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### Mapping the Island of St. Klement

I was first introduced to the Island of St. Klement in Prof. Ivancica Schrunk's Archaeology class, taken at St. Thomas during the spring of last year. I was quickly intrigued by Prof. Schrunk's current work on the Island involving the examination and preservation of building features and salt works left by the Roman Empire during their reign. What interested me more, however, was the unique geography of the Island and what I could do to help Dr. Schrunk during her future outings. During the early fall, Prof. Schrunk and I talked more and more about what could be done using ArcMap to help her either attract interest to the island project or assist her with her actual work on the Island. After reviewing the available data that Dr. Schrunk had to offer, and searching the internet for other options, it became clear to me that there was not much available. However, I knew that there was enough at my disposal to come up with something for Prof. Schrunk that would assist her with her in class lectures, professional presentations, and provide her with another image for the St. Klement Archaeological society's website.

The first process that I went through in the creation of my map for St. Klement, was accurately representing the shape of the Island. The ESRI Data showed the island in a jagged and unshapely polygon, which did not flatter St. Klement's unique shape in the least. So, I imported and georeferenced an image of the Island from Google Earth. The image from Google Earth provided me with an accurate shape and size of the Island which I needed down the road for shapefile creation. Once I had an accurate outline in place, I used the editor toolbar to edit a new polygon shapefile, which I had created in ArcCatalog. Upon completion of the polygon, I hit a bit of a roadblock. I didn't know where to go next, or what to look for.

After messing around on Google Earth, it became clear to me that I would be able to manually extract elevation data from the program. This meant that I would eventually be able to use the 3D analyst tool to create a relief map of the Island. Using the marker tool within Google Earth, I swept over the entire island of St. Klement, manually placing

markers and recording the elevation at that specific point. After placing and logging 245 elevation points, I took four separate snapshots of the Island at an eye altitude of 6392ft. and exported the images to ArcMap. I had to take four different shots so that I could see all of the markers I had placed within ArcMap. I then georeferenced each separate tile to fit the polygon shapefile I had created originally. After creating another shapefile in ArcCatalog, this time a point file, I once again used the editor tool to change the blank point file. Slowly, I placed points where the markers within the georeferenced images were, and recorded their specific elevation within the pointfile's attribute table. Upon the completion of this task, I used the 3d Analyst extension to convert my created point features into 3D, using the convert to 3D function. After the computer finished this short calculation, I once again used the 3D analyst, this time to create a TIN file. The settings I used within the tool established the points within a network based on their elevation and spatial relation to each other, and contained the network within the shape of the Island polygon. The resulting image was beautiful and surprisingly accurate when compared to a contour map of the Island.

I have enjoyed the work that I have completed thus far for the Island of St. Klement. However, there is much more that can be done in the future with improved data. For example, with improved elevation data for the island, slope and volume calculations could be done. This would allow Dr. Schrunck and her colleagues to accurately judge in the field how much dirt and earth they would need to displace in order to get to a prospective find within a hillside. With ongoing help from GIS users I am sure that Dr. Schrunck and her team will find great success at the Island of St. Klement for years to come.