

Using geographic information systems to assess coastal vulnerability due to sea level rise in Castine, Maine, USA

Sea level rise (SLR) is a growing concern for coastal communities around the world as sea levels are predicted to rise two meters or more by the end of 21st century. SLR poses many potential risks to these communities such as shoreline retreat, flooding, and infrastructure damage. Coastal vulnerability assessments can help towns and cities plan and adapt accordingly for the future of their communities when looking at the potential impacts they may face. This study used geographic information systems (GIS) to assess coastal vulnerability due to SLR in Castine, ME. Coastal slope ($^{\circ}$), coastal elevation (m), coastal bluff zones (stability), distance from road to shore (m), mean significant wave height (m), mean relative SLR (mm), and mean tidal range (m) were used to generate a coastal vulnerability index (CVI) to determine vulnerability. A best, mean, and worst case scenario were developed. In each scenario Backshore and the wastewater treatment plant were at moderate risk or more. In the mean and worst case scenarios the MMA waterfront and British Canal were found to be at moderate risk or more.

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