CLIFTON TO TANGOIO COASTAL HAZARDS STRATEGY 2120

Supplementary Workshop – 27 April 2017

Technical Questions identified by Panel Members

The following questions have been raised directly by Panel Members, either through the Workshop Evaluation process being run by the Edge team, or by email to hbcoast.co.nz. We will endeavour to discuss all questions during the supplementary workshop, and will also welcome any further questions from the floor.

Uncertainty and Debate

1. There is uncertainty in rate of future sea level rise and associated risk; how should we / can we make decisions with this level of uncertainty?

Answer provided by:	Simon Bendall, Mitchell Daysh; Dr Rob Bell, NIWA (The Edge); Dr Judy Lawrence (The Edge)

We know that sea level is rising and will continue to do so, which will make coastal erosion and coastal flooding hazards worse and more frequent. For coastal areas, it is "*virtually certain*" (in the calibrated language of IPCC) that sea-level rise will continue for several centuries - even if global greenhouse emissions are substantially reduced. But what is deeply uncertain is the rate of rise in sea level, particularly towards the latter part of this century and beyond – with the key contributor to uncertainty being how the polar ice sheets will respond to warming oceans and the atmosphere. There is more certainty in the near-term e.g. global (and similarly New Zealand) sea-level rise by 2040–60 is projected to be in a relatively narrow likely range of 0.16–0.33 m across a range of possible emission scenarios.

Thus, we need to put in place plans that can adaptively deal with rising sea levels of different rates of rise and magnitudes and the associated consequences from coastal hazard events and their increasing frequency. We must look at least 100 years out in setting this plan as required by the NZ Coastal Policy Statement (hence the 2120 target date), bearing in mind uncertainty increases with time through that period, so the adopted approach needs to be increasingly more flexible to deal with these uncertainties.

To account for the inherent uncertainties with this approach, we must ensure we have flexibility to respond to changing risks over time. This is the approach introduced by the pathways – where pathways are defined as short, medium and long-term responses. The rate of sea-level rise may shorten (if sea-level rise is faster) or lengthen (if sea-level rise is slower) the timing for shifting from our short to medium term response, and from our medium to long term response. These shifts will be defined by appropriate trigger points developed as part of the implementation and monitoring programme for the Strategy.

The overall Strategy will also include regular review points either in terms of district and regional plan review periods or as new information or impacts are more frequently felt (whichever is the sooner). This may involve a review of the latest science, new information on impacts (e.g. the effect of sea-level rise on groundwater), and then decisions can be made on whether we need to make changes to the Strategy.

2. There appears to be debate between different experts/scientists around the coastal processes in Hawkes Bay (particularly around Westshore) – how can we traverse this and access all reports commissioned by local authorities.

Answer provided by:	Richard Reinen-Hamill, Coastal Engineer, Tonkin +Taylor
To my knowledge all reports prepared for HBRC are readily available and largely include their own technical reports, the reports by Professor Komar and T+T. Professor Komar reviewed all earlier reports cited in his synthesis report and these are also likely to be available, or able to be made available on the website. From my understanding there is little debate between different experts on the coastal processes operating from between Cape Kidnappers and Tangoio apart from at Westshore. However, there are specific areas where uncertainty still exists. These uncertainties are around the amount of beach material supplied to the area from Cape Kidnappers and the river systems and the future effect of sea level rise. Uncertainties, or increased confidence will occur with the ongoing research, monitoring and analysis. The different viewpoints relate to the possible effects of the Port and access channel dredging on coastal erosion at Westshore. This is complex as this area has been subject to both natural (earthquake uplift and modification to tidal inlet flows and sea bed levels resulting from the uplift) and human induced changes. This is an area of ongoing research and debate, with the Port company likely to provide additional information and analysis as a result of their expected consent application. However, the basis for the erosion hazard assessment is from measured beach profile information along the coast. As it is based on measured data the cause of the erosion is not as necessary to define the hazard extent.	

3. The lack of historical data makes understanding current and future situation difficult – can we see historical imagery/aerial photographs of the coastline from early 1900s (as far back as can go) to today.

