



**EAST COAST**  
NRM CLUSTER



IMPACTS & ADAPTATION  
I N F O R M A T I O N  
FOR AUSTRALIA'S NRM REGIONS



# East Coast Cluster

# Final Engagement Report

## May 2016

## Background

This report has been produced as part of the Climate Change Adaptation for Natural Resource Management in East Coast Australia project. The project is being delivered by six consortium partners: University of Queensland (Consortium leader); University of the Sunshine Coast; CSIRO; New South Wales Office of Environment and Heritage; and Queensland Department of Science, IT, Innovation and the Arts (Queensland Herbarium) to foster and support an effective “community of practice” for climate adaptation within the East Coast Cluster regions that will increase the capacity for adaptation to climate and ocean change through enhancements in knowledge and skills, and through the establishment of long term collaborations.

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# 1. EXECUTIVE SUMMARY

The East Coast Cluster contains five of Australia's ten largest significant urban areas, world heritage listed environments, valuable agricultural areas, mining and extensive grazing (Cox et al., 2013). The East Coast Cluster area is also expected to experience continued increased average temperatures, increased intensity of extreme rainfall events, continued rising mean sea level with increased height of extreme sea level events, and harsher fire-weather climate as a result of climate change (Dowdy et al., 2015). As such, the capacity for Natural Resource Management (NRM) bodies to play a vital role in mitigating adverse climate change impacts on important natural resources whilst identifying and harnessing any potential opportunities to respond to change in timely and beneficial ways is extremely important. At the inception of the Climate Change Adaptation for NRM in the East Coast Australia project, the six regional NRM bodies comprised by the Cluster had a varying degree of climate knowledge, and varying capacity to analyse large volumes of climate-related spatial or modelling data (Cox et al., 2013).

The East Coast Cluster research consortium set out to deliver high quality research resulting in outputs that enable managers to make decisions for sustainable NRM in the context of climate change. This was sought through climate change adaptation pathways approaches alongside efforts to enhance the capacity of planners in regional bodies to manage change. In addition, the research consortium endeavoured to integrate and synthesise a diverse set of data and knowledge across discipline boundaries to provide succinct user-friendly information for regional bodies. The East Coast Cluster also sought to maintain or develop successful cross-disciplinary working relationships that can continue into the future.

The East Coast Cluster Planners Working Group (PWG) comprised of planners from the six regional NRM bodies, planning researchers from Griffith University, and other researchers when availability allowed. The PWG was designed to be the main method for information sharing and capacity building throughout the Project. The PWG functioned as a 'community of practice': that is, a group of (NRM planning) practitioners increasing their knowledge and expertise (around NRM planning for climate change adaptation) by interacting on an ongoing basis. The PWG formed the core group of the community of practice, with the broader group of stakeholders participating when activities aligned with their interests. In this way, the project contributed to building capacity within the wider community to effectively plan for climate change adaptation. PWG two-day workshops were held twice a year from 2013 to 2015.

This report provides a final overview and review of the uptake of the East Coast Cluster research outputs by the PWG, including its uptake and contributions of the PWG to a 'community of practice'. Information supporting this overview was obtained through interviews with participants of the PWG, and to a lesser extent, interviews with local government planners that had participated in the Griffith University Scenario Planning workshops (November 2014 and April 2015). Participants were asked to give feedback regarding which East Coast Cluster research outputs were most useful in providing information in their professional roles relating to climate adaptation planning for NRM, the features of outputs that made them useful, and opportunities to use the research outputs in future activities. Interviewees were also asked questions to give feedback on the PWG in terms of any contributions to their capacity to deal with climate change adaptation, and the impact of collaboration and any partnerships or networks facilitated by the PWG and/or East Coast Cluster research activities.

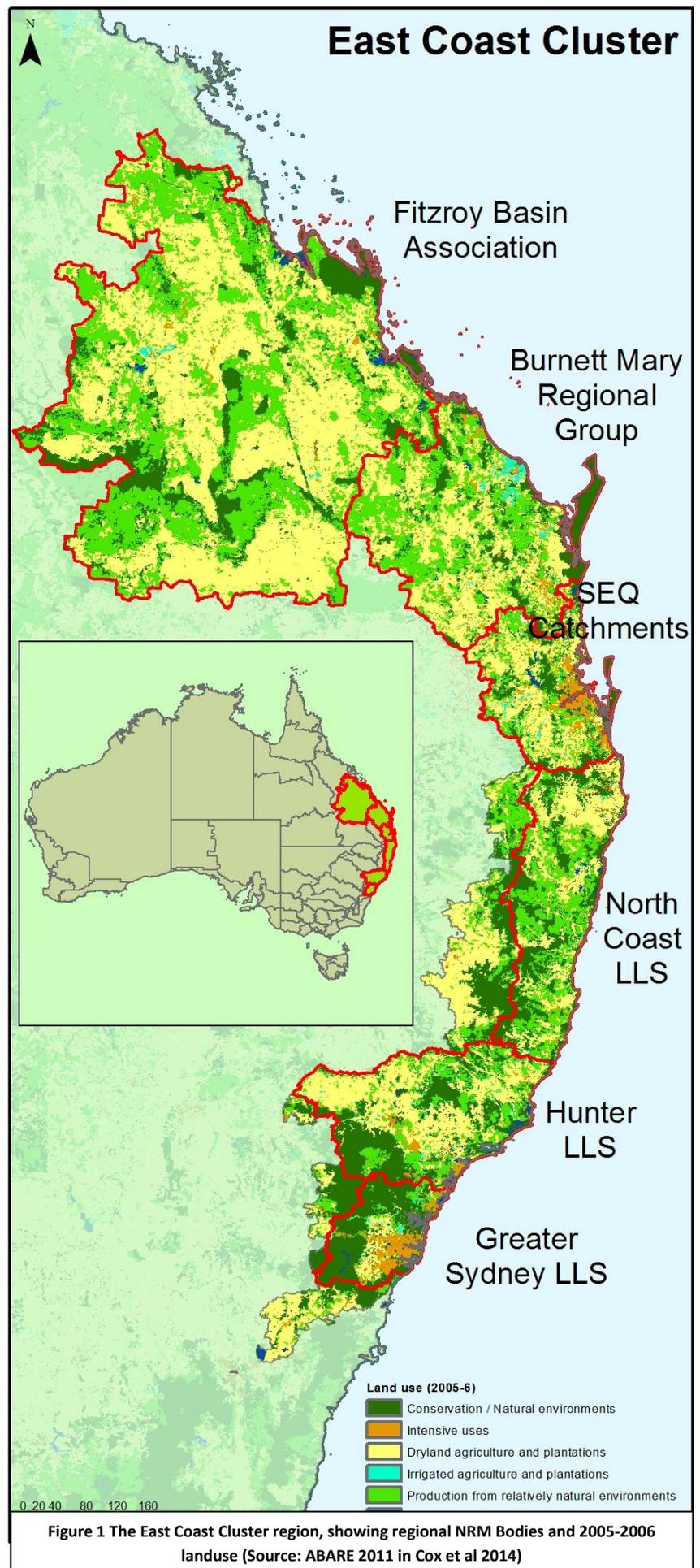
Qualitative analysis of interview transcripts was carried out, with data organised according to answers to interview questions. These were surveyed and summarised in Section 5. Broadly speaking, the feedback from PWG participants is positive: relating to both the East Coast Cluster's research applicability and community of practice. Interviewees made many constructive comments related to their use of research outputs (including research output features and opportunities for future use), and capacity building through the community of practice (including knowledge and skills learnt, and present and future collaboration/partnerships/networks attributed to the PWG). Some issues relating to staff turnover, timing of release of research outputs, concurrent research and planning exercises, differing interests and capacities of regional NRM bodies were identified as causes for shortfalls in expected outcomes in some cases.

