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Living with floods: key lessons from Australia and abroad

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The project

- Examined lessons from the 2010-11 floods in Victoria and Queensland;
- Commissioned by the National Climate Change Adaptation Research Facility;
- Undertaken by Caroline Wenger, Karen Hussey and Jamie Pittock at ANU;
- Published as: Wenger, C., Hussey, K., & Pittock, J. (2013). Living with floods: Key lessons from Australia and abroad. Gold Coast: National Climate Change Adaptation Research Facility.
- Available at: <http://www.nccarf.edu.au/publications/living-floods-key-lessons-australia-and-abroad>

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Project objectives:

- Explain relationships between floods and climate variability, and climate change adaptation;
- Synthesise the findings that aid climate change adaptation from the Victorian & Queensland flood inquiries;
- Check the lessons from these inquiries against lessons for more effective flood-risk management from overseas; and
- Refine the draft research findings with advice from end-users.

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Synthesis of findings from...

1. Brisbane City Council's Flood Response Review Board report (Brisbane Review)
2. Queensland Floods Commission of Inquiry (QLD Inquiry)
3. Victorian Review of the 2010-11 Flood Warnings and Response (VIC Review)
4. Parliament of Victoria's Environment and Natural Resources Committee Inquiry into Flood Mitigation Infrastructure in Victoria (ENRC Inquiry)

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Climate change and floods

- Uncertain projections.
- More frequent recurrence anticipated.
- More intense cyclones likely.
- Exacerbated by:
 - Flashier flooding off dry catchments?
 - Greater erosion and debris?
 - Sea level rise?
- Exceed design parameters for infrastructure?

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Our NCCARF research

- Review of inquiries and literature
- Interviews with expert stakeholders
- Benchmarking against similar studies from China, Netherlands and the USA
- Expert Reference Panel
- NCCARF peer review

 NCCARF
National Climate Change Adaptation Research Facility

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Finding 1: Climate change not covered in flood reviews

The reviews varied greatly in their scope, but one of the most notable findings was that Australian reviews virtually ignored the issue of climate change and its impact on flooding; some reports didn't refer to it at all!

That is a lost opportunity to account for future risks in current reforms...

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Key observations:

- Only the VIC ENRC Inquiry made a definitive statement on climate change when setting the context but it did not assess CC implications of the measures it proposed.
- QLD inquiry assumes stationarity (but good QRA mapping).
- Marked contrast with overseas reviews considering climate change impacts.

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Reviews' recommendations

- Better: Governance, coordination, integration, policies, strategies, management tools, standards, legislation, accountabilities, oversight, communication, resourcing, risk assessment, planning, education and training....
- But primarily response and recovery.

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PPRR > PR

- Prevention: Some consideration.
- Preparation: Focussed almost entirely on levee management, early warning and dam operating rules.
- Response: Primarily concerned with 'all agencies' inter-operability.
- Recovery: Ways to use recovery to reduce vulnerability ignored.

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Floodplain restoration?



South of Kerang, 18 January 2011.
Source: blogs.abc.net.au



Goulburn River.
Source: www.gbcma.vic.gov.au

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Finding 2: Deficiencies, inconsistencies and perverse incentives are rampant

- Governance
- Coordination
- Integrative policies, strategies and management
- New management tools
- Robust standards
- Planning
- Legislation
- Accountabilities and oversight
- Communication
- Resourcing
- Risk assessment
- Education and training.

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Interviewee's views

- Development controls needed but competing priorities
- Levees to be avoided
- Need to reduce floodwater velocity
- Catchment scale approach needed – PES
- Disaster relief over-generous and untargeted



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Finding 3: Australian approach very different to international best practice

In contrast to the Australian reviews, climate change was a driving force behind the international reviewers, and all three international reviews overwhelmingly pointed to a need for ecosystem approaches to flood control.

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Overseas situation

- China, Netherlands and the USA
- Integrated river basin management
- Ecosystem approaches > floodplain restoration
- Higher standards – 1:100 > 1:1,250 RI
- 15% disaster relief funding dedicated mitigation in the US

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Lakes in the central Yangtze River basin



- Loss of lakes – big floods
- Reconnection of 448 km²
- Retention of 285 Mm³ water
- Fisheries + 15%
- Diversified livelihoods
- Environmental benefits

Photos x 3 © WWF China PO

Map © WWF International Photo © WWF / Yifei Zhang

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Central Yangtze River lakes



Photos x 3 © WWF China PO

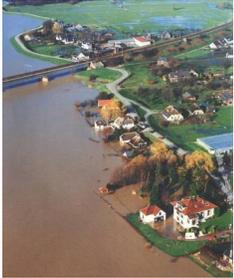
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Nijmegen, The Netherlands

Gerlense Poort floodplain restored to a 2,500 ha nature reserve

Safe flood discharge at Arnhem and Nijmegen up from 15,000 m³/s in 2006, to 16,000 m³/s in 2015, and 16,500 m³/s in 2100

Peak flow reduced by 9 cm

Photos: City of Nijmegen

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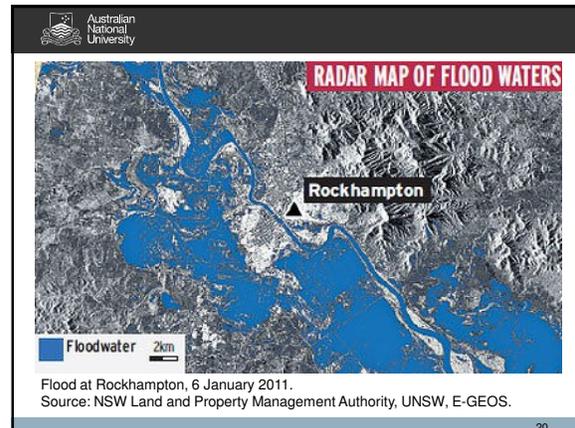
Before and after

Flood bypass channel under construction in Nijmegen



Photos: City of Nijmegen

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Conclusions: Australia would benefit from...

- Recognising climate change may exacerbate flood risk
- Increasing use of non-structural measures to provide greater resilience
- Reforming use of disaster relief funds and flood insurance – *conditionality is vital*
- Using mitigation measures such as voluntary land purchase and relocation
- Enabling local governments to act where state governments are failing.

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