

Soil Indicators of Post Colonization Land Use Change and Vegetation Patterns at Wormsloe Historic Site, Isle of Hope

Research Report: October 10, 2013

Investigators: J. Holly Campbell and Lawrence A. Morris

Objective 2

Three hypotheses are being evaluated for this objective:

- Geophysical surveys, conducted using EMI and Resistivity, will accurately locate subsurface features created by Wormsloe land use legacy that can be verified through ground truthing.
- Soil physical properties (profile description) will differ slightly between Inside, Outside, and Reference points.
- Soil chemical properties (pH, C, N, P, and Ca) will differ slightly between Inside and Outside points and will differ significantly between Inside, Outside, and Reference points.

In the field

Following up on field work this August 23-25th, when geophysical surveys utilizing EMI and Resistivity were conducted, a second field trip was made to Wormsloe on September 27-29th to observe profiles and collect soil samples in selected features indicated by geophysical images. At each of the three grid sites previously chosen (Slave Cabin, Cow Dip, Woodland Charcoal), 2-3 feature points of interest were selected from geophysical images. These are referred to as "Inside" the feature, or I. In addition, 1-2 points were selected outside the feature of interest. These are referred to as "Outside" the feature, or O. At the Slave Cabin site, a total of 3 Inside points and 5 Outside points were selected to sample the soil. At the Cow Dip site, 3 Inside and 3 Outside points were sampled and at the Woodland Charcoal site, 2 Inside and 3 Outside points were sampled. A total of 19 points were sampled. At each point, the soil was augered to a depth of 160cm, if possible. The profile was described, samples were collected at each horizon, and soil horizons with historical debris were sifted through a ¼ inch screen to collect any artifacts.

Ground truthing at the three different grid sites to conclude relationships between features on the survey images with actual subsurface features provided mixed results. At the Slave Cabin site, 1 out of 3 Inside feature points resulted in an actual anomaly or feature of interest, whereas the Cow Dip site resulted in 3 out of 3 Inside points resulting in an actual feature of interest. The Woodland Charcoal site Inside points did not have obvious features as the Slave Cabin and Cow Dip sites, such as shells and building debris, but did seem to be influenced by charcoal. Woodland Charcoal soil samples will need chemical analysis to relate high resistance image features to what is seen visually.

Lab & Chemical Analysis

Soil samples are being processed at the Whitehall lab for pH, C, N, P, and Ca. Additional "Reference" samples, or soil samples collected in areas Wormsloe historic maps indicate as only being in forest cover since 1760 (we are classifying these areas as low disturbance), will be analyzed and compared to samples collected within the three grid site locations. Reference soil results will provide a basis for comparing "native" soil conditions with soil conditions in historically high use areas. These comparisons will provide additional information to assess the effects of land use legacy on Wormsloe soils.

