod noted.

The researchers used airborne laser mapping and other techniques to pinpoint the locations of the faults and the evidence of the past earthquakes, Sherrod said.

Geologist Dan McShane, a former Whatcom County Council member, said this type of research is gradually incorporated into seismic hazard maps that are used to upgrade the seismic safety sections of building codes.

McShane said geologists have suspected the existence of the Sandy Point and Birch Bay area faults for years, based on signs of recent (in geological terms) uplift visible on the surface.

He said the most significant finding in the new research may be the faulting in the Drayton Harbor area near Blaine, which extends the known active fault zone farther north than previously demonstrated. The researchers also observe that this faulting probably extends north into the Vancouver, B.C., area, raising new levels of quake concern there.

Asked if the new research meant a major or an incremental increase in the known quake risk here, McShane replied, "I would say it's probably incremental."

Circ May, 2012

To: Whatcom Co: Planning & Dev. Services
5280 Northwest Drive
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Re: Coal Terminal / Trains
(I just received the book referenced within
this weekend.)

From: Andrea Jones
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1-15-13
Copy to submit to
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do CH2M Hill
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the Puget Trough

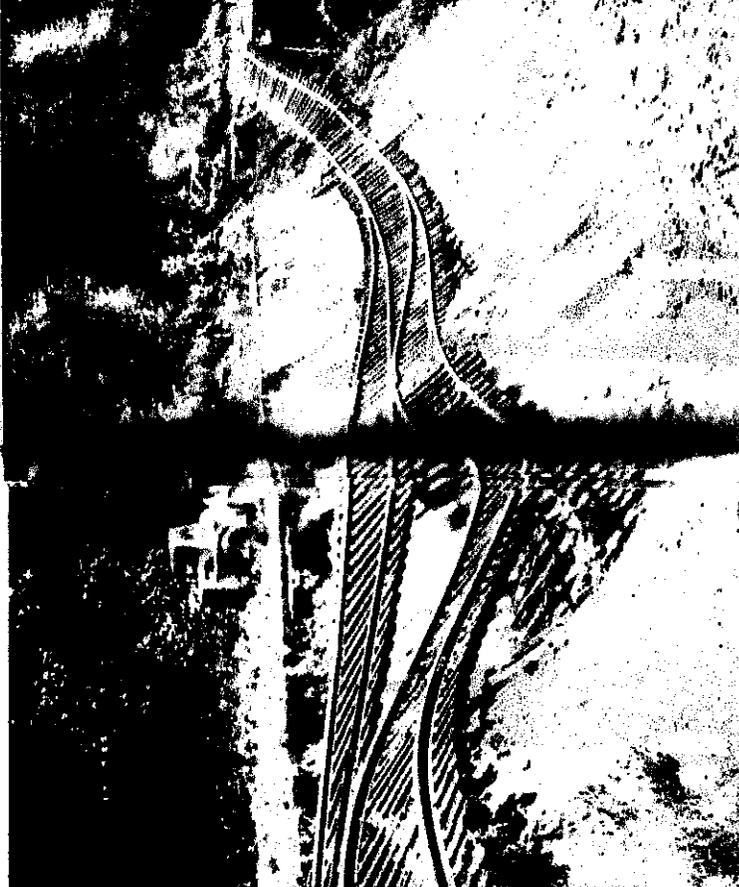
fond of quoting historian Will Durant that "civilizational consent—subject to change without notice—give their consent to human occupancy of the earth in slow, measured actions. But when earthquakes occur, they are sudden, dramatic, and often catastrophic. Earthquake country, even though the frequency of earthquakes is usually less than at other more turbulent parts of the planet. Two major quakes in the Puget lowland stand out in history: the 1949 Olympia quake of 7.1 magnitude and the 1965 Tacoma-Seattle quake of 6.5 magnitude. Both caused damage to buildings and other human fabrications and significant alterations of landforms occurred, in the form of landslides. But earthquakes of lesser magnitude in the Puget lowland with greater frequency. Only the most major magnitude make the headlines.

In western Washington are intimately associated with the tectonics of plate tectonics. Just to the west of the Pacific Plate and the Juan de Fuca plate are the continental North American and Pacific plates. The Pacific Plate moves to its east at the rate of three to four centimeters per year. The convergence of the two plates then becomes the stage on which the activity is displayed. Besides these deep earthquakes, other symptoms of plate convergence are present: the chain of Cascadian volcanoes from Mount Rainier in the south to Mount Garibaldi in British Columbia, and the deformed rocks of the Olympic peninsula.

Since the major quakes like the ones of 1949 and 1965 on Washington earthquakes issued by the Division of Earth Resources, Washington State Department of Geology, by Noson et al. (1988) estimates quakes of magnitude 3.5 to 4.5 every 10 years, and return times of 35 to 110 years for greater magnitude. This report and a companion report (1986) contain a wealth of detail on local seismicity and on the movements; they will remind us that our planet is restless!

the Sculptor: Pleistocene Glaciers in Puget Sound

The Tertiary, a lowland sedimentary trough, defined by the north mountain ranges, had been made ready for its occupation by the sculptor. Pleistocene glaciers, which were much reduced during interglacial periods, followed by a warmer interglacial period. During interglacials, montane glaciers, which were much reduced during interglacial periods, followed by a warmer interglacial period. During interglacials, montane glaciers, which were much reduced during interglacial periods, followed by a warmer interglacial period.



A massive earth slide disrupted the rail line near Olympia during the Seattle-Tacoma earthquake. (Photo by G. W. Thorsen.)

The glacier that once covered Puget Sound was 3,000 feet thick. Some idea of its depth is shown in this drawing of the glacier as it might have looked towering over the Seattle skyline. (Drawing by Pamela Harlow.)



Puget Sound. It was the action of ice and its later meltwaters that gave shape to the landscapes of today. Though often called the "Ice Age," the Pleistocene was not one period during which the land was continuously covered with ice. Many advances and retreats of continental glaciers are recorded by the repeated scourings and deposits of rock-laden glaciers.

The Fraser Glaciation was the latest of the major advances of northern ice into western Washington. Yet Washington and the Pacific Northwest were not alone in having endured repeated interglacial periods of ice inundation. It was a time of repeated ice advances and retreats on the northern continents of our restless planet. The Pleistocene epoch, beginning about 2.2 million years ago, made a telling impression worldwide but especially on the northern parts of North America and Eurasia. Massive continental glaciers spread out over northern lands until a confluent mass of ice, two to seven thousand feet thick, covered vast landscapes.

Each glacial advance and retreat (a stage) was followed by a warmer interglacial period. During interglacials, montane glaciers, which were much reduced during interglacial periods, followed by a warmer interglacial period. During interglacials, montane glaciers, which were much reduced during interglacial periods, followed by a warmer interglacial period.



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The Natural History of Puget Sound Country



ARTHUR R. KRUCKEBERG