



Minutes

SMP Coastal Panel Meeting 9 – Adaptation Pathways, Thresholds and Triggers

Times & Dates:	Mercury Bay Coast 9:00am-12:00pm Thursday 25/11/21
Venues:	Mercury Bay Community Board Room, Whitianga or MS Teams
Chairperson:	Graeme Osborne (Mercury Bay)
Attendees:	TCDC - Amon Martin, Karen Moffatt-McLeod, Jamie Boyle, (Via MS Teams) SMP Consultant (Royal HaskoningDHV) – Sian John, Nick Lewis (Via MS Teams) Coastal Panel Members: Carrie Parker, Chris Devenoges, Kim Lawry, Dave Lameson, James Hutt Via MS Teams: Jill Pierce, Howard Saunders, Jamie Ryan, WRC: Rick Liefing (Via MS Teams)

Meeting Objective

- To review Policy Unit adaptation pathways based on feedback received and to begin the process of defining pathway thresholds and triggers

Agenda Items

1. Introduction.
2. Progress:
 - a. Minutes of Meeting 8 (September 2021).

GO moved Minutes of Meeting 8 be accepted – seconded (Kim Lawry) and adopted
No matters arising

- b. Review of Actions (see page 2).

Actions:

9 – on agenda for today – was for East Coast predominantly
13 – some discussions on presenting to WRC through the climate action committee first – rather than the regional transport committee. Some WRC councillors on both committees.
28 – included in presentation today
30 – included in presentation today
33 – Not just about comms – it is comms & engagement. More to come until the end of the project. Update panels on overall project early next year. PR would like draft plan for next meeting

34 – not for this area
31, 32, 35, 36, 37 - Completed

GO – why do the PU maps not show sea level at zero?
SJ – this was corrected so it started at 0

c. Short presentation on East coast storm events (East Coast CPs only),

locations of waste disposal sites and sites of cultural significance.
Information behind this is useful as it identifies sites of contamination.
This information will be included in the final report.
Majority of sites is about 'potential' rather than confirmed areas of contamination.
A lot of sites are confidential (WRC holds info on heritage sites)
Green – unidentified potential Contamination, Blue areas – Potential contamination (but not from landfill)
could be sheep dips, spraying etc



There is a database behind this info with more information

RL - WRC will be publishing a report soon that shows top 18 coastal landfills (coastal broadly speaking given proximity to the coast - around entire WRC coastline) and ranked them according to relative risk posed to human health and the environment. WRC has a whole team that looks at contaminated land and are looking to put on a mapping survey so people can click on a property and see potential contamination.

AM- could be useful if there are more we need to think about in some areas.



Red stars are Heritage sites
Green dots – archaeological sites. A lot of this information is confidential

East Coast Storms

Date of Storm	Settlements impacted by Coastal Flooding	Estimated severity of flooding
10 Sept 1933	Whitianga	Moderate
3 May 1934	Whitianga	Moderate
1-2 Feb 1936	Whitianga	Extensive
25-26 Mar 1936	Whitianga	Extensive
6 Mar 1954	Whitianga, Tairua	Moderate
24 May 1962	Whitianga	Moderate
10 April 1968	Whitianga	Moderate
23 Jan 1972	Whitianga	Extensive
18 July 1978	Whitianga, Cooks Beach, Tairua, Whiritoa	Extensive
15 Mar 1980	Whitianga	Moderate
12 Apr 1981	Whitianga	Moderate
12-13 May 1985	Whitianga	Moderate
14-15 Jul 1987	Whitianga	Moderate
23 Aug 1989	Whitianga	Moderate
10 Mar 1997	Whitianga, Tairua, Whangamatā	Moderate
21 Jun 2002	Whitianga	Moderate
21 Aug 2003	Whitianga	Moderate
26 Jul 2008	Whitianga	Moderate
29 Jan 2011	Whitianga	Moderate
25 Sept 2013	Whitianga	Moderate
16 March 2015	Whitianga	Moderate
23 - 24 May 2021	Whitianga	Moderate

Notes:

