Lake Phelps Canoes

Slide 2

Archaeological evidence suggests that the lake Phelps area was occupied at least seasonally by prehistoric native Americans from the late Paleo-Indian period through to the late woodland period, with artifacts dating back to around 9000-8000BC. Around the timeline on this slide, you can see various artifacts from around lake Phelps that have been discovered so far.

Slide 3

The beautiful lake Phelps is the second largest natural lake in North Carolina and is in eastern North Carolina between the Albemarle sound and the Pamlico River. The lake covers 16,000 acres and has a max depth of around 9 to 10 feet with an average depth of 4 and a half feet.

Slide 4

The north shore of the lake makes up one of the last old-growth forests in eastern North Carolina. The trunks of some of the bald cypress trees measure up to 10 feet in diameter. The north shore is also where all the Lake Phelps canoes were discovered

Slide 5

All the canoes that have been discovered in the lake are dugout canoes. Dugout canoes are made by using a carefully tended fire to slowly burn into the log and hand tools to occasionally scrape away the charred wood.

Slide 6

Dugout canoes were often used for travel up and down rivers as well as fishing which you can see here in a drawing done by the artist and colonist John White. When not in use to protect and preserve them, the canoes were often buried to protect them from degrading faster.

Slide 7

During a period of drought in the 1980s, the water level in Lake Phelps lowered to a point that the log canoes could be easily seen sticking out of the lakebed, with some sticking out of the water. Buried in the sediment under the water they were in a mostly anaerobic environment or an environment without oxygen. Without oxygen in the sediment there are less macro and microorganisms to feed on the wood and break it down.

Slide 8

The process of recording the canoes began in 1985, and a total of 30 canoes were found. Most of the canoes were reburied in the lakebed, however four canoes were recovered for further study, preservation, and eventual display for the public.

Slide 9

Not only were the locations of the canoes recorded, but many of them were also measured and sketched in detail so that we could learn more information about them. Here you can see the detailed drawing of canoe 3 which is one of the 4 canoes that were removed and one of the two canoes that are being re-conserved.

Slide 10

Here is the detailed drawing of canoe 4 which is the other canoe that is being re-conserved.

Slide 11

Through radiocarbon dating, 19 of the 30 canoes were dated. The oldest canoe in the group is from around 2,400 B.C.E with the most recent canoe from around 1,400 C.E. Of the two canoes that are being re-conserved one is from 1,400 C.E. and one is from 340 C.E.

Slide 12

The canoes were removed as carefully as possible trying to keep them intact as much as they could. Here you can see archaeologists kitted up and carrying or using floats to move the canoes out of the water.

Slide 13

Here are the two canoes that are currently undergoing re-conservation. This photo shows the state of the canoes when they were first recovered in 1986. Canoe 3 is on the left and Canoe 4 is on the right.

Slide 14

Here are a couple more photos of these two canoes from a different angle.

Slide 15

In the 1980s, using sugar to conserve waterlogged wood was a common practice, and that is what archaeologists and conservators decided to use on the 4 lake Phelps canoes. The canoes were placed in water and sugar added to form a 20 percent solution by weight. Sugar was then added weekly at a rate of 10 percent by weight until a 100 percent solution by weight was reached.

Slide 16

The canoes were allowed to become saturated with the sugar solution which took about 12 weeks in total. The canoes were moved inside the lab to dry at ambient temperature and humidity.

Slide 17

If archaeological waterlogged wood is dried out without replacing the water inside the cells, the wood will warp, check, or crack. To prevent this from happening, conservators replace the water with some sort of bulking or impregnation agent. Bulking uses a chemical that can enter the cell walls and help provide support to the cell to stop shrinking. Impregnation uses chemicals that fill the lumen, or the center of the cell to also provide support and stop shrinking.

Slide 18

Unfortunately, the sugar treatment used initially eventually caused problems. Canoes 3 and 4 were stored and displayed at Pettigrew state park in an environment that was not controlled. These canoes suffered drastic swings in both temperature and humidity causing sugar to leech to the surface causing damage to the canoes in many areas.

Slide 19

Here you can see closeup images of the sugar on the surface of some of the canoe fragments. On the left you can see the large clusters of sugar crystals that raise above the

surface of the canoe. On the right you can see a white area on the wood that is microscopic sugar crystals.

Slide 20

These photos show the process of studying the canoe fragments before they go through retreatment. On the left it is possible to see the sugar that is breaking apart the surface of the wood and the damage that it can do.

Slide 21

To dissolve the sugar back into the wood, the first treatment that was tried was to use a mister to apply a solution of 75% reagent alcohol and 25% RO water. The wood was then left to dry for a day before being examined and treated again. Unfortunately, this treatment did not work as was hoped.

Slide 22

Here are some photos that show one of the smaller fragments before treatment on the left and after many treatments on the right. You can see that all the sugar has not dissolving back into the fragment, but some has been left on the surface.

Slide 23

After doing lots of research and many tests a new treatment of using a poultice was landed on. The poultice is just tissue paper that has been folded 3 or 4 times and then wetted until just damp with reverse osmosis water. This poultice is then placed on the canoe fragments and let sit for about 3 hours to allow the water to dissolve the sugars back into the wood or be removed by soaking into the poultice.

Slide 24

After a combination of using a modified misting treatment and a poultice treatment nearly all the sugar was removed from the surface of the canoe fragments. The photo on the left shows the fragment before treatment. The photo in the center shows the fragment after the original misting treatment. Finally, the photo on the right shows the fragment after the poultice treatment. Through this project we hope to help preserve these important native American artifacts for the future.