Louisiana EPSCoR
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH VOL.6 NO.2 FEBRUARY 2009

LA Archaeologist's Research Transforms Ancient Maya Knowledge

Solving ancient Maya civilization mysteries dating back over 1,300 years has become a way of life for LSU professor Heather McKillop. Her 'modus operandi'—shallow underwater excavation—make her feats that much more intriguing.

She has literally transformed the knowledge of ancient Maya architecture and economy through her discoveries of ancient Maya wooden building remnants, a massive salt industry, and the first ancient Maya wooden canoe paddle. She also proved that tropical trees have tree-rings that can be used to determine their age.

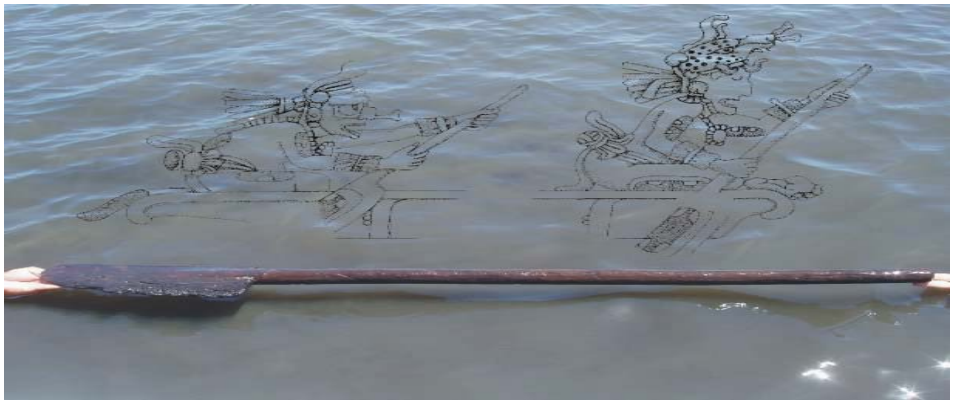
Dr. McKillop was awarded a LA EPSCoR Pfund or seed grant to fund an important segment of her archaeological fieldwork at ancient Maya sites in Belize. During the past 30 years, she has located, investigated and mapped the country's shallow coastal and underwater sites.

"Following earlier discoveries of salt works on the Belize coast, in 2004 I initiated a comprehensive survey aimed at investigating the scale of salt production in southern Belize. Knowing that Late Classic Maya (A.D. 600-900) sites were buried at least one meter below the water table, I decided to look where no-one else was looking, in the water," she says.

She and a three-member team began the search by systematically traversing lagoons in five square acres in an isolated edge of Belize Paynes Creek National Park.

"What we found— posts and beams of wooden buildings and artifacts— stunned the archaeological community and transformed our knowledge of the ancient Maya architecture and economy," says Dr. McKillop.

Preserved in a peat bog below the sea floor, untouched for 1,300 years, they provided the only evidence of walls and other wood from ancient Maya architecture. Twenty-three underwater sites with wooden architecture and the wooden canoe paddle were discovered during the 2004 survey; 100 sites were found in 2005-07 field trips.



The first reported ancient Maya wooden canoe paddle from the K'ak Naab' salt works, radiocarbon dated to the Late Classic (A.D. 660-880). The drawing shows two of the paddler gods from an incised bone from a Maya Temple burial. (Drawn by Mary Lee Eggart, Photo by H. McKillop)

"The LA EPSCoR grant opened new doors for me, " she says. "My number of collaborators and participating students has increased and we now have a proper lab and equipment."

One hundred posts were flagged in one location; up to 4,000 wooden posts and artifacts have since been flagged for mapping and future study by her teams. To store and analyze the spatial data, she developed a computerized mapping system and geographic information system.

"Extensive deposits of 'briquetage'—salt drying and transporting pottery vessels—confirmed that the buildings were used in the ancient Maya salt industry." says Dr. McKillop.