- 'Extensive' severity includes property flooding
- 2015 - Cyclone Pam
- 2002 – 'weather bomb'
- 1978 event considered largest
 - Road over wash (the Esplanade, Buffalo Beach Rd) exceeded 1.2m depth in surges
- May 2021 storm considered between 1 in 5- to 1 in 10-year event



www.tcdc.govt.nz

East Coast Storms

Summary:

- Events primarily impact Whitianga, but also Cooks Beach (east)
- Whitianga has experienced reasonably frequent coastal flooding, with at least 22 separate events since 1930
- From the recorded over the last 90 years – the highest risk properties (e.g., Esplanade Road, Ohuka Beach) have an annual probability of being flooded of more than 10% (1 in every 10 years)
- Other areas vulnerable to flooding probably have an annual probability of flooding ranging from 2-10% (between 1 in every 50 years and 1 in every 10 years)
- Note many hotspots (inc. Esplanade Road) now afforded some protection by seawalls, as is Cook Beach

This has all been incorporated in the work already done, apart from Map 2021 which is now included.

March 1988 storm (Cyclone Bola) is not on the list – NL to investigate - Worse in west coast – rainfall causing flooding was the biggest issue.

CP – comments from meetings regarding exclusion of rain from these events when it needs to be addressed.

GO – is there an AEP analysis to connect to the modelling

NL – no – there is not an AEP analysis – particularly for older events. More recent storms have been given an AEP.

GO – July 2008 storm had a significant impact – moved a lot of sand in Matarangi, flooding in houses in Kuaotunu.

GO – would like NL to put an AEP measure against the events where he can.

JB - The problem here is that wave heights and flood extent measurements are not usually available for these historical events. As such, it is difficult to put an AEP on those parameters, but as RL (WRC) said we could get tide level measurements.

1. Community consultation:
 - a. Overview.
 - b. Coastal Panel reflections.

Overview of Consultation

- 14 events – 10 in person, 4 online
- Around 280 people in person, 70 online
- In the Southeast
 - 82 in person - 14 Tairua, 34 Pauanui, 35 Whangamata
 - 25-30 online
- 17 comments online (none for the Southeast)
- All responses to the questionnaire indicated that they understood / appreciated the presentations
- Some disbelief "*the poster is wrong*" but general acceptance
- Some clarifications required (e.g., change planning practices, inappropriate development etc.)
- Requests for :
 - further engagement, inc. with younger groups
 - engagement through rate payers associations
 - more focus on the short-term, the King Tide and 5% AEP events
 - more information on costs and who pays (for what)

Well received by people who wanted further consultation. Not well attended in some areas.

Whitianga 13, Matarangi 13, Cooks Beach 9. (42 in total) 25-30 online.

Map on TCDC website launched a comment tool – you can put a pin in it and make your comments for that area or pull up the PU poster and make a comment, 17 comments to date – will stay live. JP – need to let people know that it is there. E.g. with the next rates bill.

<https://www.tcdc.govt.nz/Your-Council/Council-Projects/Current-Projects/Coastal-Management/Shoreline-Management-Plans/>

SJ – 98% of online comments have been from the MB coastal panel area.

Comments – understood what was said and appreciated.

Sticky notes comments for posters were specific to individual PU's.

How to reach younger people is a challenge for all of us to get more people involved. Looking at getting better engagement through the schools. **JB and JH (at MB School) will have a discussion.**

AM – big 2 weekends, 10 community events, staff presentation, 4 public online meetings.

Online meetings have been recorded.

GO – raised the possibility of developing teaching / educational resources that young people/parents/teachers can order online in order to engage people on the issues being faced.

DL, GO & CP – Legislative settings require particular groups should be targeted esp beach front property owners (but including rate payers, younger people etc)

SJ – covered what was discussed yesterday about doing specific area letter drops

GO – may not work with some areas where they are holiday homes, need to consider further options.

JR – feedback tool maybe good for the schools – more interactive for them. GO – not 100% on attracting school kids to respond as a priority.

