Area Suitability Analysis, Oregon
Evenson_GIS_Project
STE296

Problem

After graduation my wife and I plan to move to Oregon. Naturally, being a Geography major with a minor in Geology, my first step will be an area suitability analysis. In this study, I will evaluate the risk of wildfires in Lane County, Oregon. The site was chosen due to its latitude, proximity to the coast and elevation. The western and eastern thirds of Lane County are dominated by forests and provide massive fuel loads for fires. The county has a split in its forest matrix north of its center, this is where the city of Eugene is located. It is my hypothesis that Eugene will be the area with the lowest fire threat due to the distance from the fire's fuel source and its extensive transportation network.

The fires in California this year serve as a warning of things to come. Summers will become hotter and drier which increases stress on vegetation that can't migrate fast enough or adapt to the advance of climate change. Storms will increase in severity which in turn increase the likelihood of natural ignition coupled with the continual anthropogenic-caused fires. The key contributing factor in the fatalities that California suffered is people's inability to evacuate fast enough-many died before they made it out of their neighborhoods. The fires fed on dry fuel, winds and moved at high speed, people simply could not move out of the way fast enough. The question is: where are the safest areas to live in Lane County when considering the threat of fire? To answer this question, I will conduct a suitability analysis of Lane County based on distances from forests, major roads, cities and Oregon Fire Protection areas.

Data Collection

Data was collected extensively from Oregon Spatial Data Library, https://spatialdata.oregonexplorer.info/geoportal/, USGS Earth Explorer and ArcGIS Online.

2015_LandManagementDraft.gdb

Forestland.shp, county. Shp, Oregon_Zoning2017.shp, hwynet_2015.shp., Oregon_Forest_Protection_Districts.shp., Public_BareEarthHS.lyr

Pre- Data Preprocessing

Three of the layers share the same projection, so this is the one I will use for all layers in this project.

    Cities: WGS_1984_Web_Mercator_Auxiliary_Sphere

    Trans_network_public: NAD_1983_Oregon_Statewide_Lambert_Feet_Intl

    Oregon_Forest Protection_Districs: NAD_1983_Oregon_Statewide_Lambert_Feet_Intl

    Oregon Land Management 2015: NAD_1983_Oregon_Statewide_Lambert_Feet_Intl

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Forestland: GCS_North_American_1983

orcnty24_geo: WGS_1984_Web_Mercator

Projections were adjusted to NAD_1983_Oregon_Statewide_Lambert_Feet_Intl for all

Data Preprocessing

-All data was **clipped** to Lane County shapefile
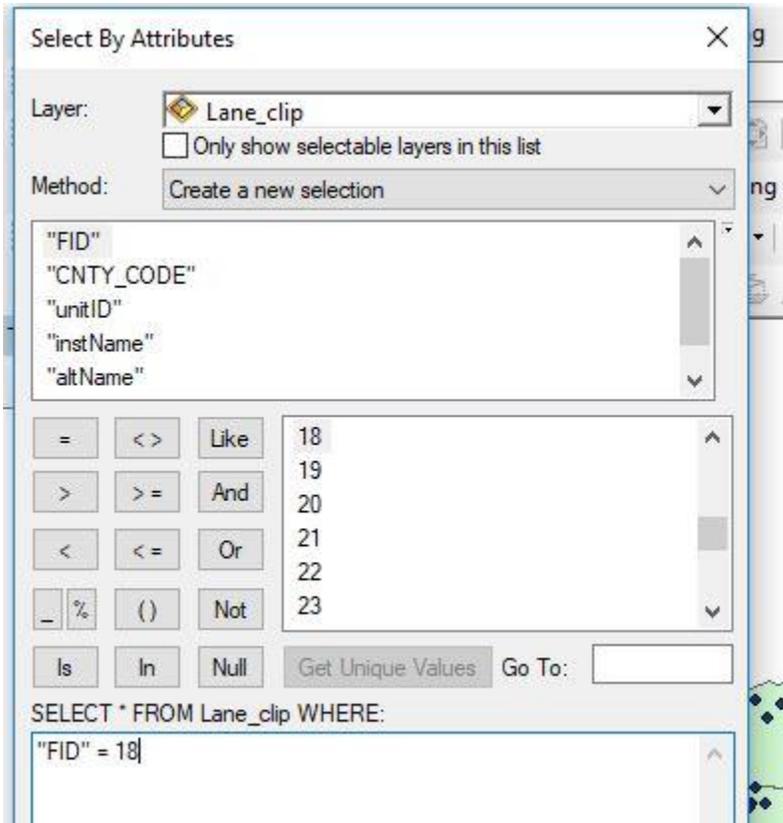
F1. Lane County was selected form the Oregon County shapefile, a new layer was created (LaneCounty) to used to clip the remaining layers.

