

## Benchmarking Best Practice In Floodplain Management

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## Introduction

- Drivers for the paper
- What is Best Practice
- Measures
  - Mapping
  - Risk
  - Floodplain management measures
  - Evacuation and Warning
  - Strategic Management
- Conclusions



## Drivers for the Paper

- national best practice guideline to floodplain management
- map ranking from the QLD commission report
- Catchment mapping process in QLD



## What is best practice

Not new to floodplain management – used in SCARM 2000

According to “Managing the floodplain: a guide to best practice in flood risk management in Australia”

*Best practice promotes understanding flood behaviour so that the flood risk to the community can be understood, effectively communicated and, where practical and justifiable, mitigated. It facilitates informed decisions on the management of this risk, and economic investment in development and infrastructure on the floodplain.*



## Measures

Six key measures were identified that could be easily assessed to measure what extent the best practice process had been used. These measures are listed below:

- **Mapping** – the reliability and types of spatial information produced,
- **Risk** – to what extent flood risk has been quantified,
- **Planning** – the extent to which flood risk was incorporated into planning,
- **Floodplain Management Measures** – types and way floodplain management measures were produced,
- **Warning and Evacuation** – the extent to which warning and evacuation measures had been incorporated into the floodplain management process,
- **Strategic management** – how strategically floodplain management was being carried out.



## Mapping

- Mapping based on surrogates
- QRA carried out massive mapping program in a short period of time to give Councils a starting point
- This approach proves no probability information
- Risk with an approximate approach is it can foster more confidence than it merits
- Doesn't consider the hydraulics



## Mapping

- Mapping historical floods
- Much of western NSW and coastal river has been mapped using historical floods in the 80's
- Many of the large events change probability along the river



## Mapping

The Commission has ranked the flood maps in order of appropriateness for use in land planning (Queensland Floods Commission of Inquiry, March 2012):

- Mapping using topography.
- Queensland Reconstruction Authority interim floodplain maps.
- Historical flood maps.
- Q100 maps – flood maps which depict the 1 percent Annual Exceedance Probability alone.
- Flood maps which depict a number of different levels of flood likelihood, for example probable maximum flood, 1 per cent (Q100) and 5 per cent (Q20) and 0.2 per cent (Q500).
- Flood maps which depict both the likelihood of flooding and the characteristics of flooding.



## Mapping

- Best practice hierarchy for measuring mapping is set out below:
  - Nil
  - Based upon surrogates only
  - Based on historical floods only
  - Mapping single flood extent based on probability
  - Mapping series of probabilities with consequences
  - Mapping hazard and floodways
  - Mapping evacuation zones and low flood islands to life, evacuation



## Risk

Risk is defined as:

“The chance of something happening that will have an impact on objectives’ (ISO 13000:2009). It is measured in terms of consequences and likelihood. Risk is based upon the consideration of the consequences of the full range of flood behaviour on communities and their social settings, and the natural and built environment” (McLuckie, 2013)



## Risk

- Best practice hierarchy for risk:
  - No assessment of risk,
  - Probability only for one event,
  - Probability for a range of events,
  - Consequence and Probability for a limited number of events,
  - Full Understanding of Probability and consequence up to PMF, and
  - Full acceptance of residual risk and consideration in management.



## Planning

- best practice hierarchy for land use planning controls:
  - None,
  - Single planning level without mapping,
  - Planning level based only on historic events,
  - Planning level based upon historic or single event considering probability,
  - Flood Planning Precincts,
  - Flood Planning Precincts considering Emergency Management.



## Floodplain Management Measures


- Best practice hierarchy for mitigation measures:
  - No mitigation works in place but risk significant,
  - Only structural floodplain management works (dams, basins and levees) based upon a design flood with no consideration of larger events,
  - Management measures consist of non-structural and structural works, and
  - Full Integrated floodplain management plan considering the full range of risk.



## Evacuation and Warning

Best practice hierarchy for evacuation and warning:


- None,
- General warning only,
- Specific Warning only,
- Specific Warning with General advice on consequences from mapping of areas at high risk, and
- Specific Warning with Detailed Emergency Management Planning based on understanding of evacuation zones and low flood islands.



## Strategic Management

Best practice hierarchy for measuring strategic management is set out below:

- None
- Anecdotal historic flood knowledge on individual catchments
- Flood studies in some known problem areas
- Floodplain management plans in some known problem areas and main new growth areas
- Flood information brought together to inform decision making across catchments
- Strategic understanding of risk and its management across the entire service area to identify knowledge and management gaps and prioritise studies and works



Mapping	Planning	Floodplain Management Measure	Risk	Evacuation and Warning	Strategic Management
Based upon surrogates only	Very limited	Nil	Nil	Nil	Nil
Based on historical floods only	Limited	Very limited	Implied	Very Limited	Nil
Mapping single flood extent based on probability	Limited	Limited	Very Limited	Very Limited	Nil
Mapping series of probabilities with consequences	Basic Planning precincts	Proper assessment of structural works	Yes	Limited	Limited
Mapping hazard and floodways	Planning precincts	Mix of structural and no structural works	Yes	Limited	Good
Mapping evacuation zones and low flood islands to life, evacuation	Planning Precincts that consider risk profile	Fully Integrated	Yes	Yes	Detailed