Answer provided by:	Dr Mark Dickson, Senior Lecturer, University of Auckland (The Edge); Dr Rob Bell, NIWA (The Edge); Dr Judy Lawrence (The Edge)
Historical data are important, and fortunately this coast has much better historical data than are typically available for other coastal areas around NZ. Beach profile data are particularly useful, including surveys from 1914-1916 in Clive and Westshore, and 1930 around Marine Parade, in the mid-40s in Awatoto, and in other areas from the 70s and 80s onward. There have also been historic coastal-flooding events, although less well documented. The last significant event was in August 1974, when extensive areas around Clive and parts of Haumoana were inundated from overtopping 6 m swell waves on the back of a storm tide. However, historical data on coastal flooding and coastal erosion will not be a good indicator of the future changes in these hazards on the back of a rising sea level. In particular, coastal	

flooding will become more frequent and occasionally will at times exceed the 1974 event. Thus we apply scenarios of sea level across a range of plausible situations to the present-day coastal hazard to test the flexibility of options being considered as pathways for reducing the risk to coastal erosion and coastal flooding.

4. We are dealing with modelled hazards risks – how likely is it that the models will match what actually happens? What happens if it's not as bad / is worse than the model? What can we do about this uncertainty?

Answer provided by:	Simon Bendall, Mitchell Daysh and Richard Reinen-Hamill, Coastal Engineer, Tonkin +Taylor

[see answer provided to Question 1 from Simon and Richard's response below]

The existing hazard extents are based on good quality beach profile surveys that have been carried out for decades combined with analysis of aerial photographs, LiDAR surveys and numerical model studies. The historic changes recorded have been extrapolated into the future with additional effects of sea level rise added.

To provide a better understanding of certainty the most recent hazard assessment uses a probabilistic approach so likelihood of erosion between 100% certainty to 1% certainty has been assessed.

However, it is acknowledged that these are still estimations, but estimations using the best knowledge that we currently have. It is also important to note that it does not consider "game changer" type scenarios, such as another earthquake and the uplift/lowering that may result.

The general approach for consideration of the hazard extents and applying them to decision making is also to think about what a "no regret" decision looks like and to think about adaptation, with a plan to implement when a particular stage or threshold is reached.

Answer provided by:	Dr Rob Bell, NIWA (The Edge)

Also, coastal hazard modelling is based around the present-day situation for the more extreme events, but with sea-level rise added (see Question 1 answers). These hazard modelling scenarios, using a range of sea-level rise scenarios, are likely to cover a range of future impacts from these hazards. But again, adopting an adaptive pathway approach, with ongoing monitoring of hazard impacts and how often they occur, can ensure a timely switch to the next pathway option and therefore address the uncertainty around future hazard impacts that exists at this juncture.

5. There is a wide range of technical understanding amongst panel members – how much technical understanding do we need to have in order to complete our task in an effective way?

Answer provided by:	Simon Bendall, Mitchell Daysh

You do not need to be coastal experts to complete your task. The key is to make informed assessments, based on your local knowledge and your own expertise, supported and complimented by the range of expertise available through TAG, T&T, Edge and other advisors and supporters of this process.

Management Options

6. Working with nature solutions for coastal erosion and inundation - what has been tried elsewhere (e.g. re-establishing, creating or expanding lagoons, wetlands etc.), is there any science to back such practices and what success has been had?

Answer provided by:	Dr Judy Lawrence (The Edge); Dr Rob Bell, NIWA (The Edge)

One large coastal re-alignment and nature-based project is underway currently in the Mississippi delta. Re-channelization is being used to move natural sediment through the delta system to recreate more natural ecosystem functions and build up the delta system. This has co-benefits to nature and to coastal systems as well as managing flood risk better.

In the UK, combined river mouth and coastal management re-creates wetlands behind beach berms in association with local NGOs who manage the bird habitats.

This is called managed re-alignment in the UK, where in most cases a historic seawall, stopbank or revetment has been opened up and allowed to tidally inundate what was previously low-lying land (in most cases so far hasn't included areas of houses). Government there stresses that provision of long-term sustainable coastal defences must start with the premise that "coasts need space".

