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FROM POINTS TO PIXELS: AN INTERACTIVE DIGITAL COASTLINE OF PROJECTED SEA LEVEL RISE ACROSS NEW ZEALAND

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The impacts of climate change are being felt more than ever, but what the future looks like is filled with unknowns, causing fear and uncertainty of how to best prepare. Understanding coastal dynamics is critical for effective coastal management and planning.

Currently, New Zealand's sea-level-rise projections are available at 2km points around the coast. However, this doesn't provide a comprehensive picture of what our future coast may look like, which calls for a novel methodology to create a projected digital coastline. This project aims to design and implement a case study for the capital Wellington to determine the feasibility of using a high-resolution digital elevation model, deforming it based on predicted vertical land movement rates, and combining this with mean sea level projections to visualise a future coastline every 10 years from 2020 to 2150, incorporating five climate scenarios and uncertainty bounds. The results are visualised in an interactive map presenting likely inundation, allowing a better understanding of the potential and realistic impact of climate-driven sea level rise.

The next steps for this project involve integrating additional research on how earthquakes, storm surges, tidal movements, and sediment deposits may influence total water height in addition to sea level rise. As well as understanding the computational feasibility of developing this model at a national scale, utilising parallel processing and HPC resources. This research offers a crucial tool for policymakers, urban planners, and environmental managers, as well as the general public, to prepare for climate change impacts and safeguard vulnerable coastal communities.