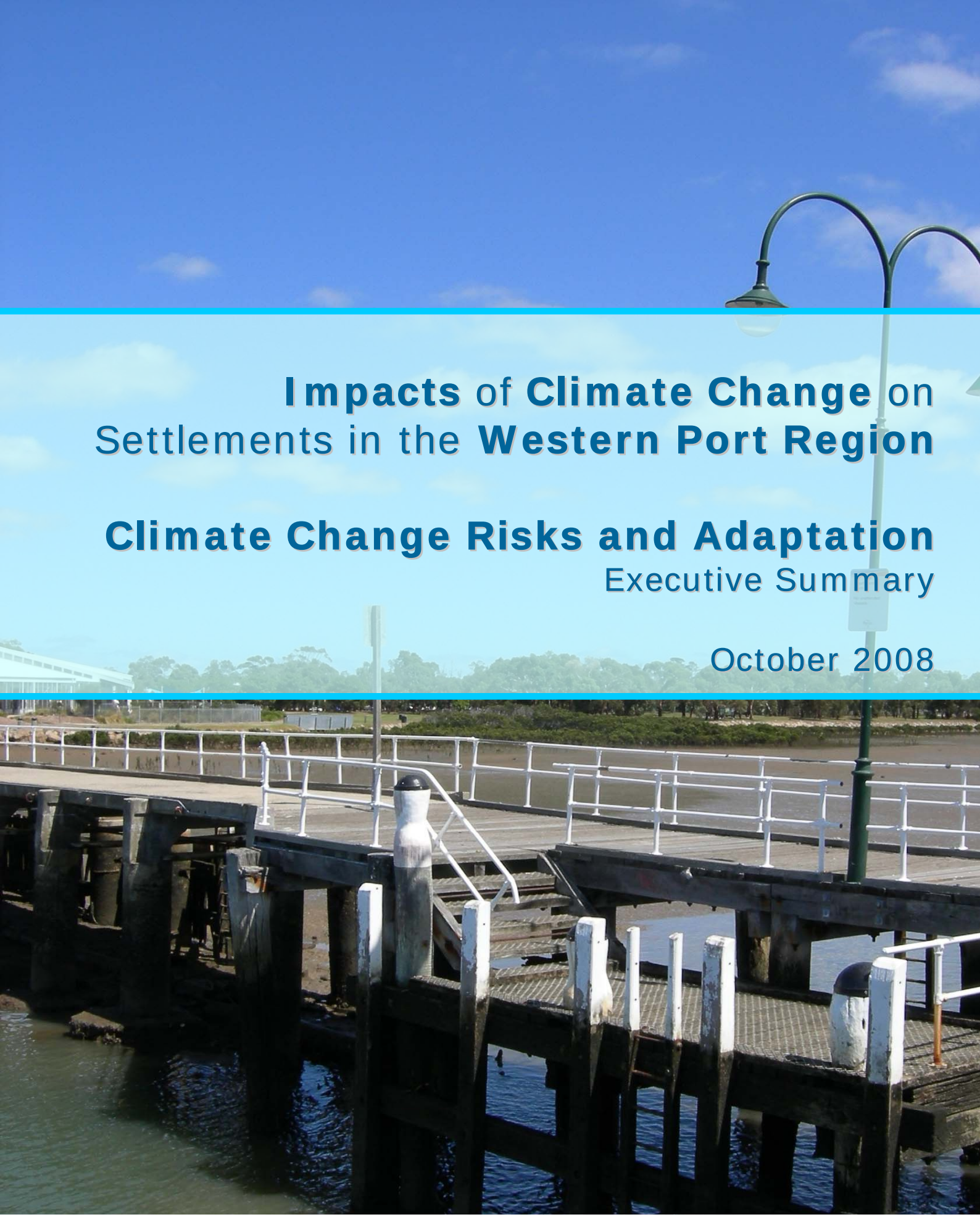

Impacts of Climate Change on Settlements in the Western Port Region

Climate Change Risks and Adaptation

Executive Summary

October 2008

WPGA Western Port Greenhouse Alliance

Marsden Jacob Associates

The Regional Development Company Pty Ltd

CSIRO

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EXECUTIVE SUMMARY

1. Climate change is emerging as a vital issue for Australian communities. Even with international action to reduce greenhouse gas emissions, the global climate is projected to undergo significant change in the 21st century.

