Chapter 27

Water and Wind Gaps—Strong evidence for a Late Cenozoic Flood/post-Flood Boundary

Geomorphology is a gold mine for substantiating the runoff stage of the Genesis Flood, when the waters ran off of the continents and into the ocean basins.[1,2] Geomorphology also gives evidence for a late Cenozoic Flood/post-Flood boundary. Water and wind gaps gives additional evidence supporting this conclusion.

Figure 27.1. Shoshone water gap through the Rattlesnake Mountains west of Cody Wyoming (view west). The Shoshone River flows east toward the viewer, but could have easily gone around the south side of the mountains that end 2 miles (3 km) south of the gap.

[1] Oard, M.J., *Earth's Surface Shaped by Genesis Flood Runoff: Volume I Tectonics and Erosion*, http://michael.oards.net/.

[2] Oard, M.J., 2008. *Flood by Design: Receding Water Shapes the Earth's Surface*. Master Books, Green Forest, AR.

What is a Water and Wind Gap?

A water gap is: "A deep pass in a mountain ridge, through which a stream flows; esp. a narrow gorge or ravine cut through resistant rocks by an antecedent or superposed stream."[3] This definition is flawed because the two speculative mechanisms of an "antecedent or superposed stream" should not be part of a descriptive definition. So, a water gap is a perpendicular cut through a mountain range, ridge, or other structural barrier; it is a gorge in which a river or stream runs through. Figure 27.1 shows the Shoshone water gap, 2,500 feet (760 m) deep, cut through the Rattlesnake Mountains just west of Cody, Wyoming. The Shoshone River could have easily circled the mountain range to the south, a very low area, but did not take the obvious path, an indication the gorge most likely was cut by other forces.

Figure 27.2. The Cumberland wind gap in the Appalachian Mountains along the Virginia/Kentucky border near Middlesboro, Kentucky, USA (view northwest from highway 58). This notch has been eroded down nearly 1,000 feet (300 m).

A wind gap is: "A shallow notch in the crest or upper part of a mountain ridge, usually at a higher level than a water gap."[4] The notch in a ridge has to be an *erosional* notch, not a notch caused by faulting or some other mechanism to meet the definition. In other words, the entire ridge was once near the same altitude, until a cut was eroded perpendicular to the top. A wind gap is considered an ancient or incipient water gap, thought to have formed either when the sediments were thicker in the valleys or before the ridge had uplifted, if the ridge is a fault block.

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[3] Neuendorf, K.K.E., J.P. Mehl, Jr., and J.A. Jackson, 2005. *Glossary of Geology*, Fifth Edition. American Geological Institute, Alexandria, VA, p. 715.
[4] Neuendorf *et al*., Ref. 3, p. 723.

Figure 27.2 shows the famous Cumberland wind gap between Virginia and Kentucky through which the early settlers of the United States traveled westward.

Thousands of Water Gaps Worldwide

Water and wind gaps are common worldwide phenomena. Although there are thousands of wind gaps, this chapter will focus mainly on water gaps, since they are often much deeper and more impressive than wind gaps. Grand Canyon is a unique water gap discussed in Chapter 38. There are 653 water gaps just in the Susquehanna watershed of the northern Appalachian Mountains that range from 75 to 1,768 feet (23 to 539 m) deep.[5] There are well over 1,500 water gaps just in the Appalachians alone.

Figure 27.3. Lodore Canyon of the Green River entering the eastern Uinta Mountains in a slot Canyon 2,300 feet (700 m) high. The river could have easily gone around the eastern edge of the Uinta Mountains several miles to the east at much lower altitudes. Moreover, this water gap is considered young—only 5 Ma within the uniformitarian timescale.

One of the deepest water gaps in North America is Hells Canyon. It cuts through the Wallowa Mountains in northeast Oregon and the Seven Devils Mountains in Idaho.[6] On the

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[5] Lee, J., 2013. A survey of transverse drainages in the Susquehanna River basins, Pennsylvania. *Geomorphology* 186:50–67.

