BYRON SHIRE COUNCIL

POLICY NO 14/006

CLIMATE CHANGE STRATEGIC PLANNING

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#E2014/43283

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Further Document Information and Relationships

Related Legislation	*Environmental Assessment and Planning Act 1979*
Related Policies	
Related Procedures/ Protocols, Statements, documents	Intergovernmental Panel on Climate Change (IPCC), 'Climate Change 2013: *The Physical Science Basis, Summary Report for Policymakers*' document, which was released in late 2013 and can be viewed at: http://www.ipcc.ch/report/ar5/wg1/docs/WGIAR5_SPM_brochure_en.pdf NSW Chief Scientist & Engineer, *Assessment of the science behind the NSW Government's sea level rise planning benchmarks*, April 2012. www.chiefscientist.nsw.gov.au/__.../CSE-Report-Sea-Level-Rise-Benchmarks _.pdf Intergovernmental Panel on Climate Change (IPCC), Climate Change 2007: *The Physical Science Basis.* http://www.ipcc.ch/ Department of Environment and Climate Change (DECCW) Floodplain Risk Management Guideline: *Practical Consideration of Climate Change,* 25 October 2007. http://www.pittwater.nsw.gov.au/__data/assets/pdf_file/0016/34630/DECCW_FRM_Guideline_Practical_Consideration_of_Climate_Change_25-10-07.pdf Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Projected Changes in Climatology Forcing for Coastal Erosion in NSW*, August 2007. http://www.environment.nsw.gov.au/resources/climatechange/nswdnrreportv1020070824.pdf Australian Government, Department of the Environment and Water Resources: *Climate Change Adaptation Actions for Local Governments*, 2007. http://www.climatechange.gov.au/impacts/publications/local-government.html SMEC *'Belongil Creek: Impact of Climate Change on Tailwater Level (Sea Level Rise)'*, Discussion Paper, July 2007.(#694571) NSW Coastline Management Manual. http://www.environment.gov.au/coasts/publications/nswmanual/index.html Byron Shire Greenhouse Action Strategy, 2008. http://www.byron.nsw.gov.au/publications

	Byron Shire Local Environmental Study, 2008. http://www.byron.nsw.gov.au/publications Climate Change Risk Assessment – (note: information arising from current grant funded work) Draft Byron Local Environmental Plan 2014 (gazetted [insert date]) International Council for Local Environmental Initiatives (ICLEI), *Local Government Climate Change Adaptation Toolkit*, March 2009. http://www.iclei.org/fileadmin/user_upload/documents/ANZ/CCP/CCP-AU/Projects/AI/AdaptationToolkit/Toolkit_CCPAdaptation_Final.pdf Sea Level Rise Policy Statement, 2009 Department of Environment and Climate Change NSW http://www.environment.nsw.gov.au/climateChange/sealevel.htm Byron and Tweed Shire Councils: Climate Change Risk Assessment, Final Report, May 2009, GHD Byron and Tweed Shire Councils Climate Change Adaptation Action Plan, June 2009, GHD Byron Shire Climate Change Adaptation Implementation Schedule #977169 Australia's Biodiversity and Climate Change: A strategic assessment of the vulnerability of Australia's biodiversity to climate change, Australian Government, 2009. http://www.climatechange.gov.au/impacts/pubs/biodiversity-vulnerability-assessment.pdf

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Policy No. 14/006

POLICY TITLE Climate Change Strategic Planning

1. NAME OF THE POLICY AND COMMENCEMENT

This Policy is known as the *Byron Shire Council Climate Change Strategic Planning Policy* ('Policy'). It sets out Byron Shire Council's policy position relating to climate change.

The current Policy was adopted by resolution of Council (Res 14-315) on 26 June 2014, to be effective 21 July 2014.

2. OBJECTIVES

- To set out Council's accepted climate change parameters to inform the decision making process for strategic, infrastructure and operational planning.
- To mitigate impacts associated with climate change on future generations through commitment to the precautionary principle.
- To review climate change parameters as further information becomes available from leading government organisations.

3. POLICY STATEMENTS

3.1 Climate Change Parameters

The following global climate change parameters (relative to reference period 1986-2005) will be considered for Council's strategic, infrastructure and operational planning:

a) temperature increases of 0.4^{o}C to 2.6 ^{o}C by 2065 and 0.3^{o}C to 4.8 ^{o}C by 2100

b) sea-level rises of 17 - 38cm by 2065 and 26 - 82cm by the end of this century

c) increases in rainfall intensities by the end of this century.

