Chapter 6

Thin, Widespread, Sedimentary Layers

Many thin, widespread layers are evident in the sedimentary rocks. *Thin* of course is relative and depends upon the area the layer extends. A layer several hundred feet thick and covering 100,000 mi^2 (245,000 km^2) would be considered thin and widespread. A few sedimentary layers can be traced over half of the United States (see Figure 1.10). Many other layers are regional. It seems the lowest layers in the geological column are the most extensive, with the size decreasing upward in the geological column.

This criterion applies mostly to the Precambrian and Late Paleozoic Boundary Models. I will use examples from North America, of which I am most familiar, beginning with the lower sedimentary layers and continuing up the geological column. I will not extrapolate from one continent to another, since it has not been established to my satisfaction that the continents were once connected.[1] I will use only the observational data of various formations.

Formations Difficult to Explain by the Precambrian Boundary Model

There are three formations that are considered post-Flood by advocates of the Precambrian Boundary Model. Beginning at the Grand Canyon, these are the Cambrian Tapeats Formation, the late Paleozoic Redwall Formation, and the late Paleozoic Coconino Sandstone. It is difficult to explain how these thin, widespread formations were deposited after the Flood. The K/T model requires continental to regional sedimentation events large enough to efficiently erode and transport material sometimes over a thousand miles.

The Extent of the Tapeats Sandstone and Its Equivalents

The Grand Canyon is a good place to begin our survey; since the sedimentary layers are well exposed in the walls (see Figure 3.1). The lowest horizontal formation, lies on top of granites and metamorphic rocks, as well as tilted Precambrian rocks, and is called the Tapeats Sandstone (see Figure 1.6). It is a course grained sandstone about 100 to 325 feet (30 to 100 m) thick, that thins and pinches out over basement highs and contains conglomerate at its base.[2,3] Above the Tapeats Sandstone is a green shale with worm burrows called the Bright Angel Shale (see Figure 1.8), followed upward by carbonates of the Muav Limestone. This vertical sequence, called the Tonto Group, forms a fining upward change in rock type that can be explained by several large scale processes, namely by mass flow, a decrease in current velocity, or deepening water. The Tonto Group can be traced at least1,000 miles (1,600 km) northward into Wyoming and Montana, where I have seen it for myself (see Figures 1.7 and 1.9). According to Dr. Andrew Snelling, the Tapeats Sandstone and its equivalents, are given different names in different locations, and can be traced through much of the United States eastward to the Blue Ridge Mountains (see Figure 1.10). The Tapeats and its equivalents are a thin layer of sandstone that lies on top of mostly basement igneous and metamorphic rocks covering more than half of the United States.[4] Dr. John Morris shows the "pancake" layer of the Tapeats sandstone and its equivalents extending up through western Canada and into northerneast Canada.[5,6]

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[1] Reed, J.K., 2000. *Plate Tectonics: A Different View*, Creation Research Society Books, Chino Valley, AZ.
[2] Middleton, L.T. and D.K. Elliott, 1990. Tonto Group. In, Beus, S.S. and M. Morales (editors), *Grand Canyon Geology*, Oxford University Press, New York, NY, pp. 83-117.
[3] Barnhart, W.R., 2012. A hydrodynamic interpretation of the Tapeats Sandstone—Part I: basal Tapeats, *Creation Research Society Quarterly* 48(4):288–311.
[4] Snelling, A.A., 2009. *Earth's Catastrophic Past: Geology, Creation & the Flood*, volume 2, Institute for Creation Research, Dallas, TX, pp. 501-510.
[5] Morris, J.D., 2000. *Wonders of Creation: the Geology Book*, Master books, Green forest, AR, p. 35.

Figure 6.1. Redwall Limestone just above its contact with the Muav Limeson (just above the trail) with about 150 million years of missing uniformitarian time as seen from the North Kaibab Trail.

The Extent of the Redwall Formation and Its Likely Equivalents

The Redwall Limestone of Grand Canyon (Figure 6.1) lies on top of the Tonto Group and can be traced northwest into Wyoming, Montana, and the Black Hills of South Dakota as the Madison Limestone (Figure 6.2). It continues eastward and is likely correlated to the late Paleozoic limestones in the Midwest and the Appalachian Valley and Ridge Province west of the Blue Ridge Mountains.

The Coconino Sandstone and Its' Equivalents Extend into Texas, Kansas, and Oklahoma

The Coconino Sandstone lies well above the Redwall Limestone in Grand Canyon (Figure 6.3). It is the white layer shown near the top of Figure 3.1. According to Dr. Steve Austin, the Coconino and its equivalents extend eastward into Texas, Kansas, and Oklahoma over an area of at least 200,000 mi^2 (500,000 km^2).[7] Whereas the Coconino Sandstone is considered a wind-blown sand in Arizona, its equivalent, the Glorietta Formation in New Mexico, is considered marine. Maybe, in truth, both were laid down by water.

