Sliding Thought Blog

Washington's Landslide Blog

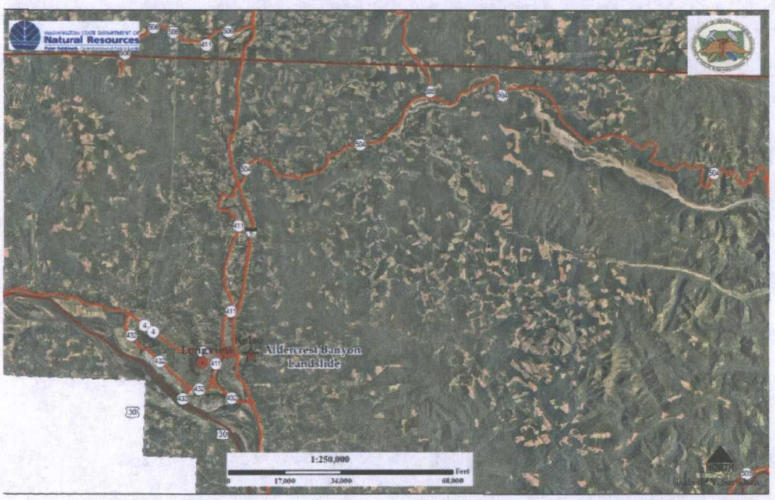
Landslide of the Week – Aldercrest Banyon Landslide

July 29, 2009

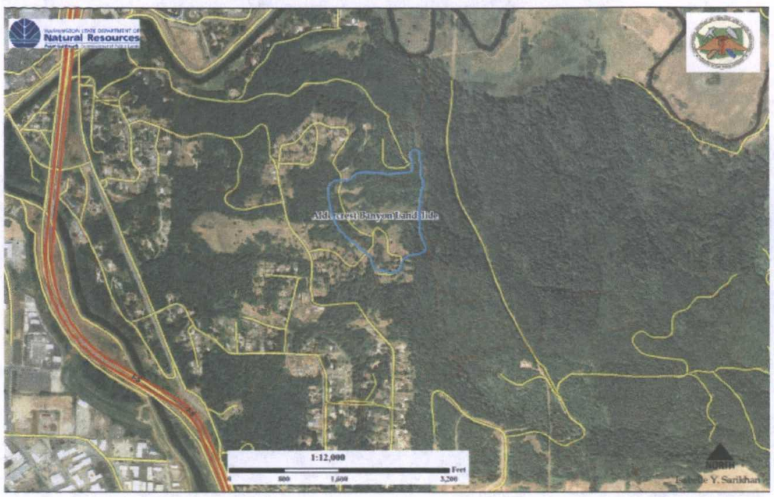
Each week we will feature a new landslide in Washington State. Washington State is covered with dynamic and sometimes quirky landslides.

Aldercrest Banyon Landslide, Cowlitz County

The Aldercrest Banyon Landslide is one of Washington's famous landslides. It was the second worst landslide disaster (in cost) in the United States, following the Portuguese Bend Landslide on Palos Verdes Hills in Southern California, 1956, where 130 out of 160 homes on a ancient landslide were damaged or destroyed destroyed when the landslide reactivated.