## 2. INTRODUCTION

The Australian climate is changing, bringing rising average temperatures, changed rainfall patterns, rising sea levels, as well as a range of other associated impacts specific to and relevant to particular regions. Climate change is projected to continue through the 21<sup>st</sup> century. In the absence of adaptation, climate change impacts are expected to have substantial impacts on water resources, coastal ecosystems, infrastructure, health, agriculture, and biodiversity. Climate change adaptation for natural resource management (NRM) is extremely important for the maintenance of natural resources and ecosystem services they provide; and to help realise any potential benefits from projected changes in climate to some sectors where possible, and timely responses for continuity of natural-resource dependent industries (Reisinger et al., 2014).

The Australian Government Regional NRM Planning for Climate Change Fund enabled much research into the impact of future climate on Australia's natural resources, and opportunities for adaptation relevant to NRM. Australia has 54 NRM regions. These NRM regions were grouped into eight NRM 'Clusters' that broadly relate to broad-scale climate and biophysical regions of Australia, and that each have a unique set of priorities for responding to climate change (Dowdy et al., 2015). This report relates to the East Coast Cluster area, consisting of six regional NRM bodies (see Figure 1) including Fitzroy Basin Association (FBA), Burnett-Mary Regional Group, SEQ Catchments, North Coast Local Land Services (LLS), Hunter Central LLS, and Greater Sydney LLS.

Over the period of April 2013 to December 2015, a number of research outputs were developed by research organisations (University of Queensland, Griffith University, University of Sunshine Coast, CSIRO, NSW Office of Environment and Heritage, and Queensland Department of Science, IT, Innovation and the Arts (Queensland Herbarium) in partnership with the NRM regional bodies in the East Coast Cluster. Outputs from research were delivered



throughout the project, and interaction between the researchers and the practitioners at workshops was a key part of the research communication process. Research outputs included:

- Needs analysis (carried out by Griffith University)
- Downscaled climate projections and impacts research (NSW Office of Environment and Heritage)
- Coastal vulnerability assessment (first pass assessment for the cluster, detailed assessments for specific areas) (University of Wollongong)
- Stocktake of available biophysical data and models, and agricultural species distribution models under possible climate futures (University of Queensland)
- Socio-economic vulnerability assessments (University of Sunshine Coast)
- Carbon farming opportunities (Queensland Herbarium)
- Integrated assessments for resource sectors (CSIRO)
- Institutional adaptive capacity (University of Queensland)
- Planning packages and research translation (Griffith University)
- Policy appraisal through scenario planning workshops (Griffith University).

The Climate Change Adaptation for NRM in East Coast Australia Project also aimed to foster and support an effective ‘community of practice’ for climate change adaptation within the East Coast Cluster NRM regions to enhance the capacity for adaptation to climate change through ‘enhancements in knowledge and skills and through the establishment of long-term collaborations’ (Cox et al., 2015).

Key to the research project was the establishment of the PWG, which consisted of representatives from each of the six regional NRM bodies in the cluster. PWG two-day workshops were held once every 6 months, with 5 held in total between May 2013 and April 2015. These workshops played an important role in producing research outputs for the East Coast Cluster, and were also instrumental in facilitating interactions among the planners as a community of practice. PWG workshops initially sought to identify the needs of the NRM bodies as a focus for research. Workshops also included presentations and discussions from researchers representing organisations operating within the East Coast Cluster as well as external research organisations (including researchers from [other clusters](#), the national [AdaptNRM](#) team, and the [national projections project](#)).

The objective of this report is to outline a research stocktake that identifies the research outputs regional NRM bodies have found most useful, any recent developments on the use of research outputs in climate adaptation planning, features that have assisted to the uptake of research outputs, and identified opportunities for future use of research outputs. This report also outlines feedback from PWG participants and scenario planning workshop participants regarding any contributions to their capacity stemming from the East Coast Cluster community of practice through enhanced knowledge and/or collaboration and partnerships (both formal and informal). It is noted that this enhanced capacity benefits not just regional NRM bodies, but also future places of employment of PWG participants, and those engaged with East Coast Cluster research outputs and related collaborations in a number of places and forms potentially over a long period of time.

Due to a high level of staff turnover in the East Coast Cluster regional NRM bodies, and mismatch of funding availability allocated to Stream 1 and Stream 2, interviews were used for data collection rather than workshops or focus groups. Feedback was garnered through interviews with PWG participants and local government participants of the two scenario planning workshops held in November 2014 and April 2015. These interviews follow previous feedback in June 2015 collected from PWG participants and regional NRM bodies regarding their use of East Coast Cluster research outputs, and experiences relating to the East Coast Cluster community of practice. Section 3 provides a brief background on the research outputs of the East Coast Cluster. This is followed by a summary of the outcomes of the previous research stocktake carried out in June 2015 in Section 4. The responses to interview questions are summarised and described in Section 5.

