

From: [NSW Government](#)
To: [Flood Inquiry](#)
Subject: Floods Inquiry
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Your details

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Submission details

I am making this submission as	A resident in a flood-affected area
Submission type	I am making a personal submission
Consent to make submission public	I give my consent for this submission to be made public

Share your experience or tell your story

Your story	I am a local environmental engineer with professional experience in flood modelling and floodplain management. I live in Ballina with my wife and three kids, and I am one of the owners and directors of a consultancy firm that employs about 40 people in Northern NSW. My family and business were relatively unscathed by the floods. We were subject to an evacuation order on
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Tuesday 1st March, so we lifted as many possessions as we could and evacuated during the night. The floodwaters inundated the street in front of our house, but luckily did not reach our property. Our company has a relatively small office in Lismore, which was inundated to the ceiling. We lost furniture, equipment and appliances, but the impact on our business was relatively minor. I am passionate about helping the local community to make smart decisions for the future.

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

The 2022 flood has been called an unprecedented event. It has been classified in the range of a '1 in 500yr' to '1 in 2,000yr' flood event. However, many locals are concerned that a similar event could occur in another 10 or 20 years. While the weather system was relatively unique, there are often intense rain events in Northern NSW. For the past few decades, scientists have been predicting that rainfall events will become more severe and intense with climate change. The 2022 flood may have been unprecedented when looking back in history, but it is likely to be the start of things to come when looking ahead to the future.

1.2 Preparation and planning

I suggest that there should be a comprehensive review of the location of flood evacuation centres and the procedures for establishing and running the centres during a flood. In Ballina, a flood evacuation centre was initially established at the Richmond Room in Regatta Avenue. This was a ludicrous decision and was met with bewilderment amongst locals. The Richmond Room is located on low-lying ground in close proximity to the river. Not surprisingly, the Richmond Room evacuation centre was subsequently closed. An evacuation centre was also established at the Cherry Street Sports

Club. This was another poor decision and this evacuation centre had to be evacuated on 1st March due to the risk of inundation and isolation. Importantly, neither of these locations is nominated as a flood evacuation centre in any documents that I am aware of. For example, the Ballina Floodplain Risk Management Study indicates Xavier College and Southern Cross School as evacuation centres. These schools were ultimately used as evacuation centres after the false starts at the Richmond Room and Cherry Street Sports Club.

There are many stories from locals suggesting that the establishment of the evacuation centres and their operation during the first couple of days was chaotic. Clearly, a review of the plans and procedures is required.

I suggest that the installation of backflow prevention devices should be considered for stormwater pipes in Ballina and possibly other locations. Some areas of Ballina were inundated only because water flowed backwards up stormwater pipes and surcharged out of the stormwater pits in the street. These areas were not inundated due to floodwaters overtopping the riverbank and flowing across the surface. They were only inundated by backflow up the stormwater pipes, which could be prevented by devices such as floodgates fitted to the pipe outlets.

1.3 Response to floods

I suggest the following should be considered to improve flood predictions and public warnings:

1. More river level gauges should be reported on the BoM website and flood level predictions should be provided for these locations. For example, gauges and predictions should be provided for Broadwater, Wardell and Missingham Bridge (Ballina). This would allow people to more accurately understand the predicted flood risk at their specific location.
2. The BoM website should be improved so that it is simpler and easier to access the data for river level gauges. At present, the relevant webpage is relatively hard to find and the map

defaults to 24 hour rainfall totals. As a result, most people have never accessed the 'river conditions' data.

3. All river level gauges and predictions should be relative to Australian Height Datum. The use of a local datum at Ballina (Burns Point Ferry gauge) caused widespread confusion during the flood. Very few people, if any, know the level of their property or house floor level relative to the Burns Point Ferry gauge level. In contrast, many residents know their house floor level relative to Australian Height Datum because this is the standard used in surveying and construction.

4. There should be more categories of flood prediction than just 'Minor', 'Moderate' and 'Major'. For example, additional classifications of 'Extreme' and 'Catastrophic' could be added above the 'Major' classification. 'Major' floods occur relatively frequently in Northern NSW. Therefore, when the BoM predicts a 'Major' flood, many residents assume the flood will be similar in magnitude to the last 'Major' flood. A 'Catastrophic' classification for the 2022 flood would have triggered increased awareness and urgency amongst residents. Consistency with the NSW fire danger rating system would be sensible.

5. There should be substantial investment in the development of a more accurate and timely flood prediction system and a more effective public warning system for the Wilson & Richmond Rivers.