JB - Other Councils undertaking the adaptive planning approach (.e.g. Christchurch, Dunedin) are specifically targeting schools and youth groups for feedback as a way of capturing diverse views and opinions on the impacts of climate change / SLR etc

CP – filter by age group/are you a beach front owner etc so you know how/why they are affected or have that view.

CP – people in Matarangi really like the structure and format of the meetings

KL – was disappointed on the 2 that were poorly attended. Need to encourage people to engage. Once people understand the process – it makes more sense to them.

CD – was the percentage of 'disbelief' about what was expected – SJ – there were less

Overview of consultation

- Maintaining access is imperative for local communities, both SH25 and local roads
- Suggestions:
 - Set funds aside now for/in those locations where defence is advocated
 - Older people, and those more able, to pay more
 - Developers to make funding contributions
 - Incentives to move to higher ground (e.g., Tararu)
- Diverse views:
 - Include 'provide space for nature' for all soft foreshores
 - Hard structures for necessary infrastructure, balanced by no protection for private property
 - ...will Whangamata have to keep paying for the Thames Coast, rather than concentrating on Whangamata?

c. Review of adaptation options and pathways.

SJ – a package of info for Waka Kotahi and WRC of comments that relate to them

PU72 – New Chum – no comments

PU73 – Whangapoua Beach (North) – will add to pathway – avoid new/inappropriate development and plan for relocation

Comments:

- Support for providing space for nature.
- Add avoid new/inappropriate development and plan for relocation

PU74 Whangapoua Beach Estuary

Comments:

- Support for providing space for nature and planning for relocation
- Not for raising hazard affected property

JP – future proofing further development. E.g. house on wheels so it can be moved back from the beach front.

PU75 – Whangapoua Beach

Comments:

- Support for plan to retreat

PU77 – Whangapoua Harbour

Comments:

- Bar very shallow, access problematic, waves steepening
- Support for avoiding new development in hazard prone areas
- Not for future proofing inappropriate development in hazard prone areas
- Current development threatened by hazards needs to relocate unless it is significant roading
- Threatened bird habitat present
- Mangroves protect the causeway
- Saltmarsh needs to be able to migrate inland

PU78 – Matarangi Harbourside

Comments:

- Support for relocating hazard affected properties and infrastructure
- **Plan to move the WWTP now** (to higher ground)
- Causeway used to washout when Matarangi was farmed, until the mangroves established

Various options have been looked at – finding a balance on what is best – move or raise site
CP – would like to see Mangroves protected.

JB – as of 19 Nov mangroves are now protected

JR – is there space allowed for the natural areas to retreat to e.g. mangroves (re zone some areas?)

PU79 – Matarangi Beach West

Comments:

- Push ups should be redone asap then planted
- Support for dune restoration and planned retreat
- Consider installing wind break fences at the highest point of the tide - they will collect sand in their lee
- This was done 10 years ago and 2m of sand built up, until a storm took it away

PU80 – Matarangi Beach East

Comments:

- Large expanse of beach – defend at western end
- **Encourage native planting**
- Support dune restoration and planned retreat
- Support for proposed pathway
- If 'defend' is adopted, homeowners should pay

PU81 – Matarangi to Rings Beach

Comments:

- With 'do nothing' the track will become dangerous

GO thinks it is worth trying to defend (the walkway system

CP – the community needs to decide if it is a valuable asset.

JH – thinks it is a more valuable asset than properties

SJ – we can acknowledge that this track is a high value asset – will update to reflect

PU82 – Rings Beach – no comments

PU84 – Kuaotunu West

Comments:

- Needs better management of waterways and livestock
- Stream needs to be cleared prior to predicted weather events
- Infrastructure pinch point re. freeboard, river & coastal flooding (at high tide)

PU85 - Kuaotunu West- Kuaotunu (SH25)

Comments:

- Seawall but.... risk to utilities infrastructure needs to be assessed

AM – time sensitive – as proposals for a footpath along here.

