Beca and GWRC review comments for Kāpiti Coast Coastal Hazard Susceptibility and Vulnerability Assessment Vol-1Methodology Report	

Reviewer Comments	Response/ Action
2.3.1 - Astronomical tides: Report would benefit from a table of astronomical tide levels.	Added in final version
2.3.1 - Last paragraph states the maximum storm surge for Kapiti is 0.38m. This is quite low and suspect this is in context of the measured data rather than a maximum?	Addressed. Modelled max is approx 0.45 m
3.4 - Appears the negatives have dropped off your VLM throughout the text and figures.	This has been addressed in final version.
5.1.2.4 - Expert panel review: Last portion of the first paragraph implies the analysis was adequate, whereas I suspect it wasn't.	Fixed in final version A "not" was missing!
6.4 - SL setback. The assessment has utilised the annual Hs as a proxy for the 12 hour (0.137%) Hs. This is likely to be conservative as annual return period is a function of the extremes within the complete dataset rather than annual exceedance trends. There also appears to be no clear justification for adopting the Metocean Solutions parameters over the NIWA analysis where the NIWA data has been used elsewhere in the assessment. It is recommend that further commentary and sensitivity assessment is completed to quantify the difference in setback as a result of the 2 datasets as the SL is likely to be the largest component in the overall assessment.	Agree the use of annual extreme Hs (1 yr ARI) will be more conservative that the 12 hr He value from Halleiemer (Hs0.137% per year), as does not need to occur for 12hrs. However, don't except the difference to be large. Due to the greater spatial spread of wave data presented in MetOcean (2007) - hence the better definition of the influence of Kāpiti Island on the wave heights, the potential conservatism of the Stephens et al (2011) data and the modelling modes being further offshore (80-120 m depth compared to 10-50 m depth for MetOcean (2007) sites), the wave heights the MetOcean (2007) study are used in this assessment for the calculation of cross-shore sediment transport closure depths required to estimate SLR erosion impacts. For these calculations, the closure depths obtained from the Stephens et al (2011) wave heights form the upper bound of the triangular distribution inputted into the 'Monte Carlo' analysis to determine the probability distribution of the erosion results (Section 6.2). NIWA waves only used in calculation of set-up & run-up for inundation, plus joint probability with storm tide in SBEACH model for ST sensitivity.
6.5 - ST erosion. The assessment hasn't progressed the quantification of ST since the Expert Panel Review and remains an item of uncertainty with limited data points.	Sensitivity of ST erosion againsrt SBEACH modelling results and geomometric modelling approach from Lumsden (2003) included as appendix to final report version. Appendix send to Beca for review
6.7 - Mapping framework for the river mouths appears practical. However, it is difficult to assess without worked examples. Ideally, historic river mouth positions would be utilised in determining the risk area. Where data is not available potential excursions could be inferred from similar environs.	Agreed, we have utilised the historical mouth positions where the projected future shoreline position is accretionary in the future. No changes needed, will give Beca worked examples with final mapping outputs.
7.5 - Further explanation is required on the method to calculate the inundation volumes. I understand the NIWA XBEACH assessment largely quantified this process.	Methodology for Beach run-up inundation has been re-written in light of new inundation methodology. See section 7.5 of updated report for details
General: The probabilistic assessment would benefit from a sensitivity assessment. This is particularly relevant as there are several assumptions on parameter range and also mean values. Particular focus would be on LT range, ST and SL.	The use of 10,000 realisations in the monte carlo simulation of the probablistic approach is to cover the uncertainty and sensitivity of the parameters making erosion components. Even if the assumptions on the upper and lower bounds of some parameters are in error, under the monte carlo simulation, this would only have minual effect of the tails of the results distribution. Details of the component bounds used in the probabliity assessment are to be included in the results report as they vary from cell to cell. The sensitivity of the parameters that make these components will be be discussed further in that report. However, we have included a limitations section in this report (section 6.9), which highlight some of the issues of sensitivity around assumptions made in the defining the components.
header needs to correct font in Kāpiti	This has been addressed in final version.
pg 1, para 3; site visit was also undertaken with GWRC staff	This has been addressed in final version.
pg 3, last para; spelling of adaptative => adaptive	This has been addressed in final version.
pg 5, 1st para; "However, consideration of ~~this~~ the full range…"	This has been addressed in final version.
