NIWA
Taihoro Nukurangi

Engaging with communities on coastal adaptation to climate change: Whitianga experience

An internal report as part of the CACC project

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Cover Photo: Whitianga Workshop participants (P.Blackett)

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Executive summary

This report has been prepared as part of the MSI funded Coastal Adaptation to Climate Change project (CO1X0802). It documents work that was carried out in the Whitianga community, during the 2009-10 year, as part of the *Engaging communities* section of the wider Coastal Adaptation to Climate Change (CACC) Project. The report is a record of process and thinking, and will be used to build a platform and inform work at the conclusion of the project.

The research team has developed an inter-disciplinary method to engage with the Whitianga community around potential changes to their coastline under climate change, and how they might adapt to those changes. Our method was informed by participatory ideologies and sought to mitigate as many barriers to participation in the discussion as possible. In particular we explored:

- Getting the right people to the table;
- Achieving consensus and representative decision making;
- Personalising the impacts of climate change (local verses national focus); and
- Appropriate and meaningful inclusion of scientific information.

In order to meet these challenges we selected a participatory GIS approach. The final method involved a two stage process – an Open Day and a Workshop. In our Whitianga case study, both events were structured around large aerial photos of the Whitianga area that illustrated three key projected impacts of climate change: coastal inundation and drainage issues, coastal erosion, and habitat change.

In reflecting on what we have learnt, we identified a number of strengths and weakness with our method, but on the whole found it an effective way to engage with a community regarding coastal climate change impacts and potential adaptation options. In order to replicate the method, the keys to success are:

- The right team - Establish an interdisciplinary team who are able to provide the necessary expertise in terms of science and small group management techniques.
- The right data – Access to both scientific data and knowledge of the community.
- The right support - The commitment of the local councils to the process is a key element to success.
- The right resources – In terms of staff time and financial resources to commit to a time intensive engagement process.

Finally we note that the process of engaging communities, using our successful method, is part of the journey of adaption which will be discussed in the CACC projects' *Pathways to Change* guidance. Further findings from our engaging communities case studies will be drawn together in a final report, *Engaging communities:Making it Work*.

1 Introduction

1.1 Climate change adaptation and mitigation

There are two main responses that are most often discussed with regard to global climate change: adaptation and mitigation.

There are many definitions of adaptation in the climate change literature. In the IPCC's AR4 Adger et al. (2007) define adaptation as being:

> *"Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Various types of adaptation exist, e.g. anticipatory and reactive, private and public, and autonomous and planned. Examples are raising river or coastal dikes, the substitution of more temperature-shock resistant plants for sensitive ones, etc."*

With a simpler and more New Zealand focus, the Ministry for the Environment's (MfE 2008) definition is:

> *"Undertaking actions to minimise threats or to maximise opportunities resulting from climate change and its effects".*

In comparison mitigation includes attempts to decrease the effects of human-induced climate change, such as through reduction of the sources or an increase of the sinks of greenhouse gases (MfE 2008).

The shift away from the sole pursuit of mitigation and control of greenhouse gas emissions, to considering how countries might adapt to the projected impacts of climate change, are well documented (e.g. van Aalst et al. 2008; Brown et al. 2011) and grounded in a realisation that some degree of climate change is inevitable, and that mitigation policies alone will not suffice (Burton et al. 2002; Ford 2010).

Perhaps a key element of any definition of adaptation is the concept of a change in systems to cope with a new context (or state). The systems may be bio-physical or human social, economic or cultural. At present, a participatory ideology dominates thinking around how to precipitate change in human systems. Rowe and Frewer (2000) suggest there are two key underlying motivations behind this: an ideological perspective where the democratic ideal of inclusion, transparency and accountability are paramount; and a more pragmatic approach with a strong desire to achieve outcomes. From a natural resource and environmental management perspective public participation is typically conceptualised as a means to improve decision making, deliver better outcomes and solutions to complex issues (Parkins & Mitchell 2005). In essence, public engagement is perceived as a way to increase the likelihood of achieving successful outcomes by accounting for, and accommodating, the local social, economic and environmental context. Moreover, it is a means to counter the public backlash against, and perceived failure of, previous methodologies (Owens 2000; Isager et al. 2001), public disillusionment, and a gap between public knowledge and action on environmental issues (Burgess et al. 1998). The rise of participatory ideology in environmental natural resource management and planning is often linked with Agenda 21

where participatory planning processes where presented as necessary to achieve sustainable development (Bass et al. 1995). Since then, the importance of public participation in decision making has been supported by numerous United Nation Conventions (Giupponi et al. 2008). Moreover, the participatory ideology has been embedded in the documents produced by both the UN Framework Convention on Climate Change (UNFCCC) and the IPCC (Giupponi et al. 2008). This provides significant drivers to encourage climate change policies to be developed, and adaptation options explored, in a participatory way.

1.2 Project context

This report fulfils part of Milestone 4 within the Coastal Adaptation to Climate Change project (CACC). This is a 3-year Ministry for Science and Innovation (MSI, formerly the Foundation for Science Research and Technology) project, intended to create the necessary information and tools to enable adaptation by central and local government and communities to the impacts of climate-induced change on the coastal environment. The key outcomes of the CACC project will be:

> *More informed proactive communities and councils developing local adaptation strategies to climate change, the inclusion of these strategies in regional and community coastal planning documents and evaluation and monitoring of the uptake and performance of adaptation strategies.*

The project has four main components:

1) Building a national coastal vulnerability profile;

2) Engaging communities and institutional decision-makers;

3) Institutionalising adaptation; and

4) Evaluating and monitoring uptake and performance of adaptation strategies.

This report describes work on the second of these components, namely *Engaging communities*. In its early stages, the project team identified that little effort has been invested in New Zealand to raise the publics' awareness of adaptation to climate change and to determine where best to target information for information transfer to specific sector groups like schools, communities and councils. The project team also identified a need to better understand what is valued by coastal stakeholders, and how these values vary and will be impacted by climate change, along with specific adaptation methods to meet community needs. A key need, of course, is developing successful processes for raising awareness and understanding values and impacts. The project team identified the Whitianga community as an ideal case-study area in which to carry out work to help address these identified needs (see section 1.5 below).

1.3 This report

In this report we will describe work undertaken between July 2009 and November 2010 to engage with the Whitianga community (eastern Coromandel Peninsula) around potential changes to their coastline under climate change, and how they might adapt to those changes. Work with the Manaia community (western Coromandel Peninsula), exploring how Māori environmental knowledge of weather and climate can be valuable in contributing to community awareness, raising research questions through local legend/stories, and providing a context/entry point for discussions between Pakeha and Māori, will be described separately (King et al. in prep 2011).

The CACC team has brought a wide range of skills and experience to bear on this topic and this report builds from a variety of published and unpublished sources of information. In particular, draft reports from the AgResearch team members in terms of theoretical backing for the processes described, and logistical plans of how the events described would run, are incorporated into this report.

The focus of this stream of work is engaging with the Whitianga community to develop and test tools and techniques that facilitate the participatory process with communities, to improve their understanding of the risks climate change poses to community values and to identify and develop local adaptation solutions. This report is a record of process and thinking, which aims to inform work in the final year of the project.

1.4 The research team

The CACC team involved in this Whitianga work included scientists (NIWA, Waikato Regional Council, EcoNomos), social scientists (AgResearch), educationalists (University of Waikato) and managers with resource management and local government experience (Waikato Regional Council and Thames-Coromandel District Council).

1.5 The Whitianga community

The community of Whitianga, Coromandel Peninsula, North Island, New Zealand (Figure 1-1) was selected for this research. It is the main settlement of Mercury Bay, and is an attractive township with a deepwater harbour. Mercury Bay is the area of water that encompasses a spectacular coast flanked by islands. Whitianga has been continuously occupied for more than a thousand years since Māori explorer Kupe's tribe settled there after his visit in about 950 A.D. (Te Whitianga a Kupe is the town's original place name, meaning Kupe's crossing place).

Whitianga's usual resident population is projected to increase from 3,765 in 2006 to about 6,000 by 2040. In summer the town experiences a large influx of holidaymakers; the population peaked at 21,680 in 2003/04 and 14,810 in 2005/06 (Beca 2007, p12).

Whitianga lies in the Waikato region and is governed by Waikato Regional Council[1](WRC) and Thames-Coromandel District Council (TCDC). Planning documents relevant to this study

[1]Waikato Regional Council have also traded using the name Environment Waikato.

include: the Long Term Council Community Plans (LTCCPs[2], prepared under the Local Government Act), 'Vision Whitianga' which is a Community Plan developed by TCDC in 2005, and a more recent future visioning project called the Coromandel Peninsula Blueprint[3]. The latter is 'a strategic framework for managing growth and sustainable development for the Coromandel', and in it Whitianga is identified as a major growth hub for the Coromandel in the future.

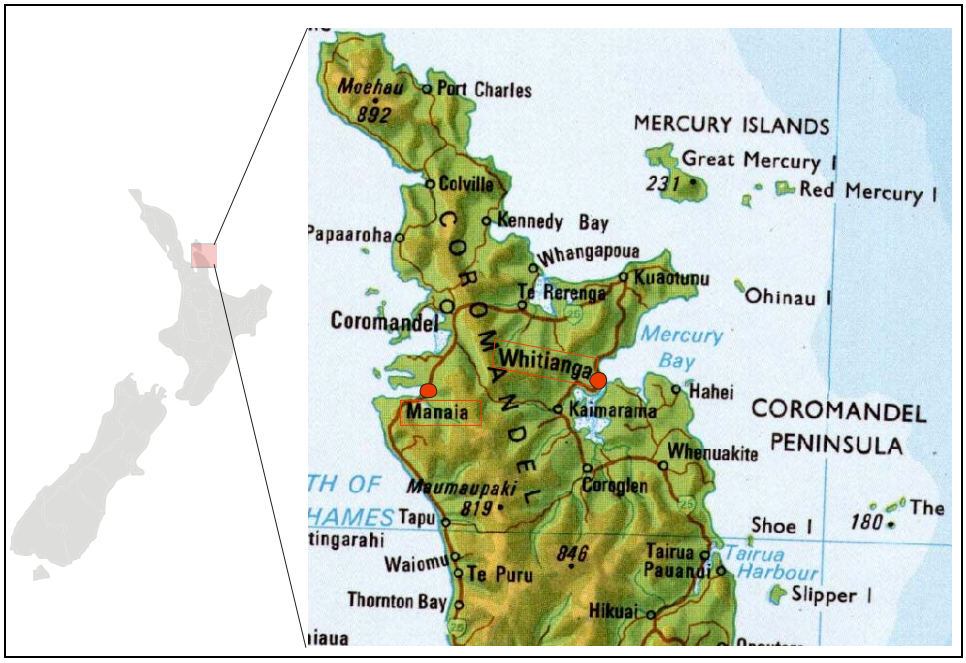

Figure 1-1: Coromandel Peninsula, showing the location of Whitianga.

The Whitianga community has experienced a number of coastal hazards, primarily flooding from coastal inundation and coastal erosion, associated with storm events which will be exacerbated by climate change (Stewart et al. 2005), and tsunami hazards. This hazards experience gives the community a good understanding of current issues at the coast. Both WRC and TCDC have undertaken research, monitoring and management work looking at these coastal issues. As a result, there is a wealth of information available and importantly, the Whitianga community has an active interest in coastal issues.

Key members of the CACC team are council staff, particularly Peter Singleton (WRC) and Peter Wishart (TCDC). The 'Peters' bring a wealth of experience in local government and Whitianga specific expertise to the team, and their help in particular in planning how we interacted with the Whitianga community was invaluable.

1.6 Parallel Whitianga engagement

In a separate strand of work developed by Dr Anne Hume of University of Waikato for CACC, students and teachers from Mercury Bay Area School successfully collaborated with the

[2] Recent amendments to the Local Government Act have changed these to Long Term Plans or LTPs.
[3] See http://www.coroblueprint.govt.nz/ for more details.

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.

2 Designing a process

2.1 Participatory processes

A participatory process was required in order for this research to be consistent with the participatory ideology expressed in the IPCC with regards to community adaptation to climate change. In keeping with Arnstein (1969), IAP2 (2011) and Pretty et al. (1995) among others, a participatory process has been broadly defined as one which shares power between those participating and traditional decisions makers. In this case, members of the local community and scientists and staff from regulatory authorities (Regional and District Council) were all involved in this process. The aim of the work was to explore together, using combined knowledge, what factors that the community valued which would be affected by climate change, and to begin considering how the community could adapt. Once the team had agreed to apply a participatory methodology a great deal of thought was required to design a process which maximised the benefits of community engagement and mitigated some of the known challenges.

There is an extensive body of literature on the benefits and challenges of participatory methodologies. These will be reviewed more extensively in Rouse and Blackett (2011) – a final research report arising from the CACC project. However, Table 2-1 provides a short summary of some of the key benefits and challenges relevant to this case study. Few et al. (2007) provide a useful overview of the challenges with participation specific to climate change adaptation projects. These include the uncertainty and complexity of the science on the magnitude and likelihood of impacts, the long timeframes involved, and often a sense of the problem being 'too big' for people to take effective steps.

The research team considered each of these challenges in order to design a method to achieve successful engagement, with the community on complex socio-economic and environmental issues. Moreover, each challenge was evaluated in terms of the highly pragmatic outputs required from the research, which were:

1) To understand what members of the community value about living in the community and how these value objects will be affected by the potential impacts of climate change;
2) To create a participative environment where members of the community can discuss future adaptation strategies (i.e., dialogue). In order to be truly participative scientists and council staff would be part of the discussion; and
3) To support the adaptation discussion with robust and meaningful scientific information at the appropriate level of complexity to provide participants with a good understanding of what the projected impacts on Whitianga may be as a result of climate change. In order to do this, the research team need to project local level impacts of climate change on the coast at Whitianga.

Table 2-1: Benefits and challenges of a participatory process to engage with communities and stakeholder groups over the impacts of climate change on their communities (compiled from Few et al. 2007; Mostert 2003; Lorenzoni et al. 2007; Hobson & Niemeyer 2011; Burgess et al. 1998; Tewdwr-Jones & Thomas 1998; Blake 1999; Laurian 2003).

Benefits	Challenges
Consensus and theoretical support for the agreed outcomes will lead into action on the part of individuals • Participation can increase the efficiency of development activities by involving local resources and skills • Crucially, participation can help to secure the sustainability of the activities as beneficiaries assume ownership	Including scientific information to ensure ecologically or scientifically effective outcomes The nature of the scientific information offers certain challenges, for example: • Climate change is extremely complex • There is a perceived lack of scientific consensus about the likely impacts of climate change
Informed and aware community (from both a scientific perspective and a greater understanding and empathy for others) • Participation helps to build local capacities and develop the abilities of local people to manage and to negotiate activities • Participation can lead to better targeting of benefits via the identification of key stakeholders who will be most affected by the activities	Tension between local level solutions and national or global interests In particular, people find it hard to see their personal impact on the problem due to: • The inter-generational nature of the impacts • Global consequences and impact of any individual actions or sacrifices
Integration of locally relevant social, economic, cultural and scientific concerns into the agreed solution • Can increase the effectiveness of solutions by ensuring that they are based upon local knowledge and understanding of problems, and will therefore be more relevant to local needs	Achieving consensus can be hard • Interpersonal animosity constrains communication • Fear of conflict inhibits discussion and debate
A community which is better connected and has a greater understanding of, and empathy with, its members	Successful engagement with the community – getting the right people to the table, avoiding pitfalls such as: • Not including the right stakeholders • Failure to include the decision makers Ensuring that decisions are representative of all participants

2.2 Some key terminology

Before any discussion could take place the team needed to develop a common understanding of key concepts and terms. Terms such as “value” or “community” are ubiquitous through the academic disciplines but have many shades of meaning and interpretation. As it was not the primary function of this work to evaluate or explore the debates over meaning it is sufficient to say we selected the most suitable and pragmatic alternative.