### 3. BACKGROUND ON EAST COAST CLUSTER RESEARCH OUTPUTS

To facilitate East Coast Cluster regional NRM bodies in capacity building for climate change adaptation a number of research outputs were produced by the six consortium research organisations in partnership with regional NRM bodies. More information on these research outputs is provided below. A number of East Coast Cluster NRM publications and related documents are provided on [terranova.org.au](http://terranova.org.au), and previous reports give an overview of the [research projects undertaken](#) (Cox et al., 2014).

**Table 1. East Coast Cluster Research Outputs**

<b>Research Outputs</b>	<b>Description</b>
<a href="#">Needs analysis (Griffith University)</a>	This analysis summarised the needs of regional NRM bodies related to planning for climate change adaptation, and provided a basis for developing the detailed work plan of the consortium.
<a href="#">Updated regional projections (CSIRO)</a>	The CSIRO and Bureau of Meteorology prepared climate change projections for the East Coast Cluster, as well as other NRM cluster regions in Australia. The East Coast Cluster was divided into two sub-clusters of 'East Coast North' and 'East Coast South'. Projections are based on four representative concentration pathways underpinned by emission scenarios.
<a href="#">Downscaled climate projections and impacts research (NSW Office of Environment and Heritage)</a>	Downscaled regional projections were provided to deliver information on climate projections and possible climate change impacts to assist NRM regional bodies as well as other stakeholders to carry out planning for climate adaptation. The NSW and ACT Regional Climate Modelling (NARClIM) provided high resolution climate projections at a scale that can assist local decision makers.
Coastal vulnerability assessment (University of Wollongong)	<a href="#">Coastal vulnerability assessments: first pass assessment for the cluster</a> , followed by detailed assessments for specific areas (University of Wollongong). <a href="#">Second order models</a> of wetland response to sea level rise were also undertaken.
<a href="#">Carbon farming opportunities report (Queensland Herbarium)</a>	This report reviewed some of the potential landscape changes that carbon farming may bring to the East Coast Cluster NRM regions. An economic analysis was provided to identify the most prospective locations for various carbon farming activities.
<a href="#">Socio-economic vulnerability (University of Sunshine Coast)</a>	University of Sunshine Coast used ABS data to look at socio-economic vulnerability to climate change in each of the East Coast Cluster NRM regions.
<a href="#">Biodiversity report</a>	Office of Environment and Heritage - Tri-cluster project biodiversity report: 3C modelling for biodiversity under future climate.
Climate suitability modelling (University of Queensland)	Modelling of predicted distribution of agricultural species under climate change.
Scenario Planning workshops (Griffith University)	Policy appraisal through scenario planning workshops.
Integrated assessments (CSIRO)	CSIRO prepared briefing notes exploring impacts and vulnerabilities of specific sectors to climate change in the East Coast Cluster, including: <a href="#">cropping</a> , <a href="#">grazing</a> , peri urban settlements, and <a href="#">horticulture</a>

## 4. METHODOLOGY

This final review of uptake of research outputs takes place after a previous review by PWG participants in June 2015. The previous review was based on feedback gathered from PWG participants. In June 2015, a number of research outputs from the East Coast Cluster Consortium were being used by regional NRM bodies as summarised in Figure 2. All regions commented that the PWG workshops were useful in establishing and maintaining connections between the regions, and for learning about the research outputs (i.e. the workshops were at least as important in terms of research communication as the final reports). Also as a result of the interactions between the regions at the workshops NRM planners from some regional NRM bodies initiated projects looking at what their local government and industry stakeholders know and are doing about climate change adaptation after discussing with representatives from Greater Sydney LLS, who have a similar project. In addition, it was found that the three NSW NRM regional bodies were working together as a direct result of participating in the PWG workshops. Although there was some connection between the regions previously, these connections were greatly strengthened by interactions at the regular workshops. Communications were also evident where SEQ Catchments produced an updated plan with several of the consortium researchers involved in the expert panels and plan reviews.

The review carried out in June 2015 also found that some regional bodies had incorporated information from the CSIRO climate projections into their own climate change information for their plan review, and into their plan as part of the background information for some of the natural assets. One regional NRM body also invited some climate change researchers to present at their community workshop. At this time there was also some interest in NARCLiM products, but they were not yet completely available. There was also some interest in using the coastal vulnerability assessment, but at this time regional NRM bodies interested required more information specific to their region and the GIS layers.

NSW based regional NRM bodies had co-initiated a project to develop a spatial analysis tool to identify the best areas for soil and vegetation carbon sequestration (both from retention of existing areas and management activities to increase carbon sequestration). The tool was developed under contract by a consultant, and uses several of the outputs from the carbon farming report, and other modelling. At the time of the June 2015 review, the tool was still in development and the local strategic plans still in development. So although it was expected that it would be a while before the information was translated into a 'plan', the research outputs were definitely being used. Also related to carbon farming research, there was some interest from PWG participants in blue carbon work, and pledged ongoing communications between regional NRM body representatives and researchers working on this. One regional NRM body had also invited some climate change researchers to present on carbon farming at a community workshop, and another regional NRM body had links to the regrowth benefits tool developed by the Queensland Herbarium in their plan.

Some interest in research outputs was yet to be manifest into specific planning activities. Specifically, some of the regions commented that understanding social and economic vulnerability was important, but they were at that time unsure how to incorporate this in their planning. One regional NRM body was interested in pursuing coastal vulnerability work, but pursued other projects that were higher priority. In some cases research outputs were incorporated through planning processes rather than specific research outputs being used directly. FBA had developed a mapping application that had potential to include more East Coast Cluster research outputs if they were provided as mapping layers.

Regarding scenario planning packages, one of SEQ Catchments' local government stakeholders had attended the scenario planning workshops to learn how to use scenario planning as a tool, with the intention of applying the methodology in their local government area.

In April 2016, eleven interviews were carried out to update this information on the application of research outputs carried out for the East Coast Cluster. In addition, interviews sought to gain an understanding of the features of research outputs that made them useful, opportunities for future use of research outputs, and feedback regarding the community of practice facilitated by the PWG.

Processes that lead to changed practices can occur over long timeframes, and it is often difficult to assess the extent of changes and their benefits until long after projects have finished. In the case of the East Coast Cluster research project, these challenges were exacerbated by a high level of staff turnover during and following the period in which the PWG was formed. To address this issue, interviewees were asked not just about the impacts of research outputs and capacity building whilst directly involved with their work carried out at NRM regional bodies, but also in any subsequent relevant employment they have been engaged in.

