Climate Change Impacts and Adaptations in Gippsland – A Regional Approach

Jo Caminiti, Senior Partnership Development Coordinator
West Gippsland Catchment Management Authority, Traralgon, Australia

Introduction
In recent times, the debate about greenhouse gas emissions and their abatement, and the political and economic ramifications of signing the Kyoto Protocol, often overshadows the discussion of climate change impacts and how to adapt to them. Indeed, many still contest the link between human produced greenhouse gases and climate, or that the climate will change at all. In a recent synthsise on the future of Australia's landscapes, Cork and Delaney (2005) cited climate change as an example of where consideration of cascading effects of environmental change is required, however, it 'is not well understood and is poorly accepted by decision makers and the public'. Up until the last year or so, the mass media were generally giving equal air time to sceptics whenever there was a report about climate change.

This paper describes the journey embarked on in Gippsland, a region in south-eastern Australia, to better understand climate change impacts and how to build this understanding into our daily lives and decision making processes.

The Gippsland Region
Gippsland, with a population of nearly 200,000, covers about one fifth of the state of Victoria and extends from the Victorian Alps to Bass Strait. The diverse Gippsland coast has over 30 estuaries, including the Gippsland Lakes, Australia's largest navigable lake system, and Corner Inlet, both of which are Ramsar listed wetlands for the protection of internationally significant water bird habitat. Gippsland also includes 8 heritage rivers, and 6 of the State's 13 Marine National Parks.

Gippsland is rich in natural resources, providing 60% of the water storage capacity for Melbourne, the state capital, generating 95% of the state's electricity from brown coal fired power stations, and accounting for 19% of Australia's milk production. Offshore oil and gas fields produce nearly all of the State's natural gas and two thirds of Australia's cumulative oil production (WGCMA 2004). Extensive native hardwood forests and expanding softwood and hardwood plantations support sawlog and pulp industries.

Institutional arrangements
In the State of Victoria, Australia, ten catchment management authorities were established in 1997 under the *Catchment and Land Protection Act 1994* to protect land, water and biodiversity in partnership with other government agencies, industry and the community. Catchment management authorities, with their community advisory structures, provide a mechanism for determination of natural resource management priorities by regional stakeholders who have to live with both the problems and solutions. These are documented in *Regional Catchment Strategies* that take into account environmental, social and economic factors. Gippsland is covered by two of these Strategies, one for the more heavily populated and developed west (WGCMA 2004) and the other for the east with its extensive areas of national parks and state forests (EGCMA 2005).

In order to facilitate a whole-of-Gippsland approach to the management of the region's natural resources, the Gippsland Integrated Natural Resources Forum (GINRF) was formed in 2000 under the slogan '*Catchment Health, Gippsland's Wealth*'. The role of the Forum is to achieve a co-operative and strategic approach to natural resource management in the region. The Forum has a membership of some fifty organisations including government departments, catchment

management authorities, municipal councils, rural and urban water authorities, universities, private industry, regional development bodies, community based groups (such as Landcare), and cross agency groups (such as Gippsland Research Coordination Group). Working groups and an Executive are drawn from the broader Forum membership. The Forum supports the implementation of the two *Regional Catchment Strategies* and their supporting action plans.

More recently, the Victorian government has also established regional managers forums (RMFs). Comprised of the regional heads of state government agencies and municipal chief executives. The aim is to achieve greater coordination of services and activities undertaken by state and local governments.

Project genesis

During the development of the *West Gippsland Regional Catchment Strategy* (WGCMA 2004), stakeholder workshops with community, industry and government consistently identified climate change as an issue that needed further investigation. Both the West and East Gippsland *Regional Catchment Strategies* (WGCMA 2004, EGCMA 2005) identify climate change as a potential threat to a range of bio-physical and socio-economic assets across Gippsland, and both strategies support management actions to understand what the impacts may be and to develop adaptation responses.

Scientific information about aspects of climate change at a broad scale has been available for some time. In Victoria, this information has been drawn together to provide regional profiles (State of Victoria, 2004a&b); however, it remains difficult to make sense of climate change in the context of local daily activities and decision making processes. The need to better understand the impacts of climate change has manifested in a range of new investigatory studies focused on specific subjects including water resources, biodiversity, bushfire risk, alpine resorts, and land suitability for selected agricultural commodities. In order to make sense of climate change at a regional level, there is a need to extract relevant information from these studies and interpret the impacts based on the modelled climate change for the region.