2.2.1 What does “value” mean?

Small (2007) introduces the concept of “value objects” as essentially objects or things in the real world to which individuals ascribe value. This definition enabled us to anchor the discussion to predominantly tangible objects in a specific place and context hence avoid abstract discussion around broader concept and impacts. Although discussion of more abstract details and impacts is valid and important, Few et al. (2007) noted that it tends to detract from place paced discussion of adaption pathway which was one of the key objectives of this research.

2.2.2 What constitutes a “community”?

Discussion and debate within the literature around what constitutes a community is extensive and will not be reviewed in this report. When it comes to beach communities with 50% absentee landowners, identifying the community is not a simple matter,and the research team had several discussions throughout the planning process on how to define the term community, what this might mean for the project and who is included in the participative process. Our definition of community has geographic boundaries so that it includes individuals who live within a particular geographic area, or have an on-going financial interest in the area. This included all landowners, residents, business owners etc. Local residents and business owners are included in this group as are holiday home owners, as well as those who rent or have a family interest in the area, but it excludes those who visit the beach from time to time. Although this definition excludes wider national interests it was considered by the team to be appropriate, as the project is about how the locals can adapt to climate change to protect what they value. Moreover, regional and national interests in the Whitianga area can be brought into the debate by resource management authorities. Our physical description of community is consistent with the physically tangible approach of value objects and fits well with scientific place based demonstrations of the impacts of climate change.

2.2.3 Resilience

In the same way that “community” has its own extensive literature, the issue of resilience is a broad field covering many disciplines from ecology to natural hazard management, with multiple interpretations and debates. With regard to resilience, our simple approach was that a resilient community was one that has the ability and capacity to adapt, which would also allow them to protect the things which they valued, in the face of future change.

2.3 Overcoming the challenges of participatory processes

In order to meet the challenges laid out by Table 2-1, we identified four key areas of focus, which are described below.

2.3.1 Getting the right people to the table

Once we had identified the boundaries of the community, our research team decided that our objective should be to achieve as high a level of community involvement as practicable while ensuring that participants gained value from the giving of their time. This meant rather than identifying stakeholder groups (which is more typical in participatory methods) we targeted all the individuals within the community. A further reason for approaching the community as a whole was that climate change is not a single issue (due to multiple impacts on multiple

value objects over variable timeframes) making it difficult to identify specific stakeholder groups who may be impacted.

Financial and time constraints were incorporated into the planning of the engagements because these would be important for future replication of any method by local authorities.

An additional decision was which team members would be part of the process, to ensure that members of the public had an opportunity to meet and discuss climate change with experts in coastal physical processes and climate change (scientists) - something which most people do not often get the chance to do.

The research team decided that as the purpose of this study was to trial a method which could be used to engage with communities over climate change it was not necessary to ensure that all the key decision makers from relevant community and central and local government were present at this point in time.

2.3.2 Achieving consensus and representative decision making

Forester and Theckethil (2009) suggest participatory process require three stages to reach a consensus: dialogue, debate and negotiation. During dialogue,conversation between participants aims to develop an understanding of other participants' perspective, interests and values. Debate between participants establishes and tests each other's arguments and rationale for particular actions. The final step is negotiation, where participants begin to work towards a solution and consensus.

The aim of our work was to design a process which local authorities could use to instigate dialogue with communities around climate change impacts and potential adaption pathways. In this respect it was not imperative to reach a consensus on how to adapt to climate change during the engagements with the community. Instead the resulting method (and underlying ideological approach) would form a stepping stone on the pathway which could progress to debate and negotiation in due course. To allow this, our method would need to contain all the necessary elements of a process that could be used to achieve representative consensus decision making. This means that as far as practicable all interests needed to be represented in the discussions (Habermas 1984, 1989; Outhwaite 1994) and people needed the opportunity to explore ideas, share their knowledge (Habermas 1984, 1989; Outhwaite 1994), and start to come to terms with the complex biological, social, economic and political aspects of climate change. These are all essential steps in order gain an appreciation of available strategies and alternative strategies and visions.

2.3.3 Local verses National focus – personalising the impacts of climate change

In order to personalise the potential impacts of climate change and generate an impetus to increase understanding and take action, we considered it best to focus on local issues and local adaptation solutions. The reason for this approach was that people are typically not concerned about a particular hazard if they have no experience of it and this is especially evident with coastal erosion issues (Cooper & McKenna 2008). If the potential effects of climate change could not be personalised we considered it would be difficult to get dialogue and traction around options to protect the community's values in the future. An appropriate method for this study must attend to this problem and seek to illustrate how individuals may be affected by climate change. However, by focusing on the local level we recognised that

other broader national or regional level interests may be neglected. A good example of this in the coastal environment is the installation of a seawall which may give an agreeable solution to protect properties at the local level, but at the regional level represents the loss of another sandy beach (Blackett & Hume 2007; Blackett et al. 2010). It will be the responsibility of councils to ensure that these other interests are accounted for where they diverge from local interests.

2.3.4 Appropriate and meaningful inclusion of scientific information

The nature of scientific information around climate change is complex, still evolving, uncertain and contested. As a consequence, any method we applied would need to be able to convey the impacts of climate change in an understandable way, address uncertainty and be flexible enough to address individual issues while remaining anchored in the Whitianga community (i.e., be place based).

Given the historical failures of the information deficit approach and the risks associated with information delivery via lecture style presentations (Pretty et al. 1995; Malouf 2003), we decided that our method should include one-on-one interactions to facilitate dialogue and learning between all participants (scientists, council staff, practitioners and members of the community). We also chose to develop simple maps of projected climate change impacts (see sections 2.6 and 3). All of the science would be geared to support pragmatic solution-based dialogue.

2.4 What methods will deliver the outcomes we want?

After working through the four considerations discussed in 2.3 above, we drafted a checklist of what a suitable method would be required to deliver:

- Ensure place-based conversations;
- Maximise participation from all areas of the community;
- Facilitate pragmatic dialogue which facilitated learning and information exchange between scientists, council staff and the community; and
- Integrate science into the discussion in a meaningful way and provide room to think about practical real world solutions for future adaptation.

Moreover, any method would need to deliver a way to identify value objects and provide a platform for participants to discuss how the things which were of value could be protected into the future.

Although there are an abundance of participatory methods (Chambers 1994), the practical basis for community based adaptation to climate change is still in its infancy (Reid et al. 2009), and as such few existing methods would deliver the above outcomes. After considering and reviewing these methods, the team concluded that utilising **Participatory GIS** concepts within a participatory rural appraisal framework would be an appropriate methodology, which would secure practical outcomes for our case study.

Participatory rural appraisal (PRA) is the term used to describe a collection of methods which *"enable rural people to share, enhance, and analyse their knowledge of life conditions to plan and to act"* (Chambers 1994, p 953). These methods are frequently applied in the developing world, typically based on participatory ideologies and tend to be highly visual. Participatory GIS (PGIS) is an emergent practice developing out of participatory approaches to planning and spatial information and communication management (Abbot et al. 1998). It combines a range of geo-spatial information management tools and methods such as sketch maps, Participatory 3D Models (P3DM), aerial photographs, satellite imagery, Global Positioning Systems (GPS) and Geographic Information Systems (GIS) to represent peoples' spatial knowledge in the forms of virtual or physical, 2 or 3 dimensional maps used as interactive vehicles for spatial learning, discussion, information exchange, analysis, decision making and advocacy (Rambaldi et al. 2006).

PGIS has evolved out of research in South Africa in the late 1990's which applied typical participatory rural appraisal methodologies to capture data for representation in GIS (Cinderby 1999). Application of PGIS to air pollution issues in the UK has illustrated that the approach works well to capture public knowledge in a meaningful way (Cinderby et al. 2008). Moreover, it provides an excellent diagrammatic base from which to generate meaningful debate around policy alternatives between experts and members of the public (Cinderby & Forester 2005). In practice, it appears as though the collection of information for PGIS can occur in many ways provided the method is based around diagrams of some type. Of particular, the method described by Cinderby (2009) was designed to engage with groups within society who typically do not engage in participatory forums. In essence, this approach placed a team of researchers on the side of a busy street around a large aerial photo. As they walked past, people were asked to write comments and concerns (about a particular issue) on small flags and position them in an appropriate location on the photo.

An immediate application was seen for capturing data for placed-based information of how climate change could potentially impact the things which the local community valued about living in Whitianga (their favourite part of the beach, their property etc). More importantly, an aerial photo which located value objects within the community could be used to anchor a pragmatic discussion around potential future adaptation options.

2.5 Final selection of our chosen method

The method developed by Cinderby (2009) provided the team with inspiration and a solid basis on how to approach our community engagement. In essence, our method would be visual - we would develop large (A0) aerial photos/maps of the Whitianga area showing the potential impacts of climate change on the Whitianga coast in GIS and use these to:

- Provide local community participants with visual and scientifically grounded perspectives of the projected impacts of climate change on the Whitianga community;
- Allow people to link those projected impacts with what they currently value about their community and wish to retain; and

- Facilitate discussion around future options, and to begin consideration of what actions could be taken to protect the things which are of value in the community against the projected impacts of climate change.

However, as it would be difficult to achieve all of these goals in one engagement, we developed a two-stage process that incorporated two separate engagement opportunities - namely an Open Day and a more focussed Workshop. This two-stage process allowed for:

- Potential to capture a wide audience at the Open Day stage; and
- Working with a more focussed group of people at the Workshop stage.

The research team considered setting up on the side of a street in Whitianga to emulate Cinderby (2009), but we decided that the practicality of the situation and risk of bad weather did not lend itself to this method. We opted to use a fixed central indoors venue, and chose to run both engagements at the Town Hall that provided a recognised and respected (by the local community) venue.

The timing of these engagement events in February/March reflected our desire to attract local residents rather than holiday makers. We also chose not to advertise using rates notices to second home owners outside of Whitianga, but instead advertised in the local media (see Appendix A).

The Open Day and Workshop engagements are described below.

2.6 The Open Day

The purpose of the Open Day was to engage with as many locals as possible over what the impacts of climate change on Whitianga will be, and how the changes will affect what they value about the community. For local residents, this Open Day presented an opportunity to question and learn from those involved in coastal climate change research.

The key aims of the Open Day were to:

- Collect data answering the question “what things do you (the locals) value in the community that will/might be affected by climate change?” ;
- Attract participants for the Workshop; and
- Provide a learning opportunity to participants.

A team of 12 people were involved in the Open Day, held on a Saturday in late summer (20 February 2010) between 10am and 2pm. The Open Day was held at the Whitianga Town Hall, and was widely advertised in the local media (see Appendix A). The lay-out of the hall for the day is shown in Figure 2-1 below. The process followed and key steps involved are described in the following sections.

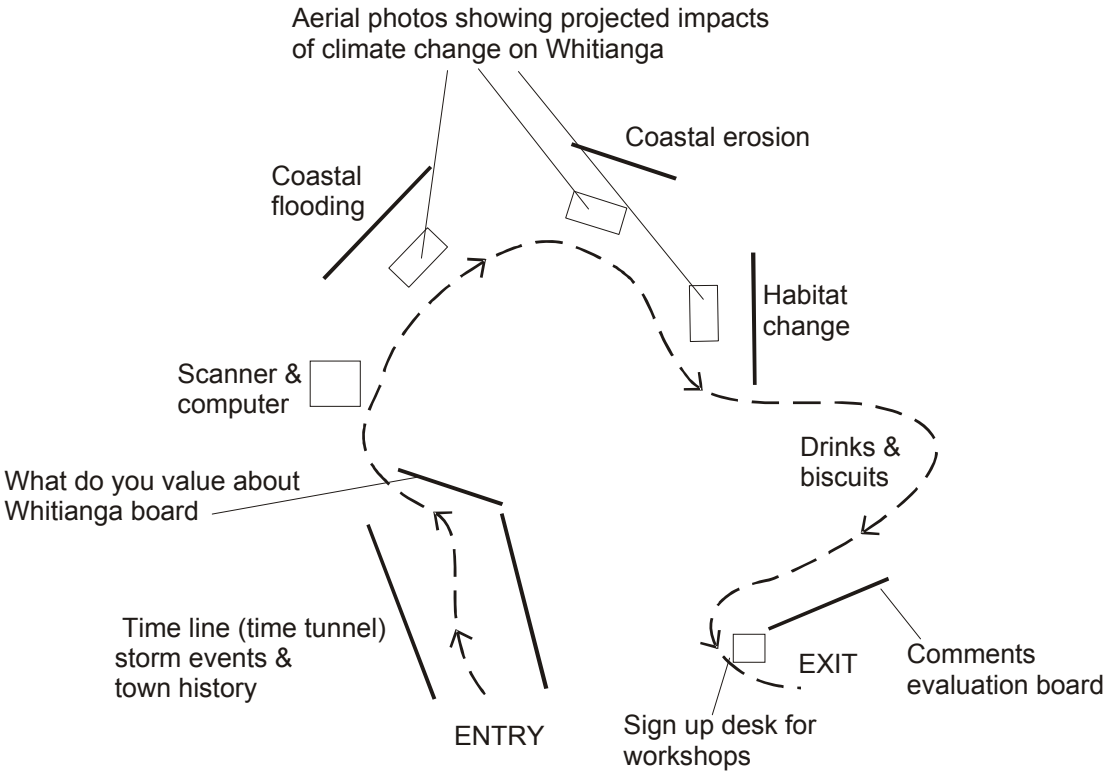

Figure 2-1: Set up of Whitianga Town Hall for the 20 February 2010 Open Day.

2.6.1 The time tunnel experience

The first step as people entered the Hall was for them to walk through the 'time tunnel' (Figure 2-2). On one wall the time tunnel displayed historic photos of the township and its development. On the opposite wall there were images of key storm events showing coastal erosion and flooding. The images were printed as large posters running the length of the tunnel and spanning a timeline from 1900 to 2010. One wall was labelled 'a century of change' and the opposite wall 'a century of hazards'. The aim of the walk through the tunnel was to get participants thinking about the type of changes that have happened previously in Whitianga, make connections with their experiences of such events, so that they would be ready to think about future changes when they emerged from the tunnel and entered the next area of display – the existing values maps.

2.6.2 Capturing existing values

A large A0-sized aerial photograph of Whitianga was used as a backdrop for a poster aimed to get visitors thinking about what they value about living in Whitianga. A number of values already identified in the Vision Whitianga Community Plan were already noted on the poster. Sticky notes and pens were provided for participants who posted additional comments to the poster about what they valued about Whitianga.

We provided a scanner, computer, and printer so that if anyone had brought along photographs of historic interest and/or of local storm events and damage, we could scan these, print them and add them to the time tunnel display. Pre-Open Day advertising in local media had encouraged people to bring old photos along.

