

Natural Resource Management

And

Climate Change and Greenhouse Effect

In the Cradle Coast Region of Tasmania

A Discussion Paper

December 2003

Draft

The Role of Discussion Papers in the development of the Cradle Coast Natural Resource Management Strategy

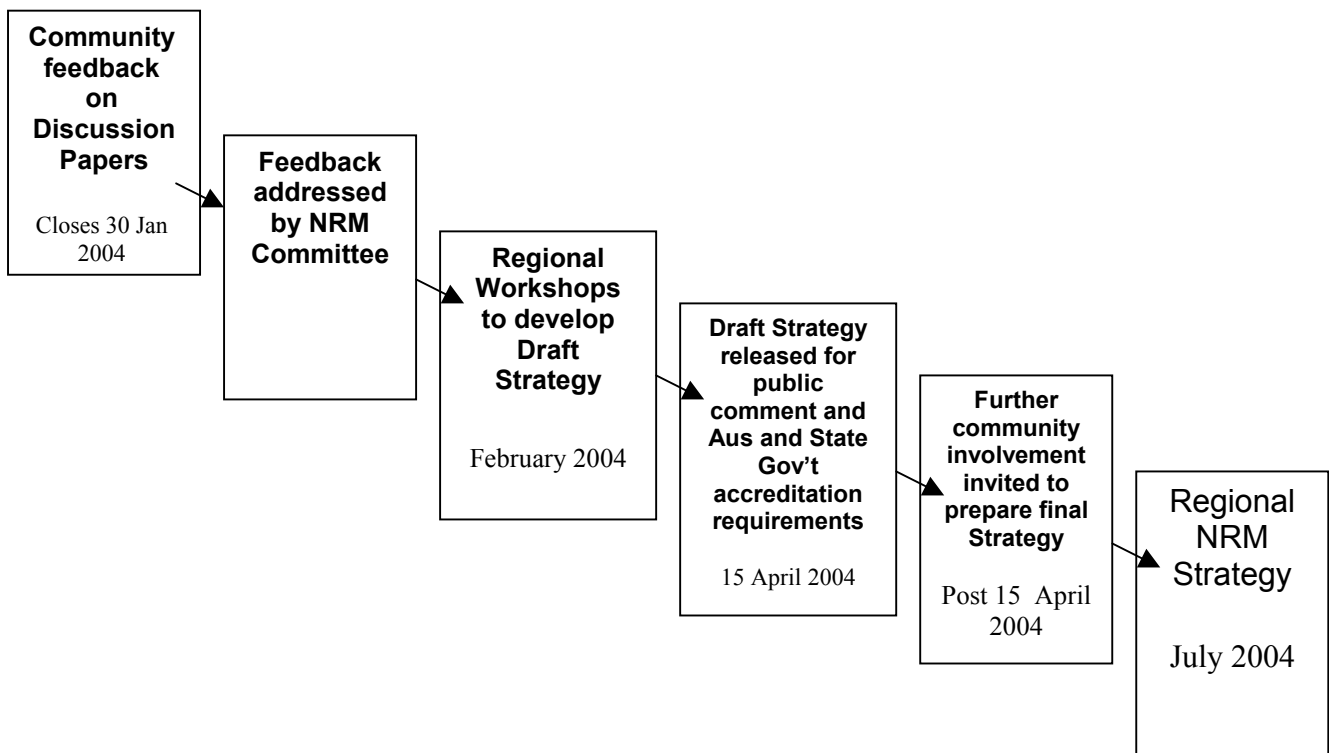
CRADLE COAST NATURAL RESOURCE MANAGEMENT COMMITTEE

A regional NRM Committee has been established to develop a strategy for the Northwest, West Coast and King Island region (Cradle Coast Region). The Committee is made up of representatives of Aboriginal community, state and local government, community and conservation interests, industry and land managers, including public land managers. This Committee is known as the Cradle Coast Natural Resource Management Committee.

WHY DO WE NEED TO MANAGE OUR NATURAL RESOURCES?

There are challenges for us all in the way we decide to utilise our natural resources such as water, air, land, plants and animals while maintaining healthy ecosystems and resources for future generations. Natural Resource Management (NRM) seeks to manage our natural resources in a sustainable manner for the longterm; achieving a balance between economic and social development and the need to protect the environment upon which they rely.