[6] Vallier, T., 1998. *Islands & Rapids: A Geological Story of Hells Canyon*, Confluence Press, Lewiston, ID.

Idaho side, the wall of Hells Canyon reaches a height of 8,000 feet (2,440 m), making it the deepest canyon in North America,[7] even deeper than Grand Canyon.

Another significant water gap is associated with the Green River. It flows through southwest Wyoming to the Uinta Mountains, an east-west range which has almost a dozen peaks exceeding 13,000 feet (4,000 m). On the north side of the Uinta Mountains, the Green River first flows east, parallel to the mountains, before turning south and flowing with entrenched meanders cut into the hard quartzite through the core of the Uinta Mountains.[8,9,10] This water gap is named Lodore Canyon or Gates of Ladore, a narrow slot canyon (Figure 27.3). The river could have flowed only a few more miles (3 km) east and *passed around* the eastern end of the Uinta Mountains at a much lower elevation than the mountain tops.[11] To add to the puzzle, the water gap is considered young, only about 5 million years old (late Cenozoic), within the uniformitarian timescale.[12]

The Zagros Mountains rise up to 15,000 feet (4,575 m) msl in western Iran. They are 1,000 miles (1,600 km) long and 100 to 200 miles (160 to 320 km) wide. They are considered unique in being very "young" within the uniformitarian timescale, only several million years old. The Zagros Mountains have been little modified by erosion, reinforcing their yount. Streams and rivers start near the northeastern margin of the highland and flow southwest through the mountains to Iraq or the Persian Gulf. There are more than *300 water gaps* in the Zagros mountains that split through anticlines, most forming individual mountain ranges.[13,14] These gaps can be as deep as 8,000 feet (2,440 m).[15] The lower walls of some water gaps are nearly vertical, sometimes *overhanging*, and several thousand feet (almost 1,000 m) high.[16] The most impressive aspect of the Zagros drainage is the streams and rivers appear to *shun* valleys, preferring instead to transect mountains—numerous times!

The deepest water gaps in the world are through the Himalaya Mountains. Cliff Ollier noted that we should expect rivers to drain away from the *axis of uplift* of the Himalaya Mountains.[17] However, this is not what we observe. There are eleven rivers that pass south through the Himalayas in water gaps, when they could have more easily snaked around the uplifts and emptied into the Indian Ocean.[14,18,19,20,21] All the major rivers pass through water gaps.[22]

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[7] Vallier, Ref. 6, p. 7.
[8] Thornbury, W.D., 1965. *Regional Geomorphology of the United States*, John Wiley & Sons, New York, NY, p. 330.
[9] Bradley, W.H., 1936. Geomorphology of the North Flank of the Uinta Mountains. *U. S. Geological Survey Professional paper 185—I*, Washington, D.C.
[10] Oard, M.J., 2013. The Uinta Mountains and the Flood: Part II. Geomorphology. *Creation Research Society Quarterly* 49(3):180–196.
[11] Powell, J.L., 2005. *Grand Canyon: Solving Earth's Grandest Puzzle*, PI Press, New York, NY, p. 8.
[12] Powell, Ref. 11, p. 152.
[13] Oberlander, T., 1965. *The Zagros Streams: A New Interpretation of Transverse Drainage in an Orogenic Zone*, Syracuse Geographical Series No. 1, Syracuse, NY.
[14] Oberlander, T.M., 1985. Origin of drainage transverse to structures in orogens. In, Morisawa, M. and J.T. Hack (editors), *Tectonic Geomorphology*, Allen and Unwin, Boston, Massachusetts, pp. 155-182.
[15] Oberlander, Ref. 13, p. 45.
[16] Oberlander, Ref. 13, pp. 12-13.
[17] Ollier, C., 1991. *Ancient Landforms*, Belhaven Press, New York, NY, pp. 31-33.
[18] Seeber, L. and V. Gornitz, 1983. River profiles along the Himalayan arc as indicators of active tectonics. *Tectonophysics* 92:335-367.
[19] Lavé, J. and J.P. Avouac, 2001. Fluvial incision and tectonic uplift across the Himalayas of central Nepal. *Journal of Geophysical Research* 106(B11):26,561-26,591.
[20] Brookfield, M.E., 1998. The evolution of the great river systems of southern Asia during the Cenozoic India—Asia collision: rivers draining southwards. *Geomorphology* 22:285-312.

