Finding Submerged Paleoindian and Archaic Archaeological Sites: Experiences from Karstic NW Florida

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Abstract

This poster presents the results of several years of offshore research in Northwest Florida, tracking the PaleoAucilla drainage system and encountering artifacts and faunal remains at several locations, including two large sites, J&J Hunt and Ontolo. Topics include: principles and methods for finding submerged prehistoric sites, stratigraphic details and radiocarbon dating, and artifact distributions, characteristics, and typologies.

Principles and methods

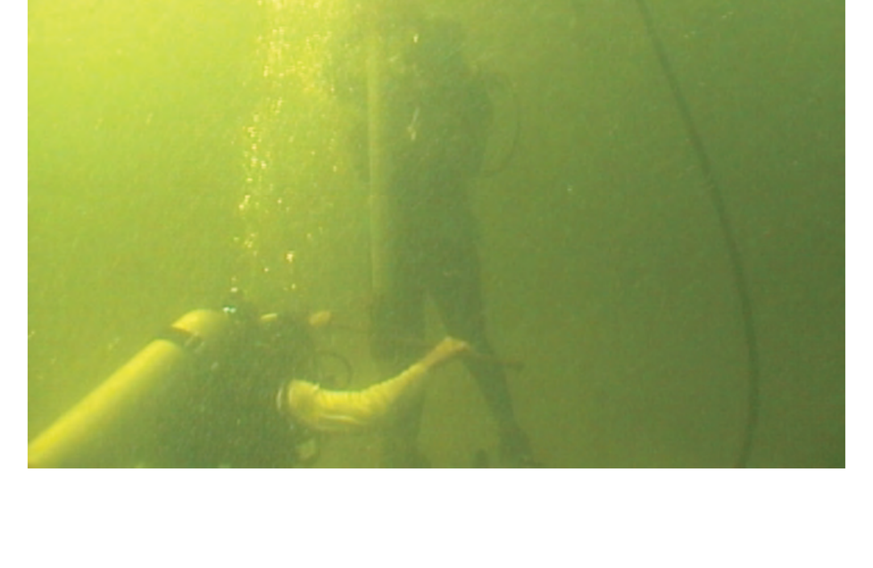
There are several principles and methods that have been developed to predict, find, and manage submerged prehistoric sites.

One important factor is the presence of sites of appropriate ages at times locally, when sea levels were lower. This means knowing site distributions in time and space, as well as local culture history in order to understand the meaning of the artifact types and diagnostics found offshore. In the Big Bend of Florida, there is evidence for Clovis people by 11,000 B.P. and a substantial amount of evidence for their progeny around 10,000 B.P. Evidence seems to slack off after 9,000 B.P., and be missing by 8,500 B.P. But evidence is good again for Middle Archaic activity after 7500 B.P. to about 4,000, B.P. when sea levels reached levels fluctuating with minor changes to those of today.

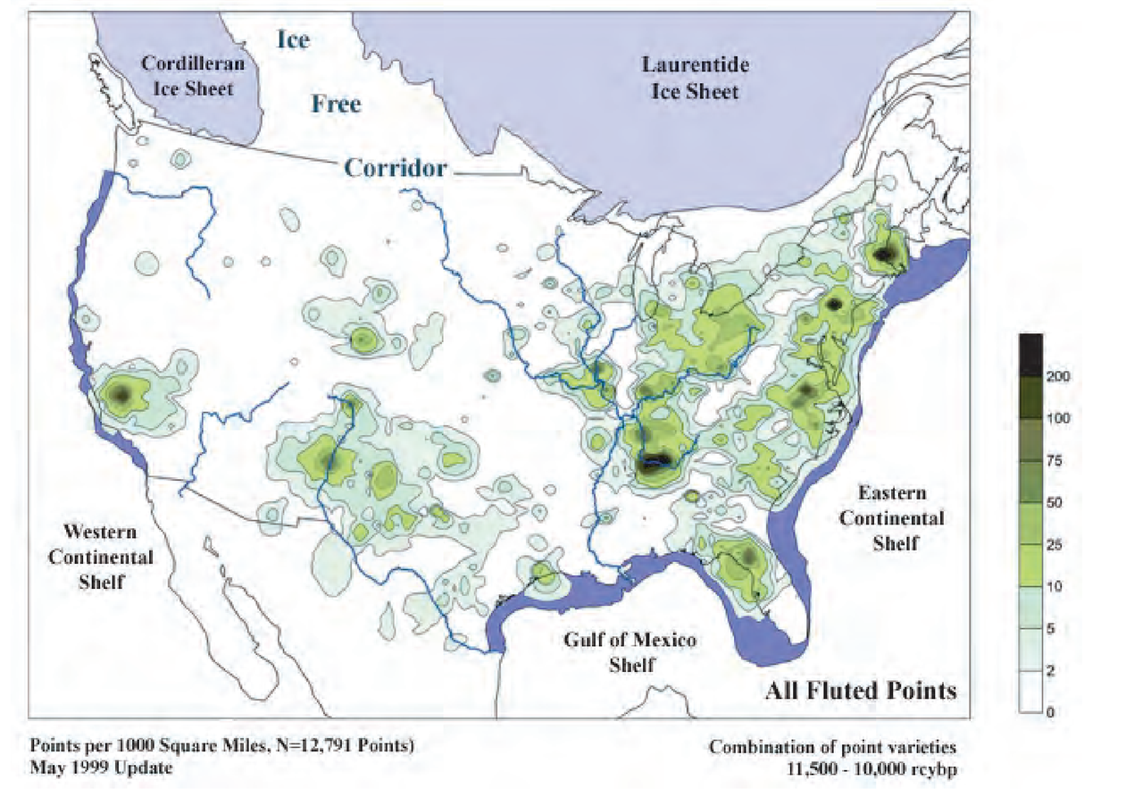
It is necessary to know the magnitude and sequence of global eustatic sea level rise as well evidence for local, relative sea level rise, to take into account possibilities of isostasy, tectonism, and sediment or water loading, in order to know when sea floor isobaths, strandlines, and local features were available for human activities. Florida's Big Bend area is a stable Karst Platform of low slope and great extent. The Paleoindian, Younger Dryas shoreline is probably at 40 meters, well offshore. Other sea level detail can be seen in graphic to the right. The surveys conducted in the PaleoAucilla system shown here reached distances of nine miles offshore, in depths of about 20 feet of water, most sites were within four miles, in 15 feet of water.

