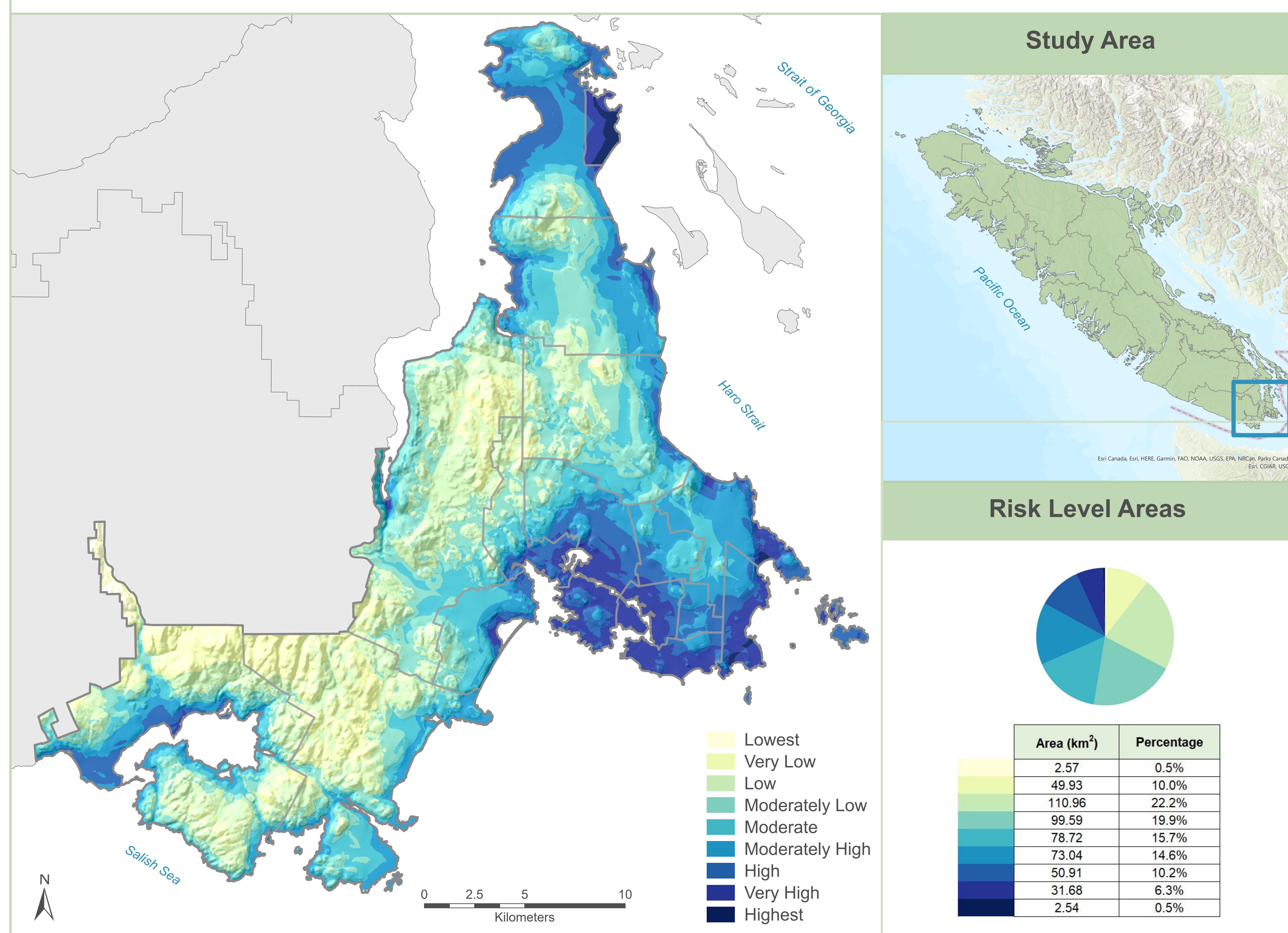


Vulnerability to Sea Level Rise

Victoria, BC



Victoria and the Sea

Victoria, BC is located on the Southern tip of Vancouver Island. Isolated from the mainland of British Columbia and surrounded by water, the island's southern capital is vulnerable to the real risk of flooding from sea level rising. Different areas of land in Victoria, BC are more vulnerable than others to sea level rising due to variations in elevation, distance from the shoreline, population density, slope, critical infrastructure such as hospitals, ferry terminals, airports, and emergency shelters, and location of major roads.

