Climate Change: Where And When to Engineer Responses

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The Conundrum!

Trophy beach house / development site – Gold Coast QLD
3551 Main Beach Parade, Main Beach, Gold Coast

A prime Northern corner; double block hugging the sands of Main Beach and the adjoining cul-de-sac, the beach house is an uncult diamond in a perfect setting. A priceless 73m² beachfront land outcrop extends the land Eastward, giving this address development edge over similar blocks along the coastline of Main Beach Parade.

- Renovated 1900s beach house on prime 300m², North corner site
- Potential development options to increase density and height
- Unobstructed 180 degree views from beachfront outlook promenade
The Greenhouse Effect
Figure 7.1. Observed changes in (a) global average surface temperature; (b) global average sea level from tide gauge (blue) and satellite (red) data; and (c) Northern Hemisphere snow cover for March-April. All differences are relative to corresponding averages for the period 1961-1990. Smoothed curves represent decadal averaged values while circles show yearly values. The shaded areas are the uncertainty intervals estimated from a comprehensive analysis of known uncertainties (a and b) and from the time series (c). (WGI FAO 3.1 Figure 1, Figure 4.2, Figure 5.13, Figure SPM.3)
Figure 2.5. Comparison of observed continental- and global-scale changes in surface temperature with results simulated by climate models using either natural or both natural and anthropogenic forcings. Decadal averages of observations are shown for the period 1900-2005 (black line) plotted against the centre of the decade and relative to the corresponding average for the 1861-1900. Lines are dashed where spatial coverage is less than 50%. Blue shaded bands show the 5 to 95% range for 19 simulations from five climate models using only the natural forcings due to solar activity and volcanoes. Red shaded bands show the 5 to 95% range for 58 simulations from 14 climate models using both natural and anthropogenic forcings. (WG I Figure SPM.4)
**Figure 2.1:** Annual mean Australian temperatures taken as anomalies from the 30-year 1961 to 1990 average. The black line is an 11-year running mean.
‘Adelaide’ heatwave - Temperatures for 1-17 March up to 12°C above normal
Record runs of consecutive hot days

Area in red set all-time records in March 2008 for most consecutive days above 35°C

15 consecutive days at Adelaide – previous record 8

Source: Dr Blair Trewin
How unusual was this event?

Source: Dr Warwick Grace
Climate Change Action

Department’s Foundations

Science
- Data
- Inventory
- Projections

Economics
- Frameworks
- Analytics

Transforming Australia’s Economy and Society

Mitigation

Adaptation

International Engagement

Government’s Climate Change Strategy
Mitigation of greenhouse gases
Carbon abatement cost curve - 2020

Climate Change Action

Transforming Australia's Economy and Society

Government’s Climate Change Strategy

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- Analytics

Mitigation

Adaptation

International Engagement
Adaptation explained

- Vulnerability of New Orleans to hurricane impacts has been known and officially recognised for more than 50 years

- The cost of raising the protective levees around New Orleans and strengthening identified weak spots was estimated prior to Hurricane Katrina at US$300-400 million

- As of April 2006, the US Government has appropriated US$105 billion for repairs and reconstruction. This does not account for the great personal losses, as well as the damage to the region’s economy through the interruption of oil supply and the destruction of the Gulf Coast Highway disrupting the region’s export trade. It does not account for the longer-term impacts on the local economy eg the fishery in the Gulf of Mexico

- It is estimated that the total economic impact of Hurricane Katrina on the States of Louisiana and Mississippi may exceed US$150 billion
Adaptation: being prepared

What would have happened if Noah had waited until the flood – before starting to build the Ark?
Adapting to Climate Change
Adapting to Climate Change
Adapting to Climate Change
Net Costs of Adaptation

![Net Costs of Adaptation](image)

Stern (2007)
As the waves break, so does the heart of one man’s dream

By BEN DOHERTY

You can hear the surf from Kevin Reardon’s block at The Honeysuckles. It is one of the reasons he bought the place.

But the sound of waves breaking on Ninety Mile Beach is no longer a comfort. It is a portent of trouble.

“I wanted close to the beach—standing dream to build a holiday and, ultimately retirement, home behind the dunes at Gippsland’s Ninety Mile Beach is in serious jeopardy. In a Victorian first, Wellington Shire Council appears set to pass a moratorium on any new building at The Honeysuckles, because of rising sea levels caused by climate change.

A last-minute intervention by two councillors last week the shire asking the Victorian Government to put an immediate 12-month ban on any development in the tiny hamlet of just over 100 houses, and less than 30 permanent residents.

But the motion is set to go back before council on Tuesday, and could mean all future building is suspended, and possibly banned forever.

He has almost $400,000 tied up in land there but fears his investment might be worth closer to $400 if his right to build on the land is suddenly revoked.

“A moratorium is unacceptable. Buy me out or just leave me alone,” he says.
Honeysuckles owners may sue council

Properties devalued by climate scare

By BEN DOHERTY

A GIPPSLAND council is facing a multimillion-dollar class action for damage already done to coastal property values as it weighs banning development in areas vulnerable to rising sea levels caused by climate change.

Following a report in The Age that the Wellington Shire Council was considering banning any new development at The Honeysuckles behind Ninety Mile Beach, up to 70 landowners in the area are joining to fight the move, potentially seeking hundreds of thousands of dollars each.

But other nearby settlements, such as Golden Beach, Paradise Beach, Sea Spray, and even major centres such as Lakes Entrance are just as vulnerable to rising sea levels.

