

Editorial process

- Improve accessibility for non-specialist audiences
- Reduce wordiness and length of draft book
- Ensure technical rigor – evidence based
- Achieve a cohesive document
- Provide modern and up-to-date perspective on urban stormwater management
- Avoid normative assumptions and values

ARR Urban Book: Coombes, Rosso, Babister



Introduction

Book 9 Ch 1

ARR Urban Book: Coombes, Rosso, Babister



Key principles of the Urban Book

- Evidence based using 30 years of additional Australian data and science
- Focus on entire spectrum of runoff events and potential flooding outcomes
- Stormwater management is part of linked water cycle systems which includes stormwater quantity and quality, water supply, urban form and waterways
- Built around Chapters 4 & 5: key elements of conveyance and storage
- Volume management is a key element of stormwater management and flood control – this will increase in future
- Stormwater volume controls have increased research effort since 1987
- There are substantial gaps in knowledge about urban hydrology
- Urban stormwater management is primarily about surface flows

ARR Urban Book: Coombes, Rosso, Babister



Aspects of Urban Hydrology

Book 9 Ch 2

Dr Tony Ladson

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The Urban Water Cycle

Urban Water Cycle
A complex system that modifies the natural water cycle – increased impervious areas, imported water

Urban stormwater runoff processes
Urban is different and more complex than rural

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Stormwater is part of urban water balance and cycle

Water Balances in cities
Average annual volumes of stormwater runoff from properties similar or greater than water use

Timelines of water balances in a city
Dependent on water collected from local rivers
Reduced flows in local rivers supplemented by groundwater and importing water from other regions
Significant urban stormwater runoff
Halved water demand using water efficiency and rainwater harvesting
Cumulative impacts on surrounding communities

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Philosophy of Urban Stormwater Management

Book 9 Ch 3

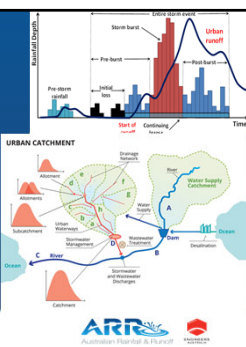
Dr Peter Coombes
Steve Roso

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Traditional cumulative scale issues

- Water demanded, stormwater and wastewater generated, hydrology altered at distributed scales
- Runoff from almost all rainfall – cumulative response
- Urban areas alter hydrology and stormwater quality:
 - Water demands (B)
 - Within urban areas (a-h)
 - Downstream of urban areas (C)
- Flow management at bottom of urban catchment (D)
- Does not account for changes in catchments (increased density, aging infrastructure, climate issues)
- Water, wastewater and stormwater impacts are linked
 - Analysed separately

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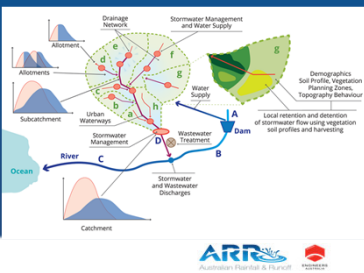


Systems Issues & Integrated Solutions

- Multiple physical and ecosystem responses within catchments
- Solutions at multiple scales
- Distributed "within catchment" solutions for whole of system benefits
 - Cannot be realised by analysis at bottom of catchment (D) and assumed runoff coefficients

Need to deconstruct peak flows into volumes, patterns and timing.

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Connectivity & variability

- History
- Evolution and Innovation
- Opportunities and challenges
- Urban flooding processes
- Market mechanisms

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Stormwater offsets

Market mechanisms, tradeable permits, water markets, development control schemes:

- Analysis from perspective of entire catchment
- Equivalent and measurable changes in flow (and quality) from infrastructure or strategies within the same catchment
- The funds from stormwater off-sets tied to measurable and timely deliverables in the catchment

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Legal insights

State Supreme Courts, High Court of Australia

- Professionals must use the latest data and science
- Default to local codes is not defence against liability
- Must account for climate change

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