

Did a Significant Cool Spell Mark the Demise of Megafauna?

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The end of the Pleistocene Epoch was marked with steadily warmer temperatures and the great ice age glaciers that covered vast areas of North America were in retreat.

Except for a 1,000-year period when things once again suddenly got remarkably colder, the cause of which is a mystery that researchers of the period have argued over for years.

Geologically, the start of this period is marked by a “black mat” of organically rich soil. Below the mat is the evidence of late Pleistocene flora and fauna, including the very large animals that once roamed across North America: mammoth and mastodons, dire wolves, horses, short-faced bears and others.

Also just below the line is the evidence of the humans who hunted these animals, called Clovis for their large fluted stone spear points first found by archaeologists at Clovis, N.M. Above the line, neither the megafauna nor the Clovis points are anywhere to be found.

C. Vance Haynes Jr., a Regents’ Professor of anthropology and geosciences at The University of Arizona, analyzed the black mats at nearly a hundred archaeological sites in North America. Stratigraphically they represent the beginning of what’s known as the Younger Dryas cooling period that began about 10,900 years ago and lasted until about 9,800 years ago. This also includes sites along Arizona’s San Pedro River that Haynes and others have excavated over the years.

Haynes' current study ("Younger Dryas 'black mats' and the Rancholabrean termination in North America") is published in the April 21 issue of the *Proceedings of the National Academy of Sciences' Online Early Edition*.

The black mats are dark gray or black soil deposits that contain a higher organic carbon content than in either the strata above or below. While not all alike, the mats all represent relatively moist conditions of the time, such as cooler temperatures and rising water tables, which likely signaled an abrupt change in climate as well.

More than two dozen archaeological sites have yielded mammoth bones blanketed by black mat. Some of these sites also contain Clovis artifacts, leftovers of the technology that was developed to kill and process very large animals.

One large species that survived the Younger Dryas extinction period was the American bison. The increased number of bison kill sites and evidence of cultural diversity also point to a significant human population increase following the Clovis period.

What caused this phenomenon is far from settled. About all that is known for certain is that the extinction of the giant Pleistocene mammals came about fairly quickly, possibly in as little as a century.

Paul Martin, a recognized expert on Quaternary geology and a retired UA geoscience professor, has argued that human predation was responsible for the demise of the animals. The Quaternary is the most recent geologic time period and includes the Pleistocene.

Haynes counters that humans would have had to have killed all of these animals everywhere at the same time. Others have suggested the demise of megafauna came from mass epidemics.

One theory suggests a comet or asteroid impact, citing microscopic glass-like carbon particles found at the base of the black mats as evidence. Again, Haynes, based on his work at Murray Springs along the San Pedro River, says these compounds could just as easily be cosmic dust that constantly rains down on Earth.

Haynes says he's skeptical of an extraterrestrial impact event as the genesis of the Younger Dryas period and the end of North America's giant animals, but he also acknowledged that "something happened at 10,900 B.P. that we have yet to understand," adding that the E.T. theory needs further testing.

Source: University of Arizona

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