



Friends of the Randell Research Center

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Impacts of Climate on the Life History of Clams

by Kylie Palmer

Clams are a popular food choice in Southwest Florida. Clam chowder, seafood pasta, stuffed clams – the delicious options are seemingly endless! Because of our desire to consume clams, the hard clam, *Mercenaria*, heavily contributes to shellfisheries' stocks in the United States. So what is going to happen to this economically and ecologically important species with changing climate conditions, such as an

Mercenaria complete a fascinating multi-stage metamorphosis going from life as a microscopic creature with cilia, to a tiny one with lobes for swimming, to one possessing a hard shell living on the bottom. Bivalve shellfishing contributes over \$1 million annually to the US marine fisheries industry.



Fossil Mercenaria were collected by Kylie from a mid-Pliocene exposure (Duplin Formation) located in Tarheel, NC. Mercenaria have a long geologic history, originating 23 million years ago. (Photo by Donna Surge.)

increase in seawater temperature? One way to determine their response to warming temperatures is to compare growth rates and lifespans of fossil and modern *Mercenaria* across a latitudinal gradient from cold and warm climate conditions. To do this, I collect fossil *Mercenaria* shells from both mid-Pliocene (3.3 – 3 million years ago, warm climate) and early Pleistocene (2.58 - 0.78 million years ago, cool climate) deposits in Florida, North Carolina and, Virginia. I have also been collecting living *Mercenaria* along the coast at similar latitudes. Once back at the lab, we cut the shells in half to expose the light and dark increments that we use to measure annual growth rate and age, much like what scientists who study tree rings do. I will be comparing those life history measurements within and among modern and fossil populations in the context of warm versus cold climates.

This summer, Randell Research Center (RRC) volunteers helped collect living *Mercenaria* from Pine Island Sound. Shells collected by the RRC volunteers will serve as a modern Florida population, and their life history will be compared to fossil and other modern *Mercenaria* collected for this study. Findings will contribute to a larger conservation paleobiology project funded by the National Science Foundation that will further our understanding of the biological response of economically and ecologically important marine clams during projected future warming of seawater.





GOOD QUESTIONS

Where Did the Calusa Come From?

by Cindy Bear

Visitors to the Calusa Heritage Trail often notice that the Calusa seem quite different from other Indian people in the United States who they have learned about. A natural question, then, is "Where did the Calusa come from?" It is a more complicated question than it might first appear.

The Pineland Site was occupied by the first century A.D., about 2,000 years ago. These people may have been the direct ancestors of the historically known Calusa, but we are not entirely convinced. By 500 years later, about A.D. 500, we are more certain that the people at Pineland were ancestors of the Calusa because of similarities in artifacts, such as their shell tools and pottery.

Some visitors wonder if the Calusa migrated to Florida from the Caribbean, Mexico, or South America. There is no archaeological evidence whatsoever that supports the notion that the Calusa came into Florida from those places.

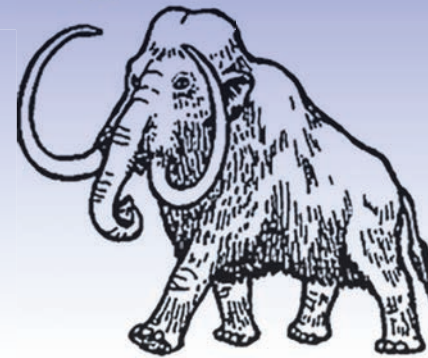
Some visitors know that there were Indian people in Florida by 14,500 years ago, a time when there were still mastodons and saber-toothed cats here. Evidence of these Floridians comes from sites that are primarily underwater today, either off the coast or in freshwater bogs, springs, and rivers. Again, a natural question is, "Where did those people come from?"

As recently as 30 years ago, archaeologists believed that people had first come

from Asia into North America across a land bridge that connected present-day Alaska and Siberia. As glaciers melted at the end of the Ice Age, an ice-free corridor allowed passage into the Great Plains about 14,000 to 13,000 years ago. There were no known artifacts dating earlier. However, many archaeologists reasoned that some people may have migrated down the Pacific coast. These would have been fishing people who traveled in boats, subsisting on fish, sea mammals, and plant foods. Unfortunately, back then there was no undisputed evidence for the Pacific coastal migration theory.

Today, there are enough carefully excavated sites and well regarded DNA studies to show that the Pacific coastal corridor was a viable route for people into the Americas as early as 17,000 years ago, certainly by 16,000 years ago. On the other hand, the inland land bridge was not easily passable until 14,000 to 13,000 years ago.