CRADLE COAST NRM STRATEGY TIMELINE



ROLE OF DISCUSSION PAPERS

These discussion papers represent the first phase towards the development of a regional NRM strategy. The Cradle Coast NRM Committee has developed discussion papers for key areas of natural resource management, they are;

- SUSTAINABLE PRODUCTION
- BIODIVERSITY
- CULTURE, HERITAGE AND LANDSCAPE CHARACTER
- CLIMATE CHANGE AND GREENHOUSE EFFECT
- WATER
- CAPACITY BUILDING
- AIR QUALITY,
- USE OF NATURAL ASSETS ON PUBLIC LAND

Please approach the discussion papers with the understanding that they are not considered to cover all issues comprehensively and do not prioritise or weight any issues more highly than others. The discussion papers are designed to stimulate and capture feedback from stakeholders on the breadth of issues concerning the community for input into the draft strategy.

THE VALUE OF YOUR CONTRIBUTION

Feedback from the papers will be used to develop material for a series of workshops beginning in February at which prioritisation of issues will begin for incorporation into and development of the strategy.

Your contributions are vital to the successful development of the strategy. To assist with providing feedback we have incorporated question boxes at the end of each paper; please detach and return to us by 30 January 2004.

If you have any questions relating to the discussion papers or the process in general please contact a NRM facilitator at :

Cradle Coast Authority
PO Box 338
BURNIE 7320
Ph 03 6431 6285

Further copies are available: hardcopy, CD, Email and on the web at <http://www.nrmtas.com.au> (please call Kay Nielson at 6431 6285)

A NRM Newsletter which provides updates on the progress of the process. It is available on the web at <http://www.nrmtas.com.au> , hardcopy or email, please contact Carol Bryant on 64316285 or cbryant@cradlecoast.com if you would like to be placed on the subscribers list.

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Introduction

A number of areas within the Cradle Coast Region have been identified as subject to risk from natural processes and hazards associated with climate change. These areas need to be managed in order to minimise the need for engineering or remediation works to protect land, property and human life.

This Paper has been prepared by a small group of members of the Cradle Coast Natural Resource Management Committee, together with some key stakeholders. This group have identified some of the various issues and actions for responding to the possible impacts of climate change and the greenhouse effect . It should be noted that the actions listed do not appear in any order of importance and have all been included without sorting or detailed prioritisation.

Community consultation is being undertaken on the contents of this Paper to establish whether the identified objectives, values, issues, gaps and possible actions have regional relevance and support. It will also identify any additional matters not currently included and begin the development of building community partnerships and ownership.

Your feedback on this Discussion Paper is extremely valued; feedback will be considered and incorporated to develop some of the social elements of the Draft Regional NRM Strategy.

Regional Priority: Climate Change and Greenhouse

Regional Goals:

- To limit net greenhouse gas emissions, in particular to meet international commitments.
 - To foster knowledge and understanding of greenhouse issues.
 - To lay the foundations for adaptation to climate change.
 - Develop appropriate planning and development policies and improve information access for suitable management of climate change effects.
 - To capitalise on agricultural opportunities for Primary Industries.
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The *Tasmania Together* process identified 5 community targets of particular relevance to climate change and greenhouse effect for natural resources:

- To foster innovative design of built and landscaped environments;
- To understand, protect and manage our globally significant natural and physical resources;
- To have a clean and green image in the international community;
- To reduce air and water pollution; and
- To mitigate the effects of greenhouse gases and ozone –depleting substances and where possible, reduce their emissions.

Current Resource Management “Drivers” and Legislative Mechanisms

In 1998 the Australian Government signed the Kyoto Protocol in support of a global effort to stabilise greenhouse gas emissions: the Protocol has yet to be ratified.

The Australian Government has responded to various international agreements on the Greenhouse effect, including the Kyoto Protocol, through establishment of the Australian Greenhouse Office and development of a National Greenhouse Response Strategy. In 1996 the Australian, State and Local Governments of Australia developed a revised National Greenhouse Strategy. The Strategy includes greenhouse gas reduction programs for matters such as increased energy efficiency (and use of natural gas), revegetation and vegetation protection; and local government action (e.g. energy efficient building standards).