Interviews were carried out over a two week period in April 2016. Interviews were over the phone, with the exception of two respondents that gave written responses to the interview questions due to their lack of availability (including one regional NRM body representative and one local government representative). The eleven interviews carried out included at least one representative from each of the six regional NRM bodies, with eight regional body representatives interviewed in total (four from NSW and four from Qld). In addition, three local government planners that had attended scenario planning workshops were interviewed.

The questions used during interviews are shown in Appendix 1. Questions were slightly altered for interviewees that had had partial engagement with PWG activities (mostly due to changes in employment throughout the duration of the East Coast Cluster project). NRM body representatives were also asked to provide some follow up feedback relating to comments made on their work during the June 2015 review of use of research outputs.

Qualitative analysis of interview transcripts was carried out, with data organised according to answers to each interview question. NVivo software was used to collate answers according to questions from interview transcripts. These were then surveyed and analysed, and interviewees' responses were collectively summarised, with key points made by individual interviewees also noted.

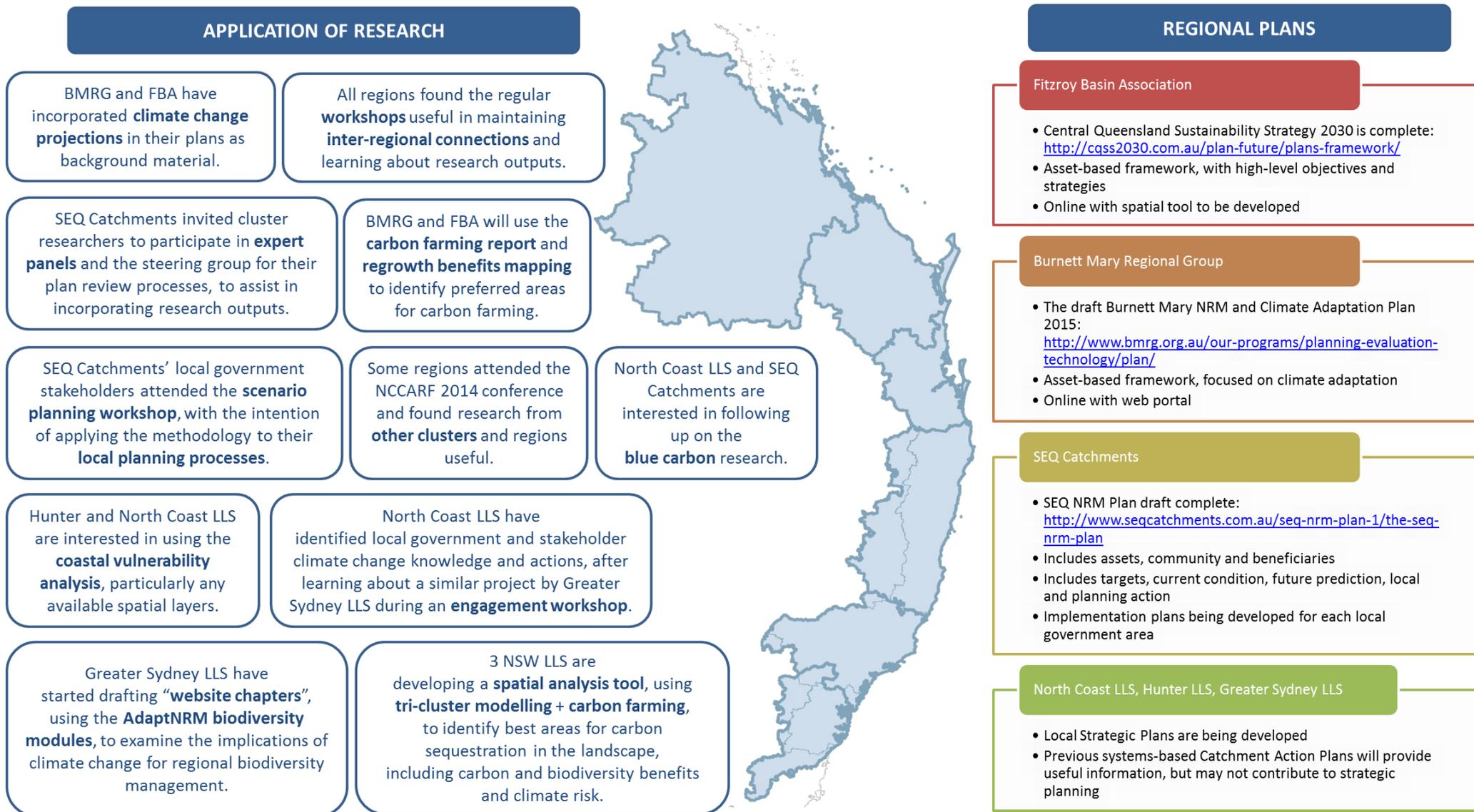


Figure 2. Summary of application of research outputs in June 2015

## 5. RESULTS

### ***5.1 Applicability of research outputs in providing information to assist in NRM planning for climate change adaptation***

Out of all East Coast Cluster research outputs the climate change projections produced by the CSIRO were most commonly cited as being useful to NRM planning for climate change, with four interviewees specifically mentioning their importance for climate adaptation in their region. These projections allowed information to be interrogated in new ways and can be applied to spatial analysis tools. In addition, the associated summary reports were used by several interviewees to clarify new information, included in vulnerability assessments and climate adaptation documents, and used as a general accessible guide.

The second most commonly cited research outputs considered useful related to the carbon farming research carried out by the Queensland Herbarium. In one NRM region, the carbon farming work was considered useful as it came out of a pilot based in that region. A significant long term impact was expected on that region as the spatial layers and research questions were considered very relevant to climate adaptation planning for their region. In another region, the carbon farming research assisted the regional NRM body alongside other stakeholders to identify areas that would have the most impact from actions to improve soil carbon (such as tree planting).

Social and economic vulnerability researchers from the University of the Sunshine Coast were engaged to fine art climate projections for one regional NRM body using SimCLiM, and another was using these research outputs in the development of a section of a climate adaptation planning document. The scenario planning package from Griffith University was used by one regional NRM body to 'start the discussion' and was considered useful to assist in engaging community members and sectors within their region in climate adaptation. NARCLiM products were used to give generalised spatial analysis and have contributed to the development of a climate change adaptation plan. Climate suitability modelling was used by some regional NRM bodies. This included applying sea level rise modelling to assist the protection of assets in coastal environments, and identify areas where monitoring should take place to assess shifts in coastal ecosystems in line with modelling. Integrated assessment reports were used by one regional NRM body to compliment climate adaptation planning where possible.