However, each site will be different to the extent these approaches will work and are usually done in combination with managed retreat programmes. The basic objective is to give the coast space to move without buildings or other protective structures that interfere with sediment and water flow.

Answer provided by:	Richard Reinen-Hamill, Coastal Engineer, Tonkin + Taylor

Natural and Nature-Based Features (NNBF) refers to those features that define natural coastal landscapes and are either naturally occurring or engineered to mimic natural conditions. Natural features (e.g. reefs, barrier islands, dunes, beaches, wetlands and maritime forest) are comparatively "long-standing" in terms of age and created through the action of physical, biological and chemical processes over time. Whereas, Nature-based features are created by human design, engineering and construction to mimic natural features and are designed to provide similar, if not identical, services.

Beach nourishment and dune restoration projects have been a longstanding part of erosion and flood risk reduction strategies globally and are probably the most commonly used approach.

Coastal restoration projects supporting wetlands, seagrass, oysters and other habitats and communities have also been undertaken around the world to restore ecosystem functions with these typically being applied to estuarine/harbour areas rather than the open coast.

A common requirement for the establishment of natural and nature based features is to provide sufficient space for the natural system to operate and adapt to ongoing influences such as sea level rise and variable sediment supply. This is a significant constraint along parts of the present coastline we are considering due to the development that extends along the coastal edge.

The following link is to a recent publication by the US Army Corps of Engineers that discussed NNBF and provides some case studies and descriptions can be found here:
http://cdm16021.contentdm.oclc.org/cdm/ref/collection/p266001coll1/id/3442

I am currently engaged in the preparation of an international guideline with the US Army Corps, the UK and Dutch researchers to progress guidance in this area.

7. Can we explore beach revetment via planting - we know that boxthorn works, what can take its place?

Answer provided by:	Simon Bendall, Mitchell Daysh
Planting is on the table and is a component of a number of the pathways. The advice from Tonkin & Taylor is that planting is not an effective response to coastal erosion or coastal inundation for Hawke's Bay, but does serve as a useful addition / supporting measure for other responses. The actual detail of what species to plant, where and when will be developed later in Stage 4 of the Strategy when the Councils develop their implementation plan (following on from recommendations made by the Panels) and begin to specify the design details and timing.	

8. There has been a reluctance to discuss hard engineering options – why is that?

Answer provided by:	Dr Mark Dickson, Senior Lecturer, University of Auckland (The Edge); Dr Rob Bell, NIWA (The Edge)
Hard engineering should be discussed along with the full suite of options. Lessons can be learned from hard engineering over many decades globally, because we have been able to study how shorelines have responded following the installation of structures, but only under current climate variability and not under changing storm conditions or sea-level rise. There have been good and bad outcomes. There have also been initially unanticipated consequences. For instance, in some areas beaches have been lost from coasts where the coast was armoured, in other areas erosion problems have been transferred from one place to another. These are not desirable long-term consequences. In terms of national policy, the NZ Coastal Policy Statement 2010 generally discourages hard-protection structures (see Policy 27) while enhancement of natural coastal buffers or dunes is encouraged (Policy 26).	

9. Can we explore offshore reefs / breakwaters – how they work, pros and cons, where might they be effective

Answer provided by:	Simon Bendall, Mitchell Daysh
Yes – offshore reefs and breakwaters are on the table for consideration for the Northern Cell. In the Southern Cell, the Panel has accepted technical advice that groynes are a more practical, cost effective and reliable solution for preserving the beach along this stretch of coastline, and on that basis are not considering offshore reefs and breakwaters.	

