

July 2003

Climate Change Case Study:

Local Government Adaptation to Climate Change: Environment Bay of Plenty and Coastal Hazards: “Issues, Barriers and Solutions”

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Local Government Climate Change Adaptation – Environment Bay of Plenty Coastal Hazards Case Study

‘Issues, Barriers and Solutions’

1.0 Introduction

- 1.1 As part of its portfolio of climate change work, the New Zealand Climate Change Office (NZCCO) within the Ministry for the Environment (MfE) has begun a programme to assist regional councils and territorial authorities to better understand and take into account climate change effects when carrying out their day to day operations. In particular, the programme aims to develop guidance materials for local authorities to assist them in assessing and managing the risks of climate change in their planning processes. The development process has involved consultation with councils, peer review, ‘test drives’ and case studies.
- 1.2 Because of Environment Bay of Plenty’s (EBOP) history with the development of coastal hazard policy, the New Zealand Climate Change Office commissioned a case study project to identify the issues, barriers and solutions associated with such policy development and implementation. In drawing upon council experiences, the Office sought to gain an understanding of where to target future coastal hazards and climate change guidance materials and related training activities targeted at local government. It was also intended that this case study would provide a review of key issues for EBOP and relevant territorial local authorities in order to focus future council work programmes.
- 1.3 This report presents the issues found during the case study project, including a brief review of the development of coastal hazard policy by the case study councils over the last ten years in order to provide a context and background to the issues, barriers and solutions. The case study involved document reviews and discussions with staff from EBOP, Tauranga District Council and Western Bay of Plenty District Council. The barriers and solutions are presented as a result of the case study, but do require further research, consultation and council debate because of the brief nature of the case study timeframe. The issues, barriers and solutions have been outlined as a starting point for further analysis by the relevant councils.

2.0 Overview of Coastal Hazard Policy Development

- 2.1 Environment Bay of Plenty (EBOP) prepared a draft coastal hazard policy in the early 1990s as part of its development of the Regional Coastal Environment Plan under the Resource Management Act 1991 (RMA). As part of its Section 32 analysis (justification required under the RMA), EBOP commissioned a review of the draft policy in 1993 which was undertaken by the Centre for Environmental and Resource Studies at the University of Waikato (CEARS). This review highlighted a number of key points as follows:

- *Sea-level rise* – IPCC best estimate was most appropriate to use.

- **Local effects** – revised wind set up and estuary effects values based on Wahine storm and tides and pressure.
- **Factor of safety** – revised the value based on summing margins of error for each variable in coastal erosion calculation
- **Planning horizon** – confirmed the validity of using a 100 year planning horizon but recognised that different horizons could be used depending on land-use.
- **Planning mechanisms** – reinforced the viability of using setback zones as a technique for hazard management.
- **Flood and Erosion Hazard** – suggested that hazard assessments need simultaneous consideration of inundation and erosion.
- **Single coastal hazard zone vs multiple** – suggested that one single zone may be too constraining and does not consider land use context, whereas several risk categories strengthens integrated planning.
- **Absence of criteria for applicants** – suggested that detailed criteria for the factors to be covered in a hazard assessment should be provided in the policy.

2.2 At the same time as EBOP was developing its regional coastal hazard policy, it jointly commissioned some hazard assessment work with Tauranga District Council (TDC) in 1992, also undertaken by CEARS. This study looked at the Mount Maunganui and Papamoa areas only. As part of this project, EBOP and TDC promoted a collaborative approach towards coastal hazard management and ran three workshops involving participants from the district councils within the region and experts from CEARS. The intention was to also initiate preparation of the Regional Coastal Environment Plan. CEARS completed the hazards assessment for TDC in 1994. It recommended a ‘unified approach’ to coastal hazard management, which involved a mix of management measures including event protection, damage prevention, loss distribution and risk acceptance. However, the key outcome was the identification of two risk zones as follows:

- Zone A = from the seaward toe of the foredune to 70-74 m inland - within this zone proposed measures included discretionary landuse, consent notices on titles, relocatable structures, and presumption against engineering works.
- Zone B = 71-75 to 91 m inland - no large infrastructure projects
- Three and four risk zones were also suggested as alternatives.