Water Gaps—A Major Uniformitarian Mystery

Water gaps, as well as wind gaps, are a challenge to uniformitarian geology. C.H. Crickmay colorfully put the problem best when he says that rivers seem to cut water gaps as if there were no mountain barrier:

> Admittedly a fascinating picture, a river runs over low, open plains directly towards seemingly impassable mountains but, undiverted by their presence, passes through them by way of a narrow defile, or water gap, to a lower region beyond.[23]

Twidale and Campbell further add that there is often an easier route around a barrier:

> Yet in many areas we find that the major streams flow across mountain ranges and upland ridges when only a short distance away there is an easier route available.[24]

Uniformitarian scientists always have ideas that attempt to solve a mystery within their paradigm. Water gaps are no exception. There are four main hypotheses. However, there is little if any evidence for any of them. Thomas Oberlander probably has studied water gaps more rigorously than anyone. He has many sobering thoughts on past and present research. For instance, he noted the *conjectural* emphasis in the explanations:

> …the question of the origin of geological discordant drainage [water gaps] has almost always been attacked *deductively*, leading toward conclusions that remain largely within the realm of *conjecture*. Accordingly, the anomalous stream courses are attributed to previous tectonic environment [antecedence], to superposition from *hypothetical* erosion surfaces or covermasses, or to headward extension under largely *unspecified* controls [stream piracy] (emphasis mine).[25]

Twenty years later, Oberlander expressed the same opinion:

> Large streams transverse to deformational structures [water gaps] are conspicuous geomorphic elements in orogens [mountain ranges] of *all ages*. Each such stream and each breached structure presents a geomorphic problem. However, the *apparent absence of empirical evidence* for the origin of such drainage generally limits comment upon it (emphasis mine).[26]

He further stated:

> Transverse streams in areas of Cenozoic deformation are routinely attributed to stream antecedence to structure; where older structures are involved the choice includes antecedence, stream superposition from an unidentified covermass, or headward stream extension [stream piracy] in some unspecified manner. Whatever the choice, we are *rarely* provided with conclusive supporting arguments (emphasis mine).[27]

John Douglas, who is trying to revive the lake spillover hypothesis for the origin of Grand Canyon, stated:

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[21] Fielding, E.J., 2000. Morphotectonic evolution of the Himalayas and Tibetan Plateau. In, Summerfield, M.A. (editor), *Geomorphology and Global Tectonics*, John Wiley & Sons, New York, NY, pp. 201-222.
[22] Fielding, Ref. 21, p. 205.
[23] Crickmay, C.H., 1974. *The Work of the River: A Critical Study of the Central Aspects of Geomorphology*, American Elsevier Publishing Co., New York, NY, p. 154.
[24] Twidale, C.R. and E.M. Campbell, 2005. *Australian Landforms: Understanding a Low, Flat, Arid and Old Lanscape*. Rosenberg Publishing Pty Ltd, New South Wales, Australia, p. 192.
[25] Oberlander, Ref. 13, p. 1.
[26] Oberlander, Ref. 14, p. 155.
[27] Oberlander, Ref. 14, pp. 155-156.

