

Application of Spatial Climate Projections To Pierce County

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Introduction

The foundation of this study was based on the need to develop a visual analysis of the areas where Pierce County will be most vulnerable to climate change

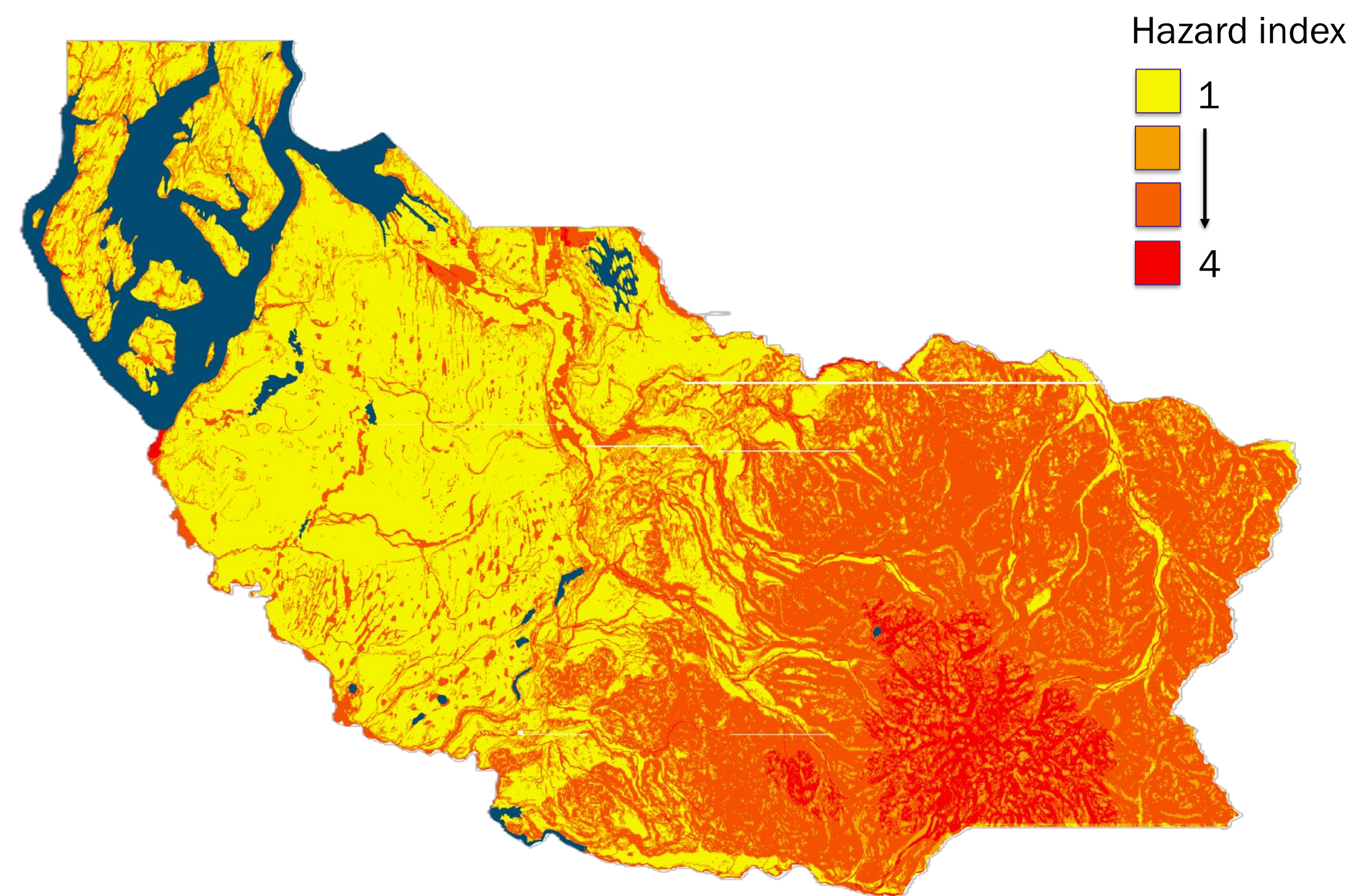
Models of climate change are often globally projected, leading to low resolution of local areas.