6. The recommendations of previous studies and reports should be reviewed for relevance. For example, the Richmond River Flood Warning and Evacuation Management Review (April 2016) by BMT WBM.

Some background to my above suggestions is provided below.

The BoM predictions of the severity of flooding along the Wilsons & Richmond Rivers were inaccurate. In all locations, except Ballina, the actual flood level was substantially higher than the level predicted by the BoM. Given the

inaccuracies of the flood predictions, substantial improvements are required. By the time the flood peak reached Ballina, it was clear that this was the largest flood in history. Ballina Shire Council issued a relatively high predicted flood level and this level was not reached.

Many people were trapped in their houses by rising floodwaters. Many homeowners and business owners moved furniture, appliances, equipment and machinery to upper floor levels or higher ground, only for the floodwaters to rise above what was assumed to be a 'flood free' level. Clearly, the system of flood prediction and warning failed.

I acknowledge that it is difficult to provide timely warnings for Lismore, due to the relatively short period between rainfall and subsequent flooding. However, the period between rainfall and flooding is significantly longer for towns such as Coraki, Woodburn and Broadwater, which are located further down river. Once the catastrophic nature of the flood was evident, the clear message to people further downstream should have been something like:

"This is likely to be the biggest flood in history. Flood levels are likely to be much higher than previous floods. The second storey of houses and buildings may be inundated. Collect your belongings and evacuate to XXX (location) by YYY (day & time). If you do not evacuate by YYY (day & time), you may be trapped by floodwaters in a life threatening situation."

Many residents in towns such as Broadwater, Wardell and Ballina had sufficient time to better prepare for the flood by removing household belongings and evacuating, but they did not do so because they did not understand the severity of the impending flood.

1.5 Recovery from floods

I suggest that a land swap should be seriously considered for the most flood affected residential properties in South and North Lismore. There are no practical or feasible ways to reduce the flood hazard in these areas. Typical measures such as levees, floodways, minimum floor levels

and flood compatible building materials cannot adequately reduce the flood risk. We need to accept that these are not good places for people to have homes.

A land swap would be similar to what was implemented at Grantham in SE Qld after the 2011 floods and also more recently for some Murwillumbah industrial land.

The broad concept would be:

1. Federal & State Governments purchase flood free land that is 'ready to go' for subdivision development. There are potential options in Goonellabah (e.g. Valley View at Pineapple Rd, Eastwood at Sawyers Ave), Caniaba and possibly the North Lismore Plateau (although I understand this is not shovel ready).
2. Landcom is brought in to fast-track the design (if not yet complete) and construction of the subdivision with the provision of quality affordable housing being a key objective.
3. Owners of flood prone properties in South & North Lismore are offered a free block in the new subdivision if they relinquish their existing block. The existing blocks are rezoned to community use or similar.
4. The most flood prone areas of South & North Lismore would be progressively converted to more suitable floodplain land uses – sports fields, parks, nature reserves, open space, or possibly even a return to agriculture.

If some raising of the Lismore CBD levee is likely as a response to the flood, North & South Lismore will become even more impacted by flooding. The draft Lismore Floodplain Risk Management Study (Engeny, Oct 2020) investigated Option 1, which involved raising the CBD levee by 200mm to 400mm along its length. A problem is that this pushes more water into North & South Lismore. Engeny's modelling predicted that flood levels would increase by 70-90mm in South Lismore and 60-90mm in North Lismore in a 5% AEP flood.

The land swap option could address both the flooding situation and also affordable housing.

The flooding is going to get worse and more frequent and surely there is a limit to people's 'resilience'.

The key is to act fast, so that property owners can be confident that this is a real option before they start spending significant money on rebuild or repairs of their existing house. For example, within the next month, residents would need to be advised that the government is seriously considering a land swap scheme. Within another month, the broad principles of the scheme and location of subdivision(s) would need to be announced. The aim would be to have blocks of land ready for people to build on within 6-9 months.

The 2012 QLD Floods Commission of Inquiry stated the following about land swaps or buy-backs: "The buy-back of properties often provides the ideal solution to the problem of mitigating the impact of damage to existing buildings in areas particularly exposed to natural hazards such as floods ... and may, in some circumstances, be the only feasible and economically justified management measure for the more hazardous areas of the floodplain".

I have spoken to other local engineers and planners and there is general agreement that a land swap is the best option for some of the most flood affected areas of Lismore.

Supporting documents or images