A new publication by anthropologist Michael Waters reviews recent dates from archaeological sites across North and South America and summarizes genetic traits to establish dates of movement and origins of the earliest North Americans. The evidence shows that people lived successfully in many places in North America by 15,500 years ago and that people lived in South America by 14,200 years ago. Waters details the genetic traits compiled and then writes, "Genetic studies conclusively show that



Evidence now confirms that people lived in Florida when mastodons and other megafauna were present. (Image by Merald Clark.)

the first Americans did not originate from Europe." The data "clearly show that eastern Asia was the homeland of the first Americans."

We have no genetic information for Calusa people to contribute to these data sets. This makes it impossible to link them to specific places and timelines of human movements. We still think that *before 17,000 years ago, there were no humans in North and South America*. So, the best answer we can give to "Where did the Calusa come from?" is, we are not sure, Florida has been populated much longer than people realize. As a whole, the Calusa people living at Pineland, Mound Key and other towns across Southwest Florida when Europeans arrived in the 1500s had benefitted from ancestral knowledge of a unique environment. No doubt that knowledge was critical to sustaining their ways of life so well and for such a very long time.

To learn more, see **Late Pleistocene Exploration and Settlement of the Americas by Modern Humans**, by Michael R. Waters. *Science* 365 (6449), 12 July 2019. DOI: 10.1126/science.aat5447 A copy is available in the RRC library at the Ruby Gill House.

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May 10, 2019 – August 10, 2019

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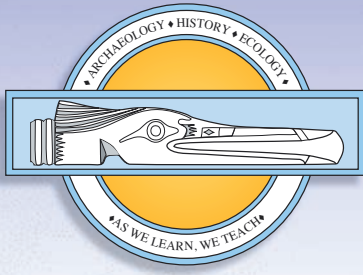
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Friends of the Randell Research Center

Pineland, Florida • September 2019
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Sincerely,

Cindy Bear
Co-Director
Randell Research Center



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Photo by A. Bell.

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The Randell Research Center is a program of the Florida Museum of Natural History, University of Florida.

Thank you for your support.



A Tour of the Islands of Pine Island Sound: A Geological, Archaeological, and Historical Perspective

Part 17: Mason Island

by Dené Patterson

Mason Island is a mangrove island located in the eastern part of Pine Island Sound about five miles northwest of St. James City. It is state-protected and managed by the Florida Department of Environmental Protection, and is not open to the public.

Mason Island is about one mile long from north to south. It is about one-half mile wide at its widest point. It has two parts connected by a thin corridor of mangroves running north-south. The northern part of the island is a small, circular mangrove key estimated to be about 700 feet in diameter. The southern part is a trapezoidal shape about 1320 feet long (north-south) by 1200 feet wide (east-west) tapering to about 500 feet wide at its southernmost end.

Mason Island has a very old shell midden ridge nearly two acres in area, described by one archeologist as extremely large compared to other shell midden ridges in the greater Charlotte Harbor region. The ridge is vegetated by tropical gumbo limbo, papaya, buttonwood, strangler fig, and indigo berry.

Mason Island has suffered more vandalism than any other site in the Pine Island Sound. State law enforcement has been required. In recent years, perpetrators were apprehended and prosecuted for



Looking east over two small keys are Mason Island and continuing back, mangrove keys, a strip of tidewater, Pine Island, Matlacha Pass, and the mouth of the Caloosahatchee River near the horizon. (Photo by Ron Mayhew.)

illegal shell mining. Damaged areas were cleaned and the vertical walls profiled, measured, photographed, and mapped, and pits were refilled in specific ways to alert future archeologists that certain parts had been disturbed.