Science Questions

10. Material transport along the coast – how does it work, where does it come from / go to

Answer provided by:	Dr Mark Dickson, Senior Lecturer, University of Auckland (Edge)

There was some discussion during the meeting. In general, cliff erosion and rivers deliver a mixture of sand and gravel to the coast. When waves approach the shore at an angle the sediments are moved alongshore. The wave regime and angle of the shoreline are such that sediments travel alongshore from south to north (in the southern cell). During transport sediments are abraded and lost from the littoral system (as mud). Hence, beaches require continual supply of material from cliff erosion and rivers in order to maintain their form over time. The various sources and sinks and transport rates have been compiled in previous work (e.g. T&T, 2005). Some numbers are based on work that could be usefully updated (e.g. the abrasion numbers)

11. Pre- and post-earthquake coast – how the coast responded to the earthquake.

Answer provided by:	Dr Mark Dickson, Senior Lecturer, University of Auckland (Edge)

The earthquake had profound effects. They can be simplified by thinking of three areas in which there was (1) ~1.8 m uplift, e.g. around Napier, (2) very little change, e.g. Awatoto, (3) about 0.8 m of vertical lowering, e.g. around Haumoana-Clifton.

1) Uplift north of Awatoto resulted in the land becoming more stable after 1931. Komar (2010) noted that prior to 1931 uplift the gravel barrier was lower and frequently overtopped by storms and Napier was commonly inundated. He noted that the shore within the Bay View cell is now relatively stable and does not experience overtopping, even during the most extreme storms. A recently completed Masters project at the University of Auckland using the XBeach-G model also suggests that these uplifted beaches do not overtop, even under storms. At Westshore a survey (described by Marshall, 1933) immediately following the earthquake showed that offshore from the gravel beach the seafloor is covered by sand, and the uplift resulted in the creation of a sand beach fronting the gravel ridge. Smith (1986) commented that much of the sand was lost by the late 1950s or 1960s.
2) In the area where vertical change was minimal, beach profile surveys between 1983-2012 show that the height of the barrier crest changed relatively little and there has been no clear trend of erosion or accretion at HB9 (Brown, 2017, Edmondson et al., 2011).
3) The southern profiles have been eroding and the 1931 earthquake is likely an important contributor. Recent Masters work at the University of Auckland using the XBeach-G model indicates that an immediate SLR of 0.8m lowered the wave threshold for both overtopping and overwashing. There would have been rapid impacts of this change, as have been seen in other earthquakes in different parts of the world (e.g. the Great Alaska Earthquake, 1964). Our modelling indicates that in the southern beaches the initial response of the subsided profiles would have been rapid and erosional, with subsidence allowing moderate wave heights to overflow barrier crests which would have shifted landward until the overwashing and overtopping frequency was reduced. Over time the barrier would have built in height and begun resisting further overtopping. However, while barrier height would have increased, barrier width may have decreased. This is important, because barrier resistance to storms is a function both of barrier height and barrier cross-

sectional area of a barrier (Orford et al., 1995, Masselink and van Heteren, 2014, Brown, 2017). Our research is on-going. Our understanding so far is that there would have been very rapid response to the southern profiles following the earthquake, and that over many subsequent years overtopping of the barrier crest would have continued, but paradoxically, on gravel barriers we understand that overtopping actually fuels barrier resilience because of sedimentation during storms, which increases ridge height. To further understand the details here we need to improve our understanding of sediment supply and sediment transport, because there needs to be a source of sediment through which the crest height and cross-sectional area can each increase.

12. Using the 'Historic shoreline change trends graph' put together by Tonkin + Taylor, it looks reasonably obvious that Erosion is occurring from site HB1 to site HB6 (other than site HB4A – the groyne at the Tuki Tuki river mouth) and Accretion is occurring from site HB7 to HB12 (Napier).

    a. Is it correct that this accretion (or build-up) has been occurring from sites HB7 to HB12 even with the extraction of 30,000m3 at Awatoto?

    b. If yes – with the stopping of the extraction at Awatoto, with this accretion be even more apparent?

    c. If this 30,000m3 from Awatoto was moved back to Clifton (and perhaps 50% to Haumoana) annually, could this potentially help reduce Erosion at sites HB1 to HB6?

    d. In the teams professional opinion, would the relocating of the 30,000m3 back to Clifton/Haumoana annually be enough to minimise erosion at sites HB1 to HB6, or would this need to be complemented with groynes.

    e. If YES to the question above, where would it be best suited for these groynes to be located between HB1 and HB4A.

    f. Where does the gravel that is moving from sites HB18 to HB23, end up?