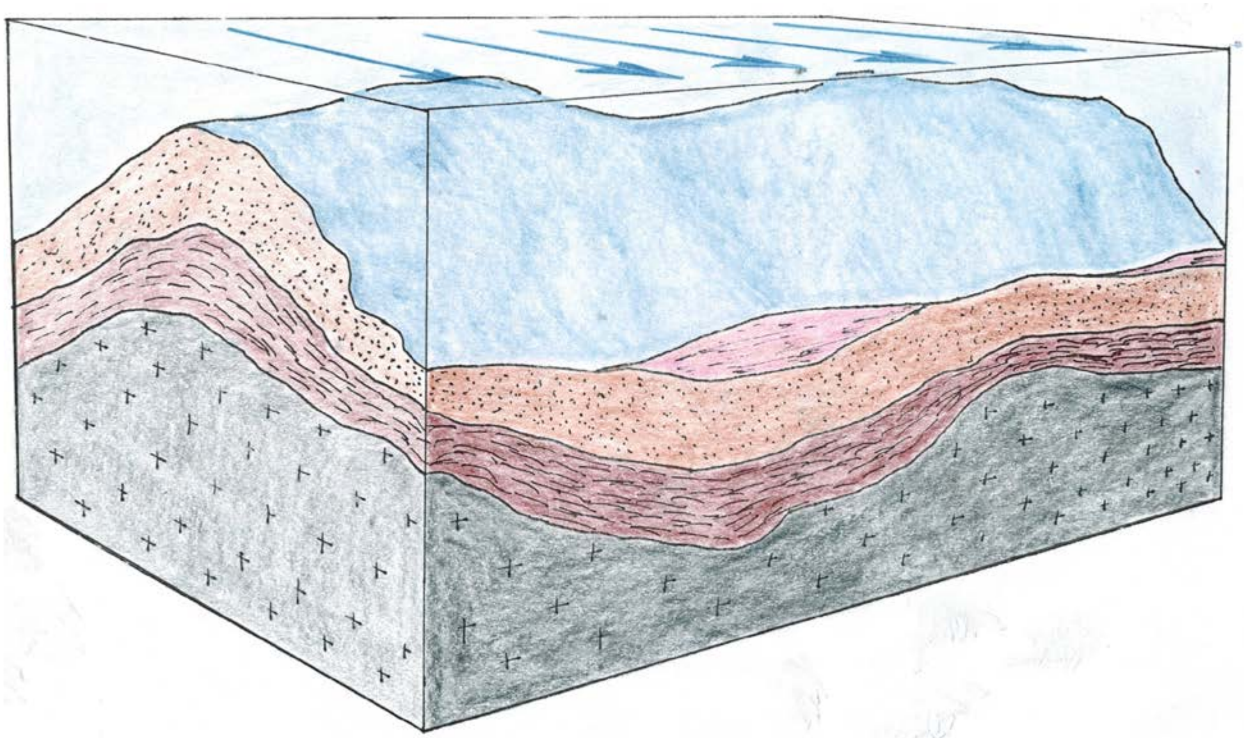
> Despite more than two centuries of study, our understanding of transverse drainage development remains very much in its infancy … No general theory building has allowed transverse drainage research to move beyond a compilation of empirical data with *intuitive explanations being the norm* (emphasis mine)."[28]

So, we really have just collected data on water gaps and at this point uniformitarian scientists only have speculative ideas with little or no evidence.

