Hiking Tour Guide:
Ice Age Floods Through the Drumheller Channels

with
Bruce Bjornstad

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Othello Sandhill Crane Festival

"The fourth spillway out of Quincy Basin was a great cascade over the southern rim. It is a marvelous region of scabland buttes and knobs, canyoned channels, rock basins interrelated in a complex unparalleled elsewhere, even in the scablands."

Bretz (1928)

In 1986, the National Park Service formally recognized the stark beauty of Drumheller Channels by designating them a National Natural Landmark. Drumheller Channels is an awesome and chaotic network of channels that Scabland floods carved out by repeatedly chewing away at the east end of the Frenchman Hills (Figure 1).

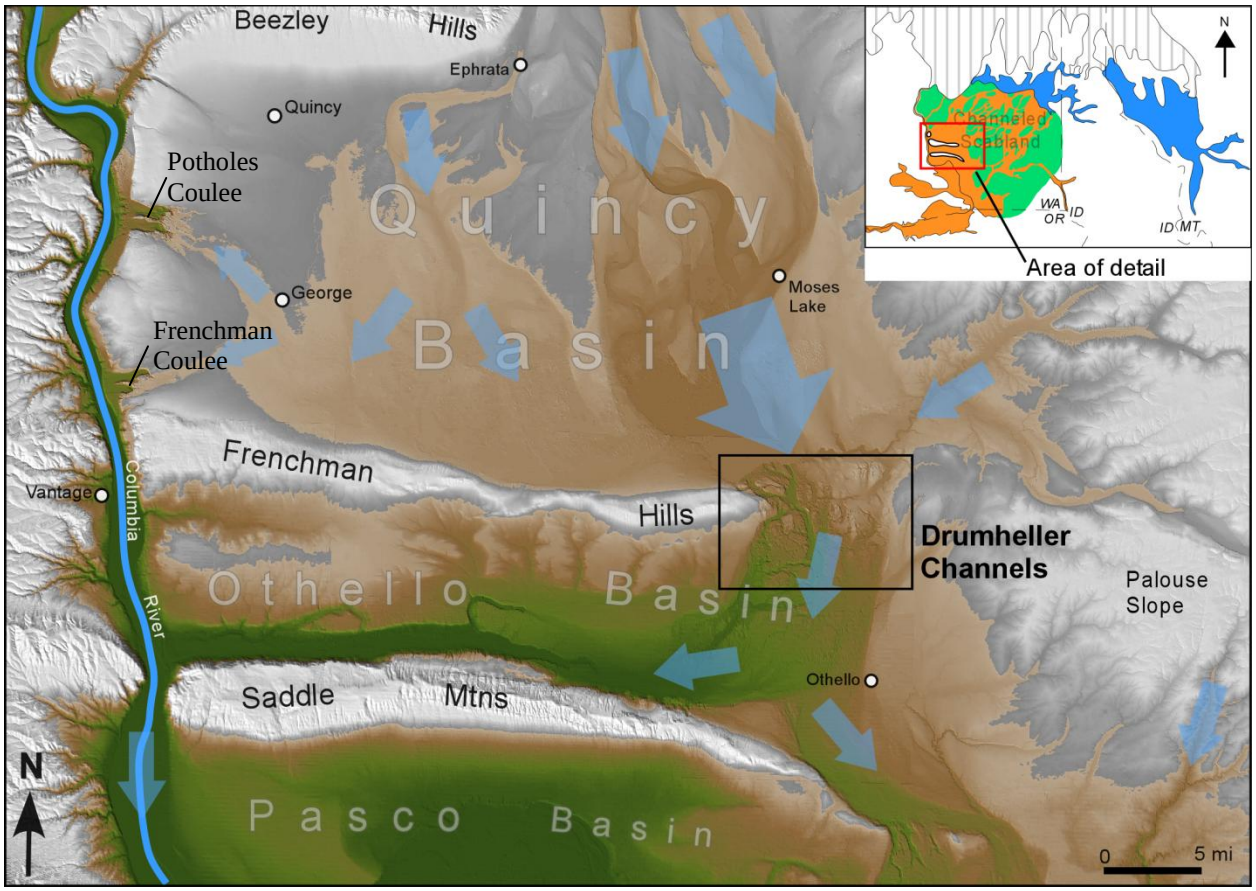


Figure 1. Shaded-relief map showing paths of Ice Age floodwaters through east-central Washington. Only areas in white lay above the highest flood level.

