A STUDY OF SLOPE, PRECIPITATION, AND LAND COVER IN NORTHWEST OREGON

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GEOGRAPHY 593

MOTIVATION & BACKGROUND

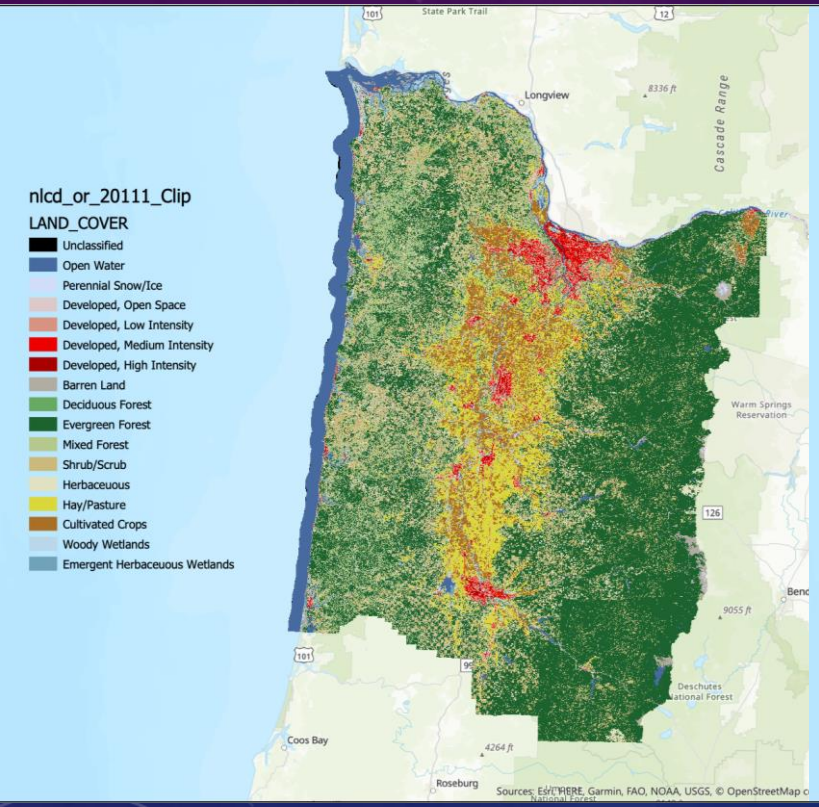
- Precipitation in NW Oregon is significantly influenced by topography
- Land cover in NW Oregon is significantly influenced by precipitation and topography
- A spatial analysis of topography, precipitation, and land cover can be a visual demonstration of an influential physical phenomenon.

DATA

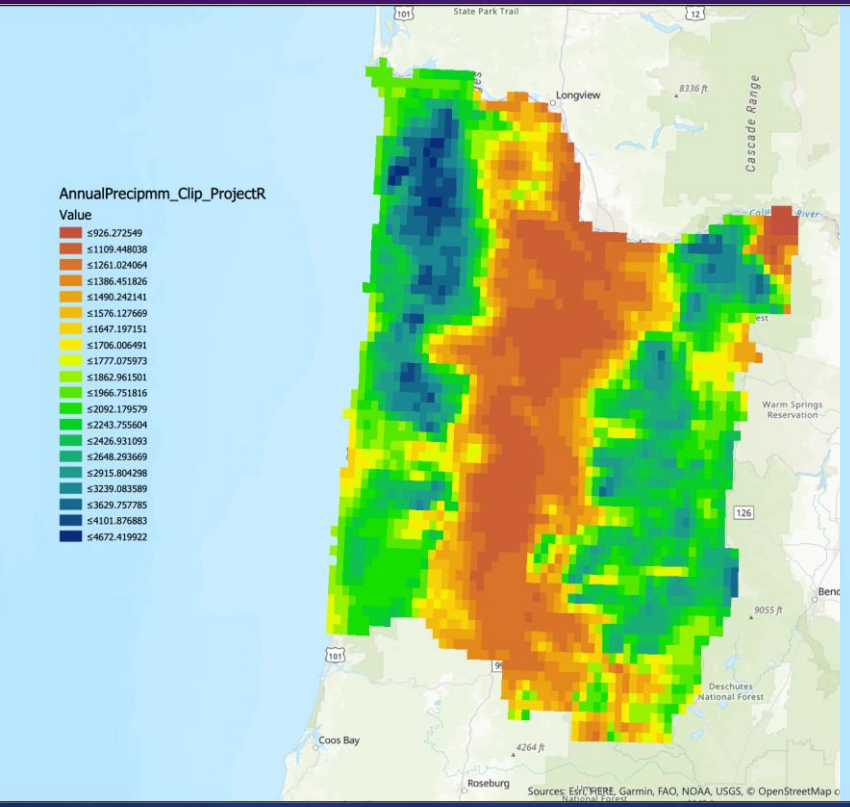
- Elevation data - Oregon 30m DEM
- Landcover data - Oregon NLCD 2011
- Precipitation data – CONUS PRISM annual precipitation data