The participants then moved on to find out more about projected impacts of climate change on Whitianga and what impacts that might have on those values.

Figure 2-2: The Time Tunnel entrance at the Open Day.

2.6.3 Projected impacts of climate change on coastal values

The Hall was set up with three tables, each with an aerial photograph/map illustrating different impacts of climate change on Whitianga:

- Coastal inundation and drainage;
- Coastal change (erosion); and
- Migration of coastal and estuarine habitats inland.

More information about the development of these three maps follows in section 3.

Each table had two team members assigned to it and a box of pins with flags (paper labels) attached, on which participants could record their thoughts and then pin them on the maps. The team members role was to: 1) discuss with participants the impacts of climate change on their community, 2) encourage people to write on the flags, and 3) to promote the follow-up Workshop. Team members on each table were able to explain the projections of flooding, erosion and habitat change illustrated on the map, and answer any climate change related questions on a one-on-one basis with participants. A deliberate decision was made to provide very little extra display material around the hall so that information transfer was primarily through inter-personal communication and driven by participants' interests and questions. This steered the conversation to individual interests and their level of knowledge, although there was healthy two way exchange of ideas and debate.

Participants were asked to mark the maps by pinning flags at the points where the things they value would likely be affected by flooding, erosion and habitat change. They did this by writing on the flags and then pinning them onto maps at the place where the 'valued objects' were located. Additional comments could be made in a book on the table.

CACC team members were ‘coached’ before the Open Day so that they knew what sort of information was required on the flags and how to illicit that information from participants. For instance, the writing on the flags needed to capture in just a few words the things a participant valued about the local area and that would be affected by climate change. The value needed to be reasonably specific and linked to a location on the map. If the flag related to a building, then team members ensured that participants identified which building (i.e., my house, or mother’s house, school, my business). The team members were also able to explain in simple language how the projections had been calculated and derived.

Importantly, as participants posted their flag on the maps, the numbers of flags built up and the ideas posted served to trigger the thoughts of following participants. By the end of the process and when the maps were covered in flags, the clusters of flags made it obvious where the areas of high values were located.

2.6.4 Roving expert

One of the team members was given the role of ‘roving expert’. Their role was to provide more detailed opinion and explanation on climate change to participants or the team when needed and also to engage with members of the public who had strong opinions on coastal issues and climate change. This served to prevent a few participants ‘hogging the floor’ at the tables and preventing other participants from having their say and asking questions.

2.6.5 Evaluation area

We provided an area where people could sit down, get refreshments and take the opportunity to talk to other people, including team members at the end of the process. Additional information in the way of leaflets and posters was placed around this area for people to look at and take away.

At the exit from the Hall, a team member manned an evaluation board where participants were encouraged to write their views or comments about the Open Day on sticky notes and place them on a poster. This level of evaluation was thought appropriate for the informal approach of the Open Day. There was also a sign-up sheet for the Workshop and a flyer giving Workshop details for participants to take away.

2.6.6 Team debrief and analysis of the information posted on the maps

At the end of the day we held a team debriefing, to discuss the experiences of the team during the Open Day. The team were encouraged to share their observations and feedback about how everything worked and what could be done differently as well as any common themes which were observed. These results are discussed in section 4.

An initial analysis was undertaken of the information posted on the maps. The positions of the flags were recorded along with the comments written on the flags. An analysis of the data allowed us to group the values into four categories, namely: recreation; infrastructure and community; ecology, biodiversity, and aesthetics; and private property and business. This information was used at the Workshop. More details about these values and themes derived from the Open Day are given in section 4.

2.7 The Workshop

The purpose of the Workshop was to engage with the community around how climate change may affect their community and how they can begin to adapt to these impacts, and in particular how to begin to act to protect the community's values as they were identified at the Open Day.

A team of 12 people (mostly the same as had been involved in the Open Day) were involved in the Workshop, held on a Saturday three weeks after the Open Day (13 March 2010) between 9:30am and 3pm. The Workshop was also held at the Whitianga Town Hall, and the lay-out of the hall for the day is shown in Figure 2-3 below. 17 people from the local community attended the Workshop. The process followed is described below.

2.7.1 Presentation to set the scene

After a brief welcome to the wider project, the first portion of the Workshop was spent presenting talks about the science behind the maps. Three team members provided some basic climate change and coastal systems information, on the three topics of climate change and inundation, erosion and habitat. The range of these talks was focussed on providing enough general background to explain the map projections (more detail on this follows in section 3). The talks were fairly brief - an hour was allowed for all three science presentations plus questions.

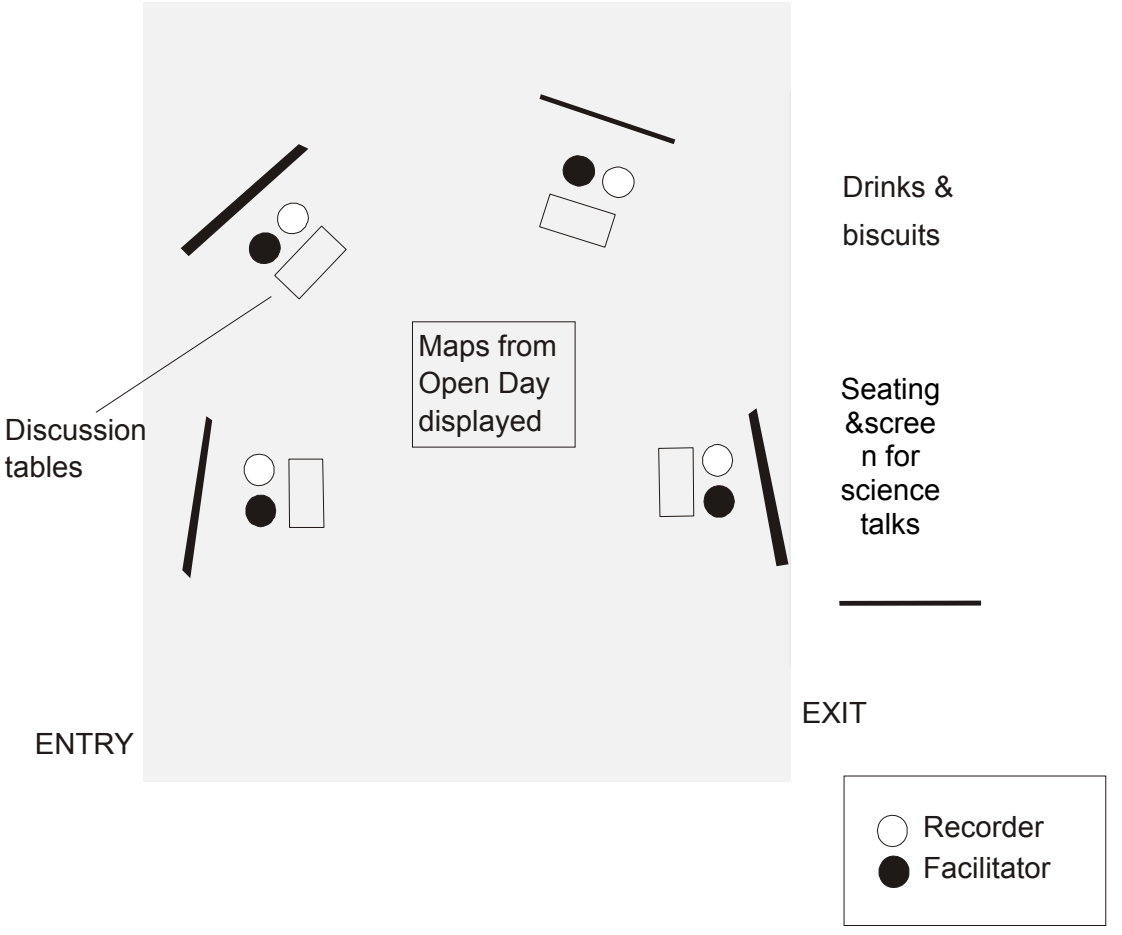

Figure 2-3: Set up of Whitianga town Hall for the 13 Mach 2010 Workshop.

After the three science talks came a short (10 minute) presentation of the information about values that we had received at the Open Day (see section 2.6.2). This was important to remind the Workshop participants that we were using community values, not research team assumptions, as the basis for our discussions. Following that presentation of values information was a (15 minute) talk on the range of options for adapting to climate change at the coast, and some practical examples of mitigation through planning and engineering.

Workshop participants were encouraged to ask questions at any point during these presentations.

(The Powerpoint presentations can be found in NIWA project drive: CACC112\Working\Open Day & Workshop stuff Whitianga\presentations for workshop\final).

2.7.2 Group discussions

We broke the Workshop participants into four groups for discussion on the basis of the four broad themes in the values information that we collected at the Open Day, being:

- Group 1: Recreation
- Group 2: Infra-structure & Community
- Group 3: Ecology and Biodiversity, and Aesthetics
- Group 4: Private Property and Businesses.

The groups were charged with discussing:

- The likely impacts of climate change on the topic area their group was looking at.
- What sort of management options might be useful -
  - Who would the “winners” and “losers” be?
  - What might be some of the trade-offs for the various options?
- Who would need to be involved to begin to make these changes?

The groups were directed to explore alternatives rather than come up with a concrete plan for the future, and be ready to report back to the wider group.

Each group had their own copies of the projected impacts maps, as well as access to the original maps with flags. They also had a list of the things that were valued by the community which fell under each general topic.

There were two team members at each table, to provide expertise on technical issues and to facilitate discussions. All group discussions were recorded to avoid the need for note taking and allow the discussion to flow freely. The groups were directed to:

- First revisit the projections and identified values that might be affected, to confirm or update that list of values;
- Brainstorm ideas (practical ideas as well as creative ones) to list possible ways of adapting to those impacts; and then

- Work through some of those adaptation ideas, discussing pros and cons of each.

The team employed standard procedures to help control the group discussions, namely: one person talking at a time, active listening, constructive contributions, and no side conversations.

2.7.3 Feedback to the wider Workshop group

Each group nominated a spokesperson to feed back their ideas to the wider group, using flipchart type lists as a prompt.

2.7.4 Final discussion

As energy and enthusiasm ebbed, a brief final discussion was held to highlight the main points of the day, re-iterate the next steps for the process and the CACC project, and thank the participants for their input. An evaluation form was circulated, with six simple questions.

1. Did you attend the Open Day?
2. What is the most valuable thing you take away with you from today's workshop?
3. Was the process you participated in today, different to other workshops around local issues you may have attended? Please explain.
4. If we ran this workshop again, what do you think has worked well? And what could be improved?
5. Do you feel that you got the right information to enable you to think about the issues we discussed today? If not, what else would have been useful?
6. Was the mix of people present right to have a good discussion about adaption to climate change for Whitianga? Please explain.

Further details on the outcomes of our Open Day and Workshop follow in sections 4 and 5. First though we will summarise the science that was used to inform this engagement process.

3 The science needed to inform the engagement

So far we have discussed the method by which the research team decided HOW we would communicate with the Whitianga community. Here we discuss how the team decided WHAT we would communicate to them.

We have included in Appendix A a table of team meetings that were steps along the way in developing our plan, and where key decision points occurred. This serves to document the team interactions required to plan the stakeholder engagement exercises.

3.1 What climate change effects?

In order to discuss with the Whitianga community how climate change might affect them, we needed to be able to make projections of what might happen and explain those projections in a simple, easy to understand way.

At a planning workshop in October 2009, members of the project team (including council representatives from WRC and TCDC) had identified potential impacts of climate change in three key areas, namely:

- Coastal flooding - What elevations will be prone to flooding? In what timeframes will this become an issue? How will managing different values (private property vs public) affect planning time frames? Will roads be affected (and loss of land where there are 'paper' roads)?
- Coastal erosion - Erosion setback lines need revision and 2002 work to establish these is under review in some areas. How will this change with sea-level rise?
- Migration of coastal and estuarine habitats inland – Need to identify areas of squeeze particularly for adjoining farmland. Presume that kick back from property owners will be inevitable. Whitianga settlement is old and built around the coast, so sea-level rise will likely lead to a loss of public coastal space and beaches.

We elected to undertake the projections of climate change effect on these three hazards/issues by using sea-level rise as our key driver. Selecting this one key driver enabled us to simplify the creation of the projections and explanations to the public.

3.2 Selection of key drivers

Figure 3-1 shows sea-level rise measured at the Port of Auckland since 1870 along with projections for sea-level rise based on various emission scenarios. The black line and grey shading at the left hand edge show global measured trends in sea-level rise. The green line overlain is the mean annual sea-level from the Port of Auckland tide gauge. Towards the right, the light blue is the likely projected range for different IPCC emission scenarios and ocean-climate models (labelled on the right-hand side of the figure), and the dark blue is an additional caveat to those projections if ice sheet melting accelerates. At the time of the

fourth round (Solomon 2007) report, the IPCC weren't prepared to provide an upper bound for potential sea-level rise, nor a best estimate (hence the wide range in blue). Since then, various studies suggest the upper bound for sea-level rise could be over 1 m by 2100 and in the worst possible case could be nearly 2 m.

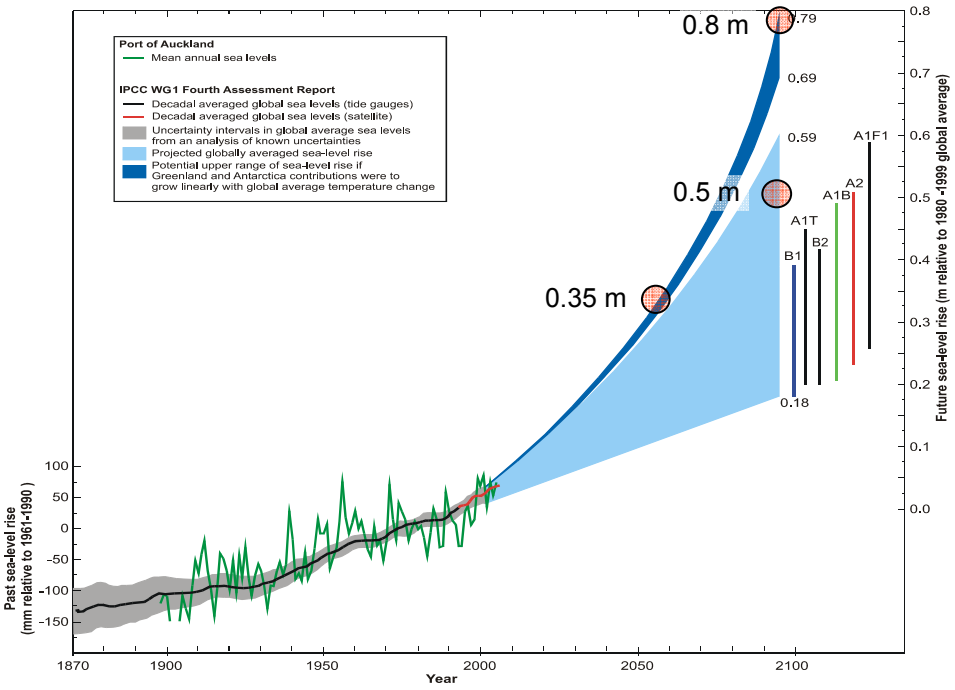

Figure 3-1: Sea-level rise. Data and projections adapted from the IPCC (2007) fourth assessment report (source: Blackett et al. 2010).