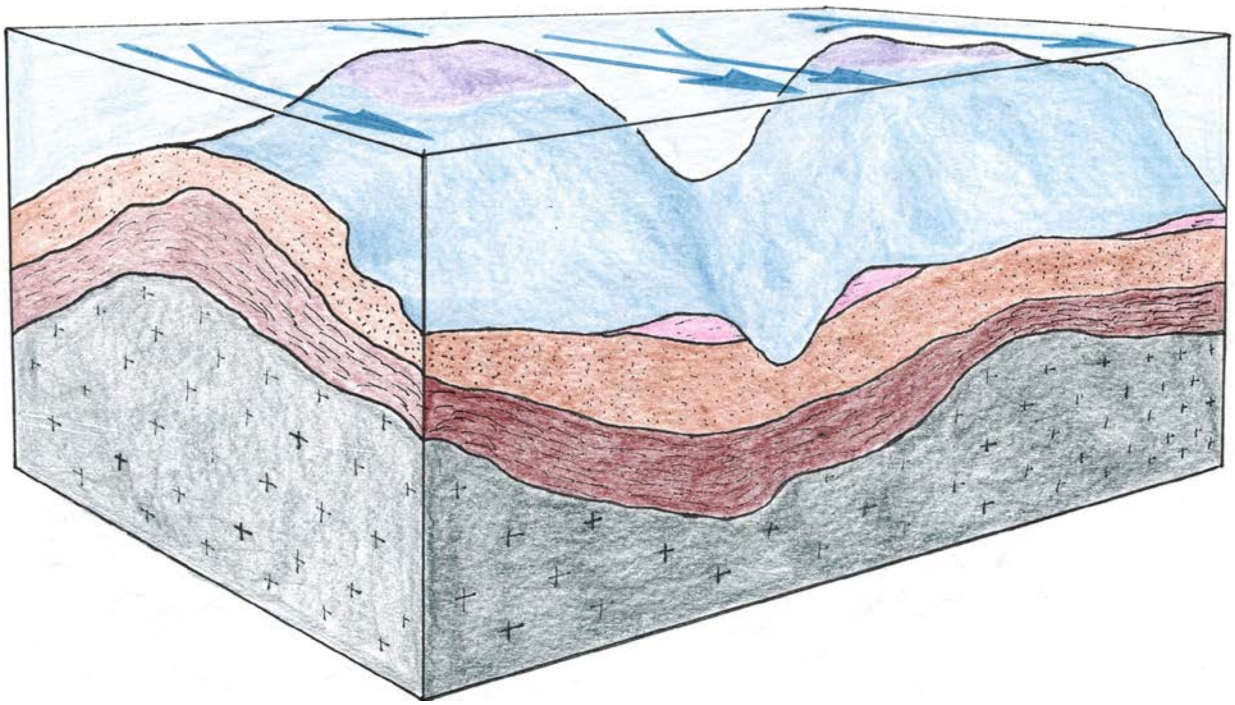
How Can Water and Wind Gaps be Cut after the Flood?

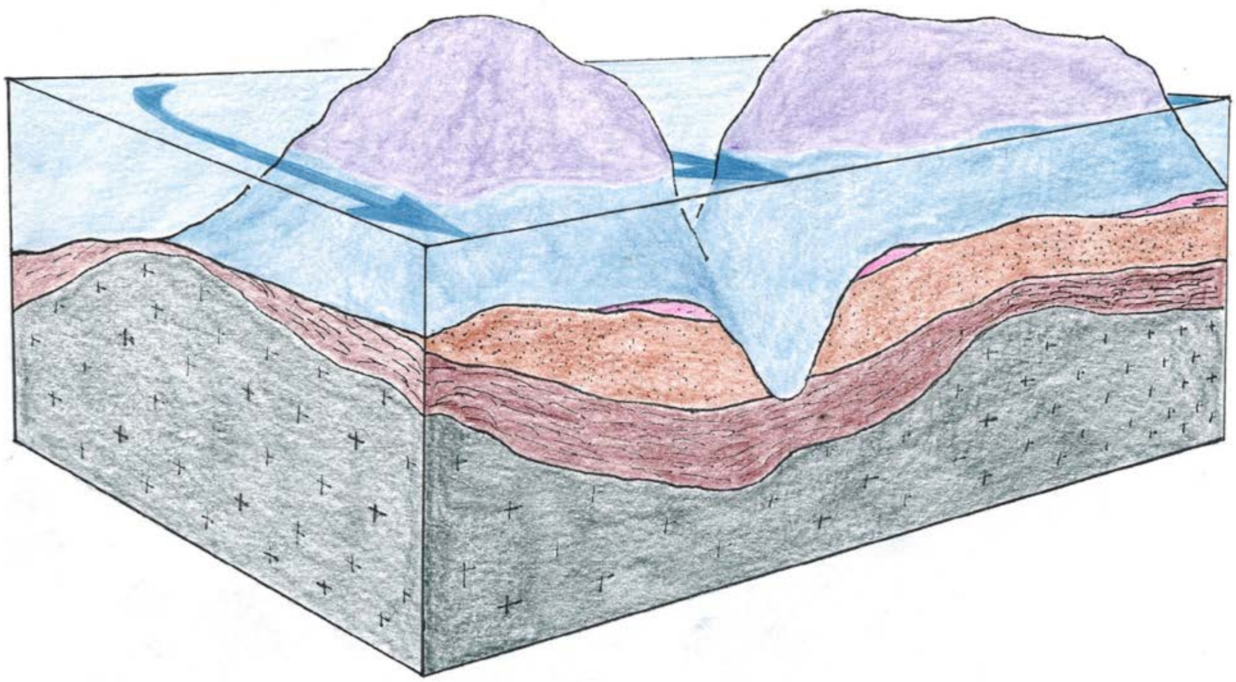
Once again, a post Flood date for water and wind gaps, for those who believe the Cenozoic is post-flood, leaves these creationist struggling with the same difficulties as the uniformitarian scientist. What watery event could possibly cut water and wind gaps across mountains, ridges, or plateaus, after the Flood? First, there is little time available for such feats of erosion. Second, there is no post-Flood catastrophic mechanism even suggested for the origin of water and wind gaps. One cannot even imagine how these remarkable gorges, many at high altitudes, were cut in local mountainous areas after the Flood.