Notes:
All parameters have been taken from the Intergovernmental Panel on Climate Change, 'Climate Change 2013 The Physical Science Basis, Summary Report for Policymakers' document, which was released in late 2013 and can be viewed at: http://www.ipcc.ch/report/ar5/wg1/docs/WGIAR5_SPM_brochure_en.pdf

In the absence of more current scientific analysis at a regional level, sea level rise parameters shall be applied in accordance with DECCW Sea Level Rise Policy Statement April 2009 as considered adequate by the most recent NSW Chief Scientist report (April 2012).

3.2 2050 Climate Change Planning Horizon

With the exception of development in new release areas, certain rezoning proposals, critical facilities and special purpose facilities, a 2050 Climate Change Flood Planning horizon will be used for any strategic, infrastructure and operational planning document or designs that may be affected by climate change.

3.3 2100 Climate Change Planning Horizon

A 2100 Climate Change Flood Planning Horizon will be used for the purpose of all development in new release areas, certain rezoning proposals, critical facilities and special purpose facilities.

3.4 Strategic Land-use Planning

If an adopted Flood Study or Floodplain Management Plan either does not exist, or does exist but has not suitably considered climate change in accordance with this Policy, then the following will be used:

a) For developments and major infrastructure upgrades that are subject to a requirement for the completion of a new flood study, climate change effects for the relevant planning horizon must be addressed in accordance with Section 3.5 of this policy.

b) For other development the following generally equates to the Projected 2050 Flood Planning Level for habitable development.

Where the site of the development is:

i) At or below 4m AHD an additional 0.4m shall be applied to the estimated 1 in 100 year flood level, or highest known flood level where no flood study exists, in addition to the normal 0.5m freeboard.

ii) Above 4m AHD then the estimated 1 in 100 year flood level, or highest known flood level where no flood study exists shall be used, together with the normal 0.5m freeboard.

If an adopted Flood Study or Floodplain Management Plan does exist which suitably considers climate change in accordance with this Policy, then the following minimum flood planning levels apply:

i) Projected 2100 flood planning level for development in new release areas, rezonings, critical facilities and special purpose facilities.

ii) Projected 2050 flood planning level for all other development.

3.5 Flood Studies and Floodplain Management Plans

Flood studies will model the 1 in 100 year event using an envelope approach. The Climate Change Flood Planning Scenarios in Table 1 provide the climate change effects that are to be considered.

The envelope approach will model two separate events for each scenario and combine the worst results from each run to create the inundation map for that scenario. One event will be an ocean dominated event that uses the 100 year ocean (storm event) level with a 20 year Average Recurrence Interval (ARI) rainfall event. The other will be a rainfall dominated event that uses the 20 year ocean (storm event) level with a 100 year ARI rainfall event.

All Council flood studies and 2100 climate change flood planning horizon developments will also model the three sensitivity scenarios in Table 1, which are

designed to consider how sensitive the catchment is to rainfall intensity increases and a large combination event (i.e. a 100 year Annual Recurrence Interval (ARI) rainfall and ocean level event). This is because the catchments within Byron Shire are short and sharp catchments, which are close to the ocean, therefore, it is not unusual for the Shire's coastal communities to experience an event with both rainfall and ocean levels peaking close to each other.

The climate change related sensitivity analyses add climate change ocean effects to the usual sensitivity analyses involved in flood and flood risk management studies undertaken in accordance with the NSW Floodplain Development Manual (i.e. using rainfall intensity only).

For the purposes of the Byron LEP 2014, the '100 year in 2100 (FPL event)' in Table 1 below is adopted as representing the **Future Flood Planning Level**.

Table 1: Climate Change Scenarios for use in Flood Modelling and Flood Planning

Scenario	Predicted Sea Level Rise (Metres above 1990 mean sea levels)	Catchment inflow (rainfall event)	Ocean Boundary Peak Tailwater Condition in (M)AHD	Increase in rainfall intensity
100 year event Current Conditions	**0**	**20 year ARI 100 year ARI**	***2.6 (Ocean Dominated) 2.2 (Rain Dominated)**	**0**
100 year event in 2050	**0.4**	**20 year ARI 100 year ARI**	**2.6 (Ocean Dominated) 2.4 (Rain Dominated)**	**0**
100 year event in 2100 (FPL event)	**0.9**	**20 year ARI 100 year ARI**	**3.1 (Ocean Dominated) 2.9 (Rain Dominated)**	**0**
Sensitivity test 1	**0.4**	**20 year ARI 100 year ARI**	**2.6 (Ocean Dominated) 2.4 (Rain Dominated)**	**10%**
Sensitivity test 2	**0.9**	**20 year ARI 100 year ARI**	**3.1 (Ocean Dominated) 2.9 (Rain Dominated)**	**30%**
Sensitivity test 3	**0.9**	**100 year ARI**	**3.1 (Ocean & Rainfall Dominated)**	**30%**

Source: Figures are in accordance with recommendations from DECCW Sea Level Rise Policy Statement April 2009 and DECCW Practical Consideration of Climate Change guideline 2007.
*The 100 year peak ARI ocean level of 2.6m AHD is based on a coastal assessment undertaken nearly 30 years ago and includes, wave and wind set up and barometric pressure effects. It is considered to have some allowance for sea level rise but the amount is unknown. It is the accepted level across the state for the 100 year flood tailwater condition and its application in Byron Shire dates back to the Brunswick River Flood Study (1986) and Belongil Creek Flood Study (1986)..

