

QFCI

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Queensland Floods Commission of Inquiry

State of Queensland submission regarding flood mapping

Background

The Queensland Government received a letter from the Queensland Floods Commission of Inquiry (Commission) dated 18 October 2011 inviting a submission from it in response to questions about flood mapping. The letter stated that answers to the following questions may inform potential findings and recommendations about flood mapping.

1. What area should be covered by a flood map? For example, a local government area, a catchment, a basin, a sub-basin?
2. Who should be responsible for flood mapping? For example, the Queensland Government, the Commonwealth Government, local governments, catchment-based authorities? If some sort of joint responsibility, how would that work in practice?
3. Who should perform flood mapping? For example, private experts, officers of local, State or Commonwealth governments?
4. Should there be mapping guidelines to guide all flood mapping completed in Queensland? If so, who should set the guidelines?
5. Who should fund flood mapping? For example, local governments wholly, State government wholly, Commonwealth Government wholly, current resilience funding program arrangements, another type of joint funding involving the State, Commonwealth and local governments? What other funding options are available?
6. What amount of data-sharing is appropriate? Should any agency which completes a flood study be required to share its information with other government agencies, insurance companies and financial institutions? On what terms should it be required to share such information?
7. What types of flood mapping should be available to the public to enable them to be properly informed when making decisions affecting land planning, such as purchasing a property or making a development application, and in the context of an emergency, such as deciding whether and when to evacuate? Should the flood mapping available to them be, for example:
 - a. the flood maps or information used in local planning schemes?
 - b. flood maps and information held by State Government agencies?
 - c. flood maps and information held by Commonwealth Government agencies?
 - d. maps showing flood risk, historical flood height at property and similar?
 - e. maps showing evacuation routes?
 - f. maps showing zones of land that are likely to be flooded in certain eventualities, i.e. when the flood rises about a certain height at a certain gauge?
8. What sort of information or education should be provided to members of the public to assist them in understanding the maps?
9. What sort of information or mapping should be available to insurance companies or financial institutions for them to use in decisions about providing products to consumers?

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Queensland Government response

The Queensland Government welcomes the opportunity to provide a response to the Queensland Floods Commission of Inquiry's questions.

Introduction

The Queensland Government considers that flood mapping must be fit for purpose. It can be delivered in varying forms for differing uses. The various forms of flood mapping include:

- Flood events – recording flooding under an actual event, such as in 1974 or 2011.
- Flood risk – representing flooding simulated from mathematical hydrology modelling with a nominated probability, such as 1% Annual Exceedence Probability (AEP). This type of mapping is used mainly for detailed flood studies of a defined locality.
- Probable maximum flood – being simulated flood modelling of extreme precipitation events, used mainly for dam safety assessments.
- A floodplain – being the spatial extent of the floodplain, which is not based on an element of risk or a defined flood event. It gives broad scale flood hazard mapping.

Each of these types of mapping can be undertaken to varying levels of precision depending on the proposed use.

The Queensland Government considers that the most appropriate form and quality of mapping must be determined at a local level by the responsible local government, informed by local needs, knowledge and issues. It notes that flood mapping may inform a range of local decisions, including:

- land use planning, including as an input to planning schemes
- development assessment
- infrastructure planning, including as a means to reduce or mitigate the impacts of potential future flooding in existing, future and potential development areas, and
- disaster management planning.

The importance of local context has been previously highlighted to the Commission.

The Queensland Government also notes that a range of activities are being undertaken that directly or indirectly relate to the questions raised by the Commission.

A range of local governments have undertaken high quality mapping in recent years, informing decisions ranging from land use planning to being a key consideration in the decision by Gold Coast City Council to upgrade Hinze Dam. This activity reflects the responsibility of local governments to determine where detailed moderate and high quality studies are required and to deliver flood mapping.

The Queensland Government continues to provide technical support to local government.

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Since the 2010/11 floods, the Queensland Government has expanded its technical support to local governments to include the provision of state-wide floodplain mapping. This mapping is being delivered through the Queensland Reconstruction Authority (Authority) and the Department of Environment and Resource Management (DERM). This mapping product is titled the Interim Floodplain Assessment Overlay (IFAO). While there is a public commitment to completing this mapping by mid 2012, it is likely to be completed by the end of 2011 based on the current program of work.

Where the mapping has been prepared, the Authority is currently working with local governments to verify the data in the IFAO based on local experiences and information. Through these discussions, the IFAO work has been widely endorsed by local governments as being of assistance. It has also been acknowledged at the national level as a potential approach that could be adopted in other jurisdictions.

The Queensland Government will continue to maintain the IFAO into the future, and to refine the mapping as improved data becomes available. Custodianship of the IFAO will be reviewed prior to the transition from the Authority.