Answer provided by:	Richard Reinen-Hamill, Coastal Engineer, Tonkin + Taylor

a. Is it correct that this accretion (or build-up) has been occurring from sites HB7 to HB12 even with the extraction of 30,000m3 at Awatoto?

The following table shows the trends of the 11 m contour movement from 1994 to 2014 and for the entire period of surveys available when sediment extraction has been occurring at Awatoto. It shows that erosion is generally occurring from HB1 to HB7 and accretion has occurred from HB8 to HB12 although accretion rates reduce towards HB11 and HB12.

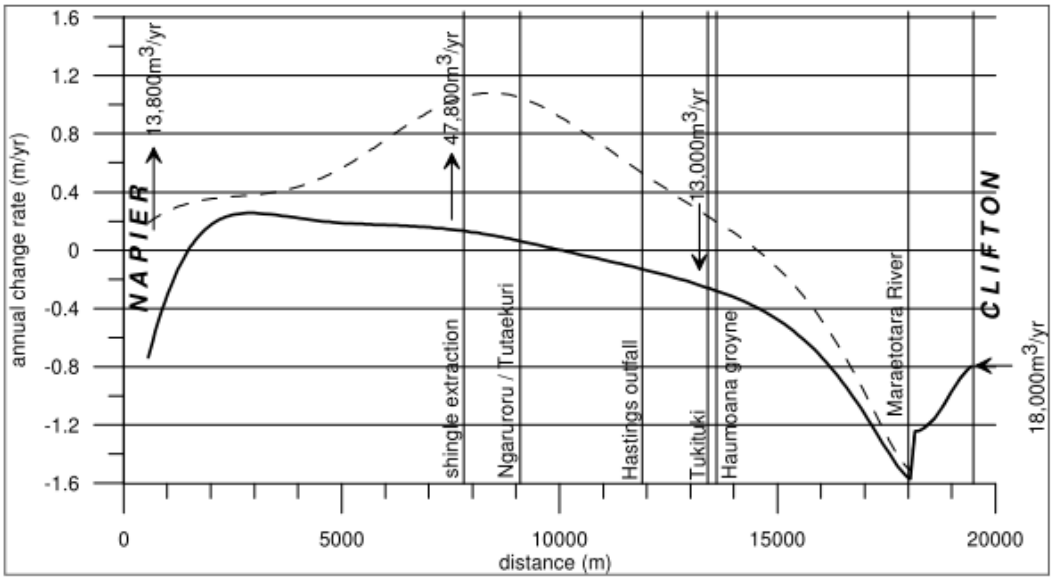
No.	Location	1994 - 2014 Trend (m/yr)	Total period Trend (m/yr)
HB1	Clifton	-0.025	-0.486
HB2	Te Awanga	0.135	-0.221
HB3	Southern end of Haumoana	-0.574	-0.529
HB4	Haumoana	0.196	-0.465
HB5	East Clive	-1.717	-1.367
HB6	Clive	-1.236	-0.69
HB7	Waitangi/Awatoto	-0.6	-1.419

HB8	Awatoto	0.544	0.634
HB9	Te Awa Avenue	0.62	0.264
HB10	Te Awa Avenue	0.759	0.636
HB11	Marine Parade	0.749	0.0053
HB12	Northern end of Marine Parade	0.068	0.458

b. *If yes – with the stopping of the extraction at Awatoto, with this accretion be even more apparent?*

The following figure from our 2005 modelling report[1] shows the annual rate of shoreline change along the coast from Clifton to Napier based on the shoreline evolution modelling. The solid black line shows the predicted present day rate of shoreline change and the dashed line shows the predicted rate of change if extraction ceased at Awatoto and Pacific Beach. This shows that the accretion should be more apparent with extraction ceasing at Awatoto.