Figure 3-1 also shows some red circles which are of importance in the New Zealand context. The Ministry for the Environment (MfE 2008, 2009) have released guidance for local authorities in regard to considering sea-level rise. This document, *Preparing for coastal change*, states that for a timeframe of the 2040's that:

- A **0.35m** sea-level rise should be assumed, and for planning and decision time-frames out to the 2090s (2090–2099):
- A base value sea-level rise of **0.5 m** relative to the 1980–1999 average should be used, along with an assessment of the potential consequences from a range of possible higher sea-level rises (particularly where impacts are likely to have high consequence or where additional future adaptation options are limited). At the very least, all assessments should consider the consequences of a mean sea-level rise of at least 0.8 m relative to the 1980–1999 average.
- For longer planning and decision timeframes where, as a result of a particular decision, future adaptation options will be limited, an allowance for sea-level rise of **10 mm per year** beyond 2100 is recommended (in addition to the above recommendation).

There was some discussion as to whether we should use different levels of sea-level from the different IPCC SRES scenarios to develop our projections. However we decided against this and followed the MfE guidance, so that for the 2040's we used a sea-level rise of 0.35m,

with 0.8m for the 2090s. By using this approach we not only used national best practice (from the MfE guidance materials) but also were able to use the real sea-level rise to date to help communicate the likelihood of future projections, and lessen debate from potential climate change sceptics.

3.3 Maps to display the projections

As described in section 2.4, we had decided to use a participatory spatial mapping approach, presenting climate change information on a number of large maps.

The maps were designed to be:

- **Large** enough for people to see detail such as locations of property and infrastructure;
- **Unambiguous** as to the projected effect being shown; and
- **Free of jargon** to make them easy to understand and explain.

In order to map projected climate change effects in sufficient detail to identify effects on individual properties or significant pieces of infrastructure, the underlying requirement for the projections was a detailed digital terrain model (DTM) which in this case was derived from LiDAR data held by WRC. We developed large coloured maps by importing aerial imagery and other information into a GIS. These maps were printed out at A0 size (1200mm x 800mm) and at a suitable definition to make them clearly visible for people standing around them.

Separate maps were developed (Figures 3-2, 3-3 and 3-4) to illustrate:

1. Coastal inundation and drainage;
2. Coastal change (erosion); and
3. Migration of coastal and estuarine habitats inland.

3.3.1 Choosing scenarios

There was a lot of useful discussion amongst the team about the level of detail and amount of information to be provided on the maps (e.g., the number of lines to be displayed). It was decide that the maps should be kept as simple as possible, with the intention that additional technical information be communicated by discussions between the team and participants as opposed to putting it in displays, written material or seminar style presentations.

As discussed in section 3.1, we had already decided to follow the MfE *Preparing for coastal change* guidance in terms of presenting one ‘average’ prediction of sea-level rise as opposed to using those for different IPCC SRES scenarios. On maps of coastal inundation and drainage and coastal change (erosion) we showed the situation for the present day and for the two future scenarios, 2050 and 2090. On the map of habitat change and distribution of different vegetation types we showed the situation for the present day and for the future scenario 2050 because predictions beyond this were considered too unreliable.

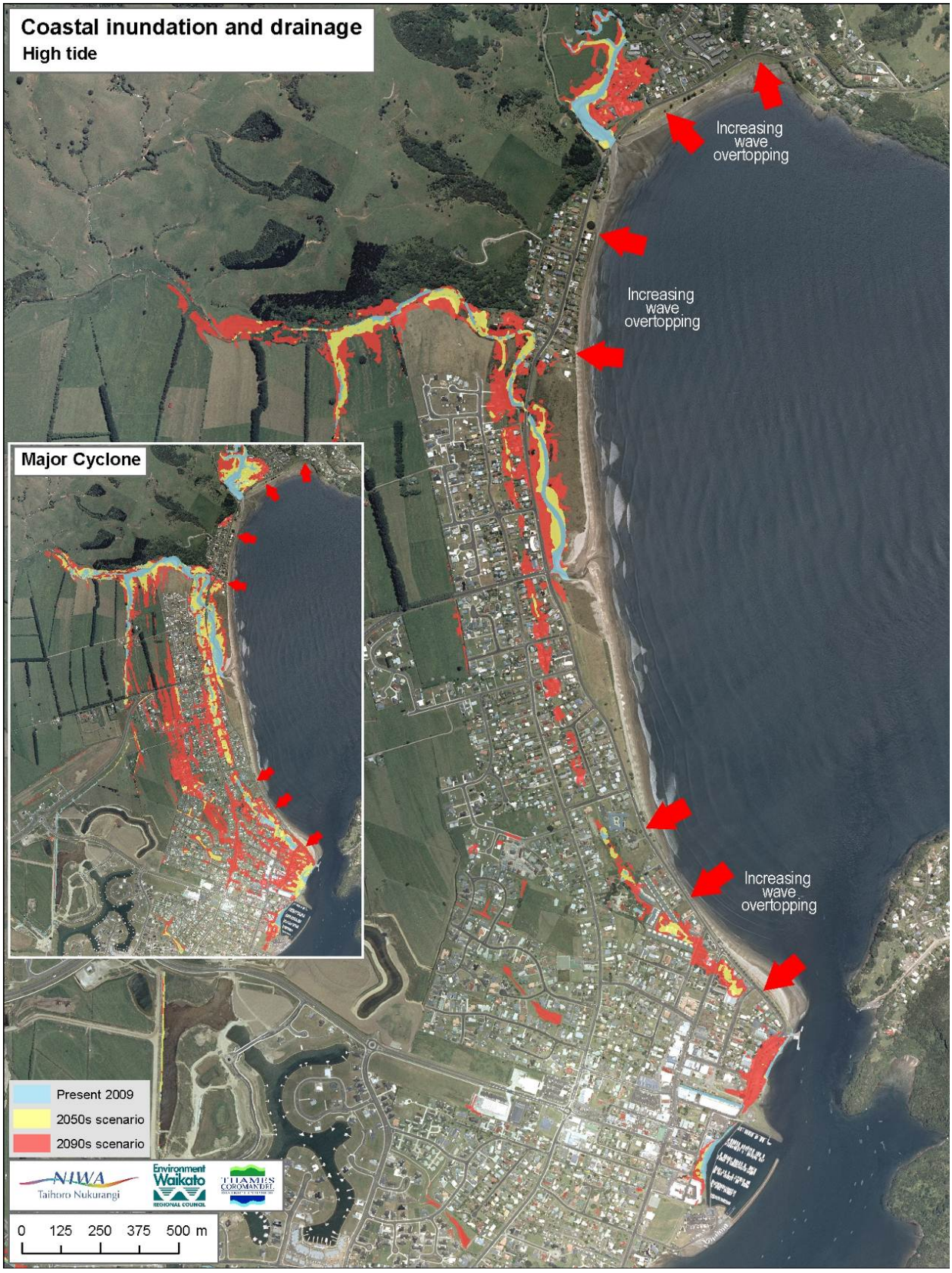

Figure 3-2: Coastal inundation and drainage. This map was produced by NIWA for the sole purpose of informing discussion at a public Open Day and Workshop. This context/purpose should be considered when interpreting the map. Use of this map for any other purpose is not permitted without permission of NIWA.

Figure 3-3: Coastal change (erosion). This map was produced by NIWA for the sole purpose of informing discussion at a public Open Day and Workshop. This context/purpose should be considered when interpreting the map. Use of this map for any other purpose is not permitted without permission of NIWA.

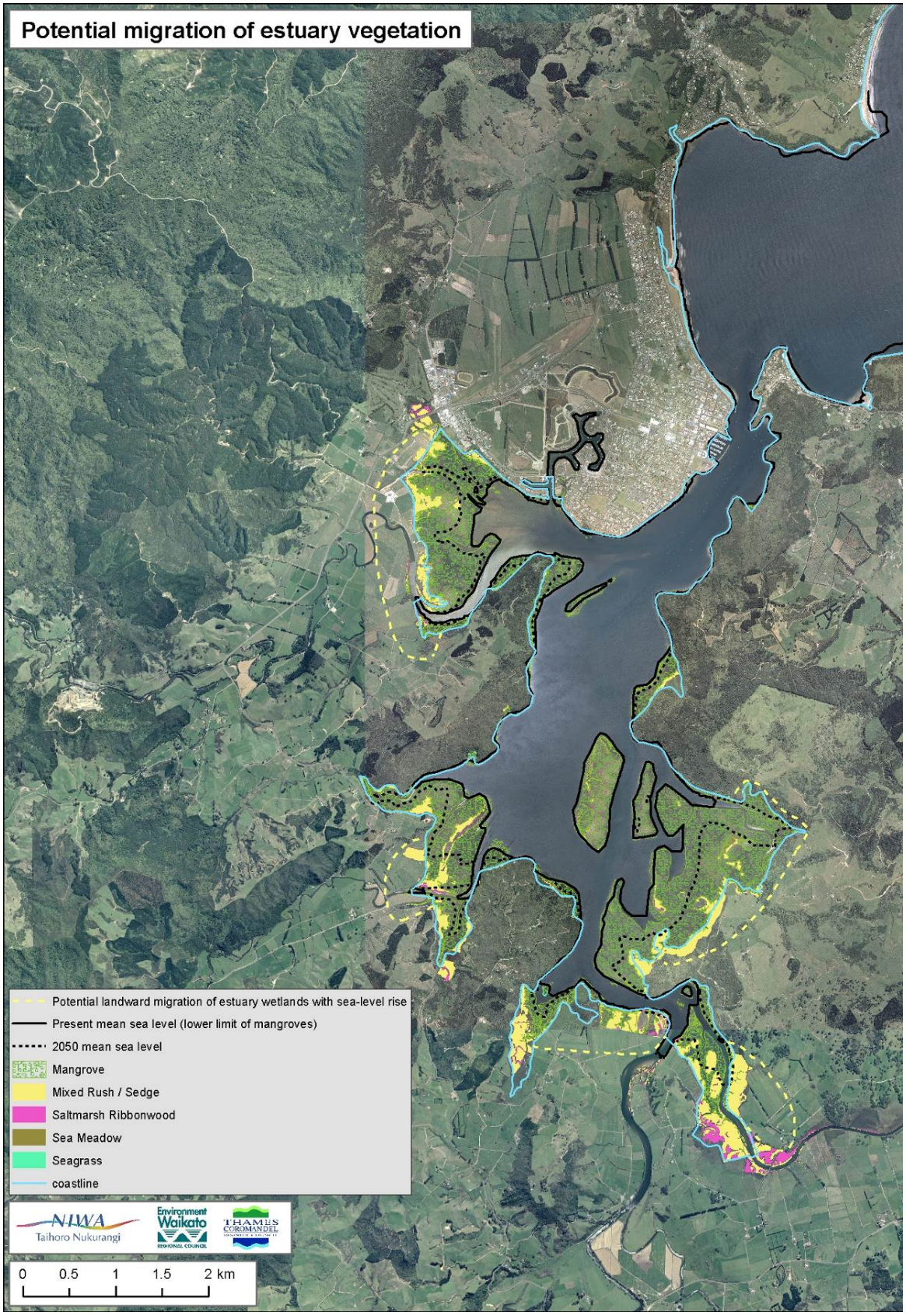

Figure 3-4: Migration of coastal and estuarine habitats inland. This map was produced by NIWA for the sole purpose of informing discussion at a public Open Day and Workshop. This context/purpose should be considered when interpreting the map. Use of this map for any other purpose is not permitted without permission of NIWA.

To help make the map of projections of coastal inundation (Figure 3-2) more understandable (i.e., to reduce knowledge uncertainty of the people looking at the maps) we mapped two situations. The first was for inundation on a spring high tide. This is a situation that the public can identify with as they see where the spring high tide rises to on a regular basis (2-weekly) when they walk the beach. The second was for a larger inundation and a 1-in-100 year storm, although to make this more understandable to the public we termed this inundation event a 'major cyclone' or storm tide.

3.3.2 Handling uncertainty

Another key to keeping the maps simple to understand was how we chose to communicate uncertainty around the science, both current understanding and future projections.

For instance when considering the map of inundation and drainage, we needed to illustrate the additional effects of wave overtopping. As these projections would have been both difficult to calculate and map and also highly uncertain we displayed this potential risk by simply using large coloured arrows on the maps to indicate where overtopping might happen (which locations might be affected; see Figure 3-2).

We also chose to minimise debate on climate change by using sea-level rise as the sole driver to our projections and using widely accepted predictions from the recent MfE guidance document (for New Zealand) and the 4th IPCC report. We also made the point that the hazards we were considering (inundation and drainage, coastal change and habitat change) are hazards that affect Whitianga at present and the adaptation options we were discussing would address those existing hazards. Hence, thinking of adaptation options is a positive step toward solutions for existing hazards even for those who may not accept that climate change will exacerbate the hazards.

3.4 Detail behind the inundation and drainage map

The inundation and drainage map (Figure 3-2) has two parts: a main map and an inset map. The main map shows a "Mean High Water Spring" (MHWS) high tide of 0.95 m relative to the Moturiki Vertical Datum-1953 (or MVD-53). This mapped high tide is comprised of the following components.

The nautical definition of MHWS is the amplitude of tidal constituents M_2 (main lunar) and S_2 (main solar) above mean level of the sea (MLOS). For Whitianga, M_2 = 0.625 m and S_2 = 0.082 m which added together give a MHWS of 0.707 m.

A 'better' upper tide mark is mean high-water perigean-spring tide (MHWPS), which is a bigger tide but still happens regularly enough for people to easily relate to. Calculations of this add on the amplitude of N_2 (due to lunar elliptical orbit) of 0.13 m to above MHWS definition, which takes it to 0.84 m.

MLOS is ~0.1 m above MVD-53 (from the Moturiki gauge at Mount Maunganui), which gives ~0.95 m MVD-53. It is this 0.95 m tide which is plotted over the LiDAR topography and displayed in the main map.

The inset map is of a ‘major cyclone’ storm tide. Due to the lack of long-term sea-level data at Whitianga, this value was derived by simply transferring the Moturiki extreme storm-tide analysis done for a separate study which shows that the 1% Annual Exceedance Probability (AEP) or 100 year Average Return Interval (ARI) erosion (storm-tide event) at Moturiki is 1.5 m MVD-53. While the tide range at Whitianga Wharf is a bit lower than at Moturiki, this estimate is the best that can be done without recourse to detailed storm-tide inundation modelling.

No allowance was made for wave set-up and run-up in either map. As discussed earlier, the potential for this was indicated on maps by using arrows to show where this might occur.

3.5 Detail behind the coastal change (erosion) map

The coloured lines on the coastal change map (Figure 3-3) show where temporary or permanent cut back of the shore line is likely to occur for the worst likely storms, both now (present conditions) and for the 2050 and the 2090s sea-level rise projections. The cut back is the worst likely erosion - corresponding to the 1% Annual Exceedance Probability (AEP) or 100 yr Average Return Interval (ARI) erosion.

The yellow or Primary Development Setback line shows how far landward coastal erosion might cut under the worst likely storms events under present day conditions (i.e., sea-level as it is today 0.0 m).It has been estimated from profile response data and so will take storm surge into account. It is an estimate of the worst likely erosion for return periods of up to 100 years. The return period estimate is for the erosion itself rather than the storms. The calculations are not based on storms (i.e., not done using the SBeach model) as the data indicates erosion cumulates/accrues over a number of storms rather than being generated by one particular storm. The yellow line has been derived from work undertaken by coastal consultants for TCDC (earlier work was revised in 2009).