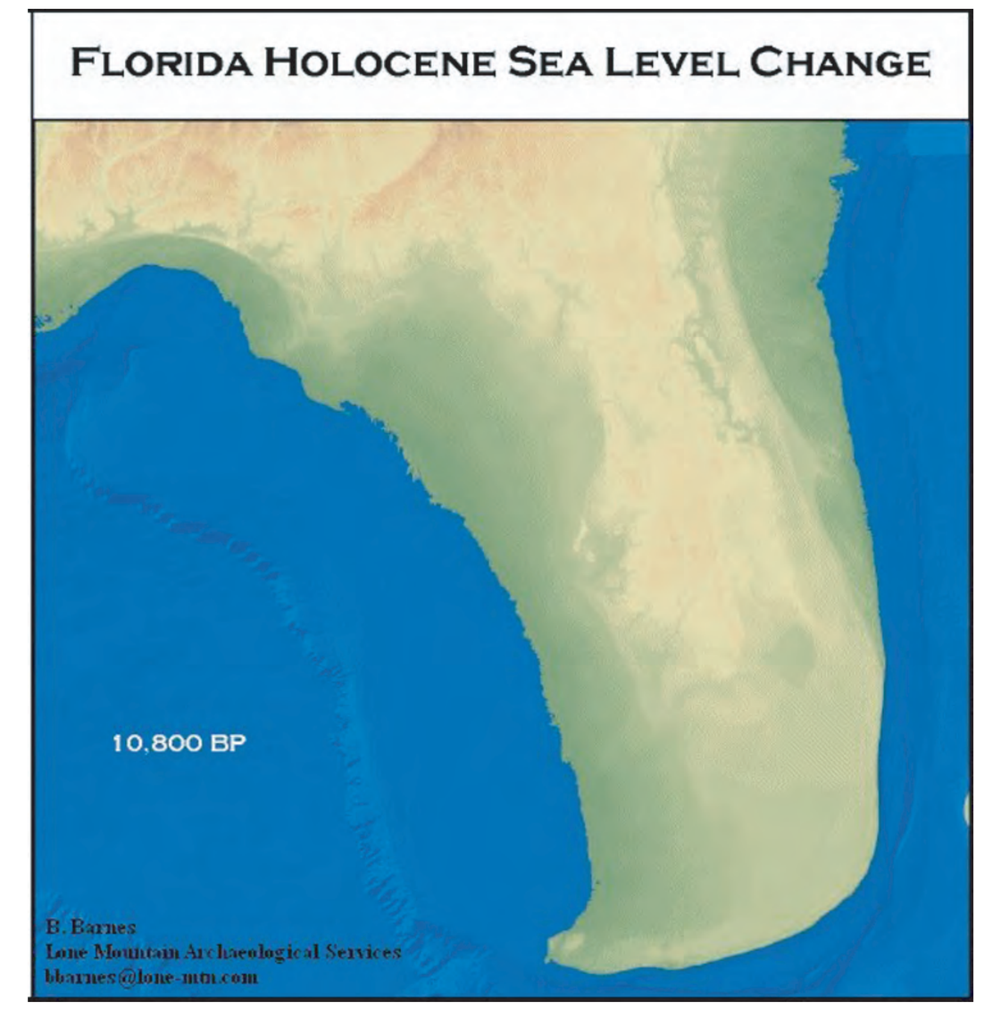
Likewise, it is necessary to know the morphology of the local sea floor bottom to understand sediment beds, drainage systems, paleoshorelines, lakes, ponds, outcrops, and other features that were likely, or not, to attract human activities and settlement. These kinds of places are known generically as "terrestrial analogs" or "cultural signatures", and they can be found and mapped by various remote sensing methods, including swath bathymetry, subbottom profiling, and side scan sonar. Magnetometers, the mainstay of shipwreck underwater archaeology is not as useful for finding submerged prehistoric sites. In this research area of Northwest Florida we have reconstructed the paleochannel system, and find artifacts at and near surface around the margins of the channels and with protruding limestone and occasional chert outcrops. There are sinkholes in the channel system that may contain early artifacts with extinct faunal remains, as found onshore.

Excavations were conducted with induction dredges. Some vibracoring was done, but the rocky nature of the sediments along the PaleoAucilla prevented useful penetration.

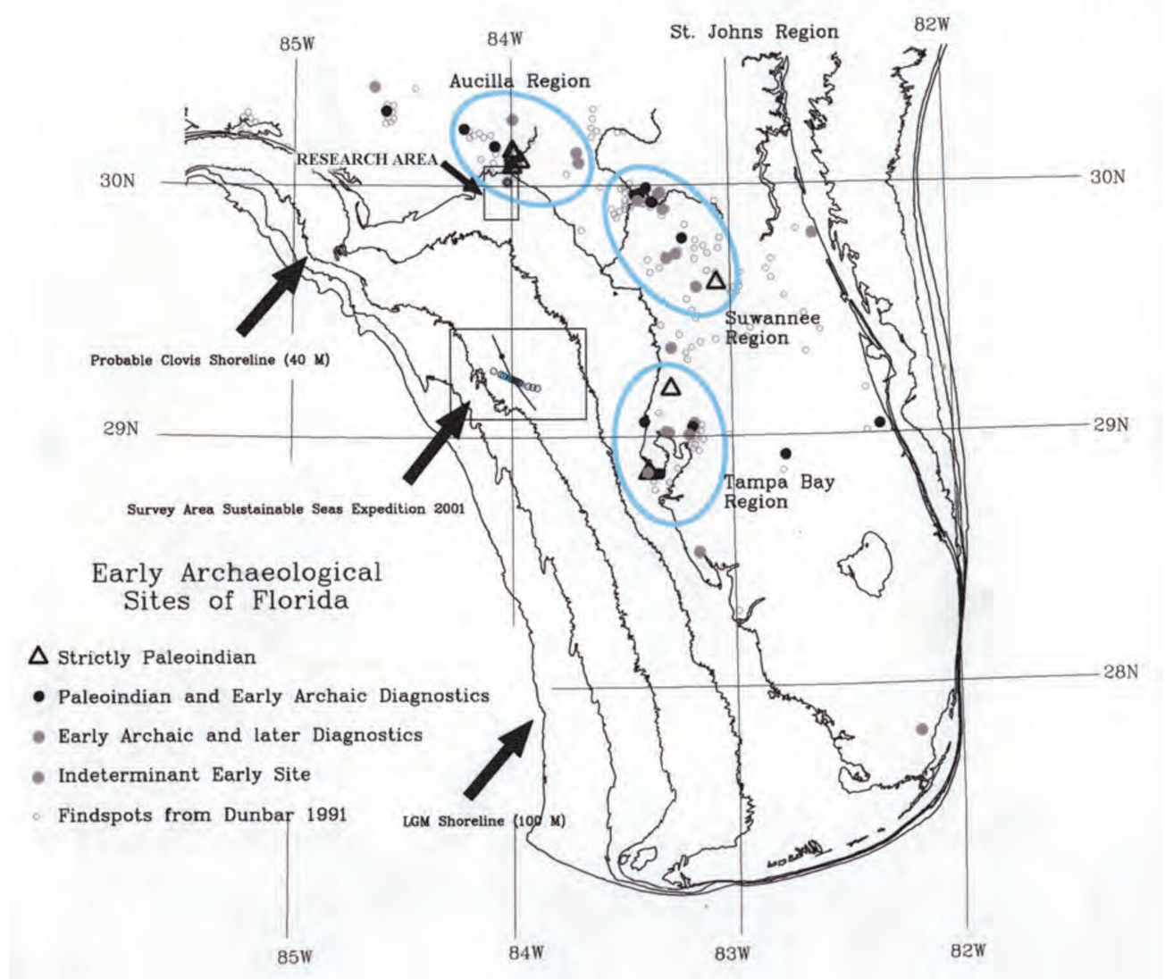


Distribution of fluted points in lower North America, showing the densities of points that occur near large continental shelf settings. Florida densities are mostly Suwannee, late Paleoindian points. This distribution is not consistent with the paradigmatic view that colonization came from Beringia.