Assuming the uniformitarian geological column for sake of discussion, most water and wind gaps are dated late Cenozoic. Some of the statements by uniformitarian scholars above indicate the late Cenozoic formation of major water gaps. This timing implies the Flood/post-Flood boundary is in the late Cenozoic, often in the very late Cenozoic.



[28] Douglas, J.C., 2005. Criterion approach to transverse drainages. PhD thesis, Arizona State University, Tucson, AZ, pp. 20, 40.





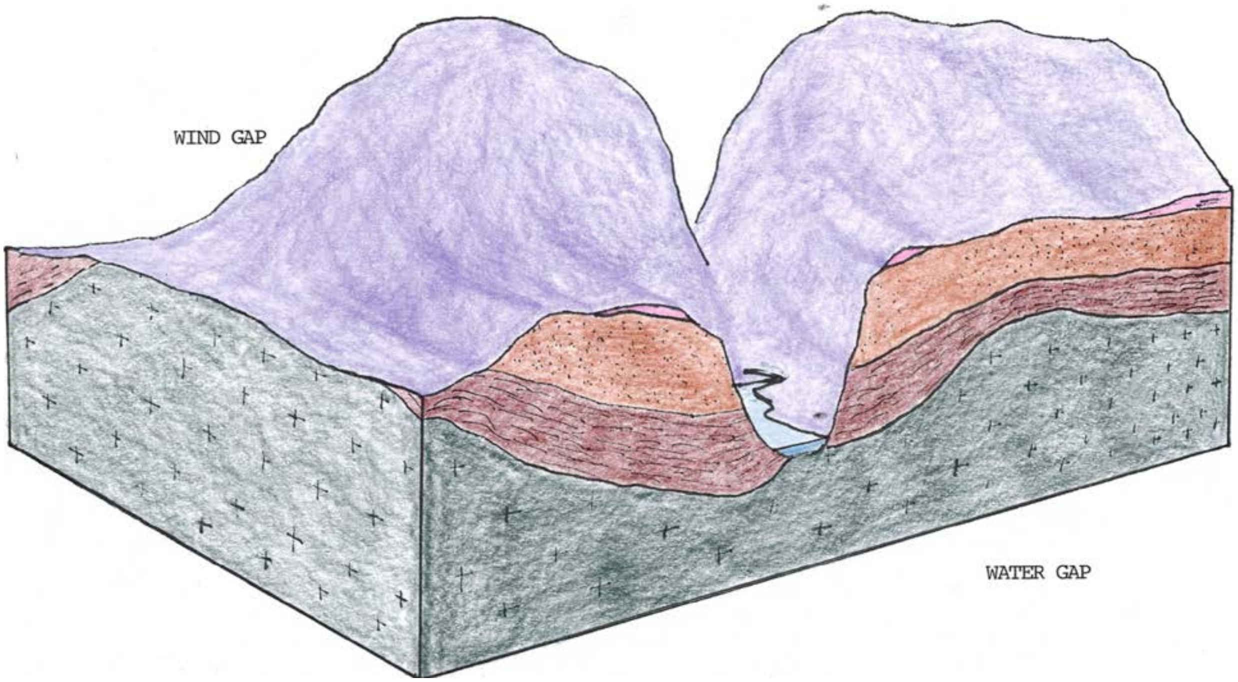


Figure 27.4a-d. Schematic showing the formation of water and wind gaps (drawn by Peter Klevberg).
a) Water flowing perpendicular to a transverse ridge forms shallow notches on the ridge.
b) Notches erode deeper as the water level drops below the top of the ridge.
c) Floodwater continues to drain with continued erosion as the notches deepen.
d) Floodwaters are completely drained with a river running through the lowest notch, the water gap. Erosion ceased too early through the other notch, leaving a wind gap.

Channelized Floodwater Easily Cuts Water and Wind Gaps during the Late Cenozoic

It is not difficult to conceive of the Genesis Flood cutting water and wind gaps by water flowing perpendicular to barriers. Water and wind gaps would be rapidly formed after the runoff changed from sheet to channelized flow. Figure 27.4 is a schematic of how the Genesis Flood could produce water and wind gaps during drainage off the continents. Wind gaps probably represent notches that formed early, and for some reason the current velocity decreased or was diverted. Erosion proceeded only so far and stopped. The water may have been diverted by upstream or downstream tectonics, or the velocity slowed in the area of the wind gap, or a nearby notch hogged all the water. These future wind gaps would then remain at elevations too high for a stream or river to flow through so only wind blows through the gap today. Therefore it is called a wind gap.