INITIAL DATA & STUDY AREA

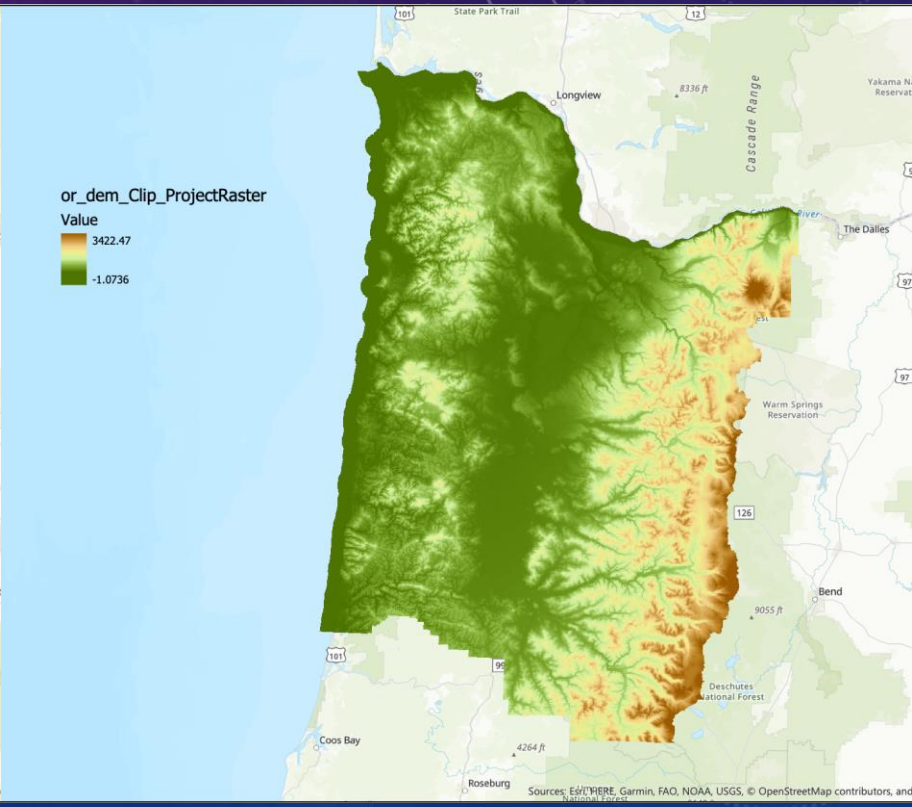
Landcover



Annual Precipitation (mm)



DEM (m)