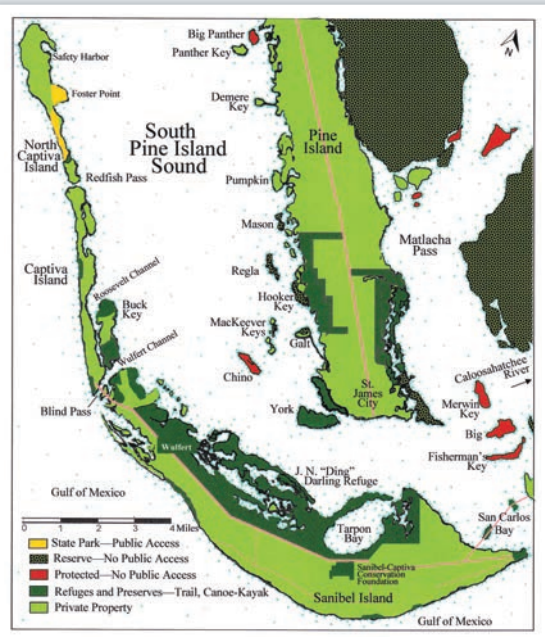
Archaeology of Mason Island

The earliest radiocarbon date from Mason Island falls in a range between 380 and 230 B.C. on a shell from a disturbed portion of a ridge. During this time, Mason Islanders would have been contemporaneous with people living on Josslyn Island, where more than seven feet of shell midden were deposited, and with people on Sanibel Island, Useppa Island, Cabbage Key, and Burgess Island. Other sites in northern Charlotte Harbor were also occupied during those decades. Sea level was about two feet lower than present sea level, according to geologic evidence from Sanibel Island. A lack of occupational data from 230 B.C. through A.D. 620 on Mason Island prevents inferences for that duration but it does not mean it was not continuously occupied, just that no formal archaeological studies on undisturbed matrix have been completed yet.

Another human occupation of Mason Island may have occurred between A.D. 620 and 1110, based on radiocarbon date ranges taken in a profile sample of the shell midden mound in a different area of the island. The initial evidence from Mason Island suggests that the human occupants engaged in short-term fish and shellfish collection whereby processing activity occurred on Mason Island's mounded ridge of shells; however, the structure of the deposits does not indicate intentional, long term habitation as if it had been a central village site, such as Josslyn Island or Demere Key. The Mason Island site also may have been associated with a collecting station on a nearby island such as Regla Island, and could have possibly been associated with a prehistoric burial site in the vicinity.

Historic Era on Mason Island

According to archeologists, a twentieth-century settler's occupation was once centrally located along the aboriginal shell ridge, with some historic-era habitation debris such as glass fragments and rusty nails partially visible on the surface. A 1944 aerial photograph shows two houses or shacks, a dock and a boat, and possible net spreads. This occupation appeared on aerial photos through at least 1958, but is not visible today.



(Map by Dené Patterson.)



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Ecology Update

Osprey Nesting



Image by Rod Partington

In our March edition we announced that five osprey pair were incubating eggs and we wrote that chick survival would be one indicator of estuary health following the devastating red tide events of

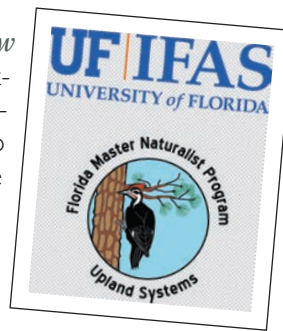
2018. Three of the five nests did have chicks hatch and all were protected and cared for by the parent birds. However, we are saddened to report that no chicks survived. Unfortunately, osprey nesting throughout our region was dismal. In May 2019, the International Osprey Foundation reported that of 73 nests monitored on Sanibel Island only 18 chicks fledged and on Fort Myers Beach 30 nests fledged only 8 chicks. Red tide is not a new phenomenon in Florida waters but evidence shows human activities are feeding the nearshore blooms. For more information on red tide visit floridamuseum.ufl.edu/earth-systems/blog/tag/red-tide/



Upcoming Events

FMNP Uplands Class

Do you know why saw palmettos are important to frogs? Do you know the names and habits of South Florida's forest birds? Do you wonder why the Florida scrub has so many unique species of plants? All these topics and more will be covered in the Florida Master Naturalist Program (FMNP) Uplands Systems course being offered at the Calusa Heritage Trail beginning Wednesday, November 6.



This adult education course, designed by the University of Florida IFAS, provides instruction on the ecology, habitats, and conservation of Florida's pine flatwoods, scrub, hammocks, prairies and rangelands. It also teaches interpretive skills and

environmental ethics. Classes include lectures, hands-on activities, and field trips.

Classes will take place from 8 a.m. to 4 p.m. on Wednesdays and Fridays, November 6, November 8, November 13, November 15, and November 20, and November 22, 8 a.m. to 4 p.m. The cost is \$275 which includes all field trips, a student workbook, and, on completion, a FMNP

Several events are in the planning stages. To receive regular updates, be sure to provide us your email address, check our website at www.floridamuseum.ufl.edu/rrc, and remember to friend us on Facebook!

Uplands patch, lapel pin, and registration in the FMNP Graduate Database. To register visit the website at: <http://www.master-naturalist.ifas.ufl.edu/>. For more information, visit the website or call instructor Cindy Bear at 239-283-6168.



RRC News

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