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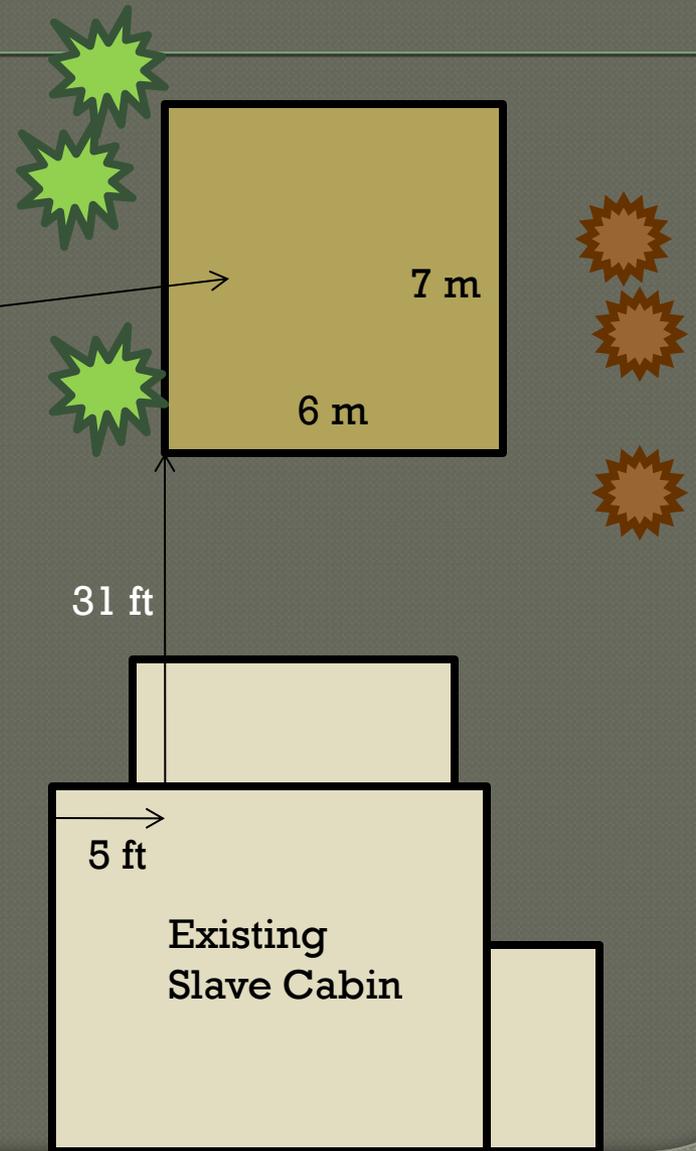
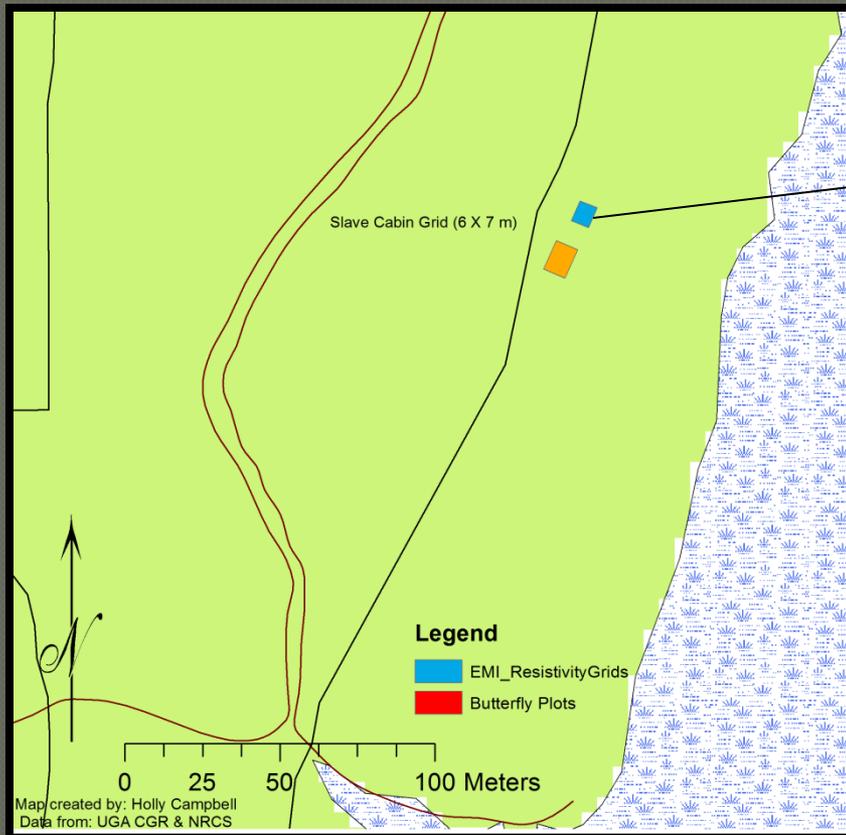
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Project Objective 2

Evaluate the utility of combining EMI, ER, and traditional soil sampling for identification and intensive investigation of sites of archeological significance.

