

Frequently Asked Questions

Draft Tweed Valley Floodplain Risk Management Study & Plan

The Draft Tweed Valley Floodplain Risk Management Study and Plan was placed on [exhibition](#) in July / August 2012 and February / March 2014 for public comment. The Study reviewed flood risk in the Tweed Valley, including risks to people and other potential impacts of flooding, and assessed a wide range of options to reduce and manage these risks. The Plan outlined the recommendations of the Study and a prioritised plan to implement these.

The Floodplain Management Committee reviewed the submissions and feedback, undertook additional investigations and put the revised Study and Plan to the appointed Floodplain Management Committee and Council. Tweed Shire Council adopted the Plan in September 2014.

The following information has been collated in response to some of the frequently asked questions that arose during the study and consultation process.

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Did the study consider the 1954 flood?

The preceding Tweed Valley Flood Study did consider the 1954 flood, however there was insufficient data (e.g. on the state of floodplain development or hourly rainfalls) to use it reliably in the development of a numerical flood model. Instead other more recent historical floods such as the 1974 event were used to check how well the model was able to replicate flood behaviour.

Whilst historical floods provide useful information about local flood behaviour, these events don't necessarily represent future floods which can behave differently due to different catchment and floodplain conditions, and different weather patterns (e.g. the peak and extent may be more or less, the onset of inundation may be faster or slower, the duration of inundation maybe longer or shorter etc). The flood model allows prediction of future floods based on parameters determined from historical floods.

What is the Probable Maximum Flood (PMF) and why is it used?

The PMF is the worst case scenario for flooding and is used for emergency response planning and specialised land use planning such as the siting of critical infrastructure (e.g. hospitals). Most other planning decisions are based on the 100 year Average Recurrence Interval (ARI) flood and an allowance for uncertainty and the potential effects of climate change.

The PMF is a theoretical flood resulting from the largest rainfall that could possibly occur within the catchment, and therefore is extremely rare and unlikely. It is also used to determine which areas are potentially flood prone (in the floodplain) and which areas are flood free (only land outside the PMF extent is truly 'flood free').

How has flood mapping affected property values?

Reviews of the effect of flood risk disclosure show that most international and domestic studies found no change in residential property values, and that property values are more likely to be affected by actual flooding than flood mapping. Flood mapping has been available for the Tweed Valley since 2005 and is not new to this study.

Council is not in a position to estimate whether this flood mapping has had any effect on property values in Tweed Valley as they are subject to a range of market factors. Irrespective of this, Council has a duty of care to advise property owners, occupiers and developers on the extent and level of flooding as outlined in the floodplain management process set out by the State Government.

How has flood mapping affected insurance?

Council is aware that insurance premiums have risen in recent years and is actively engaging with the Insurance Council of Australia (ICA) through the NSW Floodplain Management Association to raise issues highlighted by members of the Tweed community. Through this engagement, Council understands that flood insurance is a

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relatively new product for the insurance industry and premium increases have not been limited to the Tweed Valley. The inclusion of flood insurance in home and contents policies accounts for some, but not all, of the recent increases in premiums. Other factors include reinsurance costs (which is impacted by global events), profit margins, and government taxes.

Flood mapping has been available for the Tweed Valley since 2005 and is not new to this study. However, some residents have highlighted recent instances where insurance companies may be incorrectly interpreting flood mapping. Council has been proactive in this area by dealing directly with the ICA, individual insurance companies, and individual community members who have queries relating to their flood liability and require information to pass on to insurers. Projects such as the compilation of a national flood study database and standardisation of flooding definitions and mapping will help inform insurers as they continue to develop their understanding of, and pricing of flood insurance. In the absence of flood mapping, insurers will tend to quote higher premiums to cover unknown risk.

Council's discussions with the insurance industry have emphasised the need for flood insurance premiums to reflect the true risk of floods occurring at a property. Properties that are located above the 100 year ARI flood level but below the PMF event are at the low end of the risk profile and premiums should be priced accordingly. Pricing is however a matter for each insurance company to determine based on a variety of factors.

Why doesn't the study include stormwater or flash flooding?

Flooding can happen by a number of processes: high tides and elevated ocean levels can inundate coastal areas, prolonged rain over the catchment can cause the Tweed River to overtop its banks, intense localised rain can cause small creeks to rise very quickly (referred to as flash flooding) and inundation can also occur when the capacity of stormwater infrastructure is exceeded. Some or all of these types of flooding can occur during the same weather event, however they require different (though compatible) approaches to manage flood risk.