Location map for the Aldercrest Banyon Landslide

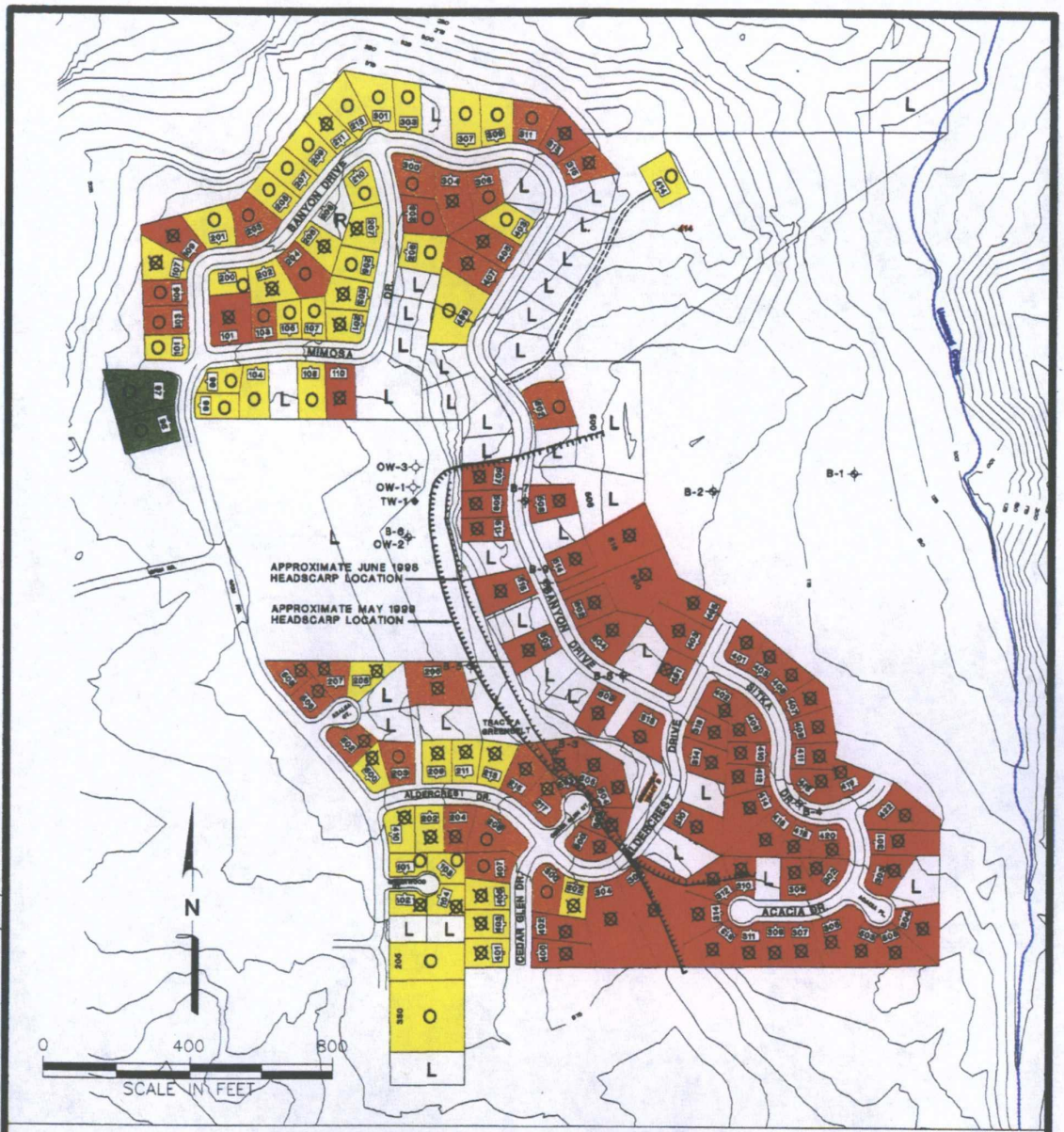


Aldercrest Banyon Landslide Map

The Aldercrest-Banyon Landslide started moving in February of 1998, many years after a housing development was established on the landslide mass. A description of the events by Dr. J David Rogers of the University of Missouri-Rolla Department of Engineering Geology follows:

"The Aldercrest-Banyon neighborhood in eastern Kelso, Washington began experiencing gross ground movements in February 1998, following 3-1/2 years of above-average rainfall. The initial signs of distress were the breakage of underground utilities. In March 1998 some framing distress was noted on a few homes. On April 10, 1998 a noticeable crack, 2.5 to 6 feet high, developed above the natural crest of slope west of Banyon Drive and north of Cedar Glen Court. Two homes on Cedar Glen Court were evacuated. The City made a valiant effort to patch streets, fill cracks and provide above-temporary above-ground utilities to the affected neighborhoods so that people could remain in their homes as long as possible."