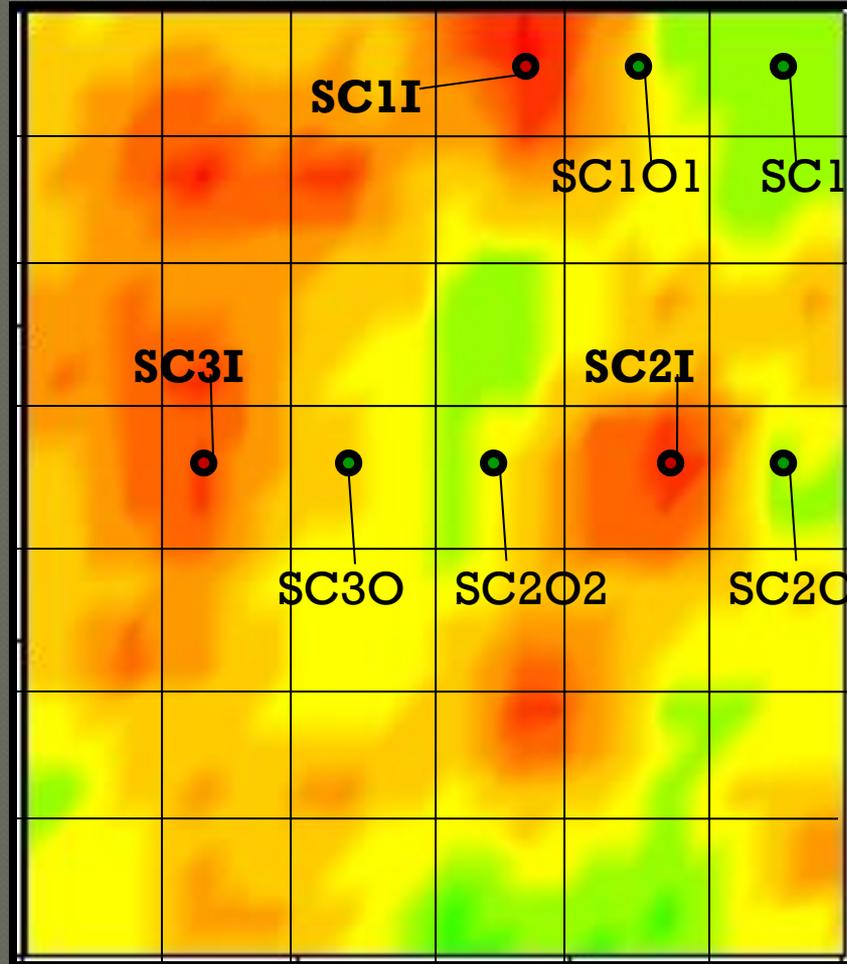
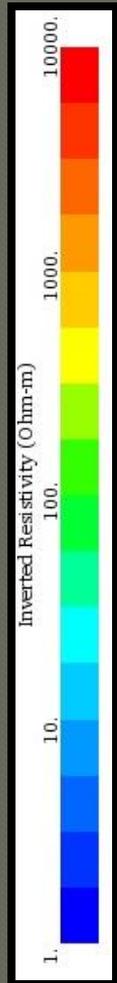
Slave Cabin Site



Slave Cabin Site



Slave Cabin Site



7 m

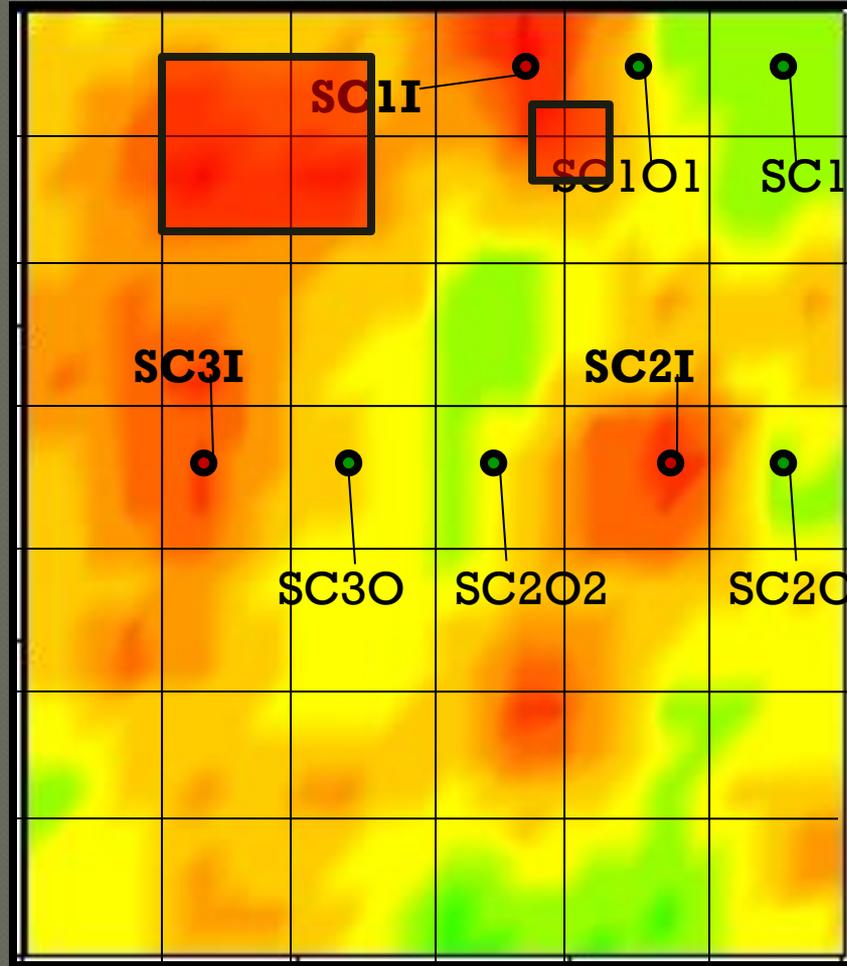
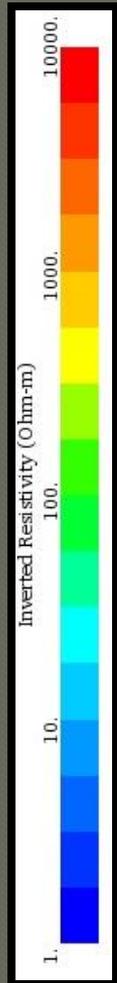
A vertical double-headed arrow indicating a distance of 7 meters, positioned to the right of the grid.

