

# Proactive vs Reactive Floodplain Management

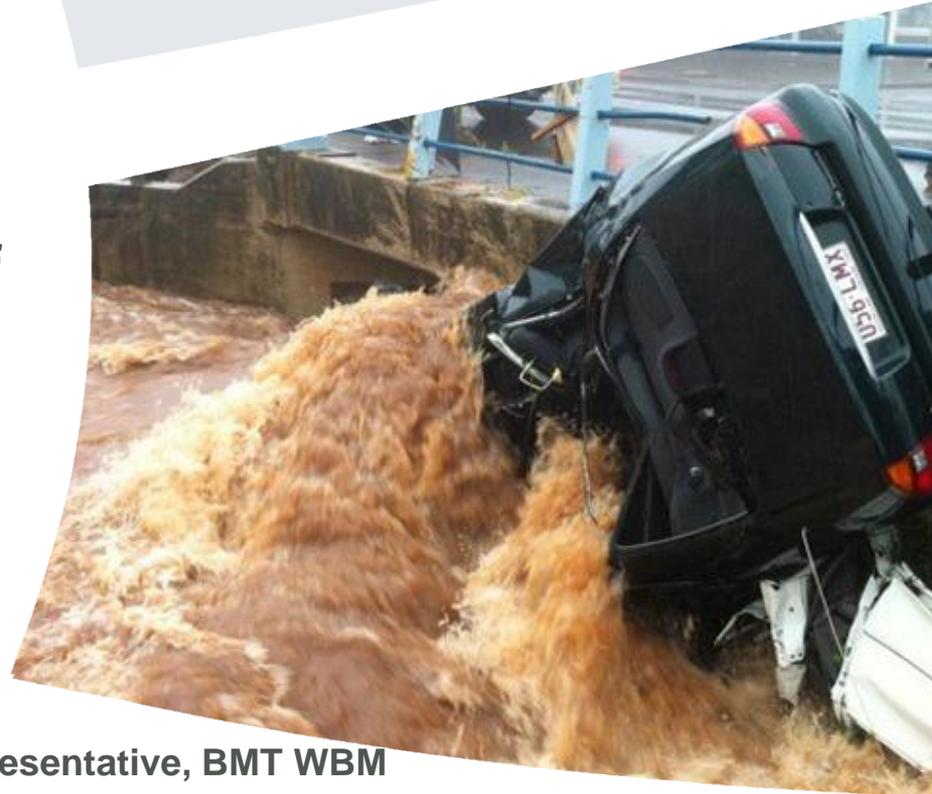
## The Diverse Consequences of the 2011 Australian Floods

**Arid Regions Conference 2013**

16 October 2013, Scottsdale

**Chris Huxley**

Senior Flood Engineer and TUFLOW Products Representative, BMT WBM



# Background

## BMT WBM

- 20 years flood risk management experience

## Chris Huxley

- 10 years flood risk management consulting (BMT WBM, Brisbane Australia)
- 20 major catchment flood risk studies in New South Wales and Queensland

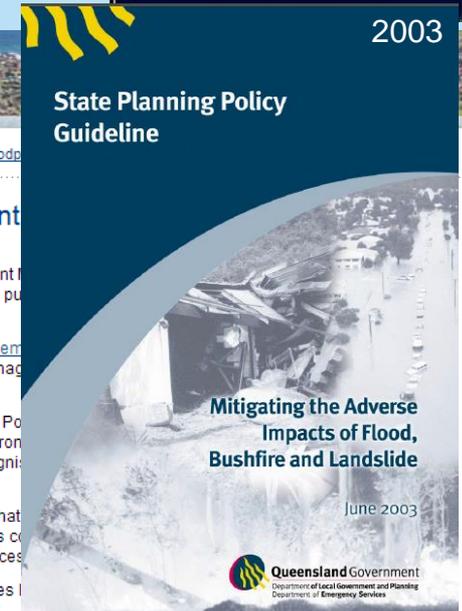
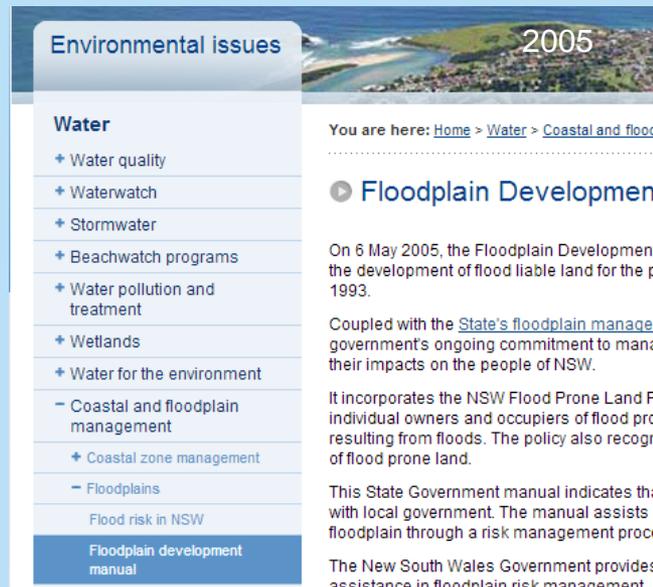
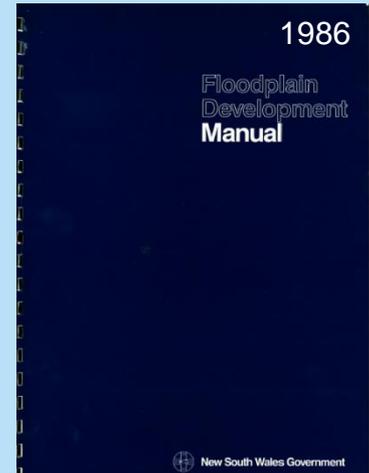
## State vs State

