

**Climate Change Adaptation and Flooding:**

Australia's Statutory and Institutional Arrangements



Floodplain Managers Association National Conference, 23<sup>rd</sup> May 2014

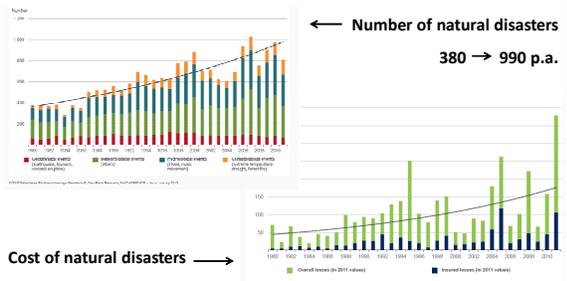
Caroline Wenger  
Fenner School of Environment and Society  
caroline.wenger@anu.edu.au

**2010-11 Flood recovery bill**  
(Qld & Vic, '000,000,000)

Federal (NDRRA):	\$5.8
States (NDRRA):	\$2.0
Insurance:	\$2.5
Uninsured losses:	?
Charity (Qld):	<u>\$0.266</u>
	~\$10.5 billion

Average annual flood cost (1967-2005) : \$377 million (Australia)

**Global disaster statistics 1980-2011**  
(source: Munich Re)



**Number of natural disasters**  
380 → 990 p.a.

**Cost of natural disasters**  
\$US 48 → \$125 billion p.a.

**Climate change and floods**

- Less predictable
- Changed intensity, frequency, location
  - Flash flood (intense rainfall events, run-off from dry catchments)
  - Cyclones move south; associated rain >20%
  - \$226 billion coastal assets at risk from 1.1m SLR
  - MDB 1:100 ARI → 1:10 ARI possible by late C21
- More severe drought: floods an opportunity?

**The Project**

A case study examining:

- current policies and institutional arrangements for flood
- reforms to reduce Australia's future vulnerability to flood

Part of the 'Statutory frameworks, institutions and policy processes for climate adaptation' project

Funding:



**Institutional Mechanisms**

Attribute	A. Jurisdictional scope	B. Sector	C. Threat	D. Nature	E. Basis of power
<b>Mechanism</b>					
1. Inter-governmental function	Case study 1 (NWC/NCC)				Case study 1 (NWC/NCC)
2. Intra-governmental function			Case study 5 (Primary industries)		
3. Regulation by prescription	Case study 5 (City of Melbourne)		Case study 7 (Floods)		
4. Planning processes		Case study 2 (Planning regs)			Case study 2 (Planning regs)
5. Funding function					
6. Information and analysis function		Case study 3 (Energy, water)			Case study 3 (Energy, water)
7. Supporting market arrangements		Case study 4 (Finance)			Case study 4 (Finance)

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## Information sources and focus

**Literature review**

- Flood reviews, policy documents, legislation, agreements, funding reports, academic literature

**NCCARF 'Living with Floods' project**

- analysis of Australian flood reviews; interviews; NL, USA, China case studies

**Focus on flood prevention**

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## 1. Non-mandatory consideration of flood risk

- Conflicting policy objectives (short v's long term gains)
- Lack of flood mapping
- Processes to revise key planning instruments

**Reform needed:**

- Consistent policy, legislation and planning processes
- Nationwide investment in basic flood mapping, eg. QRA maps
- Mandatory inclusion of flood controls in local planning schemes
- Processes for prompt inclusion of new flood information

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## 2. Inadequate incorporation of future scenarios into planning tools

- Flood modeling does not provide adequate certainty for local decision making

**Reform needed:**

- Decision making that does not rely on information certainty
- Incorporate climate change risks into building codes
- Assess adequacy of planning tools
- Use of palaeological information in mapping (eg QRA maps)
- Local government alliances that pool resources

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## Are our planning tools adequate?

- Climate is no longer stationary
  - 1:100 ARI could become a 1:10 ARI in the MDB late 21<sup>st</sup> century (Hirayabashi et al 2013)
- Safety standards higher overseas
  - NL 1:1,250 (riparian) to 1:10,000 (sea) year event
  - China >1:200 ARI where population >1.5 million
  - USA reviews: 1:500 ARI better for urban areas
- Buffers other uncertainties (eg future development, short term flood records)
- Australian Rainfall & Runoff Guidelines revision

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## 3. Inadequate on-the-ground application of development controls

- Conflicting policy priorities
- Insufficient resources for local government eg risk assessment
- Negative financial consequences of responsible decision making eg, when land is down-zoned
- Lack of financial consequence for risky decision making

**Reform needed:**

- Clear development policy priorities
- Resourcing & technical support for local governments (eg LAPP)
- Incentives/disincentives to support responsible decision making

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#### 4. Insufficient funds for mitigation v's relief and recovery funding

- Short parliamentary terms: mitigation spending is unlikely to receive credit
- Media coverage focuses on disasters and response

**Reform needed:**

- Increased funding of mitigation
- Strong promotion to the public about the benefits of prevention / mitigation and government action

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#### 5. Rebuilding to pre-existing standards

- Additional upfront recovery costs
- *Immediate* rebuild / repair needed; *lengthy* cost-benefit analysis and approval processes
- Lack of betterment provisions for private owners

**Reform needed:**

- Flood recovery strategies that merge with prevention
- Agreed processes to pre-approve infrastructure for betterment
- Targeted recovery grants; new mitigation insurance products

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#### 6. Flood risk information is not available

- Inadequate flood mapping
- Financial consequences for local governments if they apply new information  
(eg, legal fees, compensation, lower rates income)
- Financial consequences for landowners  
(eg ↓land values; ↑insurance premiums)

**Reform needed:**

- Being addressed eg NFRIP; ANZEMC Roadmap covers vendor disclosure; AR&R revision incorporates climate
- Support and incentives needed for local government
- Nationwide basic flood mapping (eg QRA maps)

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#### 7. Implementation of maladaptive approaches to flooding

- Local implementation of flood control: off-site impacts
- Effective flood mitigation can be counter-intuitive  
(eg, 'clear and straighten' increases flood damage)

**Reform needed:**

- Administrative systems support catchment based approaches
  - collection of flood information
  - assessment & implementation of flood mitigation  
(considers cumulative impacts and +/- externalities)
  - market mechanisms, eg payment for ecological services
- Raise awareness of adaptive mitigation options

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#### Key findings

1. Non-mandatory consideration of flood risk
2. Inadequate incorporation of future scenarios into planning tools
3. Inadequate on-the-ground application of development controls
4. Insufficient funds for mitigation: Generous relief and recovery funding
5. Rebuilding to pre-existing standards
6. Flood risk information is not freely available
7. Implementation of maladaptive approaches to flooding

**Email address:** [caroline.wenger@anu.edu.au](mailto:caroline.wenger@anu.edu.au)

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