PU86 – Kuaotunu

Comments:

- Identify required bridge freeboard for combined events - storm flow in the river & high tide
- Clear the outlet prior to storm events
- Support for proposed adaptation pathway

PU87 - Kuaotunu River – support

PU88 – Kuaotunu Blackjack reserve - no comments

PU90 – Otama

Comments:

- Cliff/bank erosion at the Eastern end (undermining)
- Pressure from parking close to the edge and beach access via the tree roots
 - Plant flax to encourage parking away from the cliff edge (some planting in worst effected areas already done by Otama Reserves Group)
 - Move fence back from the cliff edge
 - Mow the reserve to encourage alternative parking areas
 - Provide a new safe beach access at the estuary / toilet carpark
- Flooding of the one land bridge during storms (only access) + SLR prediction indicates that the wetland boundary will extend well into adjacent farmlands
 - Riparian planting of existing wetland boundaries
 - Land swaps with landowners to extend natural boundary
 - No development
 - Raise/replace bridge

KL – sent photos of erosion issues through

SJ – will reflect better in the pathway

PU95 – Simpsons Beach (Wharekaho)

Comments:

- Prior to 2070, encourage soft options, such as dune construction and suitable planting, to alleviate low risks
- Soft options should help to limit coastal erosion
- Seawall impracticable today in terms of cost but would be an option in (say) 75 years' time
- If coastal erosion does eventuate to the degree suggested, managed retreat from 2100 onwards could be considered if the cost of a protecting is too great

JB – already doing a lot of planting to restore back to native plants (was a lot of exotics)

PU97 – Ohuka (Brophys)

Comments:

- Need to plan/act now - get the beach protected
- Stones all along

DL – needs to be a more targeted area for consultation

AM – SH is included as well

GO – thinks sandbags are effective but remains concerned about use of plastics (JB – in the short term only)

PU98 – Buffalo Beach North

Comments:

- Protection of the beach is needed now
- **Rocks required, along the full length of the beach** (with a properly designed solution)
- Use groynes to stop the beach heading to the Wharf
- Support for maintain existing defences
- Extend wall to south to protect Boat Club
- Support for 'protection' of the vulnerable Taputapuatea Spit from adverse effects of neighbouring land use (inc. the rock structures)
- **Plan for retreat of housing in hazard affected areas**
- Remove existing defences
- Maintain/rehabilitate dunes – **no to continued use of hard structures to protect private property / remove unconsented rock wall**
- Raise SH25 where needed

PU99 – Buffalo Beach Reserve

Comments:

- **Rocks required, along the full length of the beach** (extend wall to the river mouth, extent the southern wall to the north)
- Extend wall to south to protect Boat Club
- Protecting the land on the beach front is important
- **Stop the push-ups and planting** – limited value
- Stop grooming the beach
- Groynes?
- Support for 'protection' of the vulnerable Taputapuatea Spit from adverse effects of neighbouring land use (inc. the rock structures)
- Support moving the Boat Club in land
- **Do not support continued use of hard structures** for protection of private property or Buffalo Beach Road south of Taputapuatea Stream

PU100 – Buffalo Beach South

Comments:

- Protecting property is important
- Support for making Buffalo Beach Road one lane. Moving the walkway inland – providing more space for the beach
- Do not support continued use of hard structures for protection of private property or Buffalo Beach Road south of Taputapuatea Stream

Strategy needed for 98/99/100 as all connected

PU101 – Whitianga Outer Harbour – no proposed pathway

Comments:

- To early to form a view
- Wait and see
- Support planning for retreat and **rehabilitation of natural habitats**, providing space for nature
- Do not support new walls
- Do not support retrofitting hazard affected properties and sections
- Private property needs to adapt and relocate/transition away (to allow for habitat roll back)

AM – choices to make about Thames and Whitianga

As a panel we are yet to make a choice. Are we planning for retreat or are we looking at protecting it?

CP – believes at the last meeting 'protection' was the panels preferred option.

SJ – planning would need to start now – wall may not be needed for 20 -30 years

JR – feels costings need to be very clear – including the pumps/running/maintaining

AM – need to put something out there so people can comment (positive/negative)

JH – if we are going to wall Whitianga – why not take it out further and fill (reclaim) so there is more land?