- 2011 and 2013 major flooding in both states (similar flood risk)
- So what's worked and what didn't?



# Government Roles and Approaches

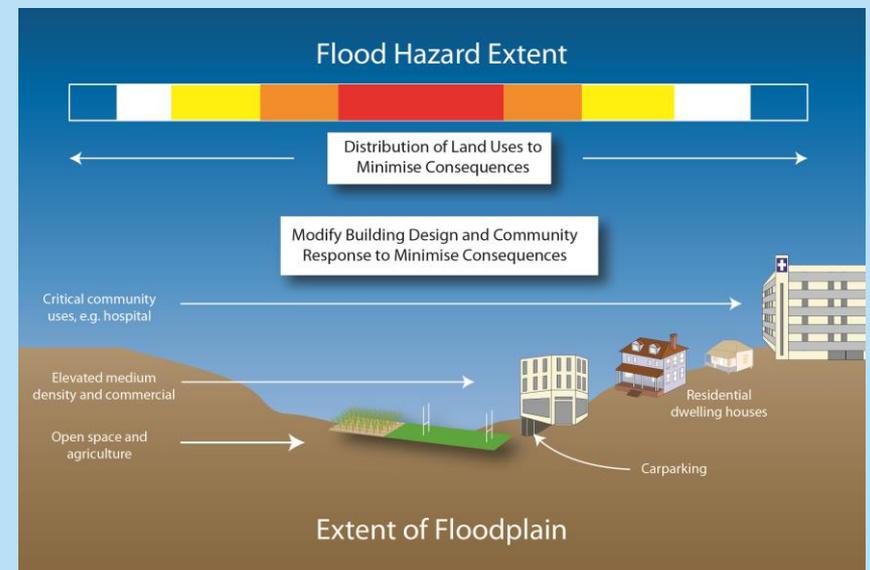
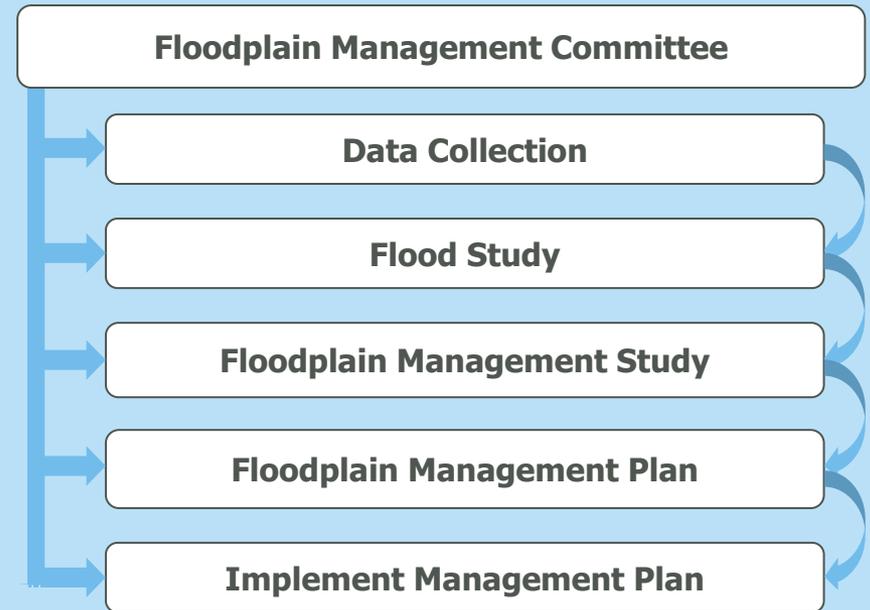
- Australian Government Roles
  - Federal government provides high level policy and funding
  - State governments provide policy, guidance and funding
  - Local governments (Councils) are responsible for flood risk management
- NSW has taken a very proactive approach to FRM for 30+ years
- NSW 2005 guidelines ~250 pages  
(Download from [www.environment.nsw.gov.au/floodplains/manual.htm](http://www.environment.nsw.gov.au/floodplains/manual.htm))
- Queensland historically taken a passive approach
  - Some councils proactive
- QLD 2003 guidelines for floods, bushfires and landslides < 40 pages flooding related