Furthermore, the Flood paradigm has an *example* of how a well-substantiated catastrophic flood at the peak of the Ice Age created a water and wind gap.[29] The Lake Missoula flood from a 2,000-foot (610 m) deep lake trapped in the valleys of western Montana by a finger of the ice sheet in northern Idaho spread 540 mi^3 (2,210 km^3) of water through eastern Washington. The water was about 600 feet (180 m) deep flowing over what is now Spokane, Washington; 1,000 feet (330 m) deep rushing through the Columbia Gorge; and 400 feet (120 m) deep spreading over what is now Portland, Oregon. One major pathway of the Lake Missoula flood was the

[29] Oard, M.J., 2004. *The Missoula Flood Controversy and the Genesis Flood*, Creation Research Society Monograph No. 13, Chino Valley, AZ.

Cheney-Palouse scabland tract in the eastern part of the flood path. The southern portion of this tract includes the upper portion of Washtucna Coulee. Prior to the flood, the Palouse River rising from the mountains of northern Idaho flowed westward through this coulee and then into the Columbia River. The Snake River flows parallel to the Washtucna Coulee about 10 miles (16 km) south. There is an east-west basalt ridge that was covered by about 100 feet (30 m) of the Palouse silt between the Snake River and Washtucna Coulee. This ridge is about 500 feet (150 m) above the Snake River. The Lake Missoula floodwater rushed south into the head of Washtucna Coulee. It overtopped the ridge between Washtucna Coulee and the Snake River at generally four locations, forming a 500 feet (150 m) deep water gap (Figure 27.5) and wind gap (Figure 27.6) predominantly in hard basalt. After the Lake Missoula flood, the Palouse River, instead of continuing its flow westward through Washtucna Coulee as before, took a 90° left hand turn and flowed south through what is now called Palouse Canyon and into the Snake River. Palouse Canyon is therefore a water gap formed during the Lake Missoula flood. A barrier at the northern end of Devils Coulee keeps water from flowing through the wind gap. This example demonstrates how catastrophic floods can easily produce water and wind gaps.

Figure 27.5. Narrow-walled, meandering Palouse Canyon downstream (south) from Palouse Falls, southeast Washington, carved in several days by the Lake Missoula flood.

Figure 27.6. Devils Coulee wind gap carved in several days by the Lake Missoula flood (view north from near the Snake River).