Ice Age floods inundated the Quincy Basin mostly from the north via Grand Coulee. When floodwaters encountered the Frenchman Hills, they were forced to divide. Some water flowed west over several low points along west side of the Quincy Basin where they cascaded into the Columbia Valley via Potholes and Frenchman coulees. The bulk of the floodwaters, however, took a much easier and direct path, which was straight south through a low area that became the Drumheller Channels.

Floodwaters naturally funneled through Drumheller Channels, carving out a well-defined, 8-mile-wide, 400-feet-deep gash across the east end of the Frenchman Hills. Distinct flood-cut scarps eroded into the Ringold Formation are up to 100 feet high. A series of straight, parallel

grooves carved into the hard basalt bedrock reveal the incredible force of the floods through this area (Figure 2).

Figure 2. Drumheller Channels, looking southwest. Arrow indicates flow direction of floods, based on direction of parallel, longitudinal grooves at lower right.

The floods formed Drumheller Channels by forcing the water to go around the nose of the Frenchman Hills but within the boundaries of the Palouse Slope. The height of the floodwaters was about 150 feet different between the upper and lower parts of Drumheller Channels. This significant difference in water level generated tremendous erosive power that scoured the complex network of channels, buttes and basins here. However, unlike most other areas in the Channeled Scabland, no central channel or dominant cataract developed; instead, floodwaters passing through behaved more like a broad cascade - up to 8 miles wide! In all, J Harlen Bretz, the geologist who first presented evidence for Ice Age flooding, reported 150 distinct channelways and more than 180 rock basins in this region. Many of the low areas are filled by water seeping in through cracks in the basalt connected with Potholes Reservoir.

Another amazing fact about Drumheller Channels is that the Columbia River used to flow through here during the Ice Age (Figure 3) as recently as 13,000 years ago. The hijacked Columbia River was shifted 30 miles east of where it flows today by the Okanogan Ice Lobe, which completely blocked its normal westward route. The Okanogan Lobe also forced floods from glacial Lake Missoula south through Grand Coulee. The Okanogan Lobe steadfastly resisted erosion by the Missoula floods during most of the Ice Age, including the time between floods. Therefore, between outburst floods the Columbia River also had nowhere else to go but down the Grand Coulee. At Moses Lake the Columbia flowed into the today's Crab Creek valley before draining through the Drumheller Channels. It then followed present Crab Creek west to rejoin the Columbia River along the north side of the Saddle Mountains at Beverly.

