In the latter part of 2006 the waters of Lake Okeechobee started to recede due to natural causes as well as part of a plan implemented by the South Florida Water Management District (SFWMD) to release two feet of water from the lake in preparation for the hurricane season. When these factors were combined it resulted in the water levels of Lake Okeechobee reaching a maximum low of 8.2ft. To provide an idea of the severity of the drought and the bathymetry of the lake when the lake level was around 10 feet, for every tenth of an inch the lake lost vertically around 100-150 meters of lake bottom was exposed horizontally (map 1). While low water levels have occurred throughout the history of the lake, this was the worst drought since records have been kept and the first time that Palm Beach County had an archaeologist and staff to document the resources.

Map 1: Lakebed Exposed by drought

Red areas were completely exposed though far from dry.
Yellow areas were covered by less than a foot of water.

In March 2007, a gentleman who would not give his name reported he had found human bones exposed by the drought and that, “The county better get out and do something about them.” Two days later Mr. Roswell Harrington contacted county officials to see if anyone had been out on the lake to look for human remains. Being new to Florida I consulted with the Florida State Archaeologist to see if this was a common occurrence. While not common, there are records of remains being found on the lakebed from both the historic and prehistoric periods. Being formally trained as a zooarchaeologist and having worked with hundreds of human skeletons it was decided that I would go determine whether the bones were human before archaeologists from the state came down. Human remains were present on two of the sites and were subsequently
collected by the State. With water levels continuing to drop and more lakebed being exposed a concentrated effort was made to survey and document as many of the cultural resources as possible. The county applied for and was granted a 1A-32 permit (number 0607.67) due to the project area falling under state laws governing submerged lands.

Prior to Palm Beach County’s involvement, Mr. George Boyer Sr. had contacted Mr. Steven Erdman of the Palm Beach County Historical Society to report that he found an old boat on the bottom of Lake Okeechobee (photo 1) and wanted to know what should be done. Mr. Erdman forwarded the call to our office and we contacted Mr. George “Boots” Boyer Jr., a resident of Belle Glade who has an interest in the history of Lake Okeechobee as well as vast local knowledge.

I would be remiss in my duties if I did not give proper credit to the real hero to this story. Four months after the first phone call county staff is still actively working in the lake thanks to Boots Boyer. Boots has provided all the transportation (his personal airboat and in drier times, off road vehicles). He has done this solely for the protection of the resources, he has never asked for compensation for his time or gas. Without a doubt Mr. Boyer has spent thousands of dollars helping the County survey the lakebed. Currently, we are working with several groups to get the recognition Boots so rightly deserves.

Survey Methodology:

Conditions on the lakebed made it both easy and difficult to survey. As the water retreated there would be a two to three week window before land base grasses and weeds started to sprout in the newly exposed land. However, once they began to grow visibility was very limited and the task became difficult, if not impossible. These factors afforded us a small timeframe to undertake a pedestrian survey of the area and record the location of artifacts with a handheld Trimble GPS unit. A sample of artifacts would be collected as they were found. In areas with high concentrations of artifacts we would roughly determine where the center of the scatter was and then head out in expanding circles. Eventually this would give provide a rough estimate of the maximum extent of
the artifact scatter. Shipwrecks were noted with GPS points and photographed. As part of the permit issued by the state, we were also able to do limited testing on the sites. Though not our primary goal, limited testing was completed in the prehistoric sites.

**Preliminary Results:**

Prior to the drought there were three known archaeological sites located within Lake Okeechobee. These were Ritta Island (8PB92), Kreamer Island (8PB43) and Pelican Bay (8PB10393) (Map 2).

From historical sources it is known that a large number of human skeletons were reported as being found at these sites. However, we feel this information may have been transposed to these sites from Sterling’s early report on the Belle Glade Mound (8PB41). Adding to this notion other historic reports refer to “pumpkin patches of human skulls” and “thousands of bodies” being located at these sites (Will 1984). It is thought this is an exaggeration since while human remains were found during the survey there were well below fifty skeletal elements identified for all sites combined. Also commonly reported are muskets and cooking kettles thought to come from the either Ft. McRae (8MT38) or the Battle of Okeechobee (8OB10) sites on the far northern end of the lake. However, during the survey no artifacts of these types were found.
As a result of the ongoing survey approximately 30 additional sites have been recorded (map 3). The sites range in size from small isolated finds to shipwrecks in various degrees of preservation as well as massive 200m diameter ceramic scatters.

At this time the artifacts that have been collected are still being cleaned, cataloged and processed. Therefore analysis is ongoing so results presented here should be considered tentative. However, of particular importance is the information the survey is providing regarding the Glades Period trade and settlement patterns in the Lake Okeechobee region. For example the prehistoric sites on Kreamer and Ritta Islands have very different artifact assemblages and contain large amounts of exotic materials.