pg 5, 1st para; Happy with this being a vulnerability assessment as opposed to a risk assessment	No changes needed
pg 5, sect 1.3; Needs to include the Wellington Region RPS natural hazards objectives (O19, 20, 21) and policies (P29, 51, 52): http://www.gw.govt.nz/rps/	This has been addressed in final version.
pg 9, sect. 2.1, 1st para; "...around the Ōtaki river mouth to Te Horo."	This has been addressed in final version.
pg 9, sect. 2.1, 1st para; "...constructed by longshore drift material…" perhaps refer to this as sediment transport as longshore drift will be one just one mechanism involved in this process.	This has been addressed in final version.
pg 9, sect. 2.1, 1st para; "...backed by large coastal plains (2-4 km wide)..." I think it is important to say that the plains narrow from north to south and are only 100-200 m wide at Paekakariki, as this is an important part of the geomorphic setting of the coast and the resaons for this help explain the greater vulnerability of the southern end of the district to erosion, as partly explained in the following paragraph.	This has been addressed in final version.

pg 9, sect. 2.1, 2nd para; "Gibb (1978) considered that the net longshore drift… is to the north..." I would add a rejoinder after this statement saying however, that this has not been confirmed (as the dominnant wave direction is still from the NW) along the southern Kapiti Coast. Also important to include this as there is a commonly repeated argument that the erosion along the southern Kapiti Coast has been caused mainly by SH1 cutting off the supply of material from the escarpmnent, that in reality would only have supplied small amounts of gravel material to the local shoreline.	This has been addressed in final version.
pg 9, sect. 2.1, 2nd para; spelling of Rauterangi => Rauoterangi	This has been addressed in final version.
pg 9, last para; delete extra word "...backed by a hapua lagoon ~~located,~~…"	This has been addressed in final version.
pg 9, last para; add word "…to the north of the district…"	This has been addressed in final version.
pg 11, 1st para; delete extra words "…reported by Gibb (1978) to have advanced with 171-195 m of accretion ~~reported by Gibb~~…" and "…Between 1974 and ~~his report in report in~~ 1978,…"	This has been addressed in final version.
pg 11, 2nd para; suggested wording "The eroding sections ~~are~~ largely ~~focused~~ occur in the southern part of the district (Paekākāriki, Queen Elizabeth Park, and Raumati), with some ~~isolated~~ localised erosion ~~spots~~ measured…"	This has been addressed in final version.
pg 11, 2nd para; Need to eloborate on this statement "Some of this observed 'accretion' is a result of the building of shoreline structures along the Paekākāriki and Raumati sections of shoreline."	We are not sure of the source of this statement so have removed, as does not add/detract from the context of the paragraph.
pg 11, 3rd para; Need to rewrite this as it currently doesn't make sense.	This has been addressed in final version.
pg 11, 4th para; Other notable recent storm events include: 29 Mar 2002; 3 Oct 2003; 2 Jan 2006; Jul 23 2008; 24 Jul 2016; 1 Feb 2018 (Fehi); 21 Feb 2018 (Gita)	This has been addressed in final version.
pg 11, sect 2.1.2, 1st para; the first sentence doesn't quite flow logically. I suggest adding a clause about erosion thereby linking the two concepts of development and seawall construction. Similarly, the last sentence needs a bit of clarification. In particular I think the first two words "These destroyed" needs to say what was destroyed and rebuilt ie, houses, seawalls etc... I'm not sure the Paekakariki seawall qualifies as being labelled 'piecemeal', I would use the example of the numerous private structures that get built in an ad hoc manner with no overall guiding strategy. Wheras, a lot of work has gone into the decisions around the Paekakariki seawall.	This has been addressed in final version.
pg 11, sect 2.1.2, last para; Suggested rewording "Today, approximately 20% of the district's shoreline is protected with an ad hoc mix of public and private structures, varying in length, type and age, which are concentrated along the ~~at~~ Paekākāriki, Raumati South and Raumati shorelines. ~~The shoreline is a collection of piecemeal structures which vary in length, type, and age.~~"	This has been addressed in final version.
pg 11, sect 2.1.2, last para; Suggested rewording "The database records that almost 8 km of these structures ~~is~~ are made of timber ~~material~~, sometimes in combination with toe riprap, rocks, concrete, and ~~rubber~~ old tyres; 670 m is made of concrete, 1.3 km is ~~made of~~ rock revetment, with the remainder being gabion baskets, railway irons, ~~rubber~~ old tyres, and vegetation."	This has been addressed in final version.