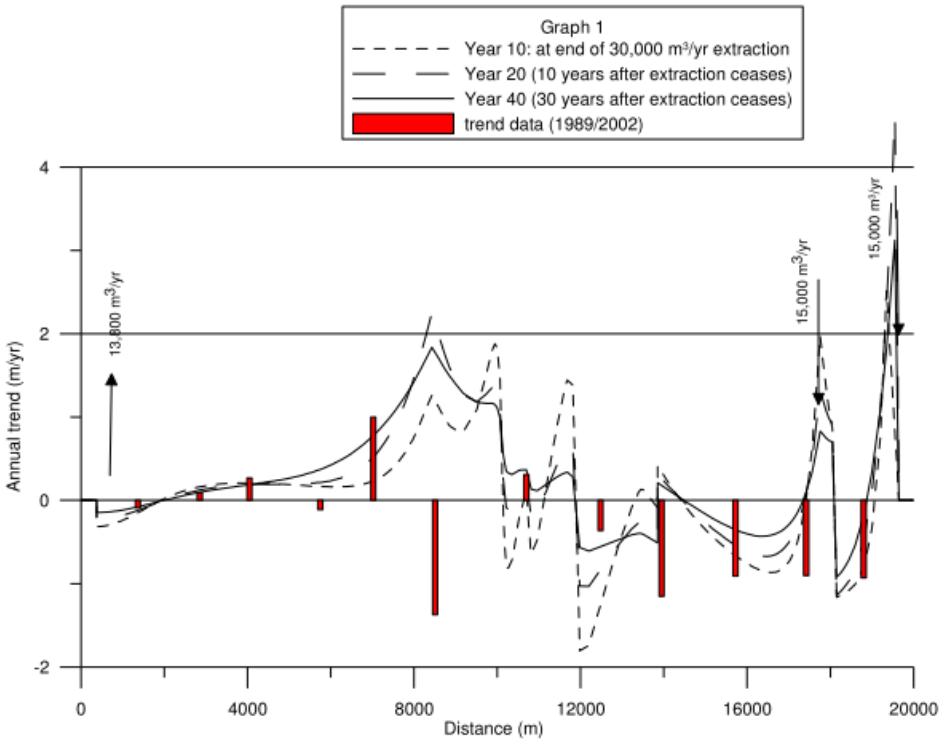
This is supported by the beach profile data. Awatoto gravel extraction reduced from around 47,500 to around 30,000 from 2005. Examining the beach profile trend plots in Appendix C of the coastal hazard report a slight increase in accretion can be seen in profiles HB8 to HB11.



c. *If this 30,000m3 from Awatoto was moved back to Clifton (and perhaps 50% to Haumoana) annually, could this potentially help reduce Erosion at sites HB1 to HB6?*

It is likely to reduce but not prevent erosion trends. The placement of 30,000 m3/yr placed at Clifton and Te Awanga was assessed in 2005 with the figure below showing the change in erosion rates and there is a reduction in the predicted rate of erosion (Note the distances are the same as the graph above for locations).

[1] T+T (2005) Southern Hawke Bay Shoreline Modelling Report, T+T ref. 20514 for Hawkes Bay Regional Council, September 2005.



d. In the teams professional opinion, would the relocating of the 30,000m3 back to Clifton/Haumoana annually be enough to minimise erosion at sites HB1 to HB6, or would this need to be complemented with groynes.

It will minimise but not prevent erosion. The volume of loss and the net along shore transport is around 70,000 m3/year and with sea level rise the volume would need to increase over time to offset sea level rise effects (this would be done with monitoring of profiles and responding to actual trend changes). However, our 2012[2] report looked at a range of nourishment and groyne scenarios and higher nourishment volumes and/or a combination of groynes and nourishment can assist in minimising erosion or creating a more stable shoreline for a longer period of time. Sea level rise will increase the effort required to manage the effectiveness of this solution.

e. If YES to the question above, where would it be best suited for these groynes to be located between HB1 and HB4A.

Our 2012 report provides a range of groyne locations largely focussed around Haumoana (i.e. between HB4 and HB3, but with benefits extending towards Te Awanga, but a similar spacing is likely to be required towards Clifton.

f. Where does the gravel that is moving from sites HB18 to HB23, end up?