3.6 Coastline Management Planning

Sea level rise parameters to be applied for the purposes of coastline management planning are in accordance with DECCW Sea Level Rise Policy Statement April 2009, as considered adequate by the most recent NSW Chief Scientist report (April 2012).

3.7 Biodiversity Planning

Impacts to coastline, coastal floodplain and river /waterway biodiversity due to coastal erosion and shoreline recession, salt water intrusion to ground water, and tidal

inundation and changes to hydraulic behaviour of waterways result in: habitat loss; habitat fragmentation; habitat squeeze; increased competition; and ecosystem health decline.

Therefore, appropriate buffering of natural ecosystems from development is to be incorporated into strategic plans, land use controls and development proposals to allow room for the migration of those communities as sea levels rise and/or changes in hydraulic behaviour of waterways are realised.

Also, current and potential future wildlife corridors are to be identified and protected via land use controls to allow for the survival and adaptation of ecological communities and associated biodiversity.

3.8 Biophysical and Socio-economic Thresholds

Biophysical and socio-economic thresholds are limits of their resilience beyond which it is assumed that irreversible degradation may ensue. The precautionary principle is a response to uncertainty in the face of poorly understood thresholds. In the absence of adequate data to determine thresholds or direction from State Government Council will apply the precautionary principle.

3.9 Review of Current Plans

Council's planning and strategic documents and infrastructure policies, where their content may be affected by climate change, will be reviewed to incorporate the impacts of the Climate Change Flood Planning Scenarios and Climate Change Parameters, as funding and resources, including grants, permit.

3.10 Review of Climate Change Parameters

Climate Change Parameters will be reviewed and/or updated upon receipt of more current scientific analysis, including further Intergovernmental Panel on Climate Change (IPCC) reports and/or Commonwealth Scientific and Industrial Research Organisation (CSIRO) or NSW Government Department recommendations.

3.11 Resourcing

Council will pursue grant opportunities to further examine climate change issues as they affect planning and infrastructure provisions.

4. DEFINITIONS

Annual exceedance probability (AEP) is the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of 100 m^3/s has an AEP of 1%, it means that there is a 1% chance of a peak flood discharge of 100m^3/s or larger occurring in any one year.

Average recurrence interval (ARI) is the long term average number of years between the occurrence of a flood as big as or larger than the selected event. For example floods with a discharge as great as or greater than the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.

Critical Facilities are uses where any inundation or loss of function in an extreme flood would represent an unacceptable level of risk. It includes emergency services organisations (SES HQ, Police Stations, Fire Stations (including rural bushfire), Ambulance Stations, Hospitals), Public Halls (where used for flood evacuation centre), Intensive Aged Care, Nursing Homes, Telephone Exchanges, Telecommunication Repeaters, Flood Evacuation Centres and Flood Refuges, and Critical Service Facility Components (e.g. essential components of sewage treatment plants, essential water supply reservoirs).

Flood Planning Level (FPL) has the same meaning as in Byron LEP 2014. It is the combination of flood levels (derived from significant historical flood events or floods of specific AEP) and freeboard selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans. The required FPL varies with land use.

Freeboard is a factor of safety to provide reasonable certainty that the risk exposure selected in deciding on a particular flood chosen as the basis for the particular Flood Planning Level (FPL) is actually provided, and is incorporated into the FPL. The freeboard is the difference between the particular FPL and the flood used to derive it and may vary with different land uses, parts of the floodplain or types of mitigation works.

New Release Areas refer to largely undeveloped sites that have been rezoned or subdivided for urban development (ie. residential, industrial, commercial) purposes in accordance with this Policy.

Projected 2050 flood planning level means the level of a projected 2050 climate change flood event derived in accordance with Section 3.5 of this policy plus 0.5m freeboard.

Projected 2100 flood planning level means the level of a projected 2100 climate change flood event derived in accordance with Section 3.5 of this policy plus 0.5m freeboard.

Special Purpose Facilities means infrastructure, community service and other developments where use of the General FPL is considered to represent an unacceptable level of risk for the type of development. Included in this category are developments such as: generating works; sub stations; liquid fuel depots; units for aged persons (other than self-care); retirement villages (other than self-care); schools; and hazardous industries.