

From: [NSW Government](#)
To: [Flood Inquiry](#)
Subject: Floods Inquiry
Date: Friday, 24 June 2022 2:00:08 PM



Your details

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Submission details

I am making this submission as	Other
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Submission type	I am submitting on behalf of my organisation
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Organisation making the submission (if applicable)	Byron Environment Centre Inc.
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Your position in the organisation (if applicable)	Convenor
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Consent to make submission public	I give my consent for this submission to be made public
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Share your experience or tell your story

Your story

Please see 1.1 Causes and contributing factors

Terms of Reference (optional)

The Inquiry welcomes submissions that address the particular matters identified in its [Terms of Reference](#)

1.1 Causes and contributing factors

Submission Re: 2022 NSW Independent Flood Inquiry

John Lazarus
Convenor Byron Environment Centre Inc.

Byron Bay
NSW 2481
Phn.

Dear Sir/Madam

I constrain the Byron Environment Centre's comments to the one aspect of unavoidable increased coastal, and up river, flooding caused by sea level rise and the associated cause of increasing temperatures

Unavoidably increasing sea height levels from global warming will increase:-

- 1) direct coastal flooding from sea inundation,
- 2) flooding from increased water heights in coastal creeks and rivers,
- 3) flooding caused by increased height of coastal ground water,
- 4) flooding from loss of coastal flood retention wetlands,
- 5) flooding from decreased inland river gradients,
- 6) flooding from loss of flood water slowing, and water uptake, vegetation
- 7) flooding from increased height of trapped water in Intermittently Closed and Open Lakes and Lagoons (ICOLLS)
- 8) flooding from increased number and intensity of Cyclones
- 9) flooding from increased quantities of rain at any one event.

Increasing sea level heights, caused by global warming, will cause flooding from:

1) Ocean salt water flooding of coastal land.

Increased sea level heights will cut through dunes, erode any sub ground surface material apart from rock, and overtop hard surface structures surrounding beaches and coastal development, causing direct ocean water flooding of existing developed, and environmentally reserved, land.

Ballina town centre presently experiences ocean inundation flooding, where high tides and storm surges already cause flooding by sea water coming up through storm water drains.

Noting that in 2015, Australian scientists identified that the worlds biggest glacier on Australia's Antarctic Territory was melting from both top and bottom, and wont stop melting, and just itself would eventually cause a 1.5 metre sea level rise.

And that here is nothing in place, as yet, to restrain a temperature rise to 1.5 degrees, which is associated with an aprox. 3 metre sea level rise.

And that at the extreme potential of a 4 degree temperature rise, that significantly higher sea levels will occur from both ocean water expansion and from the potential 100 metre sea level rise from ice presently on land in just Greenland and the Antarctic. Much of Australia's coastline will inevitably be lost to direct ocean flooding, from the same sea level rise that concerns our Pacific neighbors island countries.

2) Direct fresh water flooding.

Coastal creeks and river water heights will increase, commensurate to the increased height of the sea that the rivers/creeks drain into (noting that most coastal rivers and creeks are tidal, ie

they increase in water height in response to the incoming tide). Example: Mullumbimby, approx 5 km inland in Byron Shire, is on a tidal river where the ocean high tide results in the river flowing inland through the town. The increased river/creek water height will cause direct flooding of adjacent land, and decreased capacity of storm/flood water dispersal

3) Flooding from increased height of ground water

Coastal underground water levels will rise, in commensurate levels to the associated increased rise in sea/river/creek water levels, causing less storm and flood water ground percolation, and thus less dispersal of storm/flood water via underground water flows to rivers/creeks/sea

4) Flooding from loss of coastal flood retention wetlands

Increased sea level heights will cause present flood retention wetlands, that are presently just above sea level, to be either permanently inundated by sea water, or permanently inundated by standing fresh water due to lack of capacity of dispersal to the ocean, causing decreased flood detention capacity, and decreased flood water dispersal, causing increased storm/flood water flooding on adjacent lands

5) Increased flooding from decreased inland river gradients.