To address this need, a group of regional stakeholders under the leadership of the West Gippsland Catchment Management Authority, put together a project brief to synthesise the current climate change information relevant to Gippsland, and to identify regional information needs about climate change and options for adaptation. At the same time, the Victorian Government was looking at how best to build the community's capacity to adapt to climate change through its *Victorian Greenhouse Strategy Action Plan Update* (State of Victoria 2005).

The project also in part meets the needs of a partnership between the Shire Councils of Wellington, East Gippsland, South Gippsland, and the Latrobe City Council to consider development of a *Gippsland Regional Climate Change Action Plan*. It also complements the Natural Heritage Trust funded project being undertaken by the Gippsland Coastal Board on *Sea Level Change Implications for the Gippsland Coast* (McInnes et al. in prep).

The ensuing project *'Climate Change Impacts and Adaptations in Gippsland'* , one of three regional pilot projects in Victoria funded by the Victorian Government, commenced in mid 2005.

The project

The project had three main objectives:

- Synthesise current information on climate change projections and potential impacts for the Gippsland region and assess the key climate change issues to provide integrated, cross-sectoral information on which to base future strategies and activities for climate change adaptation

- Determine what information key stakeholders in the Gippsland region need to know about climate change impacts on both the bio-physical assets and flow on effects to socio-economic assets, and about adaptation options to feed into their decision making processes
- Identify priorities to fill information gaps in understanding of potential climate change impacts and appropriate adaptation responses.

A steering committee including representatives from Latrobe City, Wellington Shire, Department of Sustainability and Environment, Department of Primary Industries, Department of Victorian Communities, Gippsland Water, Southern Rural Water, Gippsland Agribusiness Forum, Gippsland Coastal Board, was chaired by the West Gippsland Catchment Management Authority. Members of the steering committee and the Gippsland Integrated Natural Resources Forum provided in kind support for the project. The Pathfinder Network and Commonwealth Scientific and Industrial Research Organisation (CSIRO) were appointed to synthesise current information on climate change and engage with key Gippsland stakeholders to explore potential impacts, information gaps and adaptation opportunities.

Along with numerous formal and informal conversations, a series of workshops were held for the project over the second half of 2005. The first workshop was hosted by the Gippsland Integrated Natural Resources Forum and was designed to enroll regional leaders and technical specialists in the project and inform participants of the latest scientific work on climate changes, its causes, projected changes and likely major impacts on biophysical and socio-economic assets.

A month later, six concurrent ½ day technical workshops used the CSIRO Climate Impact Matrix to systematically assess potential impacts of the main climate variables for various sectors including: water, rivers and coasts; biodiversity; forests and fire management; communities, infrastructure and services; agriculture and fisheries; and industry and commerce.

Concurrently, a synthesis of climate change impacts in Gippsland was prepared by CSIRO (Brooke and Hennessy 2005). This updated and expanded on information provided in regional climate change profiles developed by CSIRO and published by the Victorian Government in 2004 (State of Victoria 2004a&b).

A final meeting was held with regional leaders and technical specialists to absorb the overall picture of impacts on Gippsland and to identify the priorities for action, whether they be filling in gaps in knowledge, communicating the issues of climate change and its impacts, organising to adapt or taking adaptive action.

The final project report provides an overview of all components of the project (Fisher, 2006). Its appendices include the above mentioned synthesis containing detailed information on current climate change studies relevant to Gippsland (Brooke and Hennessy 2005), and methods and results of the three workshops. The report and appendices are available to download from the West Gippsland Catchment Management Authority's website www.wgcma.vic.gov.au.

Project findings

It must be remembered that when this project was initiated, with few exceptions, climate change had not made it onto the mainstream agenda of regional organisations with a role in natural resource management. The regional climate change profiles produced by the Victorian Government had been released but had not penetrated (State of Victoria 2004a&b). The diversity of views are encapsulated by the following paraphrased comments made during a briefing of one regional decision making body during the project development phase, '*the climate will not change, it is all a beat up; the climate might change but it will be long after we're gone; the climate is changing but humans have nothing to do with it; the climate is changing but*

we cannot do anything about it; never mind the climate change impacts, we have to do something about greenhouse gas emissions.'

