

# Sediment Gives Glimpse of Sand Hills' Past Climate

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Pollen and bugs are acting as weathermen in the Midwest — but the weather information they're providing is thousands of years old.

A geology doctoral candidate at the University of Nebraska-Lincoln and a scientist with the National Oceanic and Atmospheric Administration (NOAA) in Michigan have been doing separate studies using lake sediments to determine past climates.

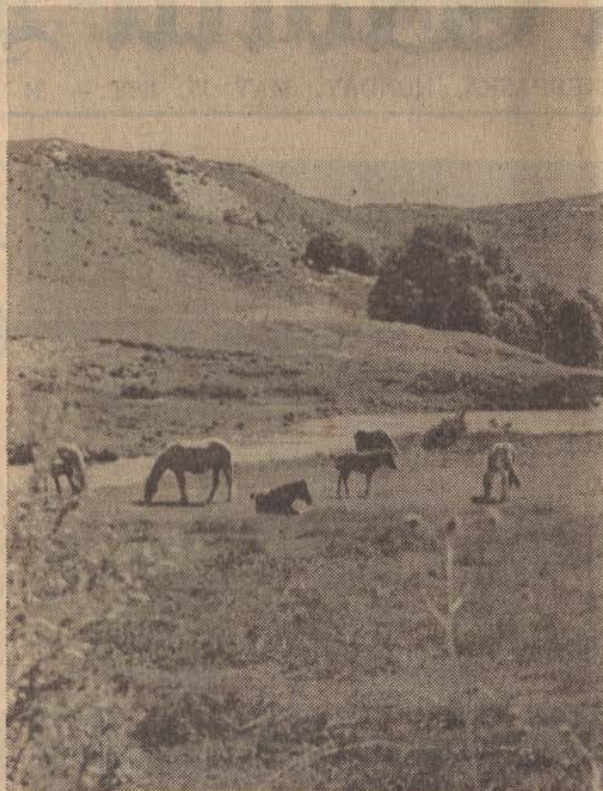
David Maroney of the conservation and survey division at UNL says in a doctoral dissertation that samples taken from points in the Nebraska Sand Hills indicate the sand in those areas was moving from 3,000 to 7,000 years ago, indicating a desert climate.

Maroney said in an interview he believes as a result of his studies that it is possible the Sand Hills are no more than 10,000 years old.

## Samples

Maroney said he took samples of organic sediment from dry lakes under dune sand, some of it 120 feet deep, in the Sand Hills. He worked in a 50- to 60-mile stretch at the southern edge of the Halsey National Forest where it abuts the Dismal River, then west to the river fork south of Mullen on Highway 97.

He said carbon-14 dating of the sediment showed it was 3,000 to 7,000 years old and existed during a relatively damp,



Sand Hills . . . near the Dismal River.

cool period. It was then covered by blowing sand, indicating dry weather.

"This doesn't mean that the Sand Hills were deposited at that time," Maroney said, "but it is suggestive of that."

He said it has been documented that there was a sheet of ice over northeastern Ne-

braska some 12,000 years ago. In all likelihood, there was high atmospheric pressure over the glacier, which was retreating.

"High pressure over the ice could have produced wind powerful enough to create a cold desert," he said. "The weather system was there to provide a source of wind to blow the Sand

Hills dunes."

Maroney said other carbon-14 dating has shown some Sand Hills sediment 8,000 to 12,000 years old.

## Interest

He said a slight climatic change, such as worldwide warming, could turn today's Sand Hills into a desert again. "We're not that far removed from that," he said.

Maroney said there is added interest in his studies because archaeologically it's known that Indians lived along the area of his studies 3,000 years ago and about 7,000 years ago.

"But there is a cultural hiatus in those 4,000 years between," he said. "I'm inclined to think that may be because Indians don't like blowing sand any better than anyone else."

Maroney said he needs "lots of hard data" to document his theory that the Sand Hills are no more than 10,000 years old and plans to return to take lake sediment core samples this summer. The conservation and survey division will finance the study, as it has his other work, he said.

## Pollen

As for implications for the future from his studies, Maroney said: "We have a neat little catch-phrase in geology that the key to the present is the past. If we can determine when the Sand Hills were active and why, it could be predictive."

J. Christopher Bernabo, National Research Council resi-

## Tree Rings Tell Tale Of Western Climate

Arthur Douglas, a professor of geology at the University of Nebraska in Lincoln, said two studies of past climate in the Midwest, one in Michigan and the other in the Nebraska Sand Hills, offer information about an area of the country where little is known.

"We have information on climate for the western United States taken from the rings of trees alive at those times," he said.

He said information on other areas of the country, and worldwide, has been documented, including a "little ice age" from 1450 to 1850. That cool period was noted in Michigan studies by J. Christopher Bernabo of the National Oceanic and Atmospheric Administration by studying fossil pollen in lake sediment.

Douglas said that the ice age has been documented elsewhere, that ice over Scandinavia and the Alps expanded until 1850 and has been retreating ever since.

"But we didn't know that much about it in the Midwest," he said.

Douglas said all studies of past climates bring predicting future climatic changes closer.

As for the near future, Douglas, who makes seasonal weather forecasts based on the surface temperature of the Pacific Ocean, said that Nebraskans can expect a "cool and wet" summer.

dent research associate with the Environmental Data Service of NOAA, also believes that predicting future climatic changes may hinge on knowing what's gone before.

Bernabo has studied fossil pollen in lake sediments taken in Michigan. His studies cover a more recent period than Maroney's. He said his initial research indicates that the last 30 years in the upper Midwest

have been warmer than any similar period for the last 775 years.

He also noted a "little ice age" from 1450 to 1850, with temperatures averaging about 2 degrees cooler than those for the past 30 years.

Bernabo's climatic estimates are based on pollen accumulations in lake bottom mud. The types of pollen change according to climatic changes.