"While sources of salt were scarce in the Yucatan interior where the Classic Maya civilizations were located, research indicated a strong inland demand for salt," she continues.

"Researchers had long wondered where the some 80 Maya city states obtained salt. The 103 sites that we ultimately discovered indicate there was a large industry for the production, storage and distribution of salt, the white gold of the ancient Maya."

The first evidence of ancient Maya waterborne navigation, the wooden canoe paddle, corroborates the shape of paddles shown in ancient Maya art, which differs from modern Maya and other paddles.

The evidence of a massive salt industry and significant infrastructure for production and transportation, indicate that the ancient Maya political economy was more complexly organized than previously considered, adds Dr. McKillop.

A 200-year gap in the radiocarbon dating of her team's early wood discoveries led the LSU professor to turn to tree-ring dating for more precise dating. In part dependent on the amount of moisture available to a tree, tree-ring dating is in its infancy in the tropics; some doubted it could be done.

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About Dr. McKillop

The LSU William G. Haag Professor of Archaeology, Dr. Heather McKillop has authored six books or monographs on the Ancient Maya civilization, had her research covered by hundreds of newspapers worldwide, and various magazines, notably Natural History and Geotimes, NPR and Belize TV.

She has a book contract with University Press of Florida for her manuscript, Underwater Maya: Mapping Ancient Maya Wooden Architecture below the Sea Floor, which she is completing through a LA Board of Regents Support Fund (BoRSF) Louisiana Artists and Scholars Award.

Dr. McKillop has been invited to lecture throughout the U.S. and abroad, including an invitation to discuss ancient salt with scholars from around the world at the 2006 Ancient Salt Industry in China Workshop.

Dr. Heather McKillop holding a wood sample cut from a post at a lagoon salt works in one hand and a measuring tape and knife in the other.

The Canadian native joined the LSU faculty as an assistant professor in 1990 and has held a secondary appointment in the Department of Foreign Languages and Literature since 2005. She earned her Ph.D. from the University of California-Santa Barbara and her M.A. and B.S. from Canada's Trent University.

A member of a number of national archaeological organizations, in 1992 she was appointed to Louisiana's Archaeological Survey and Antiquities Commission and has served as chair since 1994.

Besides Louisiana EPSCoR and BoRSF, Dr. McKillop has been the recipient of grants from, among others, the National Science Foundation, National Geographic Society, Foundation for the Advancement of Mesoamerican Studies, LSU, and Earthwatch/Center for Field Research.

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"We could see rings in teak, leading me to believe we could use annual rain fall data for dating purposes," she says. " A nearby family had collected and recorded daily rainfall records for 35 years. Coupling that information with our enormous data base of water logged wood samples we created sequence by comparing modern core samples to the water samples."

In 2008, with funding from her LA EPSCoR Pfund grant, Dr. McKillop carried out basic experimental research in tropical tree ring-dating in Belize. "We collected 124 increment core samples from modern trees in order to investigate the occurrence and interval of rings at the LSU Forestry Departments Tree-Ring Lab. Cross-sections of the cores were photographed and the 35-year rainfall information were compared with the increment core rings."

"The LA EPSCoR grant opened new doors for me," she says. "My number of collaborators and participating students has increased and we now have a proper lab and equipment. "It also enabled me to bring in a number of experts: A leading wood anatomist to identify the water-logged wood and establish a protocol for preparing samples and identifying wood species of selected posts, and two conservation specialists to evaluate and experiment on how to best cut and study the waterlogged samples for the tree-ring study, which is on-going."

"We are able to see rings in the ancient wood post samples. Our wood is deteriorating from bacterial growth so it's critical to study it as soon as possible after its removal from the peat bog. In the future, we will cut samples in our Belize field lab, photograph them under a microscope and have them identified in the field by our wood atomist.

"We are also in the process of extending our underwater excavation by literally diving into deeper waters. So far, we have removed 15 levels of sediment from below the seafloor, representing 4,000 years of sea-level rise, that we are now in the process of studying and analyzing."

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