

## Beware of paleoenvironmental deductions

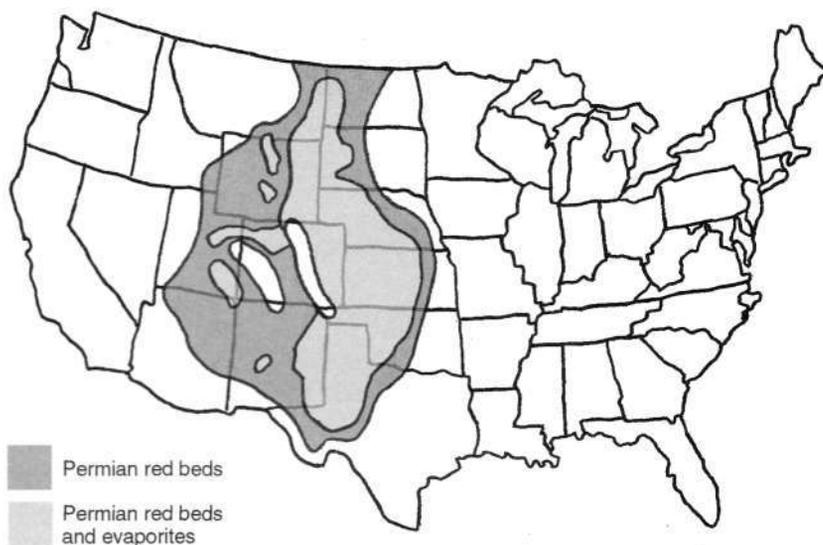
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As a reader of the geological literature, I am amazed by the paleoenvironmental interpretations that are so often made. Rarely do the researchers qualify their interpretations with 'possibly', 'maybe', or other such words to indicate uncertainty. We read, for example, that a particular conglomerate was **laid down by a braided stream**, or such-and-such siltstone was **deposited by oscillating tides**. Sometimes they will even tell you what the climate was like millions of years ago when formation X was laid down. These paleoenvironmental deductions use the uniformitarian assumption and are usually based on the type and character of the formation and the particular fossils contained in the rock. Here is one such statement about a Permian evaporite formation in the North American mid-continent deposited over an estimated area of 200,000 km<sup>2</sup>:

*They were deposited in non-marine saline lakes, pans and mud-flats, settings that are typically assumed to have been alkaline.*<sup>17</sup>

Usually these evaporites would automatically be assumed to have been deposited in non-marine saline lakes, pans and mud-flats. They would have simply stated that the environment was alkaline, except for a rather shocking new discovery, which sheds light on the value of such paleoenvironmental deductions as well as on the uniformitarian assumption.

The researchers analyzed fluid inclusions within halite from the evaporite formation.<sup>2</sup> These inclusions provide information on the properties of the fluid from which the 'evaporite' precipitated. The analysis revealed that the formation was deposited in an **extremely acid environment with a pH less than 1**. Saline lakes are normally alkaline, so discovering such



Map of the United States showing the Permian red beds and evaporites, which were interpreted as an ancient lake of strong and concentrated acid! (after Benison et al.)<sup>1</sup>

acidity should cause the researchers to ask whether the formation was really laid down in saline lakes, pans and mud-flats. But not bashful about further paleoenvironmental interpretations, the researchers now state that the evaporites were deposited in the same environment over a 200,000 km<sup>2</sup> area in very acidic lakes. Furthermore, the 'paleolakes' were shallow, based on salt crusts and desiccation cracks. 'Root features' also are found in this highly acidic paleoenvironment. The best modern analog the researchers could find is a series of natural acid lakes in southern Australia with a pH ranging from 2 to 4 — much higher than suggested for the Permian formation.

It is interesting how the addition of just one variable can upset so much previous environmental interpretation. Although they can find a poor comparison in southern Australia, a highly acidic lake and groundwater system over such a large area defies uniformitarianism and should cause the researchers to question their basic assumptions. The authors do suggest that paleoenvironmental interpretations for other formations should be checked more closely.

For creationists, this report warns us about paleoenvironmental interpretations.<sup>3</sup> Some of these interpretations may be okay. However, many are

simply an outgrowth of uniformitarianism, and the modern analogs they employ are often poor. Paleoenvironmental interpretations need to be checked thoroughly within the creationist Flood paradigm. After all, the Flood was unique in earth history. Deductions based on uniformitarianism are fraught with error.

If the highly acidic fluid inclusions in the evaporites represent the pH of the water during the Flood in this area when the formation was precipitated, it indicates that some, if not all, Flood depositional environments were unique. What would cause such a highly acidic environment over such a large area during the Flood? There is work to be done by creationist chemists.

### References

1. Benison, K.C., Goldstein, R.H., Wopenka, B., Burruss, R.C. and Pasteris, J.D., Extremely acid Permian lakes and ground waters in North America, *Nature* 392(6679):911, 1998.
2. Benison et al, Ref. 1, pp. 911-914.
3. Froede Jr, C.R., *Field Studies in Catastrophic Geology*, Creation Research Society Technical Monograph 7, Chino Valley, Arizona, pp. 7-13, 1998.