Local government interviewees were mostly not aware of the majority of East Coast Cluster research outputs but recognised a few (although only superficially). High levels of staff turnover at times also resulted in current regional NRM body NRM planners being unaware of the full suite of East Coast Cluster research outputs: *"I'm not aware of any of those. I only started in the role in May 2015 so they may have been – and I replaced someone else so they – she may have been aware but I'm not aware and I haven't used them in my time so far"*.

### ***5.2 Further developments on the use of research outputs that were identified in the June 2015 research stocktake***

One regional NRM body was continuing to use research outputs from University of Queensland climate modelling, and CSIRO's climate projections to complement investigations into climate change impacts on biodiversity assets and the identification and merit of adaptation zones; and mapping projects to identify hotter suburbs and the role of waterways and green spaces in the cooling of neighbourhoods. Another regional NRM body had organised workshops and webinars with CSIRO researchers to inform local government practitioners of East Coast Cluster research outputs, and another had presented to key stakeholders in their region.

NSW regional NRM bodies did a collaborative project with an external consultant to develop spatial analysis tool (using MCAS-S) modelling opportunities for supporting biodiversity and biosequestration under a change in climate using NARCLiM products, tri-cluster modelling and carbon farming research outputs. This is to assist in prioritising investment in land management and biodiversity in climate adaptation planning. Mapping developed as part of this considered current, 2030 and 2070 climate projections to assist decision making at a range of time scales. A couple

of these regional NRM bodies were continuing to use NARCLiM data to assist in preparing a climate change adaptation plan. One was waiting for NARCLiM products relating to coastal erosion and inundation impacts to use.

*“The intent is to incorporate future NARCLiM products as they become available to refine the outputs of the current models”.*

One regional NRM body had referred to spatial products developed as part of carbon farming research products and had continuing discussions with a researcher involved in this research. The interviewee affiliated with this regional NRM body also had an interest in keeping up to date with any developments on blue carbon.

A couple of interviewees from regional NRM bodies mentioned that they continued to refer to and used integrated assessment briefing notes. One local government interviewee mentioned that they were currently starting on a climate adaptation plan and intended to use the University of Sunshine Coast’s research outputs on social and economic vulnerability, as well as mentioning that they had found the scenario planning workshops by Griffith University useful for considering when embarking on adaptation planning processes.

*“I’m sure all of those tools and others would be helpful as we’re starting to do our risk assessments and vulnerability assessments and determining adaptation options for this area”.*

*“I’m aware that they’re there and it would be crazy not to refer to them and take the lessons from them and the understandings from them”.*

### **5.3 Enablers to the application of research outputs in NRM planning activities**

Some interviewed PWG participants mentioned that a mix of formats allowed for ‘different products or outputs for different purposes’. GIS data was much appreciated by those NRM planners working in mapping, whereas synthesis reports did a good job of providing clear concise information whilst acknowledging uncertainties. Accessibility of research outputs on the web in different formats was considered helpful, especially for research outputs that allowed interactive interfaces relating to climate projections. Documents that provided summaries of research products and understandings were considered very important by some interviewees (for example, reports with case studies and tips and directions for applying research outputs).

Some interviewees expressed concern that the depth and breadth of research outputs would be overwhelming for NRM planners and other potential users of research outputs, particularly for those that had not participated in the community of practice.

*“But it seemed like the project became bigger than Ben Hur and I fear that there’s a whole lot of stuff that’s been produced, a whole lot of money spent, and I hope it hasn’t been wasted. So in terms of the applicability of the research I’m – in my current role as a planner I don’t know how any of that could be applied in my work basically because it’s so overwhelming”.*

Workshops were considered by some interviewees to have been very successful in delivering research materials and allowing regional NRM body representatives to make contributions. Feedback given regarding some of the workshops was particularly positive and even suggested as a potential remedy to address issues relating to the potential for the enormity of research outputs to overwhelm NRM planners:

*“They made it fun. I knew probably half the people in the room and a lot of them were long-term really well-experienced council staff in NRM and they were saying, “This is the first time that I’ve understood this” and you want those people to understand it. They’re putting training in the hands of people who can really use it because they’re working at the NRM coalface and they need to be able to understand that information. So they’re coming full circle. If you said there’s a worry that the depth and breadth of information is overwhelming, something like those workshops were the key to unlock that”.*

The East Coast Cluster research project involved concurrent research and planning investments and activities. Two interviewees mentioned that simultaneous research and planning investments made NRM planning and the use of research outputs difficult to plan together. Compounding these challenges in timing, one interviewee mentioned that their funding was not able to be spent at the time when research products were available, and several others mentioned that research outputs were only available very late in the project.

In terms of alignment of research outputs with core NRM business, one interviewee stated that for landuse planning issues the research outputs had been very helpful, as well as for matters involving writing policy around sustainable communities and exploring regulatory aspects of land use plans for this purpose. Similarly, other feedback from interviewees showed that there was alignment of research outputs with current NRM core business:

*“so the NARCLiM products gave us regional scale climate projections and that one of our modelling questions was related to different scenarios in the future under different climates. So I think we – so the fact that they gave us some regional scale information on – related to a question that we were trying to answer which is what can we expect our carbon sequestration to look like in 20 – I think it was 2030 and 2070, whatever the time periods were. So that’s what helped us there, that’s what enabled the application .... The carbon farming.... it was very useful for the same reason, we were looking at potential for carbon storage in vegetation in the landscape and that was a new product that was very useful to our question”.*

One interviewee suggested that the varying nature of issues relevant to individual regional NRM bodies in the East Coast Cluster produced significant challenges for the research consortium in producing research outputs that are pertinent to all East Coast Cluster NRM regions.

#### **5.4 Opportunities for the use of research outputs in future NRM planning activities**

Two interviewed PWG participants said they thought the climate projections work by CSIRO could complement a range of other planning activities, such as landuse planning, by adding a dimension of climate change.

