Johnny Sullivan
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GIS – Term Project
Status Report

The first step in the project was to assemble the SSURGO soil polygon data. This data was obtained from the SSURGO website in coordination with ESRI. There were many different polygons with the same value for available water storage (AWS), so these were combined using the "Dissolve" function in ArcGIS. This data was then joined to a map of 30 min quads, as that is the accuracy with which NLDAS data is presented, and this would be added later. This allowed for the determination of the total number of unique AWS values for each 30 min quad.

The rest of the work on the project so far has dealt mainly with data acquisition. The data from the National Land Data Assimilation System (NLDAS) is continuously updated and available online in the grib file format. This format is not compatible with ArcGIS, which means that it must be converted to a format that does work. NetCDF was chosen because it is a standard in the field. Time was initially devoted to opening the grib files just to access certain data, but this was abandoned after it was found that there was neither a simple way in which to do this nor much longterm value for the project in doing so because the process could not be easily automated.

It was eventually decided that the grib files would be hosted on a CRWR-run THREDDS Server. THREDDS stands for Thematic Realtime Environmental Distributed Data Services, and it is a project run by Unidata that seeks to make gridded data easily accessible to scientists and researchers. The TDS (TREDDS Data Server) will continuously download new NLDAS data as it becomes available using the LDM (Local Data Manager). When it intakes data, the TDS

automatically converts it to a local file format. Users can then request downloads from the TDS and specify which file format they would like to data in, and the TDS will convert the data from its local file format to the format requested by the user. In this way, the grib-formatted NLDAS data will be continuously and automatically accessible in the NetCDF format.

There were some problems, however, in getting the TDS set up. THREDDS relies on an xml file named catalog.xml to instruct it regarding where to look for the data. This was updated, but the TDS was not refreshing properly and was therefore not referencing the updated instructions. This was eventually fixed thanks to the work of the IT personnell at CRWR. The next step will be getting the LDM set up to download the NLDAS data.

Additionally, now that the TDS/LDM system is nearly operational, time has been spent learning the Python language so that code can be written that will automatically complete the steps necessary for analysis:

1. Download the NLDAS data from the TDS
2. Add it to the ArcGIS map as a raster layer
3. Update the AWS values of each soil polygon

The way in which the last step will be completed is, for now, based on a ratio of the potential AWS from the SSURGO data to the total AWS for that county. The Python code will include this distribution method and allocate the NLDAS data accordingly.

In summary, there has been a significant amount of work invested in making the required data available, but that is nearing completion. The second portion of the project will be manipulation and analysis of this data; this step is currently in the beginning stages and will be worked on for the remainder of the project.