6 m

A horizontal double-headed arrow indicating a distance of 6 meters, positioned below the grid.



Slave Cabin Site

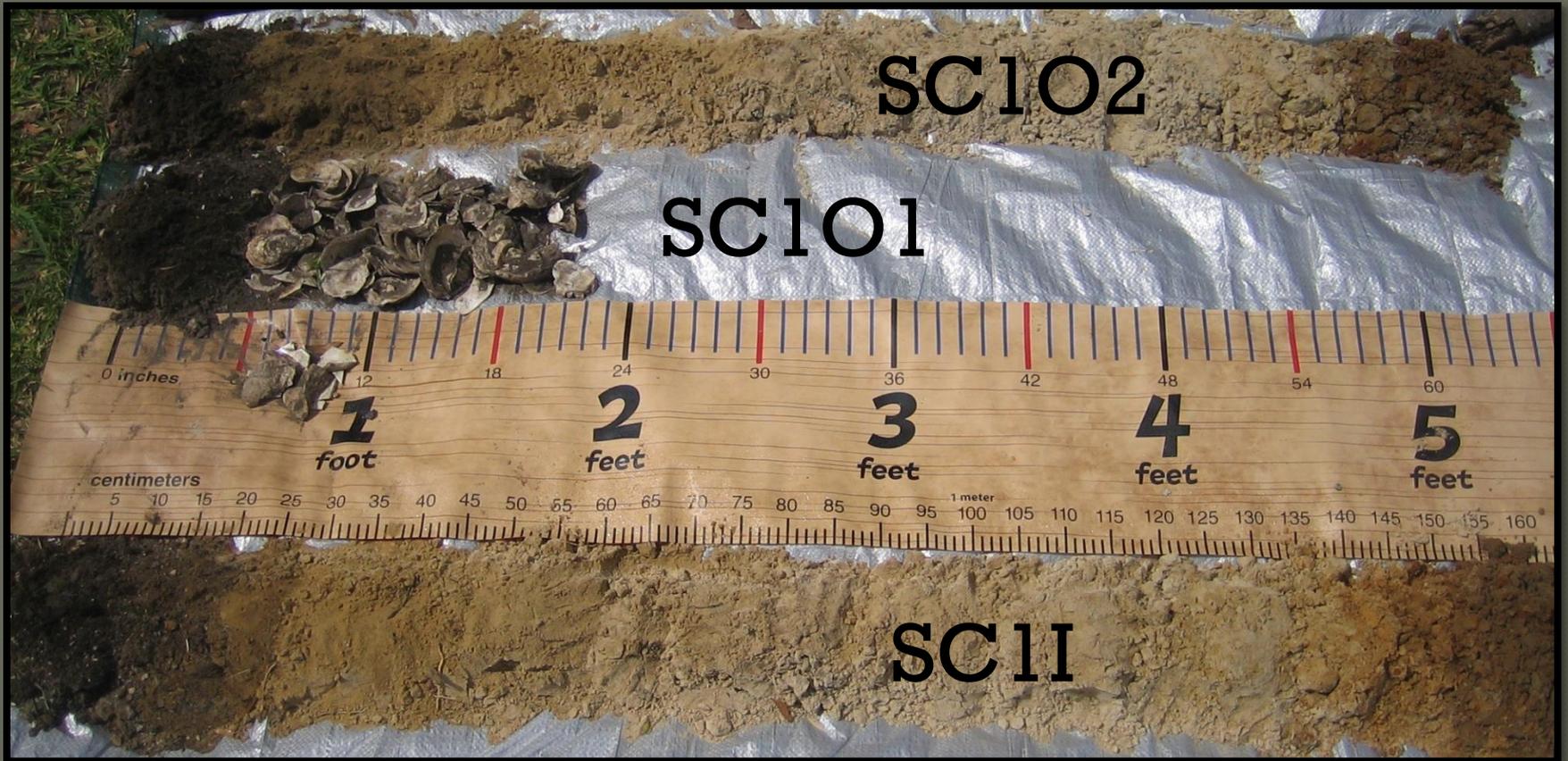


7 m

6 m



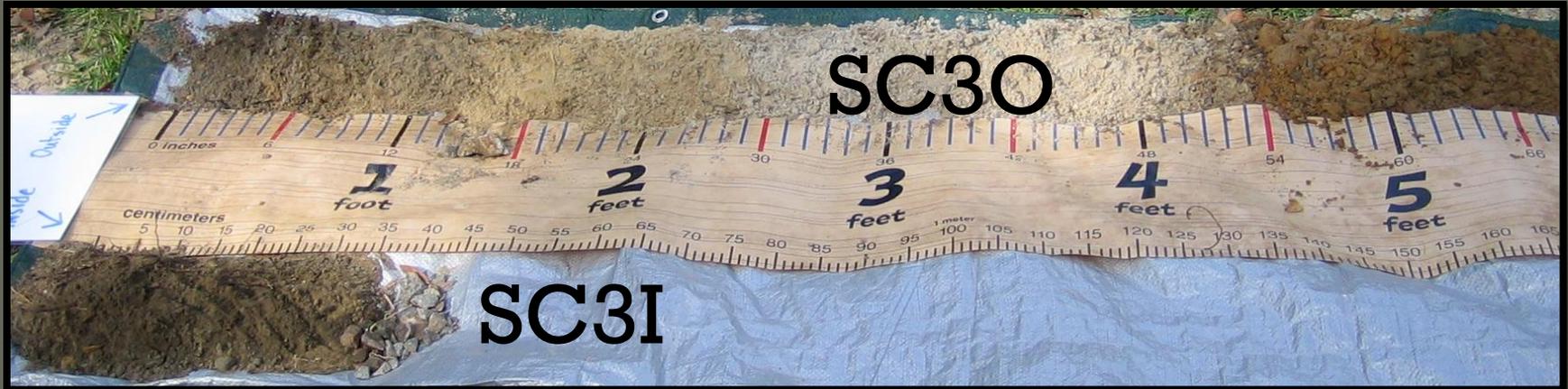