There are 2 page 11's	This has been addressed in final version.
pg 12, Fig 2.2; Maybe replace longshore drift with logshore sediment transport as this captures both nearshore and foreshore transport systems and say the figure is based on the report rather than a straight copy. Longshore drift is generally used to describe the classic zig-zag movement of material in the swash zone. Also, shoreline accretion is labelled in red- is this correct?	This has been addressed in final version.
Pg 13, 1st bullet pt; I think this statement needs to be qualified and carefully applied. De Lange's assessment is based on geologic timescales. In the Post-Glacial, early Holocene, there was a huge amount of sediment that was released out of the catchments and material being swept up off the nearshore continental shelf and being bought onshore as sea levels rose. Once the catchments and sea level stabilised there was much less sediment moving around in the system. Moving to the present day, we now have a shoreline that has a large natural cuspate on it, hugely modified dune systems full of marram, many areas heavily developed and km's hardened with engineered structures, truncating and fixing it in place preventing natural shoreline response. A rise in sea level will have an effect on this. I don't think we can say that a change in sea level will result in no clear relationship's to shoreline change, otherwise we may as well just dismiss sea level rise as having any effects at all. In other words, this may apply to the past but it doesn't necessarily apply to the present or future as the environment we are dealing with has changed both from natural and human induced causes.	Addressed with following in final version with qualifying statement on 3rd bullet point (considered more relevant that on 1st point) "*However, it is considered that this statement needs to be qualified for current conditions as De Lange's assessment is based on geologic timescales. In the post-glacial, early Holocene period, there was a huge amount of sediment that was released out of the catchments and material was being swept up off the nearshore continental shelf and being bought onshore as sea levels rose. However, once the catchments and sea level stabilised there was much less sediment moving around in the system. In the present day, we now have a shoreline that has a large natural cuspate on it, has hugely modified dune systems full of stabilising marram, and many heavily developed areas are protected by engineered structures - truncating and fixing the shoreline in place and preventing natural shoreline response. A rise in sea level by the projected rates and magnitudes will have an influence on these processes; in potential sediment supply and transport, in the nearshore -beach - dune profiles on un-protected shoreline, and in effectiveness of existing structures on protected shorelines".*
pg 13, 3rd para; Agree that it needs to be neutral, but I'm not sure we can even say that there may be an increase in sediment supply, as I think there is too much uncertainty. Both Bryan and Coco (2020) and a MetService analysis of wind records for Wellington over the past 50 years indicate the wind, particularly from the NW has become less strong. This may lead to lower wave energy and reduced longshore sediment transport. Of course, it is unknown whether this trend will continue.	Met Service analysis added and uncertainty leading to netrual assessment added.
Pg 13, 3rd para; "…Bryan and Coco (2020) suggest that there is unlikely to be an increase…"	This has been addressed in final version.
pg 13, sect 2.3.1; "...to the south of the Kāpiti Coast District…"	This has been addressed in final version.
pg 13, last 2 bullet points; maybe refer to sea level rise as short term lift in MSL so as not to confuse people with eustatic SLR "...sea-level to rise. The standard relationship is expressed as 1 cm of SLR…"	This has been addressed in final version.
pg 14, table 2.2; Need to add units (eg, m amsl) to the figures or column headers	This has been addressed in final version.

pg 15, 3rd para; 1% AEP isn't the equivalent of a 100 yr ARI, maybe say (ie, 1% chance of occurring in any given year), "...1%AEP (e.g. 100-year ARI) wave heights".	This has been addressed in final version.
pg 15, last para; I suggest adding AEP % to the 1 yr and 100 yr return periods	This has been addressed in final version.
pg 17, 2nd point; "...~~beach~~ erosion of beaches…"	This has been addressed in final version.
pg 17, last para; You need to clarify this …"wave set-up and run-up (excluding set-up) heights…" and pluralise "...Lane et al (2012) that the beach slopes at Te Horo and Paraparaumu are much steeper…"	As per Lane et al (2012) Appendix B (p93) *" Note that Equation B-1 does not include wave set-up which is directly accounted for in the inundation modelling"*
pg 18, 1st para; ..."but would ~~except~~ expect…"	This has been addressed in final version.
