Lower Columbia Chapter

NW Oregon and SW Washington

The Lower Columbia Chapter of the Ice Age Floods Institute is dedicated to the study of natural prehistoric events that sculpted this region, and education of the public to the geological wonders that surround us. The Lower Columbia Chapter spans from the west end of the Columbia River Gorge down the Willamette Valley to Eugene, up through Clark Co. Washington and out to sea at the mouth of Columbia River.

When the Ice Age Floods, coming from Glacial Lakes Missoula and Columbia, entered the Portland Basin from the Columbia River Gorge, they were so vast they could not drain quickly enough through Kalama Gap, so they backfilled the Tualatin, Yamhill, Clackamas and Willamette Valleys to the 400 foot elevation. These floodwaters created flood channels, gravel bars up to 11 miles long and 330 feet high. and left behind huge erratic boulders carried encased in icebergs from the Canadian border area. But they also brought rich Palouse loess soils from eastern Washington to the region which where deposited in the Willamette Valley. Those fertile soils later became a focal point of the Oregon Trail migration.

The Lower Columbia Chapter has forged an excellent relationship with the City of Tualatin, which has branded itself an ice age destination, and the Tualatin Historical Society whose Heritage Center we use for monthly meetings. We sponsor guest speakers at meetings and host an annual field trip within our chapter's region.

ICE AGE FLOODS INSTITUTE
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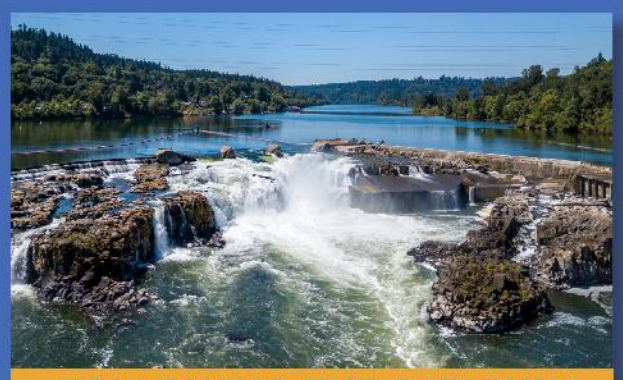


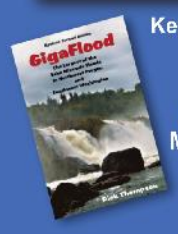
FOLLOWING THE PATHWAY

During the last glacial cycle of the ice-age some 80,000 to 14,000 years ago, continental glaciers and repeated massive floods carved many of the unique distinguishing features of the Northwest's interior landscape.

This is your local guide to dramatic evidence of those cataclysmic forces, from spectacular canyons and cliffs to waterfalls and vast, flood-eroded scablands, that can be witnessed with a short road trip.

It is our hope that you will use this guide to explore these fascinating geological features in our region and will want to learn more about the dramatic ice-age story of glaciers and floods.

OF THE GREAT FLOODS



Key resources for understanding the geology of the Lower-Columbia region: www.GigaFlood.com and

GigaFlood: The Largest of the Lake Missoula Floods in Northwest Oregon and Southwest Washington.

Thompson, R. (2015), LMF Publishing. Portland, OR

A GUIDE TO ICE AGE FLOODS IN NORTHWEST OREGON AND SOUTHWEST WASHINGTON

Our Cataclysmic Floodscape

Learn more at: www.iaf.org

Interesting Flood Facts!

The ice dam that blocked the Clark Fork River and formed Glacial Lake Missoula was over 3,000 feet thick.

Glacial Lake Missoula was as big in volume as Lakes Erie and Ontario combined.

When the ice dam broke the floodwaters ran at a rate greater than 10 times the flow rate of all today's rivers in the world combined.

The floodwaters filled the Columbia River Gorge, spilling over the top and eroding side channels in several places, creating the cliffs and the highest density of waterfalls in the country.

Huge boulders embedded in icebergs floated hundreds of miles in the floodwaters before running aground. These erratic, are scattered across our landscape and still visible today.

A downstream constriction in the floods path at Kalama caused the floodwaters to backup, creating and filling temporary Lake Allison in the Willamette Valley to an elevation of 400', and placing Portland under 370' of water.

Lacamas Lake and Lake Oswego were gouged out by the in-rushing floodwaters.

The floodwaters carried rich Paolouse loess (rock flour) topsoil from central Washington that settled out and deposited up to 300 feet thick in temporary Lake Allison and now comprise the fertile soils of the Willamette Valley.

The Story of the Great Ice Age Floods

During the peak of the last Ice Age, a vast Cordilleran continental ice sheet covered southwestern Canada and the northern parts of Washington, Idaho and Montana. An eastern Purcell lobe of the ice sheet descended into the Idaho panhandle, blocking the Clark Fork River with an ice dam thousands of feet thick.

Water rising behind the dam flooded the valleys of Montana creating Glacial Lake Missoula – a great inland lake stretching over 200 miles to the east with a volume of water greater than Lake Erie and Lake Ontario combined.