2.3 Western Bay of Plenty District Council commissioned Terry Healy in 1993 to carry out a coastal hazard assessment for Waihi, Bowentown and Pukehina. While this assessment concentrated on coastal erosion, some analysis was included on coastal flooding in which floor levels were recommended for houses. A single setback line was identified ranging from 127-137 m from the toe of the existing frontal dune. This setback was recognised but the Proposed District Plan did not include any corresponding rules governing buildings or activities within the hazard zone except for subdivision, roading, utilities and protection works. The single setback line was ‘right lined’ to the edge of property boundaries rather than being identified in its true alignment on the ground. This was viewed as a pragmatic solution to administering Plan

provisions and zoning controls. Further provisions controlling building development were placed in the Plan in 1997 through a variation to the Plan.

2.4 As TDC received its hazards assessment in 1994, EBOP commissioned a hazards assessment of selected parts of the region's coastline by Jeremy Gibb. It was viewed as an initial assessment to be further refined by district councils and it identified Areas Sensitive to Coastal Hazards (ASCH). A coastal sensitivity index formed the framework of this assessment using eight variables across five sensitivity classes from very low to very high. The eight variables were:

- Coastal landform elevations
- Maximum storm wave run-up
- Gradient
- Maximum Tsunami wave run-up
- Lithology
- Natural landform
- Long-term shoreline trend
- Short-term shoreline trend

2.5 ASCH widths were mapped and incorporated into the Proposed Regional Coastal Environment Plan (PRCEP) in 1995. They varied in width from 50 m for coastlines with low to very low sensitivity to coastal hazards to 100-350 m for coastlines with high to very high sensitivity. The coastal hazards chapter in the PRCEP provided a context for identifying and assessing coastal hazards around the region. It required territorial local authorities to do more detailed assessments within the ASCH line in accordance with specific criteria. It advocated the use of the IPCC best estimate for sea-level rise being 0.49 m for a 100-year planning horizon and other values were recommended for variables, such as the factor of safety.

2.6 The ASCH line within the Tauranga District Council (TDC) jurisdiction showed that TDC had been too limited in its scope in requiring hazard assessments for Papamoa and Mount Maunganui only. It was considered that in order to develop appropriate provisions for the new District Plan the area of study needed to be extended and a more detailed assessment was required. Consequently, in 1996, Project Dune Watch was set up and Jeremy Gibb engaged to carry out a more detailed hazard assessment along TDC's entire coastline. This assessment resulted in four coastal hazard erosion policy areas as follows:

- *Extreme-risk area*
- *High-risk area*
- *Medium-risk area*
- *Safety buffer area*

2.7 During 1995 and 1996, all of the councils were engaged in the Proposed Regional Coastal Environment Plan (PRCEP) statutory process as well as their respective proposed district plan processes. The PRCEP received 533 submissions and 60 further submissions, of which 206 were on the coastal hazards chapter of the Plan. Jeremy Gibb was engaged to provide advice on the

coastal hazard submissions. The majority of the submissions were in support of the chapter but sought amendments. In 1998, Gibb and EBOP staff recommended changes to the Plan.