pg 18, sect 2.6.1, 1st point; …"to suggest that ~~this~~ any…"	This has been addressed in final version.
pg 18, sect 2.6.1, 2nd point; I take the point made here, but I'm not sure it applies to sections of the coast backed by seawalls, as they won't be able to repsond in the same manner to the relatively unmodified sections of coast.	Text altered to include" Along structured sections of the coastline, the presence of set-up/ run-up occurring at higher wave levels will interact with the structures more frequently, likely resulting in more frequent beach scour in front of the structures and overtopping of low structures with corresponding increase the likelihood of backscour, therefore increasing the likelihood of subsequent failure of structures.
pg 20, 1st para; Suggested rewording, "…complex network of crustal faults associated with the ~~convergence~~ subduction of the Pacific Plate under the Australian Plate ~~and Pacific crustal plates~~, that converges some 20–40 km beneath the surface of the lower North Island."	This has been addressed in final version.
pg 20, 2nd para; What is the difference between the *magnitude* and *rate* of future RSLR? Maybe just say the 'future rate' ?	This has been changed to 'future rate'.
pg 20, 2nd para; "...and are presented here together, rather than…"	This has been addressed in final version.
pg 20, sect 3.1; Needs to reference figures from the more recent report by Bell et al 2018 as it has more detailed local figures and timeframes. Also, it would be worth adding in global eustatic rates measured by satllite altimetry since 1990 that show rises of 3.2 mm/yr. It would also be good to detail the amount of rise since 1900 and compare that to rates since mid-20th C and since 1990 and tease out the eustatic, relative and local tectonic contibutions as detailed in the 2018 report as they show that current RSLR is much higher in the Wellington region that long term average.	Have added in SLR chnages from 1891 to 1960 compared to 1961 to 2015.
pg 21, 1st para; "...of a better understanding of the contribution…"	This has been addressed in final version.
pg 22, 2nd para; Suggested rewording "…local vertical land movements (VLM) have had a significant influence on RSLR for the Wellington region due to subsidence from slow slip activity and vertical uplift following ~~in~~ recent large earthquake events. However, the certainty of ~~further~~ future projections is limited by the measurements of vertical land movement being restricted to a little ~~long-term subsidence being limited to just~~ over 20 years (Bell et al, 2018) and the inability to predict displacement ~~in~~ from future ~~event~~ earthquake events."	This has been addressed in final version.
pg 23-22, last para; But the point also needs to be made that there is no reason to expect that the regional long term trend of subsidence being driven by the Australian-Pacific Plate subduction is going to stop. As included in the following section 3.4 analysis.	Point added to final report
pg 27, table 4.2; Would be good to identify what areas are covered by these eg, Otaki North - does that include Te Horo?	This has been addressed in final version.
pg 28, sect 5.1.1; "...low sloping dissipative beaches of the Oregon coast, "	This has been addressed in final version.
pg 31, 1st sentence; "A summary of the methods involved in ~~calculation~~ calculating each of the above components…"	This has been addressed in final version.
pg 31, In relation to the summary of findings of the Carley report, it would be worth saying that the panel didn't reject outright Roger Shands scientific work or approach, but that there were some aspects that were overly conservative and/or mis-applied to an RMA planning approach for the district plan.	Point added in final version
pg 31, 2nd para; suggested rewording, "…in the development of ~~more robust~~ a revised set of hazard lines to be included in the~~ir~~ District Plan. A summary of the feedback from the panel for each of the erosion components is ~~also~~ presented below."	This has been addressed in final version.
pg 36, bullet pt 2; Are you calculating *accelerated* relative SLR or just future relative SLR? This needs to be defendable	It is accelerated as the rates accelerate in the future from the present day, however to avoid any confusion we have removed 'accelerated' from this statement.
pg 36, bullet pt 4; suggested rewording "...or the magnitude of erosion that may occur from the failure of ~~coastal protection~~ seawalls." I think we need to move away from this idea that seawalls are protecting the coast when in fact they protect infrastructure. It seems a small point, but its all part of the language of erosion = bad, seawalls = good, we'll fight nature on the beaches etc etc...	This has been addressed in final version.
