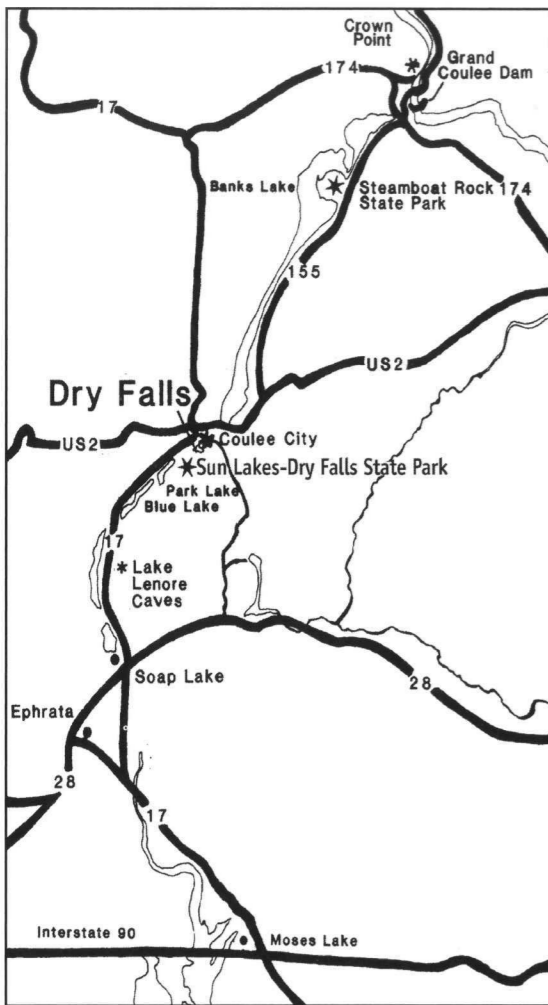
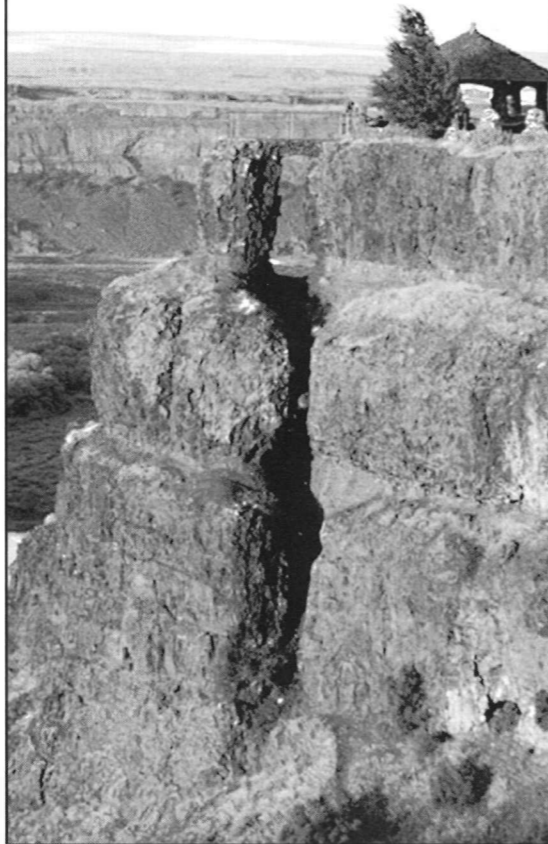


Dry Falls

A Washington State Parks
Heritage Area



Washington State Parks and Recreation Commission

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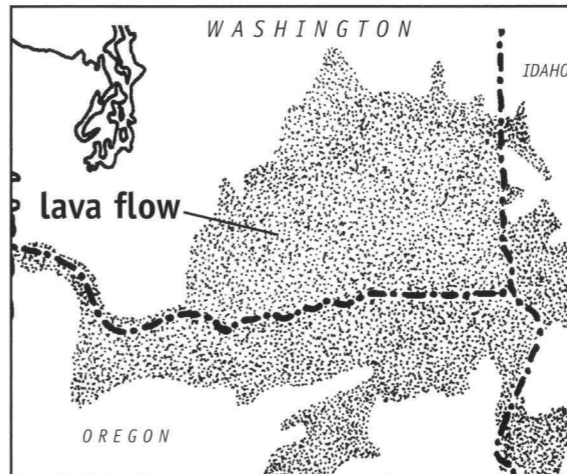


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The Dry Falls Story

Miocene landscape

About 20 million years ago, during the Miocene Epoch, the landscape of Central Washington consisted of mountains, valleys, streams and lakes. Trees, shrubs and plants flourished in a moist, temperate climate. Sequoia, oak, elm, hickory, cypress, chestnut, ginkgo and other large trees grew in profusion.