The pink setback line shows how far landward coastal erosion might cut under the worst likely storms events by 2050 (i.e., sea-level 0.35 m higher than present day). The red (most landward) setback line shows how far landward coastal erosion might cut under the worst likely storms events by the 2090s (i.e., sea-level 0.8 m higher than present day). The setback does not take storm surge into account. The pink and red lines have been estimated by the study team using standard methodologies (i.e., the Bruun rule).

3.6 Detail behind the habitat change map

The migration of coastal and estuarine habitats inland (habitat change) map (Figure 3-4) shows the distribution of different types of intertidal estuarine vegetation (as supplied by WRC), although aggregated to show mainly mangroves and mixed rush, sedge, salt marsh ribbon wood, sea meadow and sea grass. The map shows the present distribution of intertidal vegetation types and how they will change by 2050 when sea-level will be 0.35 m higher than the present day. The change in vegetation distribution was based on the assumption that vegetation growth in intertidal areas is depth limited. For instance, research has shown that mangroves will establish themselves to a seaward limit and level equivalent to about the mean level of the sea (MLOS). When sea-level rises the outer limit of the

mangroves will retreat landwards to stay at MLOS. Using this reasoning and with a knowledge of harbour bathymetry we were able to map the likely distribution of mangroves and other habitat for the year 2050 and the potential migration of estuary wetlands with sea-level rise. Our mapping did not take into account the fact that in the future the estuary shores may be bunded to prevent the incursion of the sea.

Bed levels in the coastal marine area were derived from a harbour model grid developed by Glen Reeve for his MSc thesis (University of Waikato) based on swath bathymetry, LiDAR (where available in the town area) and the coarser LINZ topographic DEM. The depths were provided relative to Chart Datum (CD; Chart NZ5318).

MLOS for present day was estimated to be 1.35 m above CD, and is marked with the solid black line.

For 2050, the MLOS bed level (black dashed line) was calculated as the present MLOS plus sea-level rise of 0.35 m minus a predicted sediment accumulation rate (SAR). An average SAR of 4 mm/yr was used but there are some areas that already show higher SAR (of up to 9 mm/yr), and some areas less. Thus MLOS bed level (2050) = 1.35 m CD + 0.35 (SLR) – 40*4 mm/yr (SAR) = 1.54 m CD.

Note: for 2050 and 2090s, SAR would need to be nearly 9 mm/yr to keep up with SLR.

4 Outcomes of the Open Day

The Open Day was considered a success by both the research team and the participants. Feedback that we sought from the participants proved to be unanimously positive with most finding the day extremely informative. In particular, participants reported that they appreciated the opportunity to ask the scientists questions about coastal hazards, habitat in the harbour and climate change. Over the course of the 4 hour period between 70 and 100 people attended the Open Day.

The large coloured GIS maps illustrating the projected impacts of climate change used in our participatory spatial mapping approach were especially well received and proved to be a valuable tool for initiating and focusing discussion. Keeping display material to a minimum and letting participants learn by questioning the team proved highly successful, as participants were able to engage the project team members on their particular topic(s) of interest with the scientists.

4.1 Results

The Open Day produced three maps (inundation, erosion, habitat changes) covered in pins located at places where the participants valued things within their community that would likely be impacted by climate change (Figure 4-1). The flags on the pins contained notes on the item of value. This spatial geographical mapping of information had two key benefits. First, it laid the foundations for a more detailed discussion of potential future actions and trade-offs at the subsequent Workshop. Second, it provided the council research partners (WRC and TCDC) with valuable information and maps to inform future discussions and planning decisions.

4.1.1 Objects which the participants valued that were potentially impacted by climate change

The objects which the participants valued that were potentially affected by the potential impacts of climate change were recorded and grouped into similar themes. It is important to note that details around the geographical location were retained where possible, but the number of flags marking each item was not noted. This is primarily because the Open Day was more about scoping out the potential effects on the community than obtaining quantitative data. In total, there were in 102 flags from an estimated 70+ attendees. No ranking or prioritisation of the objects was undertaken.

Figure 4-1: Finished coastal change map showing flagged values from Open Day.

The key themes were:

Theme 1: Recreation:

Inundation: boats and trailer parking areas affected, parks and reserves flooded, open drains may be unsafe, playground and picnic areas (wharf and other areas throughout the town), beach use along the length of the foreshore.

Erosion: swimming, playgrounds, young children use Brophy's Beach, schools use the area for trips, adults swim in the sea in front of main toilets on Buffalo Beach. What will happen to the surf? Beach access for recreation and public use.

Vegetation change (within the estuary): navigation issues, raft race, open space for boats & kayaks, sedimentation, mooring, loss of reserves, food gathering/fishing for flounder snapper, and effects on local shellfish.

It is clear that Whitianga has a number of highly valued recreation assets which are very likely to be affected by the impacts of climate change.

1. Buffalo and Brophy's beaches. (Brophy's Beach is frequently used for family oriented activities as it is a safe swimming environment. Adult swimmers appear to utilise the beach area near the toilet block on Buffalo Beach).
2. Foreshore reserves and playgrounds.
3. Wharf area (boat ramps, cafes, tourist facilities).
4. Recreation space within the estuary.

Theme 2: Local infra-structure:

Inundation: Harbour/wharf area/ferry/boat ramps. Underground parking area may flood. Road access.

Erosion: Several roads under threat, effects on wharf harbour area.

Vegetation change (within the estuary): No comments.

The primary areas of concern were the road along the foreshore, the wharf area and the boat ramps. Many other community facilities and critical infrastructure appear to be located out of the range of projected impacts.

Theme 3: Community

Inundation: Will affect the appeal of the area as a nice place to live – affect community feel – people may move away.

This is more of an abstract concept but of concern to several people who attended the Open Day. The main idea here was that the desirability of Whitianga as a place to live could be diminished if the projected impacts of climate change were not managed to protect the things that people valued about the locality. Of particular concern were the beach, local reserves and estuary, infrastructure and community facilities.

Theme 4: Ecology and biodiversity

Inundation: Specific trees and habitats may be affected.

Erosion: Loss of reserves along the beach.

Vegetation change: Natural ecosystems – value these, but don't let them affect the other estuary activities. Impacts on wildlife and birds, value natural landscape.

The majority of concern was in the upper estuary and the foreshore reserve and 'Mother Brown's creek'.

Theme 5: Aesthetics

Inundation: No comments.

Erosion: Beach view and natural state.

Vegetation change: Estuary landscape.

Similar to the previous theme, the concern focused around the natural appearance of the beach, estuary and surrounding landscape.

Theme 6: Private Property and Businesses

Inundation: Homes/businesses flooded.

Erosion: Protect property from beach erosion.

Vegetation change: No comments.

The primary focus of this theme was around the protection of private property and business from the projected impacts of climate change.

4.2 Purpose of the Open Day data collection

The information collected at the Open Day, around what the community valued about their environment that could be potentially affected by the projected impacts of climate change, was used to guide and inform the discussion at the subsequent Workshop. The information was presented to Workshop participants, and the maps of values and a list of values was made available to each group. By linking the Workshop discussions with the issues identified at the Open Day, the research team hoped to:

- Retain a highly pragmatic basis for discussion around potential adaptation strategies;
- Ensure a range of viewpoints were considered, beyond those of just the Workshop participants; and
- Provide a means of facilitating discussion and managing vested interests and particular interests.

In order to achieve the aforementioned objectives, the six themes identified above were further reduced into four groups to provide discussion themes for the subsequent Workshop:

Group1: Recreation

Group 2: Local infrastructure and community

Group 3: Ecology biodiversity and aesthetics

Group 4: Private property and business.

The reduction of the discussion topics from 6 to 4 was primarily a logistical decision that enabled the research team to have enough researchers to provide a facilitator and scientist

for each table, and more importantly there would be enough participants to provide a varied discussion and interaction at each table.

4.3 Attendees evaluation

As described in section 2.6, people who visited during the Open Day were asked to leave comments evaluating the Open Day. Overall, the comments were very positive. The most common comment was "*Very informative*", and both the posters and other graphics and the staff present on the day were complimented. The main thrust of other comments included:

- Action is stronger than words (i.e., what happens next?)
- Need the right people and power to make (potentially unpopular) decisions
- Concerns about costs (via rates) to do something about projected effects.

4.4 Research team evaluation of Open Day

At the end of the Open Day the research team conducted a group evaluation based around several key questions; perceptions of how the day went, the things they learnt and what could be improved.

The team was unanimously pleased with the way the Open Day had gone, attendance was perceived to be good (greater numbers than other recent Council led consultation), despite competition from another event - a local fishing competition. All the *"usual suspects"* expected at community consultation or information days were present. It was unanimously considered that having a local person (a Council staff member) walking along the street directing people to the event was pivotal to getting participants through the door.

Extensive planning and briefing of the research team and attention to detail paid off in the smooth running of the Open Day. The positioning of the research team in the room and manning the tables worked well, although we made a few modifications on the day. In particular, a person at the door encouraging people to enter and explain the process at the entry to the time tunnel. Arrows on the floor (using tape) which indicated the direction of the flow for attendees was also a very useful last minute addition.

The role of "roving expert" who was able to answer more challenging questions and manage some of the more time consuming and detailed discussions proved particularly helpful. It freed up the team members on the tables to deal with their more specialist areas, gave other participants more opportunity to have their say and enabled us to deal with larger numbers of people.

Regional and District Council involvement in the day (through several members of the research team) was invaluable as it gave public confidence that their thoughts were being heard and this wasn't just another dead end data gathering exercise. For the Councils, it was a chance to have a different sort of conversation with the community, because in this environment Council staff were not seen as driving the process.

Project team members reported holding some very interesting conversations with attendees who they felt appreciated the chance to interact with scientists and ask questions. Overall the team believed the day provided a forum for everyone to gain some learning (team members included), irrespective of their previous state of knowledge. By using personal interaction as a means to exchange information, language and explanations were modified to suit the particular person and their interests. Moreover, team members were able to cover wider issues (i.e., general coastal and vegetation management issues) and provide attendees with further information and understanding of their local environment. Although managing the conversations sometimes proved challenging due to the continual movement of people around the tables (i.e., new people would arrive in the middle of a discussion), it was considered to be manageable. However, if the number of attendees doubled more scientists on each table would be required to interact with everyone in a meaningful way.

The maps proved to be a very valuable tool for initiating discussion because people were happy to 'pour over' them for a variety of reasons often unrelated to the projected impacts of climate change. It became clear over the course of the day that displays and graphs would likely not have the same power for facilitating discussion around climate change. One of the team was surprised at how many people stayed for long periods of time and checked out all the tables.

As expected (and planned for), climate change sceptics were in attendance, however, not in great numbers. The "roving expert" (armed with resource material) played a key role in managing sceptics by taking them away from the main tables and entering into one-on-one discussions. At the main tables an effective general strategy proved to be shifting the conversation to refocus on the current challenges and failings of coastal management and not whether climate change was occurring (and caused by human action). This promoted a discussion of current adaptation strategies and mitigation options and seemed to prompt agreement that if the current situation could not be managed effectively than how would any future changes (whatever the cause) be dealt with. It is interesting to note that there were a handful of attendees who expressed a fatalistic (doom and gloom) attitude to climate change – however this was a minority view.

Many members of the team took away some key learning and messages picked up from the Open Day, including just how much Whitianga residents value the local beaches and dislike the use of rocks as an erosion mitigation measure. One team member expressed surprise at the willingness and openness of people to consider a range of future development alternatives (his work normally involves conversations with those who had a particular *"barrow to push").* A further surprise was that some attendees illustrated a willingness to pay (by way of rates) for the retention of sandy beaches and have the things which they valued protected into the future. One of the more valuable learnings for the team and council staff was how the beach was used in different ways by different groups. For example, the beach in front of the toilet block on Buffalo Beach is very popular for swimming, Brophy's Beach and the stream mouth is a safe place for young families to swim and people don't swim in front of the seawall rocks because it is considered dangerous. The high value that participants placed on the Whitianga estuary was not expected, and especially the more favourable attitude towards the role of mangroves in the ecosystem than found in some other Coromandel Townships.

Suggestions for improvements to the process were mainly around increasing attendance (e.g., producing flyers for door to door distribution, a prize draw for attendance) and additional resourcing for the day (a white board to help explain concepts and ideas). A more general climate change expert might be useful as well – a number of questions required answers which the team were not equipped to answer – especially around rainfall intensity and how that might change under the scenarios.

5 Outcomes of the Workshop

The broad aim of the Workshop (held three weeks after the Open Day) was to focus group discussion around possible alternative strategies to adapt to the projected impacts of climate change in a way which protected the things that the community valued. This required participants to not only think about the things that the community valued (based on their own ideas and augmented by the information collected at the Open Day), but how these could be protected into the future and what the likely trade-offs and debates could be. The opening presentations at the Workshop set the scene for discussions, giving the participants plenty of information to consider and setting a very pragmatic tone for the day.

The maps and flags from the Open Day (which were displayed in the centre of the room), provided a point of reference for all the participants and constantly reminded them of what it was that other members of the community valued.

5.1 Results and observations

5.1.1 The participants

17 people attended the Workshop, more than half of whom had attended the Open Day. They were from a diverse range of locations within the community, ranging from those with beach front properties to those living in areas which are unlikely to be affected by the projected impacts of climate change. Informal discussions revealed that many of the participants had been associated with the Whitianga community for a considerable period of time – in several cases in excess of 30 years. Many were involved in the community through historic and current memberships of organisations such as the Environmental Society, Forest & Bird, the Rate Payers Association (members and secretary), Grey Power and the Community Board. In addition, several of the participants had been involved in resource consent issues associated with the marina development, seawall construction (at the north and south ends of the beach) and other local issues. Experience with natural hazards was related primarily to coastal hazards, in particular coastal flooding, storm or cyclone events, and raised awareness due to the recent Samoan tsunami. This experience would have helped the participants consider what needed to occur to protect the things which the community valued against the projected impacts of climate change.

5.1.2 Key discussions and dilemmas

Overall, the different discussion groups covered very similar topics as participants did not stick within the original group brief. This reflects the overlaps in issues between the four topics, and the desire of participants to comment on all aspects relevant to their own views. Many of the points raised were around current issues and problems which were perceived as likely to be exacerbated due to the projected impacts of climate change. The following is a summary of the discussion from all the different groups based under key issues.

Private beach front property and the beach

Buffalo Beach has two seawalls along its length, one at the northern end near Brophy's Beach and another at the southern end (Figure 5-1). Both walls were constructed to protect

private property and have resulted in the loss of a high tide beach where waves reflecting off the walls have scoured the sand.

Figure 5-1: Approximate location of the two existing seawalls along Buffalo Beach at Whitianga.

Coastal erosion was not a problem when one of the participants purchased their beach front property over 30 years ago. However during an erosion event in the 1990's, they were surprised to discover *"tyres and all sorts of things in the sand, which had obviously been placed earlier"* to protect the property from previous erosion events.