Studies suggest that future changes in extreme weather systems may have a substantial effect on flood risk.

Flood factors are incorporated into this analysis for a comprehensive visualization of the hazards the area may face.

Climate Hazard Model

Model indexed on a scale from 1-4. Areas indicated as highest class are concentrated in mountainous regions. Outback terrain is often influx, leading to this outcome. Populous regions in high indexed areas show pattern of adjacency to bodies of water.

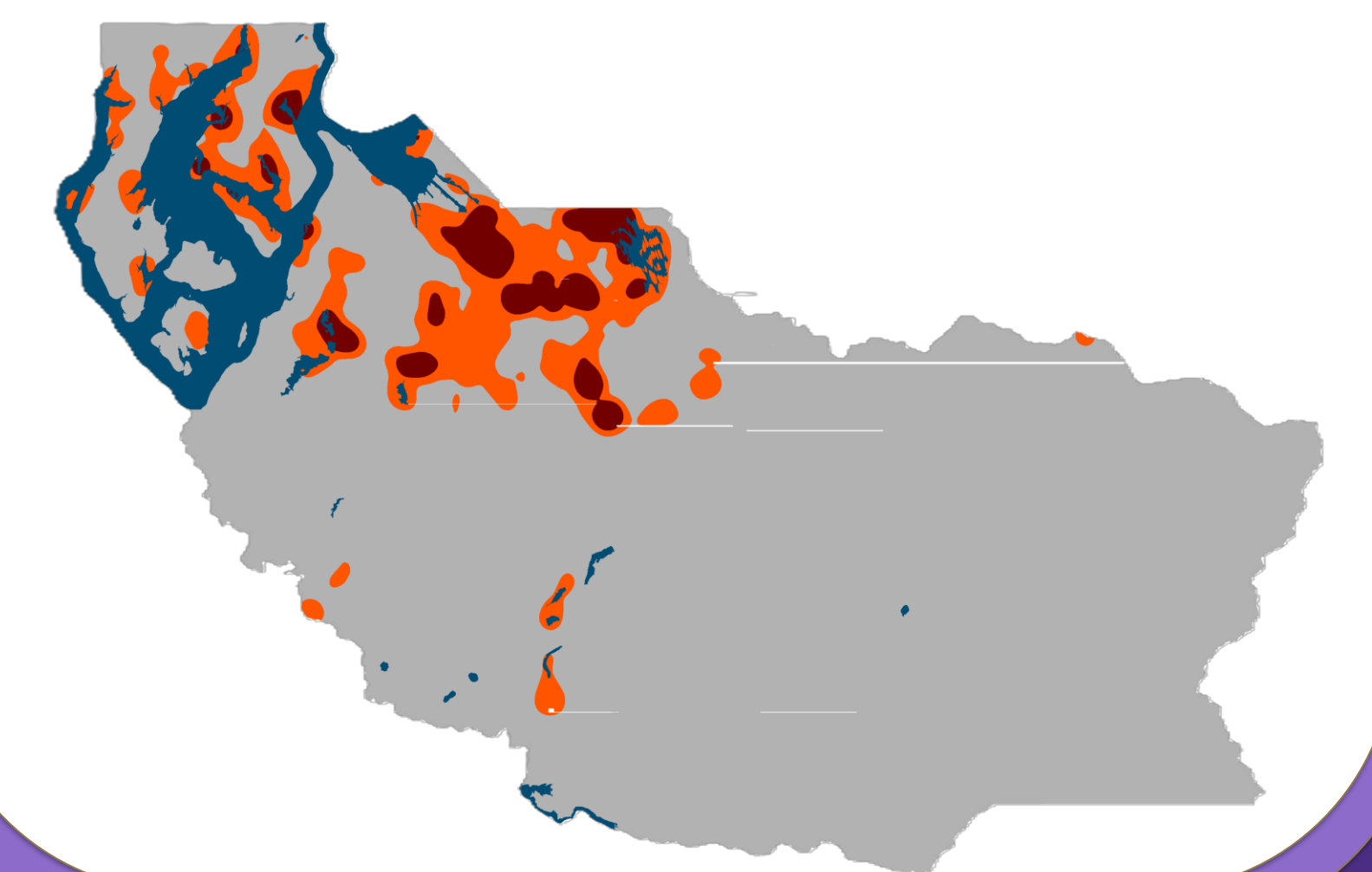


Raster calculation of four environmental factors. Slope color ramp indicates overlap of factors. Yellow indicates 1 layer present; Red indicates all environment factors overlapped.