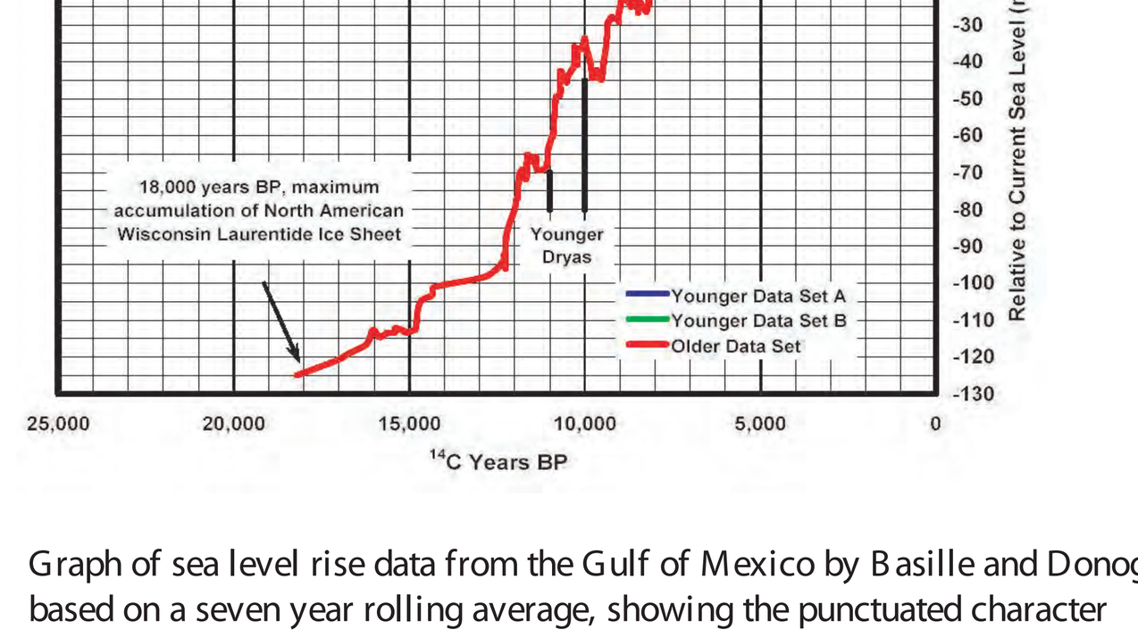




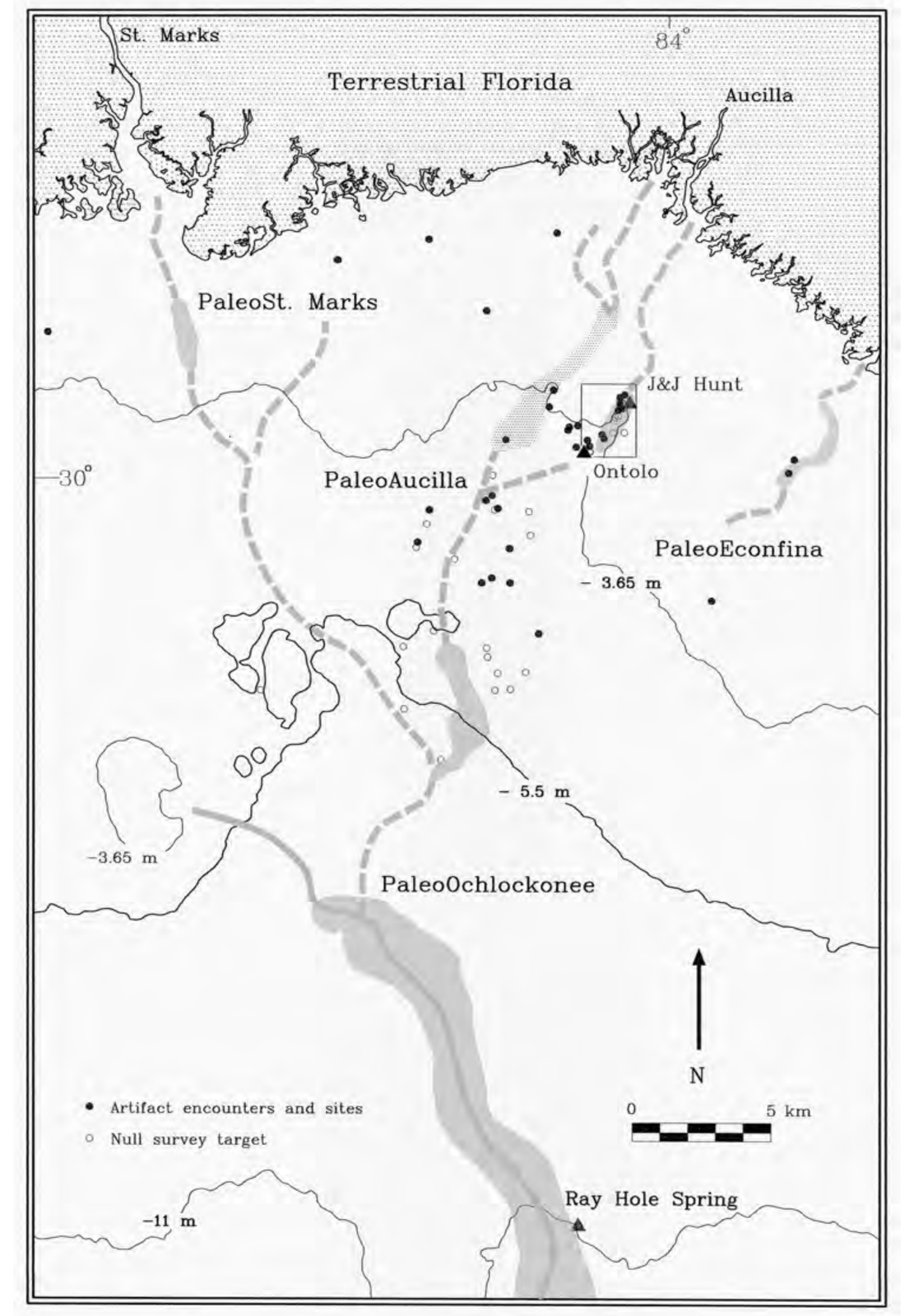
Combined bathymetric and DEM data reconstructing the morphology of the peninsula at the Younger Dryas climatic reversal, 40 meter contour.



Map showing the locations of a selection of early sites in Florida with some clusters of sites indicated, the location of this research, and one expedition the the Florida Middle Grounds, courtesy of Sustainable Seas and NOAA.

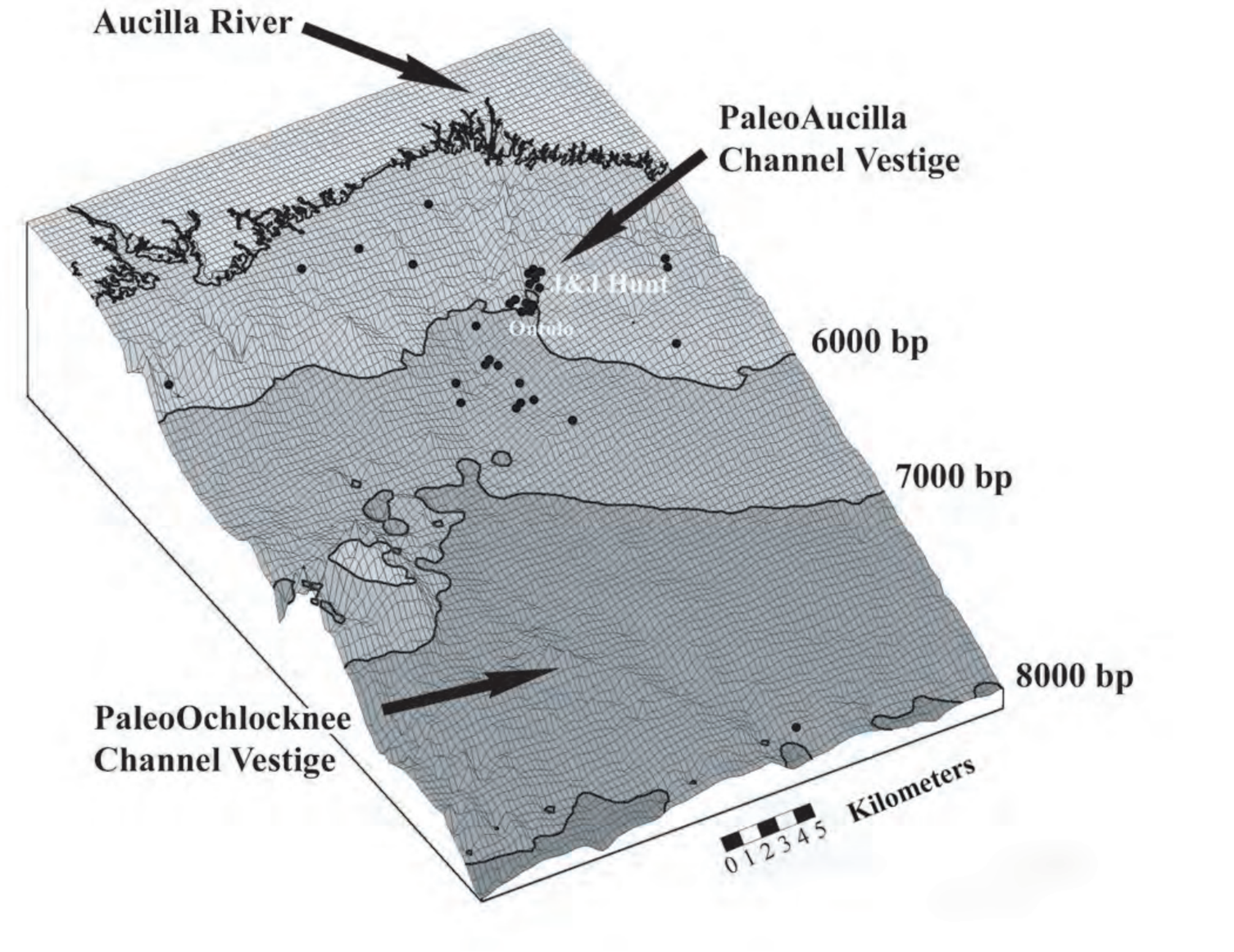


Graph of sea level rise data from the Gulf of Mexico by Basille and Donoghue based on a seven year rolling average, showing the punctuated character of the data.