Slave Cabin Site



Slave Cabin Site



Slave Cabin Site



Woodland Charcoal

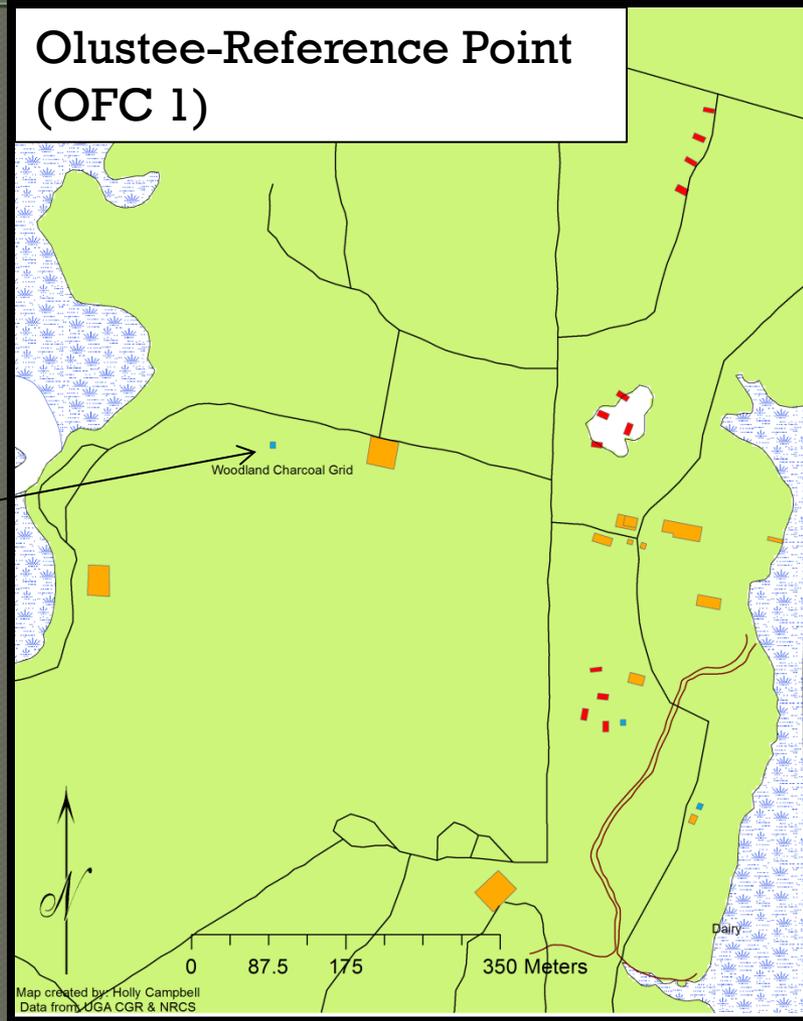


← surface

↙ 45-55cm:
↘ Charcoal layer

← 160cm

OFC 1