# NSW Approach

## NSW Government has provided guidance and incentives for +30 years

- Outlines a defined FRM framework
  - Best practice measures to improve level of flood information and manage existing and future flood risk
- Funds 2/3 of Council FRM studies
- Provides staff to oversee and review studies
  - To keep the consultants honest!
  - Ensures consistency across assessments
- Funds up to 80% of implementation costs for measures with a good BCR (with Federal assistance – 40/40/20)
- Hosts FRM conference every 18 months
- Actively helps Councils to
  - Manage and plan new development
  - Reduce the risk to established areas



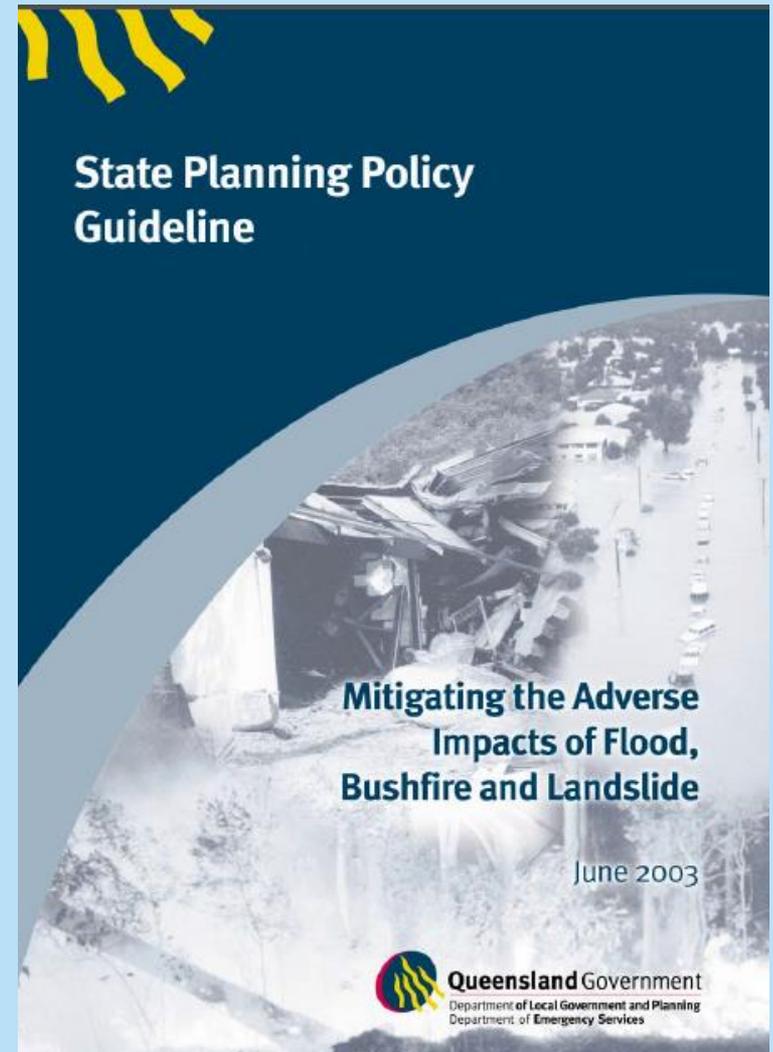
# Qld Approach

## Qld Government in comparison has historically

- Not actively pursued / encouraged / funded FRM as a long-term strategy
- Provided minimal staffing to assist councils (particularly important for small councils)
- Missed out on federal funding (some proactive councils have received federal funds directly)
- Not hosted FRM conferences
- Let councils “do their own thing”

### This approach has resulted in:

- Flood planning is largely the responsibility local Councils
- 63% of Councils in Queensland did not contain flood information in their planning schemes at the time of the 2011 floods!!



# 2011 and 2013 Floods

How did NSW and Qld fair?

## Key areas of difference

- Community Preparedness
  - Did people know what to do?
- Flood Warnings
  - Were the warnings useful?
- Development Planning Controls
  - Were planning controls effective?



# Community Preparedness

In many areas in Qld before the 2011 floods preparedness was very poor

- People in general had little idea of what to do
- Those that experienced previous floods much more astute