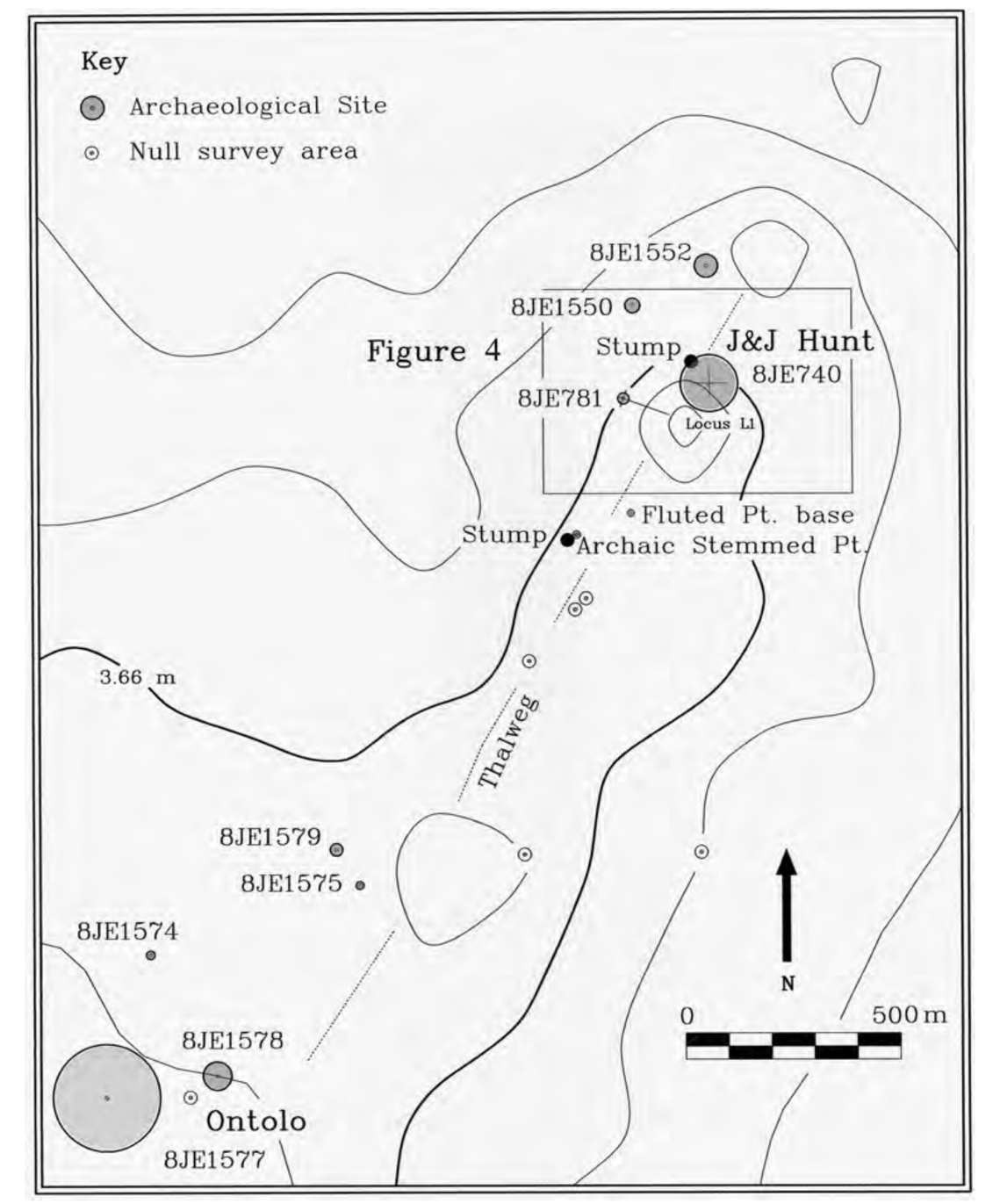


Map of the research area defined for dissertation research between 1986 and 1992. Research resumed in 1998 through 2003. Each field session consisted of survey and testing activities. Survey included remote sensing and diver surface collections. Excavations were conducted at three of the sites (J&J Hunt, Ontolo, and Econfina Channel). The paleochannel vestiges are shown in gray. Ray Hole Spring is the farthest site the Big Bend at 35 foot depth and 35 mile distance, found by Aneskuwitz et al.

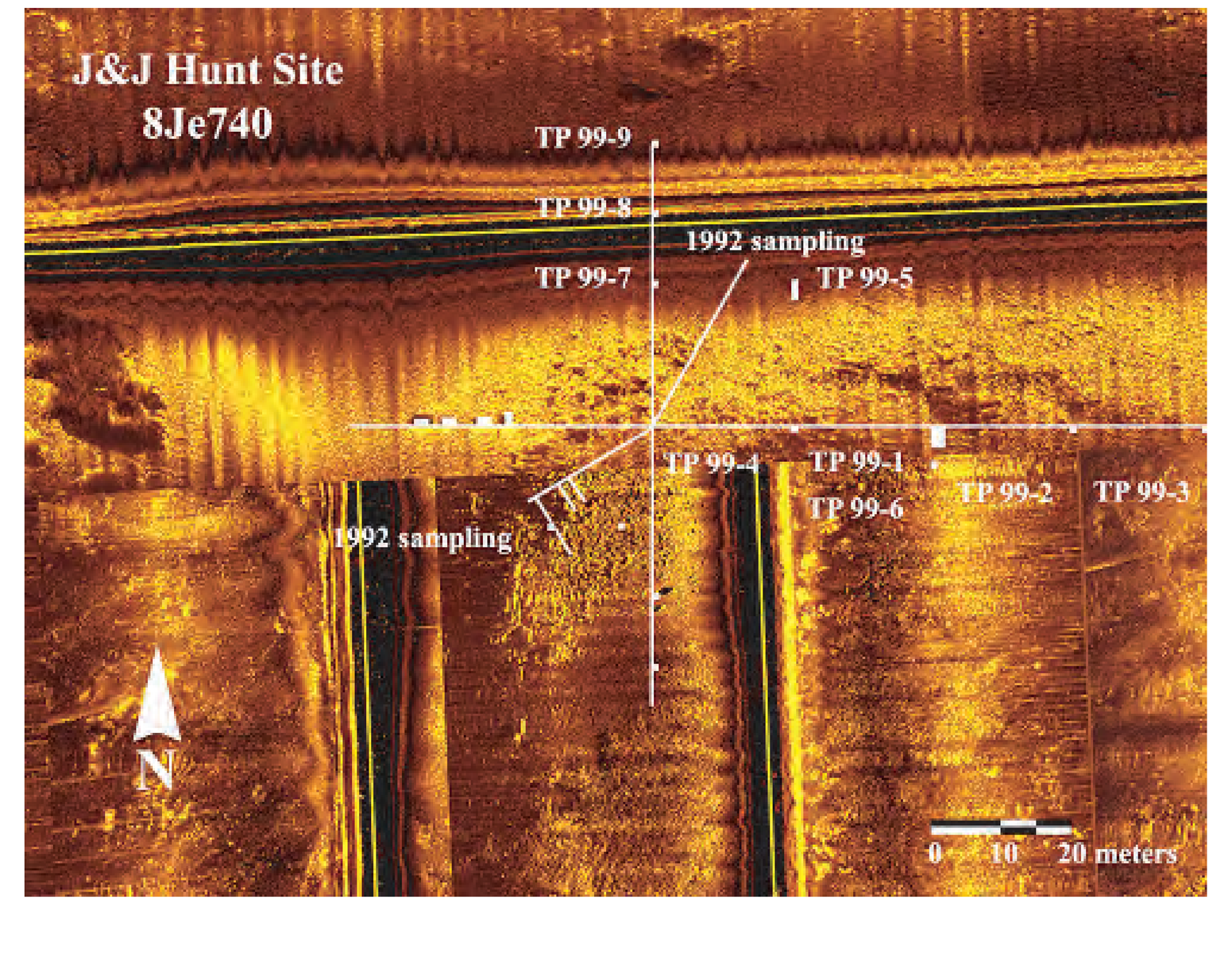
Overall 40 submerged archaeological sites are know in the Apalachee Bay, Big Bend area. Over 5,000 artifacts have been recovered from these sites, most coming from J&J Hunt and Ontolo. These include chipped stone debitage, tools, and diagnostic artifacts. Extinct faunal remains have also been recovered in significant numbers. Two or three Middle Archaic shell middens have been tested, and one sondage was made into the Paleo-Aucilla to encounter Paleoindian artifacts and extinct fauna. No such remains were found, but excavations penetrated Marine, Brackish, and Freshwater deposits to depths of 3 meters.



