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Regional Australia: preparing for climate change

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Regional Australia: Preparing for Climate Change



Nadine White
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9th September, 2008 – ARTN Workshop, Barossa Valley

What is Climate Change?



- Climate change is the climatic changes resulting from global warming and their consequences
- There is agreement in the international scientific community that human-induced climate change is occurring
- Arguably the most serious environmental problem facing the global community



Climate Change in Australia



In Australia changes include:

- Temperature increases of 3 to 4°C by 2050
- More frequent and intense El Nino Southern Oscillation (ENSO)
- More frequent extremes of weather



Regional impacts may include



- more severe storms and high intensity rainfall events
- more very hot days
- increased fire and flooding events
- sea level rise of up to 80cm by the end of the century
- increased coastal erosion due to increased wave height
- water supply restrictions
- increase in cases of vector-borne diseases

Water and Drought



- ☞ Increased summer drying and associated incidence of drought
- ☞ Water restrictions
- ☞ Longer dry periods
- ☞ Variations in rainfall
- ☞ Increased evaporation




Coastal Erosion



- Due to climate variability
- Main issues:
 - *SL rise,
 - *Wave climate shifts,
 - *Magnitude and frequency of extreme events

Belongil and Gold Coast (1967)





Desert regions: arid and semi arid



- **Higher mean temperatures:** increased heat stroke and heat exhaustion of tourists and staff
- **Decreased effective rainfall:** more frequent severe droughts and reduced water availability (supply issues) and increased instances of biotoxin-contaminated waterholes (health issues)
- **Reduced biodiversity:** Loss of plant and animal refuges for relic species, and increased CO₂ and higher temps lead to change in vegetation composition, favouring woody plants
- **Increased storms** including dust storms: affect desirability of a destination
- **Increased bushfire risks**



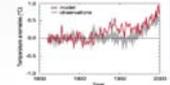
Climate Change and Tourism



Impacts of:

Climate change on tourism

Tourism on climate change

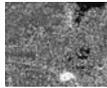


Impacts of Tourism on Climate Change



Impacts of tourism on climate change include:

- Greenhouse gas emissions from:
 - Air travel
 - Shipping
 - Road transport
 - Rail transport
- Pressure on water supplies
- More....



Impacts of Climate Change on Tourism



- Physical
e.g. infrastructure
- Economic
e.g. forecast losses and costs
- Social
e.g. loss of employment opportunities, health



Loss of beach and coastal amenity due to erosion



Biodiversity as an attraction



- ▶ Loss of marine and terrestrial biodiversity as attractions
- ▶ Australia relies on many natural attractions including world heritage national parks
- ▶ Loss of species and ecosystem biodiversity may impact tourist destination choice



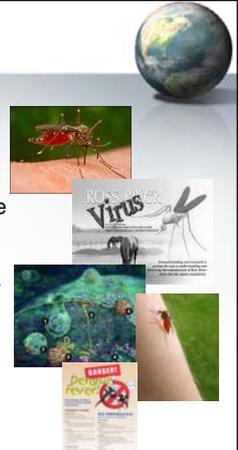
Increased floods and extreme weather events

- Flooding
- Storms
- Heatwaves
- Drought conditions



Vector Borne Disease

- Mosquito borne diseases such as the Ross River Virus and Dengue Fever
- Increase temporal and spatial range as temperatures and seasons change
- Range extending further south over time
- Also mite borne diseases and conditions such as asthma



Water Restrictions

- Lack of available water resources for tourists
- Limits the number of tourists who can visit the region
 - Limits the amount of tourism development permitted within the region
 - Limits recreational activities such as beach showers, use of spa baths, swimming pools etc.



Impacts on Tourism Industries

Potential economic impacts:

- Damage to infrastructure
- Increased insurance costs
- Cost of retreat/ relocation from coast or flood zones
- Loss of staff productivity due to increased sick days – diseases

Potential social impacts:

- Job losses due to increased seasonality and reduced patronage



Government Policy

While the increased cost of air and road travel is linked to the price of oil, in the future it will also be linked to Emissions Trading Schemes (ETS) and Carbon Taxes.

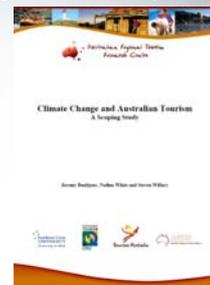
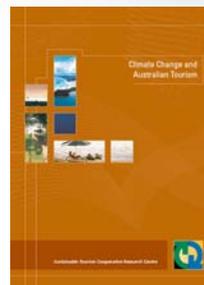
Implications for tourism in regional Australia are:

- Increased cost of goods and services
- Decreased visitor numbers, increased length of stay
- Decreased visitation from countries that have high taxes for long distance international travel (Europe?)
- Increased staff/ consultancy costs for environmental carbon reporting



SCOPING STUDY

For more in depth information download this free report:
<http://www.crctourism.com.au/bookshop/search/default.aspx>



Workshop discussion

Difference between the concepts of mitigation including 'greening' your organisation, and adaptation to the impacts of climate change

Demystifying the range of predictions and scenarios so you know what you are planning for

Staying abreast with the most up to date news and strategies on how to deal with climate change on a regional level

Strategies to increase the resilience and agility of your organisation to respond to the threat of climate change



Mitigation and Adaptation



Predictions and Scenarios



Predictions and Scenarios

- We have weather predictions for the next few days.
- We have climate forecasts for the very distant future.
- But why don't we have forecasts for, say, 2015?
- Predicting how the climate will change over the next few years is harder than saying what it will be like in 2030 or 2050.