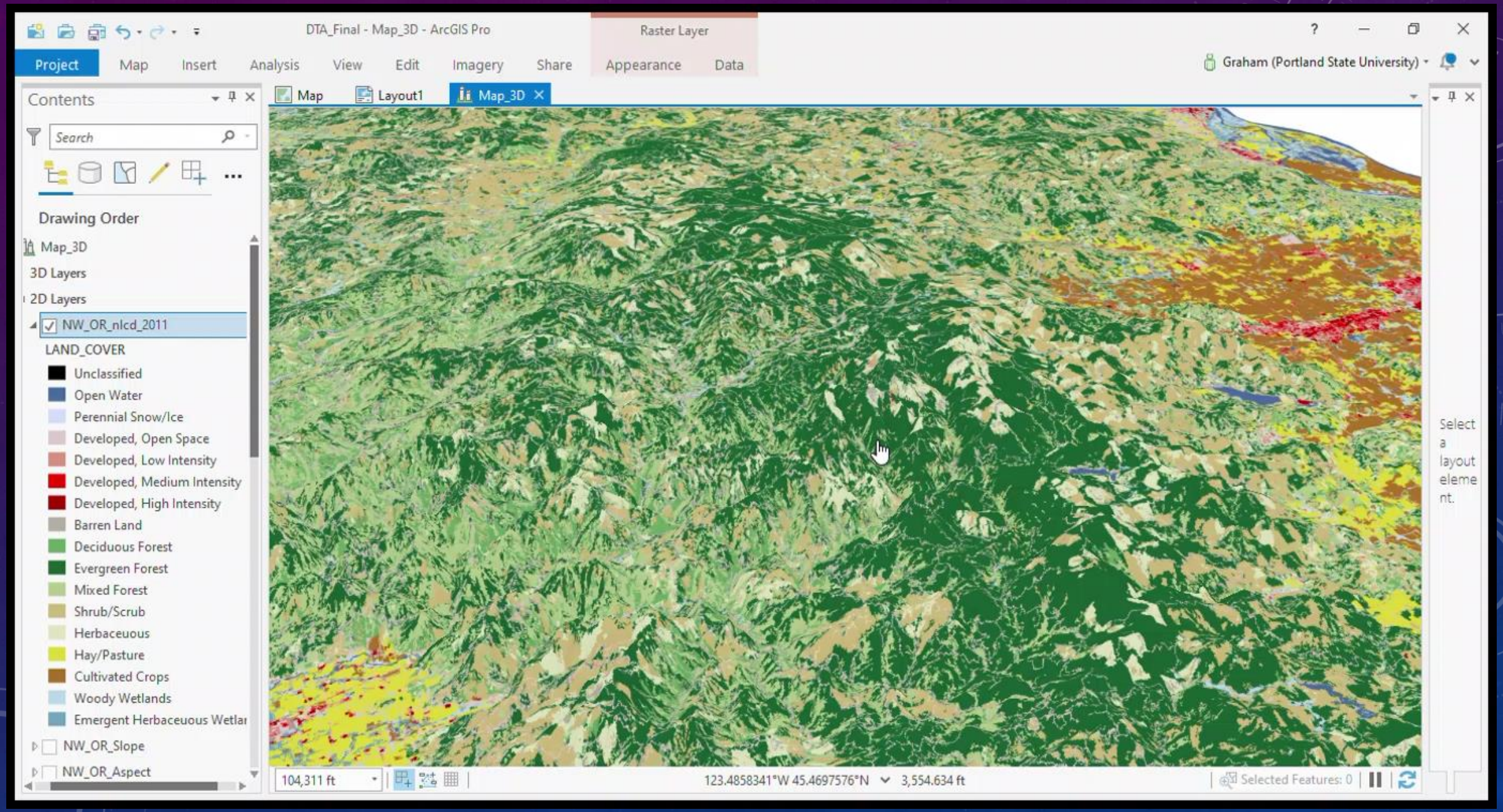
RESULTS

- Spatial correlation between raster datasets was less than expected
  - 0.43 correlation between annual precipitation and slope
  - 0.37 correlation between precipitation and elevation

