

**Woodwards, D. G., et al “Hydrogeologic framework of the Willamette Lowland Aquifer System, Oregon and Washington.” USGS Professional Paper no. 1424 B (1998): B1-B82. (Reviewed by Eleanor Gordon)**

This paper outlines the geologic features of the Willamette Lowland in Oregon and Washington, and discusses population rise in terms of declining water availability. The Willamette Lowland is 145 miles long and averages 10 to 15 miles in width. The area is divided into four structural basins: the Portland basin, the Tualatin basin, the Central Willamette Valley and the Southern Willamette Valley, each with different hydrogeologic properties.

There are five distinct units of the aquifer system in the lowland, which are described in detail. These are the basement confining unit, the Willamette aquifer, the Columbia River basalt aquifer, the Willamette confining unit, and the Willamette silt unit. The Willamette aquifer is described as consisting of “coarse grained proximal alluvial fan and braided stream deposits.” The central Willamette Valley consists of three major alluvial fans and the southern Willamette Valley of two. Although each basin has a distinct aquifer system, they are all connected through restrictive water gaps. Fault lines of the area are also discussed in terms of their relation to the aquifer system. The hydraulic gradient of the Willamette aquifer is discussed in terms of ft/mile at different point along the Willamette River.

For this study, an analysis of ground water recharge from precipitation was carried out, concluding that the regional estimate of annual recharge is about 42% of the mean annual precipitation. On the other hand, water leaves the Willamette lowland aquifer system through reservoirs, streams, springs, pumpage and evapotranspiration.

## **Critique**

I found this source very interesting and relevant for an overall look into the hydrogeology of the Willamette Lowland. The relevance to future water uses in the Willamette Valley with an estimated doubling of the population in the valley in the next 50 years is obvious. As a USGS paper the research seems high quality and well supported, and the format easy to read even with little geologic knowledge.

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