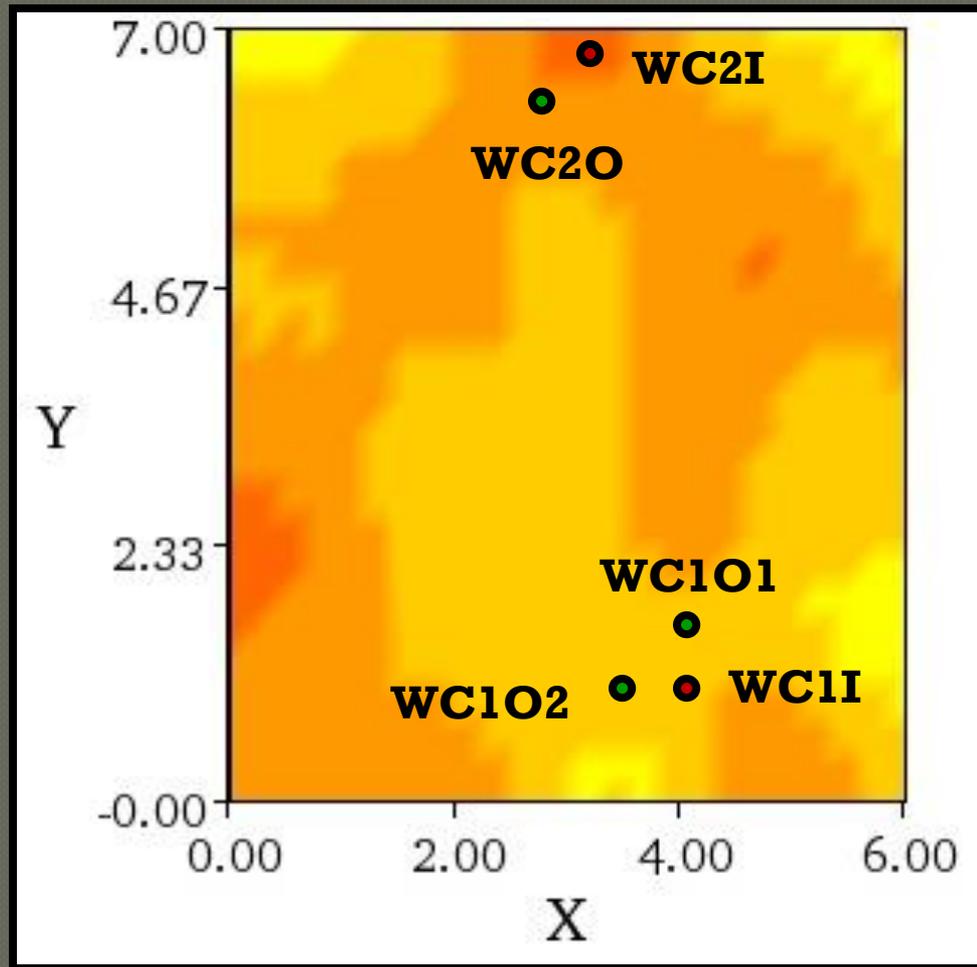
Olustee-Reference Point
(OFC 1)

Woodland Charcoal Grid

Dairy

Map created by Holly Campbell
Data from UGA CGR & NRCS

Woodland Charcoal



Thank You!