As well as technical support, the Queensland Government also provides financial support to local governments to undertake more detailed mapping. During the first three years of the current four year Natural Disaster Resilience Program (NDRP), more than \$5.2 million of shared Commonwealth and State funding has been allocated to 34 flood study projects. In the 2011/2012 round six flood study projects (Stanthorpe, Leyburn, Central Highlands, Rockhampton, Lockyer Creek, and Flinders River) were allocated a total of \$1.19 million Commonwealth/State funding (11% of total).

At the national level, the National Strategy for Disaster Resilience (NSDR) was endorsed by the Council of Australian Governments (COAG) in February 2011 and the Implementation Plan version 1.3 was released in September 2011. This implementation plan identifies seven strategic priorities, including:

- a. Strategic Priority 2: Understanding Risk; and
- b. Strategic Priority 6: Reducing risks in the built environment.

Strategic Priority 2 of the NSDR identifies a program of work (priority 2.4) to be delivered by the Risk Assessment Measurement and Mitigation Sub-committee (RAMMS) in conjunction with the National Spatial and Information Management Working Group (NSIM). It includes the development of a work program to map areas of risk relating to riverine flooding, flash floods, storm surge and coastal inundation. The end product is delivery of a National Flood Mapping Plan for COAG consideration on 28 February 2012. The Queensland Government is taking an active role in this work.

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Question 1 – What area should be covered by a flood map? For example, a local government area, a catchment, a basin, a sub-basin?

The area to be covered by a flood map should be determined based on the purpose of that mapping, following the principle that flood mapping must be fit for purpose.

The Queensland Government is providing technical support to local government through the development of state-wide floodplain mapping, the IFAO. This floodplain mapping is being prepared at the sub-basin or catchment level through the Authority and DERM with local government verification. This state-wide mapping will be refined over time, as and when better information becomes available.

The IFAO will be available to inform decisions by local governments about where detailed flood studies may be required or where detailed assessment should occur as part of the development assessment process. They may decide they require more detailed mapping across the sub-basin or catchment level, or for part of it.

Mapping of all sub-basins across the state coupled with existing high quality mapping will deliver a state-wide picture of flood hazard, to a level sufficient for local government to manage the hazards for which it is responsible.

The Queensland Government notes that all flood mapping needs to be reviewed and refined over time, as additional data becomes available and as the purposes of that mapping change. The frequency with which moderate and high quality mapping is reviewed is a matter for the local government that prepared it, taking into account their specific circumstances and needs.

The Queensland Government also notes that it is unnecessary and impractical to prepare high quality mapping (based on hydrological and hydraulic studies) across the entire state, particularly in low and no growth areas. However, ultimately it is the responsibility of each local government to determine its flood mapping requirements.

Question 2 – Who should be responsible for flood mapping?

As flood mapping is primarily used to inform local area decisions on land use planning, development assessment, and disaster management the most significant responsibility for flood mapping rests with local government. This responsibility reflects the primary role in applying flood mapping.

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Support is provided to local government by the State and Commonwealth governments, including technical and financial support. Since the 2010 and 2011 floods, this technical support to local governments has included the provision of the IFAO through the Authority and DERM. The Queensland Government will continue to maintain the IFAO into the future, and to refine the mapping as improved data becomes available. Custodianship of the IFAO will be reviewed prior to the transition from the Authority.

These roles and responsibilities are well established, reflecting an appropriate allocation based on the expertise of each jurisdiction and its ability to deliver flood mapping at a sub-basin level.

The Queensland Government considers that the roles and responsibilities of local government in relation to flood mapping could be enhanced through the Regional Planning Committees taking an active role in this matter. The Government has established Regional Planning Committees to advise on the preparation and implementation of regional planning programs in regions across Queensland. They include senior representatives of the Queensland and local governments, often being the relevant Ministers and Mayors.

The Queensland Government proposes that the RPCs could be used to help develop a collaborative approach to determining the need for flood studies and flood mapping across sub-basins and helping to coordinate funding requirements for that work. Specifically, the RPCs would help local governments within a sub-basin to:

- coordinate an analysis of the needs and priorities for moderate or high quality mapping; and
- inform their funding decisions, including coordinating requirements between local governments and options for funding, such as from the NDRP.

The Government will seek local government support for this to occur.

Table 1 below outlines roles and responsibilities for each level of government with a new role proposed for Regional Planning Committees.

Table 1: Responsibility for flood mapping.