Enrolling the leadership in the project was a major task that required individual face to face and telephone contact in order to get people along to the first workshop which then made the scientific case for climate change and started to elucidate the expected climate change impacts for Gippsland. This workshop was crucial to get climate change on participants' personal agendas and provide the authorising environment for their organisiations to participate in the rest of the project. It is interesting to note that a recently published guide to climate change impacts and risk management presupposes that participants in the proposed initial climate change risk management exercise 'must have a common view of all these matters for the exercise to operate efficiently' (Commonwealth of Australia 2006). Experience in the Gippsland project suggests that considerable effort is required to initially get the leadership to participate so that they can start to develop a common view.

Specific climate change information for Gippsland is documented in the project reports and Government regional climate change profiles (State of Victoria 2004a&b, Fisher 2006, Brooke and Hennessy 2005). Rainfall is predicted to decrease slightly in the west of Gippsland and may increase slightly in the east due to the influence of east coast lows. It appears that Gippsland will not be affected as severely as areas inland to the north. However, with increasing temperature and evaporation, streamflow is expected to decrease by 4% to 19% by 2030 (State of Victoria 2006a). The alpine areas are expected to experience a large reduction in the extent and duration of snowcover. Sealevel is expected to rise by 0.8 to 8cm per decade, and may be exacerbated by more extreme weather events. The impacts of this on the fragile barrier dunes that separates the Gippsland Lakes from Bass Strait, and the low lying areas around Corner Inlet are currently been investigated (McInnes et al. in prep).

Once organisations were enrolled in the project, six concurrent ½ day technical workshops were held to systematically assess potential impacts of the main climate variables for various sectors. The discussions held during this process helped to tease out participants' understanding of the impact of climate change and come to some concensus about which impacts may be more important to what activities within each sector (Fisher 2006). Many participants, including the facilitators and the steering committee, had difficulties in coming to grips with how climate change information is presented as a range of percentages with uncertainties, and what that actually means when translated to daily business. A major finding of the project is *'how do we make this real for people?'*, especially when most people are too busy to spend days at workshops developing their understanding. In an effort to address community feedback which indicated previously published material is sometimes hard to understand, CSIRO have just released a publication of simplified climate change scenarios for use in the above mentioned risk management assessment (Hennessy et al. 2006).

The final workshop held in December 2005 aimed to draw all of the information together and identify the priority actions needed to develop adaptation responses and fill important information gaps. It was well attended, as were all of the workshops, however many participants were new to the project. This, along with the workshop design, led to a reopening of discussion to build the participants' understanding rather than honing down of options to a succinct list of priorities to inform future projects. Consequently, the project report contains a broad ranging list of options and recommendations for future action (Fisher 2006). Three major recommendations were to:

- develop an authorising environment to ensure climate change is considered in regional decision making processes;
- fund and establish a regional coordinating function for climate change that can progress the work commenced through this project; and

- ensure that the project findings are fed into planning processes, particularly the *Central Region Sustainable Water Strategy* (State of Victoria 2006a).

Rather than spend more time refining the reports from the project, the steering committee decided to focus getting the information out to people and implementing these three recommendations.

The next steps

The Gippsland Integrated Natural Resources Forum (GINRF) executive supported by the Gippsland Regional Managers Forum have now taken on climate change as a permanent agenda item, providing the authorising environment at the most senior levels in the region. Concerns about how climate change is dealt with in the *Central Region Sustainable Water Strategy* have been communicated to government through submissions from GINRF and member organisations.

As a consequence of the project, a highly successful public forum on climate change was held in June 2006 at the request of a community group in South Gippsland who organised the function. This could be a model for wider public engagement in understanding and adapting to climate change in the future.