KL – is there an option to take soft engineering to a higher degree and move the beach back and create a dune system for protection?

JB – would be ok for ST & MT but not for potential SLR in the future

RL – cost's – be careful they are very ballpark to give an impression. What steps need to be taken from this process to starting to build something – it involves a lot more planning/costing/processes. Part of this process is providing more information around this.

AM - Older parts of Whitianga will be more vulnerable than the newer parts

PU102 – Whitianga inner harbour

Comments:

- Healthy mangroves dissipate wave attack – should be maintained
- Plan should state that mangroves should be preserved and protected from spoil dumping

PU103 – Maramaratotara - Flaxmill Bay

Comments:

- No dunes to rehabilitate
- End effects visible beyond southern groyne
- High ground inundation modelling output questioned
- Spoil from road widening (rock, soil and trees) in the 1970s was pushed onto the beach and is now being eroded – will result in erosion of the road soon

JR – all ready works that hold the road up.

PU105 – no comments

PU106 Cooks Beach

Comments:

- Some support for dune fencing – is planting just as effective?
- Support for plan for change and relocate assets/properties

PU107 – Purangi – no comments

PU110 – Hahei – support pathway

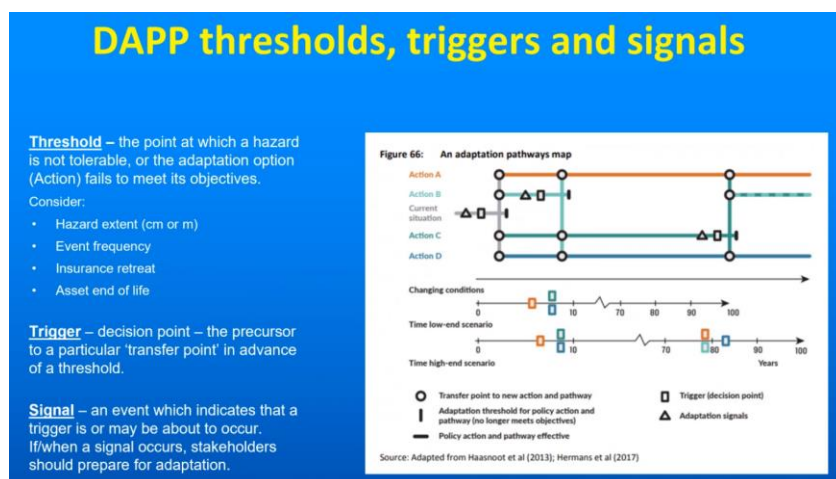
PU112 – Hot Water Beach

Comments:

- Support for proposed adaptation pathway

HS – more active rate payers group now in the area.

2. Setting thresholds and triggers:
 - a. Presentation



Approach to determining thresholds, triggers and signals

Principles

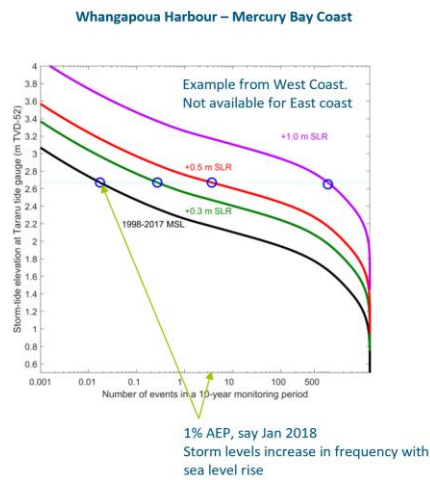
- Draft thresholds and triggers are to be developed by the Coastal Panels
 - Then sense checked by the TAG and wider community
- Focus will be on determining 'thresholds' first and then 'triggers'
 - Signals can wait – these can be science/engineering derived
- Representative, or key, PUs have been selected for discussion
 - Not those where more work is to be done