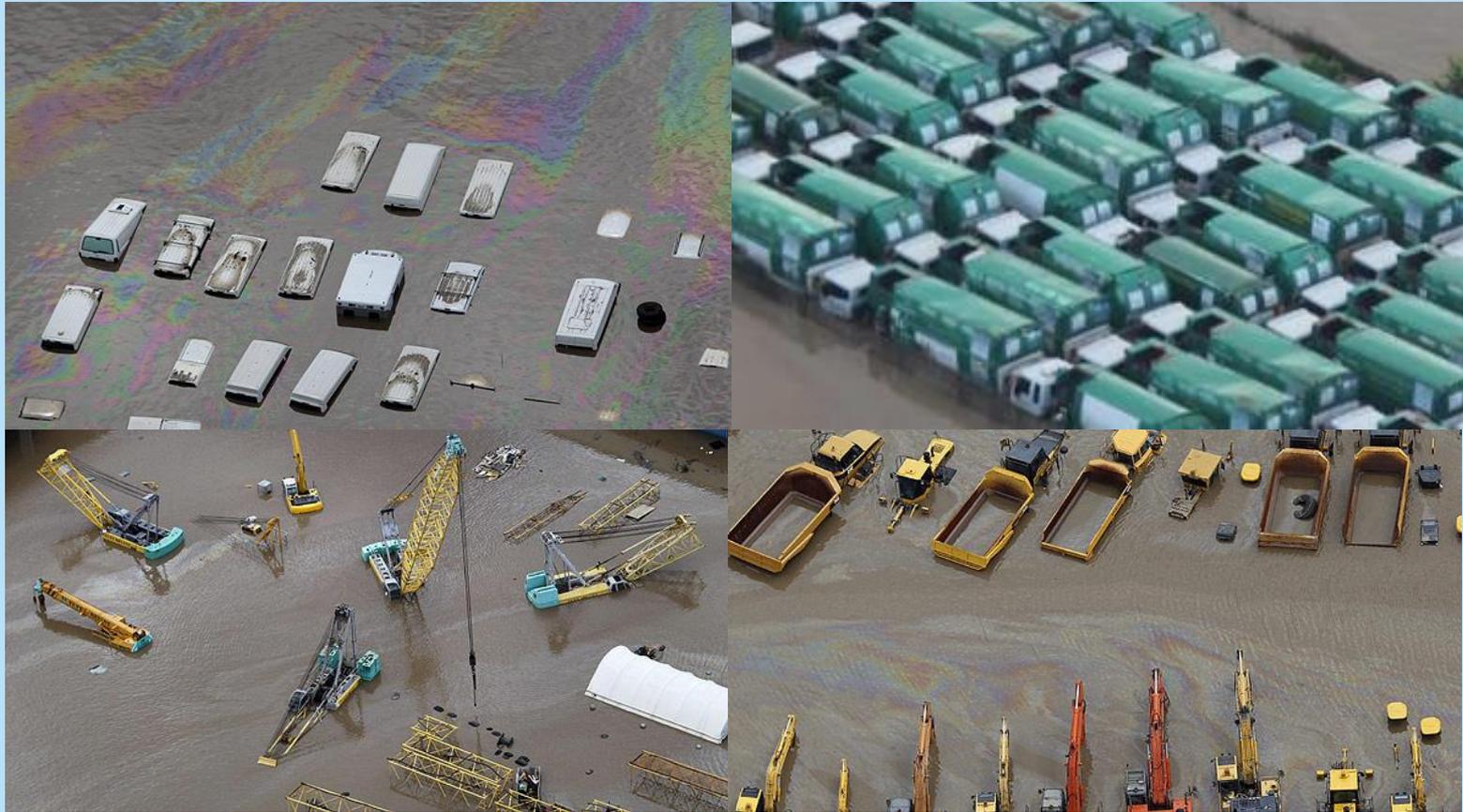


Brisbane QLD – Warning Time >24hours

If we were a prepared community would we have had this...

ABC

# Community Preparedness



**Or This?? The tangible flood damages associated with each of these pictures alone would cover the costs for a catchment flood risk management study...**



# Being Prepared

## Grafton, NSW

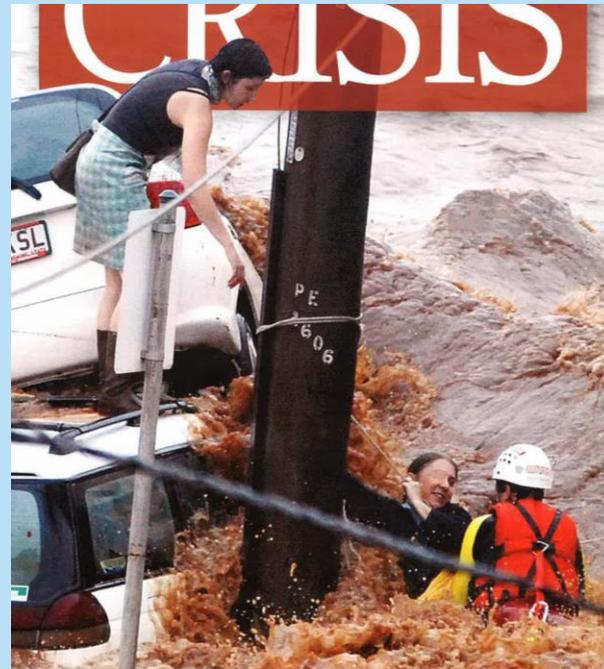
- 2013 highest flood on record (over 170 years of records – started in 1839)
- 2013 flood forecast predicted 200mm overtopping with half the town inundated
- Overtopping points identified in flood study were sand-bagged
- Sector specific evacuation warnings issued
- Potential emergency averted!
- Event was a major test of model accuracy  
“we got it right” was the response! 😊