The focus of the Tweed Valley Floodplain Risk Management Study was ocean and Tweed River (or catchment) flooding only. However, it is recognised that flash flooding and stormwater flooding are also significant risks in the Tweed Valley and will be addressed in subsequent studies. Flood studies to date have been conducted at a regional scale, and have only included major trunk drainage infrastructure, not individual stormwater drains in each street.

One of the recommendations of this study is the commissioning of local drainage flood studies which will improve Council's understanding of stormwater flooding, especially in known hotspots such as Murwillumbah, Banora Point, Tweed Heads South and

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Chinderah. This will enable Council to develop a similar plan for the future management and upgrade of stormwater infrastructure and drainage, including behind levees.

How were the floodplain management options selected?

A Floodplain Management Committee was formed at the beginning of the study, made up of representatives from Council, the State Emergency Service, the Office of Environment and Heritage (State Government), elected community representatives and the floodplain management consultants (BMT WBM). The Committee undertook a preliminary review of all flood management options and identified management measures which would be investigated in more detail during the study.

A key objective of the study was to identify opportunities to minimise flood risk to the community, property and infrastructure now and into the future. In a catchment as large and diverse as the Tweed River, there are many floodplain management options to consider, including structural measures, land use and development planning for areas at risk, and options for emergency response planning. However, not all measures are feasible, on economic, environmental and / or social grounds.

The Committee decided some preliminary options were not feasible and / or did not justify further investigation. These options included the construction of flood mitigation dams (such as on Byrill Creek), retarding basins, and channel modifications (such as dredging, or a Fingal Head causeway or outlet). During the community consultation period in August 2012, a number of queries were made about these types of structural measures. As a result, the Committee reconsidered whether any of these options justified more detailed investigation, however did not identify any additional structural options which were economically, socially and environmentally viable.

In particular, there was found to be no flood-related justification to recommend construction of a dam on Byrill Creek or elsewhere, due to the large catchment size (which makes it difficult to significantly reduce downstream flooding), significant cost and potential for environmental degradation.

Will raising the Tweed Heads South levee worsen flooding in some areas?

Raising the levee will not worsen flood levels elsewhere in the catchment. The area behind the levee is primarily at risk of inundation from ocean storm surge and does not currently experience significant flooding from the Tweed River catchment due to the terrain and presence of the existing levee. The flood model was used to investigate whether raising the levee would affect flood levels and found that levels remain generally unchanged. The levee raising measure also includes new drainage infrastructure and pumps to drain local stormwater from behind the levee.

This is the main structural measures recommended in the Floodplain Risk Management Plan. At present, the levee protects the Tweed Heads South area from small floods (less than a 20 year ARI flood) but would be overtopped in larger floods. The study assessed

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the feasibility of raising the levee high enough to protect residents and properties from a 100 year ARI flood.

How does the SES plan for flood events?

The State Emergency Service (SES) records their evacuation strategies and flood risk information in the Local Flood Plan, which is a sub-plan of the Tweed Shire Disaster Plan (DISPLAN). The Local Flood Plan describes the process that the SES will follow in the event of a flood, including the logistics of warning and evacuating communities throughout the Tweed Valley. Local knowledge, information about past flood events and recommendations from studies, such as the Tweed Valley Floodplain Risk Management Study, are all used to develop the Local Flood Plan.

In conjunction with the Local Flood Plan, the SES conducts a range of education and awareness campaigns throughout the year, with a stronger push leading up to the storm season. The SES has helped many businesses and individuals develop personal flood plans and better prepare themselves for future evacuations. Recognising that flood risk doesn't stop at state borders, the Richmond Tweed SES has developed a Cross-Border Plan with Gold Coast City Local Disaster Management Group to improve coordination of emergency response between Tweed Heads and the Gold Coast.

Who issues flood warnings and evacuation orders?

If heavy rainfall and flooding is predicted, the Bureau of Meteorology (BoM) issues a Flood Watch, which is upgraded to a Flood Warning if river levels are expected to go above predefined threshold levels. Flood warnings are published [online](#) as well as being provided directly to other government authorities (including the SES and Council) and broadcasters (including ABC North Coast). Flood warnings issued by the BoM don't translate predicted flood levels to risk on the ground, and as such are not used in isolation to trigger an evacuation.