RISK values	O.F.P. Lane	Forest boundary	Roads	Cities
3 - high	1 mile	1 mile	10 miles	10 miles
2 - med	5 miles	5 miles	5 miles	5 miles
1 -low	10 miles	10 miles	1 mile	1 mile

F2. The following tables shows the distance away from a feature and the risk value. Note: roads and cities are considered safe, so the risk is the reverse of the Oregon Forest Protection and Forest layers.

A **buffer (multi ring)** was created for each of the features, a new attribute of "RISK" and assigned value was added.

Feature to raster was done using the "Risk" attribute for each of the 4 risk factors.
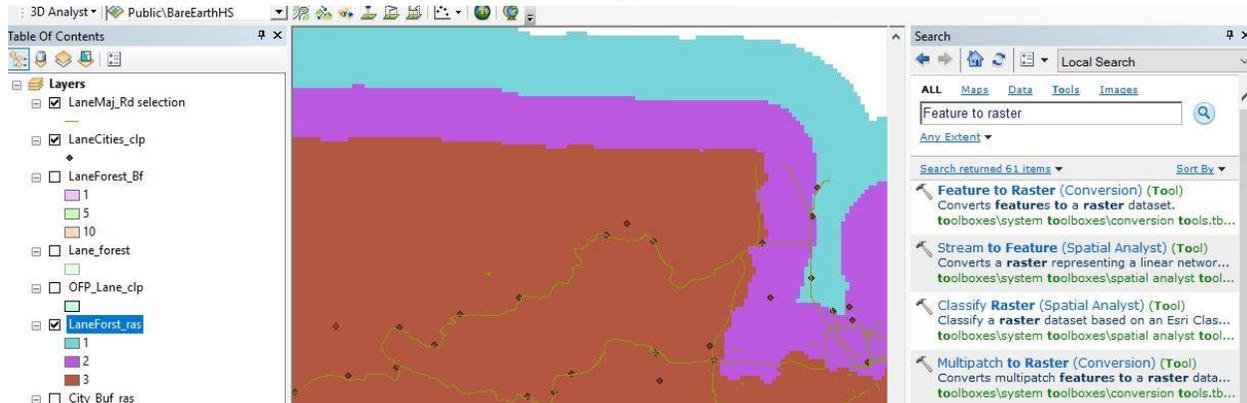
F3. Feature to raster was done to allow analysis

All the new rasters where added in **Raster Calculator**
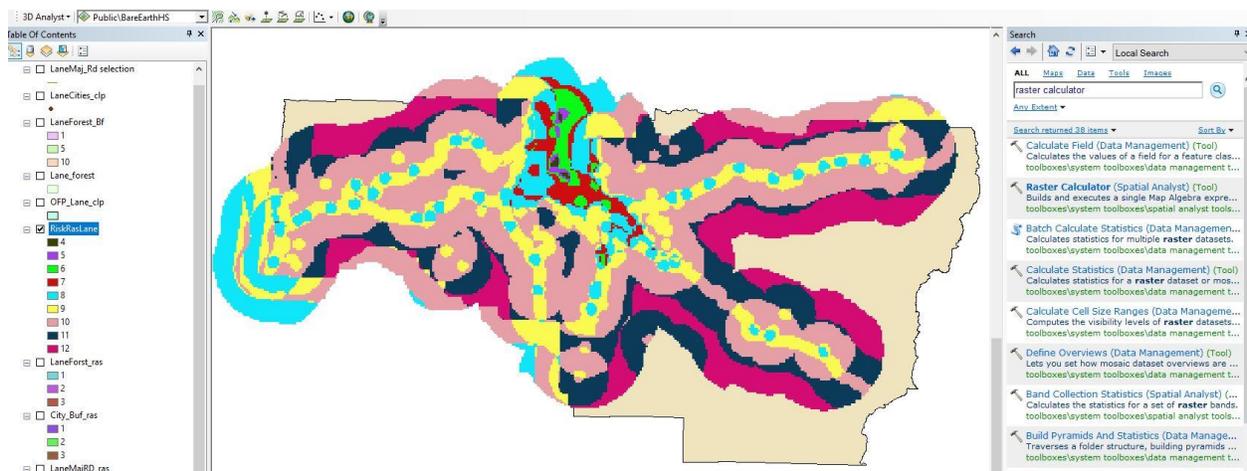
F4. The output from the Raster Calculator yielded a fire threat scheme with values from 4 – 12.

Symbology was changed to a ramp and added to the final product.

