



Exploring the Migration of the Roanoke Colonists

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ABSTRACT

Characterization of Environmental Attributes of Potential Lost Colony Archeology Sites Using satellite based optical sensors, and Synthetic Aperture RADAR, aerial LIDAR and Ground Penetrating RADAR.

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Historical maps and records identify at least four (4) sites in North Carolina's Dare (2), Hyde (1) and Tyrell (1) Counties (just west of Roanoke Island) as locales with Contact Period Native American Habitation. There is reason to suggest one or more of these locations as providing sanctuary for refugees from the ill-fated colony established on Roanoke Island in 1587. The results of prior study of high-resolution satellite imagery of two (2) of the sites to identify environmental characteristics (factors) conducive to habitation and to search for the presence of cultural features possibly related to either Native American or European habitation were inconclusive. This effort indicated that the use of satellite or aerial multispectral imagery at visual or infrared wavelengths, and at even the highest conceivable spatial resolution would yield limited results due to the considerable vegetative canopy that obscures the ground at these sites.

In February 2000 NASA flew an Interferometric Synthetic Aperture RADAR (ISAR) aboard the Space Shuttle Endeavor to accurately map the Earth's topography. Since that time, data from the Shuttle RADAR Topography Mapping Mission (SRTM) has become publicly available providing 30 meter spatial resolution for the entire United States. The major advantage of the dual band being that obscuration by vegetative canopy would be minimized providing more reliably accurate data than by optical techniques. The primary disadvantage of this technique is that the resolution is insufficient to detect the features at the scales most likely to pertain to the search for the lost colony.

Since 2003, very high spatial resolution (approximately 1 meter) Light Detection and Ranging (LIDAR) instrument was flown to collect elevation data across the entire state of North Carolina and used to derive maps to improve flood insurance rates and assist Federal Emergency Management Agency (FEMA) planning. These data have fortuitously become publicly available within the past year as a result the North Carolina Flood Plain Mapping Program. While this data provides improved coverage at appropriate spatial scales, and was collected during minimal leaf conditions, there is a statistical component to the data that produces invalid elevations.

It is possible to improve the accuracy of the North Carolina elevation data by combing the two data sets (SRTM and NCFPMP). Thus the use of both new data sets may provide an opportunity to determine environmental and cultural features beyond the limitations of either. Moreover, the proximate location of both sites to ECSU yields an opportunity to establish ground truth for measurements made remotely. Once elevation data has been validated, features with the requisite characteristics of habitability, arability, and defensibility will be sought to provide a focus for future in situ study.