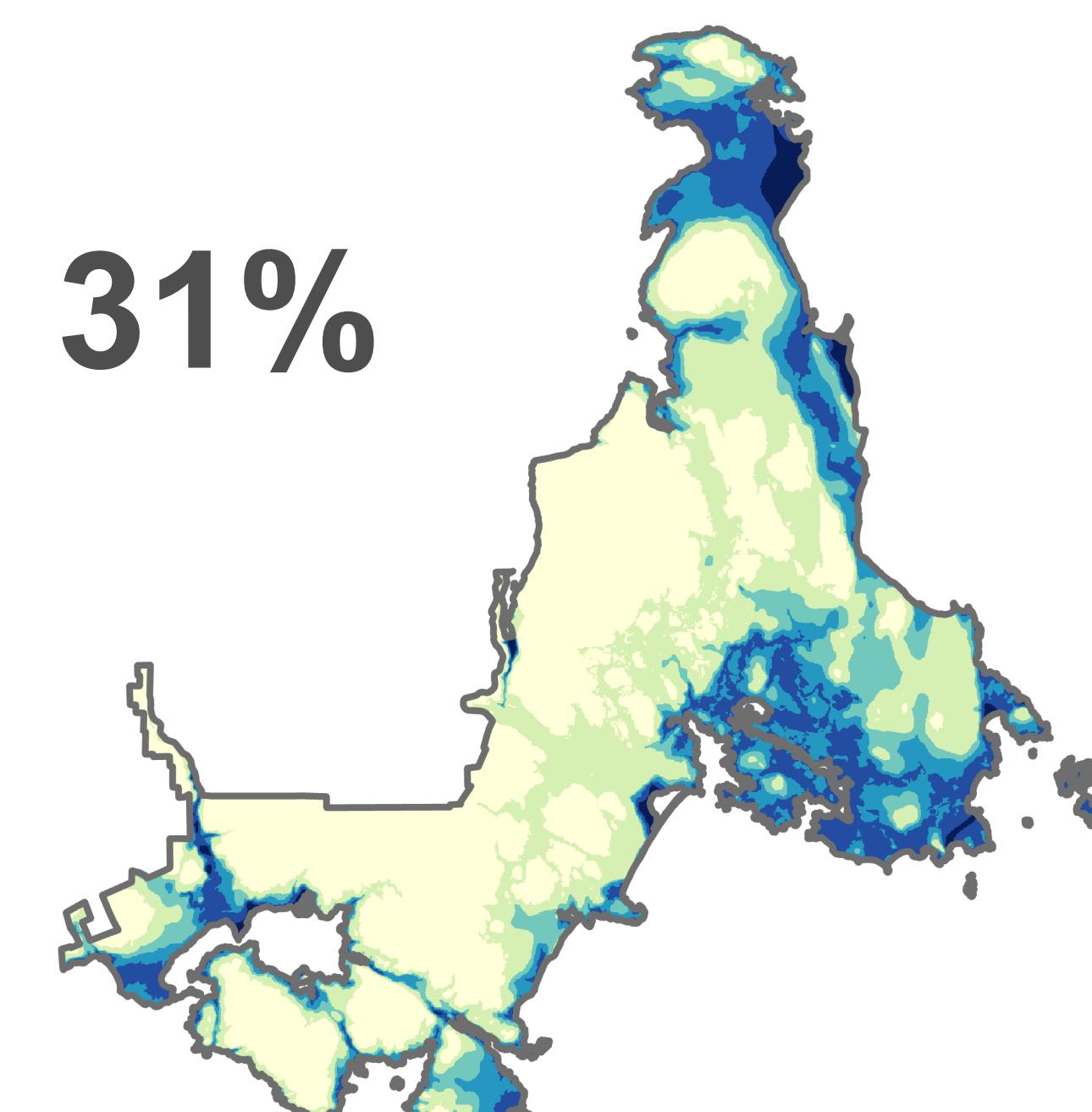
Methodology

A Multi-Criteria Analysis was conducted in order to determine which areas are at a high risk due to sea level rising. An Analytical Hierarchy Approach (AHP) was conducted in order to determine the importance of each of the six identified criteria. It was found that elevation was the most important factor in determining areas that are vulnerable to sea level rise with a weight of 31.3%. Next was distance to shoreline with a weight of 27.9%. The other four criteria display a lower level of importance with weights determined to be of 16.4% for population density, 9.5% for slope, 9.1% for major roads, and 8.7% for critical infrastructure. The criteria then was analyzed in ArcGIS Pro 2.7.1 by applying predetermined risk level ratings from 1-9 and applying the AHP weights using the Weighted Overlay Tool to produce the final risk level surface.