**Kreamer Island Discussion:** The Kreamer Island artifact scatter measures roughly 400m east to west and 230m north to south. The site also contains a dense concentration of artifacts roughly 100m in diameter. The site’s prominent location, directly on the lakeshore, adjacent to a river mouth which provides about 270 degree view of the surrounding area (Map 4). While other sites in the area are found in the muck, Kreamer Island is unique as it is located on a sandy beach.
The site is littered with shell tools, shell pendants and Belle Glade pottery. Other ceramic types found at the site include: St. Johns Checker Stamp, St. Johns Plain and Sand Tempered Plain (Photo 2).

In addition to shell artifacts and ceramics a single PPK, a damaged Pinellas style point was also recovered (Photo 3). At this time the material type has not been identified.
The amount of shell tools present on the site was somewhat surprising since Lake Okeechobee is a freshwater lake. To date Cassis sp. (helmet conch), Strombus costatus (milk conch), Mercenaria mercenaria (hardshell clam) and Strombus gigas (queen conch) have been identified. Currently, it is thought most of these shells are being traded north from far southern Florida since these species don’t exist in large numbers on the west or east coasts of the state. 

Given the amount and diversity of shell hammers/adzes, celts (Photos 4 and 5) and shell debris the inhabitants at this site were likely doing a considerable amount of woodworking. However, only one large piece of Cypress was found on the Kreamer Island site. While one end had been clearly shaped it could not be determined if the carving was done by shell or modern tools.
Numerous shell ornaments were also found on the site (Photo 6). Again being new to Florida we were under the impression that such exquisitely made items must be relatively common. It wasn't until Dr. Ryan Wheeler came to the site that we learned that these items are not common and that we had discovered something very important.

As to why these items are appearing on the shore of the lake our current thinking is these ornaments are produced on site as a by-product of woodworking tools wearing out and being recycled into pendants and gorgets.

Without a doubt there were more sites located around and on the lake than exist today. However, the nearest sites to compare these finds to are the Belle Glade Mound and Midden complex (8PB40 and 8PB41). The Belle Glade sites were excavated several times during the last millennium. The Kreamer Island site assemblage is very similar in composition compared to the assemblages from the Belle Glade complex. Both sites produced a plethora of ceramics, shell and stone pendants, shell artifacts and shell tools. The one obvious difference between the sites is the lack of stone material at Kreamer Island. Given the lack of lithic sources in Palm Beach County it is not surprising that such rare items would cluster at ceremonial centers versus habitation sites.

One of the nagging questions regarding the Belle Glade Mound is the fact that the mound was originally constructed of sand. There has been much speculation as to where the sand was coming from. Ocam's razor dictates there was or is a sand deposit someplace close to the mound site to facilitate it's construction. However, it is intriguing to think that the Kreamer Island site is the only known naturally occurring sand deposit in the immediate region. This notion became even more relevant when some remote sensing work was completed.

Ritta Island Discussion:
Another major prehistoric site investigated during this survey was the Ritta Island (8PB92) site. This site is also located on the shore of the lake along side a large river mouth (Photo 7). Even today the old river course was the last to drain as a result of the drought and the first to refill when the rains returned. Photo 8 depicts the rivers course as it appeared in mid April.

This site was one of the first sites exposed by the receding waters. It’s artifact scatter covers an area 334m east to west and 400m north to south. The densest concentration of artifacts occurs along the sides of the river mouth and measures roughly 330m north to south and 280m east to west. When the waters had first retreated individual circular clusters of artifacts were observed. Though strictly speculative these might represent single campsites.

The Ritta Island site had the largest deposits of human bone found during the survey, covering an area of approximately 100m. Interesting to note is that the remains clustered close to the old river course. The implications of this are discussed in more detail latter.

In direct contrast to the Kreamer Island site, the site on Ritta Island contained only one shell tool but various stone tools and copious amounts of chert debitage. The chert is consistent with sources located near Tampa and the Peace River areas. The overwhelming amount of lithic material at Ritta Island and the lack thereof in Palm Beach County is clear evidence of long distance trade with the lake from northwest regions.

Only one PPK was found on the site. It is identified as a Bolen point, made out of agatized coral (Photo 9). According to Dr. Brown and Dr. Wheeler this material is consistent with sources located near Tampa. This type is known to occur in the area as one had been previously found and is now on display in the Laurence Will Museum in Belle Glade. However, the other point is made of a black chert, which is likely from the Peace River formation.

One excavation unit was placed on site and screened through 1/8-inch hardware cloth. Among other artifacts hundreds of agatized coral micro flakes of a material similar in color and translucency to this piece were recovered. While the Bolen point is the only PPK found at the site the amount of debitage clearly indicates more of this type of material was present on site.
One finely made basalt pendant was also recovered (photo 10). The nearest basalt source that we are currently aware of is along the boundaries of northern Florida. If this identification is correct than this item has traveled the greatest distance.

