Cheney-Spokane Chapter

SPokane, WASHINGTON

The Cheney-Spokane Chapter is part of the Ice Age Floods Institute, a non-profit organization dedicated to the study of the geologic events that scoured the Pacific NW region and to promoting public education of the unique geologic wonders of the surrounding area. The Institute and its local chapters work closely with the National Park Service to interpret the history and significance of the Ice Age Floods National Geologic Trail to the general public.

The City of Spokane, Washington, is the gateway to the world-famous Channeled Scabland, an area sculpted by immense Ice Age floods from repeated catastrophic ice dam failures in northern Idaho. Those dam failures released hundreds of cubic miles of water from Glacial Lake Missoula and sent huge volumes of water through the Spokane Valley and across eastern Washington. The Cheney-Palouse Scabland Trail extends from Cheney to the Snake River near Washtucna, Washington.

The Cheney-Spokane Chapter sponsors public presentations, field trips, guidebooks, and displays. Contact us at https://IAFI.org/Cheney-Spokane

Interesting Flood Facts!

Glacial ice dams over 2000 feet thick and several miles wide blocked the Clark Fork River and impounded over 500 cubic miles of water in Glacial Lake Missoula, as much as Great Lakes Erie and Ontario combined.

When the glacial ice dams collapsed, the released floodwaters surged away at a rate greater than 10 times that of all the rivers in the world combined.

Floodwaters hundreds of feet deep roared down the Rathdrum Prairie into the Spokane Valley and often into Glacial Lake Columbia, a giant lake formed when the Okanogan glacier dammed the Columbia River near the present Grand Coulee Dam.

Floodwaters overflowed the Spokane Valley onto the West Plains and headed south through the Cheney area, cutting a wide swath of distinctive eroded topography called “Cheney-Palouse Scabland Tract.”

Floodwaters stripped away much of the thick silty Palouse soil covering the area, and locally dug deeply into the underlying basalt layers, creating basalt buttes, plateaus, and closed wetland basins.

Floodwaters tens of hundreds of feet deep raced southward for about 70 miles before spilling over the Palouse Falls area and into the Snake River.

FOLLOWING THE PATHWAY

During the last glacial cycle of the Ice Age, some 80,000 to 14,000 years ago, massive floods repeatedly carved many of the distinguishing features of the Northwest’s unique landscape.

This is your local guide to dramatic evidence of these historic floods, 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 the fascinating geological flood features in our region and want to learn more about the dramatic story of Ice Age Floods.

ICE AGE FLOODS INSTITUTE

ON THE TRAIL OF THE ICE AGE FLOODS

by Bruce Boulton and Eugene River

Key resources for understanding the impacts of the Ice Age Floods

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 Ice 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, catastrophic 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 Pacific 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 raced across the landscape at up to 80+ mph.

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

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 interpretive 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.

Detailed Map Inside

Highlighting day trips to prominent ice age floods features in the Cheney-Spokane Area

A regional guide to geologic evidence of the Ice Age Floods

that sculpted the unique floodway landscape
Explore Ice Age Floods Features in the Cheney- Spokane Area

1. Bowl & Pitcher Riverside State Park, Spokane

**SHORT DRIVE/HIKE**
1 hr 10 min hike to Spokane River footbridge

The Bowl and Pitcher is a rock formation along the Spokane River several miles west of downtown Spokane. The “Bowl” is a circular depression in the Spokane River and the “Pitcher” is a detached block of highly fractured basalt with a distinctive shape.

No other area within the Spokane River valley has a more geomorphic signature on a single spot than this. Cliffs of basalt on the west side of the river give way to a geologic fault, now hidden by a smoke shrub and large side blocks of basalt in and along the river shorelines. The upper columnar and pillow basalt exposed in the high bluff that was derranged to river flood by the Lusgate Fault can still be viewed in late winter when the water is low. The Spokane River incised through the northern basin process over millions of years.

During the last Ice Age, glacial Lake Columbia occupied all of the Spokane River drainage basin up to 2,000 feet above the present-day greenbelt and public parks area. Glaciers filled the Columbia River Valley completely with glacial Lake Missoula floodwater. The Spokane River began to incise and intermittently remove this floodfill as glacial Lake Columbia surface levels dropped in response to heatwave erosion at the junction of the Grand Coulee and the Columbia River, until it emptied completely with the melting of the Okanogan Ice Lobe. The granite butte on the east side and the basalt benches on the west side of the Spokane River gave rise to the river’s ever-decreasing flow by the end of the last Ice Age. The Bowl and Pitcher can also be accessed from the west side by following a paved road northward from the parking lot on a prominent basalt bench and back south along a dirt trail to the foot bridge.