The National Greenhouse Gas Inventory has been established to provide gas emission estimates for the United Nations Framework Convention on Climate Change (UNFCCC) and for Australia’s 108% Kyoto emissions target. The Inventory reports on human-induced greenhouse gas emissions in six sectors: 1. Energy, 2. Industrial Processes, 3. Solvent and Other Product Use, 4. Agriculture, 5. Land Use Change and Forestry, and 6. Waste.

As part of the community education and capacity building aspects of climate change and greenhouse the National Greenhouse Office has set up the Cool Communities Program. In Tasmania there are three projects, however, none of these are in the Cradle Coast Region. The projects deal with air quality - wood smoke in particular, transport and sustainable home energy use.

The Tasmanian Government will establish a Consultative Committee to deal with the *Tasmania Together* Greenhouse targets and National gas emission targets.

The Sea - level Reference Group provides technical expertise on the likely impacts of sea-level rise and will coordinate response strategies particularly with respect to monitoring and evaluation.

Some Local Governments e.g. Hobart City Council, have developed Greenhouse Local Action Plans. These have been prepared under the auspices of the Cities for Climate Protection Program (CCP), an international program to assist local governments to reduce greenhouse gas emissions. In Australia CCP is delivered by the Australian Greenhouse Office and the International Council for Local Environmental Initiatives.

Current Conditions:

GREENHOUSE EFFECT

The greenhouse effect is a natural process in which various gases in the Earth's atmosphere trap some of the heat radiating from the Earth. This process provides an insulating effect and raises the Earth's surface temperature above the temperature it would otherwise be. This effect is essential to sustain life on Earth. However the quantity of greenhouse gases being released into the atmosphere has been increasing significantly above those released through natural processes. Industrial activity over the last century, in particular, has been responsible for increasing the quantities of greenhouse gases released into the atmosphere. The additional insulation resulting from this accumulation of human-induced greenhouse gases is believed to be slowly increasing the Earth's surface temperature. This global warming phenomenon is termed the enhanced greenhouse effect.

There is a lot of uncertainty about the greenhouse effect and how human activities are causing climate change. Although the Earth's surface is getting warmer, we're not sure exactly how much warmer it will get. Furthermore, we are unable to say what is likely to occur in a particular region, as the potential impacts of global warming at the regional level are difficult to quantify. Climate change will affect human activities throughout the world and will continue to affect all countries including the west-northwest region of Tasmania. It is an emerging issue in natural resource management organisations in Australia and the region.

The potential impacts of global warming include changes in rainfall levels and coverage, increased fire danger, an increase in the frequency and severity of extreme climatic events such as storms, drought and floods, and an increase in sea levels as glaciers melt and oceans expand. By changing the environment, particularly alpine and coastal ecosystems, the enhanced greenhouse effect will also impact on many plant and animal species if the rate of climate change is too great for these species to adapt.

'Rainfall, rather than temperature, is more significant in Australia, warming may not be beneficial for Australian farmers. Change, while not catastrophic, will alter productivity in other parts of the world and Australian farmers need to be aware of the implications'. (Neville Nicholls: leader of the Climate Forecasting Group at the Bureau of Meteorology).

Recent climatic modelling by the CSIRO indicates that in Tasmania, rainfall patterns are likely to change. There may be decreased precipitation and less intense rainfall in summer; with an increase in rainfall intensity in winter. Tasmania is also likely to experience stronger westerly winds associated with deeper low pressure systems. Storm surge would consequently increase in frequency and intensity, with higher tides and wind waves. These changes have the potential to impact significantly on erosion and sedimentation processes, both inland and along the coast.

SEA LEVEL RISE

The impact of sea level rise, such as increased erosion and sedimentation processes on coastal areas is an issue that is insufficiently understood by coastal management organisations in the region, and inadequately planned for. While sea levels rose significantly at the end of the last ice age (between 10,000 and 6,500 years ago), the most recent changes have been created by global warming, resulting from human's impact on the world environment. These changes are occurring at a rate considerably greater than has occurred during the last 6,000 years of the present interglacial period.

Experts are divided on the past and future height of sea level, not whether it has, or will continue to rise.

