

# Vulnerability of wastewater infrastructure of coastal cities to sea level rise: A South African case study

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## **Abstract**

Sea-level rise is one of the consequences of global warming that has the potential to affect the infrastructure of coastal urban areas. In this context, it is important to perform vulnerability assessments in order to understand how this infrastructure may be at risk, and, if necessary, adapt and maintain functionality of infrastructure systems. This study investigates the vulnerability of the wastewater collection and disposal infrastructure (i.e. pipelines and manholes, pumping stations and wastewater treatment plants) to sea-level rise in eThekweni Municipality, South Africa. By using geographical information systems (GIS) and a multi-criteria analysis considering elevation, operational capacity and connectivity, a scale of vulnerability was established and the most vulnerable infrastructural elements were identified in the municipality. These should be prioritised for detailed monitoring and adaptive interventions in order to maintain the functionality of the wastewater system as sea level is predicted to rise. As such this study presents a model of how vulnerability of wastewater systems can be evaluated in coastal cities.

**Keywords:** climate change adaptation, urban vulnerability, wastewater infrastructure