Steps – for each Policy Unit

1. Information review:
 - a. Identify the hazard/s and the sequence in which they occur
 - b. Consider assets/values at risk and the 'condition' and 'age' of critical infrastructure, including existing defences
 - c. Review rates/extents of predicted change (e.g., 20cm increments of SLR for KT, 5% and 1% AEP events)
 - d. Consider the changing frequency of events
2. Assessment:
 - a. Reassess tolerances
 - b. Propose thresholds for each pathway
 - c. Propose triggers for each threshold

and repeat

<p>1.2m Sea Level Rise:</p> <ul style="list-style-type: none"> • 1% AEP event now occurs multiple times every year (frequency increase x 200 +) • Current KT level now Mean Sea Level
<p>1.0m Sea Level Rise:</p> <ul style="list-style-type: none"> • 5% AEP event now occurs multiple times every year (frequency increase x 20 +) • KT now above MHWN (every high tide) (frequency increase x 300 +)
<p>0.4m Sea Level Rise:</p> <ul style="list-style-type: none"> • 1% AEP event now occurs every 20 years (frequency increase x 5) • KT now between MHWs and MHWN (most high tides) (frequency increase x 300 +)
<p>0.2m Sea Level Rise:</p> <ul style="list-style-type: none"> • 1% now every 30 years (Frequency increase x 3) • KT now MHWs - every 14 days (frequency increase x 30)



b. Example Policy Units.

PU 100 - Whitianga – King Tides – current day

KT with 0.6m SLR



KT with 0.8m SLR



KT with 1m SLR



AM – is that amount of flooding (0.8m) that will happen 3 x yr on a KT going to be acceptable to the residents? Or has that reached a threshold?

KT with 1.2m SLR



5% AEP 1 in 20yr storm with 0.2m SLR



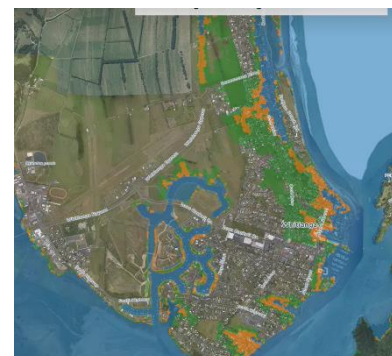
5% AEP 1 in 20yr storm with 0.4m SLR



5% AEP 1 in 20yr storm with 0.6m SLR



1% AEP 1 in 100yr storm with 0.4m SLR



SJ – 1/2m SLR with 1 in 20yr (which will be more frequent once has been reached)

the SLR

GO – keen to focus sometime soon on on how we are going to monitor SLR etc ... need a monitoring program for SLR/Storm events

AM – need to set the thresholds to determine what we are monitoring.

GO – where do I go to see the supporting Science? Can we reference it?

NL – There is a report, being reviewed by WRC and academics. Analysed the 1 & 5% AEP's of historical events. Modelling does not take into account added rainfall.

DL - A 'cost/benefit analysis is required and I am concerned that the modelling does not take into account rainfall events.

SJ - At what point are we saying do we defend, or do we retreat? Is it 0.4ml SLR?

JR – is a slow managed retreat a viable option – open up development into the farmland?

DL – give a cost and start charging the ratepayer now for the next seventy years to pay for it (wall/pumps).

SJ – look at defend or retreat costs and put in front of the community

AM – real options analysis done in Thames (2 hundred million to protect, 1 billion worth of infrastructure), but we can do that for Whitianga.

Look at human cost as well.

RL – still some uncertainty at a national level about compensation/funding etc defending/retreating options.

GO – speaking for himself, doesn't feel equipped to say what the thresholds are, feels a bit uncomfortable. Need the experts to inform/guide.

DL – information is getting a bit too technical – will not be understandable for the lay-person.

SJ – next meeting we will have a ruler bar for thresholds from information and feedback from the meetings.

CP – how do we get a handle on who in Whitianga can tolerate e.g. 300ml of water in their house X times a year (like Te Puru)

AM – needs more targeted engagement.

GO – could set up focus groups? Important to connect in more detail to get a better understanding of the community feeling.

JR – can we not have a rolling timeline on SLR? And when we are expecting these things to happen?

RL – this is what was done for Wharekaho – did the modelling and asked the community 'how often would you tolerated or not tolerate this type of event'. Gave an idea of the threshold.