All of the groups acknowledged that coastal erosion had caused a lot of tension within their community over the last few decades. Moreover, that climate change was predicted to make the situation considerably worse as sea-level rose. Many of the participants believed that *"to the Council's credit it is now very difficult to build on marginal or erosion prone areas"* but although this is a good strategy for the future, it does not help manage existing areas where homes are too close to the sea. The discussion in each group illustrated an understanding of the tension between the property owners' personal interests, the high value of the beach to the local community (this was clearly evident on the flags from the Open Day) and the Council's legal responsibilities. This may have been due to the comprehensive presentation on coastal erosion management delivered earlier during the day.

All of the groups discussed future coastal erosion mitigation strategies and appeared to be seeking alternatives which protected both the beach and private property rights. The suggestions included:

1. To buy out beach front land owners – one of the participants suggested that there was a time when many would have accepted the offer due to the stress associated with the threat to their homes. Another participant suggested that beach front properties frequently came up for sale and could be purchased by the Council and turned into public reserve land. None of the groups considered the cost to the local authorities of this option.

2. The concept of a back-stop wall (which was presented to participants earlier in the day) proved to be a very popular idea. Participants felt that it represented a "win-win" situation as people don't lose their homes and the community still has a beach the majority of the time. In other words, all the things which the community values are protected into the future. *"A back-stop wall might be cheaper in the long run and would also protect recreation interests and the private property owners"* although landowners *"would have to accept that part of their land was going to become the beach – buy-in might be very difficult".*

3. Beach re-nourishment was also considered to be an option: *"Security could be provided by building up and planting the dune in front of the area"* (either the back-stop seawall or current seawall).

Although no conclusions were reached (this was not the aim of the engagement), all participants demonstrated an ability to examine the issues from a highly pragmatic perspective and consider a range of interests and potential trade-offs.

Dotterel nesting areas

The endangered New Zealand Dotterel nests above the high tide mark in the area known as Mother Brown's Creek, at the northern end of Buffalo Beach. A fenced off area currently protects the nesting sites from disturbance but the potential impacts of climate change (principally coastal erosion and inundation) would affect the long term viability of this site, particularly if the shoreline became armoured. The Biodiversity and Aesthetics Group believed that the only plausible way to retain these nesting sites would be to allow the beach to move without restriction, or develop a means to move the birds' nests by no more than small increments at a time. The Recreation Group also recognised that the nesting sites would be lost if hard engineering solutions were applied to mitigate beach erosion, although they did not provide any ideas on how to manage the problem.

Reserves and public space

Whitianga has a number of parks, reserves and children's playgrounds spread throughout the town. However, a number of these are along the foreshore or around the wharf/marina - areas likely to be affected by the potential impacts of climate change. The primary concern was retaining public space along the foreshore and access to the beach. For many participants, this issue was strongly related to effective coastal erosion management. If coastal erosion was well managed and a beach was retained, then public access would be assured. However, little attention was given to other reserves in the area as the common

view appeared to be that playgrounds could be relocated and new recreation areas could be developed to replace those lost. There was a particular interest in improving access to the Mother Brown's Creek area.

Local flood/coastal inundation management

The Private Property and Business Group suggested that all future homes, new sub-divisions and home renovations be required to have a minimum floor level to protect against flooding and coastal inundation. They were aware that this applied to new sub-divisions because they had noticed the Canal development building up the sections. However, they questioned if this would make the situation worse for others in the surrounding low-lying land.

The boat ramps

All of the discussion groups were concerned about the projected potential impacts of climate change on local boat ramp facilities (See Figure 5-2).

Figure 5-2: Location of the main Whitianga boat ramps.

Many of the issues were based around experience with current issues and problems and how these would be exacerbated by the potential impacts of climate change.

The boat ramps are principally located around the marina area (Figure 5-2) and seem to present a number of current problems with respect to:

1) The amount of trailer parking, which is perceived as limited and fully utilised during peak times. One participant suggested it was busy during most weekends irrespective of season.

2) The location of the ramps, as boats and trailers are driven through town to access the facilities, which results in traffic congestion and increased accident risk to locals.

Boat ramp facilities are likely to be affected by the projected impacts of climate change, in particular coastal inundation, which will compromise the use of the marine boat ramps and the trailer parking area.

The northern beach boat ramp and boat club have recently been moved to a better location and the boat club building is now on piles (i.e., relocatable). It was moved because at the previous location the ramp was providing the sea with an easy route to wash into private property during storm events. However, moving the ramp has presented a new set of problems; one of the participants suggested that the proximity to the northern rock wall is affecting the beach in front of the ramp and causing the sea to keep washing out the base of the ramp. In addition, during larger storm events the water washes up the ramp and inside the club building. Although *"we can live with these factors at present, climate change is going to increase the impacts".*

The alternative management options proposed by the discussion groups to protect the boat ramps from the projected impacts of climate change included:

1) Protecting the ramps from inundation at the existing locations. It was noted that this would not deal with any of the current problems of parking and traffic congestion, but it would allow for continued use of the ramps. The Recreation Group felt there was enough room in this area to move some of the facilities around into a more defensible position.

2) Moving the ramps to another location. However, the key question here was where could they be moved to? Any new boat ramp would need to provide for all tide access and avoid launching small craft into a strong current. Because of this, moving the ramps further into the harbour could prove problematic and would require careful consideration. Another alternative suggested was shifting the ramps to Brophy's Beach. However, this would compromise the value of that area as a safe family recreation area and create conflicting recreation uses of the beach. It was noted that many small non-motorised craft (i.e., optimists) already launch from Brophy's Beach, but these did not appear impact on other activities.

No solution was proposed to the likely future issues at the northern boat ramp. Although many options were discussed, no conclusions were reached but clear trade-offs were identified.

Vulnerability of local roading networks

The vulnerability of Whitianga's roading network to flooding events and tsunami has been exposed during several large historical storms and the recent Samoan/Chillean tsunami events (September 2009 and February/March 2010 respectively). In essence Whitianga has two ways in and out of the township; north towards Kuaotunu or east towards Kaimarama (Figure 5-3). However, both exits rely on the main road along the foreshore remaining navigable in order for people along who live along the main beach to evacuate if necessary.

Several participants described traffic jams along the foreshore during the two recent tsunami warnings (and suggested evacuation) – "*it was nose to tail (with traffic) last time there was a*

warning with people trying to get to higher ground". A further problem was that *"one of the new sub-divisions (some 400 sections) has only one road out of it"* which directs traffic onto the main road along the foreshore. These recent experiences coupled with the maps illustrating the potential projected coastal inundation and erosion risk to the main foreshore road prompted several groups to discuss what to do about the location of the main road. It was clear to the groups that a rethink on the location of the road was required *"For us there is only one way out of town and it is a flood risk area and the main road is right along the foreshore"* and*"why not just move the road …..much of the road floods anyway ….. and it looks like it may be under greater threat due to climate change".* Both the Private Property and Business Group and the Recreation Group briefly considered armouring the foreshore in front of the road (and raising the road) but rejected this idea because of the resulting loss of the beach, a highly valued local feature. It is interesting to note that both groups were prepared to think 'outside the box' and suggested moving the main road to an area of lower risk (as guided by the potential impact maps) and making the current road one way to provide access to the beach and to beach front property for owners. They believed that this solution would maintain access, reduce the vulnerability of the road network to flooding and tsunami but also *"provide nature with some additional room to move",* thus protecting the beach. Although the general consensus was to move the main road, there was very limited discussion on where it might be moved to or what other interests may be affected.

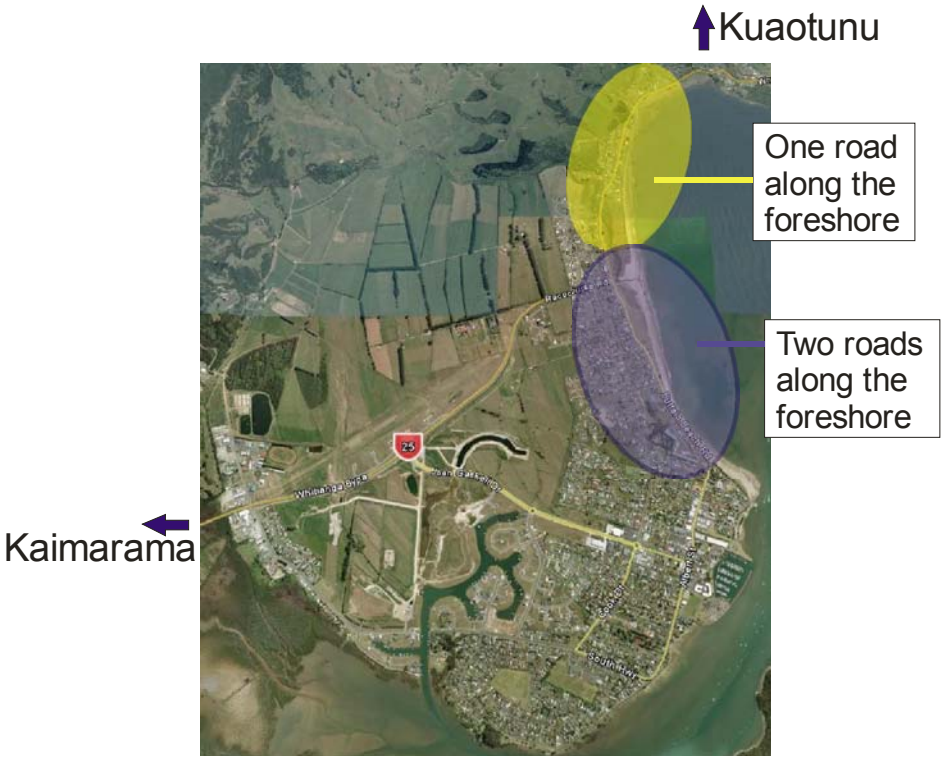

Figure 5-3: Local road networks around Whitianga.

Local business and town centre

Participants identified a number of key local businesses and activities which would be affected by the projected impacts of climate change, primarily in the wharf/marina area. The

"wharf area is the hub in many ways"; it has a museum, shops, cafes, backpackers, and bed and breakfasts. A number of water based businesses also operate from this area – glass bottom boats, charters, and the Ferry to Cook's Beach. It is also important for launching privately owned vessels. Other businesses which are likely to be affected are along the foreshore and include motels, a camp site, and a boat club.

Overall, the group discussion produced more questions[4] than potential solutions, particularly for the wharf/marina area which is widely recognised as *"one of the lowest lying areas in the town"*. Participants clearly recognised that climate change would affect the way that business occurred in the area, but were unsure of what could actually be done to prepare. Optimists in the groups suggested that climate change may bring new business opportunities, particularly for estuary recreation.

Pressures on harbour ecology

In general, participants were a little confused over what the effects on the estuary might be given the unknowns associated with the interaction between sea-level rise and changes in sedimentation rate infilling the estuary. When considering their response to the questions raised during the discussion, participants mostly seemed to take the view that sea-level rise would outstrip the sedimentation rate and that the estuarine vegetation would need to move inland to maintain its existence in water of the optimum depth for growth.

Participants appeared to consider the estuary in two sections that were related to the way they valued it and used the environment, namely the upper harbour which was viewed as reasonably pristine and largely free of human modification and the lower section which was highly modified and bordered by the town (Figure 5-4).

The Biodiversity Group believed that as the upper part of the harbour had retained its ecological value it should be treated differently to the lower highly modified section. For the group, this meant that the vegetation in the upper estuary should be allowed to retain its natural characteristics and move inland with sea-level rise as required. Both the Recreation Group and the Private Property and Business Groups agreed. The upper harbour was viewed as an important area for bird habitat and nesting, nursery for juvenile fish species (principally those of recreational interest), and as a pollutant filter for farm run-off. However, all three groups recognised that this would result in the loss of farmland in this area which *"farmers won't like and may be unlikely to just let it happen", "peoples' livelihoods will be affected".* One participant pointed out that much of the land which would be affected was *"marginal at best, and couldn't be producing all that much".* Moreover, that the land surrounding the upper harbour had a lot less owners and expensive holiday homes than the Buffalo Beach foreshore which may make it easier to negotiate solutions.

From a recreation perspective, increased sea-level and the deeper water and associated die-off of mangroves might open more areas up for kayaking, fishing or jet-skiing, and boat trips up river to Coroglen may be possible once more. *"Coroglen – it's a vibrant little community and would be good to have water links with it".* However, navigation could be impacted if the submerged bars shifted and future conflicts between recreational uses (i.e., un-motorised vs motorised craft) may need attention in the future.

[4] Questions mostly revolved around, what will happen, what is the current water level, and how fast will things change.

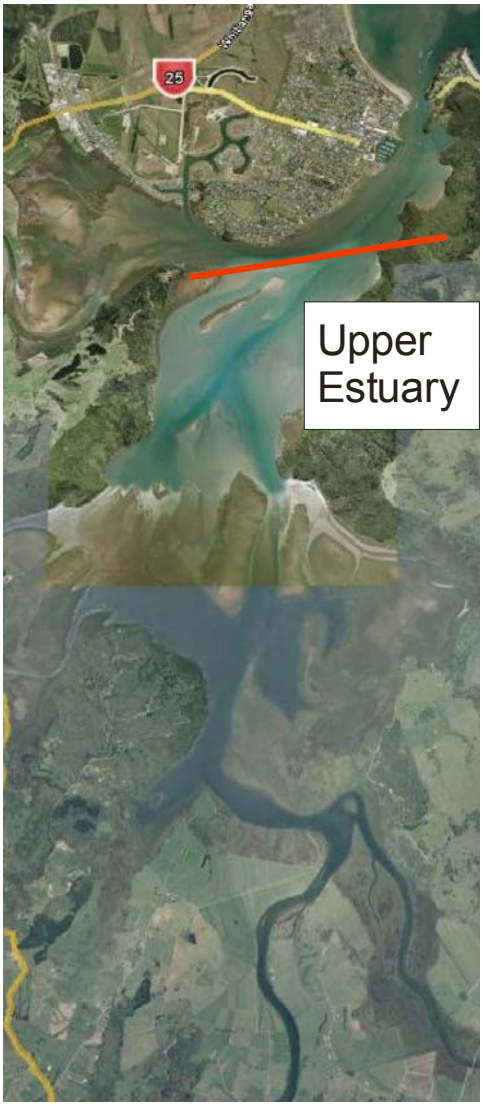

Figure 5-4: The Whitianga estuary with the approximate location of the perceived divide between the upper and lower estuary.

The Biodiversity Group was concerned about what changes in sea-level and sedimentation rates could do to bird habitat and nesting areas. At present the estuary has several small islands which provide predator-free safe areas for birds. If changes within the harbour resulted in the loss of these areas it could have a significant impact on local bird populations. The Group was not sure what to do about this, because they did not know if artificial islands/habitat could be established and maintained. In truth, they hoped that any changes would see the islands move rather than disappear.

The lower part of the estuary was considered to be highly modified and the groups did not appear to be concerned about what might happen in these areas.

Stormwater management

The Infrastructure Group were particularly interested in how stormwater drainage could be managed as sea-level rose. One of the participants had observed that stormwater drains already backed up at high tide and concluded that this phenomenon would be considerably

more frequent as sea-level rose, primarily as the drainage relied on gravity. One of the main concerns was that it could *"become a health issues if it flows over the streets".* Potential solutions were identified as:

- Establishing storm water holding ponds in the area to store the water until it could be discharged into the harbour. However, this would involve acquiring suitable land close enough to the harbour to be of use
- Encouraging the use of rainwater tanks on private property to reduce the volume of storm water produced
- Reviewing the location and size of the current storm water pumps and prepare a plan to future proof these over time. It was noted that the District Council would need to deal with this.