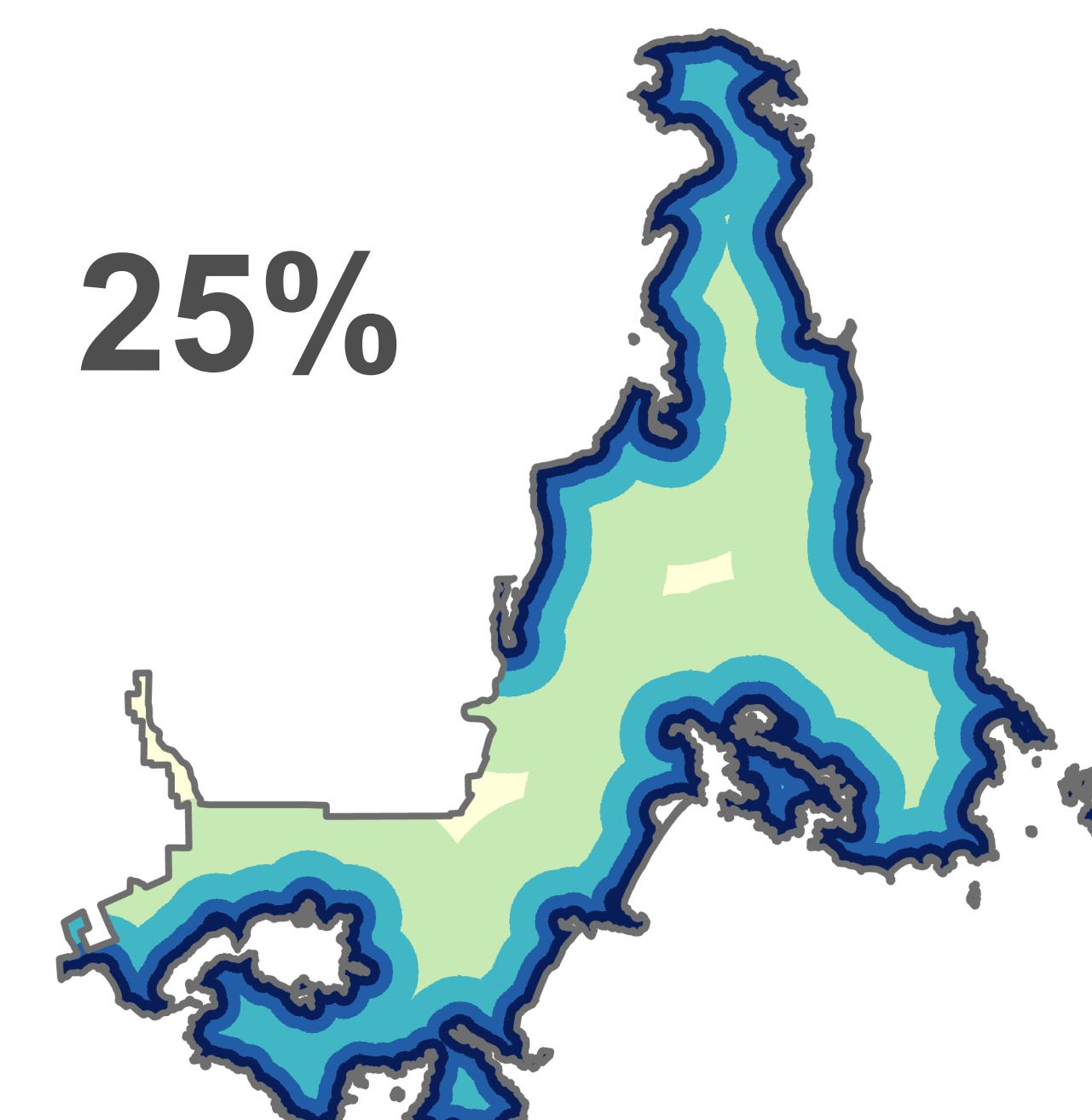
What's at Risk?

