

Case study on hazard planning and the potential impacts of sea level rise in Rodney District – Kim Buchanan, Rodney District Council

Rodney District Council covers almost 2,500km² of land just north of Auckland. It includes the large Hibiscus Coast urban area as well as numerous rural and beach townships and settlements. Rodney has over 1000 km of coastline along its west and east coasts and consequently, addressing coastal hazards is of major concern to the District. However, with such an extensive and attractive coastline, only 85,000 residents and a growth rate of almost 15% over the past 5 years, Rodney has a pressing need to provide development controls in coastal areas but has very thinly spread resources to do it with. This paper discusses Council's efforts to identify and address coastal hazards as well as the constraints that we have encountered and our next steps at developing good policy.

The West Coast: The Kaipara Harbour on Rodney's west coast is the second largest in the world and development control is shared between the Kaipara and Rodney District Councils and the Auckland and Northland Regional Councils. At the southern end of the harbour lie the communities of Helensville and Parakai. Both communities have low lying land on the flood plain of the Kaipara River (both zoned and unzoned) that is being considered for development. The local wastewater oxidation ponds and the Parakai community are stopbanked; however, the Parakai stopbanks have been overtopped in the past and Council needs to establish correct design heights for upgrades. The main risk along the exposed west coast is erosion of the extensive dune systems.

The East Coast: Rodney's East Coast includes numerous splendid beach communities such as Omaha, Snells Beach, Pakari, etc. in addition to urban development on Whangaparaoa Peninsula and at Orewa. Many of these areas have properties with ground levels at 2 to 5 metres above sea level and identification of risk is important for setting building controls, zoning and for civil defense. Many of the communities are inside estuaries or have watercourses passing through them which complicate assessment. Generally hazards are better defined for these communities than for the west coast and include coastal erosion, tidal inundation, tsunami and flooding risk from the generally short, steep catchments along the coast.

First Steps: Council initially commissioned Tonkin and Taylor to conduct a study on inundation threats for 22 communities on the east coast. This included use of local wave buoy data, bathymetric and beach profile data, wind speed and frequency data as well as assumptions regarding surge and estuary effects. Less information is available for the West Coast and to assess inundation and storm surge risk on the West Coast Council installed a tidal gauge within the Kaipara Harbour and engaged DHI Water and Environment to develop a Mike11 hydraulic model for assessing the Kaipara Harbour levels (which will also help with Kaipara River flood levels). Medium term climatic effects, such as the Inter-decadal Pacific Oscillation (IPO) and El Nino- Southern Oscillation (ENSO) cycles, and a provision for longer term sea level rise are included in both studies.

Once the inundation levels were estimated for the East Coast communities, Council needed to establish how they would be used. First, the Consultants reports as well as

summary tables and maps were put on the Council website. Secondly, the information was incorporated into Council's GIS system so it could easily be referred to as part of Land Information Memoranda (LIMs). To be relatively consistent across all the affected communities and because some areas do not have topographic information to a high degree of resolution Council decided to list inundation as a potential hazard to all properties below 5m above mean seal level. It is expected when new topographic data becomes available (2006) this level will be refined with less properties having affected LIMs.

It is interesting to note that the primary driver of sea levels likely to cause inundation is not projected Sea Level Rise. The worst scenario is generated by a peak spring tide combined with a major storm on the east coast causing tidal surge due to low atmospheric pressures and wave build-up generated by gale force easterly winds. Medium term tidal cycles as noted above are also significant contributors.

Developing Building Controls: Generally, the precautionary approach suggested that minimum floor levels should be established assuming a 1% Annual Exceedence Probability (AEP, e.g. 100 year return period) inundation level, with a 500mm freeboard and a widely accepted Sea Level Rise (SLR) estimate to the year 2050. The effect on Rodney District would be to raise minimum floor levels between 0.6m and 1.6m (depending on the community) from current levels. Council decided to take a less conservative approach and has required minimum floor levels to be based on a 2% AEP inundation level, with 200mm freeboard and SLR prediction to 2025. This corresponds to the current 1% risk level (without freeboard) with the net effect of raising minimum floor levels from 0.1 to 1.1m above current minimums. However, Rodney District intends to continue to monitor the situation with respect to best practice, level of data and scientific advances.