In October of 1998, a federal disaster declaration was issued by President Clinton for 138 homes affected by the landslide (Wegmann, 2006). The destruction exceeded $70 million, but the buyout for the houses was 30 cents on the dollar and totaled around $30-$40 million.



OCCUPANCY AND DAMAGE STATUS, MAY 23, 1999.

- NO DOCUMENTED DAMAGE
- NO DAMAGE
- MINOR DAMAGE
- MODERATE DAMAGE
- SEVERE DAMAGE-UNINHABITABLE

- L VACANT LOT
- O OCCUPIED
- ⊠ UNOCCUPIED
- R REMOVED OR RELOCATED

Note: The locations of all features shown are approximate.

Reference: Based on topographic surface map supplied by City of Kelso.

City of Kelso Aldercrest-Banyon Landslide Area	Geo Engineers	STATUS MAP OF OCCUPANCY AND DAMAGE	FIGURE 2

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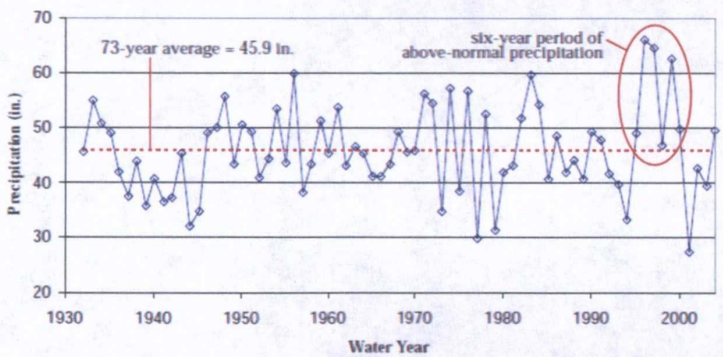
Map of houses affected by the Aldercrest Banyon Landslide, Map from Dr. J David Rogers

Photo of landslide damage, Photo from Dr. J David Rogers

Triggers

Deep-seated landslides are difficult to determine the cause of movement. This landslide was a relict landslide that could have been many thousand years old. The original triggers for movement are gone, perhaps an earthquake, a series of storms or prolonged (for years) rain, or maybe perhaps some sort of removal of lateral strength, by a stream or river. In modern day, the causes can be just as difficult to determine and each scientist has their theory, sometimes in agreement with one another, more often, not. For the Aldercrest Banyon landslide, the only theory most people seem to agree on is years of higher than average above rain probably played a big role.



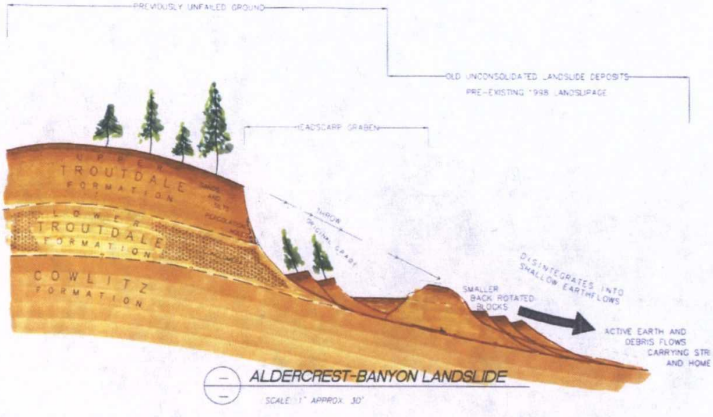
Rainfall Rates for the Cowlitz County Area, from DGER RI35

Karl Wegmann (who was a landslide geologist here at the Washington Geological Survey) states in his publication that 6 years of increased rainfall correlates to a period of increasing landslide activity (Wegmann, 2006). Others reduce this somewhere between 2-4 years of increased precipitation. As a friend of mine would ask about now, but there are many areas of above normal rainfall on the graph, why this time, why this event? We might want to look at when the housing district first was established in this area. The housing development was in full swing in the area in 1975-76 with what I suspect is a

septic system, although it could be sewer. With an increase in houses comes an increase in house related activities, watering the lawn, roofs pouring out water in the downspouts, concentrating water, etc. All things bad for landslide stability. Increased in rainfall would rates could have contributed to the reactivation of the landslide as well.