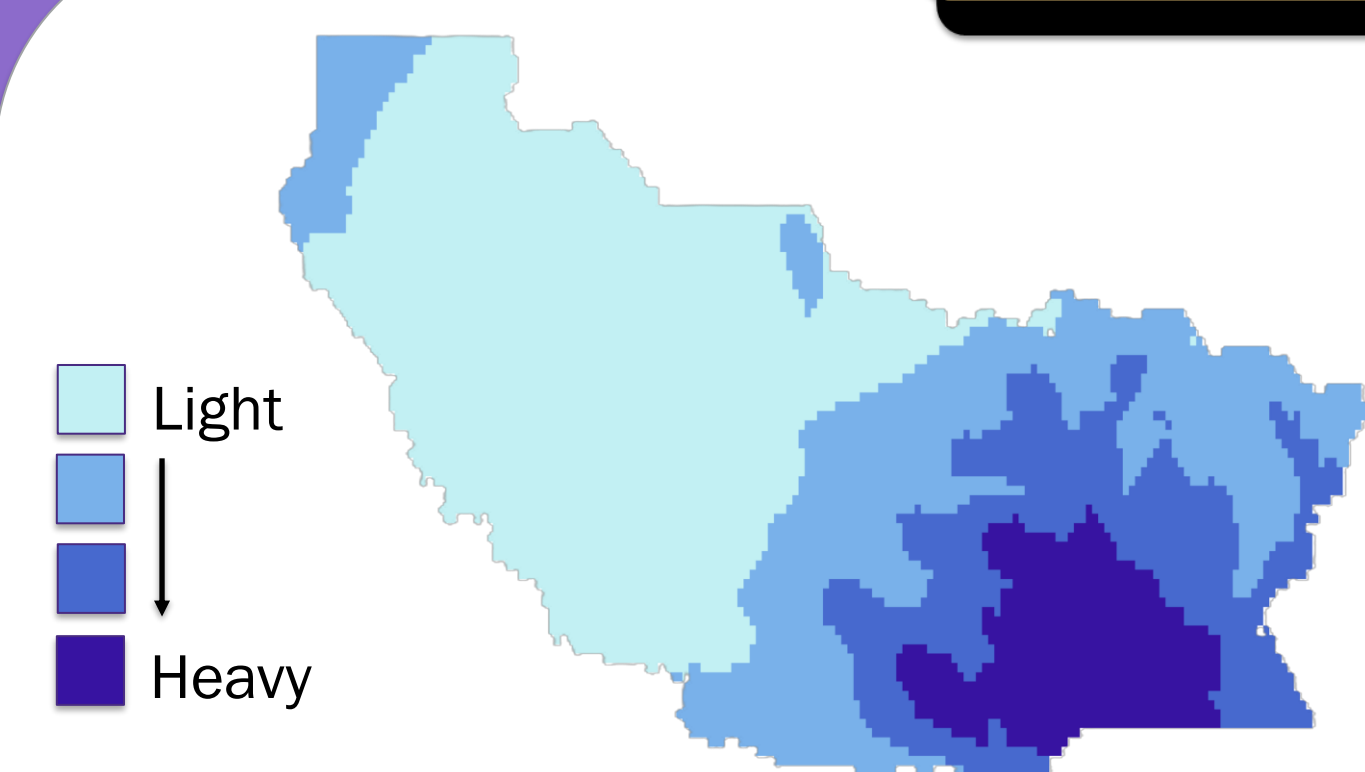
Discussion

To demonstrate the practical application of the model, an analysis was performed to pinpoint communities located within areas ranked highly on the hazard index

Notable Areas in High index zones	Port of Tacoma Lake Tapps Gig Harbor/ Fox Island Puyallup
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Future Climate Scenarios



Precipitation Pattern

Precipitation from the wettest quarter projected for the year 2090. Dataset created by CHELSA. Prediction based on wind fields, valley exposition, and boundary layer height. Standardized and classified for use in raster algebra.