2. It is important that the impacts of climate change are addressed at regional and local levels since local attributes, including socio-economic characteristics and the physical environment, will significantly determine the extent of the risks and opportunities as well as the nature of community responses.

3. The *Western Port Climate Change Integrated Assessment* is a two year study examining climate change impacts on the built environment and communities of the Western Port region[1] and local adaptation responses to those impacts.

4. The study has four major phases:

   i. regional climate changes and biophysical impacts;
   ii. socio-economic and infrastructure impacts;
   iii. risk assessment; and
   iv. adaptation response.

   This report documents the risk assessment and adaptation phases of the study.

Risk Assessments

5. The report *Impacts of Climate Change on Settlements in the Western Port region: People, Property and Places* indicates that climate change could pose significant risks to settlements and communities in the Western Port region. To identify the nature of those risks and assess their relative importance, risk assessments were undertaken with each of the five member Councils of the Western Port Greenhouse Alliance.

6. The centrepiece of each risk assessment was a full day workshop at which the risks were identified, analysed and evaluated. Outputs from the risk assessments were then detailed in a series of reports to each of the five Councils.

7. Risks were assessed across the full range of potential impacts of climate change to the Western Port region. Well over 200 climate change risks were identified and rated by the five Councils combined. Of those risks, more than 50 percent are linked almost equally to two major categories of impact – 'coastal inundation' and 'flooding due to intense rainfall'. A further 42 percent of risks are associated with changes projected for 'bushfires', 'average and extreme temperatures' and 'average rainfall'. 'Concurrent trends and other'[2] was the remaining source of risks.

8. There is significant commonality between the five Councils with regards to risks identified, but also substantial differences. Differences reflect differing

[1] The region covers the local government areas of Bass Coast, Casey, Cardinia, Frankston and Mornington Peninsula Shire.

[2] 'Concurrent trends' refers to demographic, social and economic trends that are occurring in the region and which may be affected by climate change. 'Other' relates to risks that cut across a number of categories of impact.

circumstances of the municipalities, both in terms of the potential impacts of climate change and also the circumstances of local councils and communities.

9. In all risk categories there are, at most, only a few risks that are rated 'extreme' in the current period. This outcome most likely reflects participants' judgement that most climate related impacts are manageable in the short term (next five years) with existing controls.

10. There is a trend however, towards a significant increase in the number of high and extreme risks in the medium term (to 2030) and long term (to 2070). The trend is apparent for all Councils and for all categories of risk but is particularly strong in relation to risks associated with coastal inundation – for example, 43% of the long terms risks associated with coastal inundation are rated as extreme and a further 36% are rated as high.

11. This trend suggests, for many risks, that Councils recognise existing controls will not be adequate should long term climate change projections eventuate and that effective adaptation strategies are needed over the longer term to deal with many of the risks.

12. From the full register of risks a small number of 'priority risks' were selected for treatment analysis in the adaptation phase of the project. The priority risks are set out in Table A.

13. The principal criterion for selecting the priority risks is that each risk had been rated as 'moderate', 'high' or 'extreme' in the short and medium terms and as 'high' or 'extreme' in the long term by a majority of Western Port region councils.

14. Of the ten priority risks, only the first seven listed in Table A were carried forward into the adaptation phase of the project.

Table A: Priority Climate Change Risks, Western Port Region

Risk	Risk description	Climate variable(s)
1	Uncertainty over or lack of planning controls in areas affected by coastal inundation and/or flooding	Sea level rise / intense rainfall
2	Loss or degradation of beaches and foreshore areas	Sea level rise / intense rainfall
3	Flooding of essential public infrastructure in low lying areas	Sea level rise / intense rainfall
4	Loss of road access due to coastal inundation and/or flooding	Sea level rise / intense rainfall
5	Increased flash flooding due to drainage system being overwhelmed	Intense rainfall
6	Increase in frequency or intensity of wildfires	Fire weather
7	Increased community anxiety about climate change and loss of wellbeing, especially amongst vulnerable groups	Various
8	Loss of use of sports grounds and other recreational areas	Temperature / average rainfall
9	Loss of biodiversity, especially coastal and freshwater biodiversity	Various
10	Health impacts of extreme temperatures	Temperature

Adaptation

15. Treatment of identified risks is an essential step in the risk management process. In climate change parlance, the treatment of risks is generally referred to as 'adaptation'. Climate change adaptation can be defined as '*actions in response to actual or projected climate change impacts that lead to a reduction in risks or realisation of benefits*'. Adaptation represents a planned, active response to climate change.