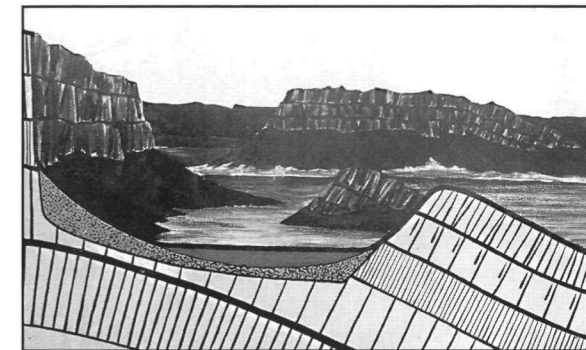
Lava flows

During late Miocene and early Pliocene times, one of the largest basaltic lava floods ever to appear on the earth's surface engulfed about 63,000 square miles of the Pacific Northwest. Beginning about 17 million years ago, and lasting for about 11 million years, lava flow after lava flow poured from the earth. Together these flows, one on top of another, were as much as two miles thick. The ancient Columbia River was forced into its present course by the northwesterly advancing lava.

The lava, as it flowed over the area, first filled the stream valleys, forming dams that in turn caused lakes. In these ancient lake beds are found fossil leaf impressions, petrified wood, fossil insects and animal bones.

With the end of the outpouring of lava, tremendous forces deep within the earth began to warp the plateau in several places. A general uplift of the mountainous region in the north caused the entire plateau to tilt slightly to the south. This tilting and associated stair-step rock folds, called monoclines, in the vicinity of

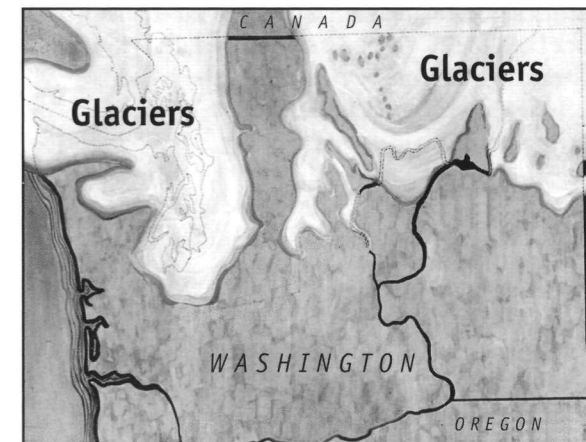
Coulee City and Soap Lake, played an important role in the formation of the Grand Coulee.

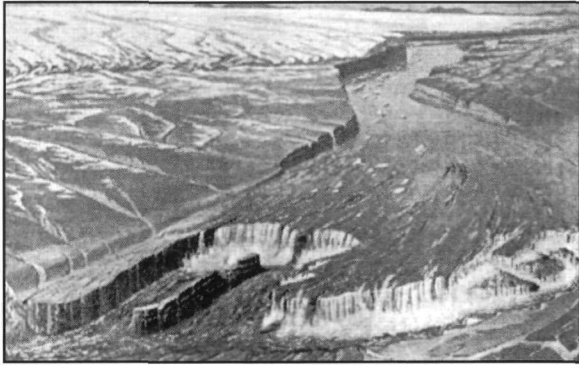


The Ice Age

With the beginning of the Pleistocene Epoch, about one million years ago, a cooling climate provided conditions favorable to the creation of great sheets of moving ice, called glaciers. Thus began the most recent Ice Age.

During the centuries, as snowfall exceeded melting and evaporation, a great accumulation of snow covered part of the continent. As the snow depth and pressure increased, glacial ice was formed. This vast ice sheet moved south into Washington, Idaho and Montana. Near the Canadian border, the ice sheet was up to one mile thick. At its leading edge, the ice dammed rivers and created lakes. At times, the Columbia River was forced to flow through what is now the Grand Coulee.





One especially large lake, covering a portion of north-west Montana, played an important role in the formation of Dry Falls. As this lake grew in size, it eventually broke through the ice dam, unleashing a tremendous volume of water to rush across northern Idaho and into Eastern Washington. Catastrophic floods raced across the southward-dipping plateau a number of times, etching the coulees or ravines that characterize this region, now known as the Channeled Scabland.

As the floods in this vicinity raced southward, two major waterfalls formed along their course. The larger was that of the upper coulee, where the river roared over an 800-foot cliff. The eroding power of the water plucked pieces of basalt from the precipice, causing the falls to retreat 20 miles and self-destruct by cutting through to the Columbia River valley near what is now the Grand Coulee Dam.

The other major waterfall started near Soap Lake, where less resistant basalt layers gave way before the great erosive power of this tremendous torrent. As in the upper coulee, the raging river yanked chunks of rock from the face of the falls, and the falls eventually retreated to their present location.