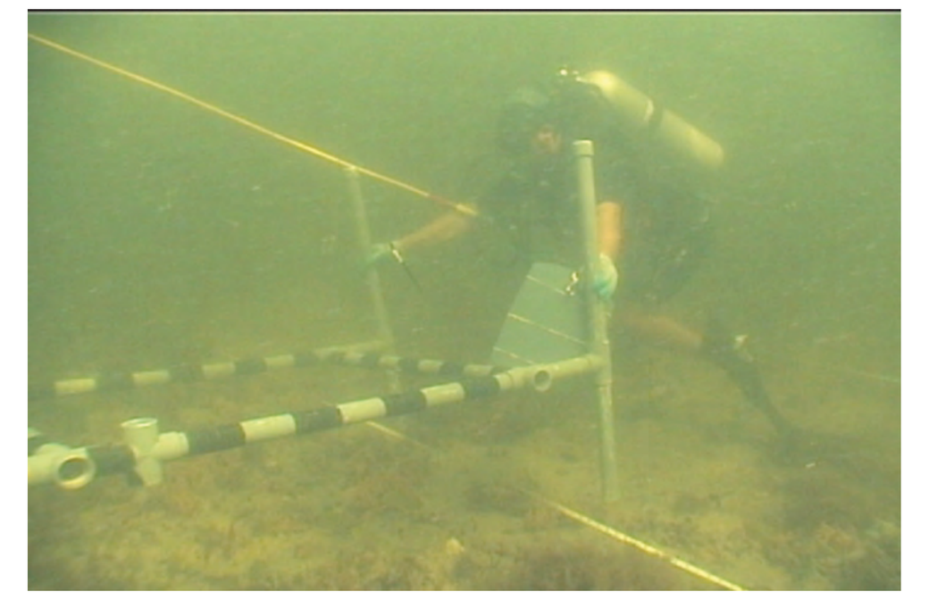
Mesh bathymetric reconstruction of the PaleoAucilla channel vestige, done with navigation chart data, digitized, and contoured in Surfer



Detail of a portion, or reach, of the PaleoAucilla river channel offshore showing the locations of artifact encounters and sites, namely J&J Hunt and Ontolo. The bounded area represents the detail map shown to the right. The paleo channel is made up of seven distinct sinkhole features that are in the thalweg.

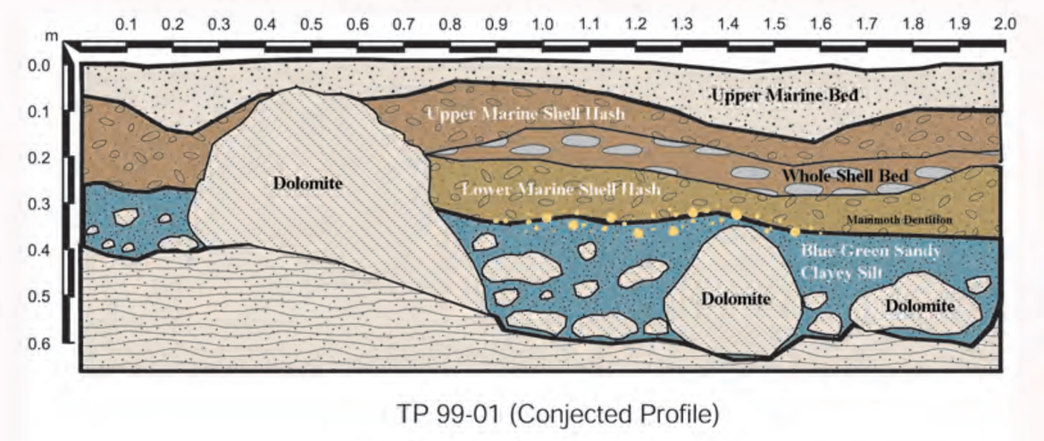


A mosaic of the rocky area that makes up the J&J Hunt Site, and the locations of test pits. To the north and west is one sink hole of the PaleoAucilla, to the south and west is another. Seagrass beds cover the southeastern portions of the site

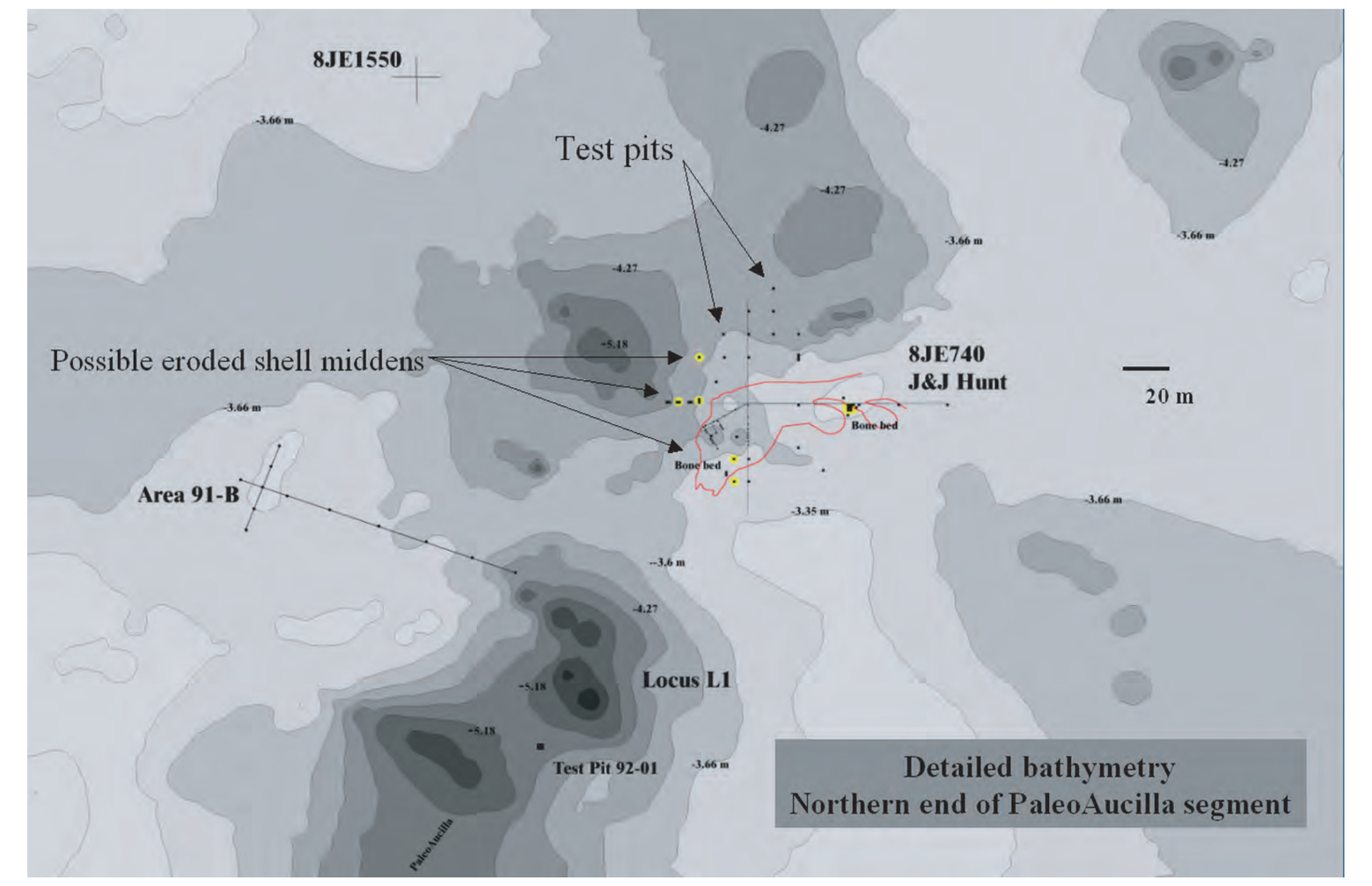


Surface collections and detailed mapping were conducted underwater with PVC grids. Surface supplied air hose is visible as well as the required bailout bottle.