Other sites in the region have also produced pendants made of this material and of similar quality. However, to date this is the only one found on a site from within Lake Okeechobee. A very similar pendant in form and size to this one was recovered from the Bell Glade Mound Complex.

Again working with Dr. Wheeler and Bob Carr it appears that the Ritta Island site has the most Peace River chert south of Ft. Center (photo 9).

An interesting point regarding this material is that the southern most site this material was found at was the Miami Circle. Given the shell material coming to Lake Okeechobee from far south Florida the presence of this material at the Circle may suggest a trade route between southern Florida and Lake Okeechobee.

The Ritta Island site had the most human bone of any site. It was scattered in a 100m area. The remains clustered close to the old river course. Though the state collected the bones from field observations there were at least three individuals present. One distal femur was very robust likely belonging to a male over 18 years of age since the distal epiphysis was completely fused. One right humerus was gracile with a large septal aperture, a feature that is often associated with females. The distal epiphysis was fused indicating the person was at least 18 years of age. Also collected was another right humerus that was more robust and did not have a septal aperture. Again the distal epiphysis was fused indicating the person was at least 18 years of age. The rest of the remains were fragmentary and scattered. The presence of the remains closer to the river originally led us to believe the site may have held burials interned underwater. After further field investigation it is more likely these remains are eroding out of the muck.
**Field Survey Discussion:**

As with most large-scale archaeological surveys many questions and very few answers have been brought up. One of the most poignant however is why do we have two very similar sites in close proximity to each other yet have very different artifact assemblages? One possible hypothesis is that the two sites show two different periods of occupation. This hypothesis is one of the more likely due to the differences in elevation between the two sites. The site at Ritta Island had been exposed since March, whereas the full extent of Kreamer was not seen until early June. Furthermore, it is not known if the artifact assemblages are representative of one occupation or a series of occupations. This is due to the lack of stratigraphic levels during excavation. Due to the nature of the Torry Muck soil series and its rapid oxidation in air the sites presented as deflated lenses of artifacts present within the first 10 centimeters of the deposits.

**Remote Sensing:**

While a lot of time has been spent on the ground surveying the lake, a large portion of time has also been spent analyzing aerial photographs of western Palm Beach County, both current and historic views. Due to the historic and ongoing intensive agricultural use of the area, the landscape has been significantly altered.

Using data from the historic aerials of 1938 and 1949 the location of historic sites in areas that have now been turned into farmland were marked. Hopefully, at some point in the near future it will be possible to ground truth these areas to see if anything remains of these early pioneer sites.

We are also starting to reconstruct the landscape of the everglades around Lake Okeechobee prior to the draining of the region. Early settlers to the area wrote about the many “dead rivers” which flowed into the lake. Settlers reported that most of the time there was not much flow to these rivers however when heavy rains would come these rivers moved mass amounts of runoff directly into the lake. Conversely when the lake levels were high these rivers would backup and flood the surrounding areas. While most of these rivers have long since run dry, their scars on aerial photographs show where they had once flowed. One such river was the
Democratic River. Until now the location of the mouth of the river was not known. However from ground observations and the use of historic aerials we feel we can safely say the river emptied into Lake Okeechobee at the north tip of Kreamer Island (map 4). With this in mind what today are called islands are actually deltas of major rivers feeding Lake Okeechobee. It should be no surprise that such geographical features would have been attractive areas for Native Americans to settle.

When the historical aerial data was compared with the County’s Map of Known Archaeological Sites and Conservation Areas a tendency was noticed that prehistoric sites tend to be located along the highest and widest areas along these “dead rivers”. Another tendency noticed was the location of ceremonial sites inland from the lake near the “headwaters” of these rivers with satellite sites located directly on the lakeshore itself.

Other Native American sites in the county have a similar pattern of ceremonial sites inland and occupation areas along waterways. These sites include Riverbend Park (8PB7511), Boynton Mounds (8PB100) and on a micro scale Jupiter Inlet Midden 1 (8PB34).

Ultimately, continued research utilizing remote sensing will help us to better understand the settlement patterns employed by the Native Americans within Palm Beach County.

Conclusions

Similar to other areas in Florida, Palm Beach County is under enormous development pressure. Unique to Palm Beach County is the Everglades Agricultural Area (EAA). The EAA is reserved for agricultural uses but with the depletion of the muck, farmers are turning to other ventures in order to produce a profit. One such change is the move from agriculture to mining. It is not unusual for 3000-7000 acre quarry proposals to come in for review. Prior to this survey the County did not have a way to identify where sites may have been located. With the recent work and subsequent preliminary findings we have a better understanding as to where and of what type of a resource should expected to be found.
Currently, our objectives are to finish identifying sites before the water returns to its “normal level”. Exploration of some of the interior areas will be continued in the winter when it is cooler and less bug and gator infested. In 2009 the final report is due to the state. Once the report is in various articles will be produced from this endeavor.

Acknowledgements:

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