The rising lake waters periodically caused the ice dam to fail, resulting in sudden, cataclysmic floods that rushed across northern Idaho and the Channeled Scablands of eastern and central Washington, through the Columbia River Gorge, and into Oregon's Willamette Valley, before emptying into the Pacifc Ocean at the ancient mouth of the Columbia River. Glacial Lake Missoula would have drained in just a few days as a volume of floodwaters greater than all the rivers of the world combined roared across the landscape at up to 60+ mph.

Now imagine this happening not once but dozens, perhaps even hundreds of times as the advancing continental glacier built a new ice dam!

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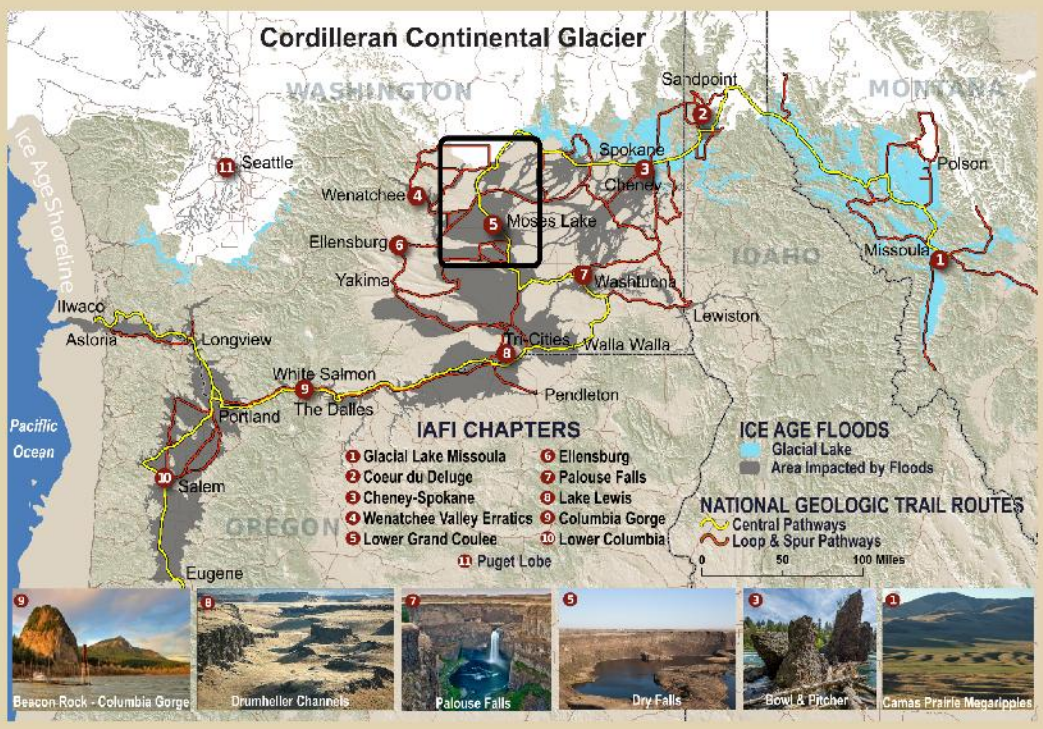
ICE AGE FLOODS
NATIONAL GEOLOGIC TRAIL

Ice Age Floods National Geologic Trail

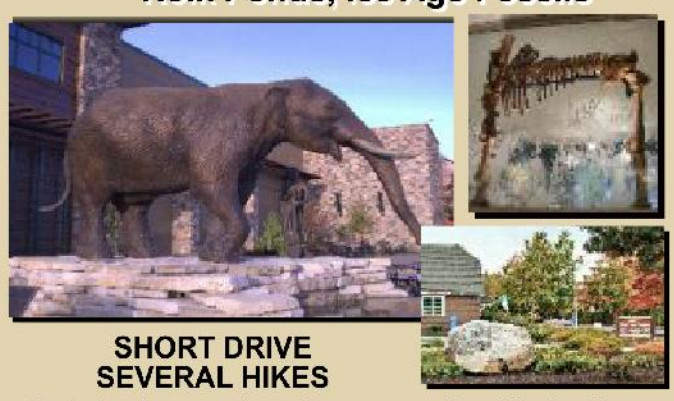
Since the 1990's the Ice Age Floods Institute (IAFI) has worked to create and to build support for the Ice Age Floods National Geologic Trail.

The Ice Age Floods National Geologic Trail is essentially a network of marked touring routes extending across parts of Montana, Idaho, Washington, and Oregon, with several special interpretive centers located across the region. Many interested parties are being brought together in a collaborative and effective interpretive program at a remarkably low cost, despite the extraordinary size of the region.

The Trail is being developed under the National Park Service on existing public lands, with no changes in jurisdiction and no threats to private property rights. The role of the National Park Service is to coordinate and manage the planning of the project and the telling of the story, without taking custodianship of public and private lands.