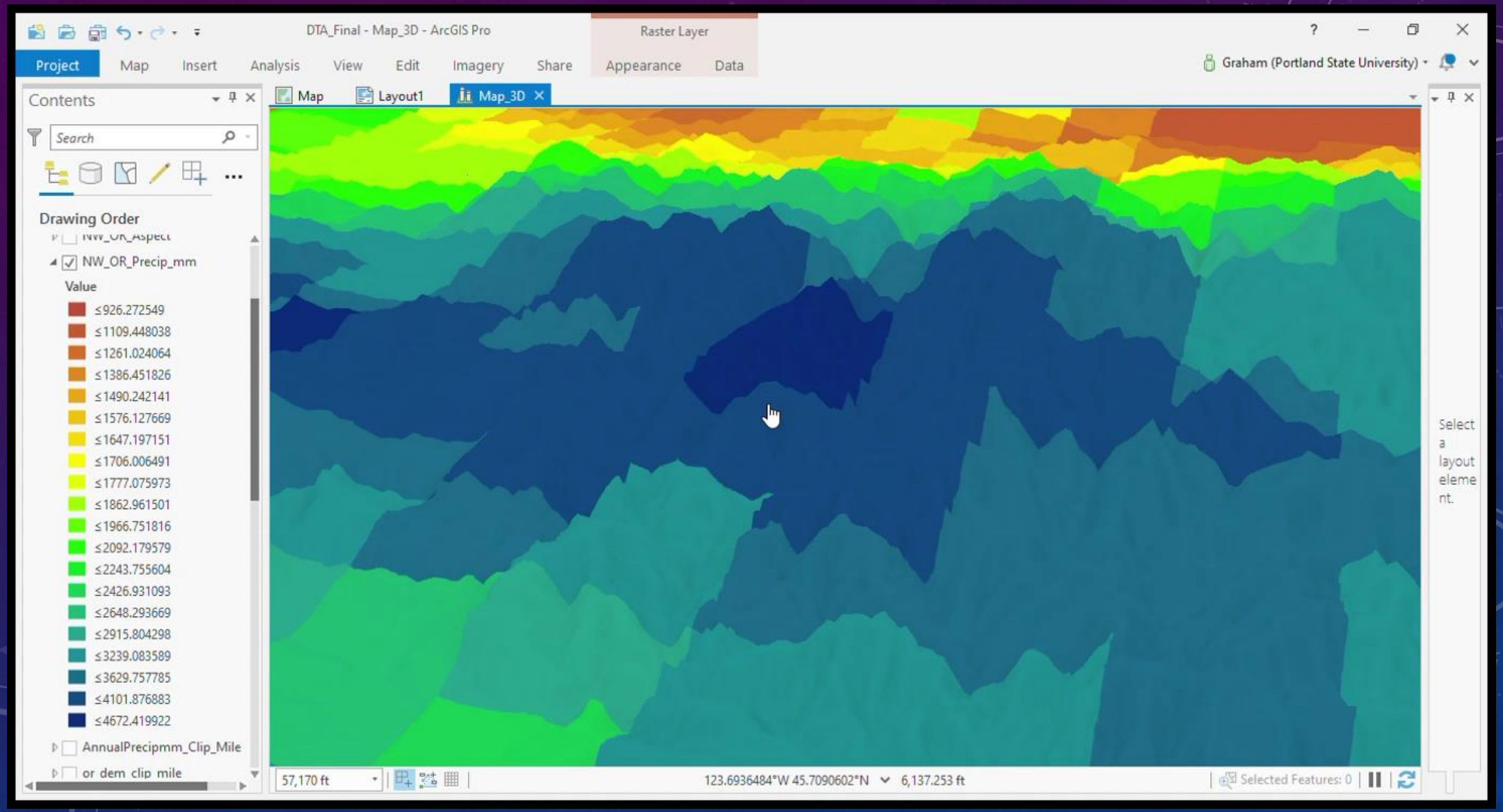
- Disparate data resolutions led to difficulty in correlating precipitation and land cover type