# Flood Warnings

- The Bureau of Meteorology (Federal Government) issues warnings as predicted levels at river gauges
- These warnings are relayed to
  - The community via the web/phone
  - The media who must quote verbatim
- But many (most) people did not know what a flood gauge height warning meant
  - Does 5.5m mean we get flooded?  
no idea?
  - When do we lose access?  
no idea?
  - Should we relocate possessions?  
no idea?
- **Community Flood Education is a critical element of flood risk management**

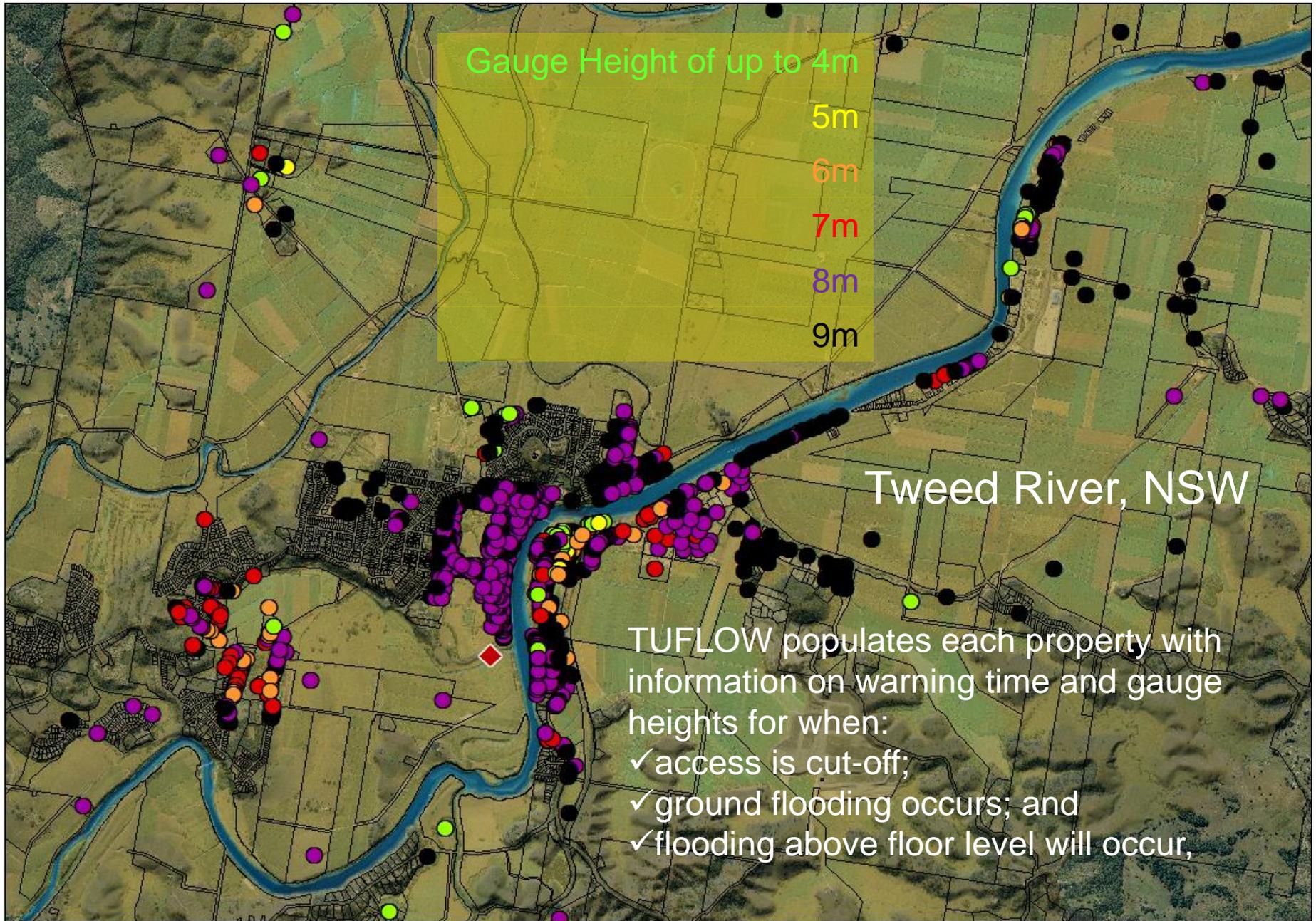
*The Toowoomba Chronicle*



# Flood Warnings

Forecasted gauge heights – let's make them mean something!