- 2.8 In 1999, EBOP engaged Gibb to review the ASCH lines in light of better sea-level rise data, more advanced GIS technology and recognition that the safety factor previously used was too conservative and could be reduced. This resulted in the ASCH lines being re-positioned on the maps. These lines have been confirmed subject to one site-specific court appeal.
- 2.9 Tauranga District Council (TDC) faced a major appeal to the Environment Court in 1998 regarding its hazard assessment and setback lines. The appeal was by a Mr Skinner who presented a technical challenge from a coastal expert (Keith Smith of NIWA) who advised that the setback line could be moved further seaward. Despite negotiations over several years involving; mediation, peer review by Harvey Brooks and Andrew Benson from the Auckland Regional Council (which did not support Smith's conclusions) and further work commissioned by TDC relating to short-term dune fluctuation, no agreement between the parties could be reached. Consequently, the matter went to an Environment Court hearing held in 2001 and 2002. Judge Bollard after hearing lengthy conflicting evidence from numerous coastal experts (10 days of hearing, nine experts, five in support of Council and four in opposition) upheld TDC's position but asked for some amendments of planning provisions. Three risk zones were confirmed but the safety buffer zone was removed on the basis that safety factors were built in to the assessment of each risk zone at the outset. This decision was appealed to the High Court by Skinner but was struck out by Judge Salmon in March 2003 on the grounds there was no matter of law on which to base the appeal. No appeal has been lodged with the Court of Appeal so TDC is now preparing the final provisions for the District Plan consistent with the Environment Court recommendations. More than 10 years after commissioning its hazard assessment, TDC is close to being able to fully implement it but first must alter its Plan from four risk zones to three which still may take some time.
- 2.10 Western Bay of Plenty District Council (WBOPDC), through the District Plan variation process and after considering submissions, divided its single setback line into primary and secondary hazard areas. In the primary risk area, buildings were at first proposed to be discretionary and in the secondary risk area permitted. These controls were appealed by EBOP and the Waihi Beach Protection Society to the Environment Court. The Waihi Beach Protection Society sought no controls on building development while EBOP considered buildings should be discretionary in the secondary risk area as well. The Court upheld EBOP's view in part by making buildings limited discretionary in the secondary risk area. WBOPDC has recently notified a plan change to its provisions in the hazard zones at Waihi Beach, which further tighten its planning controls.

3.0 Issue 1 – Which methods of Coastal Hazard Assessment should be used?

- 3.1 The methodologies and approaches used to carry out hazard assessments vary considerably. Largely the variance can be attributed to risk specificity; use of

differing factors of safety and different emphases placed on local short-term coastal dynamics vs the long term. This variance results in hazard assessments, which can advocate one setback line through to a number of lines delineating areas of risk. As outlined in the background, hazard assessments over the last 10 years in the EBOP area have resulted in numerous ways of delineating coastal hazards. This has led to confusion within the community, technical and scientific debate between the experts, court proceedings, considerable costs to councils and implementation problems. In essence, the following issues surround coastal hazard assessments:

- broad brush/single setback lines vs multiple setbacks
- ‘right lining’ setback lines to follow cadastral boundaries vs true alignment
- presence of existing development, existing vacant sections or Greenfield sites and deciding appropriate level of hazard assessment
- determination of factor of safety – level of conservatism, range of expert opinions about how to incorporate into assessments, link to development context and ensuring transparency
- erosion hazard and inundation hazard – recognition of dynamic relationship
- tsunamis – planning for low probability/high impact event
- factoring in climate change into inundation assessments
- interrelationship with other hazards such as earthquakes and subsidence.

4.0 Issue 2 – How can Hazard Assessments be integrated into the Planning Context?

4.1 A hazards assessment, carried out in isolation of the planning context, can lead to setbacks or risk zones being impractical and unable to be used effectively to implement appropriate controls and mechanisms. This was shown in the Western Bay of Plenty case where a single setback line was identified at the outset but then had to be further refined to primary and secondary hazard zones to enable different planning approaches and thresholds. Planning strategies depend on: whether there is existing development; the type of existing development (small baches vs large expensive houses); existence of empty sections; greenfield growth areas or remote coastline with no expectation for development. Hazard assessments need to reflect these contexts and the preferred planning strategies associated with each. The following issues surround the integration of hazard assessments with planning contexts:

- recognition of planning context and preferred strategy and planning mechanisms
- recognition of development situation – existing use rights, development expectations, growth area or greenfields
- level of detail required of hazard assessment – resource consent applications, development situation and planning context
- integration of hazard assessments with other coastal considerations – natural character, landscape and amenity.