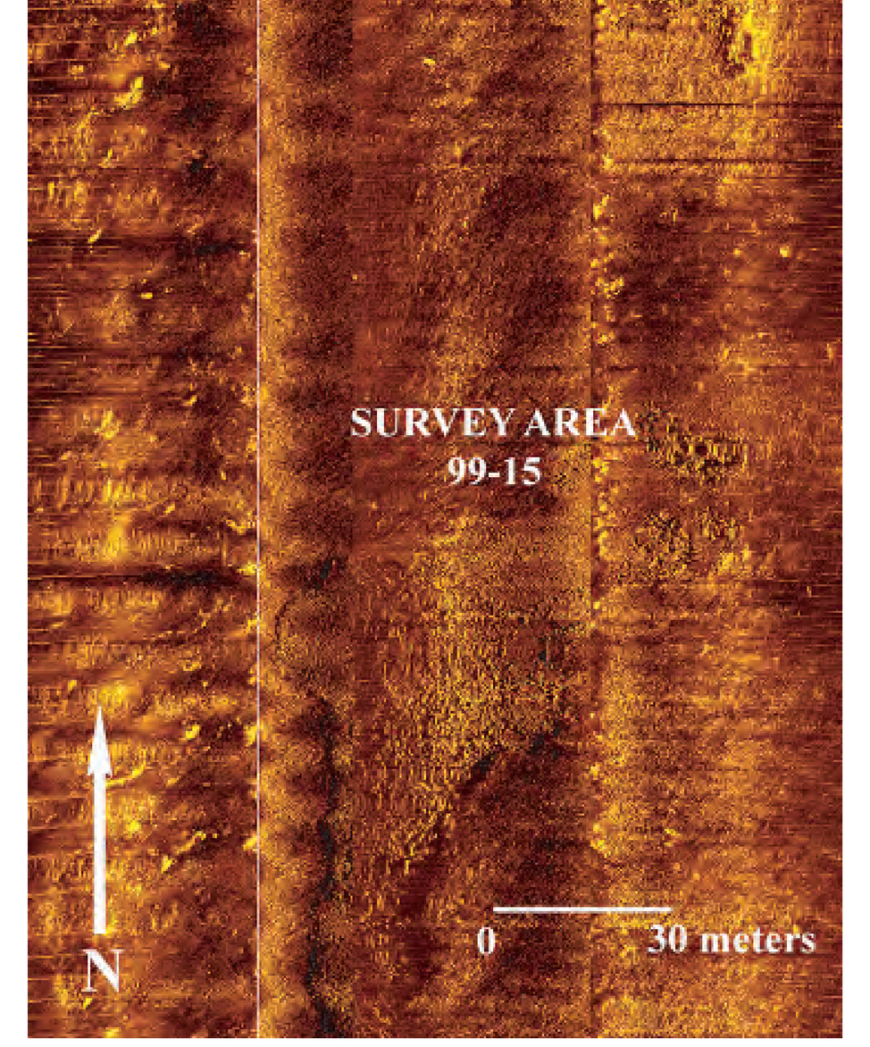
Geology and Stratigraphic Details



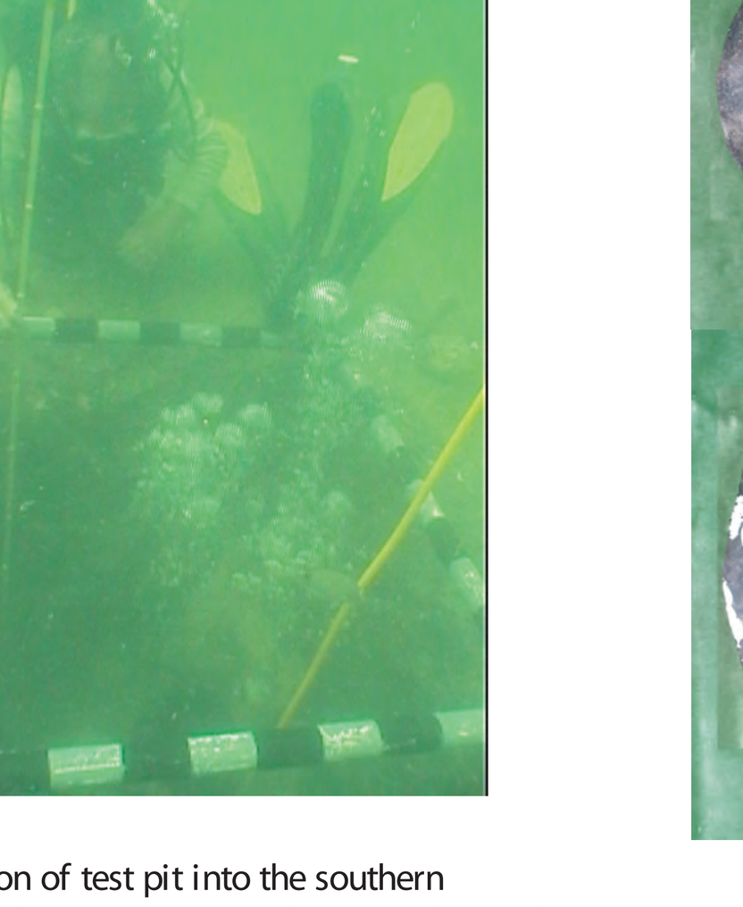
Three major beds comprise the geology of the PaleoAucilla and its margins: Marine, Brackish, and Freshwater or terrestrial.
In all cases the artifacts and faunal cases were found in the Brackish or Marine beds and in re-worked condition. In one case, shown, mastodon dentition was found in and above a previously desiccated hard bed of clayey silt that also contained in-place tree roots and eroded trunks.



Detailed bathymetric reconstruction of the PaleoAucilla channel showing the locations of various sinkhole depressions, survey and collection areas, locations of test pits, and shell middens of probable Middle Archaic age.



Another side scan image showing the rocky character of the drowned karst plain in the research area.



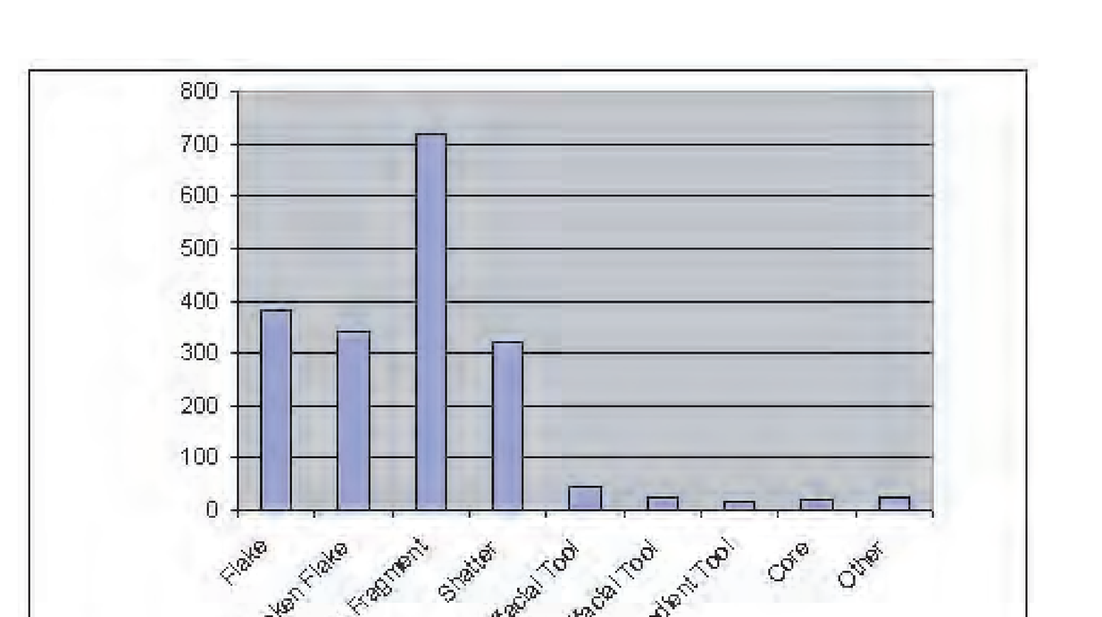
Excavation of test pit into the southern margins of J&J Hunt, into a bone bed located at, and under the brackish bed at 2 meter depth.

