

STATUS REPORT – TERM PROJECT THE IMPACTS OF URBANIZATION IN AND AROUND AUSTIN TEXAS

INTRODUCTION

To examine the impacts of urban growth in and around Austin Texas, land use data as well as water pollution data will be examined. For additional benefit land use data changes will be compared with digital orthoimagery. The result will be a comprehensive understanding of how land use and the change of land use impacts the local environment in an objective way.

Austin is a small city in central Texas and is home to the University of Texas main campus as well as a several other smaller universities. Austin has been one of the fastest growing cities since 2000 and has seen a 20% increase in population since then, from 656,562 to 790,390 people. In addition the local has been subject to and is currently in a severe drought. It is important then to consider how recent and long term land development has and can affect the area.

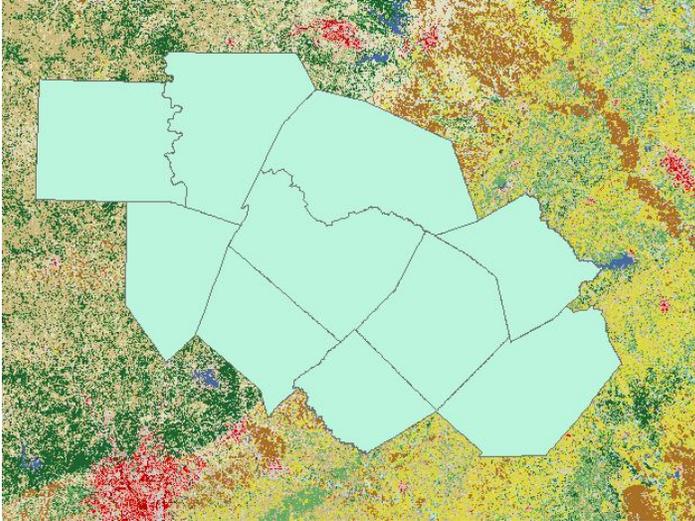
METHODS AND RESULTS STATUS

To understand the impact of land use and the change in land use it is necessary to first extract land use data for Travis and surrounding counties. Land use data used in this study has been obtained from the Multi-Resolution Land Characteristic Consortium (MRCL) This data may be found at: <http://www.mrlc.gov/finddata.php>

This data is available as a contiguous coverage raster image for the entire country. The most recent data sets are available as 30 x 30 grid cells.

To initial begin working with this data it is necessary to reduce the amount of data and fit it to a shape that is relevant to the problem that is being studied.

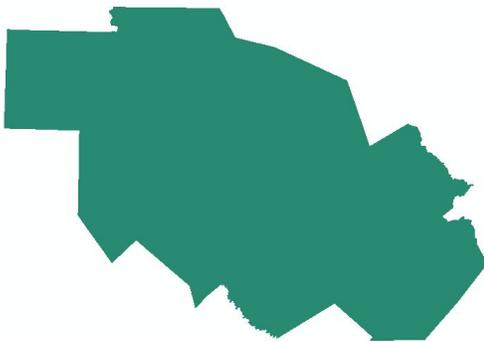
To do this for my data a polygon feature set defining Travis and adjacent counties was downloaded from the capcog website (<http://www.capcog.org/information-clearinghouse/geospatial-data/>)



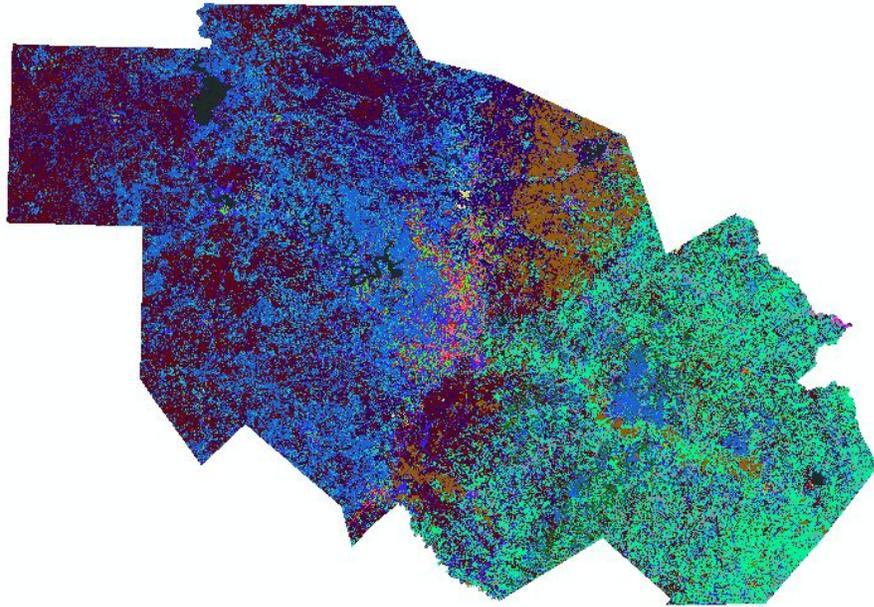
To use this boundary set to define the locality of Austin against the land use background it is necessary to re-project the data. To do this the feature was re-projected using the tool project. In doing so the coordinate system is change to match that used by the larger raster land use file.

After this the goal was to shrink the working space of the land use information as the land coverage data set is larger than necessary. To do this the polygon feature set defining the counties areas and borders must be converted to a raster image. This was done using the ArcGIS raster to tool.

Next the raster is converted to grid values all equal to 1. This will then allow the smaller working county raster to be multiplied by the land use data set to in essence “extract” the land use data for the counties only. Before this is done however, the land use data set must first be cut down to a useable size. Note that the data set covers the entire country such that the operation would take a long time to run. To shrink this processing time the arc tool “clip” can be used from spatial analysis to clip the input raster area to match the extent of the target raster. The extent can then be matched to the county binary data set.



Using the raster calculator tool, the county raster with value 1 is then “converted” through a simple multiplication ($1 * \text{land use value}$) and the land use mask is extracted. Below is given an example of this for both the 2001 and 2006 land use data.



REMAINING GOALS AND TASKS

The remainder of the project will compare the changes in land use using the Map Algebra tools in ArcGIS. Initially a coverage change map will be produced showing what land values changed between 2001 and 2006 for the locality. Later a comparison between the 2006 and 1992 data sets can be compared to understand a larger time period of change.

The data will be used to create numerous comparisons between changed values. This data can then be examined as to what percentage was gained to impermeable coverage. It has been found that a correlation exists between impermeable land use and water pollution. In understanding the progression over a larger time frame the more subtle changes, maybe the loss rural forests indicate that in a much later time the land will convert to a more impermeable coverage.