The United Nations Intergovernment Panel on Climate Change (IPCC 2001) has estimated that there was a 10 to 20 cm rise in sea level in the 20th century and predicts that a further rise of 9 to 88 cm will occur in the next 100 years. This is a significant departure from the current sea level. On sandy coasts a horizontal retreat of 50 – 100 times the vertical rise in sea level might be expected. This may result in the incursion of sea levels between 10 and 100 m inland.

Recent sea level rise is a probable cause of the active coastal erosion presently widespread throughout Tasmania. In the Cradle Coast region, areas of greatest risk from the effects of sea level rise are sandy coasts, particularly those backed by low gradient and low altitude plains of unconsolidated sediments. The effects of coastal erosion resulting from sea level rise and changing weather can extend inland substantially.

Sandy coasts currently in equilibrium or eroding are likely to erode or erode more quickly. Locations of this nature with substantial human usage and infrastructure, include Port Sorell/Bakers Beach sand-spit, Northdown Beach/Pardoe Beach (East Devonport), Lillico Beach, Turners Beach and Forth Estuary and Ocean Beach spit (Macquarie Harbour). Sandy coasts currently prograding (growing outwards) may continue to do so at an increased rate: the principal area in the region of such activity is between Woolnorth and Rocky Point.

Estuaries are also likely to experience significant impacts due to climate change. Sediment is likely to be eroded between mean sea level and mean high water, and redeposited sub-tidally. This may cause estuary mouths to widen and become

shallower. Consequently, there will be disruption and retreat of intertidal communities that occupy a specific section of the tidal range, such as salt marshes.

Rocky coastlines will be less rapidly affected by sea level rise and climate change, although some exposed rocky coasts may experience increased frequency of coastal landslips and sea-cliff instability.

Although changes of a similar nature have occurred at various times through geological history, at present the rates of change of sea level rise and climate change which are occurring are well in excess of those which would have occurred naturally under the conditions of the present interglacial phase. The changes will impact significantly on human infrastructure, agriculture and other systems developed under an implicit assumption of a stable climate and sea level. These activities were not planned to accommodate significant environmental changes. Moreover, the presence of widespread human alteration and fragmentation of natural ecosystems means those ecosystems are now less capable of 'smoothly' adapting to the effects of climate change than during previous changes prior to the growth of human civilisations. This means more species extinctions and other deleterious environmental effects can be expected than would have occurred during purely natural periods of climate change.

In 1998, the West North West Coastal Management Plan project commissioned a report on coastal geomorphology incorporating the issue of sea level rise/climate change, titled 'West North West Tasmania Coastal Management Plan: Geomorphology and Geo-heritage' by Chris Sharples. The report identified areas and locations at risk from the effects of a rise in sea level and climate change. However, locations within the west northwest region likely to be affected by climate change and sea level rise, require more detailed assessment to determine the nature and level of impacts and actual risk, particularly those containing permanent human activity and infrastructure investment. Research of areas at risk could employ the use of computer modelling to test the effects of various "greenhouse" scenarios.

The State Government is hoping to have data available by mid-2004 which will enable modelling for both sea-level rise and impacts of climate changes on agricultural production.

Specific Goals

Specific goals identified for climate change and greenhouse effect are:

- Review and expand on information currently available;
- Increase the accessibility of information;
- Identify and assess areas at risk, including the assessment of potential processes and hazards of climate change on these areas;
- Review planning policies and develop control provisions in areas identified as at risk;
- Develop policies to respond to the potential effects of climate change on the use and development of natural resources;
- Reduce/improve current practices that are contributing factors to climate change such as green house gas emissions;
- Awareness program on the value of maintaining coastal vegetation;

- Generate public awareness of the nature, extent and likely impact of climate change and sea level rise, particularly on property, nature conservation values, land form systems, infrastructure and industry;
- Increase the awareness of landowners, infrastructure organisations (particularly Councils), industry, educational institutions and funding bodies for the need to reduce greenhouse gas emissions;
- Implementation of a consistent program of research and monitoring of climate change, aimed at determining the nature and rates of change (past and future) for geomorphic forms (coastal landforms, erosion and sedimentation rates), the impacts on vegetation communities and fauna, and the likely impacts on servicing infrastructure, agriculture and other human activities;
- Formulate appropriate planning and management policies to manage the likely impacts of climate change (including sea level rise);
- Create a database containing information on landform systems and sites to assist informed decisions about planning policy and development;
- Generate a comprehensive and accessible State-wide information data base of information required to effectively manage climate change;
- Adapt an integrated state, regional and local management approach to research and monitoring, information sharing, planning and seeking funds;
- Develop an adequate resources program to cover relevant aspects of climate change management, including research, monitoring, planning and mitigation projects;
- Ensure decision makers have adequate and appropriate advice on climate change impacts; and
- Encourage Department of Primary Industries Water and Environment, sustainable agriculture research institutions and primary producers to investigate the agricultural opportunities provided by changes in environmental conditions.