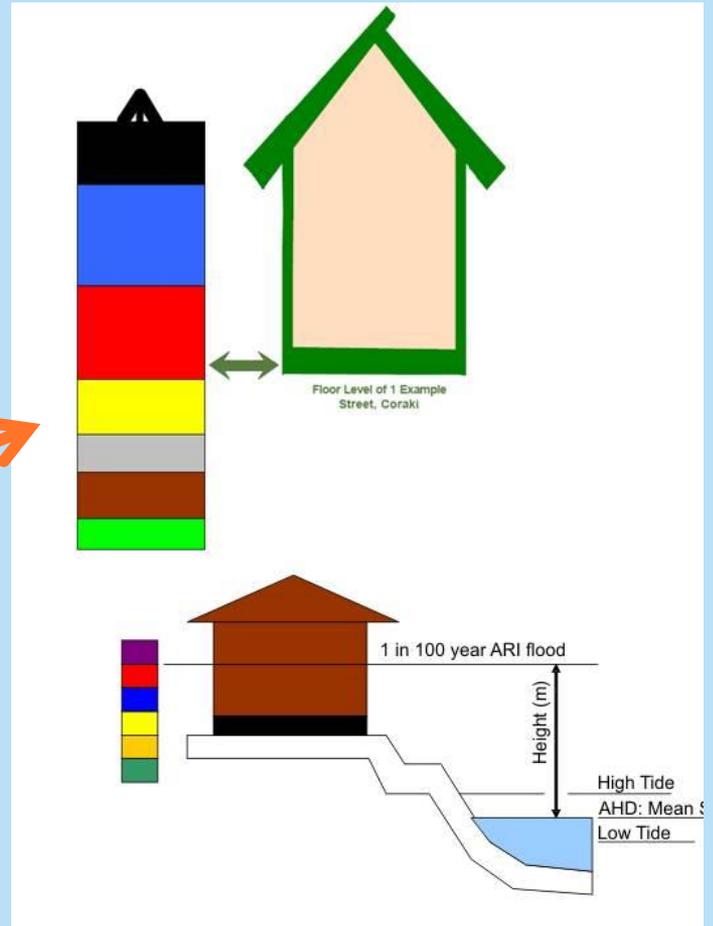
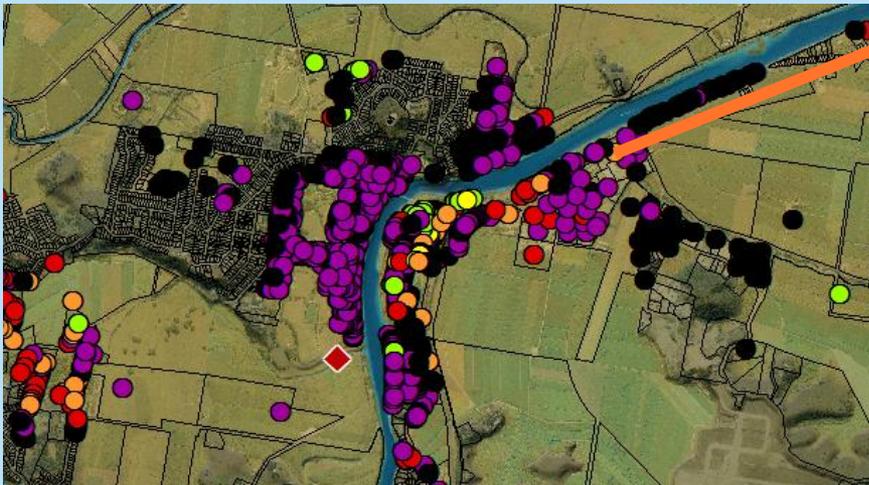




# Making Flood Warnings Useful

## For at Risk Buildings

- Critical gauge heights for each building placed somewhere permanent (eg. inside the electricity box)
- Send messages to residents and owners
- Residents/owners can make an informed decision on the action to take
- Flood education/awareness => warning response



# Flood Totems

## The Next Step on from Gauge Heights

- Links Response Modification Measures (Flood education and warning)
- Help solves communication problems
- Being trialled in Innisfail, North Queensland (a proactive council)