Here then is Dry Falls, the skeleton of one of the greatest waterfalls in geologic history. It is 3.5 miles wide, with a drop of more than 400 feet. By comparison, Niagara, one mile wide with a drop of only 165 feet, would be dwarfed by Dry Falls.

The ice recedes

When the climate warmed, the ice slowly melted and the glacier retreated north. The Columbia River returned to its original channel around the edge of the lava plateau. The Grand Coulee and the network of

other rivers and streams across the plateau were left high and dry several hundred feet above the Columbia River. Today, travelers see numerous coulees and small lakes, as well as the giant precipice of Dry Falls; all are reminders of the raging torrent that once scoured this area.

J Harlen Bretz

In the summer of 1922, geologist J Harlen Bretz of the University of Chicago became intrigued by the maze of huge streamless canyons, dry falls and other strange features in arid Eastern Washington. During the next seven summers, Bretz painstakingly documented what he named the Channeled Scabland. Nothing within known geologic theory could account for what he saw. Based on the physical evidence, Bretz arrived at a revolutionary conclusion: The strange landforms of the Channeled Scabland were carved by a catastrophic flood greater than geologists had ever recognized.

Geologic understanding in the 1920s strictly followed the principal of uniformitarianism—that geologic changes occur slowly, through steady processes. To geologists, the idea of a sudden, colossal flood was unthinkable heresy. Though warned repeatedly that he would not be believed, Bretz published his conclusions, setting in motion one of the greatest debates in the history of modern geology.

Alone and against all odds, Bretz persisted in defending his unpopular hypothesis. In 1952, when he was nearly 70 years old, Bretz returned for his last summer of field work in the Channeled Scabland. With the discovery of some startling new evidence — giant ripple marks — his arguments could no longer be ignored. In 1965, following a tour of the Channeled Scabland, the International Geological Congress



sent Bretz a telegram: “We are now all catastrophists.” After more than 40 years, his vindication finally had come. In 1979, at age 96, he was awarded the Penrose Medal of the Geological Society of America, the nation’s highest geologic honor.



The Blue Lake Rhino

One of the most unusual fossils ever found in the Columbia Plateau is a mold and a few bones of a small rhinoceros. In 1935, a group of hikers found it in a cavity in the vicinity of Blue Lake, a few miles south of Dry Falls. This fossil is commonly known as the “Blue Lake Rhino.” The mold is preserved in pillow basalt overlying a thin sand bed. The rhino probably lay dead in a small pond when lava flowed into the water and hardened, forming a mold around the body.

Lake Lenore Caves

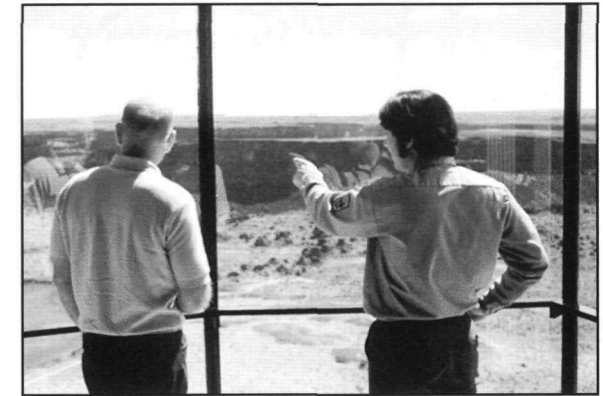
The Lake Lenore Caves were formed when melt water from the Ice Age floods plucked basalt from the walls of the coulees. For thousands of years, the caves were used as temporary shelters and storage areas by Native Americans who were hunting and gathering food in the coulee.

A trail leading to some of these caves has been developed near the north end of Lake Lenore. The caves are about 10 miles south of the Dry Falls Interpretive Center, just off State Route 17, and are open to the public during park hours.

Dry Falls Visitor Center

The visitor center at Dry Falls tells the story of this amazing geological phenomenon. From lava flows to the Ice Age floods, and from the Native American legacy to

the modern discovery of how Dry Falls was created, the Dry Falls story is revealed to tens of thousands of visitors each year.



A gift shop in the visitor center has a wide selection of books, maps, guides, videos, postcards, film and other merchandise about Dry Falls and the surrounding area. At the end of your visit you will want to spend time looking through the wall of windows over the precipice, it is magnificent. Please note that a donation helps support the operation of the center.

Throughout the park, roads and trails will take you to other fantastic views of geologic features and bring you closer to the desert plants and animals. Take time to make your own discoveries and create your own explanations for what you see. If you had been J Harlen Bretz, would you have come up with such an “outlandish” theory as huge Ice Age floods?

The Grand Coulee, of which Dry Falls is a central feature, has been designated as a National Natural Landmark by the National Park Service. As you drive or hike through Grand Coulee, please do your part to help preserve this national treasure.

