

Scientists uncover prehistoric hurricane activity

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Hurricanes Katrina and Rita focused the international spotlight on the vulnerability of the U.S. coastline. Fears that a "super-hurricane" could make a direct hit on a major city and cause even more staggering losses of life, land and economy triggered an outpouring of studies directed at every facet of this ferocious weather phenomenon. Now, an LSU professor takes us one step closer to predicting the future by drilling holes into the past.

Kam-biu Liu, George William Barineau III Professor in LSU's Department of Oceanography and Coastal Sciences, is the pioneer of a relatively new field of study called paleotempestology, or the study of prehistoric hurricanes. Liu, a long-time resident of Louisiana, became even more interested in the subject during the aftermath of Hurricane Katrina, when a national debate was sparked concerning hurricane intensity patterns and cycles.

"People were discussing the probability of a Category 5 hurricane making direct impact on New Orleans," said Liu. "That's tricky, because it's never actually happened in history. Even Katrina, though still extremely powerful, was only a Category 3 storm at landfall."

Currently, experts tend to agree that Atlantic hurricane activity fluctuates in cycles of approximately 20-30 years, alternating periods of high activity with periods of relative calm. But records of such events have only been kept for the last 150 years or so. What would happen, Liu wondered, if you looked back thousands of years? Would larger cycles

present themselves?

How does a scientist study storms that happened during prehistoric times? "Basically, we worked under the assumption that the storm surge from these catastrophic hurricanes would have the capability to drive sand over beach barriers and into coastal lakes," said Liu. "This is called an overwash event. We believed that pulling sediment cores from coastal lakes and analyzing the sand layers might give us the information we needed." The same methodology can be used to find overwash sand layers in coastal marshes. Using radiocarbon analysis and other dating techniques, Liu and his research team worked to develop a chronology of prehistoric storms in order to analyze any emerging patterns or cycles.

This methodology has proven successful for the group. In an article printed in the March issue of *American Scientist*, the magazine of Sigma Xi, the Scientific Research Society, Liu states that evidence from the Gulf Coast drill sites shows that hurricanes of catastrophic magnitude directly hit each location only approximately 10 – 12 times in the past 3,800 years. "That means the chances of any particular Gulf location being hit by a Category 4 or Category 5 hurricane in any given year is around 0.3 percent," said Liu.

After spending more than 15 years studying dozens of lakes and marshes along the U.S. Gulf and Atlantic Coasts, Liu and his students are moving on to a more tropical location. Liu was recently awarded more than \$690,000 from the Inter-American Institute for Global Change Research, or IAI, for his new project titled "Paleotempestology of the Caribbean Region," which is slated to run for five years. He serves as the principal investigator for this international and multi-disciplinary project, which involves 12 other co-investigators from four different countries, including another contributor from LSU, Nina Lam, a professor in the Department of Environmental Studies.

Source: Louisiana State University

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