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[6] Morris, J.D., 2012, *The Global Flood: Unlocking Earth's Geologic History*, Institute for Creation Research, Dallas, TX.

[7] Austin, S.A., 1994. Interpreting strata of Grand Canyon. In, Austin, S.A. (editor), *Grand Canyon—Monument to Catastrophism*, Institute for Creation Research, Dallas, TX, pp. 21-56.

Figure 6.2. The Madison limestone in the Little Belt Mountains, central Montana (courtesy of Peter Klevberg who provides the scale).

Formations Difficult to Explain by the Late Paleozoic Boundary Model

Three formations from the Mesozoic, considered post-Flood by advocates of the Late Paleozoic Boundary Model are the Morrison and Navajo Formations and the Shinarump Conglomerate of the western United States.

The Morrison Formation

As we climb higher upward in the geological column into the Mesozoic, we come to thin, widespread formations that outcrop at regional scales. Mesozoic sediments are rare in the Midwest and less extensive in the eastern United States. The Morrison Formation is one of the largest in the United States, covering over 390,000 mi^2 (one million km^2) from southern Alberta and Saskatchewan, Canada, south to New Mexico, USA (Figure 6.4). But the type of sedimentary rock varies. It is not like the Tapeats Sandstone and its sandstone equivalents in other states which are consolidated sand. Therefore, it could be difficult to determine if the area covered by the "Morrison Formation" represents a single sedimentary event," since it is mainly dated by dinosaur fossils. But I will assume the Morrison Formation is a single depositional layer for the sake of discussion.

Figure 6.3. The Coconino Sandstone just below the North rim of Grand Canyon.

The Navajo Formation and Its Equivalents

Another regional formation is the Navajo Sandstone and its equivalents. It is about 2,000 feet (600 m) thick in the canyon walls of Zion National Park (Figure 6.5) and covers 156,000 mi^2 (400,000 km^2) of the western United States[8] (Figure 6.6). This formation is also one of many supposed wind-blown sandstones of the Colorado Plateau, which all show a direction of transport from the north. It stretches the imagination for sand-laden, northerly winds to consistently blow over the Colorado Plateau, let alone blow for hundreds of millions of years. Looking to the north there is no source for the sand. The evidence, however, strongly indicates the Navajo Sandstone was laid down in a water environment.[9] It is interesting to note uniformitarian geologists believe that the source of the tremendous amount of sand in the Colorado Plateau sedimentary rocks is about 1,200 miles (2,000 km) away, from around the Appalachian Mountains.[10,11] Since they postulate normal rivers it becomes difficult for uniformitarianism as well as post-Flood catastrophism to explain.

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[8] Pratt, S., 2003. Tracing the Navajo Sandstone. *Geotimes* 48(11):6–7.

[9] Oard, M., T. Vail, D. Bokovoy, and J. Hergenrather, 2010. *Your Guide to Zion and Bryce Canyon National Parks: A Different Perspective*, Master Books, Green Forest, AR.

[10] Oard, M.J., 2009. Colorado Plateau sandstones derived from the Appalachians? *Journal of Creation* 23(3):5–7.

[11] Froede Jr., C.R., 2004. Eroded Appalachian Mountain siliciclastics as a source for the Navajo Sandstone. *Journal of Creation* 18(2):3–5.

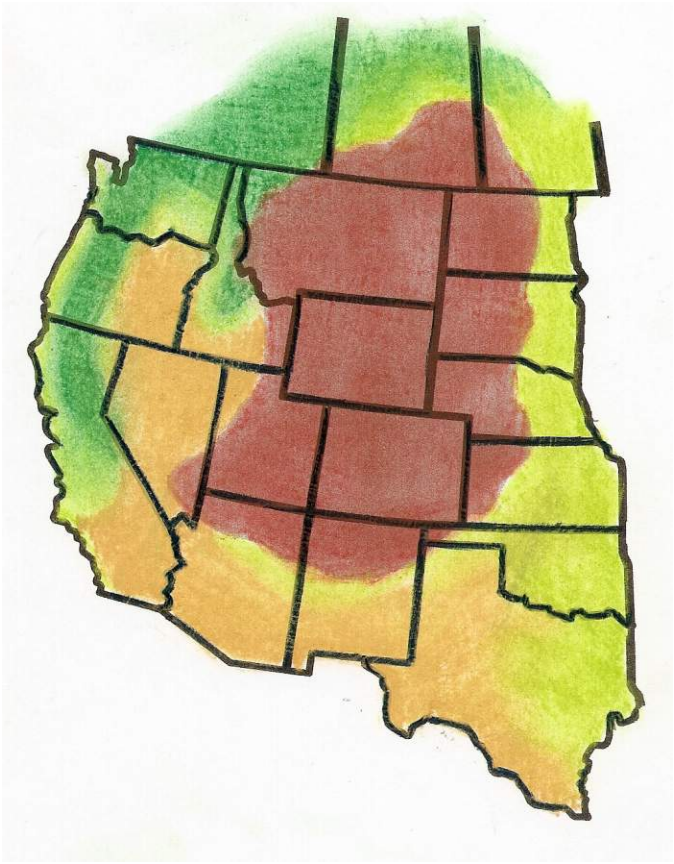

Figure 6.4. The area of the Morrison Formation (brown pattern) from northern New Mexico and Arizona north into southern Alberta and Saskatchewan.