*“Yeah I think as new data becomes available; the climate change predications will be really critical and crucial in engaging stakeholders in really getting the discussion about climate change back onto the table”.*

Interviewees also mentioned that as time passes East Coast Cluster research outputs are likely to be used and ‘value-added’ by NRM planners and other users. Research outputs such as NARCLiM products and carbon farming products were referred to by one interviewee as ‘products that will be used for a long time in terms of prioritising investment’, and useful in communication with stakeholders and plan development.

*“The information is there now to be used and applied. I guess some of them will continue on. Certainly we’re looking at social and economic indicators with [regional environmental organisation] and their report card. I guess some of that will carry forward. We’ve been doing climate proofing of areas for a number of years too, so any of this information that we can use to continue that will be applied. We’ll continue to work with the universities to get that finer scale data; that’s what we need for [our region]. In saying that we do have a lot of data, so I think we’ve already got a lot of information to make our decisions on, and as new information becomes available we’d update and inform that decision and support and make progress”.*

In order to create more consistency with their NRM planning approach more broadly, one regional NRM body was looking at how to translate climate change impacts into assets based planning. East Coast Cluster research outputs were being used to do this and identify key criteria that should be used in climate adaptation planning for NRM in their region.

#### **5.5 Key learning’s from participation in the project (PWG)**

Some of the things that interviewed PWG participants said they had learnt from participating in the PWG were: an understanding of NRM systems across state borders; and learning about variations across the East Coast Cluster

regions in terms of NRM issues, differing capacities, NRM planning activities and processes, and different ways of approaching issues.

*“there were learnings of how people were going about things; we all had a slightly different way of approaching it”.*

*“What was the main thing I learned? Probably an appreciation of what others were doing, I guess”.*

For one interviewee participating in the PWG alongside other regional NRM bodies gave the chance to identify some things that they were doing in their region that was different and potentially of use to other regions.

*“you not only find out things you don’t know, you find out what people are not doing”.*

Being in touch as people were developing their planning processes and tackling different challenges in their regions was considered valuable to a number of interviewees. One interviewee stated that this experience was valuable learning as it *“consolidated [their] understanding to a practical level rather than just the theoretical”*.

### ***5.6 Impact on participants’ capacity to include/deal with climate change adaptation in their work-related activities***

All interviewed PWG participants stated that their participation in the PWG had increased their capacity to include/deal with climate change adaptation in their work-related activities, although for varying stated reasons. The PWG contributed to one participants’ capacity to include/deal with climate change adaptation through establishing social networks that can be drawn on in future.

*“Yes and I think the community of practice, the Planners Working Group is a forum to actively socially engage with projections and what they mean for different ventures is a really great way to get your head around the science and the scenarios more”.*

Looking at different projections as a large group, and explanations of social and economic vulnerability and the factors involved in workshops was considered a great learning process by another interviewed PWG participant. In addition, having the spatial applications of research outputs explored in workshops, and working through adaptation scenarios with those applications was appreciated by one interviewee who said they had taken skills learnt into their current work practice.

Another two interviewees said their capacity to carry out climate change adaptation was increased by the provision of scientific information and ‘multiple lines of evidence’ and scientific information to share with stakeholders and decision makers. One interviewee also believed that by using the PWG to include NRM planners in the early stages of the project, the integration of science with applied science was enhanced, and as such their capacity to apply scientific knowledge on-ground and monitor it over time was also enhanced.

### ***5.7 Supporting existing collaboration between organisations (regional bodies, community groups, research institutions, government agencies etc)***

Not all interviewed PWG participants believed that East Coast Cluster project activities supported existing collaboration between organisations. One interviewee believed NSW based regional NRM bodies benefited more in terms of collaboration than Queensland-based regional NRM bodies. Another interviewee reasoned that staff turnover was a substantial block to collaboration between organisations.

*“Not much, I would say. I don’t think it changed the relations between the Queensland regions that participated in that. Yes, it increased some networks into New South Wales but in terms of how collaboration within regions happened, I don’t think the working group had any influence and government agencies were pretty absent on the Queensland side of the border. So not much, I don’t think”.*

*“I’m not sure that it actually did much actually. That’s not a fault of the process, but the staff turnover can be fairly high in our own sector and in the academic sector”.*

Some interviewees found it difficult to answer this question because they felt true collaboration was difficult to achieve even in the most suitable environments and approaches.

Interviewed PWG participants mentioned a number of collaborations, including collaboration with government agencies (including interstate government agencies), and research institutions that were supported by the East Coast Cluster. One interviewee stated that this collaboration alongside capacity building outcomes of the project allowed their regional NRM body to take on more of a leadership role in climate change adaptation in ongoing relations with stakeholders in their region. Also interpersonal collaboration was mentioned, although it was noted that the longevity of these relationships may be questionable due to the high rates of staff turnover in NRM-related organisations. One specific collaborative outcome mentioned by several interviewees was the bringing together of the NSW-based East Coast Cluster NRM regional bodies and NRM stakeholders in collaborative project with them on spatial modelling of opportunities for carbon in the landscape, carbon sequestration in the landscape using NARCLiM research outputs.

*“There was a very loose collaboration with some of those, but having this climate adaptation project and the East Coast Cluster really strengthened that and provided a lot more opportunities”.*

*“I think a lot of those things tend to often be person rather than organisation-specific. So there was a range of people who worked fairly closely together for a while through that and while they’re present, that has some lasting value but as they move on, that will probably erode over time”.*

*“I think it’s fostered continuing and improved collaboration between organisations in that I think it made the regional bodies feel as though we’re not alone. I’ve worked in a lot of places where I’ve had colleagues who have collaborated with a university, maybe not a lot but a few. I’ve worked at a university in [this region]. But I don’t remember ever working on a project where I got to collaborate with a university. That’s very valuable”.*

### **5.8 New initiatives/partnerships/networks as a result of participation in the project**

Most interviewees could not solely attribute any new initiatives/partnerships/networks as a result of their participation in the PWG. One interviewee commented that in the absence of a continued formal mechanism to continue monitoring and collaborating around the implementation of East Coast Cluster research outputs, new initiatives/partnerships/networks are less likely. It was also mentioned that ongoing and new initiatives/partnerships/networks are dependent on adequate resourcing.

