

**AUSTRALIAN
RAINFALL AND
RUNOFF
WORKSHOP**

HWRS2008 - Adelaide
April 2008

Australian Rainfall and Runoff
A guide to runoff estimation

DISCUSSION TOPICS

- Australian Rainfall & Runoff Revision
- Topics Covered in Workshop
 - At-Site Flood Frequency Analysis
 - Regional Flood Methods
 - Catchment Modelling
- Future Directions & Needs

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ARR REVISION

Basic reasons for revision include

- Changing focus of hydrologic design or analysis problem;
- Development of new approaches;
- Inconsistencies in existing recommended approaches; and
- Need to give explicit advice on Climate Change

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ARR REVISION

Earlier editions focussed on flood estimation for structural design (i.e. design flow with a particular frequency). Current issues faced by practioners still include this problem but there are many other problems where advice is desired.



ARR REVISION


- New problems include
- Environmental flows – estimation of magnitude of frequent events e.g. 1 year flow;
 - System analysis rather than point analysis – particularly relevant to urban drainage systems; and
 - Climate Change





BOOK LAYOUT

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|--|--|
| Book I - SCOPE AND PHILOSOPHY <ol style="list-style-type: none">1. INTRODUCTION2. RANGE OF APPLICATIONS3. RISK BASED DESIGN | Book IV - PEAK FLOW ESTIMATION <ol style="list-style-type: none">1. INTRODUCTION2. AT-SITE FLOOD FLOW FREQUENCY ANALYSIS3. REGIONAL METHODS FOR FLOOD FLOW ESTIMATION4. RATIONAL METHOD FOR FLOOD FLOW ESTIMATION |
| Book II - APPROACHES TO RUNOFF ESTIMATION <ol style="list-style-type: none">1. INTRODUCTION2. HYDROLOGIC DATA3. RANGE OF TECHNIQUES4. SELECTION OF AN APPROACH | Book V - HYDROGRAPH ESTIMATION <ol style="list-style-type: none">1. INTRODUCTION2. EVENT BASED MODELS3. CONTINUOUS RUNOFF ESTIMATION4. LOSS MODELS5. BASEFLOW ESTIMATION6. SURFACE RUNOFF ESTIMATION |
| Book III RAINFALL ESTIMATION <ol style="list-style-type: none">1. INTRODUCTION2. SYNTHETIC RAINFALL BURSTS3. SYNTHETIC STORMS4. CONTINUOUS RAINFALL SEQUENCES | |



BOOK LAYOUT	
<p>Book VI - FLOW HYDRAULICS</p> <ol style="list-style-type: none"> 1. INTRODUCTION 2. BASIC ASPECTS OF OPEN CHANNEL HYDRAULICS 3. HYDRAULIC STRUCTURES 4. UNSTEADY FLOW AND NUMERICAL MODELS <p>BOOK VII – APPLICATION OF CATCHMENT MODELLING SYSTEMS</p> <ol style="list-style-type: none"> 1. INTRODUCTION 2. CATCHMENT MODELLING PRINCIPLES 3. SELECTION, CALIBRATION, AND VALIDATION OF PARAMETERS 4. RISK AND UNCERTAINTY DETERMINATION 	<p>Book VIII – LARGE TO EXTREME FLOOD ESTIMATION</p> <p>Book IX – RUNOFF IN URBAN AREAS</p> <ol style="list-style-type: none"> 1. INTRODUCTION 2. ANTHROPOGENIC INFLUENCES 3. URBAN DRAINAGE CONCEPTS 4. DRAINAGE SYSTEM HYDRAULICS 5. RUNOFF DETENTION AND RETENTION 6. SAFETY CRITERIA 7. URBAN DRAINAGE MODELLING
 <p style="text-align: right;">Australian Rainfall and Runoff A guide to runoff estimation</p>	


BOOK 4
<ol style="list-style-type: none"> 1. INTRODUCTION General introduction to foci of book. Definition of terms used in book 2. AT-SITE FLOOD FLOW FREQUENCY ANALYSIS Draft available on web page. Details of flood frequency approaches.
 <p style="text-align: right;">Australian Rainfall and Runoff A guide to runoff estimation</p>

BOOK 4
<ol style="list-style-type: none"> 3. REGIONAL METHODS FOR FLOOD FLOW ESTIMATION Chapter of interest today. Techniques applicable when data is limited and modelling not appropriate. 4. RATIONAL METHOD FOR FLOOD FLOW ESTIMATION Necessary.
 <p style="text-align: right;">Australian Rainfall and Runoff A guide to runoff estimation</p>

BOOK 5

1. INTRODUCTION
General introduction to foci of book.
Definition of terms used in book

2. EVENT BASED MODELS
Broad overview of event modelling concepts.
Links back to Book 2.




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BOOK 5

3. CONTINUOUS RUNOFF ESTIMATION
Broad overview of continuous modelling concepts.

4. LOSS MODELS
Concepts of loss models
Probability bias in application
Relevance of calibration parameters for design purposes




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BOOK 5

5. BASEFLOW ESTIMATION
Concepts of baseflow and its analysis.
Estimation of baseflow for frequent flood flows.


6. SURFACE RUNOFF ESTIMATION
All different forms of models that can be used to develop flow hydrographs at points of interest



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BOOK 6


- 1. INTRODUCTION**
 General introduction to foci of book.
 Definition of terms used in book
- 2. BASIC ASPECTS OF OPEN CHANNEL HYDRAULICS**
 Basics of flow hydraulics



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BOOK 6


- 3. HYDRAULIC STRUCTURES**
 Bridges, Culverts, Weirs, Channel junctions,
 Blockage of structures
- 4. UNSTEADY FLOW AND NUMERICAL MODELS**
 Basics of unsteady flow, Numerical techniques
 Advantages and disadvantages of different approaches
 Issues in application



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BOOK 7

- 1. INTRODUCTION**
 General introduction to foci of book.
 Definition of terms used in book
- 2. CATCHMENT MODELLING PRINCIPLES**
 General guidance for best practice application of catchment modelling systems
 Flow chart and explanation of generic steps in modelling and flow estimation



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**3. SELECTION, CALIBRATION, AND
VALIDATION OF PARAMETERS**

General guidance and more specific
information for different classes of models

**4. RISK AND UNCERTAINTY
DETERMINATION**

General guidance on uncertainty in
prediction and parameter values