pg 36, last para; suggested rewording, "...remaining 20% at Paekākāriki, Raumati South, Raumati, and parts of Paraparaumu is dominated by an ad hoc series ~~collection~~ of ~~coastal protection~~ seawalls that have had a large influence on ~~the~~ past and present rates of ~~past~~ shoreline movement and will continue to do so as sea level continues to rise ~~projected SLR effects, which~~. Thus, the presence seawalls needs to be appropriately taken into account ~~impacts on the results of~~ in the erosion assessment under this general approach. ~~So, for~~ For meaningful..."	This has been addressed in final version.
pg 37, 1st sentence; delete s in needs "...the general methodology need~~s~~ to be made…"	This has been addressed in final version.
pg 37, sect 6.1.1., Is there room for a scenario where there is one more replacement cycle of the council owned seawalls (eg, as started in Paekakariki) with maintence until the end of their engineering/residual life followed by removal and shoreline restoration, thereby allowing managed retreat planning in the interim (eg, this might be a period of 50 years out to 2070/80).	This has not been included in the current assessment, however could form part of the stage two scope if it was a scenario the CAP wanted to look at.
pg 37, sect 6.6.1., agree with proposed scenario D	No action required.
pg 39, table 6.1, The Raumati cell needs to be 'Raumati - Raumati South'	This has been addressed in final version.
pg 42, 1st para; delete extra word, "...distribution ~~is~~ assessment…"	This has been addressed in final version.
pg 42, 2nd para; I wonder if there is scope to have a three scenario approach eg, 1. 'most likely' = ≥ 66% probability of occurrence; 2. 'likely' = 33–66% probability of occurrence; 3. 'unlikely' = 66-90% probability of occurrence. This way there are three crediable scenarios for people to pick and choose from when assessing risk in different locations allowing for different risk appetites. My concern is that the 'very unlikely' 10% chance scenario will be too easily discounted, effectively leaving just one scenario.	This will effectively be shown in the mapping of the scenarios, as we will have them mapped as 'zones' so 33-66% will be a zone, and the area from the present day shoreline to the 90% line will be shaded, so effectively people will be able to see from the shoreline to the 33% line, from the 33%-66% shaded seperately, and 66-90% area shaded. People will be able to infer these from the maps. KCDC have been consulted about this approach and confirmed they are happy with it.

pg 42, Table 6.2 needs to include Raumati South	Ruamati south is included in the Raumati Cell, and therefore is not seperated out from Raumati in this table.
pg 43, last para; "For shoreline sections where a ~~coastal protection~~ seawall structure was present…"	This has been addressed in final version.
pg 43, 3rd para: "In some instances, earlier shorelines were removed from the analysis as the rate of movement in these early periods were not representative of current day processes." It might be good to explain this a bit more, I don't quite understand the following example given for the Waikanae River mouth.	We have altered the text of this paragraph, and also added in the following paragraph about using the LRR rate at Te Horo. *"For example, river mouth migration and residential development adjacent to the Waikanae estuary meant that there were significant periods of shoreline advancement between 1948-1956, which meant that the overall R2 value was low due to the longer term lower accretion rates in the years between 1956-2017. To give a more accurate indication of the long-term rate which should be extrapolated into the future, the 1948 shoreline was removed from the analysis at transects on the southern side of the Waikanae Estuary, and the LRR rate used was based on long-term shoreline movement from 1956 onwards.* *Between transects 558-607 within the Te Horo cell, a large section of transects had R2 values lower than 0.5. The shoreline movement over the available aerial imagery was assessed between these transects and adjacent sites, which showed that similar trends of shoreline change at different magnitudes occurred. It was determined that the linear regression rate could not be used here due to the poor linear trend, and the End Point Rate (EPR) was used instead. A ± 50% of the EPR was applied to form the probability distributions for these sites, which was determined to be appropriate, as there was more uncertainty in the future using the EPR given the inconsistent trends across these transects. For adjacent sites with high R2 values and the LRR has been used, of which there is more certainty around the future trends at the site, and the 90% confidence interval applied for the probability distributions at these transects equate to between 20-40% of the raw LRR rate. Therefore, applying a ± 50% factor to the EPR to form the probability distribution is appropriate to demonstrate this uncertainty. "*
pg 43, last para; suggested rewording, …"due to the ~~large~~ continuous length of seawall ~~longshore distance of piece-meal~~ structures."	This has been addressed in final version.