Through discussions with the Department of Sustainability and Environment, resources have been allocated to engage a Gippsland climate change coordinator to progress the work commenced through this project and help the region to adapt to the changing climate in an informed and effective manner. This supports the Victorian State Government's 2006 *Sustainability Action Statement* (State of Victoria 2006b) which provides policy direction on adapting to climate change through:

- Improving resilience of Victoria's natural assets to cope with more bushfire –risk coastal erosion, flood control, and stormwater infrastructure;
- Making Victoria's agricultural systems resilient to climate change;,
- Making our buildings, infrastructure and homes more adaptable to climate change, such as heat stress;
- Understanding what climate change will mean for the health of Victorians, especially the elderly, young and sick; and,
- Understanding what climate change will mean for individual communities in regions, so they can better prepare.

As chair of the project steering committee, and the instigator of the project, the author feels that the project has helped to positon the decision makers in Gippsland to take on the challenge of adapting to our changing climate in a more informed and timely manner.

Acknowledgements

The author wishes to acknowledge the Victorian Department of Sustainability and Environment for funding and supporting this pilot project, the project steering committee for their bravery and efforts, and the West Gippsland Catchment Management Authority for supporting the project and preparation of this paper.

References

Brooke, C., & Hennessy, K. (2005) ***Climate Change Impacts in Gippsland,*** prepared by Climate Impacts and Risk Group, CSIRO Marine and Atmospheric Research for the West Gippsland Catchment Management Authority, Traralgon, Victoria http://www.wgcma.vic.gov.au/default.asp?action=page&catID=20&pageID=278 accessed 14 August 2006

Commonwealth of Australia (2006) ***Climate Change Impacts and Risk Management – A Guide for Business and Government***, Australian Greenhouse Office and Department of

Environment and Heritage http://www.greenhouse.gov.au/impacts/publications/risk-management.html accessed on 14 August 2006

Cork, S. & Delaney, K. (2005) ***Thinking about the future of Australia's landscapes*** Land and Water Australia, Canberra

EGCMA (2005) ***East Gippsland Regional Catchment Strategy 2005-2010*** East Gippsland Catchment Management Authority, Bairnsdale, Victoria http://www.egcma.com.au/file/East%20Gippsland%20Regional%20Catchment%20Strategy%202005-2010_1.pdf accessed on 18 August 2006

Fisher, S. (2006) ***Report for the Climate Change Impacts and Adaptation in Gippsland Project - A Regional Pilot Project Initiating Gippsland's Response to Climate Change***, prepared by The Pathfinder Network for the West Gippsland Catchment Management Authority http://www.wgcma.vic.gov.au/default.asp?action=page&catID=20&pageID=278 accessed 14 August 2006

Hennessy, K., Macadam, I. & Whetton, P. (2006) ***Climate Change Scenarios for Initial Assessment of Risk in Accordance with Risk Management Guidance*****,** Prepared by CSIRO Marine and Atmospheric Research for the Australian Greenhouse Office and Department of the Environment and Heritage, Canberra, May 2006 http://www.greenhouse.gov.au/impacts/publications/risk-scenarios.html Accessed 14 August 2006

McInnes, K.L., Macadam, I., & Hubbert, G.D. (in preparation), ***Climate Change in Eastern Victoria Stage 3 Report: The effect of climate change on extreme sea levels in Corner Inlet and the Gippsland Lakes***, prepared by CSIRO Marine and Atmospheric Research & Global Environmental Modelling Systems for the Gippsland Coastal Board, Bairnsdale, Victoria

State of Victoria (2004a) ***Climate Change in West Gippsland***, Department of Sustainability and Environment, Melbourne, Victoria

State of Victoria (2004b) ***Climate Change in East Gippsland***, Department of Sustainability and Environment, Melbourne, Victoria

State of Victoria (2005) ***Victorian Greenhouse Strategy Action Plan Update***, Department of Sustainability and Environment, Melbourne, Victoria

State of Victoria (2006a) ***Draft for Community Comment Sustainable Water Strategy Central Region***, Department of Sustainability and Environment, Melbourne, Victoria

State of Victoria (2006b) ***Our Environment, Our Future – Sustainability Action Statement 2006*** http://www.dse.vic.gov.au/ourenvironment-ourfuture/responding.htm accessed on 18 August 2006

WGCMA (2004) ***West Gippsland Regional Catchment Strategy 2004-2009***, West Gippsland Catchment Management Authority, Traralgon, Victoria http://www.wgcma.vic.gov.au/default.asp?action=page&catID=39&pageID=201 accessed on 18 August 2006