The Richmond Tweed (regional) SES closely monitor local weather and will start to prepare a response if they believe flooding may occur. When a flood warning is issued by the BoM, the Tweed Shire (local) SES translates predictions of flood height into consequences, such as flooding of certain areas or roads which might become cut. The SES then provides bulletins to the media and public about the predicted flooding. If the predicted flooding may result in the need to evacuate, the Richmond Tweed SES issues an evacuation warning, which is upgraded to an evacuation order if evacuation is considered necessary.

How has climate change been considered?

Council aims to balance the economic cost of planning for climate change now, with protection of people and property in the future, via two mechanisms of planning controls for future development and a Climate Change Adaptation Action Plan already developed by Tweed Shire Council in conjunction with Byron Shire Council. Outcomes from the

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Tweed Valley Floodplain Risk Management Study will be used to review and update these measures.

Council has adopted a climate change projection which allows for a 10% increase in 100 year ARI rainfall intensity and 91cm increase in 100 year ARI sea level by 2100. These adopted benchmarks are based on State Government advice released in 2007, and consistent with the subsequent NSW Sea Level Rise Policy (2009), applicable at the time of the preceding 2009 Tweed Valley Flood Study. While the State Government has since abandoned the Sea Level Rise Policy and no longer recommends statewide sea level rise benchmarks, it still requires Councils to determine local future hazards, and include consideration of potential sea level rise and climate change impacts in its flood studies and risk management studies, based on the best available data. Accordingly, Council has maintained its adopted climate change benchmarks until further authoritative advice is released, such as the 5th Assessment Report (AR5) by the Intergovernmental Panel on Climate Change (IPCC). Council does not possess the required expertise to use and analyse the outputs of complex climactic models to set its own benchmarks in the meantime. Climate change projections do not relate to the PMF, and insurance is based on existing risk, not projected future risks such as climate change affected flood levels.

Will new development worsen flooding?

To ensure new development does not worsen flooding, Council requires a hydraulic assessment of any development that may impact flooding by a suitably qualified engineer. This typically involves the use of the flood model to demonstrate that the proposed development itself is not subject to unacceptable flood risk, and that it does not worsen the flood risk in surrounding areas, prior to being granted development approval.

Much of the Tweed River catchment is in the floodplain but is only likely to be flooded on rare occasions. For these areas, Council aims to encourage suitable development while ensuring that the new development isn't at serious risk of flooding and won't worsen flooding elsewhere in the catchment as a result of its construction.

Council have a detailed land use plan and associated development controls which outline where development can occur, as well as regulating certain features of the development (such as the type or size of development). During the study, a review of Council's planning mechanisms was undertaken using latest information about flooding. Development will not be permitted in areas of the catchment which have an extremely high flood risk, whereas areas which are known to be flood free do not have flood related planning controls.

How was the community consulted?

Council sought input from the community, community representatives and stakeholders throughout the study to help identify flooding problems in the catchment, potential

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floodplain management options and to determine whether recommended options will be acceptable to the community.

To support the decision making process, Council also sought input from a wide range of community and business groups at the start of the study. Feedback from these groups helped select and shape the management options tested during the study. The Floodplain Management Committee, which includes a number of community representatives, was involved throughout the life of the study, reviewing various stages and providing valuable input to the decision making process. Towards the end of the study, the broader community was invited to view the draft Study and Plan and comment on these documents during the exhibition period (19th July to 30th August 2012). Drop-in consultation sessions were also held at the Murwillumbah Civic Centre and Tweed Civic Centre on 13th and 14th August 2012. The exhibition period and consultation sessions were publicised via Council's [website](#) and [Tweed Link newsletter](#).

Council made note of all discussion points and questions made during the session. Feedback from the community was reported back to the Floodplain Management Committee, who updated the Study and Plan to reflect the comments. Significant issues raised during community consultation were considered and, if decided to be necessary, studied in greater detail before finalising the Study and Plan. The updated Study and Plan including amendments made in response to the submissions and feedback received during the initial exhibition period were then re-exhibited from 12th February to 12th March 2014.

What happens next?

The main outcome of the study is the Floodplain Risk Management Plan – a roadmap for Council and other agencies (such as the SES) to implement the recommendations of the study. The Plan prioritises recommendations from the Study, provides a preliminary cost estimate and details the steps required to implement the recommendations. This Plan was adopted by Council in September 2014.

Some of the recommendations, such as updating the Local Flood Plan, can be undertaken straight away, while other recommendations, such as raising the Tweed Heads South levee, will require more detailed investigation. For recommendations which require a major investment, Council will apply for funding through the NSW State Government's Floodplain Management Program.