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Environmental Studies Internship Fund
Summer 2010

Sewanee Forest History Project

The Sewanee Forest History Project is now in its third year and proceeding exemplarily. After two years of scanning documents, sorting files, organizing, developing, and maintaining databases, proofing scans and quality checking data, and digitizing what data could be digitized, we finally piloted into phase III- basic analysis using our long worked-for data. Although this was originally going to be the meat of my summer internship, extenuating circumstances added considerable work on top of this. Nick Hollingshead, previous director of the Landscape Analysis Lab where I worked, left in June with a replacement not yet found. The other lab staff we were counting on helping out this summer obtained a job in Chattanooga at the same time, leaving the lab with only two overworked interns with knowledge of lab software and computing abilities. Meagan McMillan and I thus assumed semi-administrative roles, and I became chief tech-support for the various ecological research projects operating out of the lab. In addition, I took on administrative work such as preparing data for the lab presentation to the new Vice Chancellor and aiding in the interview process for the replacement lab manager. I also provided tech support to the Sewanee Environmental Institute summer program, especially in the form of cartography, and did some cartography work for the Sewanee Outing Program. Finally, I helped in post-program wrap-up of the Sewanee Environmental Institute Archeology Field School.

Sewanee Forest History Project Research

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The intent of the phase III preliminary data analysis was to experiment with meaningful uses for the data of the Sewanee Forest History Project. The primary data used was digitized inventory data from forestry inventories taken every decade and harvest history data digitized from contracts, receipts, aerial imagery, and harvest marking tallies. The explicit point of our initial analysis was to determine how the harvest history data influence changing forest composition, reflected in the forest inventory data. I also proposed to do further field work to re-inventory selected areas of interest on the domain to see how forest structure continued to change in our post-harvest management forests (only two small harvests have been conducted in the non-pine plantation forest in the last 20 years).

While this was originally set to take up most of my time, the additional responsibilities cut into time I could spend on research and my goals here were not achieved. I was able to make a format for compartmental analysis and apply it to selected forestry compartments (the domain is broken up into about 40 of these compartments). This work was almost entirely done on the computer, with most days that I worked on it structured more or less as an 8am-5pm typical work day. While no obvious correlations of structural of composition change with harvest history could be discerned (aside from a short term decrease in stand density, lasting about 20years from harvest but obviously expected), interesting patterns in species change, especially on the plateau were found which we have yet to explain. An example is the odd conversion of most plateau forest from scarlet oak (*Quercus coccinea*) dominated to white or chestnut oak (*Q. alba* and *Q. prinus*, respectively) dominated.

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During the last week of my internship I finally was able to get to the field sampling I proposed, however I only managed to sample 4 plots. This was obviously an insufficient sample number for any analysis, but I was able to familiarize myself with forest inventorying methods which may prove useful for any senior honors research I do. Also the insight into methods may help advise the office of the domain management as, together with the forestry department, biology department, and the Landscape Analysis Lab, they prepare for another spate of forest inventorying. I was able to improve my general tree identification abilities and see a continuance of patterns visible in the inventories- namely continued increase in forest density and a trend towards an older age structure.

Administrative Work

As senior GIS-proficient researcher, I took over many of the minor functions of Lab Administrator this summer after our previous Lab Manager left. GIS, or geospatial information systems, uses spatial data including aerial imagery, GPS point, area, and line drawings (types of what are known as "vector data"), and similar geospatially referenced data to conduct various analyses. A related though technically different field which, at the basic level, uses the same skill set is cartography. I used these skills, as well as general technical knowledge, to aid other researchers and interns working for the LAL or our sister organization (who uses the same facilities) SEI.

Flora of the Domain: Nathan Bourne and Katy Qualls worked this summer out of the LAL on their summer research project- the ecologically mapping of the flora of the domain. I was

tasked with helping them identify sites of interest for sampling flora in order to obtain samples from a maximum of different habitats. This was some intense GIS work as I manipulated Sewanee's "Digital Elevation Model" to obtain slope, aspect, moisture, elevation, and roughness data and combine/compare this with currently digitized ecological data. This work will further be used this semester in our continuing efforts to produce a vegetative map of the domain. I also produced a basic map for the flora researchers to keep track of their sampling.

SEI High School Summer Program: The SEI high school program provides environmental education, including topics in biology, geology, archaeology, policy, and outdoorsmanship. My primary responsibility for this program was simply tech support- making sure the counselor's computers worked right, etc. I did make a pair of maps for a couple of outings, and gave an orientation to the LAL and GIS to one student prevented from going on an outing by an injury.

SEI Archaeology Field School: Meagan McMillan provided almost all tech support, GIS support, and cartography for this program, however after the end of the program I was called upon to help with physical support with the clean-up. For the next week I aided in the excavation of a rock shelter archaeology site. This was perhaps the portion of my internship where I learned the most as I was working directly with a professor and a grad student in a field I had no previous experience in. I was taught sifting, basic excavation (I removed half of a float column myself one morning), and use of a total station, as well as a working knowledge of Native American archaeology and recognizing artifacts. This experience is of continuing use as

I'm currently in contact with the grad student as an on-the-ground consultant for possible pollen coring of the domain's ephemeral ponds.

Other responsibilities: minor odds and ends I did in addition to the aforementioned included cleaning up some cartography done by Eric Keen to prepare SOP maps for printing as well as helping prepare computer facilities for the upcoming semester. Finally, I was a contact point for faculty needing to use LAL facilities for research or teaching purposes.

Multiple benefits came from my work this summer. While I was not able to find anything significant in my research, I was able to compile information which may be useful for my future research, other researchers, and the domain management planning process. In addition I learned new skills including more advanced GIS knowledge and a whole new set of archaeology support skills. I also established/broadened contacts with several researchers and staff with whom I may be working with in the upcoming year. Finally, I learned a great deal of management skills in my role as co-acting lab manager.

This semester I will be continuing work done this summer and, partly as a result of my experience this summer, filling the role of acting lab manager as our new hire finishes the semester at his old institution. In this position I will be coordinating LAL research and faculty support, as well as continuing with my own personal projects including SFHP research, domain planning support, and building a floristic community map of the University domain. My summer experiences will be vital in helping manage these responsibilities and all together this should look excellent on future resumes and applications for continuing education.