Geology

The subsurface in any landslide is an important characteristic to study. The area surrounding the landslide was mapped by Walsh et al., 1987. The deposits that the landslide sits on is known as the Troutdale Formation, which is appoximately 2 to 14 million year old Columbia River deposited gravels, sands, silts, and clays. Under the Troutdale is the Cowlitz Formation(roughly 38 million years old), depositing silt, sand, and mud in a near-shore marine deposition environment.



Geologic formations associated with the Aldercrest Banyon Landslide, image from Dr. J David Rogers

The formation creates areas of weaknesses at the contact between the Troutdale and Cowlitz Formation (and probably somewhat between the upper and lower Troutdale Formation).The increase in water over time probably contributed to increasing pore water pressure between the contact. This combination is present in many areas around the Kelso area and is probably responsible for much of the instability in the area.

The Aldercrest Banyon Landslide got the attention of many people. Its destruction caught the attention of the legislature, who initiated a landslide mapping project within the Washington Geological Survey. The landslide also propelled counties to look closer at landslide hazards to prevent another Aldercrest Banyon Landslide.

Reference

Walsh, T.J., Korosec, M.A., Phillips, W.M., Logan, R.L., and Schasse, H.W., 1987, Geologic Map of Washington Southwest Quadrant. Washington Division of Geology and Earth Resources Geologic Map GM-34.

Wegmann, Karl W., 2006, Digital landslide inventory for the Cowlitz County urban corridor, Washington; version 1.0: Washington Division of Geology and Earth Resources Report of Investigations 35, 24 p. text, 14 maps, scale 1:24,000. [accessed Mar. 6, 2008 at http://www.dnr.wa.gov/ResearchScience/Topics/GeologyPublicationsLibrary/Pages/pub_ri35.aspx]

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4 Responses to "Landslide of the Week – Aldercrest Banyon Landslide"

1.  *Precipitation of the Nile Landslide « Sliding Thought Blog* Says:

   October 28, 2009 at 9:15 pm

   […] Precipitation is an important component into landslide movement. During the investigation into the Alderwood-Banyon and the Carlyon Beach-Hunters Point Landslides, long-term precipitation (over five years) had been […]

   Reply

2.  *Gene* Says:

January 4, 2010 at 2:04 am

I lived in the Portugese Bend land slide in California for over 20 years. I moved and lifted houses as a General Contractor as well as my own. It was quite an experience for me and my family.
If I can offer my experience and assistance please let me know.

Reply

3.  *Linda Pace* Says:

February 1, 2011 at 8:20 am

My husband and I purchased our first home in the Aldercrest #1 development. We left there 3 years later and were not part of the disaster. But many friends were hurt. If the State of Washington and Cowlitz County and the City of Kelso knew this was a known slide area, why did thye allow Frank Fundingsland to build the development? There were many culpable parties in this disaster. We had a crack develop in our driveway 3 months after moving in the house. Water ran from the crak and never stopped. Our house was at the apex of Aldercrest Drive before the road steeply went down to later developments. We found hugh sinkholes in the road leading down to the newer developments towards Banyon Dr. the third year we lived there. They were reported to the City but no one cared.

Reply

4.  *contaminated well water* Says:

August 24, 2013 at 2:27 pm

Good day! This is my first visit to your blog! We are a team of volunteers and starting a new project in a community in the same niche.
Your blog provided us beneficial information to work on.
You have done a marvellous job!

Reply