pg 43, last para; suggested deletion, …"the future extrapolation, ~~being~~ obtained from the CSL…"	This has been addressed in final version.
pg 43, last para; suggested rewording "CSL acknowledges the limitations of the calculation of this earlier rate, ~~should~~ as cadastral surveys and aerial imagery ~~using~~ use different shoreline indicators…"	This has been addressed in final version.
pg 43, last para; The last sentence doesn't read right and needs a bit of rewriting.	This has been reworded to *"For this study, CSL (2008) "earlier rates" were used as the long term rate at relevant shoreline transects (as presented in Table 6.3) which were in close proximity and had relevant shoreline features (e.g. located north of a key sediment source). "*
pg 44, table 6.3; It might be worth explaining some of the differences between the CSL rates and the rates of change presented in this study	We have used the CSL pre-structure rates in this study, as per table 6.3. The rates that we calculated arent compareable to the contemporary rates from the CSL study due to the way that we deal with structures.
pg 44, 1st para; suggest keeping the wording active, "For example, if a structure has a residual life of 20 years, then the long-term rate ~~would~~ is only ~~be~~ extrapolated from 2040 onwards, and therefore only 10 years of the extrapolated long-term rate ~~would be~~ is included in the shoreline calculation for the 2050 timeframe."	This has been addressed in final version.
Pg 44, 2 para, first sentence; suggested rewording, "An exception to this approach was applied along the section of shoreline between 169 – 183 Manly Street, Paraparaumu that is backed with a concrete block seawall constructed in 199?."	This has been addressed in final version.
pg 44, last sentence; maybe replace the words magnitude with 'increase'; "...the same vertical magnitude as the magnitude of SLR."	This has been addressed in final version.
pg 46, sect 6.4.2, 1st para; This sentence doesn't quite make sense "...visit which formed the basis of quasi-distributions of the sand/gravel ratio together consideration of the longshore distance from the gravel source (Ōtaki River)."	This has been reworded to: *". Although there was no sediment sampling data available from the beach profile sites used, observations of the sediment size distribution were noted on the site visit which formed the basis of quasi-distributions of the sand/gravel ratio, along with consideration of the longshore distance from the gravel source (Ōtaki River). "*
pg 46, last para; "...formula to account for how much gravel ~~was~~ is present ~~on~~ in the beach…"	This has been addressed in final version.
pg 46, sect 6.4.2; What sections of the foreshore/nearshore do the gravel-sand percentage assumptions include? Is it averaged across the whole profile?	This was averaged across the whole profile, and informed by sediment data we had from sites on the Canterbury coast which had similar characteristics. This has been reworded to cover this: *"Although there was no sediment sampling data available from the beach profile sites used, observations of the sediment size distribution averaged across the whole profile were noted on the site visit"*

pg 47, sect 6.4.3; The second point notes that elevation changes were not taken into consideration, but I thought this is was undertaken for the SLR analysis es explained in sect 6.4.1? Maybe need to clarify further	There was some sensitivity testing carried out around this noted in 6.4.3, however it is still a limitation so has been listed here. For clarity, I have added in "temporal" as the limitation is around us not adjusting the dune height as the shoreline erodes back over a 30, 50 and 100 year timestamp. *"It does not take into consideration progressive elevation changes in the backshore over a temporal scale as the shoreline retreats, which as elevation increases in the backshore, there is more volume of material to erode and hence the erosion rate may slow, and therefore could be over-conservative in some locations, as noted above. "*
pg 47, sect 6.4.3; The 5th point is a bit confusing to follow and would do with some clarification. Also, correct spelling of 'Rauterangi' to 'Rauoterangi'.	Have ammended to wording of this point to make it clearer that the beach profile is not the typical equilibrium profile used for Bruun: "*The effect of SLR is dependent on the total beach/nearshore slope out to the closure depth (termed closure slope), where steeper slopes require less sediment volume to raise the nearshore bed, and therefore less erosion distance is predicted. The nearshore profile south of the cuspate foreland differs to the typical equilibrium sand beach profile due to the widely flatted nearshore caused by the downdrift sand bank from the cuspate foreland, which then drops steeply into the Rauoterangi channel. This non-equilibrium nearshore profile results flatter closure slopes to the inner Hallermeiers limits, and hence greater erosion with SLR, compared to the steeper slopes out to the outer Hallermeiers limit due to the steep drop off into the Rauoterangi channel."*
pg 47, sect 6.4.3, last point; I understand what is being meant here, but it might be difficult for a lay reader. Maybe tease this out a bit more. Also, change MSG to mixed sand and gravel. 'on gravel' in the first sentence should be 'of'.	Difficult to describle in any other way.