Higher ocean levels will cause a decreased river/creek flow gradient, as the river height gradient to the sea is lessened by the increased height of sea/river/creek water levels at the river/creek mouth. The lower gradient will cause an inland slower river water flow, causing a slower dispersal of inland storm/flood water.

6) Loss of flood slowing, and water uptake, vegetation.

Higher sea levels will cause altered coastal vegetation cover, with limited time for adaptation, due to both salt sea water inundation and increased height of sub surface ground water levels, (and temperature increases), causing both lesser vegetation uptake of flood/storm water, and increased overground flood water speed.

7) Increased flooding from altered Intermittently Closed and Open Lakes and Lagoons (ICOLLS).

ICOLLS are created by sand bars across ocean entrances to coastal lakes and lagoons blocking water exiting to the ocean. The entrances are closed caused by ocean waves forming sand bars. The height of the sand bars will increase as the ocean water level height increases. Presently ICOLLS cause flooding, with Councils utilising different management procedures regarding the increased height of water trapped landward behind the sand bars. As sea levels rise, these present management techniques, to address adjacent and inland flooding, will increasingly be ineffective at even a small increased height of trapped ICOLL water heights.

8) Increased flooding from increased number and intensity of Cyclones.

At the time of the recent 2022 floods, the ocean temperature off Main Beach Byron Bay was 26.1 degrees Celsius. Science identifies that Cyclones are formed when ocean temperatures are around 26.5 degrees, and as such the the ocean temperature at the time of the recent floods was extremely likely to be a factor in the weather pattern and intensity of rainfall. Cyclones/East Coast Lows, and their subsequent intensity of rainfall causing subsequent flooding, are an outcome of high

ocean water temperatures with water temperature unavoidably increasing at least up until the end of this century

Note:

That, even if we reduce our greenhouse emissions to net zero within government commitments, that we will still see temperature rises, and thus sea level rises, continuing up to the end of this century.

There is a several decades lag, from when our greenhouse emissions are emitted, until the gas's drift up to our atmospheres periphery, where they then form an insulating barrier that lets light through but insulate the subsequent reflected heat from the earth. And then a further several decades lag, from when the earth experiences the increased temperature, until the eventual heat expansion of ocean waters, and the eventual increased ocean height level from the heat driven land ice melt - ie if we stopped all greenhouse pollution tomorrow we will still see increasing temperatures, and increasing sea heights, driving land flooding, until approximately the end of this century.

9) Increased flooding caused by higher quantities of rain at any one event.

Increasing temperatures will cause more evaporation, and cause higher air temperatures to hold increased quantities of moisture, which will result in higher quantities of rain at certain storm events, resulting in an increased number of storm events resulting in increased levels of flood water (and increased snow, with subsequent increased quantities of snow melt, where temperatures still drop below freezing).

Note, locally, Byron Bay, Ballina etc. will be unavoidably permanently inundated by ocean flooding sea level rise, as the sea, and our coast, inevitably moves inland, and are just two

examples of towns that will eventually be removed from Australia's land map as our coastline recedes from the increasing sea level height, even from the hoped for limit of a 1.5 degree temperature rise (rough rule of thumb - a 1.5 degree temp. rise is associated with an unavoidable, inevitable sea level rise of approx. 3 metres - noting that Byron Bay and Ballina are developed from 2.5 metres above former sea level height). In Sydney the ocean is projected to permanently join Sydney harbour, with the ocean permanently flooding the development and the golf course between Bondi Beach and the Harbour, and for the ocean to permanently flood Manly between the ocean and the Harbour, and projected that development along rivers, such as the Cooks and Paramatta rivers, will eventually be permanently flooded from projected global warming heat increases

Yours
John Lazarus
Convenor Byron Environment Centre Inc.

Supporting documents or images