The Shinarump Conglomerate

Another widespread layer on the Colorado Plateau is the Shinarump Conglomerate.[12] It is about 50 feet (15 m) thick and covers more than 100,000 mi^2 (250,000 km^2).[13] It is mostly made of sand and rounded pebbles (Figure 6.7). There is nowhere on earth where present processes (uniformitarianism) have deposited a uniform thickness of sand and gravel over a huge, generally level area. Furthermore, after deposition, large areas of the conglomerate were eroded leaving behind numerous erosional remnants. How can this be explained by post-Flood catastrophism or uniformitarianism?

Thin, Widespread Sedimentary Layer in the Cenozoic—the Fort Union Formation

The Cenozoic Era has fewer widespread/thin sedimentary layers, but there are enough to make it difficult to explain by the K/T Boundary Model. For example, the Fort Union Formation of early Cenozoic age within the geological column was described in Chapter 5. It is composed of sandstone, shale, and coal. It outcrops over an area of about 60,000 mi^2 (150,000 km^2) (see Figure 5.1). The area where it is supposed to have been eroded is about 117,000 mi^2 (300,000 km^2), making its total area once 177,000 mi^2 (450,000 km^2). The Fort Union Formation is around

[12] Brand, L., 1997. *Faith, Reason, and Earth History*. Andrews University Press, Berrien Springs, MI, pp. 222-223.
[13] Snelling, Ref. 4, pp. 519-520.

1,000 feet (300 m) thick in eastern Montana and western North Dakota,[14] and because of its large are can be considered thin and widespread.

Figure 6.5. Cliff in Zion National Park, the top 2,000 feet (600 m) of whch is Navajo Sandstone.

Advocates of the K/T Boundary Model will have no trouble ascribing all of the formations briefly described above, except for the Fort Union Formation, to the Flood. John Whitmore and Paul Garner claimed at the 2008 International Conference on Creationism that the Fort Union Formation was deposited during the post-Flood period.[15] But the Fort Union Formation is on a scale close to some of the widespread, thin Mesozoic formations described above. Its pre-erosion size was larger than the Shinarump Conglomerate, and is similar in size to the Navajo Sandstone and its equivalents, and half the area of the Morrison Formation.

[14] Belt, E.S., Hartman, J.H., Diemer, J.A., Kroeger, T.J., Tibert, N.E., and Curran, H.A., 2004. Unconformities and age relationships, Tongue River and older members of the Fort Union Formation (Paleocene), western Williston Basin, U.S.A., *Rocky Mountain Geology* 39(2):113–140.

[15] Whitmore J.H. and P. Garner, 2008. Using suites of criteria to recognize pre-Flood, Flood, and post-Flood strata in the rock record with application to Wyoming (USA). In, Snelling, A.A. (editor), *Proceedings of the Sixth International Conference on Creationism*, Creation Science Fellowship and Institute for Creation Research, Pittsburgh, PA, and Dallas, TX, pp. 425-448.

Figure 6.6. Area of the Navajo Sandstone and its equivalents (dark brown pattern).

However, there are additional problems, if the Fort Union represents a post-Flood formation, besides the problem of Sentinel Butte described in Chapter 5. It includes dozens of coal layers, some very thick and more than 200 feet (60 m) thick, including the Wyodak Coal Seam mined at Gillette, Wyoming (see Chapter 13 and Figure 13.1). It would be extremely difficult to form coal after the Flood, and it does not appear to be forming now. Worse, there is no source of plant material after the Flood. Advocates of post-Flood catastrophism must explain how this much plant material was ripped up, transported, concentrated, and then buried in the Fort Union Formation—after the Flood. So, coal presents further evidence for the Flood formation of the Fort Union Formation (see Chapter 13).

Summary

The global Flood is a ready explanation for the vast regional and continental thin and widespread sedimentary rock layers. Such layers deposited in water require a Flood mechanism of at least regional extent, which seems unlikely. Since some of Cenozoic sedimentary rocks are large scale, this places the Flood/post-Flood boundary well above the early Cenozoic.

Figure 6.7. An outcrop of the Shinarump Conglomerate in northeastern Arizona (Tom Hamilton provides the scale).