Sea Level Rise

Created with NOAA Elevation Models (DEMS). Based on conditions under moderate carbon emissions. Layer displays scenario of sea level rising to 1.5 meters globally.

Conclusion

Model provides clearer insight on climate change on a local level. Has various spatial applications but the system itself has no direct mitigation of climate change.

To best support our communities in changing climate, a holistic approach is best suited to the needs of our future

Spatial planning has been identified widely as being essential but not sufficient in wholly addressing climate change.

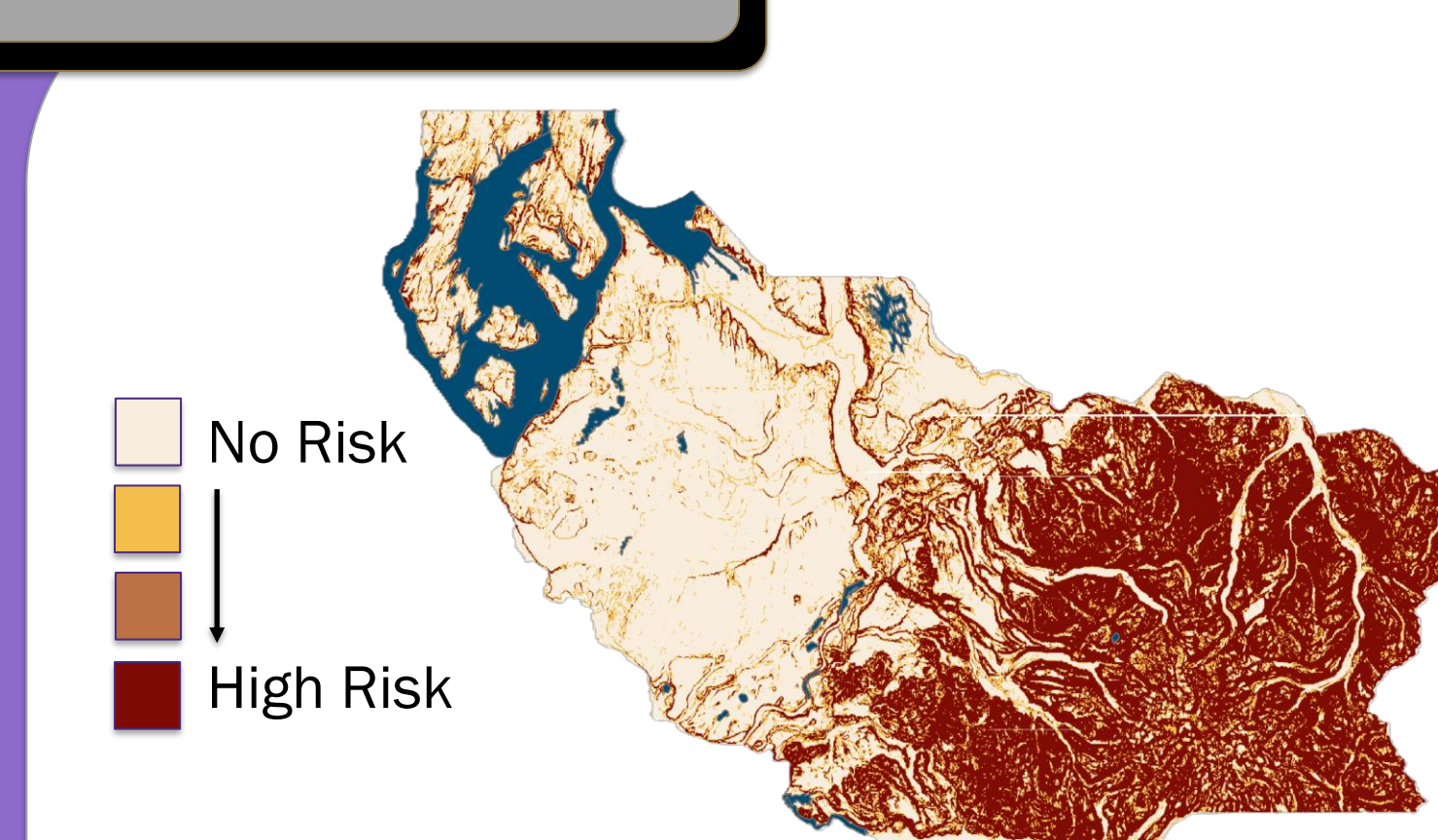
Integrating regulatory measures with spatial planning are a necessity to reducing the impacts of climate change.