5.0 Issue 3 – Understanding the full implications of different Planning responses.

5.1 There is a wide range of planning mechanisms, which may be employed to avoid, remedy or mitigate the effects of coastal hazards, such as: prohibition of buildings, relocatable buildings, floor levels and hard protection works. Each planning mechanism has associated policy and implementation issues, which should be recognised in the decision process. Based on the EBOP case study, the following issues are highlighted for a range of planning responses:

- ***Prohibition of new buildings*** - enables risk to be minimised or avoided
 - existing use rights for district council vs regional council control
 - ‘property right’ expectation
 - compensation issues
 - allowing larger houses if they are relocatable.
- ***Planned Retreat*** - enables hazard avoidance
 - district council vs regional council responsibility (joint)
 - cost implications
 - public vs private benefit debate
 - requirement of space and alternative locations
 - trigger mechanisms and timeframe.
- ***Setbacks/siting*** - promotes hazard acceptance and understanding and enables planning mechanisms to be implemented effectively
 - determination of lines or areas
 - understanding levels and types of risk
 - building location on site
 - integration with beach amenity, landscape and natural character objectives.
- ***Rules for activities in district or regional plans*** - avoid or mitigate hazards
 - setting appropriate thresholds for different types of activities
 - controlled vs discretionary vs non-complying activity statuses
 - providing policies, assessment criteria or standards for assessing consent applications
 - consistent administration of rules and policies
 - district council vs regional council rules.
- ***Building Design*** – minimises effects of hazard and lessens the physical risk-
 - bulk and size controls
 - coverage limitations
 - floor levels
 - relocatable standards and guidelines
 - integration with beach amenity, landscape and natural character objectives.
- ***Active Protection*** – attempts to mitigate hazard and reduce the risk
 - Soft protection vs hard protection

- integration with other planning mechanisms
 - minimising the pressure to undertake hard protection works
 - reserve management planning
 - ad hoc placement of hard protection works and effects on neighbouring properties.
- ***Reserve Management Plans – mitigate hazard***
 - non-regulatory mechanism, but enforced under Reserves Act
 - integration with active protection mechanisms such as dune restoration (beach care) and monitoring.
 - ***Guidelines – mitigate hazard.***
 - non-regulatory mechanism
 - encourages appropriate building design and siting.

6.0 Issue 4 - Building Act versus the Resource Management Act as a basis for hazard management

6.1 The Building Act and Resource Management Act (RMA) have specific provisions relating to hazards in Sections 36 and 106 respectively. Councils, in trying to deal with development in hazardous areas, can heavily rely upon these sections rather than provisions in their district plans. This is especially the case with section 36 of the Building Act, which enables properties to be tagged with a consent notice advising of the hazard thus limiting Council's liability. However, this approach is increasingly viewed as a tenuous and ad hoc way of dealing with natural hazards. The issues surrounding reliance on the Building Act include:

- ***Site by site debate*** – leaving hazard assessments and debate to a case-by-case situation is costly and promotes uncertainty.
- ***Liability*** – S36 notices by themselves are not adequate means of avoiding, remedying or mitigating natural hazards as promoted by the RMA. In the absence of any other technique, they do not meet the requirements of the RMA and as such open a Council to liability.
- ***Relocatable housing and floor levels*** – often these techniques are applied through the building consent process under the Building Act not through District Plan regulation. The extent to which this can statutorily be enforced is tenuous and relies upon willing applicants.

7.0 Issue 5 – Dealing with coastal hazards in the political context

7.1 Inevitably, coastal hazard management is controversial, as it is complex and crosses jurisdictional boundaries. It can become a political 'hot potato' that must be dealt with at regional and territorial council levels. The political issues identified in the EBOP case study are:

- ***Lack of acceptance*** – there can be denial that coastal hazards, associated risks and climate change exist.

- ***Individual liability vs council/public liability*** – individuals often wish to exert their right to accept risk despite wider public issues (e.g. health and safety) and common law duty of care towards neighbours.
- ***Regional council vs District Council jurisdictions*** – because natural hazard management is a function shared jointly between regional and district councils, there needs to be considerable co-ordination and integration. Even if regional councils delegate much of the responsibility, they still have a role to play in working jointly with district councils at a policy and consent level. Determining the relationship, extent of delegation, provision of information and funding and making it work in practice can be difficult.
- ***Public vs private costs*** – determining funding provisions and the public/private benefits for carrying out hazard assessments or implementing mechanisms such as active protection can be fraught with difficulty and lengthy to resolve.
- ***Variation in governance*** – because dealing with coastal hazards is controversial and involves a public process, decisions are made at a political level within councils. Inevitably this means there will be variation in decisions throughout the region, which can lead to inconsistencies.