It is thought that gravel within the northern cell remains in that cell with accumulation around HB15 – HB17 (refer appendix B of the coastal hazard report). There is movement both to the north and south depending on incident wave direction and either ends of the bay are subject to more evident erosion pressures and there is no new supply to these areas when sediment moves away from these areas. However, within the entire cell there is an ongoing reduction in gravel volume due to abrasion.

[2] T+T (2012) Haumoana Coastal Erosion Study: Concept design and assessment of groyne field protection. T+T ref. 28150-R5 for Hastings District Council and Hawkes Bay Regional Council, February 2012.

Managed Retreat Questions – raised by WOW in document circulated by email 18 April 2017

13. If retreat is enacted would it be piecemeal, eg one or two houses at a time, voluntarily or as part of a 'planned' retreat where this occurs within a specific timeframe?

Answer provided by:	Simon Bendall, Mitchell Daysh

Managed retreat as a process requires a great deal of pre-planning. There are many different ways it can be achieved. It can be differentiated from retreating in an ad hoc manner as and when houses / properties are lost, in that it is a 'managed' process i.e. a plan is put in place ahead of time to determine who, when, where and how the retreat occurs.

There is no one defined way of achieving this, and there are limited coastal examples in New Zealand, except in riverine situations. In the absence of this, it is likely that where a managed retreat option is adopted, the particulars of how it happens are designed, working with the affected communities, on a case by case basis.

14. At what point does removal go from optional to a legal requirement?

Answer provided by:	Simon Bendall, Mitchell Daysh; Dr Judy Lawrence (The Edge)

To date, managed retreat that has taken place in New Zealand and occurred prior to damage, has been voluntary through property purchase by a council or the government, or after a repeat flood or coastal storm event.

Legal implementation could occur if the landowner in question entered into an agreement of some sort to enable the retreat to take place, and then failed to fulfil their contractual obligations (i.e. refused to move), in which case it could become enforceable through the Courts under contract law.

Another scenario could be where new legislation was introduced granting new powers to local or central government, or where the Regional Plan was amended (which would need to happen through a full public process with appeal rights on decisions) to extinguish existing use rights, such that any buildings damaged by natural hazards would not be allowed to be re-built. Tasman District Council developed a District Plan Change 22 for Mapua and Ruby Bay which is now operative. It was developed as an integrated plan that considered coastal hazards, contaminated sites and coastal development plans. Development was provided for in a nearby lowland hill area away from the hazard-prone low-lying coastal area and further subdivision was prevented in some areas or activities that could increase risk from erosion and sea level rise inundation risk. New or significant alteration to buildings are to be avoided in the Closed Residential zone to avoid long-term adverse effects of coastal erosion and inundation. A relevant Environment Court decision in 2014 related to a subdivision in the same general area which was declined in terms of the NZ Coastal Policy Statement. *D and C Gallagher v Tasman District Council W245/2014 refers.*

15. Where would these people go?

Answer provided by:	Simon Bendall, Mitchell Daysh; Dr Judy Lawrence (The Edge)

As above in question 13 and 14, to be effective, managed retreat would need to be designed on a case by case basis, with objectives set – e.g. trying to keep the community together if that is desired. Implementation could be through District Plan / Regional Plan changes as in

the Mapua/Ruby Bay case in 14 above which included identifying and opening up new nearby areas for development that are not subject to coastal erosion or inundation hazard. How people affected actually make their own decisions cannot be predicted.

16. What responsibilities do property owners have for the land they are forced to vacate?

Answer provided by:	Simon Bendall, Mitchell Daysh; Dr Judy Lawrence (The Edge)
In all examples of managed retreat that I'm aware of, assumes a new 'owner' which to date in New Zealand has been councils or the Government, and the vacated land is returned to a natural state / changed into reserve. The Public Works Act 1981 deals with the rights of central and local government to acquire land for public purposes including reserves and the procedures for acquiring and disposing of this land. The acquisition of land for reserve purposes is a way of providing coastal buffers and setbacks. The Public Works Act covers the procedures where land is acquired by agreement with the landowner or where it is acquired compulsorily. On change of ownership all responsibilities of the prior owner would be extinguished.	