Cathie Barton

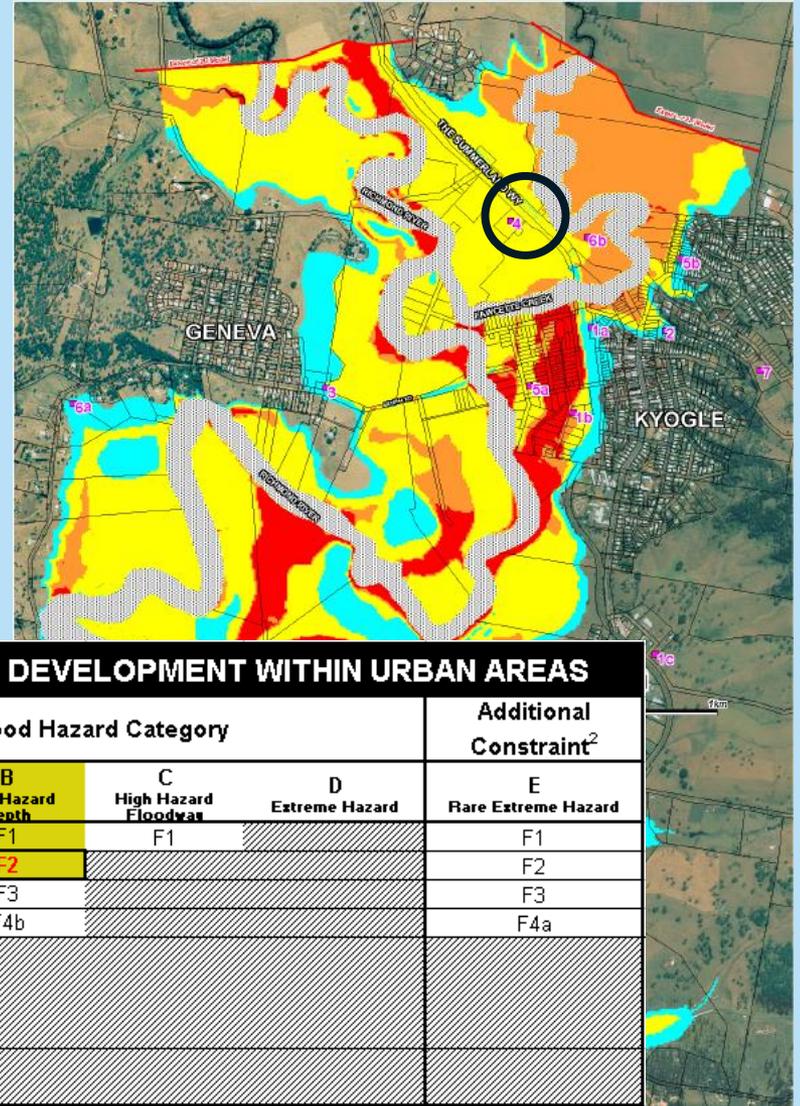
# Development Controls NSW Approach

## Risk Based Development Controls (Consequence vs Likelihood)

- Quantify the risk
- Assign development controls accordingly

## Example – New Mechanics Garage

- High hazard depth
- Flood planning controls (eg. FPL= 59.3 mAHD)



**TABLE 2-3: RESIDENTIAL, COMMERCIAL AND INDUSTRIAL DEVELOPMENT WITHIN URBAN AREAS**

Controls	Development / Building Type	No Hazard	Flood Hazard Category				Additional Constraint <sup>2</sup>
			A Flood Fringe	B High Hazard Depth	C High Hazard Floodway	D Extreme Hazard	E Rare Extreme Hazard
Floor Level	New Ancillary Building (eg shed, carport)	N/A	F1	F1	F1		F1
	New Commercial or Industrial Building	N/A	F2	F2			F2
	New Habitable Building	N/A	F3	F3			F3
	Building Extension	N/A	F4a	F4b			F4a
	New Emergency Services (eg hospitals, etc) /Critical Infrastructure (eg major telephone exchange, etc)	N/A	F5				
	New Other Community Service (School, etc) /Special Evacuation Needs (eg aged care)	N/A	F5a				

# Qld Approach to Development Controls

- Varies widely from sound risk-based approach to a minimalist approach
- Prior to 2011 some Councils using a 25 year event for setting residential planning levels!
- Improved since 2011 with Councils changing approach/policies



Courier mail



The Australian



Courier mail

# Reactive Flood Risk Management

After the 2011 flood, Brisbane City Council , QLD

- Raised minimum floor level to 2011 flood levels
- Relaxed building height restrictions so houses could be raised higher