Predictions and Scenarios

- Long-term forecasting - about underlying trends.
- Key trend is warming due to rising levels of greenhouse gases.
- In the short term - about natural variability.
- Global warming does not mean that each year will be warmer than the preceding one.

There are a lot of 'ifs' involved in short term predictions



Predictions and Scenarios

While we *could* talk about the science of Pacific Decadal Oscillation and Atlantic Multidecadal Oscillation...

That isn't really what you need to know, is it?



Predictions and Scenarios



You need to know...

- What the current predictions are
- and
- How to stay up to date with predictions as they become available.

Predictions and Scenarios



What we DO know:

- Each region in Australia will experience different impacts.
- Mitigation: The global community is aiming for a maximum 2 degree C rise in global temperatures
- Adaptation: Chief scientists say we should plan for 4 degrees C rise

Predictions and Scenarios



- What many believe to be the most reliable predictions (from IPCC) are already considered to be out of date.

- CSIRO is more recent and specific to Australia.

Go to

<http://www.csiro.au/science/ClimateWeather.html>
to remain up to date



Key Findings of CSIRO and BoM 2007 report



Temperatures

- By 2030, temperatures will rise by about 1 °C
– a little less in coastal areas, and a little more inland
- Later in the century, warming depends on the extent of greenhouse gas emissions:
 - low emission scenario: warming of between 1 °C and 2.5 °C likely by around 2070: best estimate of 1.8 °C
 - high emission scenario: the best estimate warming is 3.4 °C, with a range of 2.2 °C to 5 °C.
- Changes in temperature extremes with substantially more days over 35 °C.

Key Findings of CSIRO and BoM 2007 report



Rainfall

- Decreases in annual average rainfall are likely in southern Australia, little annual rainfall change in the far north
- For 2030: Rainfall projections for later in the century are dependent on greenhouse gas emissions:
 - low emission scenario in 2070, the best estimate of rainfall decrease is 7.5%.
 - high emission scenario the best estimate is a decrease of 10%.
- Although there will be more dry days, when it does rain, rainfall is likely to be more intense.

Key Findings of CSIRO and BoM 2007 report



Other findings include:

- droughts likely to become more frequent, particularly in the south-west
- high-fire-danger weather likely to increase in the south-east
- tropical cyclones likely to become more intense
- sea levels will continue to rise

Strategies



Risk Management

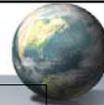


- Risk-based adaptation to climate change
- Matrix: potential level of harm and likelihood

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Severe
Almost certain	M	H	H	E	E
Likely	M	M	H	H	E
Possible	L	M	M	H	E
Unlikely	L	M	M	M	H
Rare	L	L	M	M	H

Source: <http://www.pmc.gov.au/implementation/policy.cfm>

Risk Management



Rating risk level:	(E)	Extreme risk - detailed action plan required
	(H)	High risk - needs senior management attention
	(M)	Moderate risk - specify management responsibility
	(L)	Low risk - manage by routine procedures
Likelihood:	5	Almost certain - expected in most circumstances
	4	Likely - will probably occur in most circumstances
	3	Possible - could occur at some time
	2	Unlikely - not expected to occur
	1	Rare - exceptional circumstances only
Consequences:	5	Severe - would stop achievement of functional goals / objectives
	4	Major - would threaten functional goals / objectives
	3	Moderate - necessitating significant adjustment to overall function
	2	Minor - would threaten an element of the function
	1	Negligible - lower consequence

Risk Management



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Possible	L	M	M	H	E
Unlikely	L	M	M	M	H
Rare	L	L	M	M	H

- Multiply the likelihood by the consequence (value from 0-5)

- So the Risk Factor will be from 0-25

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Risk Management



Components to consider in your risk analysis:

- ✓ appeal of your destination
- ✓ transport infrastructure
- ✓ transport operations
- ✓ natural resource base
- ✓ human resource base
- ✓ tourist satisfaction
- ✓ tourist safety
- ✓ viability/sustainability of tourism facilities

(Adapted from Becken and Hay, 2007)

Consider your destination:
will it become MORE or
LESS competitive under climate change?



- MORE is usually based on existing low climatic appeal
Action: plan how you will make the most of that opportunity- marketing, product development, enhanced infrastructure
- LESS is usually based on unfavourable climatic impacts
Action: plan how you will adapt and diversify.
Can you 'climate proof' any of your attractions or product?

'Climate proofing' can:



- ✓ reduce the disparity in demand between high and low season
- ✓ increase the attractiveness of a destination that is suffering unfavourable climatic impacts

Plan beyond your sector



- Tourism does not exist in a closed system
- There are interactions, inputs and outputs from numerous industries and environments:
 - policy environments,
 - regulatory environments,
 - social environments...
- Integrated climate change planning for your destination or across your region involves
 - water providers,
 - coastal/other managers,
 - lobby for your council to collaborate with your RTO and other regional bodies

Protect your natural resources



- Conserving biodiversity and maintaining ecosystems is an important climate change adaptation strategy
- Reduce pressures on ecosystems, such as coral reefs or wetlands, that your destination relies on



Precautionary Principle



"There is no science on how we are going to adapt to 4 degrees warming."

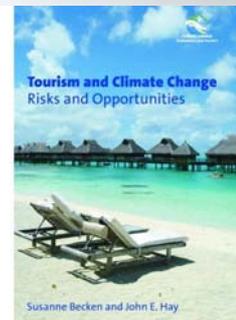
(Prof Neil Adger, climate change adaptation expert, Tyndall Centre for Climate Change Research, UK)

<http://www.guardian.co.uk/environment/2009/aug/16/climate-change-science-of-climate-change>

The Precautionary Principle – prepare for the worst

...by applying this principle you increase your *resilience* and thus your *competitiveness*

Recommended reading



Thank You



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