16. When considering adaptation to the impacts of climate change in the Western Port region the project team focussed on two main objectives:

- to ensure that adaptation options for the priority risks were identified and assessed; and
- to develop an approach to climate change adaptation that has the potential to be applied more generally.

17. The method applied to identifying and assessing adaptation measures for priority risks was, like the risk assessments, centred on a series of workshops.

18. In total, almost 70 people from stakeholder organisations, including WPGA Councils, state government departments and agencies, utilities and other organisations, participated in one or more of the workshops to:

- identify adaptation measures relevant to each risk;
- undertake a preliminary assessment of measures against a range of criteria; and
- make recommendations on carrying forward 'preferred' measures.

Planning and infrastructure responses to coastal and inland flooding

19. Priority risks 1 to 5 (Table A) were addressed concurrently by sub-groups in a workshop examining *Planning and Infrastructure Responses to Coastal and Inland Flooding*. In total, well over 100 adaptation options relevant to coastal inundation and inland flooding risks were identified and assessed by the groups.

20. Many of the 19 'preferred measures' recommended by workshop participants have a planning and legislative focus. This indicates a perception amongst participants that key planning policies, supporting legislation and decision-making processes have not kept pace with emerging understanding of climate change, particularly with respect to coastal impacts.

21. Research and community and stakeholder education are the other main categories of measures proposed by the coastal workshop groups.

Responding to increased frequency and intensity of wildfires

22. Priority risk 6 was addressed in a workshop examining *Responses to Increased Frequency and Intensity of Wildfires.* Three major aspects of wildfire management were considered by three sub-groups in the workshop:

- wildfire prevention;
- wildfire preparation and response, including emergency management; and
- recovery.

23. Unlike those in the 'coastal' and 'communities' workshops, groups in this workshop focussed on assessing the adequacy of **current** policies and measures (in the context of climate change), recognising that management responses to wildfire in the Western Port region are already well developed.

24. In total, over 20 policy and program areas were assessed by workshop participants, resulting in 14 recommendations to governments and agencies aimed at improving wildfire prevention, response and recovery in the Western Port region and in Victoria more widely.

25. Many if not most of the recommendations have merit regardless of the climate change issue, i.e. they are 'no-regrets' measures.

26. Particular focus in the recommendations of all groups is given to improving inter-agency co-ordination and information, education and training.

Communities dealing with climate change

27. Priority risk 7 was addressed in a workshop examining *Communities Dealing with Climate Change*. Three major aspects of the issue were considered by three sub-groups in the workshop:

- general community anxiety and uncertainty about climate change and the impacts of climate change;

- loss of community wellbeing due to climate change and the impacts of climate change (with a particular focus on vulnerable groups); and
- increased pressure on volunteer organisations associated with greater frequency and/or intensity of climate related natural hazards.

28. In total, over 30 policy and program areas were assessed by workshop participants, resulting in 12 recommendations to governments and agencies. Recommendations can be grouped into three broad areas:

- coordinated and targeted climate change communications;
- focussed policy and planning measures to assist vulnerable groups to deal with climate change; and
- increased recruitment, support and recognition of volunteers and volunteer organisations.

29. There is a particular focus in the recommendations on improving information flows on climate change to the community, especially to vulnerable groups.

30. As with recommendations from the 'wildfires' workshop, many of the recommendations of the 'communities' workshop have merit regardless of the climate change issue, i.e. they are 'no-regrets' measures.

Conclusions and next steps

31. The adaptation phase of this project resulted in over 150 policies and measures being identified and considered – against just seven climate change risks. This outcome indicates how enormous is the task involved in identifying and assessing adaptation measures for all potential impacts and risks of climate change and points to the critical importance (in terms of resources and efficiency) of prioritising climate change risks and adaptation response.

32. A number of other generic issues have emerged from the adaptation phase of the project which point to major factors to consider when carrying forward the project outputs. These include:

- the need for a **whole of government approach** to climate change adaptation, with effective coordination between the three tiers of government;
- the need to deal with **resource constraints** likely to be encountered when implementing climate change adaptation policies and programs, especially at the local government level; and
- the importance of fully **engaging communities** in all aspects of the climate change issue.

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