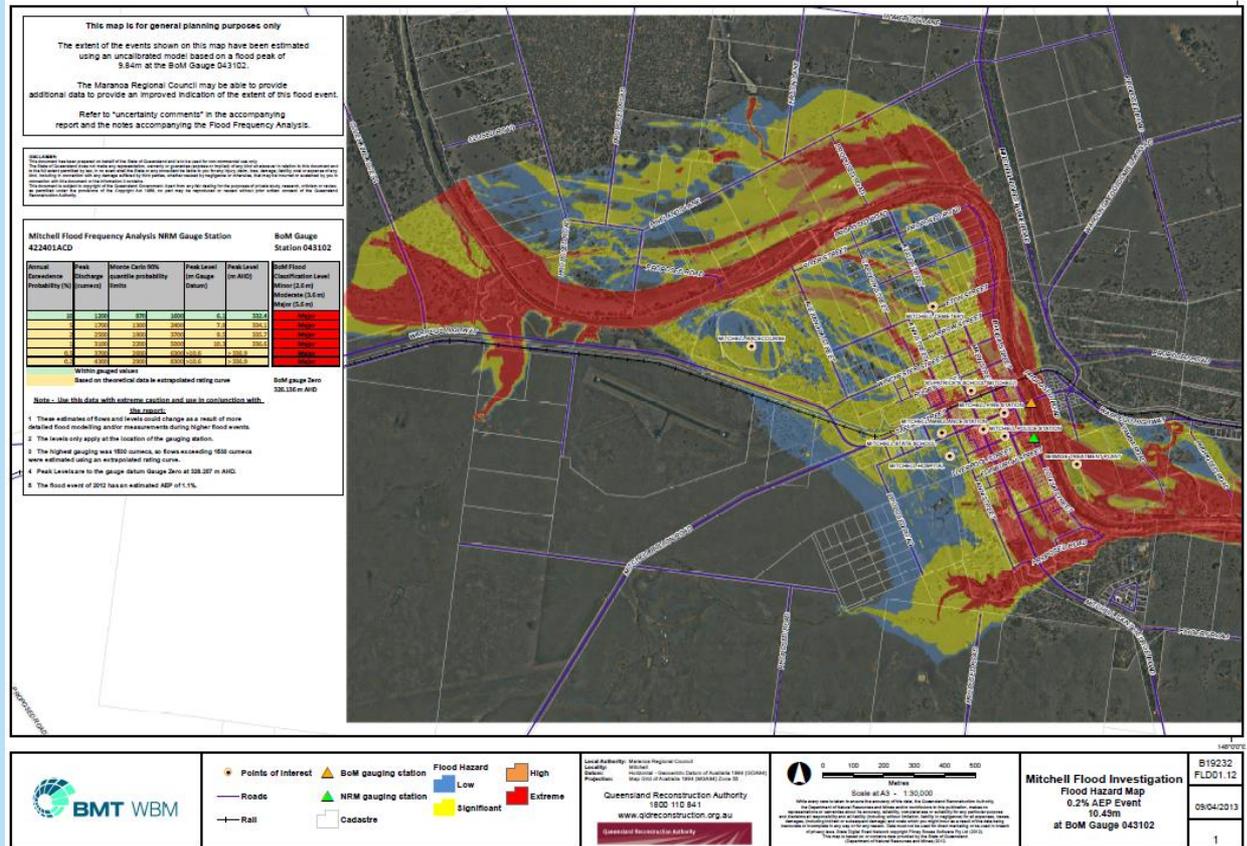
# Post 2011 Queensland Reconstruction Authority

- **Created by the Qld Government in response to 2010-11 natural disasters**
- **Remit to part fulfil the Qld Floods Commission of Inquiry**
  - To rebuild
  - Improve the State's preparedness for future events
- **Flood hazard mapping program underway**
  
- **Qld are reacting (positively) to the 2011 floods**
- **If they had been proactive.....**

# Qld Flood Hazard Mapping Program

## QFMP

- > 100 townships modelled in several phases and work bundles (3 Phases)
- All consultants except one used TUFLOW ☺
- Phase 1 and 2 are complete



# Qld Flood Risk Management Studies

- Flood Risk Management Studies in QLD

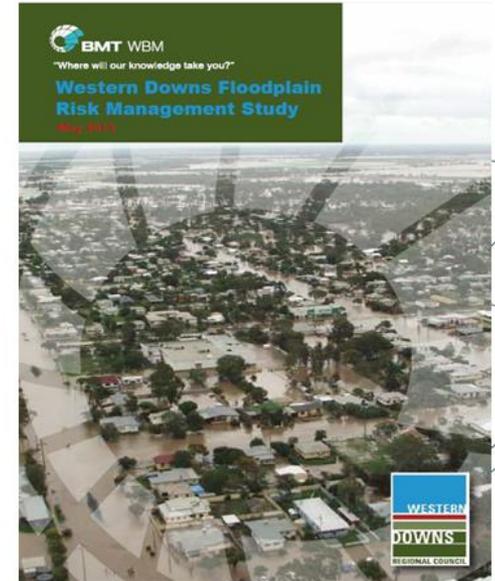


"Where will our knowledge take you?"

## Western Downs Floodplain Risk Management Study

Barry Rodgers

14 May 2013



# In Hindsight...

## NSW's +30 years of proactive flood risk management paying off

- NSW also experienced major flooding events in 2011 and 2013 (of an equivalent magnitude to QLD)  
Did we hear about these? **“No News is Good News”** or **“No News is Good FRM!”**
- Still much work to be done, but by being proactive the overall risk before the floods came was lower

## Qld historically took a passive approach and is now in a reactive phase (some proactive councils excepted)

- Becoming proactive through flood risk mapping and risk mitigation studies
- Will now hopefully pursue a long-term flood risk management process



Toowoomba Chronicle

# Conclusion

## A proactive approach

- keeps future developments
  - out of the floodplain, or
  - “high and dry”
- minimises the existing flood risk before the floods come
- Increases a communities level of flood awareness /preparedness. Enabling appropriate response to warnings during an event

**A passive/reactive approach will just keep cleaning up the mess**



Piles of household goods damaged in the Brisbane flood littered suburban streets after an army of volunteers turned out to clean up Australia's third-largest city. PHOTO: Eddie Safarik AFP

Thanks