8.0 Barriers to Achieving Effective Coastal Hazard Management

8.1 Through the case study a number of barriers became apparent as issues were highlighted in relation to coastal hazard policy development and implementation. These have not been analysed in any depth and are simply identified in broad terms. It is intended that these will provide a starting point for focussing efforts in improving coastal hazard management by raising awareness and focussing discussion. Some of the barriers could also apply to other work areas of council.

- ***Clarity of policy guidance*** – vague policy and associated rules and criteria creates interpretation and implementation problems. This is relevant not only at a regional policy level but also in District Plans. While the policy frameworks in the Regional Coastal Plan and the region's District Plans are sound there is generally an absence of criteria to guide the assessment of resource consent applications. This was a particular concern expressed by interviewees. The Regional Coastal Environment Plan does provide criteria in respect of hazard assessments, but not on how they can be implemented. Tauranga District and Western Bay undertook hazard assessments before the Regional Coastal Environment Plan was notified; however, they were undertaken in a consistent fashion with EBOP criteria.
- ***Differences in expert opinion*** – because coastal hazard assessments involve expert opinion and interpretation of data (or absence of data) there will always be issues surrounding the interpretation of risk, especially with the factor of safety and level of conservatism applied. This can lead to litigation and uncertainty. While it is not possible to

totally avoid conflicting opinions, as this is inherent to the field of science, it can be lessened by clear guidance on the issue.

- ***Inappropriate hazard assessments*** – as already discussed, it is important to undertake a hazard assessment with the appropriate level of detail and specificity on risk to fit the planning context. Where a hazard assessment does not fit the circumstances (for example, it is too simplistic with one setback line in a developed area) it can be ineffective in achieving sound environmental outcomes.
- ***Council or applicant capacity*** – engaging experts to carry out hazard assessments, especially detailed assessments, is costly. For individual property owners and low rating base district councils the costs can be prohibitive. This means that the requirement to carry out hazard assessments needs to be fully justified and provide clear direction as to what it involves, including implementation.
- ***Lack of knowledge*** – not understanding the interrelationship of hazard assessments with planning or the range of appropriate planning responses and their implications can render policy approaches ineffective and costly in terms of increasing financial and physical risk. This barrier was not overtly apparent in the case study but has been highlighted in terms of the subtleties involved with managing coastal hazards and where improvements could be made in terms of information and guidance.
- ***Lack of mandate*** – dealing with coastal hazards at any level within local government requires a mandate whether it is in legislation, a plan or consent. The absence of policy in plans means there is no direction for assessing consent applications or carrying out hazard assessments. To achieve strong policy direction at a local level in relation to coastal hazards, it must be first mandated at a central government level. The case study highlighted that the New Zealand Coastal Policy Statement could be stronger in its direction related to coastal hazards and that government needed to be more direct in legislation regarding climate change.
- ***Lack of commitment to implementation*** – this issue has been highlighted in relation to implementation at a district council level. It is perceived that the commitment to implement coastal hazard policies during the consent process is low. However, differences throughout the region at a District Council level, either in relation to hazard approaches, policy or implementation, are probably due to political commitment and difference in governance. District Council councillors vary in their political commitment and philosophies towards regulation, intervention, and acceptance of issues. This being the case, there have been examples where councillors have made decisions contrary to staff advice. A current appeal is pending with the Western Bay of Plenty District Council where council granted a resource consent for two houses on a lot in a primary coastal hazard area against the recommendation of staff. This appeal has been lodged by Environment Bay of Plenty. EBOP is concerned that while buildings may be discretionary activities in district plans, decision-makers grant consents regularly contrary to policy.