17. Are they required to remove septic tanks, foundations and plumbing or is that the responsibility of local authorities?

Answer provided by:	Simon Bendall, Mitchell Daysh
This is a detailed implementation issue that would need to be determined as part of any land ownership change in the planning for a managed retreat response, should this be adopted.	

18. What period of notice is required for people to remove their homes?

Answer provided by:	Simon Bendall, Mitchell Daysh
As above at question 14, managed retreat is a planned and managed situation– this is not a situation where eviction notices are issued (as might be the case where homes are seriously damaged in a natural event and are unsafe to re-enter). A great deal of planning would be required for it to happen effectively. If a decision is made that managed retreat is required at some point in time, the planning process would involve a large degree of consultation with communities and landowners.	

19. What would be the legal consequences to those refusing to move?

Answer provided by:	Simon Bendall, Mitchell Daysh
It would depend on the manner in which the managed retreat was confirmed and under what circumstances / legal context. As noted above this is not an eviction, but a planned response.	

20. How do councils assist in relocation or is that left up to individual property owners?

21. How would councils assist those who cannot afford to move or clean up their properties?

22. Who takes care of resource and building consents for removal and clean up?

23. What compensation is offered for people to move? (Market rates?)

Answer provided by:	Simon Bendall, Mitchell Daysh
Questions 20 – 23 relate to detailed implementation issues that there are simply no answers for at this time. These questions are crucial as to how managed retreat would be implemented, and would need to be determined as part of planning for a managed retreat response, should this be adopted. Suffice to say that the council would be expected to work in partnership with land owners to develop a plan for management retreat.	

24. Will the councils require resource consent to remove the properties for the proposed realignment of Beach Rd?

Answer provided by:	Mark Clews, Principal Advisor District Development, Hastings District Council
If buildings are required to be removed to a new site to make way for the relocation of a road they will generalluy require both a Building Consent and a Resource Consent. A Resource Consent is not required in all cases however. See the following link to the HDC brochure on this subject http://www.hastingsdc.govt.nz/files/HDC11527_RelocatingBuildings_A4Flyer_P4P.pdf. These requirements are intended to ensure the building is both structually sound and asthetically appropriate to its new location. If the buildings are to be demoilished to make way for the realligned road no consnets are required but services disconnections must be made with the supplier.	

25. Will the councils need resource consent if they seek to remove the 18 at-risk homes?

Answer provided by:	Mark Clews, Principal Advisor District Development, Hastings District Council
The same answer as for Q24 applies here.	

26. At what point would property owners no longer be required to pay rates on at risk or removed properties?

Answer provided by:	Simon Bendall, Mitchell Daysh
This is a detailed implementation issue that would need to be determined as part of planning for a managed retreat response, should this be adopted. Some points to note: • If the property is purchased by the Council as part of a managed retreat process (e.g. to be converted to reserve) then clearly any rates obligations from the previous owner would be removed upon transfer of ownership	

- If significant erosion losses occurred and the property is removed from the rating information database it would no longer be rated
- If the property is uninhabitable but still privately owned, then rates could be remitted under a rates remission policy (as occurred in Christchurch)

27. If a decade after 'managed retreat' the foreshore is still intact and the land is unused do the original owners have some claim on it?

Answer provided by:	Simon Bendall, Mitchell Daysh; Dr Judy Lawrence (The Edge)
Again, a detailed implementation issue and subject to the manner in which the retreat actually occurs. One possible scenario where is that once the land in question is owned by the Council a planned approach could include lease back to the previous owner until a future trigger point is reached and the retreat process initiated.	

28. Does the land resort to public or council ownership, DOC or beach?

Answer provided by:	Simon Bendall, Mitchell Daysh
Detailed implementation issue to be resolved on a case by case basis. Creating new public reserve areas would provide broader benefits to the community.	