Present Vulnerabilities



Regulated Flood Plains

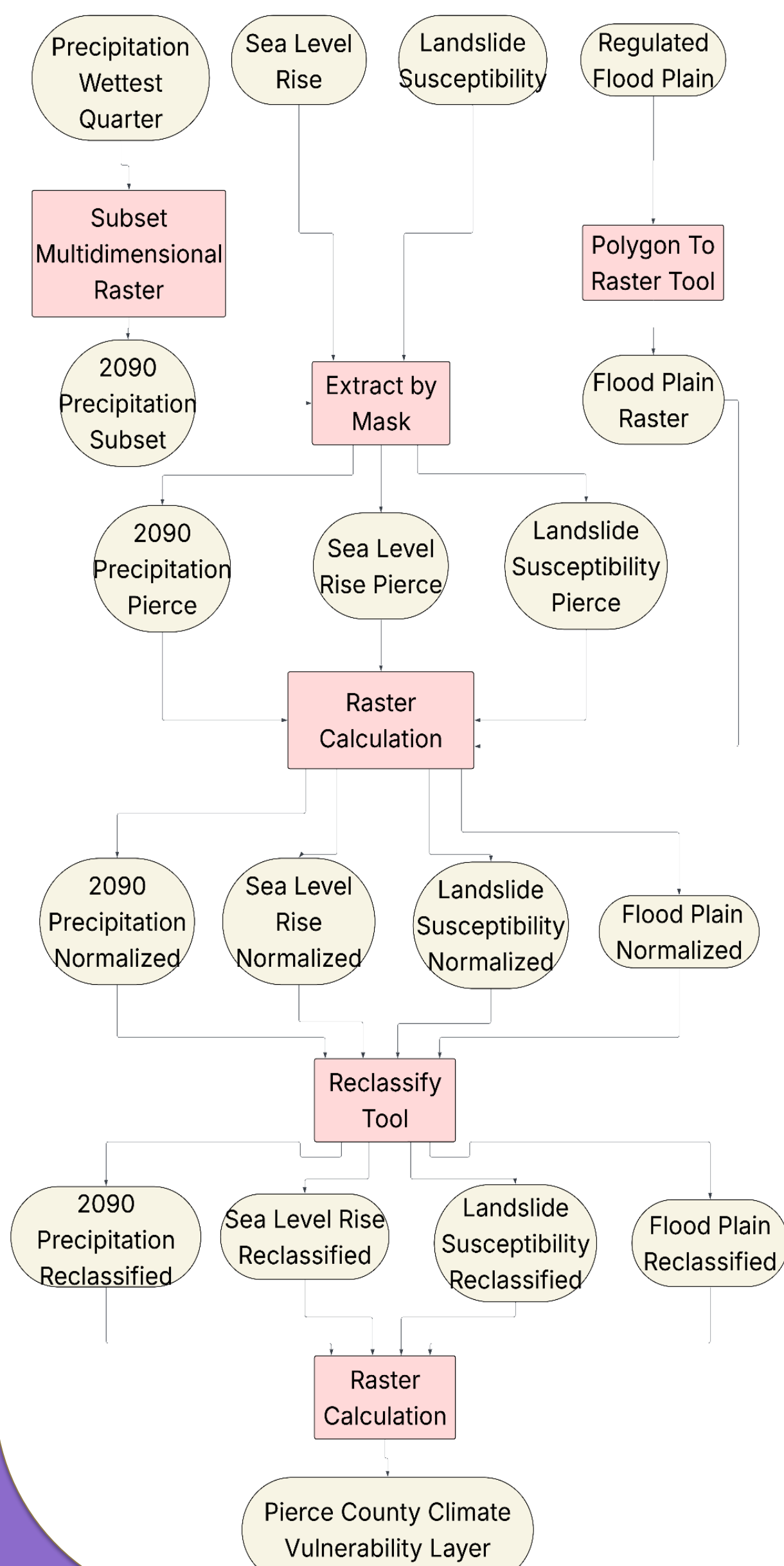
Based on Pierce County.gov flood insurance study. Generated for the purpose to qualify structures for flood insurance. Converted to raster for inclusion in model's algorithm