9.0 Solutions to Achieving Effective Coastal Hazards Management

9.1 Based on the barriers and the issues identified, the following solutions are proposed as possible starting points for further work by central and local government:

Central

- **Clarify central government policy guidance** – continue with the development of the coastal hazards guidance note in a way which provides more in depth planning guidance covering the issues, identified in the case study.
- **Incorporate findings into the NZCPS review** – some of the issues identified relate to policy guidance, clarity and political commitment. In order to strengthen decision-making regarding coastal hazards at the local level, the NZCPS could provide greater direction. Because it is being reviewed currently, the NZ Climate Change Office could integrate with this process to ensure sea level rise and coastal hazard assessment and planning issues are refined and updated.
- **Increase local government capacity** – there is a role for central government to play in increasing the capacity of councils to effectively deal with coastal hazard issues by providing information, tools and resources. This is especially so in relation to climate change and how it factors into the mix. The proposed guidance materials are considered a first step in providing more capacity, but should be followed up with training and possible provision of data or tools on a region-wide basis. Every regional council has to undergo the same process in determining the impacts of climate change and this exercise could be facilitated in a cooperative way between central and regional local government.

Comment: A number of the barriers identified in this report are currently being addressed by central government, either through existing programmes or as part of the emerging work programme relating to the Resource Management Act (Energy and Climate Change) Amendment Bill.

Regional

- **Clarify regional policy** – The EBOP Regional Coastal Environment Plan could be further clarified and amended in relation to:
 - coastal erosion and inundation methodologies and how they interrelate
 - level of detail required from hazard assessments in terms of risk, for particular circumstances e.g. resource consents vs policy and existing development vs greenfields
 - planning response guidance for district plans
 - regional and district roles and integration
 - regional interests and expectations in district council resource consents within hazard areas.
- **Analyse regulatory options at a regional level** – investigate the need for regulation in the Regional Coastal Environment Plan in relation to existing development in consultation with the district councils.

District

- **Clarify EBOP's role in district council consent applications** – as part of the regional council's role in ensuring integration and consistency of regional issues, it is involved with particular district council consent applications in accordance with an agreed protocol. This role may need clarifying in respect of district council discretionary and non-complying activities in hazard areas in terms of information requirements, expectations of the level of assessment, appropriate mitigation techniques to be applied and circumstances for declining. This clarification could be done through a practice note.
- **Develop assessment criteria and strengthen district council policy for assessing consents** – greater guidance and direction is required in relation to hazard assessment and mitigation in district plans such as:
 - why assessments need to be undertaken and to what level of detail
 - what is meant by relocatable housing
 - explanation of planned retreat
 - reducing physical and human risk through limiting location, size and scale of buildings
 - introducing floor levels for houses.
- **Continue regional and district council joint initiatives** – there are good examples of EBOP and district councils working together on coastal hazard issues and this should be encouraged and supported. Regional council financial and expert assistance to district councils is necessary and should be promoted hand in hand with policy guidance.

10.0 Conclusion

- 10.1 The Coastal Hazards case study has highlighted a range of technical, planning and political issues that warrant attention at central, regional and district levels of government. The Guidance Notes developed by central government are only one mechanism in enabling better coastal hazards management. However, they have the potential to provide critical and much needed direction if focussed on the key issues and the case study findings. The implementation of the Guidance Notes will be enhanced if supported by a wider package of training and capacity building initiatives.
- 10.2 The case study has also shown that while coastal hazards have been recognised and planned for regionally and locally in some areas, there is still some way to go in completing the hazard assessment process at a local level and achieving effective implementation. It is intended that this brief case study provide a springboard for continuing coastal hazard policy development and implementation in a focussed and positive way. The issues, barriers and solutions identified in this report are not definitive or final and should be viewed as a preliminary view based on a limited timeframe of research.
- 10.3 To conclude, the main findings of the case study can be summarised as follows:

- Regional councils play a significant role in providing support, capacity building, information and direction in relation to coastal hazards, including the effects of climate change.
- Considerable co-operation and integration is required between regional and district councils to effectively plan for the effects of coastal hazards. At a staff level, Environment BOP, Tauranga District and Western BOP have been successful in achieving good integration and are in a position to continue relationship building.
- More guidance and clarity is required in relation to planning and political issues surrounding coastal hazards, including increasing political awareness and education.
- Central government has a key role in capacity building at a local level through education, training, information provision and policy guidance, with a particular focus on local government politicians and decision-makers.