pg 48, sect 6.6; "Where STR is the landward distance ~~to~~ the scarp top must retreat to achieve dune stability (DS)."	This has been addressed in final version.
pg 48, sect 6.6; In the last paragraph explaining the STR values there are two maximums and one mean. Check this and replace one with 'minimum'.	This has been addressed in final version.
pg 49, 2nd para; delete word, "..., however it is likely that the following changes to river/stream mouth environments may be observed ~~inlets~~ with SLR"	This has been addressed in final version.
pg 49, 2nd bullet; replace 'come' squeeze with 'some'	This has been addressed in final version.
pg 49, 2nd to last para; "...method used at each inlet ~~in~~ is presented…"	This has been addressed in final version.
pg 49, last para; "...extent of potentially~~y~~ longshore migration…"	This has been addressed in final version.
pg 51, sect 6.7.3; The exception to this is large flood events that cause scouring and erosion around the outlet that exceeds the historic recorded envelope of change, which is plausible with climate change induced rainfall, combined with SLR, similar to what is used in method 4, except for discrete periods of time during large storm events.	This exception has been included in the paragraph in the final report, however while it is acknowledged due to the size of the inlet and the dominating coastal processes we think that our current approach is still valid.
Section 6.7; I think this a fairly good approach considering the technical challenges faced with these areas. I like the decision tree, its clear, logical and defendable.	This has been addressed in final version.
pg 53, 3rd para; add 's' to hazards in first sentence.	This has been addressed in final version.
section 7.2-7.3; This is all very resonable. I think it would be worthwhile spending some more time providing justifications for using the RCP8.5+ scenario. Maybe add some more in Sect 3.2 and elobrate further in 7.2.	This has been justified in section 3.2.The inundation section of methodology has now been altered to a bathtub approach after discussions with KCDC and Beca, and is subject to a subsequent review.
pg 61, sect 7.3.5; Has the 17% increase intensity of rainfall been increased to 20% now or will it be inconsequential for the amount of effort involved to update this?	Increase in intensity of rainfall has not been adjusted, we have used the existing model inputs as they are as reasonable drivers to illustrate areas likely to be at risk and for undertstanding influence of coastal processes (and recognising that more detailed modelling and mappiing of specific probability events is ongoing in parallel)
Section 7.4; This appraoch is thorough and defenable based on the information available. The captions to the map figures would benefit further from having more descriptions of the colours and what they are illustrating.	The inundation section of methodology has now been altered to a bathtub approach after discussions with KCDC and Beca, and is subject to a subsequent review.
sect 7.5; This seems a very reasonable approach.	This has been addressed in final version.
pg 71, pt 4; "...an additional inundation area…"	This has been addressed in final version.
Section 8.0; will sewer mains be considered in the vulnerability assessment as well? For example the Wharemauku road block wall was built because the sewer main become exposed.	No we have not included sewer mains as this was not specified by KCDC for inclusion in the assessment.
pg 72, last para; 'effected' should probably be 'affected'.	This has been addressed in final version.
pg 72, 1st para; Suggested rewording to keep the language active "The purpose of this assessment ~~was~~ is to determine…"	This has been addressed in final version.
Minor formatting and other amendments noted in tracked changed version. In addition, MSL definition needs to be added to glossary and X/Y axis needs to be added to Fig 2.6.	
The revised approach for inundation assessment is as per our conference all discussion. I would encourage the report to be clearer in stating that the bathtub approach is an interim assessment in lieu of the more detailed assessment that is currently being completed.	
The latest responses in the spreadsheet to the Beca questions are adequate.	
I note the report refers to maps showing areas of wave runup potential but these have not been supplied. I am not clear on how these are being mapped/quantified but note the actual affect is likely to be small.	