

A Technical Discussion of the John Smith's Nanticoke River Rectification Project in Summer 2004

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In order to better inform interested parties of the specific process used to arrive at the conclusions outlined in “A Digital Historical Geography of Vienna, Maryland: The Digitization of John Smith’s 1612 Map of the Chesapeake Bay and Thomas Ennals’ 1706 Map of ‘Vienna Towne,’” (Scott, 2005), we were asked to outline key processing steps. Not every single step is included in the following list, as that would essentially amount to a repeating list of ArcGIS commands with the occasional interpretative comment. What follows, however, are the major steps and important professional judgments made during the research. All of the point references may be found on Map 1.

1. Digitized lines and points from high-resolution image of Smith’s 1612 map, obtained from the Library of Congress. Digitization took place at most detailed scale necessary to capture the major map details.
2. Affine transformation to rotate, scale, and shift the map into the correct approximate scale and position (Used four points around the bay)
3. Clipped the study area (the current day Nanticoke River) from the entire dataset
4. Identified key control points
 - a. Confluence of Nanticoke and Wicomico is obvious and was the first point placed
 - b. The west bank across from Wetipquin Creek (Point “I”) seems to be an noticeable feature
 - c. Smith recorded an island in the river at point “E.” While no such island now exists, a bar exists at the mouth of Barren Creek. It seems somewhat likely that this bar could be a tombolo, connecting an old island with the mainland. Therefore, these points were matched.
 - d. The confluence of the Marshyhope Creek with the Nanticoke River is distinctive, as it is one of the few major tributaries on the west bank of the river. Point “B” seems the obvious connection.
 - e. Two major issues that were more difficult to resolve:
 - i. The creek on the west bank of the lower Nanticoke. Again, today no navigable creek in that area. However, looking at the 1:24000 Mardela quadrangle, a very conspicuous pattern of wetlands surrounding Peachorchard Creek shows a similar pattern as Smith recorded. We have anecdotal evidence that Peachorchard Creek was navigable by small boats even in the last 50 years from people who have lived in the area. Therefore, our working theory is that the extensive wetland feature now seen is a recent addition and that the creek was large enough in 1608 to

- traverse. Working with local geomorphologists, we are currently planning to take marsh core samples of the wetlands to try to date the feature.
- ii. The creek on the east bank of the lower Nanticoke. While this creek may have been Wetipquin Creek, we actually believe that this represents Rewastico Creek. The elevation surface and the current river course suggest that the current path of Rewastico Creek may have been formed by a stream migrating headward and capturing the flow.
5. Performed rubbersheeting transformation using 3rd-order polynomial in ArcGIS 8.3. RMS error was in the thousands but the number is irrelevant given the lack of units from the original scanned map.
 6. Upon presenting this data to the Town of Vienna, Chief Fitzhugh (spokesman for the descendants of the Nanticoke Indians), described the location of Nause (he pronounced it Nah-soo) was near Elliot's Island (where our analysis put it) and a "congregation" island near the primary village of Kuskarawaok where the villagers would meet to prepare for war...this would match with the Barren Creek location

Significant issues still left unresolved:

1. The map has distinct differences between points "F" and "G" and "A" and "B." Again, dealing with the multitude of sources of potential error in both Smith's measurements, the recording of those measurements, and the change in the River over the past 400 years, one has to allow for some significant inaccuracies.
2. The Delaware Question: as to whether Smith reached Delaware, given our results, our answer would be yes. If Point "B" is indeed the confluence with the Marshyhope, Smith records several turns upriver which must be beyond the Maryland border. Unfortunately, it will be nearly impossible to pinpoint how far upriver the expedition went because of the lack of recognizable features on that portion of Smith's map. Simply put, we don't have any points at the northernmost end to anchor our interpolation

All interpolation is subject to interpretation. Not only will different control points create different results, but picking them in a different order will often result in slightly different output. That is why best practices suggest picking those control points that the analyst has the most confidence in first, and the least certain last. To further add confidence in our results, our rubbersheeting process was actually done several times with slightly different control points. Therefore, given all of the potential error sources in matching 400-year old maps with current scientific surveys, we feel reasonably confident that our results accurately represent the link between John Smith's 1612 version of the Nanticoke River and that drawn by the US Geological Survey in 1990.

WORKS CITED

Scott, Michael S. (2005). *A Digital Historical Geography of Vienna, Maryland: The Digitization of John Smith's 1612 Map of the Chesapeake Bay and Thomas Ennals' 1706 Map of "Vienna Towne."* Unpublished Report: Salisbury University. 11 pp.