Council found that in some areas they were unable to adequately limit further intensification of development as it was already allowed under the District Plan (DP), or the DP assessment criteria weren't suitable. Additionally, the provisions of the Building Act (BA) and the Resource Management Act are not necessarily definitive drivers for eliminating "at risk" development. Some relevant provisions of the two acts are listed below.

Section 106 RMA provides:

	<p>(1) <i>Despite section 77B, a consent authority may refuse to grant a subdivision consent, or may grant a subdivision consent subject to conditions, if it considers that –</i></p> <p>(a) <i>the land in respect of which a consent is sought, or any structure on the land, is or is likely to be subject to material damage by erosion, falling debris, subsidence, slippage, or inundation from any source; or</i></p> <p>(b) <i>any subsequent use that is likely to be made of the land is</i></p>
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	<p><i>likely to accelerate, worsen, or result in material damage to the land, other land, or structure by erosion, falling debris, subsidence, slippage, or inundation from any source; or</i></p> <p><i>(c) Sufficient provision has not been made for legal and physical access to each allotment to be created by the subdivision.</i></p>
	<p><i>(2) Conditions under subsection (1) must be-</i></p> <p><i>(a) for the purposes of avoiding remedying, or mitigating the effects referred to in subsection (1); and</i></p> <p><i>(b) of a type that could be imposed under section 108</i></p>

The relevant Building Act (2004) provisions are:

S71	<p><i>(1) A building consent authority must refuse to grant a building consent for construction of a building, or major alterations to a building, if -</i></p> <p><i>(a) the land on which the building work is to be carried out is subject to or is likely to be subject to 1 or more natural hazards; or</i></p> <p><i>(b) the building work is likely to accelerate, worsen, or result in a natural hazard on that land or any other property.</i></p>
	<p><i>(2) Subsection (1) does not apply if the building consent authority is satisfied that adequate provision has been or will be made to -</i></p> <p><i>(a) protect the land, building work, or other property referred to in that subsection from the natural hazard or hazards; or</i></p> <p><i>(b) restore any damage to that land or other property as a result of the building work.</i></p>

As noted above the RMA uses phrases indicating that Council may refuse to grant a consent, subject to material damage, that is likely to accelerate, worsen or result in material damage. However, these are not precise terms and there is not sufficient case law on the matter to allow definitive interpretation. The BA says a s72 waiver must be granted if it is reasonable to grant a waiver or modification of the Building Code (BC). Again, there is limited case law regarding what is considered reasonable and what is being modified (as the BC refers to buildings, not land). As Councils generally do not want to be involved in appeals and are subject to significant pressures from developers, it can be difficult to implement rules that Council Engineers consider appropriate for the long term benefit of home-owners and the community.

Other problems encountered by Rodney District Council included officer, Counsellor and public perceptions regarding diminishing of property values, insurance, and private property rights. The lead role in implementing policy has also shifted from the Assets

and Facilities directorate (with an engineering focus) to the Customer Service and Policy and Planning directorates (with a regulatory and consenting focus). These issues have highlighted the complex nature of these issues and how important it is to have ongoing dialogue regarding these issues.

Next Steps: Our next steps include:

- Further assessment of specific sheltered estuaries where there are a number of homes to make sure that the identified risk is not overly conservative and minimum floor levels are appropriately assessed
- Further assessment of Council infrastructure against the risk levels (this includes pump stations, critical assets such as pipe bridges and stopbanks)
- Assessing the combined risk due to stream flood runoff and high sea levels in several key catchments
- Developing criteria for determining when it's unreasonable to grant a Building Consent waiver
- Developing a DP change to allow further assessment of risk in inundation prone areas
- Developing guidelines for coastal and integrated developments with respect to gully traps, building materials, and access.
- Improving communication with affected communities and understanding the inherent risks associated with coastal development.