*“I think when there was something there for everyone to do, it just all naturally came together but as that’s kind of dissipated, then yeah, that fell off a bit. But there will certainly be a role for ongoing collaboration between NRM bodies in particular. But I guess the test for a lot of them now is implementing what they’ve garnered and that in part will depend on resourcing and if there’s not a lot of external funding, then I suspect a lot of that might actually fall off”.*

However, two interviewees mentioned that they were still engaged in informal communications with other PWG participants and researchers. One of these interviewees engaged with other PWG participants through ‘using and trailing the [research] products and comparing notes on that’. The other interviewee mentioned that they had engaged in dissemination of climate change theory and impact management through existing relationships with local government and other regional bodies and community groups, and attributed this to their involvement in the PWG. This included organizing CSIRO delivered workshops for council officers, assisting grant applicants with climate risk planning and developing ‘citizen science’ monitoring programs with landcare groups to record changes in indicator species of native and exotic plants. This interviewee also mentioned that they had consulted widely with other NSW-

based regional NRM bodies to achieve as much consistency as possible across regional boundaries, and share resources and concepts.

### **5.9 Use of 'storylines' in climate change adaptation initiatives**

Interviewees from local government areas had not extensively been engaged in communicating climate change potential futures to community members in their areas. However, one interviewee mentioned that they were in the process of '*finalising a communication strategy which is heavily focused on "telling a story" when communicating any of [their] environmental messages*'. Another interviewee had not used the idea of storylines, but was amenable to the concept. They also mentioned that their local government was planning to develop a communications plan as part of their climate change adaptation plan project, and sought to include '*some strong messaging that the community can relate to*'. This interviewee had reservations regarding the use of 'doomsday type' storylines, in preference for storylines that related to identified community values, and that connected to present conditions in some way.

*"Not trying to do everything all at once, just slowly, slowly iterates as things change over time we can continue to adapt. So that sort of messaging rather than a futuristic storyline maybe".*

### **5.10 Additional findings – collaboration and new initiatives/partnerships/networks.**

Interviewee responses to questions regarding the extent to which they believe East Coast Cluster project activities supported existing collaboration, and the emergence of any new initiatives/partnerships/networks as a result of their participation (Questions B3 and B4) in the project differed greatly.

Whereas some interviewees rated the level of collaboration that has come from the PWG very highly, others did not perceive that there was much collaboration at all. Similarly, although some interviewees mentioned ongoing communications and projects that were started with crucial stimulus from the PWG, others could not mention any ongoing relationships or projects at all. Generally speaking, regional NRM bodies that cover more isolated settlements tended to have a lower perception of collaboration achieved through the East Coast Cluster community of practice. The greatest level of collaboration tended to be between NSW regional NRM bodies, with collaborative projects such as the development of a detailed series of maps using MCAS-S to assist activities across the three NRM regions (although some interviewees were reluctant to attribute this purely to the East Coast Cluster), and other more informal collaborative actions such as consulting with other Local Land Service regions to achieve as much consistency as possible across regional boundaries.

Table 2 (below) lists the plans and documents developed by the East Coast Cluster regional NRM bodies using either input or use of East Coast Cluster research outputs, as well as other products developed with assistance from research outputs. This list compiled in this table is based on information gathered from interviewees and is not presented as an exhaustive list. Additionally, the timing of release of research outputs for some regional NRM bodies did not correspond with their time period of adaptation planning, so for these regions it may be some time before research outputs are formally included in climate adaptation plans and associated documents.

**Table 2. List of regional NRM plans, documents and products developed with input and/or use of research outputs mentioned in interviews**

Regional NRM Body / Local Government	Name of plan, document or product	Research outputs used or referred to
<a href="#">Fitzroy Basin Association (FBA)</a>	<a href="#">CQSS:2030 Science synthesis: Compilation of science and knowledge to support the review of the regional NRM Strategy 2013-2014</a>	Although the FBA document did not directly use East Coast Cluster research outputs in this document, summary reports from the climate projections work clarified for FBA staff which climate change information was out of date, and which was relevant to current circumstances.
<a href="#">Burnett-Mary Regional Group (BMRG)</a>	vulnerability assessment (not be completed or publicly available)	Climate change projections produced by CSIRO assisted the development of a vulnerability assessment of regional assets.
<a href="#">North Coast LLS</a>	Climate change adaptation plan (not yet published on North Coast LLS website).	The plan has a table that provides the basis of North Coast LLS's adaptation planning which uses NARCLiM data.
<a href="#">Greater Sydney LLS</a>	Climate Ready Tool (not yet publicly available).	A tool to assist natural resource managers to prepare conceptually for management under a changing climate. Once values and relevant natural resource assets have been identified, it is expected that climate projections will be applied to analyse which assets will be resilient, which can be managed for the most favourable outcomes and which may be unmanageable.
	Adaptation Planning documents. Not yet publicly available	CSIRO climate change projections as well as NARCLiM data were used in the background information for adaptation planning. University of Sunshine Coast social and economic vulnerability research outputs also provided inputs for a section on adapting agriculture management, and the Queensland Herbarium's carbon farming research provided input for mitigation planning.
North Coast LLS, Hunter LLS, and Greater Sydney LLS	Spatial analysis tool	The tool aims to support biodiversity and biosequestration under a change in climate, and is based on NARCLiM data. Models produced as a part of this exercise are expected to incorporate future updates to NARCLiM.

## 6. CONCLUSION

This final report has provided a final overview and stocktake of the to-date uptake and future opportunities for uptake of East Coast Cluster research project outputs. In order to gather this information feedback interviews were carried out with PWG participants and scenario planning workshop attendees. This final overview follows up on the previous research stocktake carried out in June 2015. This includes assessments made by interviewed participants of research outputs regional NRM bodies have found most useful, any recent developments on the use of research outputs in climate adaptation planning, features that have assisted to the uptake of research outputs, and identified opportunities for future use of research outputs. This final report has also reviewed and collated final feedback from PWG participants regarding their experience of the East Coast Cluster community of practice. This includes contributions to their capacity stemming from the East Coast Cluster 'community of practice' through enhanced knowledge and/or collaboration and partnerships (both formal and informal).

Feedback from PWG participants is imperative in assessing the impact of the East Coast Cluster, as the PWG was key to the research project. Broadly speaking, the feedback from PWG participants regarding both the research outputs and the East Coast Cluster community of practice is positive. Staff turnover, timing of release of research outputs, concurrent research and planning exercises, differing interests and capacities of regional NRM bodies were all cited as causes for shortfalls in expected research output uptake and outcomes in some cases.