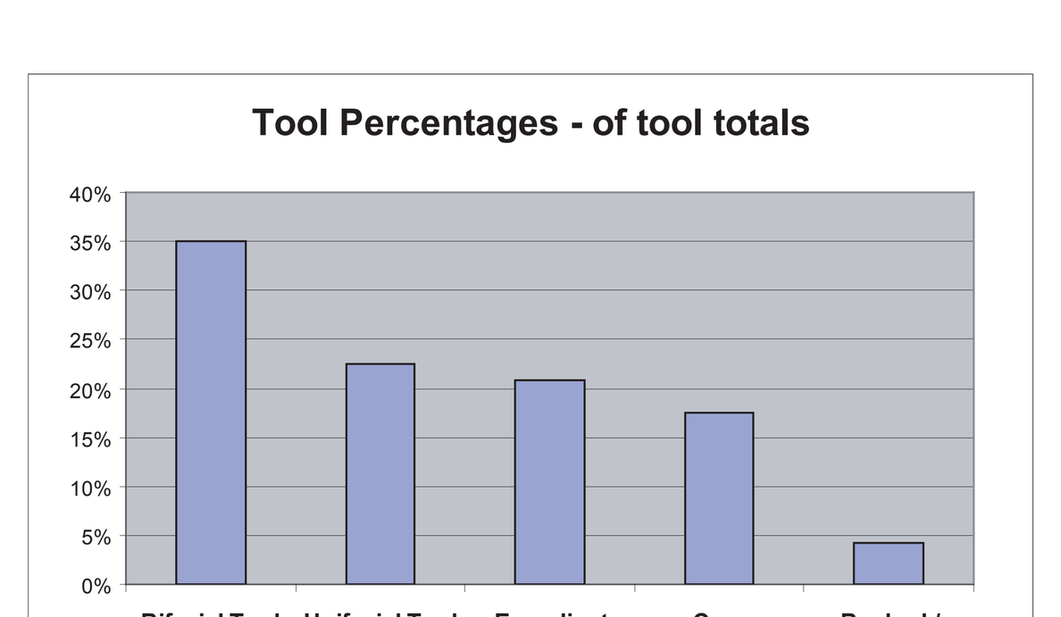
The RV Bellows of the Florida Institute of Oceanography, a fine vessel to conduct multiple day operations offshore. A floating pontoon with induction dredge is operating in the foreground, and another to left. Surface supplied air was used as the breathing mechanism.

Radiocarbon Dating

Summary of radiocarbon dates from geologic units offshore

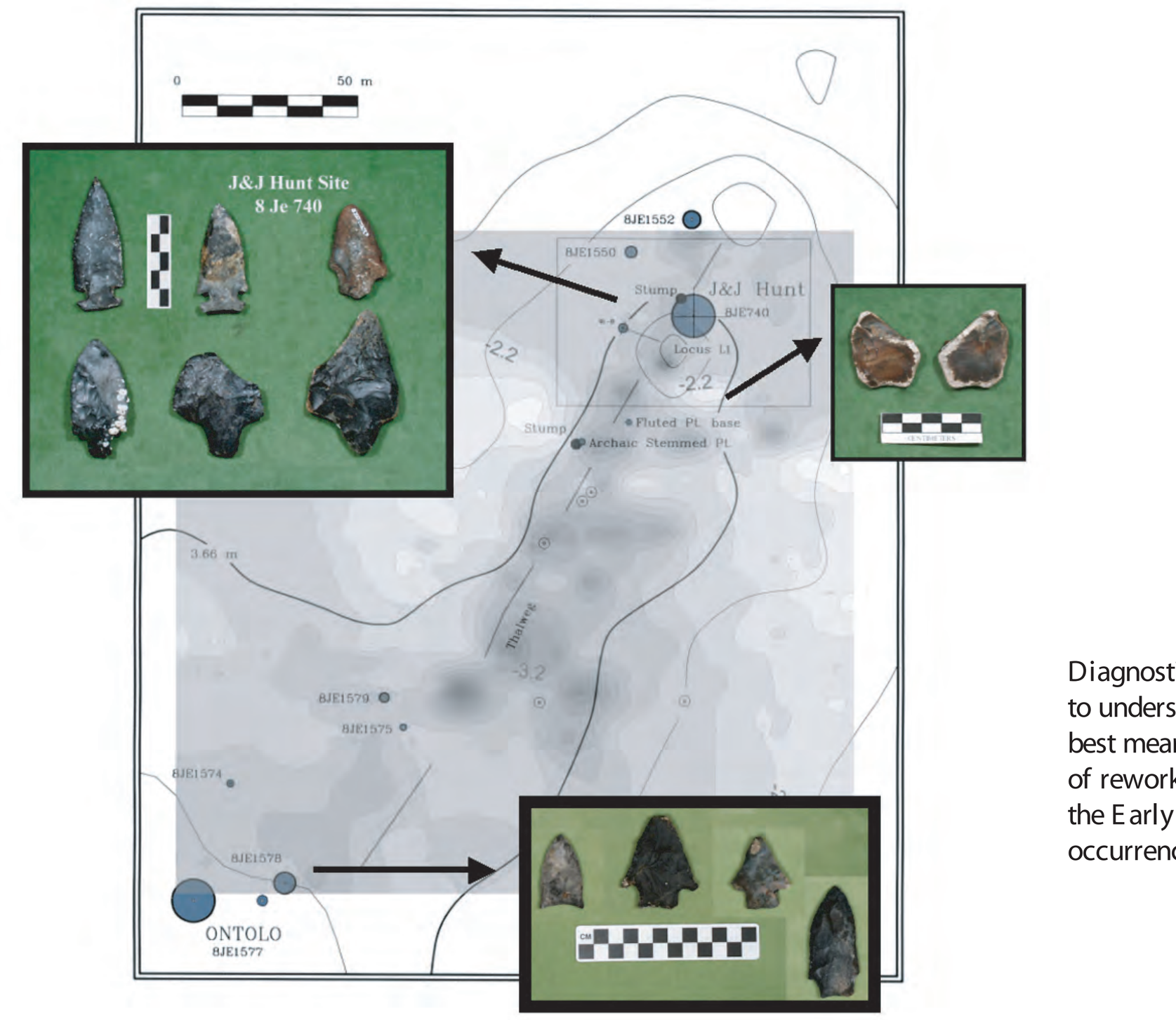
Marine Sandy Shell Unit Marine Conditions	Brackish Horizon Brackish Conditions	Gray Sandy Silty Clay Unit Freshwater Conditions
Oyster 7,390 +/- 60 **RAY HOLE SPRING** 5,260 +/- 75 (shell organic) 6,135 +/- 80 (shell carbonate) 6,375 +/- 80 (shell carbonate) **Wood found in marine sandy shell matrix** 5140 +/- 100 (Econfina Channel Site) 6100 +/- 60 (Area A J&J Hunt) Averages: Shell Organics: 5800 rcybp (**4687, 4629, 4623** CalBC) Shell Carbonates: 6255 rcybp (**5229, 5222, 5211, 5160, 5150** CalBC)	**Wood** 6,785 +/- 80 (Core 91-3) 6,825 +/- 120 (TP 1 - L1) Average: 6805 rcybp (**5713, 5675** CalBC)	**All** Wood Samples 8,220 +/- 80 **RAY HOLE SPRING** 7,160 +/- 95: (TP 1, L1 Mud) 6,755 +/- 60: (TP 1, L1 Mud) 7,010 +/- 80: (TP 1, L1 Mud) 7,130 +/- 75: (Core 91-3 Mud) 7,240 +/- 100 (in place Oak tree-15 fsw A-6714) Average: 7014 rcybp (**5887, 5849, 5844** CalBC)