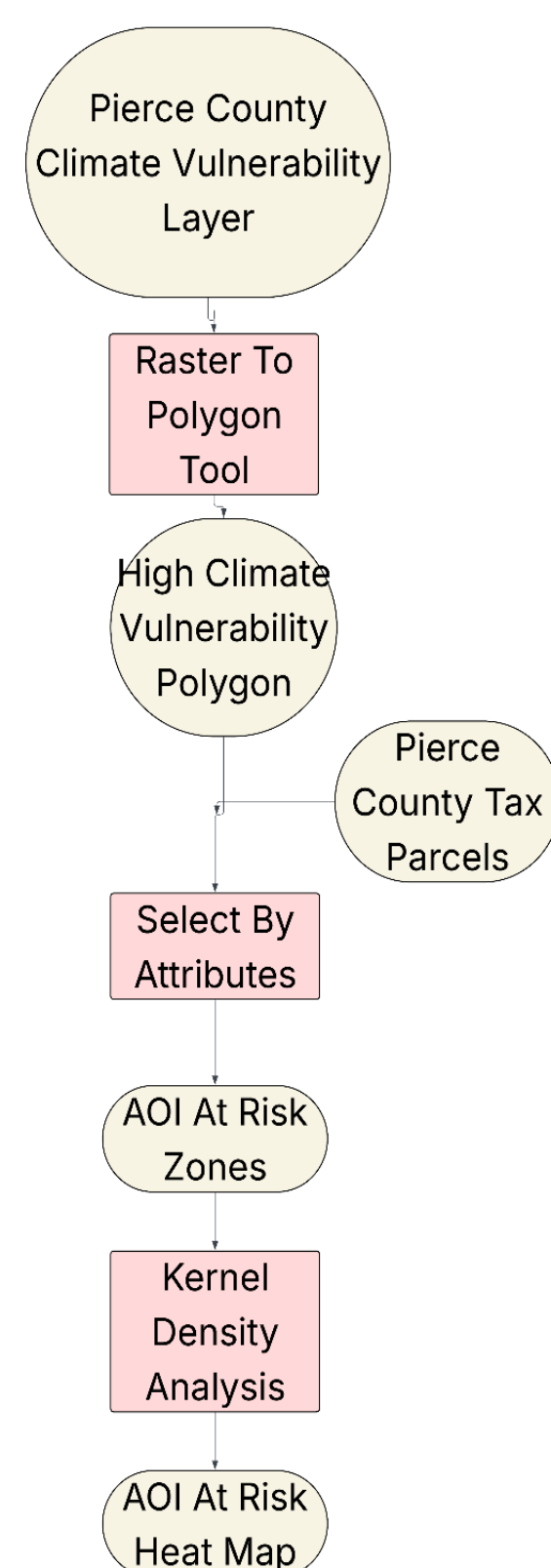
Landslide Susceptibility

Developed by USGS. Model sourced by information from locations of landslides and High-Res USGS elevation data. For this study, layer has been classified and normalized to distinguish risk ranges.

Climate Model Workflow



Tax Parcel Analysis



References