Water supply and sewerage

Salt water intrusion was considered a potential threat to local freshwater supplies by the Infrastructure and Biodiversity Groups. However, this discussion did not progress beyond speculation as no further information could be provided by the research team at the time. The local sewerage plant was believed to be located outside of the area likely to be affected by the potential impacts of climate change. However, there was some discussion on how changing groundwater levels would affect land-based water treatment operations.

Who to be involved?

The discussion groups clearly articulated that any decisions on how the community would adapt to the potential impacts of climate change would require the involvement of many agencies and groups. Key participants would be:

- Locals (especially those likely to be affected)
- Regional and District Councils as they have a role in planning, re-jigging existing facilities and moving things around as changes occur
- Central Government may have a role in funding some of the required changes
- Technical people as they know what is possible and can present some of the alternatives (provision of expert advice)
- Transit NZ (due to the national highway roads)
- Iwi
- Other government agencies which have a role/interest in the area
- Clubs
- Interest groups.

The group accepted that reaching a consensus on prioritising adaptation alternatives would be extremely challenging - but necessary. Many of the participants stressed the need to begin planning and consideration of options early so it wasn't just a last minute knee-jerk

reaction. They considered it important to find *"solutions that the community can afford"* and plan and budget for the spending over the next few decades to spread the costs.

Key group questions and information requirements

The discussion within the groups raised a number of questions, some of which the scientists at each table could answer and others that they could not. The questions which could not be easily answered at the time included:

- What animal species actually use the different areas in the upper estuary?
- What is the importance of the upper estuary as a nursery for marine organisms?
- What is the importance of the upper estuary in terms of protecting/enhancing water quality?
- Can land-use change/management in the catchment be used to reduce the sediment input to the harbour?

However there was no undertaking from the team to respond to these questions as follow-up.

5.2 Group dynamics

In spite of the research team's concerns about how the groups may behave, and what arguments may surface, there was very little open disagreement or conflict either within or between the discussion groups. Discussion was mostly pragmatic with identification of the key problem, some potential solutions and open discussion about the trade-offs, likely issues and key stakeholder groups.

All the groups discussed the alternatives clearly and rationally without any reference to personal vested interest. This may have been because the forum was structured to achieve this, but more likely it was because no decisions were to be made at this Workshop. The situation would probably have been quite different had choices between different strategies been the objective. The atmosphere created in the Workshop gave participants a place to begin considering the trade-offs and the choices required for successful adaptation to climate change (that is to maintain a community where the things which people value are protected) - a chance they had not had in the past.

The presentations from technical staff that morning did set the scene and provided very useful background information and introduced a suite of potential adaptation options. Many of the participants commented on how helpful and understandable the presentations were. These presentations probably provided an early countermeasure to some of the more outlandish suggestions for adaptation options. However, the impact of the information contained in the presentations was very clear in the discussions.

It is interesting to note that there was quite a bit of overlap in the discussion topics which is not surprising as the categories themselves overlap. As a result, more or less the same issues were raised in each group.

5.3 Attendees evaluation

12 individuals completed an evaluation form asking 6 simple questions;

1. Did you attend the Open Day?
2. What is the most valuable thing you take away with you from today's workshop?
3. Was the process you participated in today, different to other workshops around local issues you may have attended? Please explain.
4. If we ran this workshop again, what do you think has worked well? And what could be improved?
5. Do you feel that you got the right information to enable you to think about the issues we discussed today? If not, what else would have been useful?
6. Was the mix of people present right to have a good discussion about adaption to climate change for Whitianga? Please explain.

A summary of responses is given below.

1. Yes – 7; No – 5
2. Generally the high quality of information provided was what was most valued, so that people's awareness of issues was raised.
3. Generally while respondents had attended other workshops the quality of presentations and the opportunity to hear from experts and Council together was appreciated.
4. Respondents generally thought the workshop was well structured and facilitated, with good presentations. Some suggestions for improvement included wider advertising to get more participants and a wider spread of age ranges.
5. Most respondents thought they received the right information, although a few mentioned that they would have liked to receive information on tsunami flood levels as well.
6. Some respondents thought the mix was right (science and locals and Councils), while some again commented that a wider range of people in terms of background and ages would have been good.

Overall, the feedback from the Workshop participants was very positive.

5.4 Research team evaluation

Overall the research team were happy with the way the Workshop went.

The participants were committed and engaged, in spite of the lower than hoped turn out (17 people attended but around 25 had been expected). Participants were pragmatic with respect to discussing the issues and finding solutions, had empathy for those affected and clearly recognised that the potential impacts of climate change were significant and that

adaptation would require a change from business as usual. Overall the group had very high levels of local knowledge and insight, although it was very clear that the younger generations were absent from the discussion.

The maps and flags from the Open Day (which were displayed in the centre of the room) provided a point of reference for all the participants and constantly reminded them of what it was that other members of the community valued – in particular they provided a strong statement of the value of the beach. It seemed to give participants a whole community perspective and may have countered the dominance of personal agendas.

Many of the comments and key points of discussion coming out of the groups reflected the presentations. "*A lot of the expert knowledge was reflected back at us*". The research team especially noted comments with respect to the back-stop wall options for coastal erosion mitigation. A key question for the team was *"is it a good demonstration of learning …..because it shows they were listening to us"* or does it constrain ideas? This is difficult to answer as an increased level of scientific knowledge is necessary to help evaluate options and establish realistic alternatives, but it may stifle creativity at the same time. The downside of this is that people focus on tried and true options rather than generating new ideas which may better reflect the local community.

The primary concerns for the team were around the number and representativeness of participants. The process itself operated very well, with the common exception of not having enough time to talk through some of the issues due to the time constraints of the Workshop.

Participant numbers were lower than hoped which generated some discussion during the team debrief. Small numbers in some of the groups made keeping the conversations going or obtaining differing viewpoints more challenging. Suggestions for increasing numbers were to split the day into two sessions and perhaps look at holding evening sessions during the week. Another was to increase the number of participants through further advertising using flyers or tapping into local networks more successfully. On the whole, previous experience suggests that the turnout was reasonably good given that the team was asking people to commit the greater portion of a sunny summer Saturday to discussion about the impacts of climate change. In addition, representation from the younger generations was absent. Although this is very common at such events, they are a group that need to participate as it is this younger generation who will be most affected by the impacts of climate change.

For several members of the team the Workshop was as an excellent awareness raising exercise. Although participants did not make any decisions, and key issues like 'who pays?' were not explored, people left with a new appreciation of the dilemma and choices with respect to adaptation to climate change. This in itself was a considerable achievement. It potentially marked the beginning of on-going discussions between Council's technical experts and the community. However, careful thought must be given to how to maintain this momentum and encourage on-going learning and discussion. Issues for the team to consider were primarily around what happens next – how do we present the results to the community, and to the Council and Community Board.

The highly co-ordinated nature of the morning presentations (Workshop) provided some very clear messages for the participants. The issues were clearly presented in an understandable

manner – the team skill set and ability to communicate with the community members is essential to the success of this type of work.

One suggestion for what could be improved was to allow movement of participants between the groups, so that people could think about a number of issues. We now note though that an analysis of the transcripts showed that by and large groups covered very similar ground, which may make moving individuals around to expose them to different topics largely redundant. However, it could be an advantage from the perspective of getting to meet other participants.

6 Final report back to the community

6.1 Purpose and structure of report back

As a follow-up to the Open Day and Workshop, a public meeting was held to report back our initial findings to the Whitianga community. The meeting was held in the evening of Wednesday 17 November 2010, some 8 months after the Workshop, at the TCDC Community Board meeting room (TCDC offices, Monk St).

The evening was structured as a series of brief presentations with time for discussion in between. The structure of evening was as follows:

7pm	Drivers of coastal climate change (Rob)
7:15	Overview of NIWA's CACC project (Helen)
7:30	Whitianga community engagement (Terry)
7:45	Working with Mercury Bay Area School (Paul S)
8:00	Context for councils (Peter S)
8:15	Summing up (Helen)
8:30	Cup of tea

A major aim of the meeting was to provide a wrap-up of our project to the community, and to give them some ideas of what would happen as our project moved on to concentrate on writing up our research findings to help other communities benefit from what we did in Whitianga.

6.2 Main outcomes of the report back meeting

There was a pleasing turn-out, with approximately 25 members of the community in attendance, many who had attended the Open Day and/or Workshop.

Between and following the presentations, open discussion took place. Major topics of discussion (in rough order in which they occurred) included:

Issues around the science

- Sedimentation of estuaries and coastal areas – would this cause a mean sea-level rise too? [No- generally it will lead to decreased volumes flowing in and out of an estuary, but levels will only be affected slightly by resistance as water depth changes.]
- Has the upward movement of land been considered in New Zealand SLR estimates? [Yes, being measured by GNS Science and LINZ using continuous GPS].

Questions of local management of the potential impact of climate change (the audience took global and national SLR information and applied it to their local context, asking questions particular to Whitianga observations)

- Are we learning from what other countries are doing about SLR and climate change impacts? [Yes, but overseas areas that are being stressed more by hazards now are responding quicker than NZ].
- Are floor level regulations in our local plans? [Yes].
- Is there a need for national guidance/or approach on regulating e.g., floor levels? [No – need to deal with these issues at a local scale].

Debate around current protection works on Buffalo Beach

- 'Eroding the brand' – beaches are a key to Whitianga (and the entire Coromandel) community and economic income – should be protecting the beaches and ease of access as far as possible.
- Debate on local protection options – discussion of previous gabion baskets at base of escarpment and beach behaviour – did removal of gabion baskets to be replaced with rock wall worsen situation? Is a rock wall better or worse?
- One person wanted the entrance groyne proposal from the 'Prof Raudkivi days' to be installed to hold sand at southern end of Buffalo Beach and improve depth through main channel etc.

Other project specific questions

- Did school students discuss climate change with parents? [Not much – original plan for students to interview parents didn't work out. One observer noted that the age group involved are teenagers, for whom grunting is a common form of communication with parents]. Potential shift to delivery in Year 9 might help ease this link-up with parents.
- Discussion about how councils will use information from CACC work – to look at options, consider cost, make decisions.

6.3 Research team reflections

While there was no formal debrief or evaluation of this report back meeting, the research team reflected on the meeting and noted:

The different time of the meeting didn't alter the demographics of those who attended in comparison to the Open Day and Workshop; there was no representation of people of a younger age group at the meeting. At least one direct comment was received that someone had not been able to come to Open Day and Workshop on weekends, and that weekday evening was better.

Community members clearly observe effects – for example, changes to coast or sea-levels at their farm boundary since 1950's or mangrove build-up. However, while some persons

come to ‘technically correct’ explanations (i.e., in line with current scientific opinion) for the cause of what they see, others draw much simpler and partially or incorrect conclusions from their experience. Evidence is then mentally accumulated to build that case and help the person defend their position. For instance, in discussion community members argue opposing cases with respect to the value of putting groynes on the beach. One was arguing for groynes and another against, and both believed that the information presented suited their argument. However, they were not listening to each other’s perspectives and didn’t seem to hear any parts of the discussion which disagreed with their own view. More interesting, the participants actually seemed to think they were in agreement with each other when their positions were completely contrasting. This could be a classic example of information filtering whereby individuals filter what they hear through their own social, cultural and economic contexts and personal experience.

For several members of the team a key question was what can we (scientists) do about this? Perhaps we can keep presenting our view of cause and effect, explaining why things happen so that communities have a viable alternative explanation of what they have observed happening at the beach. We could also agree to explore their theories and then present evidence back which (hopefully) shows why the scientific cause-effect explanation of what they observe fits best. The literature suggests experience based learning and knowledge exchange would be one way of addressing this sort of problem (Malouf 2003).

Some people do understand the technical and environmental issues and see clearly what the potential solutions might be for coastlines, but these people are minority and in fact we need many people to have the same level of understanding before the community can mandate councils to make policy shifts.

In the CACC project outline we refer to “communities and councils” but a point made during the meeting is that councils ARE community mandated, Councillors are therefore community representatives. We often forget this.

Another significant point is how we can build flexibility to plan for incremental changes as e.g., old houses need to be rebuilt and/or require consents.

Overall, there is still plenty of work to do unpacking sceptic views that people pick up from DVDs or blogs or documentaries. They get part of the picture (from cherry-picking by sceptic scientists), but people don’t easily pick up the complexities or nuances of the bigger picture. Those things need to be continued to be explained succinctly and in a digestible form.

The meeting was also followed up with another media release, as well as a discussion with a local journalist (Shenagh Gleeson of The Coromandel Peninsula Post) during the last day of the NZ Coastal Society Conference. Again, emphasis was on giving the community some feedback from our previous visits, helping them to understand that any decisions are now theirs and the Council’s, and that our focus was now on writing up our research.

7 What have we learnt?

There are two main divisions of lessons learnt by the research team during the course of this project. First, we have collected a data set which illustrates and explores how the projected impacts of climate change could affect the things which the community values, and some ideas on possible adoptions which could mitigate these impacts. Second we have developed and tested a successful interdisciplinary approach to engage with communities over climate change.

7.1 What does the data tell us?

As this report focuses mainly on the development and trial of an engagement process, the data collected will not be discussed any further in this document beyond the brief summary of outcomes given in sections 4 and 5 above.

7.2 What have we learnt from the method development?

This Whitianga case study has provided vital lessons for the CACC project in terms of engaging with local communities about adaptation to coastal climate change. The research team set out to develop a participatory process which would:

- Provide local community participants with visual and scientifically grounded perspectives of the projected impacts of climate change on the Whitianga community;
- Allow people to link projected impacts with what they currently value about their community and wish to retain; and
- Facilitate debate around future options, and to begin consideration of what actions could be taken to protect the things which are of value in the community against the projected impacts of climate change.

We constructed a two stage process (Open Day and Workshop) centred around large aerial photos/maps illustrating the projected impacts of climate change. At the Open Day, participants interacted with scientists and council staff, exchanging knowledge and exploring the potential impacts of climate change on the things which they valued. At the Workshop, the participants thought through possible adaptations to protect the things that they valued into the future.

7.2.1 What worked?

An interdisciplinary team

The interdisciplinary approach to developing this method has led to current climate change knowledge (around coastal issues) being embedded in our process. By embedding the science in a participatory process, the impact to the community was maximised. Moreover, the mix of researchers, practitioners and council staff in the project team provided considerable breadth of skills and experience. Council commitment was valuable and vital to project success. In this case it was aided by having:

- The WRC & TCDC Blueprint process underway
- LiDAR data to undertake projections of future changes
- Councils fully engaged in the process, and
- A community already aware of coastal issues.

Use of aerial photos

The aerial photos which were central to this method proved to be a highly successful means to:

1) Illustrate and personalise the projected impacts of climate change (Open Day). By looking at the maps participants were able to clearly see places of interest to them and how these may be affected by coastal inundation, coastal erosion and estuarine habitat change. This effectively countered any “climate change won’t ever affect me” attitude.

