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Farming Was Extensive in Ancient North America, Study Finds

A millenniums-old settlement in Michigan has archaeologists rethinking the rise of agriculture on the continent.

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A new study has found that a thickly forested sliver of Michigan's Upper Peninsula is the most complete ancient agricultural location in the eastern United States. The Sixty Islands archaeological site is recognized as the ancestral home of the Menominee Nation. Known to the members of the tribe as Anaem Omot (Dog's Belly), the area is a destination of pilgrimage, where remains of the settlement date to as far back as 8,000 B.C.

Located along a two-mile stretch of the Menominee River, Sixty Islands is defined by its cold temperatures, poor soil quality and short growing season. Although the land has long been considered unsuitable for farming, an academic paper published on Thursday in the journal Science revealed that the Menominee's forbears cultivated vast fields of corn and potentially other crops there.

"Traditionally, intensive farming in former times has been thought to be mostly limited to societies that had centralized power, large populations and a hierarchical structure, often with accumulated wealth," said Madeleine McLeester, an environmental archaeologist at Dartmouth College and lead author of the study.

“And yet until now the assumption has been that the agriculture of the Menominee community in the Sixty Islands area was small in scale, and that the society was largely egalitarian.”

The findings of the new survey indicate that from A.D. 1000 to 1600 the communities that developed and maintained the fields were seasonally mobile, visiting the area for only a portion of the year. They modified the landscape to suit their needs, by clearing forest, establishing fields and even amending the soil to make fertilizer.

“This may force scholars to rethink some ideas that are foundational to archaeological theory and to archaeology generally,” Dr. McLeester said.

A ground-level view of the ridged garden beds at Sixty Islands. Madeleine McLeester

Mapping an ancient site

In the spring of 2023, when the snow cover was gone but the leaves had not yet emerged, Dr. McLeester and her team conducted a drone-based LIDAR survey over some 330 remarkably intact acres of Sixty Islands, about 40 percent of the site.

LIDAR uses pulses of laser light to create a detailed map of Earth's surface. Over the last decade, archaeologists have relied heavily on the technology; drone-based LIDAR has only become practical or possible within the last few years. "It provides much higher resolution, which enables us to recognize subtle features that would otherwise be invisible," said Jesse Casana, the Dartmouth archaeologist who operated the drone.

The survey detected looted burial mounds, ritual earthworks, a circular dance ring, the remnants of 19th-century logging camps, the foundation of a building that may have been a colonial trading post, and, most unexpectedly, a raised ridge field system, where grouped garden beds had been built with heights ranging from four to 12 inches.

Cultural features other than agricultural field ridges were also visible, including top left, a newly documented dance ring; middle top, a building foundation; top right, a 19th-century logging camp; bottom left, a looted burial mound; bottom center, remains of the Backlund mound group; and bottom right, a burial mound. Carolin Ferwerda and Jesse Casana

John Marston, an archaeologist at Boston University who was not involved with the project, said most traces of agricultural features at Native American sites were erased during the 20th century by the introduction of mechanized farming. “The Sixty Islands region appears to preserve features that were likely much more widespread across eastern North America at the time of European contact,” he said. For the record, that was in 1634.

The landscape at the site is covered by quilt-like patterns, created by parallel ridges oriented in different directions. This suggested to Dr. McLeester that the ridge locations were decided by individual farmers, rather than dictated by the natural environment. And what did these premature agronomists cultivate? “Crops such as corn, beans and squash,” Dr. McLeester said.

A sacred landscape

According to one version of the Menominee creation story, a holy man, inspired by a dream, told a search party to journey through the morning with the promise of finding a treasure when the sun reached its highest point at noon.

At midday, the story goes, the leader of the party spotted an unfamiliar object. “This is corn,” he declared. “We will call it Wapi’min, white kernel.” The others sampled the Wapi’min, liked it, and took some kernels back with them. They sowed the seeds in the spring and watched them flourish.

Twenty-five years ago, David Overstreet, an archaeologist at the University of Wisconsin who lived and worked with Menominee elders, discovered the site’s elevated agricultural beds. He proposed that the planting mounds protected against frost and that the depressions between ridges served to manage moisture. In 2023, he helped convince federal officials to place Sixty Islands on the National Register of Historic Places.

Madeleine McLeester excavating a cross section of one of the garden beds. Jesse Casana

While surveying the terrain, Dr. McLeester and her crew excavated three raised ridges set at varying distances from the Menominee River. The recovery of charcoal, broken pottery and other artifacts suggested to them that ancient farmers probably used burned household waste, wetland soils and possibly sturgeon guts as compost to enrich their fields. Carbon dating of the charcoal showed that the ridges were rebuilt over a 600-year span, beginning around A.D. 1000 during what is known as the Late Woodland period in North America.

Matthew Boyd, an anthropologist at Lakehead University in Thunder Bay, Ontario, said the study should make scholars and the general public cast aside many assumptions about the Indigenous peoples of antiquity. He believes that on the eve of European colonialism, the ancestors of the Menominee were highly successful farmers who most likely produced large surpluses of corn and other foods in a less-than-ideal setting and profoundly altered the natural landscape to increase its productivity.

“They developed a very sustainable agricultural system capable of supplying food from the same fields for hundreds of years,” Dr. Boyd said.

The land and its findings are threatened by large-scale industry in the area. For the last decade, the Menominee Nation has battled open-pit mining companies that hope to extract gold, silver, zinc and copper in the area.

Susan Kooiman, an anthropologist at Southern Illinois University in Edwardsville, considers the new survey, initiated by the tribe and carried out in partnership with them, a model for ethical archaeology, particularly in light of previous practices that disenfranchised descendant communities from their heritage.

“Sixty Islands is part of a sacred landscape for the Menominee,” Dr. Kooiman said. “It’s important that it be documented before it’s potentially destroyed.”

A correction was made on June 8, 2025*: An earlier version of this article misidentified the academic affiliation of Susan Kooiman. It is Southern Illinois University in Edwardsville, not in Carbondale.*