Of all the East Coast Cluster research outputs, the climate projections provided by CSIRO were most commonly cited as being useful to interviewees. This was second to carbon farming research products produced by the Queensland Herbarium. However, a range of other research outputs were mentioned as being useful to interviewees, whether in regional NRM bodies, or translatable to new roles they may have in other organisations. The research outputs used depended on the particular environments of NRM regions and where their particular stage of climate adaptation planning. Interviews showed continued progress in the development and use of a number of research outputs since the research stocktake carried out in June 2015. A number of features were identified as assisting (or hindering) the use of research outputs, including the diverse mix of formats, mapping products, summary documents, and workshops. Interviewees identified a range of knowledge areas and skills, and overall increased capacity, that they gained from their involvement in the PWG. These included knowledge of the issues and approaches of other regional NRM bodies, as well as knowledge of networks and individuals that they could (informally) communicate climate adaptation experiences with.

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## APPENDIX 1.

### Interview Questions Used in April 2016

#### Questions for regional NRM body representatives that were engaged with all of the PWG engagement activities and still employed at the regional NRM body

##### A) Research applicability

Applicable research outputs based on 2015 stocktake of uptake for the region:

- climate change projections (CSIRO)       NARClIM products (OEH)
- coastal vulnerability assessment (UoW)       carbon farming (QLD Herbarium)
- social and economic vulnerability (USC)       climate suitability modelling (UQ)
- scenario planning package (GU)       integrated assessment (CSIRO)

1. Are there any further developments on the use of research outputs listed above in your planning activities?
2. Do you see opportunities for the use of these and other outputs in your future NRM planning activities for climate change adaptation in your region? (e.g. next plan review, negotiation/ communication with stakeholders, etc)

##### B) Community of practice

1. What do you consider was the main thing that you learnt from the process of participating in the project (PWG)?
2. Do you think your participation in the project (PWG) has changed your capacity to include/ deal with climate change adaptation in your work-related activities?
3. To what extent do you think the project activities supported existing collaboration between organisations (regional bodies, community groups, research institutions, government agencies, etc)?
4. Were there any new initiatives/ partnerships/ networks that emerged as a result of your participation in the project and are important for your professional development?

#### Questions for regional NRM body representatives that were engaged with only some of the PWG engagement activities, and still employed at the regional NRM body

##### A) Research applicability

1. The project resulted in several research outputs. Out of these outputs which ones were the most useful in providing information to assist in NRM planning for climate change adaptation in your region:

- climate change projections (CSIRO)       NARClIM products (OEH)
- coastal vulnerability assessment (UoW)       carbon farming (QLD Herbarium)
- social and economic vulnerability (USC)       climate suitability modelling (UQ)
- scenario planning package (GU)       integrated assessment (CSIRO)

2. What enabled the application of these outputs in your NRN planning activities? (e.g. format of material, issue

covered, timing of release, mode of delivery, alignment with current NRM core business, etc)

3. Do you see opportunities for the use of these outputs in your future NRM planning activities for climate change adaptation in your region? (e.g. next plan review, negotiation/ communication with stakeholders, etc)

*B) Community of practice*

1. What do you consider was the main thing that you learnt from the process of participating in the project (PWG)?
2. Do you think your participation in the project (PWG) has changed your capacity to include/ deal with climate change adaptation in your work-related activities?
3. To what extent do you think the project activities supported existing collaboration between organisations (regional bodies, community groups, research institutions, government agencies, etc)?
4. Were there any new initiatives/ partnerships/ networks that emerged as a result of your participation in the project and are important for your professional development?

**Questions for regional NRM body representatives that were engaged with only some of the PWG engagement activities, and no longer employed at the regional NRM body**

*A) Research applicability*

1. The project resulted in several research outputs. Out of these outputs which ones were the most useful in providing information that you can use in your current role?  
( ) climate change projections (CSIRO)      ( ) NARClIM products (OEH)  
( ) coastal vulnerability assessment (UoW)      ( ) carbon farming (QLD Herbarium)  
( ) social and economic vulnerability (USC)      ( ) climate suitability modelling (UQ)  
( ) scenario planning package (GU)      ( ) integrated assessment (CSIRO)
2. What features of these outputs made them useful in your current role? (e.g. format of material, issue covered, timing of release, mode of delivery, alignment with current core business, etc)
3. Do you see opportunities for the use of these outputs in future activities associated with your current role?

*B) Community of practice*

1. What do you consider was the main thing that you learnt from the process of participating in the project (PWG)?
2. Do you think your participation in the project (PWG) has changed your capacity to include/ deal with climate change adaptation in your work-related activities?
3. To what extent do you think the project activities supported existing collaboration between organisations (regional bodies, community groups, research institutions, government agencies, etc)?
4. Were there any new initiatives/ partnerships/ networks that emerged as a result of your participation in the project and are important for your professional development?

## Questions for local government participants

### A) Research applicability

1. The project resulted in several research outputs. Out of these outputs which ones were the most useful in providing information to assist in NRM planning for climate change adaptation in your region:  
( ) climate change projections (CSIRO)      ( ) NARClIM products (OEH)  
( ) coastal vulnerability assessment (UoW)      ( ) carbon farming (QLD Herbarium)  
( ) social and economic vulnerability (USC)      ( ) climate suitability modelling (UQ)  
( ) scenario planning package (GU)      ( ) integrated assessment (CSIRO)
2. What enabled the application of these outputs in your NRM planning activities? (e.g. format of material, issue covered, timing of release, mode of delivery, alignment with current NRM core business, etc)
3. Do you see opportunities for the use of these outputs in your future NRM planning activities for climate change adaptation in your region? (e.g. next plan review, negotiation/ communication with stakeholders, etc)

### B) Community of practice

1. What do you consider was the main thing that you learnt from the process of participating in the project (PWG)?
2. Do you think your participation in the project (PWG) has changed your capacity to include/ deal with climate change adaptation in your work-related activities?
3. To what extent do you think the project activities supported existing collaboration between organisations (regional bodies, community groups, research institutions, government agencies, etc)?
4. Were there any new initiatives/ partnerships/ networks that emerged as a result of your participation in the project and are important for your professional development?

### C) Climate Storylines

1. Have you used 'storylines' in your climate change adaptation initiatives? If not, how do you communicate climate change projections to stakeholders? What sorts of strategies do you use to convey messages relating to climate change and potential futures?