Level of Government	Flood mapping responsibility
Local government	Deliver flood mapping for specific localities where required. Mapping may be used for: <ul style="list-style-type: none">• land use planning;• development assessment;• infrastructure planning; and• disaster management planning and implementation, through leadership of Local Disaster Management Groups.
Regional	The Queensland Government will seek support for Regional Planning Committees to be used to prioritise the need for moderate and high

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Level of Government	Flood mapping responsibility
	quality flood mapping across and within sub-basins, and to develop a collaborative approach to delivering this mapping (including coordination of timing and funding requirements).
State	Provide support to local governments through various means, including: <ul style="list-style-type: none"> • capturing data about the extent of flooding events; • preparing and maintaining default state-wide floodplain mapping (the IFAO); • providing technical support to local governments in incorporating their flood studies into planning schemes; and • providing funding through the NDRP to support local government deliver disaster preparedness activities including flood mapping.
Commonwealth	Provide technical and financial support to local governments through various means, including: <ul style="list-style-type: none"> • providing base-line data, including elevation data in the form of a digital elevation model or contours; • providing best practice guidance, to achieve national consistency; and • providing funding through the NDRP to support local government deliver disaster preparedness activities including flood mapping.

The Queensland Government notes that the more detailed the flood mapping, the greater the requirement for elevation data that underpins it.

The best available elevation data available across Australia is Geoscience Australia's one-second digital elevation model, which can only be used to produce 10m contours. For detailed flood studies, much higher resolution data is required. Access to readily available fit-for-purpose elevation data would significantly help local governments deliver on flood studies for their communities. The Queensland Government understands that the acquisition of this data can represent up to one third of the cost to local governments of detailed flood studies and mapping.

The Queensland Government considers that the responsibility for maintenance and improvement of Australia's elevation data appropriately rests with the Commonwealth Government. The availability of 10m contours nationally is a useful general resource but a data acquisition program that provided contours of around 1m would deliver the data resolution required for flood mapping at regional levels. In towns, high resolution data able to produce 0.25m contours or better is required.

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Commonwealth Government investment in the next level of elevation data (possibly a national 1m data set) would significantly improve the ability to deliver more detailed flood mapping. The Commonwealth Government's continuation and expansion of the funding that has previously been made available for high resolution elevation data acquisitions, particularly in towns, which would continue to be organised by the States, would also deliver significant benefits for flood studies and mapping.

The Queensland Government will continue to investigate ways in which the Commonwealth and State governments can work together to improve the availability of fit-for-purpose baseline elevation data in Queensland.

Question 3 – Who should perform flood mapping?

Local governments are responsible for ensuring that flood mapping is fit for purpose. If a local government considers that moderate or high quality mapping is required, then that local government should perform the flood studies to deliver it.

For moderate and high quality mapping, a local government may choose to undertake the mapping itself or it may engage suitably qualified engineers. The Queensland Government notes that most local governments use consultants to prepare moderate and high quality flood studies, because of insufficient internal technical resources.

Whether performed by internal resources or by consultants, the mapping should be undertaken using guidelines and best practice provided by the Commonwealth and State governments.

The Queensland Government will continue to provide technical support to local governments by delivering and maintaining the IFAO. Local governments may decide that this baseline floodplain mapping is sufficient to meet their local needs, either across the local government area as a whole or for key parts of it.

The Queensland Government will progressively update the IFAO based on verification from local governments and the provision of detailed flood studies and mapping undertaken and provided by local governments. The Queensland Government is using internal resources to develop the IFAO. The Queensland Government will continue to maintain the IFAO into the future, and to refine the mapping as improved data becomes available. Custodianship of the IFAO will be reviewed prior to the transition from the Authority.

Question 4 - Should there be mapping guidelines to guide all flood mapping completed in Queensland?

Mapping guidelines should direct local governments in how flood studies should be prepared to deliver flood mapping in Queensland.

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Best practice direction for guidelines comes from the national level through the "Floodplain Management in Australia – Best Practice Principles and Guidelines" by the Standing Committee on Agriculture and Resource Management, CSIRO 2000 (SCARM Report no. 73) and its subsequent review.

The Queensland Government, through the Authority, is preparing a flood study template and supporting guidelines as Part 2 of the *Planning for stronger, more resilient floodplains – Flood Study Template and Standard Planning Scheme Provisions*. These documents are based on the SCARM report, but adapted to Queensland and specifically the delivery of new *Sustainable Planning Act 2009* planning schemes through the Queensland Planning Provisions framework. Part 2 is due for consultation release in draft format in November 2011. The guidelines will specify how climate change can be accommodated in a flood study.

Consistency in language and terminology used in the development and delivery of flood studies will be a key focus of the guidelines to ensure better translation into land use planning and emergency management responses and improved understanding by the general public.

Question 5 - Who should fund flood mapping?

The primary responsibility for detailed flood studies and flood mapping rests with local government. The current situation is that the Commonwealth funds base-line data, the State funds the default IFAO, and local governments fund detailed studies as required. The Commonwealth and State governments also provide funding support to local governments to undertake detailed studies.