AM – may bring an expert in to talk about lease options for managed retreat for future meeting.

3. Next Meeting (20 January 2021)

Meeting Closed: 12 o'clock

Actions Table – SMP 8

No.	Action	Responsible	Status
9	Timeline of storm events for the East coast sought.	JB/WRC RHDHV	Information provided to TCDC/RHDHV for inclusion in the Coastal Environment Report. Brief presentation on the agenda for the East Coast CPs.
13	Awareness of the SMP Project to be raised with the Regional Transport Committee	Project Office	In progress - presentation tentatively proposed for Oct 2021 did not occur. Matter to be discussed with Tony Fox re. appropriate timing.
28	Obtain WRC mapping for tip sites around the peninsula that could be used to inform the risk assessment	WRC/Project Office	Completed. Information provided to RHDHV for inclusion in the Coastal Environment Report. Brief presentation on the agenda.
30	Provide maps for areas of cultural significance	Project Office	Brief presentation on the agenda. Information to be uploaded to project shared folder subsequently.

31	Definition posters for the open days (icons included?)	Project Office	Complete
32	Include on posters if the solution is for erosion or inundation	Project Office	Complete
33	Communications Plan	AM/CB	Plan implemented for open days and now to be updated re. work to date and steps to project close
34	Kuaotunu West – re-work the posters and send back out to the group before printing. Also add to next TAG meeting for discussion	Project Office/SJ AM	Posters revised and provided Discussion at TAG meeting to follow
35	Reassess PU 118 (Southeast) – look at King Tide data and access issues	Project Office	Complete
36	Change public consultations days and times for Western side of coromandel peninsula	AM/KMM	Complete
37	Update (PU 68 & 69) with options and send to Stephanie for further comment	Project Office	Complete
38	PU120 (SE) most of the feedback is to defend. Update pathway to reflect	SJ/Project Office	
39	PU127 (SE) Update sediment recycling and beach push ups on the pathway proposals	SJ/Project Office	
40	WRC to provide a frequency assessment for Whitianga Tide Gauge (to be assessed by NIWA).	RL/WRC	
41	Follow up with David Grieg – Waka Kotahi on their engagement in this process and follow up from presentation at last Thames meeting	AM/SJ	
42	put an AEP against the storm events where it is possible (East Coast)	NL/Project office	
43	Look at adding filter to online comment tool to group by age/location etc	SJ/Project Office	

From chat:

CACC project team in identifying and finding solutions to local problems associated with coastal adaptation to climate change. The School at Whitianga was seen as an important contributor to the CACC project's community-based initiative, since school pupils are likely to experience the effects of climate-induced changes to their coast in their lifetimes and perhaps have responsibility for making decisions in the future about how the Whitianga coastal community might respond and adapt to climate change.

An initial meeting with the Head of Science and participation by four teachers from the school at a public Open Day on the topic of climate change and coastal adaptation run by the CACC project team sparked interest in developing a programme wherein teachers and students would have the opportunity to learn about the risk of coastal flooding, erosion and habitat change associated with sea-level rise and climate extremes and develop solutions to issues faced by their community.

The overall learning goal of the programme was to raise student awareness and understanding of the need for adapting to climate change on the coast. The teaching and learning programme, when implemented, was taught to a mixed ability Year 10 class for a 7-week period during Term 3. This averaged 14 hours per week spread over Science, Mathematics, English and Social Studies timetabled classes (approximately 100 hours in total), and Science occupied 28 hours of teaching time over a 6 week period. The project culminated in a display of the students' findings at the school's annual 'Enviro-showcase' which was open to the community.

The positive experience of teachers at MBAS and the empowerment the students experienced in this collaborative, cross-curricular approach prompted them to make their unit available to other New Zealand schools via their school website. The unit, called 'Coastal Adaptation to Climate Change', can be found on the school website at www.mbas.ac.nz/. An article in the New Zealand Science Teacher summarising this work can be found at www.niwa.co.nz/our-science/coasts/research-projects/all/coastal-adaption-to-climate-change.