The final product is a map illustrating the fire threat based on the work flow of the study. The risk is indeed greatest to the west and the east and Eugene is at the center of the low threat zone. The process was to gather data, pre-process information layers to focus on an area of interest, and then execute buffers based on distances from dangerous and safe places. Some areas to the far east and west are undefined due to the lack features studied in those areas. Once I find employment, I will repeat this study in a more refined area centered around my new GIS job. While it is nice to affirm my hypothesis, the process was far more rewarding.

By Shawn Evenson

Lane County, Oregon Fire Risk Assessment
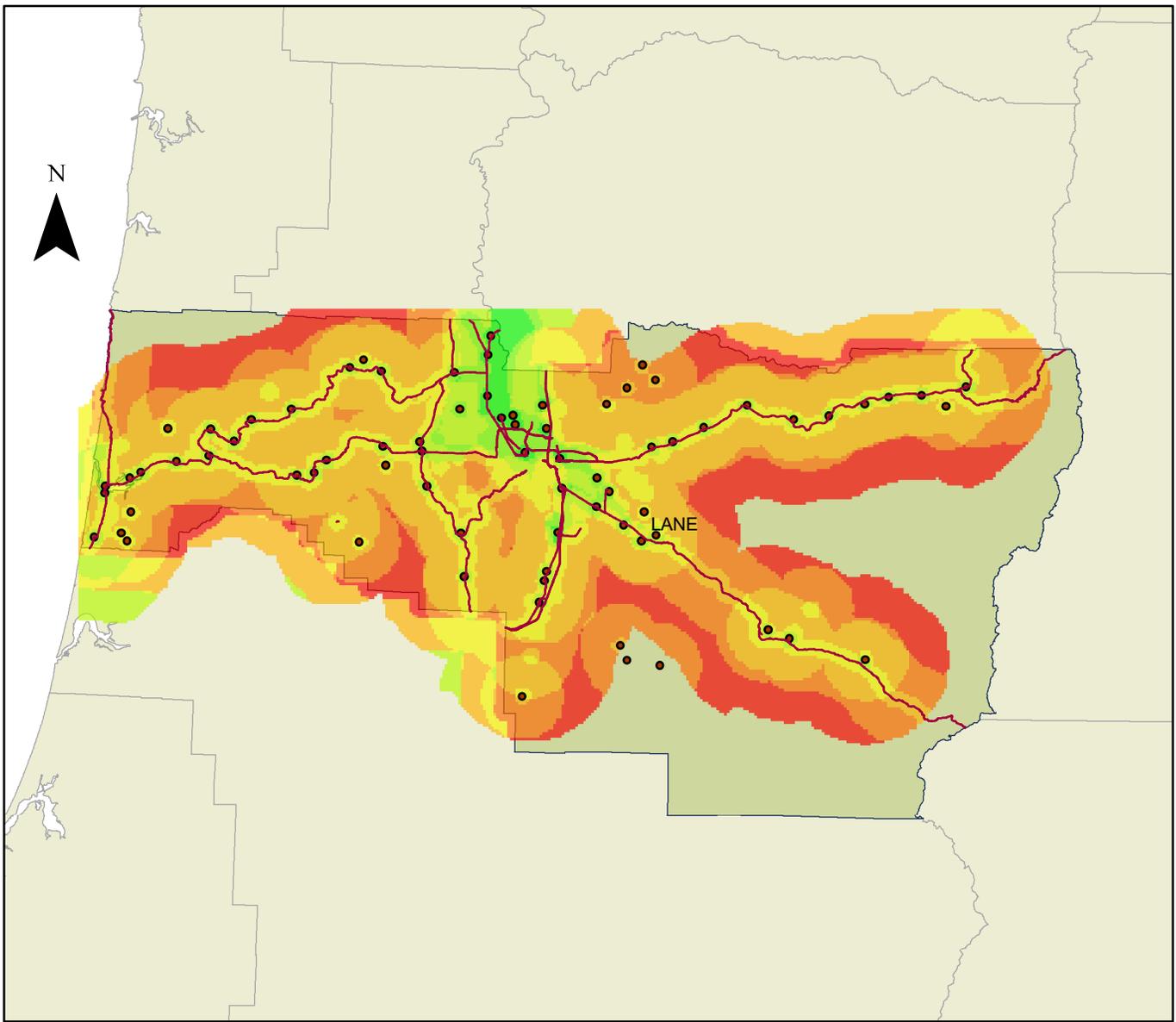
Legend

—————— Major_Roads selection

• Lane_Co_Cities

LaneFireRisk

Value

High : 12

Low : 4

county_map

Lane_County