Find an interactive map and additional details online about these and other Ice Age features at [https://isif.org/floodscapes/](https://isif.org/floodscapes/)

2. Fish Lake Columbia Plateau Trail State Park

**SHORT DRIVE/HIKE**
5 mi. from Cheney
27 mi. from Spokane

Fish Lake lies along the Columbia Plateau Trail State Park which follows the Missoula Floods path for 120 miles from Spokane in the north to the Snake River in the south. A wealth of flood and geologic features exemplified by the spectacular and unusual topography produced by the Ice Age resurgences are located and well exposed along the amazing rail-trail path that is the former path of the Spokane-Fort Benton Railroad.

Missoula floodways overwhelmed the Rathiub-Spokane valleys and found numerous outlets across eastern Washington at a number of locations. One path led into Hahnaman Valley and southward up to the Washougal and 5 Mile Creek Valleys, joining forces with other flood channels near Cheney. Floodwater eroded through a narrow gap in the shoulder of the resistant rock step that makes up Prexill Hill across the lake and just west of Cheney. A potential cataract or perhaps a pair of powerful whirlpools dented into the bedrock, forming two plunge pools of deep basins separated by a shallow water divide. Following the Ice Age, water in Minnie and Marshall Creeks again returned to their pre-glacial paths eventually draining northward into Hahnaman Creeks. Fish Lake can be accessed from the Cheney or Fish Lake trailheads by hikers, bikers, and other non-motorized users.

*Local Geologic and Geomorphic Terms*
Scalblands – flat land deeply scarred by fluvial channels, with poor soil and little vegetation.
Recessional Cataract - a waterfall that migrates upstream by headward erosion as material is torn from its face by the plunging water.
Plunge Pool: rock basin created at the base of a waterfall.
Steppe: an isolated hill or mountain surrounded by lava Loess: glacial-ground and wind-deposited silt sediment.
Screw: broken rock fragments accumulated through periodic rockfall from adjacent cliff faces.

3. Cheney Scabland Vista E. Washington Univ. Water Tower

**SHORT DRIVE/HIKE - in Cheney**
30 minutes with hike to viewpoint

Water Tower Scabland is easily accessible from parking lot P1 in the Eastern Washington University campus. On a clear day a commanding view overlooking part of the Cheney Plateau Scabland and other terraces is visible.

The water tower is located on the eastern edge of a large long-crested island sand ridge protected from floodwaters by the steep rock ridge to the north. Floodwater sliced through the edge of the crossee island leaching and streamlining water tower hill. The hill was overrun by floodwaters up to the eagle insignia painted on the large water tower. Several tens of feet of loose silt over the basin lake exposed in the rugged scabland below.

To the north local steppe hills (or mountain tops) of water rocks surrounded but not overrun by lavas formed a resistant topographic barrier to floodwaters running south from the Spokane Valley. Water falling between the steppe hills was funneled into the Fish Lake- Cheney flood channel that directed water through the Cheney area. Here it found its way into an even larger flood channel.

To the south of the water tower the broad fluvial fan raised through Turnbull National Wildlife Refuge located in the forested scabland area below. Beyond on the horizon is Steptoe Butte 34 miles to the southwest.

4. Turnbull Natl. Wildlife Refuge Wetlands and Scablands

**SHORT DRIVE - 13 mi.**
Cheney to Refuge
Allow 2-5 hours for hiking

**Turnbull National Wildlife Refuge** protects over 16,000 acres of Channeled Scabland landscape that displays lake and braid topography. A significant part of the Missoula floodwater in the Cheney-Palouse Scabland Tract was concentrated in a broad 10-mile-wide area between a ridge of steppe north of Cheney and the box or Palouse Hill near the town of Spokane to the east. Turbulent floodwaters over 250 feet deep poured into hundreds of basins in the basin bedrock, now contain the most extensive wetland in the Channeled Scabland.

A flat post-flood wetland (wind-deposited silt-sediment) embayment of varying depths, grassland, and elk and mule deer to prosper in the Refuge and surrounding areas.

A 54 mile auto doubling road provides access to a number of trails, marshes, and ponds. Other roads up Smilak is also available. A 5-mile paved loop trail by Pine Lake is wheelchair accessible.

Ergastic silt mounds called Mima mounds as much as 30 feet in diameter are present near Keppe Lake and other Refuge areas. These may be wind caused but generalized agreement on origin is lacking.

5. Williams Lake

**MODERATE DRIVE/SHORT HIKE**
ROUNDTrip 27 mi. from Cheney
Allow 2 hours with short hike to dry falls rim

The deep canyon containing Williams Lake to the south and Badger Lake to the north is in a flood channel cut into the 30-mile-wide Cheney-Palouse Scabland Tract. Local deepening by floodwateer carved a series of cataracts that resurgences have used again as part of the valley’s unique topography.

A 9.8 mile long auto road provides access to a number of trails, marshes, and ponds. Other roads up Smilak is also available. A 2-mile paved loop trail by Pine Lake is wheelchair accessible.

The area is wind-carved bushy terraces, and other non-motorized users.

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