



J Harlen Bretz (1881-1981) was a University of Chicago professor who studied the channelled scablands of eastern Washington. His 1923 theory proposed the scablands resulted from a catastrophic ice age glacial flood, an idea that was not accepted until 1940.

What is a Jökulhlaup?

Jökulhlaup is an Icelandic term that has been adapted into the English language, and originally only referred to glacial outburst floods from Vatnajökull, which are triggered by volcanic eruptions, but now is accepted to describe any abrupt and large release of sub-glacial water.



Aquifer Formation

Passing through the Rathdrum Prairie and Spokane Valley, floodwaters carried great quantities of sediment. The heavier, larger materials (boulders, cobbles, and coarse gravel) were deposited along the main valley on top of the previously accumulated glacial outwash materials. These coarse materials today underlie the Rathdrum Prairie-Spokane Valley lowland and form the water-bearing formation we call the Spokane Valley-Rathdrum Prairie Aquifer. Above is a cross section of a Spokane Valley gravel pit that illustrates the ice age flood episodes: various layers of sands, gravels and cobbles.



Ice Age Floods

The rapid draining of over 500 cubic-miles of water in Glacial Lake Missoula, probably in only a few days, resulted in a maximum discharge across the Columbia Plateau 10 times the combined flow of all the rivers of the world today. The painting above is an artist's rendition of the "Purcell Plug", the glacial lobe that created the Glacial Lake Missoula dam. The painting at left illustrates the very beginning of the ice dam breach and the start of an ice age flood. The floods occurred repeatedly perhaps every 40 to 140 years. Paintings courtesy of Stev Ominski; used with permission.



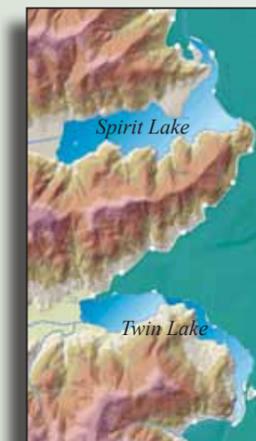
Palouse River Cataract Canyon

Glacial Lake Missoula floodwaters cut the Palouse River cataract canyon after leaving the Cheney-Palouse Scabland. The canyon is a discontinuous collection of coulees, cataracts and buttes that extends for 11 miles between Washtucna Coulee and the Snake River.



Rathdrum Prairie-Spokane Valley

Within a few minutes of the Glacial Lake Missoula ice dam failure, flood waters on the Rathdrum Prairie were about 440 feet high traveling at 76 miles per hour. As the flood continued into the Spokane Valley, the flow was constricted and rose to 570 feet. During the 3-day draining of the lake, flood water velocities over the Rathdrum Prairie-Spokane Valley ranged from 56 to 100 miles per hour with an astounding minimum discharge of 4.5 billion gallons per second.



Lakes

The floods created a few small lakes perched in the lower parts of tributary mountain valleys. These lakes include Spirit, Twin, Hauser, and Newman Lakes on the flanks of the Spokane Mountain area, Hayden Lake at the base of the Coeur d'Alene Mountains, and Liberty Lake below Mica Peak. Discharges from the lakes percolate rapidly into the main valley gravels, and only a few short stream channels exist.

Aquifer Facts

Ice Age Flood Facts: The flood waters spilled into the Snake River causing the river water to backup past present-day Lewiston, Idaho. About 50 cubic miles of rich topsoil was stripped by the floods from the area we call "scablands" and was re-deposited in the Tualatin, Yamhill and Willamette valleys of western Oregon. The flood waters carved the fifty-mile-long Grand Coulee in central WA.