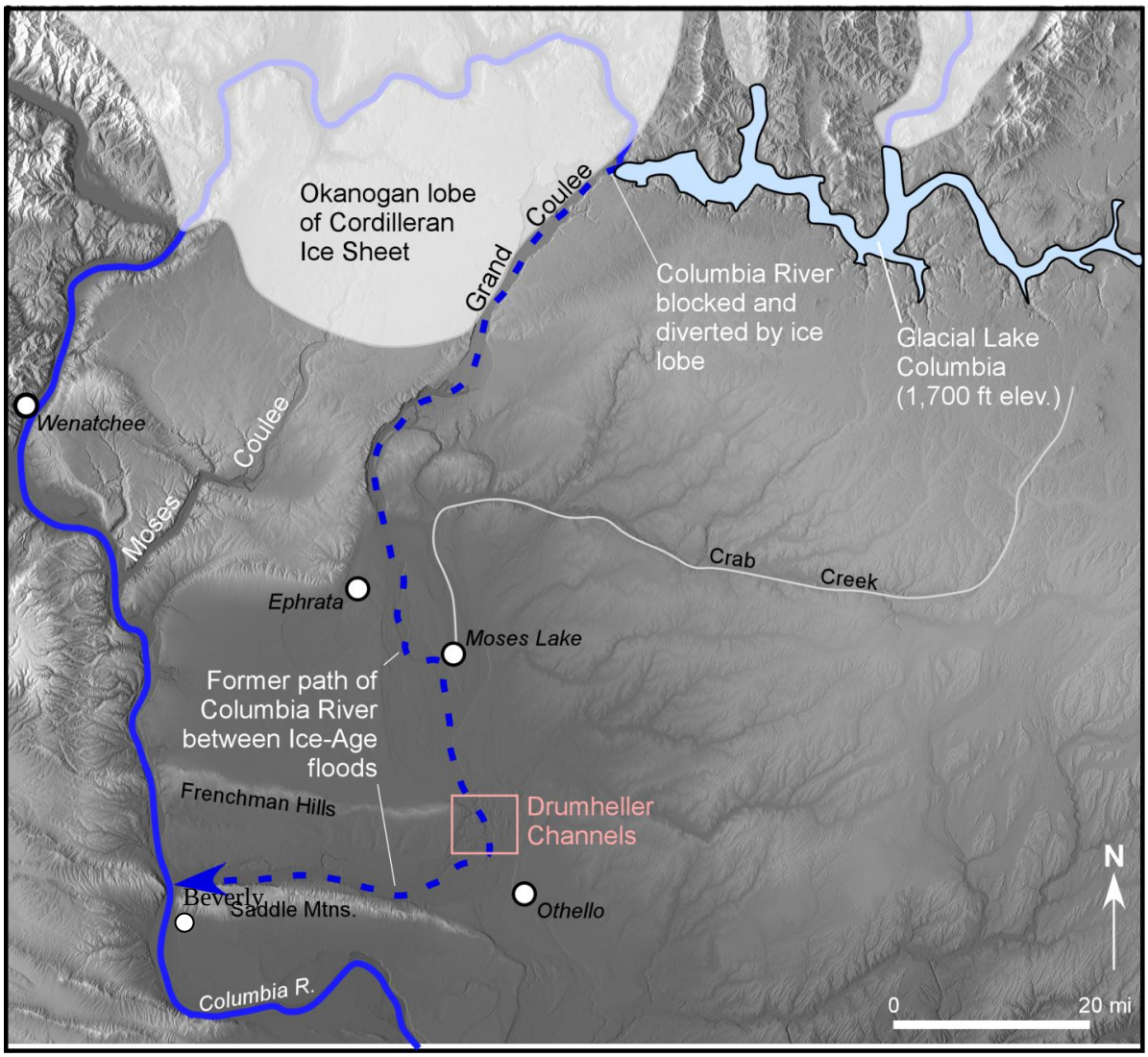


Figure 3. The Columbia River used to flow through the Drumheller Channels when the river was blocked by a lobe of ice during the Ice Age. During the Missoula floods the ice lobe also deflected floodwaters down Grand Coulee toward Drumheller Channels.

The Hike

Directions to Trailhead: From Othello take N. Broadway Ave., which turns into McManamon Rd. At ~5.7 miles turn right onto Morgan Lake Rd. Continue north 4.5 miles to turn off to Upper Goose Lake. Turn left and drive one mile to end of road at U. Goose Lake. *Washington Discover Pass required to park.* Follow trail that heads into valley to the south.
Visible Flood Features: Coulees, buttes, rock basins and benches, giant potholes, streamlined and scarped Ringold hills, abandoned spillways, cataracts and plunge pools
Elevation: 885-1,100 feet
Difficulty: Easy to moderate
Land Manager: Washington Department of Fish and Wildlife (Seep Lakes Unit of the Columbia Basin Wildlife Area).

From the parking area follow the trail that heads southeast along a steep-sided flood channel scoured into basalt bedrock. Altogether the hike is about three miles long. Maximum elevation gain is about 200 ft. We'll be hiking near the middle of the 8-mile-wide floods' spillway that makes up Drumheller Channels.