1 Tualatin, Oregon
Flood Channels, Iceberg Erratics, Kolk Ponds, Ice Age Fossils



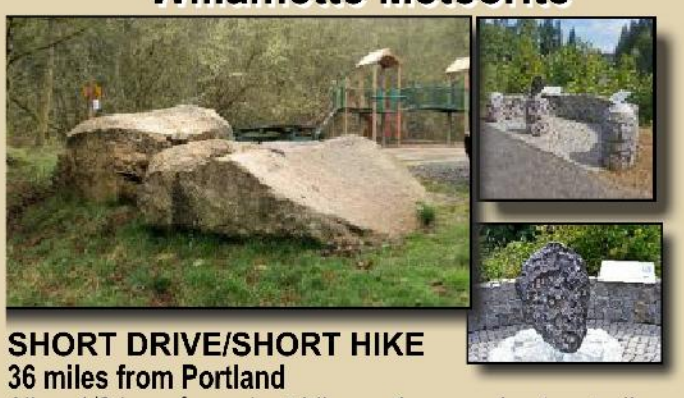
SHORT DRIVE
SEVERAL HIKES

Tualatin, Oregon sits at the crossroads of the Ice Age Floods in the lower Columbia region since both the incoming and exiting waters came through Tualatin. The city has extensive Ice Age features and displays including but not limited to mastodon bones at the library, a life-size bronze mastodon sculpture outside Cabela's, Tualatin Commons designed with artful Ice Age Floods features and displays of erratics, the ArtWalk: a self-guided tour of public art and natural history, Tualatin River Greenway Trail.

The Tualatin Heritage Center displays two huge erratic rocks and Ice Age fossils, Ibach Park is designed with play features based on the Ice Age Floods.

Nyberg Wetland flood channel, the Ice Age Tonquin Trail across the Tonquin scablands, kolk ponds of Koller Lake and Coffee Lake, gravel deposits and erosional remnants are all to be seen in or near Tualatin.

2 Fields Bridge Park
West Linn
Willamette Meteorite



SHORT DRIVE/SHORT HIKE
36 miles from Portland
Allow 1/2 hour for a short hike on the paved nature trail.

Fields Bridge Park is a 2/10ths mile nature walk along the Tualatin River with three kiosks and 8 interpretive panels dedicated to telling the story of the Ice Age Floods. It is located ust two miles from the discovery site of the Willamette Meteorite, which is thought to have been transported to the area in an iceberg during the Ice Age Floods.

The Willamette Meteorite is the largest found in the United States and sixth largest in the world. Displayed at the 1902 Lewis & Clark Exposition, the nickel-iron meteorite was then donated to the American Museum of Natural History in New York and now resides in the Hayden Planetarium in New York. Fields Bridge Park is located at 821 Willamette Falls Dr., West Linn, OR, and is ADA accessible with Interpretive signage and self-guided tours available.

3 Willamette Falls
Oregon City and West Linn

SHORT DRIVE/SHORT HIKES
28 miles from Portland
Allow 2-3 hours with moderate hiking.

Willamette Falls is the second largest, by volume, waterfall in the United States. Created as a receding waterfall during the outflow of the Ice Age Floods this falls on the Willamette River drops 50 feet.

Designated a National Heritage Area in April of 2015, the falls is an important historic, cultural and industrial site. The trading and fishing spot for Native Americans, the end of the Oregon Trail for the pioneers, and in 1889 the first long distance transmission of electrical power.

High on the bluffs above Willamette Falls are scablands eroded by the Ice Age Floods: Camassia Nature Preserve on the West Linn side and Canemah Bluff Nature Park on the Oregon City side. These scablands offer nature walks where you can enjoy the unique ecology of the area.

4 Bellevue Erratic
Erratic Rock
State Natural Site

SHORT DRIVE/HIKE
46 miles from Portland
Allow 1 hour with very short hike

Six miles west of McMinnville just off of Hwy. 18 sits a 90-ton rock that was floated as much as 500 miles in an iceberg by way of the Columbia River during the Ice Age Floods and is the largest iceberg erratic found in the Willamette Valley. Coming originally from the Northern Rocky Mountains, when the iceberg in which it was encased melted, the rock was left behind at the 300 foot elevation level.

A short uphill hike leads visitors to the Erratic Rock State Natural Site where they can look out across the vast landscape and imagine the huge amount of water that filled the Willamette Valley during the Ice Age Floods.

The discovery that erratic rocks were found at or below the 400 foot elevation in the Willamette Valley indicated that the water inundated this region from Portland down to Eugene up to 400 feet above present day sea level.

5 Museum of Natural and Cultural History
University of Oregon
Eugene

LONG DRIVE
123 miles from Portland
2:20 travel time each way.

The Museum of Natural and Cultural History (MNCH) is Oregon's primary repository for publicly owned collections. The museum has its roots in the late 1800s, when Thomas Condon joined the University of Oregon as one of its first three professors and brought his extensive fossil collection.

As the premier natural and cultural history museum in the State of Oregon, the MNCH is home to hundreds of thousands of ethnographic and archaeological objects, fossils, and biological specimens from Oregon, the Pacific Northwest, and around the world.
1680 E. 15th Avenue, Eugene, OR 97403-1224

A key resource for understanding the geology of the Lower-Columbia region: (www.GigaFlood.com)
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Thompson, R. (2015), LMF Publishing, Portland, OR