



COLLABORATE

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X - SECTION 7

IS IT WORKING?

New Zealand's coastal policy statement and the Auckland unitary plan.

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Abstract: This paper uses the objectives and policies inherent in the New Zealand Coastal Policy Statement 2010 as a template for benchmarking the adaptation strategies contained in the natural hazards section of the Unitary Plan for Auckland City, New Zealand's largest coastal municipal area. The research assesses through selected criteria and a rating system developed in conjunction with literature studies and stakeholder contribution, the degree to which the coastal hazards section of the plan aligns with the appropriate adaptation policies required by the Coastal Policy Statement. A case study tests the effectiveness of the adaptation requirements. Results indicate an appropriate degree of compliance with the relevant adaptation criteria, but that, in order to minimise future disruption, more attention should be given to the long-term planned withdrawal of housing from hazardous coastal situations.

Keywords: Building regulations, coastal inundation, sea level rise, adaptation strategies

Introduction

Research studies into the effects of global warming and its anticipated effect on sea level rise (SLR) have undergone a significant increase in the last 15 years¹. These studies have a particular relevance to the New Zealand context. Hall et al, for example, suggests present day sea levels in the United Kingdom could rise by up to 0.69 metres by the year 2080² with damage depending on size and frequency of surge event³⁻⁴. Studies emanating from Latin America suggest population rise and building development in coastal areas is set to continue alongside rising sea levels and changes to extreme sea levels associated with storms, thereby adding to the risk level⁵ and, of course, the cost⁶. Peer-reviewed publications

such as Rahmstorf, using techniques that relate sea level to historical average temperatures, suggest a rise of 0.55 metres to 1.25 metres, depending upon emission scenarios⁷. Research studies in New Zealand by the Parliamentary Commissioner for the Environment suggest similar increasing frequencies of 100-year exceedences over time, with Auckland's rise lagging that of other New Zealand cities due to tidal differences⁸. Gollidge, et al. suggest the upper limit of SLR projections could be too conservative, with ice sheet melt from Antarctica alone estimated in their modelling to contribute a base sea rise of as much as 0.40 metres by the year 2100 if a maximum global temperature rise of 2 degrees is not maintained. This would, if borne out, result in Antarctic sea-ice melt, ice-shelf erosion (and subsequent melt) and a resultant SLR of several metres⁹.

The above research gives urgency to Local Authority adaptation policies designed to mitigate the effects of coastal climate changes. Whilst local government responses to implementing these can vary considerably, public participation and collaboration processes can, at the very least, help to inform and involve a diverse public audience, deepen mutual understanding and assist in ensuring that planning and decision-making is informed by the needs and interests of the affected communities, whatever they may be. This research can be seen as a part of that process¹⁰.

Methodology

Criteria

The criteria selected, and against which the adaptation policies are rated, are outlined in Table 1. They have been derived from the relevant policies contained within the overriding document, the New Zealand Coastal Policy Statement 2010 (NZCPS)¹¹.

Rating System

A four-point (0,1,2,3) rating system outlined in Table 2 assesses the coastal hazard adaptation plan against each of the four outcome criteria. Scores reflect the amount of quantifiable detail present and its relevance to the local area and loosely follow, in format, a more extensive plan evaluation analysis undertaken for the southeast Queensland regional area¹². The criteria values rate the degree of specificity of a policy to a particular hazard or locality.

The more generic or global the objective or policy, the less its assessed value. The more focused the policy on geographically specific risk, the higher the rating. This approach is supported by academic research that suggests good adaptation processes include working with coastal communities to achieve change, understanding existing local risks and vulnerabilities to coastal hazards and identifying and mitigating the most adverse in a flexible process that is open to change through on-going monitoring¹³.

Table 1. Outcome Criteria

Criteria	Description
Criterion 1	Significant coastal issues clearly identified and defined. ¹
Criterion 2	New (sub-divisional) developments are located away from areas prone to coastal hazard risks. ²
Criterion 3	Coastal risks are managed by considered responses, including managed retreat, for considered responses in these areas. ³
Criterion 4	Hard protection structures are discouraged. Natural defences to coastal hazards are protected or restored. ⁴

Table 2. Criteria Evaluation System

Rating Value	Description
0	No evidence of criterion in the natural hazard section of the plan.
1	Passing reference only to criterion in the natural hazard section of the plan
2	Criteria mentioned with moderate level of detail, however entirely descriptive and lack local application and analysis
3	Detail analysis of criterion is provided, addressed in a manner that can be interpreted locally, using a variety of tools such as vulnerability, exposure or risk assessments, maps fieldwork or GIS analysis.

The comparison evaluates just one section of a multi-sectioned document. The assigned values were the final determination of the writer, but were subject to check and discussion with planners and engineers familiar with critiquing adaptation policies. The evaluation is qualitative in nature. A level of subjectivity within the evaluation process is inevitable and acknowledged.