After ~0.4 miles climb east up a gentler basalt slope that rises to the top of a flood-swept mesa (Figure 4). Continue south along the edge of the mesa for some great views down into the adjacent channels and wild scabland (Figures 5, 6, and 7). The rest of the trail follows the perimeter of the half-mile-wide, one –mile-long mesa before looping back to our original route. Except for the first 0.3 miles there are no established trails along route. We'll be travelling cross country except for an occasional game trail.

Figure 4. Upper Goose Lake, looking south. The hike starts near the lake and proceeds counterclockwise atop the mesa at upper left.

Figure 5. Lunch stop above abandoned flood coulee along hiking route.

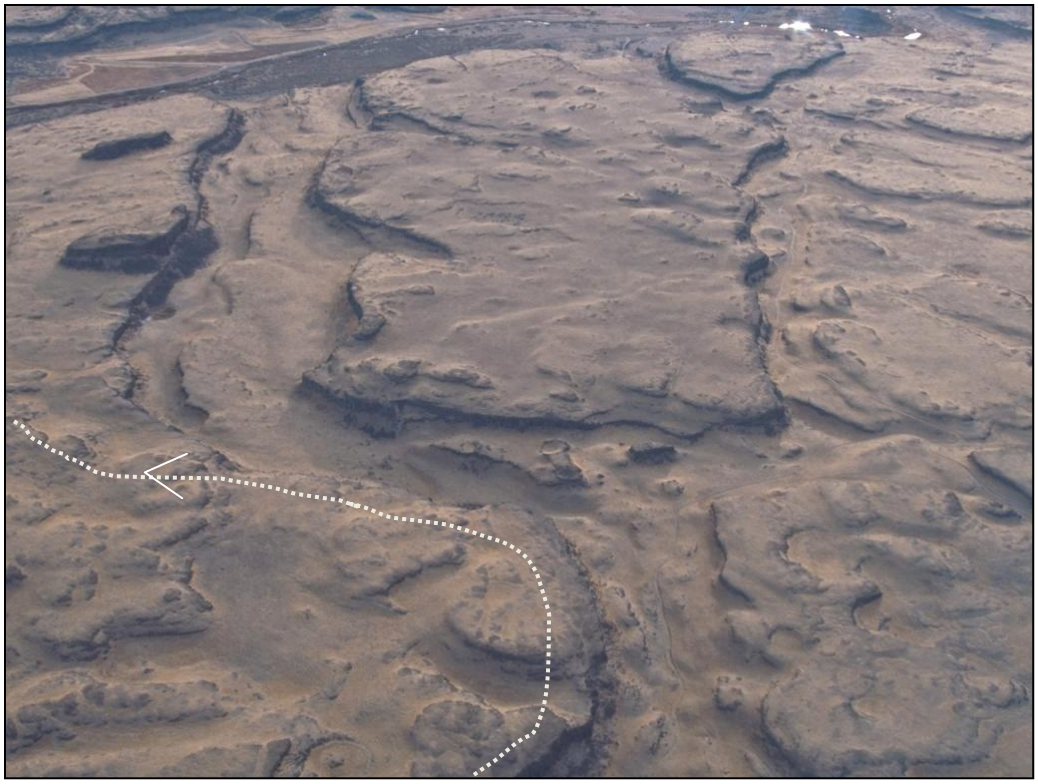


Figure 6. Aerial view of abandoned flood channel (left) shown in previous photo. Dashed line is a portion of the hiking route.

Figure 7. Aerial view, looking northeast. Hiking route circumvents mesa (arrow) in upper left corner. Crab Creek (former Columbia River channel) runs diagonally across the image at lower right.