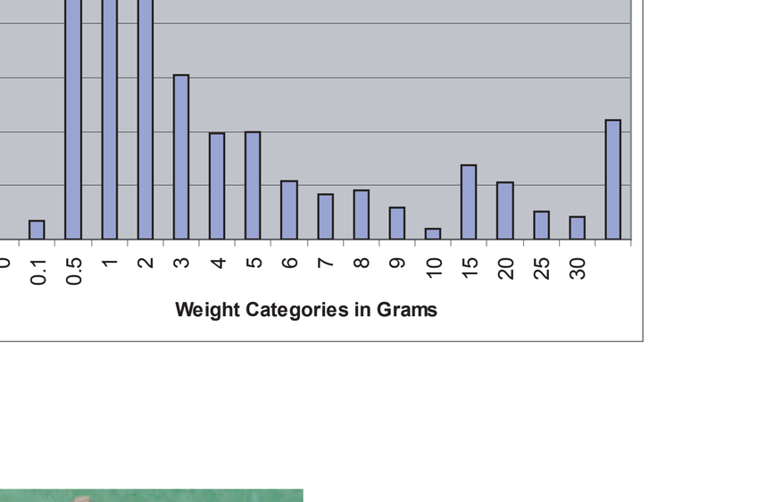
Distribution of chipped stone debitage and tools.

Artifact Distributions, Characteristics, and Typologies



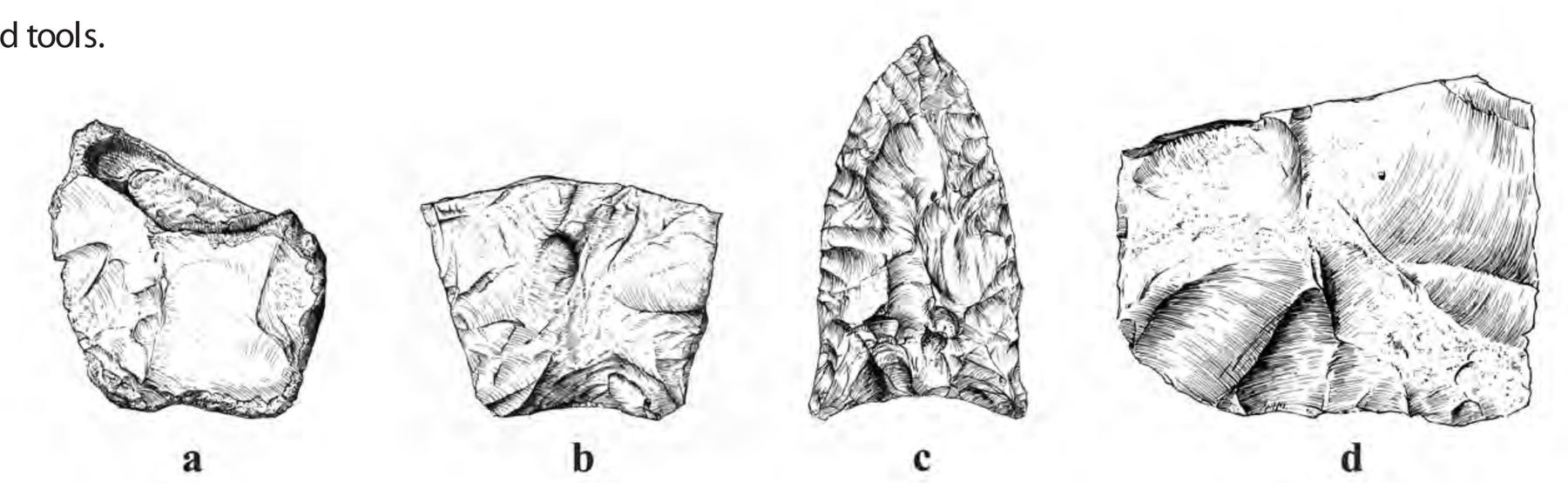
Selected examples of scrapers from sites along the PaleoAucilla Channel vestige. The example in the upper left is a Hendrix scraper, diagnostic of the Early Archaic in Florida, approximately 10,000 B.P., the blades, and blade core in the lower right are evidence for continuity with earlier Paleoindian technology.

Distribution of artifact sizes from the J&J Hunt Site - showing the unsorted character of the cluster.

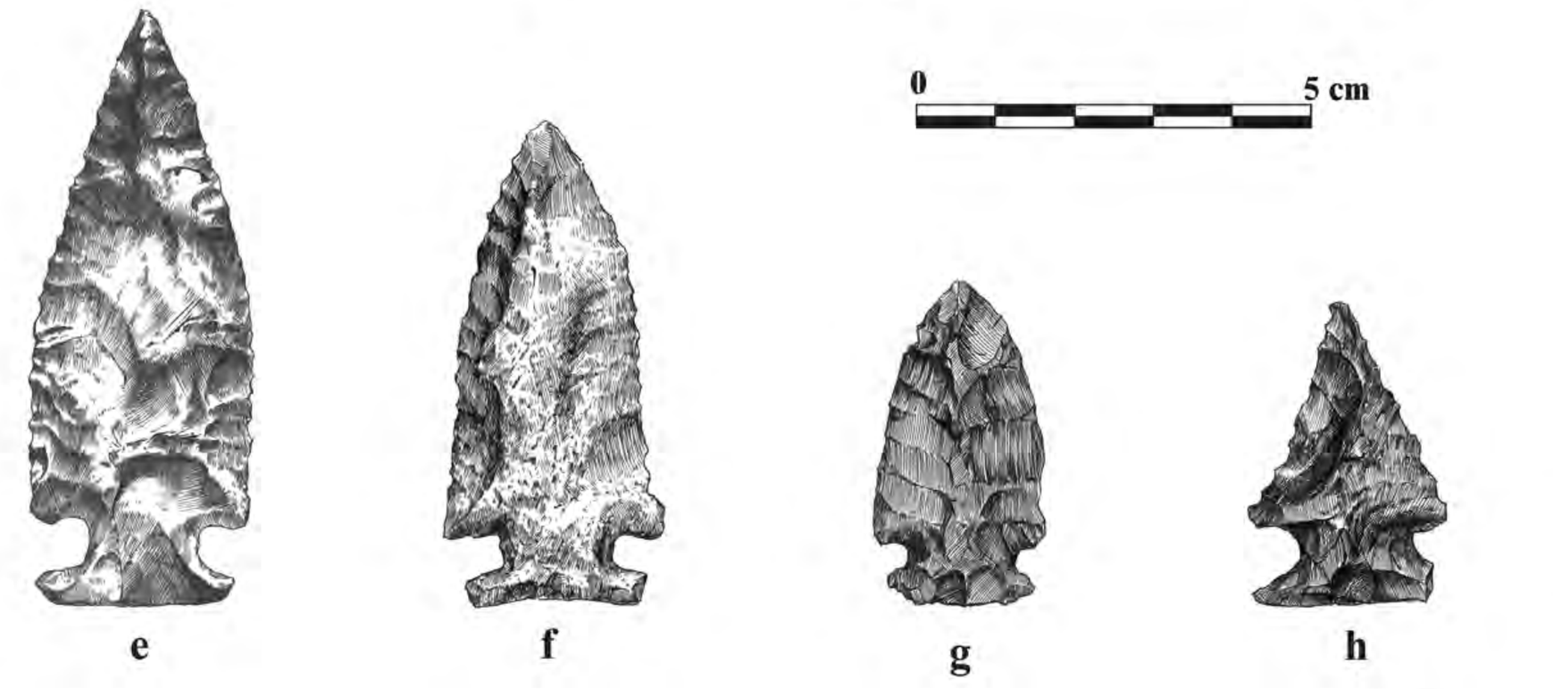


Diagnostic artifacts are important to understand because they are the best means of determining age, culture, and function of reworked submerged prehistoric sites. In particular, the Early Archaic notched points have multiple, stratigraphic occurrences with radiocarbon ages around 10,000 B.P.

PALEOINDIAN



EARLY ARCHAIC



MIDDLE ARCHAIC