The criteria and rating values established will, in the following sections, be applied to the relevant sections of the AUP with the findings summarized in Table 3. A case study will test the effectiveness of these AUP adaptation measures for the low-lying coastal urban settlement area selected.

Comparative Policy Analysis

The criteria selected are adapted and summarized in Table 1 with a rating value identified in Table 2.

Criterion 1: Significant issues outlined and hazard identification clearly stated

The AUP natural hazard policies acknowledge the risks associated with their locality, including coastal erosion, coastal inundation, tsunami, land instability, flooding, earthquake and volcanic eruption. A detailed definition of land that may be subject to natural hazards is provided.

A base requirement of planning schemes is to augment written information with maps or databases that identify the location and scale of the hazard. In the AUP, the Auckland Council has taken the map technology one step further, with New Zealand's National Institute of Water and Atmospheric Research (NIWA) assigned to instigate a series of digital overlay maps based on cadastral level information which, when overlaid over any base zone map, provide information about the projected extent of coastal inundation within a zone represent a considerable advance in digital plan technology (Figure 1).

Criterion 2: New (subdivisional) developments are located away from areas prone to coastal hazard risks

The AUP's policy allows subdivision in certain limited circumstances, contrary to NZCPS objectives, but in all cases requires a full risk assessment of each sub-divisional proposal. Eleven specific criteria are outlined against which the subdivision proposal is measured. In addition, all such land requires an engineering assessment to confirm whether the land is, or will be, subject to erosion, inundation or instability over the next 100 years. Such criteria should, if assessed correctly, ensure this criterion set by the NZCPS is followed.

Criterion Three: Coastal hazard risks are managed by considered responses, including managed retreat, for existing development in these areas.

Development of existing land and building in the AUP is subject to the same restrictions as subdivision and new development, namely, an engineering assessment to assess its hazard free status. Failing that, a resource consent is required in which the risk criteria outlined in Criterion Two and applicable to Criterion Three are examined. Should planning consent be given, finished floor levels for dwellings, alterations or extensions to the dwelling(s) located in coastal inundation areas are required to be above the mapped 1 percent AEP storm tide event plus 1.0 metre projected SLR. Absent however as a specific policy is the concept of "managed" or "voluntary" retreat, where communities and local government discuss and agree on long-term action strategies to remove building stock from inundation and erosion prone areas. This has led studies, such as the New Zealand Climate Change Research Institute (CCRI) report, to voice concern that coastal management at a local authority level in New Zealand is not taken seriously enough, in spite of recent internationally published estimates from researchers such as Rahmstorf⁷, that point to the inevitability of SLR. CCRI's report expresses the view that existing settlements in low lying coastal areas, as exist in many parts of New Zealand, may have already accepted the inevitability of a coastal adaptation approach that depends on hard engineering stabilization. This approach, whilst it may be appealing in the short-term, will in their view, 'decrease community resilience and increase vulnerability in the long term'¹⁴.

Criterion Four: Natural defences to coastal hazards are protected or restore

The AUP requirements allow "non-natural" defences around development in hazardous coastal situations but are quite specific in what is not acceptable as a hard engineering solution. For example, such solutions must not "undermine the foundations at the base of the structure, cause erosion in front of, behind or around the ends of the structure, cause settlement or loss of foundation material, movement or dislodgement of individual structural elements, long-term loss of sediment

from the immediate vicinity or long-term adverse visual effects on coastal landscape and amenity values." ¹⁵:Policy 8, (a-g)] Whilst the requirements fall short of the NZCPS criterion, there are limitations defining what level of hard engineering work is acceptable as a solution

Table 3: Comparison summary

Criteria	New Zealand Coastal Policy State-ment 2010	Max Rating	Auckland Unitary Plan	Rating
One	Significant issues outlined and hazard identification clearly stated. Definition of coastal hazard identified.	3	Coastal hazard issues identified and defined. Detailed GIS inundation maps relevant to any stated locality. Floor height formula.	3
Two	New (sub-divisional) developments are located away from areas prone to coastal hazard risks.	3	Subdivision development permitted in hazard situations although subject to risk assessment analysis. Criteria for these outlined. Detailed requirements listed within Ch5.12.of the AUP.	2
Three	Coastal hazards risks are managed by considered responses, including managed retreat, for existing development in these areas.	3	Existing development: New extensions or alterations allowed in restricted circumstances or with Engineer's certificate. Risk assessment analysis required with detailed requirements listed. Floor height defined, general formula. Planned retreat issues not addressed for existing buildings.	1.5
Four	Hard protection structures are discouraged. Natural defences to coastal hazards are protected or restored.	3	Hard engineering solutions are permitted to protect development in hazardous coastal areas, contrary to NZCPS criteria. However there are considerable restrictions on what is permitted within these types of solutions.	2
Total Value		12/12 (100%)		8.5/12 (71%)