The NDRP funding program provides an existing vehicle for State and Commonwealth governments to provide funding for local governments who choose to undertake moderate and high quality flood studies and flood mapping. For approved projects, funding from the NDRP program is predominantly shared in thirds between the Commonwealth and State governments and the applicant (usually a local government).

The NDRP is a four year \$44 million dollar program of shared Commonwealth and State and Territory contributions. The final round of funding in this four-year cycle will be in the 2012/2013 financial year, with funding commitments typically announced in October 2012. This program, and input through the Regional Planning Committees, could contribute towards the delivery of the flood studies in identified priority areas.

Future cycles of NDRP funding are in the early stages of consideration by the Commonwealth and the States and Territories.

Question 6 - What amount of data sharing is appropriate?

Full data sharing covering the input to flood studies and any ultimate mapping is appropriate.

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Any completed flood study should be provided to and made available on the Australian Flood Studies Database administered by Geoscience Australia. This could be facilitated through a State Government portal.

Separately, the Queensland Government will investigate amending the existing DERM/local government data share agreements so the State has access to high quality flood mapping data where it exists.

In providing data-sharing, matters relating to liability and intellectual property need to be considered. The Queensland Government notes that an opportunity to improve the release and sharing of information is through legislative changes. This has been achieved in New South Wales where Section 733 of the *Local Government Act 1993* (NSW) states that '(a) council does not incur any liability in respect of any advice furnished in good faith by the council relating to the likelihood of any land being flooded or the nature or extent of any such flooding'.

Queensland does not currently have this protection. The Queensland Government will investigate whether legislative change is a viable means of achieving a similar level of protection.

Question 7 - What types of flood mapping should be available to the public to enable them to be properly informed when making decisions affecting land planning, such as purchasing a property or making a development application, and in the context of an emergency, such as deciding whether and when to evacuate?

All completed flood mapping and information should be made available to the public. This follows the principles contained in the *Right to Information Act 2009*, which is to give a right of access to information in the government's possession or under the government's control unless, on balance, it is contrary to the public interest to give the access.

An important issue is the 'channel' by which data should be conveyed to the public. The Queensland Government recognises that not all of the public have ready access to information on-line so access to digital and hardcopy maps will be required. The Authority is providing digital and hardcopy maps of its IFAO to local governments.

Question 8 - What sort of information or education should be provided to members of the public to assist them in understanding the maps?

The public education and understanding of flood risk is very important. The public should be able to understand the language used in flood mapping and its implications for flood risk.

Specific communication activities should be delivered by local government, taking into account local circumstances and needs. There are a range of means by which local governments inform and educate local communities about flood risks, ranging from SMS

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alerts to the installation of flood markers to identify flood levels. This helps to inform an appreciation and understanding of an expected event.

The range of communication activities implemented in any local government area would be informed by the likely risk in that area. For example, in high risk areas, being able to identify what a 4.46 metre flood at the city gauge means in a street or to a home is essential and cannot be achieved where high quality mapping does not exist.

The Queensland Government will continue to support these local government activities. For example, in September 2011 it released a document titled *Understanding Floods: Questions and Answers*. This document was prepared by the Queensland Floods Science, Engineering and Technology Panel, convened by the Queensland Chief Scientist, Dr Geoff Garrett AO. It explains, in clear and simple language, the fundamental concepts of floods – including flood causes, impacts, forecasting, and flood risk management now and in the future.

Consistent terminology is required to assist in communication about flood mapping. Part 2 of the Guideline being prepared by the Authority will build on best practice and seek to deliver a standardised approach to terminology.

The Queensland Government will investigate the feasibility of, and options for, a generic communication strategy for public education on flood maps. This strategy could be an awareness campaign that builds upon the *Understanding Floods* booklet, providing similar types of generic information to what is provided for other hazards, including storm and bushfire.

Question 9 - What sort of information or mapping should be available to insurance companies or financial institutions for them to use in decisions about providing products to consumers?

Insurance companies and financial institutions should be treated no differently from the general public (that is, no information should be withheld).

The Queensland Government is aware of comments by industry representatives that the lack of visibility of flood studies and flood maps is making it difficult for insurers to offer and determine cover, particularly in Queensland. Based on information provided by the Insurance Council of Australia, it is understood that around 60 percent of people currently covered for riverine flood do not require coverage. Therefore, the more information and the more parameters available to help identify an area of risk the better placed insurance companies and financial institutions are to offer appropriate cover.

However, the Queensland Government notes that there needs to be an understanding that the types of studies and ultimate mapping will determine a different level of risk. The state-wide default IFAO identifies potential flood areas but does not identify the probability of a flood event nor the depth of inundation during that event. It also does not include consideration of local issues, such as stormwater and overland flow. However, the maps do set parameters for

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where further more detailed assessments may be required to be undertaken, thus improving the information available to insurance companies or financial institutions.

If full data sharing and open access is agreed, no additional action would be required for the insurance industry.