From the Multi-Criteria Analysis, it was found that 31.6% of land in Victoria, BC is at a moderately high to very high risk from sea level rising with 6.8% within the highest risk levels. 52.6% of the land is in the lowest to moderately low risk areas. The land found within the highest risk areas were found to be within one kilometre of the shoreline, have an elevation of less than 6 metres and a slope of less than 5 degrees. It was also identified that areas of high risk include locations with larger populations with over 1000 people per square kilometre and areas within one kilometre of critical infrastructure and roads that are important for survival and transport such as hospitals, ferry terminals, airports, and emergency locations. As the global temperature continues to rise, so does the sea level; therefore, plans should be developed to deal with the areas that have been identified as high risk areas due to sea level rising for Victoria, BC.

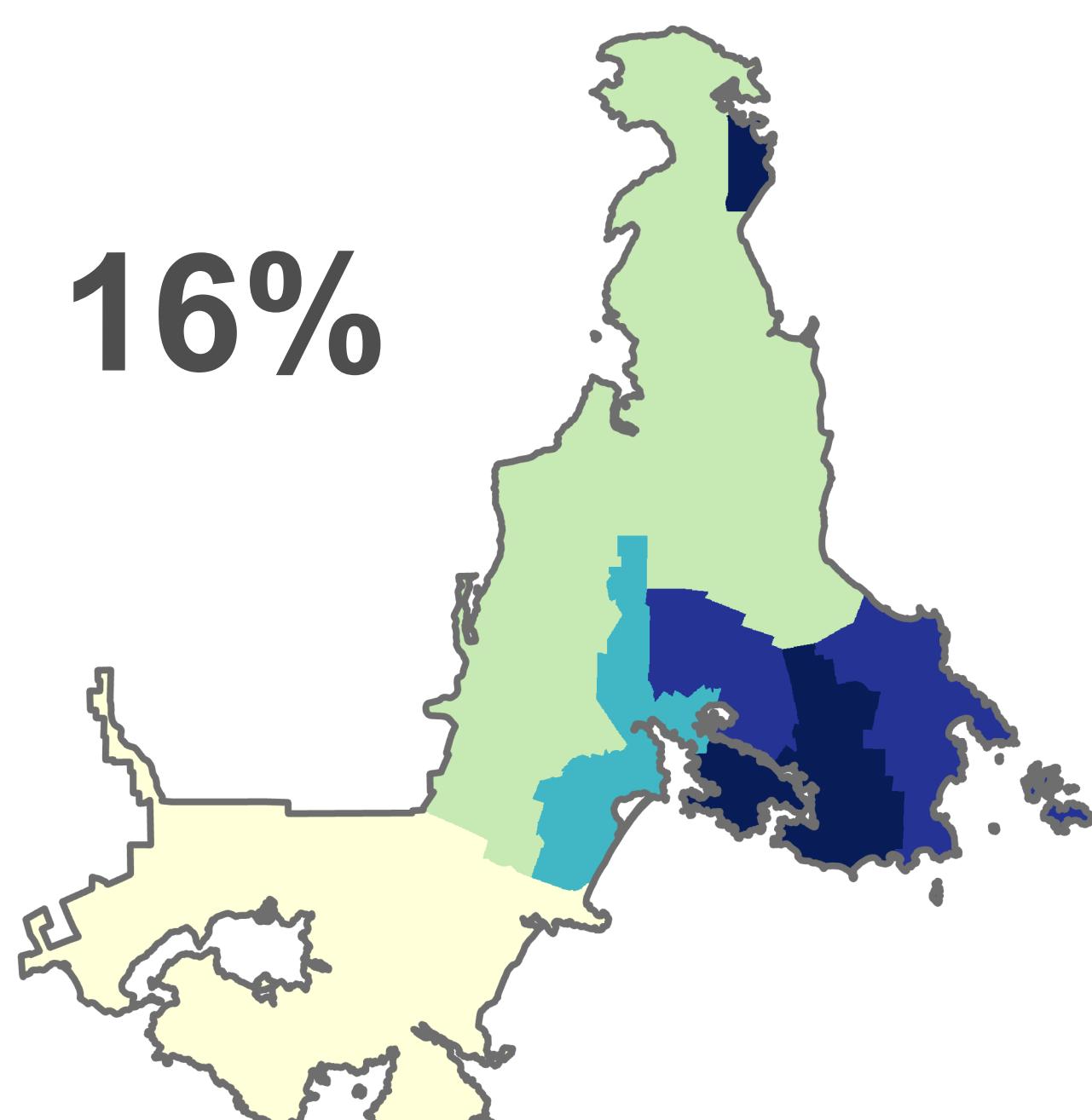
Elevation



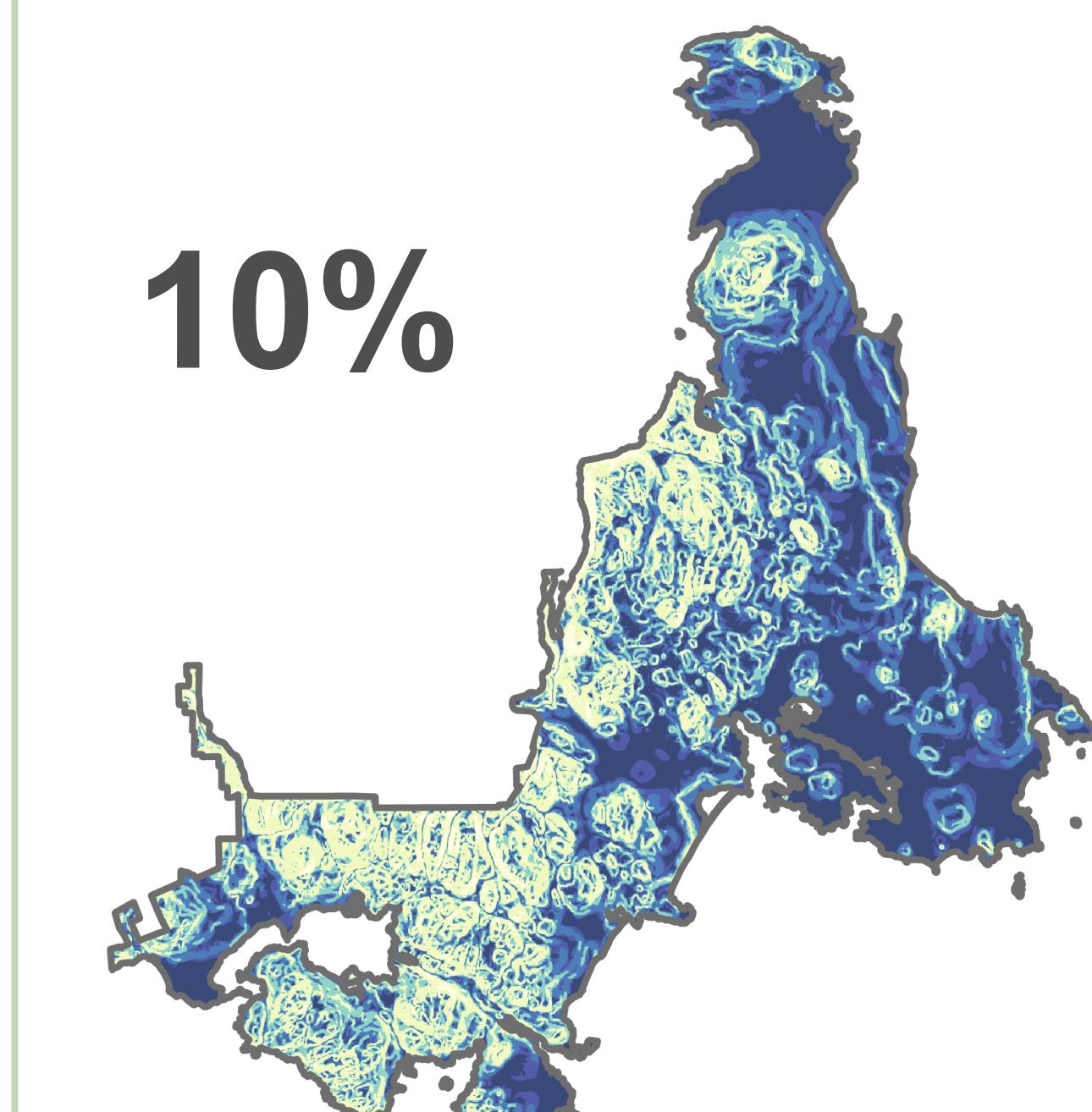
Distance to Shoreline



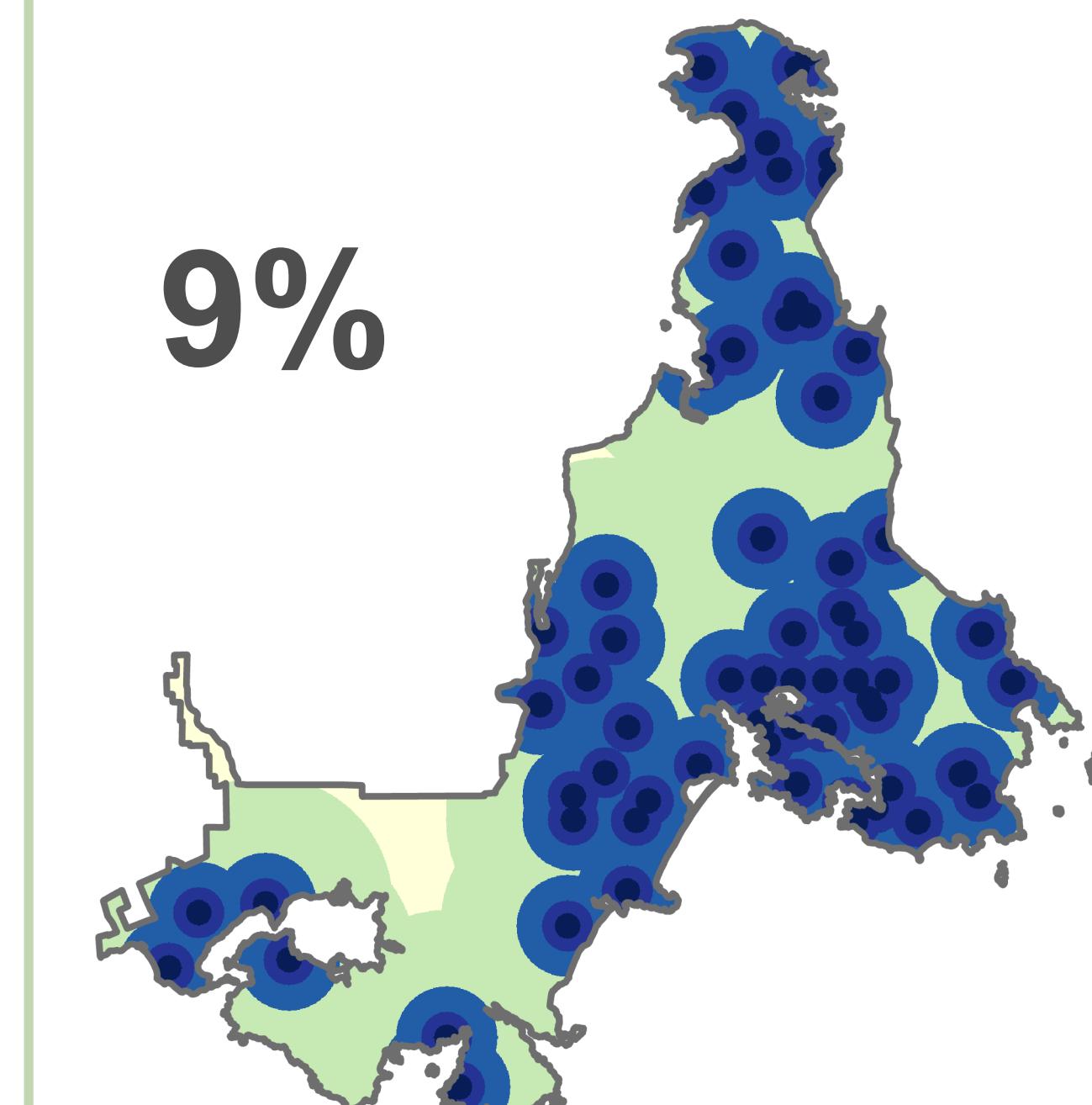
Population Density



Slope



Critical Infrastructure



Major Roads