Even Melbourne's bayside suburbs such as Elwood, Brighton and South Melbourne are at risk, according to CSIRO and State Government studies.

Graham Smit, a landowner who intended to build his retirement home at The Honeysuckles, said by singling out one settlement Wellington Shire Council had depressed property prices forever, even before it makes a final decision on whether to outlaw development.

30 permanent residents at The Honeysuckles, said joining a class action against the council was being seriously considered by other affected residents and landowners.

Wellington Shire Council meets this morning to decide on whether to write to Victorian Planning Minister Justin Madden asking for a 12-month moratorium on all development in The Honeysuckles.

Shire chief executive Lyndon Webb said the council was "caught between a rock and a hard place", with the State Government's Victorian Coastal Strategy Draft in January, the shire itself said banning development was not the only strategy to balance development with climate change concerns.

“There is a need to investigate alternative approaches including physical barriers such as sea walls, better-vegetated sand dune systems or even levy banks, to protect coastal residential areas in lower coastal areas, rather than prohibiting development altogether,” the sub.

KEY POINTS

- Residents say existing property values have been gutted by talk of a development ban.
- Up to 70 are considering a class action for millions of dollars in damages.
Reprieve on Ninety Mile Beach homes
Council baulks at building moratorium

By BEN DOHERTY

RESIDENTS and landowners in a small community on Ninety Mile Beach in Gippsland have won a planning reprieve, with Wellington Shire Council backing down on a proposal to ban development in the hamlet.

But home owners in low-lying coastal settlements could still be slapped with extra building conditions, or forced to indemnify the council of any responsibility in the event of flood, with the council meeting behind closed doors yesterday afternoon to discuss legal advice on new regulations.

And the council might face a class action from angry landowners, who argue that speculation about climate change was ignored.

But outraged residents overwhelmed a council meeting yesterday, with more than 50 protesters attending, and more than 20 residents and landowners condemning the move.

The council voted six to one to drop the proposed ban.

Kylie Stolk bought a block at The Honeysuckles last year just after she turned 21.

She broke down as she told councillors of the sacrifices she had made, and that her dream had been shattered by the council's effects of climate change on coastal settlements and, in particular, how to minimise any exposure to legal liability.

Yesterday, the council considered legal advice behind closed doors about the possibility of mandating certain building conditions — for instance, that all dwellings be demountable, or setting minimum floor levels — for new coastal dwellings. It also considered section 173 agreements, which could relieve council of any legal ligh-

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**KEY POINTS**

- Proposed building ban at The Honeysuckles overturned.
- Council considers legal advice behind closed doors.
- Mayor fears big problems with projected rise in seas.
Australian Government Support for Adaptation

MAINSTREAMING ADAPTATION

STAKEHOLDERS
Traditional, Current and Future Knowledge-Information-Data-Models

UNDERSTANDING IMPACTS
Models/Scenarios
Impacts/Adaptation Research
Systematic Observations
Science Assessments

NEEDS OF AUSTRALIANS
Economic prosperity and health
Air/Food/Water/Energy, Security,
Biodiversity and Quality of Life,
Cities/Infrastructure

ADAPTATION OPTIONS
Reduce vulnerabilities
Enhance opportunities

SCIENCE
Quality and Utility of Knowledge and Prediction
Integrated Assessments and Knowledge

MEETING DECISION-MAKERS NEEDS
Solutions (e.g. Policies, Tools, Technology, Behaviour) & Managing Risks and Opportunities

SOCIETY
Building the Adaptive Capacity
Together & Awareness/Communication

Source: Adapted from Environment Canada, 2004 and Wheaton and Maciver, 1999
The purpose of the ‘first pass’ national coastal vulnerability assessment is to support decision-makers through:

- identifying areas in Australia’s coastal zone with high, medium and low potential impact from climate change;

- linking biophysical and socio-economic analyses so that decision-makers can better understand the vulnerability and potential costs of climate change in the coastal zone; and

- providing analysis of policy and governance of relevance to governments, and outlining priority research areas and national data gaps.
Completion date: late December 2008
Live on OzCoasts - End 2008

Northern Territory - End August 2008

New South Wales - End August 2008

Victoria - End July 2008
Vulnerable Infrastructure (within 200m of the coast)

Within 200 m of coast

Australia

- 559,000 residential addresses with replacement value $104 billion
- replacement value plus contents 128 billion

- 24,000 commercial and small – medium industrial buildings with replacement value $33,581 billion

Total for residential, commercial and small – medium industrial buildings

- 583,000 buildings with replacement cost (without contents) of $33,685 billion

Includes:

- 35 ambulance stations
- 117 fire stations
- 106 police stations
- 11 SES establishments
- 44 shopping centres
- 244 post offices
- 538 caravan/ camping grounds
- 32 hospitals and health services
- 102 nursing homes
Vulnerable Infrastructure (within 200m of the coast)

Plus (uncosted)
120 ports and harbours
360 universities, technical colleges, schools and related institutions
1 grain silo
10 tank farms for petroleum products
3 power stations, 2 substations
4 factories
1 shipyard
170 unidentified industrial zones
3 water treatment plants
15,900 km freeways, highways, roads valued at $25 billion
1841 bridges spanning 199,813 metres
5,210 m freeway tunnels
Total Building Replacement Value = $108 Million
Digital Elevation Model (DEM)
Flooding

1 m rise

3 m rise

5 m rise
Vulnerability

Smartline coastline with all attributes

Nationally consistent data and information products

with

sufficient resolution to be useful at the local government level

with

easy access to information products
The Conundrum!

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