- Qualitative visual analysis of datasets draped over a 3D DEM are enlightening

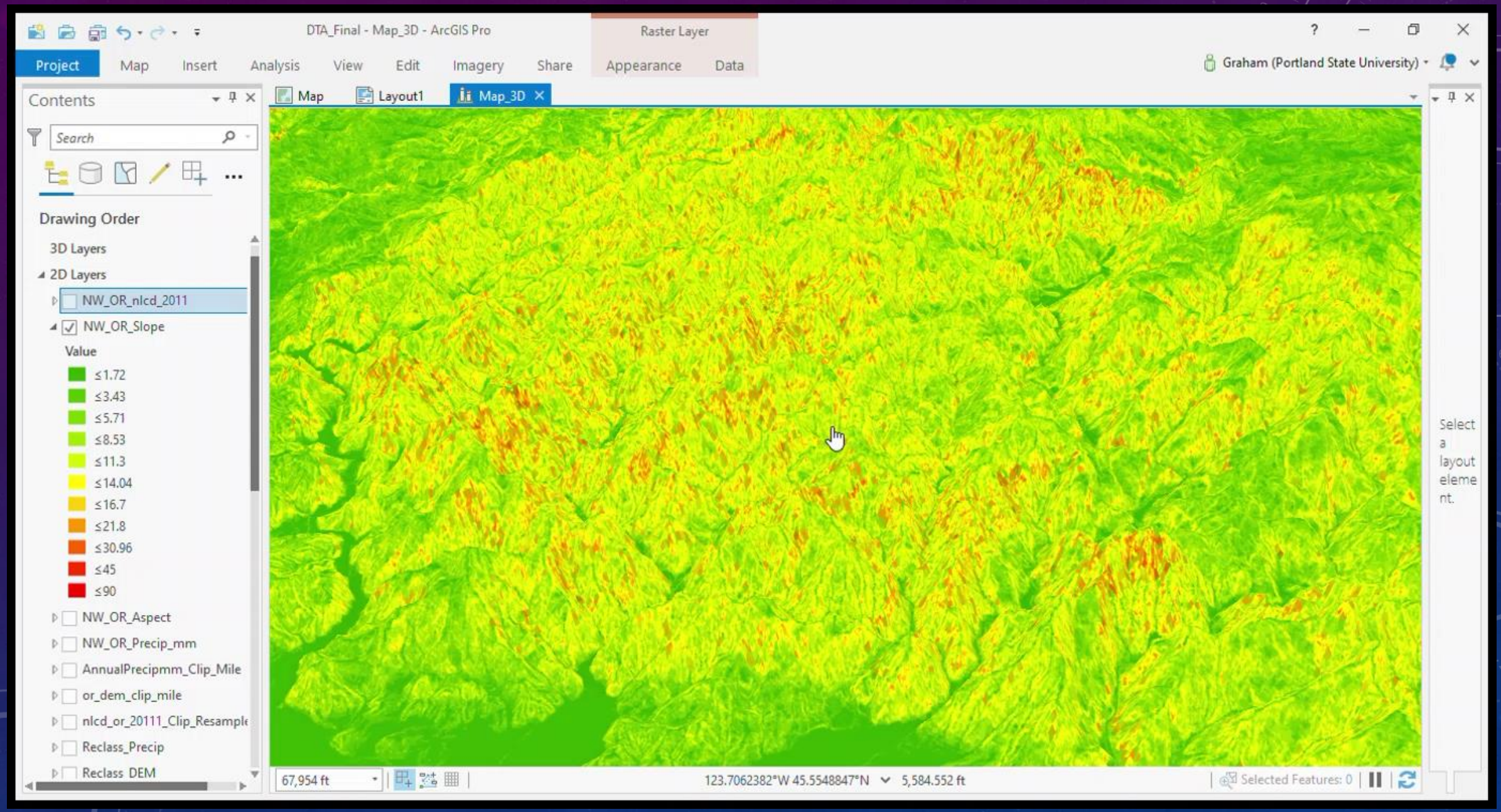
LANDCOVER DATA OVER THE DEM



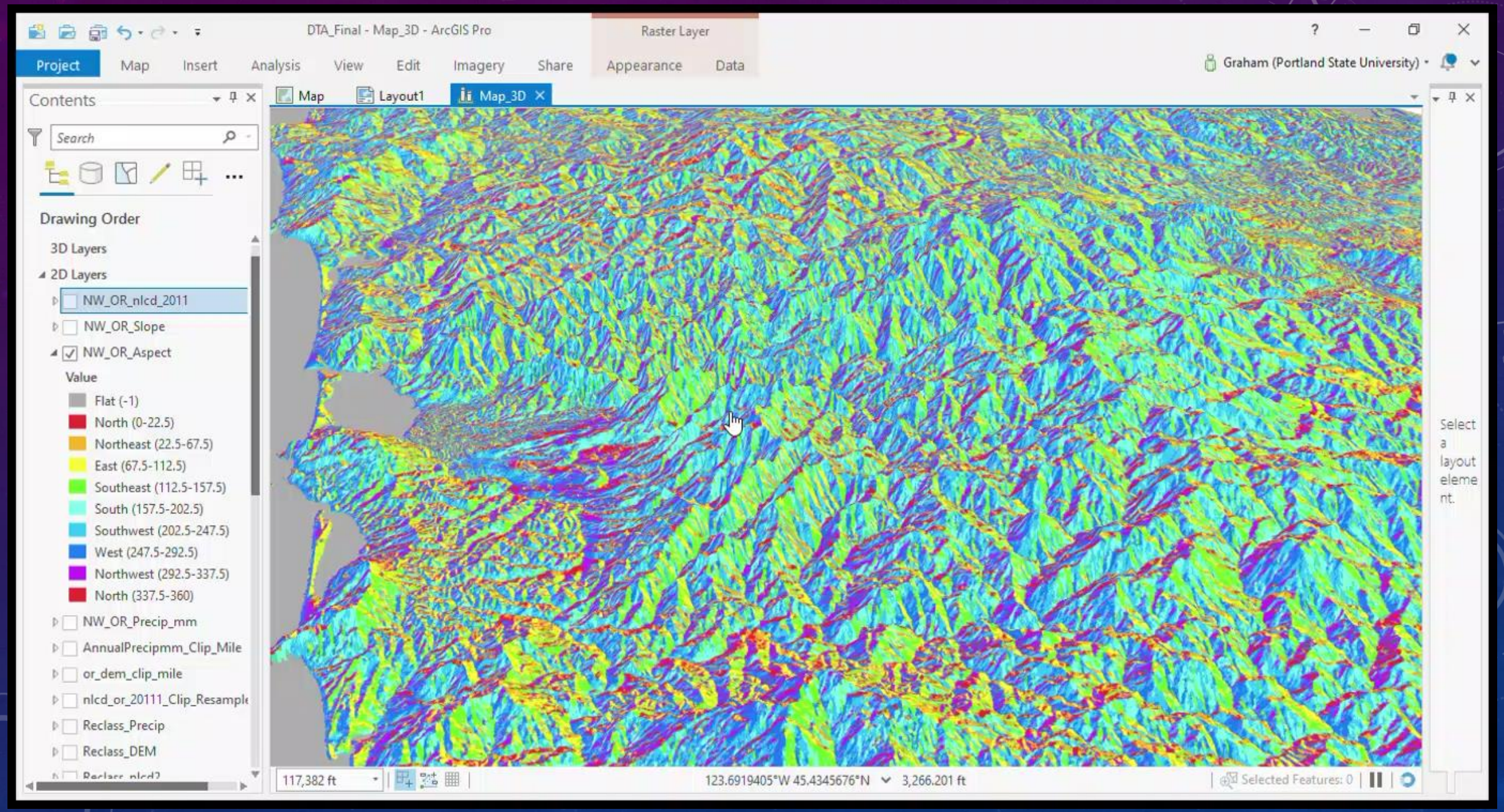
PRECIPITATION DATA OVER THE DEM



SLOPE DATA OVER THE DEM



ASPECT DATA OVER THE DEM



CONCLUSIONS & FUTURE DIRECTIONS

- Quantitative analysis that produced meaningful results proved to be a challenge.
- Results were less conclusive than hypothesized, but a small scale case study in a similar manner could produce more robust conclusions.
- Visualizations of a 3D DEM surface are a strong demonstration of orographic precipitation and its relationship to elevation and landcover.