Issues identified:

Issues identified for climate change and greenhouse effect are:

- Lack of information on areas at risk and on the processes and hazards of climate change;
- Availability of information;
- Inadequacies of planning and development policies;
- Increased and continuing green house gas emissions;
- Vegetation clearing along the coastline;
- Slow, slight changes make it difficult to appreciate the significance of the problem;
- Increases in fire occurrence, insect outbreaks, land degradation, weeds, and pest infestations due to changes in climate;
- More frequent high-rainfall events resulting in increased flooding, landslides and erosion impacts, with flood-prone urban areas being heavily exposed to financial loss;

- Increases in blowouts of dunes, and flooding and erosion of coasts (including estuaries), coastal settlements, and infrastructure arising from storm surges, sea-level rise and meteorological changes;
- Increases in rainfall and wind patterns causing a variety of impacts on air quality, drainage, waste disposal, mining, transport, insurance and tourism;
- A marked increase in coastal erosion and recession, particularly on the most exposed sandy lower lying coasts;
- Flooding of low lying coastal plains and estuaries during storm surges, particularly in the Smithton region and north coast sheltered estuaries;
- Greater sand erosion (“blowouts”) of vegetated dune areas where vegetation cover is disturbed, resulting from increased westerly winds;
- Increased long-shore drift of sand on the west coast resulting in increased coastal progradation in the sheltered Woolnorth-Circular Head area;
- Heightened soil erosion in disturbed catchments resulting from increased winter rainfall intensity, and increased rates of flooding, turbidity and siltation in sheltered estuaries;
- Rise in water tables (and possibly soil salinity levels) in coastal areas;
- Changed vegetation patterns and animal habitats, possibly affecting threatened species; and
- A need for greater water management including increased reliance on irrigation for cropping.

Proposed Actions:

Proposed Actions identified for climate change and greenhouse effect are:

- Establish a regional public awareness program incorporating information sheets, media exposure and personal representations;
- Develop a regional program targeting selected groups incorporating relevant information and personal representations;
- Design a computer model which identifies past changes in geomorphic forms and can predict future changes, using Tasmanian research and monitoring data, in conjunction with global research modelling of climate change impacts;
- Develop a computer model which identifies present water use patterns and can predict future needs, using Tasmanian research and monitoring data, in conjunction with global research modelling of climate change impacts;
- Establish a beach profile monitoring program in conjunction with scientific experts, local government and community groups;
- Undertake detailed professional research and monitoring, particularly low lying coastal areas at Port Sorell, Northdown and Pardoe Beaches, Lillico Beach, Turners Beach/Forth Estuary, Ocean Beach spit (Macquarie Harbour) and major estuaries in the region;
- Assess existing and future infrastructure for climate change impact as part of strategic planning exercises and prior to committing significant sums for works,
- Review existing land use and development policies and determine and introduce appropriate changes;

- Review the State Coastal Policy to ensure it incorporates appropriate provisions to control development in areas subject to climate change risk;
- Review DPIWE information data base/s for incorporation of geomorphic information about geo-regions, landform systems and sites, and its integration with information on vegetation type, land tenure, land use, structures and infrastructure;
- Develop the Tasmanian Greenhouse Consultative Committee as a State co-ordination and information sharing forum, incorporating the regions and local government;
- Approach Cradle Coast Authority, to co-ordinate and support local and regional level climate change initiatives;
- Increase research on impacts of climate change on agriculture, irrigation and the Hydro-electricity industry;
- Identify and trial potential agricultural species that can adapt and/or cope with a changing Tasmanian climate (drier warmer summers and wetter winters).