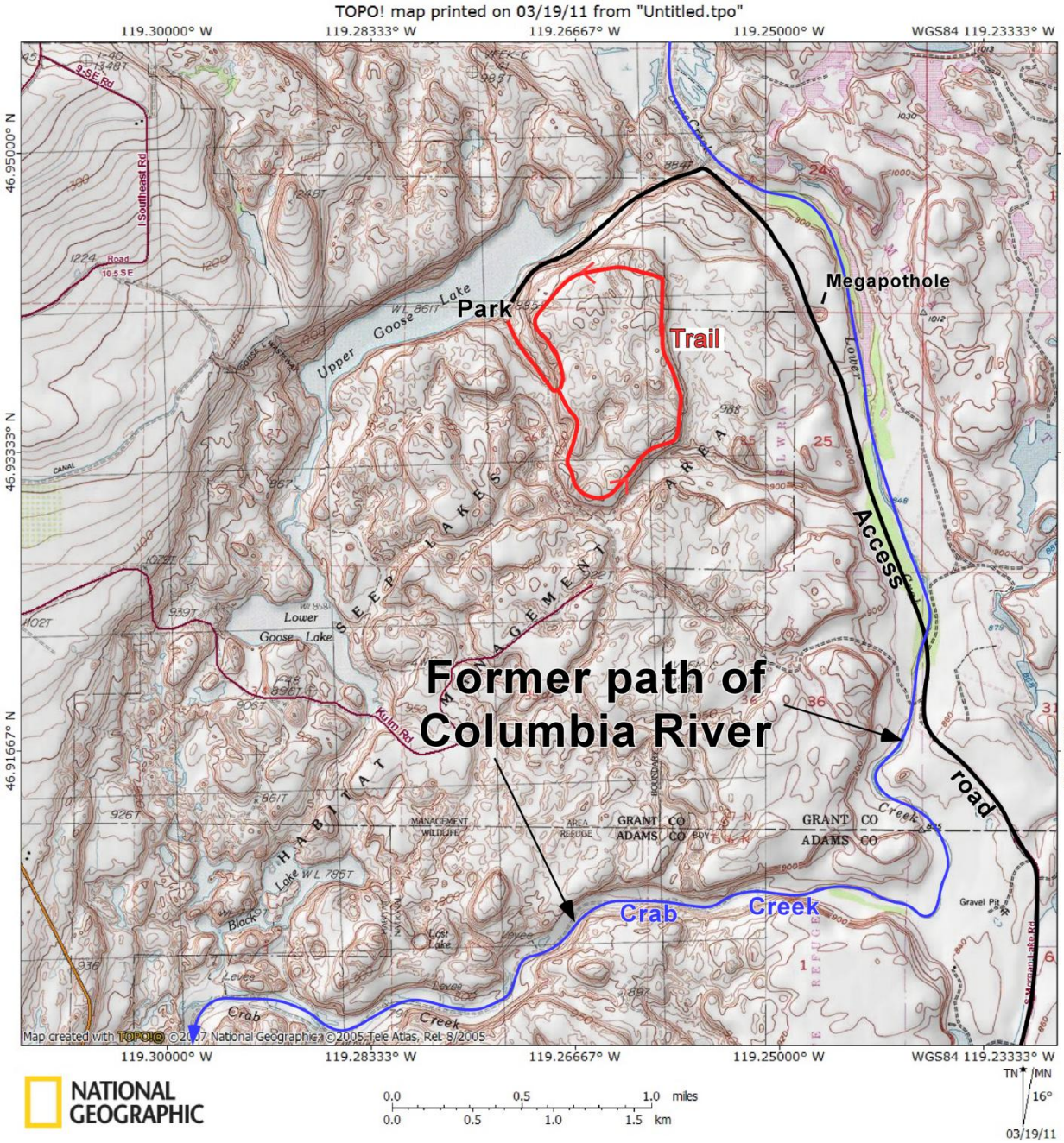
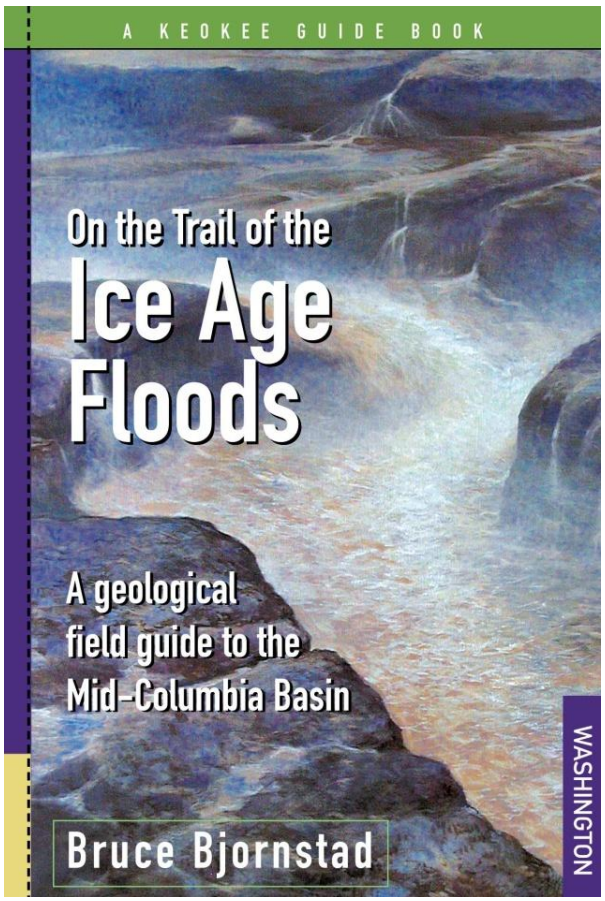
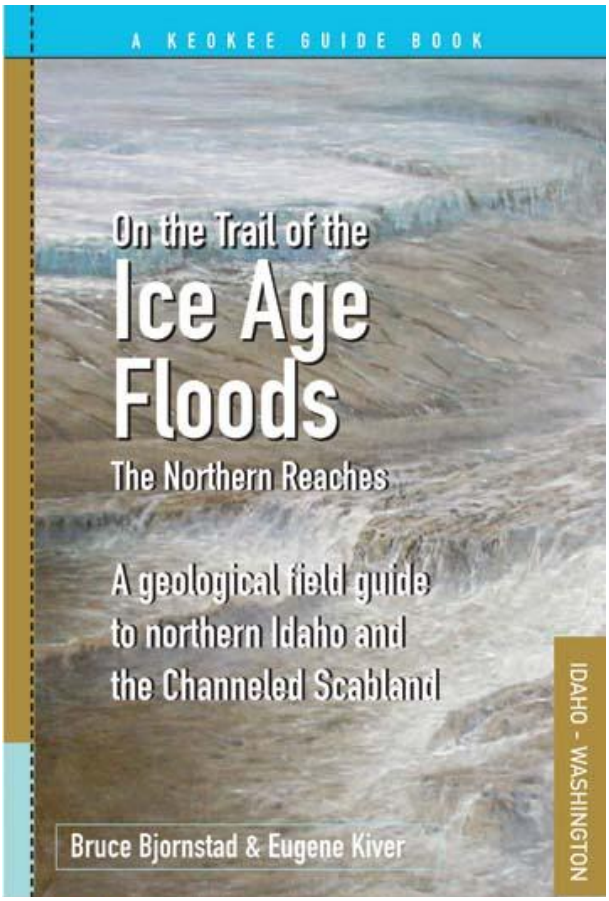


Figure 8. Topographic map showing hiking route through a portion of flood-ravaged Drumheller Channels.

Geological Field Guides for the Ice Age Floods





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Ice Age cataclysms violently transformed the Northwest thousands of years ago, leaving behind scores of flood features, many found nowhere else on Earth. The floods helped gouge out Idaho's largest and deepest lake, Pend Oreille, and sculpted the weird topography of eastern Washington.

Following up on his first volume, *On the Trail of the Ice Age Floods: A geological field guide to the Mid-Columbia Basin*, geologist Bruce Bjornstad joined forces with colleague Eugene Kiver to guide readers upstream – northward into the Channeled Scabland and northern Idaho. The authors explore numerous flood features and present dozens of trails and tours directing readers to experience firsthand, the striking aftermath of the Ice Age floods.