2) Facilitate discussion and knowledge transfer between scientists, Council staff and the community (Open Day and Workshop). Scientists were able to discuss topics of interest to individual participants, at an appropriate level to match understanding and interest. This method proved to be a very successful way to convey the uncertainty inherent in climate change predictions.

3) Capture and spatially illustrate value objects (Open Day). Participants could look at what others had written and at a glance obtain an overview of what was valued about the community.

4) Facilitate pragmatic discussion around adaptation alternatives (Workshop). The maps that linked the landscape and values that the community were familiar with to climate change issues retained the focus on pragmatic solutions relevant to Whitianga rather than more abstract debates. In addition the maps provided a constant reminder of the full scope of values within the community and appeared to avoid capture of the discussion groups by particular interests. Overall, the Workshop discussions were very pragmatic, participants recognised and acknowledged potential conflict, and possible trade-offs. Moreover, participants appeared to feel empowered by the opportunity to propose and consider alternative adaption strategies. By visually displaying value objects, participants were better able to grasp where different solutions may be appropriate. For example, the upper harbour contained a lot of things of value, while the lower harbour contained very little. As a result, strategies which cause habitat loss in these different areas would be quite differently received by the general public.

The science behind the photos/maps was robust and consistent with the MfE guidelines (MfE 2008 and 2009), and the decision to adopt a simple approach to illustrating the impacts which was backed up with explanation by individual scientists (on each table at Open Day and through presentations at the Workshop) proved to be the right choice.

Presence of a roving expert

The roving expert filled two functions at both the Open Day and the Workshop, firstly providing additional technical support to the scientists on each table and secondly, for providing more detailed discussion for participants who wanted it. By removing the more

“time hungry” participants (and also climate change sceptics) from each table, the scientists at the table were able to focus on engaging with more participants. Our strategy for dealing with sceptics relied on the roving expert – essentially the sceptic was given the opportunity to have an extended discussion with an expert so they felt they were heard. What is more, the team could begin to understand the sceptics view and work towards engaging with them on what they thought should be done. Overall, this role worked well.

A focus on positive actions

Through-out the Open Day and the Workshop the team retained a positive focus on promoting action to protect the things which the community valued into the future. Our aim was to empower people to consider their alternatives - to do anything else would potentially have inflated concern and promoted fatalism in the participants. This attitude was reflected in the way participants, particularly at the Workshop, were able to sit down and pragmatically consider adaptation alternatives.

The logistics

At the Open Day

The set up in the hall for the Open Day was carefully considered and planned and proved to be very appropriate and successful. Some of the most successful elements of this day were:

- The entrance way which contained a time tunnel (large pictorial and chronologically accurate display of local development and local hazard events such as local storms and flooding) and a display of things which people valued about the community. After moving through this entrance seeing a history of development and hazards, people were better prepared for a discussion of the projected future impacts of inundation and erosion on the things which they valued.
- Arrows on the floor to indicate which way to go allowed the participants to clearly see what to do next. This proved to be a highly successful last minute addition.
- A well- known local Council staff member went out into the main street of the township to encourage people to head down to the hall for a look. We may have had lower attendance at the Open Day had we not done this.
- A lack of wider reading material on the walls was a conscious decision to channel all communication through the scientists at each table, and was really helpful for information exchange. Participants did not have anything else to look at, which encouraged them straight to the tables and to become part of the discussions going on there. This proved to encourage a more interactive experience for participants.
- Provision of tea and coffee allowed people to linger, and swap thoughts with other participants and research team members.

The Workshop

The Workshop aimed to provide a mix of technical information which would be useful in the discussions around adaption options on one hand and time to sit around the maps and talk through ideas on the other. Presentations set the scene at the start of the day but reduced the time available for group discussion.

Small group discussions around different topics proved to be a good way to generate ideas and keep everyone involved. It was interesting that many of the same themes arose at each table highlighting an overlap in the issues to be faced as the community considers adaptation alternatives. Participants expressed a desire to have been more mobile and switch between groups to hear what was said at each table.

By placing a scientist and a facilitator at each table, the scientist could be part of the discussion and ignore the group management task. This freed them up to really engage with participants and critique ideas against the likely outcomes.

7.2.2 What would we do differently?

The things we would do differently are mainly related to the levels of participation in the events.

Although the turn out for the Open Day was high compared to other similar Council run consultation over the Coromandel Blueprint Plan, the team would have liked to engage with more participants. However, the team noted that the level of attendance was a good fit to the number of people in the research team, as our approach relied on people intensive communications. The attendance at the Workshop was lower than hoped.

We identified some key questions to explore the weaknesses with our approach:

Did we get the right people and representative groups of people to the Open Day and Workshop?

Some members of the community are notoriously difficult to engage with (Hipkins et al. 2002). The original method proposed by Cinderby (2009) did address this by setting up the stands on the main street. However, for the Open Day we rejected a street-side stall approach in favour of the Town Hall (near the main street) for a number of reasons. As most of the team members lived several hours drive from Whitianga, it was not practicable to just wait until we had a fine day and then set up a stand on the street. There was a need to plan ahead and fix a date and venue also in order to advertise the event and attract participants. We attempted to counter engagement problems by choosing a location close to the main street, having signs up and sending a team member off to encourage passers-by to become participants. We did get a good mix of people through the door (who represented the expected range of value objects), but probably less than if we had set up on the street.

The Workshop attendance did not represent the local demographic, with a high number of older participants. This is fairly typical of workshops as they require participants to be able to give up large blocks of time.

Could/should we have advertised more to attract people along?

Adverts for the event were distributed across to local media and via community networks identified by local council partners. However, in the future we would recommend using local people to distribute flyers in shops and via mail drop to as many local businesses and addresses as feasible, which was not done due to the research team being out-of-towners.

Did we choose the wrong times to get people along? – Evening meeting was slightly more successful on numbers?

Overall, the consensus is that no time is really any better than others, people who have the time will attend whenever it may be. It is not practical to hold lengthy engagement processes such as workshops in evening timeslots of a few hours, unless this is done on a number of subsequent evenings.

In summary

We faced the same issues of low levels of participation as many other community engagement projects. As a result, only people with time and interest came to listen, so a large percentage of the Whitianga community is not any more aware of coastal climate change issues. However, if the Open Day design was modified into a more 'mobile' approach there is potential to increase local engagement and awareness. The Workshop aspect of the design presents a greater challenge in order to include a wider number of participants. In essence, more time and more discussion and debate will be required to reach a robust consensus, however, greater commitments of time will mean less people participate. This really is a key dilemma for public participation.

7.3 Limitations of the method

One of the key limitations of this method is that it does not generate agreement on specific adaption strategies (that is, it opens up dialogue but does not progress through debate and negotiation, in the parlance of Forester and Theckethil 2009). Our approach will form one of the first steps in raising awareness of climate change impacts on the community and begin the discussion over what could be done. Many further face-to-face meetings would be necessary in order to formulate actual adaptation plans, and resolve conflicts. Nevertheless, our method has illustrated a considerable potential as it sets up a partnership between scientists, Council staff and the community to begin to address future issues.

The Open Day and Workshop can only handle a certain number of people at any given time due to the people intensive communication approach selected. More participants would require more resources in terms of personnel and time.

7.4 Replicating the method

This method has a considerable amount of potential as a means to engage with communities over the potential impacts of climate change and begin discussions about possible adaptation alternatives which protect the things of value.

In order to successfully transfer this method to help other coastal communities adapting to climate change, we have distilled certain key issues which are central to the method's success:

7.4.1 The right team

A key step is to establish an interdisciplinary team who are able to provide the necessary expertise in terms of physical science and small group management techniques (i.e., social science). A certain level of expertise and skill within the project team is required to create the climate change projection maps, engage with participants and answer climate change related questions in a manner understandable to the public. Scientists will need to be comfortable explaining concepts to the public and using their own judgement and opinion (and to speculate) in order to answer questions. A mix of researchers, practitioners and council staff in the project team provides a good mix of theory and pragmatism with which to approach the community.

7.4.2 The right data

Two subsets of data are important, firstly scientific data and secondly, knowledge of the community.

Access to the information required to construct the impact maps is essential for this method (see section 3 for further details). LiDAR data are very important for underpinning the projections of potential impacts of climate change on coastal communities, and allowing these to be clearly mapped. While LiDAR is lacking in many coastal areas today, it is becoming increasingly available and we can count on using it for this purpose in the future. Meaningful projections of sea-level rise are also essential, and in this context are provided via MfE guidance (2008).

Members of the research team need a good knowledge of the area, experience with coastal erosion and community planning issues, and access to information and expertise relevant to local issues. In addition, it will help if the team can draw on council documents and advice which provide additional context for the engagements.

7.4.3 The right support

The commitment of the local councils to the process is a key element to success. If councils are not fully supportive then no partnership will be established between researchers, the council and the community. As a consequence the step between exploring the adoption alternatives and considering future implementation cannot occur.

7.4.4 The right resources

It is obvious but still worth stating that access to the resources necessary (financial resources and staff) to organise and run the two step process is a pre-requisite for duplicating this process. In addition, further resources will be required to run further sessions with key stakeholders and decision makers to move beyond the dialogue and debate into negotiation, in order to prioritise certain areas or issues that require adaptive management. Securing funding from external sources, such as Environlink advice grants for eligible councils, may be one way of helping fund such exercises.

7.5 Future method development

As this method facilitates the initial steps towards community and council dialogue and debate around adaption to climate change, additional steps will be required to move through debate towards negotiation of a final outcome or response. Our method, based around large maps illustrating projected impacts of climate change, could very simply be extended to form the basis for the further debate and negotiation. This is principally because the use of maps appears to keep the discussion grounded in reality, promote the discussion of pragmatic alternatives and clearly (and visually) illustrates the trade-off between various potential adaptation options. A major challenge would be embedding the maps in a process which engages all the relevant stakeholders in a forum where (all) participants work with the local management authorities to generate consensual responses to the projected impacts of climate change. Other researchers have trialled various approaches that have been designed to do precisely this, and so further method development would involve an evaluation of these methods and testing a suitable alternative.

8 Conclusions

The research team has developed an inter-disciplinary method to engage with the Whitianga community around potential changes to their coastline under climate change, and how they might adapt to those changes. Our method was informed by participatory ideologies and sought to mitigate as many barriers to participation in the debate as possible. In particular we explored:

- Getting the right people to the table;
- Achieving consensus and representative decision making;
- Personalising the impacts of climate change (local verses national focus); and
- Appropriate and meaningful inclusion of scientific information.

In order to meet these challenges we selected a participatory GIS approach. The final method involved a two stage process – an Open Day and a Workshop. In our Whitianga case study, both events were structured around large aerial photos of the Whitianga area, that illustrated three key projected impacts of climate change: coastal inundation and drainage issues, coastal erosion, and habitat change.

In reflecting on what we have learnt, we identified a number of strengths and weakness with our method, but on the whole found it an effective way to engage with a community regarding coastal climate change impacts and potential adaptation options. In order to replicate the method, the keys to success are:

- The right team - Establish an interdisciplinary team who are able to provide the necessary expertise in terms of science and small group management techniques
- The right data – Access toboth scientific data and knowledge of the community
- The right support - The commitment of the local councils to the process is a key element to success
- The right resources – In terms of staff time and financial resources to commit to a time intensive engagement process.

Finally we note that the process of engaging communities, using our successful methodology, is part of the journey of adaption which will be discussed in the CACC projects *Pathways to Change* guidance. Further findings from our engaging communities case studies will be drawn together in a final report, *Engaging Communities: Making it Work* (Rouse & Blackett 2011).

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Appendix A

List of CACC team planning meetings and Workshops for Whitianga community engagement process

Date	Who was there	Main topics
20 July 2009	TMH, HLR, DougR plus PB	Re-cap of discussions to date (write up of white-board discussions). Initial plan was a series of 4 workshops to: explore potential methods with project team; confirm values with community; raise awareness of cc impacts; and discuss adapting and understanding trade-offs. The need to split the community into groups (communities of practice?) had been noted. In this meeting we discussed what was necessary to be able to: determine community values & what impacts on those values will be; build capacity/awareness in the community; and work out what steps can be taken to protect values. An output from the meeting was a task list and list of materials to gather in order to develop Whitianga projections, aiming to do this by end of Dec 2009.
22/23 Oct 2009	TMH, HLR, DR, PB & ES, plus Peters and Jim by phone	Listing of available info for Whitianga coastal issues and hazards. Development of 2 step plan: Step 1 – participatory GIS Open Day; Step 2 – Focussed community Workshop(s). Presentation of 2 step plan to Jim, consolidated with his experience in engaging communities. Presentation of 2 step plan WRC, TCDC, checking with engagement used for BluePrint process. Preliminary discussion of key challenges for Whitianga – first outlined Inundation, Erosion and Habitat squeeze as issues from Councils perspective. Determine next step – technical workshop. Outline aims of that workshop. Develop possible matrix of Issue-Cause (drivers)-Effect of cc-Adaptation options. Develop whiteboard list of tasks for each step of process – became working 'to do' list until completion of Open Day and Workshops.
30 Nov 2009	TMH, DR, HLR, PB & ES, PS, PW, VP, SS, JD	Technical workshop to plan Open Day & Workshop. Started by displaying base data – photos, maps etc. All technical data was available at this workshop. Outcome was agreed list of tasks and timeframes for completion leading up to Open Day and Workshop events
17 Dec 2009	NIWA incl RB, PB&ES, PS, PW, JD	Discuss projections and maps, specifics for graphics
18 Feb 2010	Open Day team (without Peter W and Jim)	Briefing for Open Day
Open Day 20 Feb 2010	Open Day team	Team debrief
11 Mar 2010	Workshop team (without Peter W and Jim)	Briefing for Workshop
Workshop 13 March 2010	Workshop team	Team debrief

List of other resources and location of those resources

Raw data from the Open Day [in CACC112\Working\Open Day & Workshop stuff Whitianga\Transcripts Open Day] and Workshop [in CACC112\Working\Open Day & Workshop stuff Whitianga\Transcripts Workshop].

PPT presentations from Workshop [in CACC112\Working\Open Day & Workshop stuff Whitianga\presentations for workshop\final] and final public meeting [in CACC112\Working\Open Day & Workshop stuff Whitianga\follow-up visit Nov1010].

Posters & time tunnel from Open Day [in CACC112\Working\Open Day & Workshop stuff Whitianga\CACC 2010 poster pdfs]

Media releases and advertising flyers [in CACC112\Working\Open Day & Workshop stuff Whitianga\advertising & media]

Advertising for our engagement steps

Open Day

The Open Day was advertised via:

- A media release picked up by: Informer, Peninsula Post, Cool FM, Mercury Bay Breeze FM.
- Interview on Mercury Bay Breeze.
- Flyers distributed to contact lists.

Workshop

The Workshop was advertised via:

- A4 invitation flyer available at Open Day.
- Direct mailouts of an A4 invitation flyer.
- A media release picked up by: Informer, Peninsula Post, Cool FM, Mercury Bay Breeze FM.
- Interview on Mercury Bay Breeze.

Report back meeting

The public meeting was advertised via:

- Direct mailouts of an A4 invitation flyer.
- Flyer uptake into Mercury Bay Area School newsletter.
- A media release picked up by: Informer, Peninsula Post, Cool FM, Mercury Bay Breeze FM.
- A small advert in Peninsula Post.

- Plus by flyer at the New Zealand Coastal Society conference that was being held in Whitianga in the same week.