

ARR & Climate Change

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Supported By



Australian Government

Topics

1. General background to ARR Flood Estimation
2. Climate Change and ARR
3. Terminology



BACKGROUND



Background

Initial desire was evolution.

Enhance existing document with new information.

Result is revolution.

Computerised information.

New computer based techniques replacing old hand calculation approaches.

New guideline delivery approaches.

Background - Concept

- Design flood estimation requires prediction of characteristics of the flood hydrograph; and
- Exceedance probability of that value.
- Relationship between flood characteristic magnitude and probability required for risk management.

Background – Desired Data

Traditional hydrograph characteristic was

- Flow Quantile

Current hydrograph characteristics include

- Flow Quantile
- Level Quantile
- Flood Volume
- Rate of Rise of Flood Hydrograph
- System failure

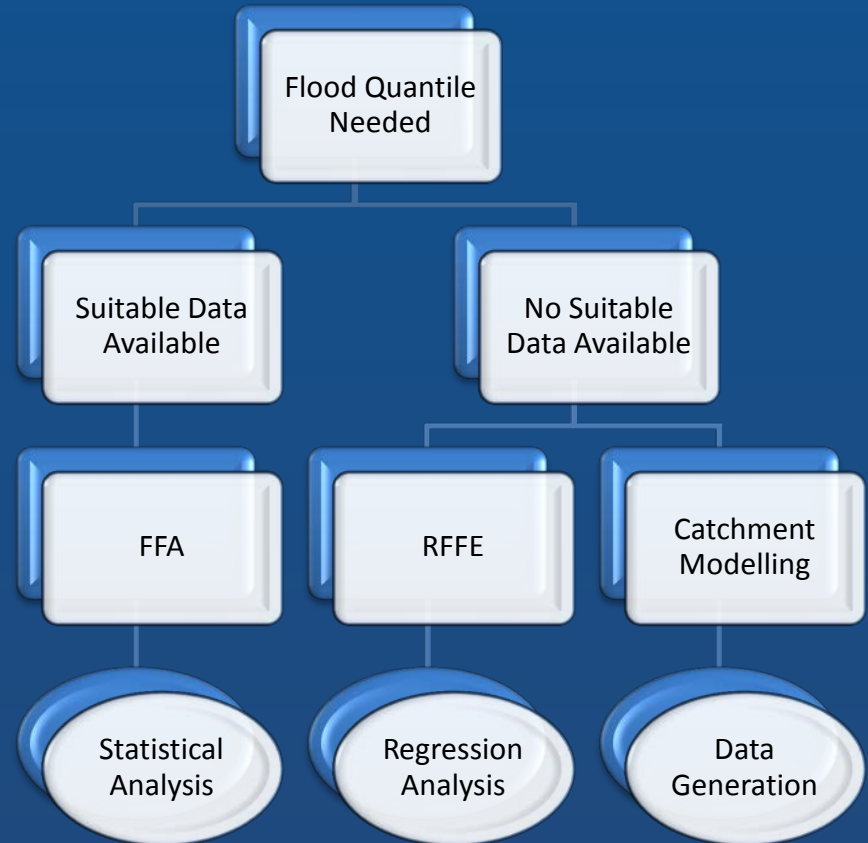
Background – How?

Statistical parameter

Based on data

- Gauging station
- Generated by model

Many different techniques



ARR & CLIMATE CHANGE



Climate Change

Issues regarding climate change and the response include

1. Natural or anthropogenic ?

Not a concern as **adaptation is the concern of ARR**, not the source of the change.

2. Reliability of science ?

Provide guidance based on **best available information** and **expect changes**.

Climate Change

Language

Need precision in ARR regarding terminology.
Example is exceedance probability period.

Approaches

Methods suitable for use in multiple climate regimes preferred to static climate regimes (RFFE approach is an example).

Climate Change

A review of research needs for design flood estimation (both short and long-term) has been prepared – download from www.arr.org.au

This was prepared as a collaboration between CSIRO, BoM, Universities and EA.

Guidelines

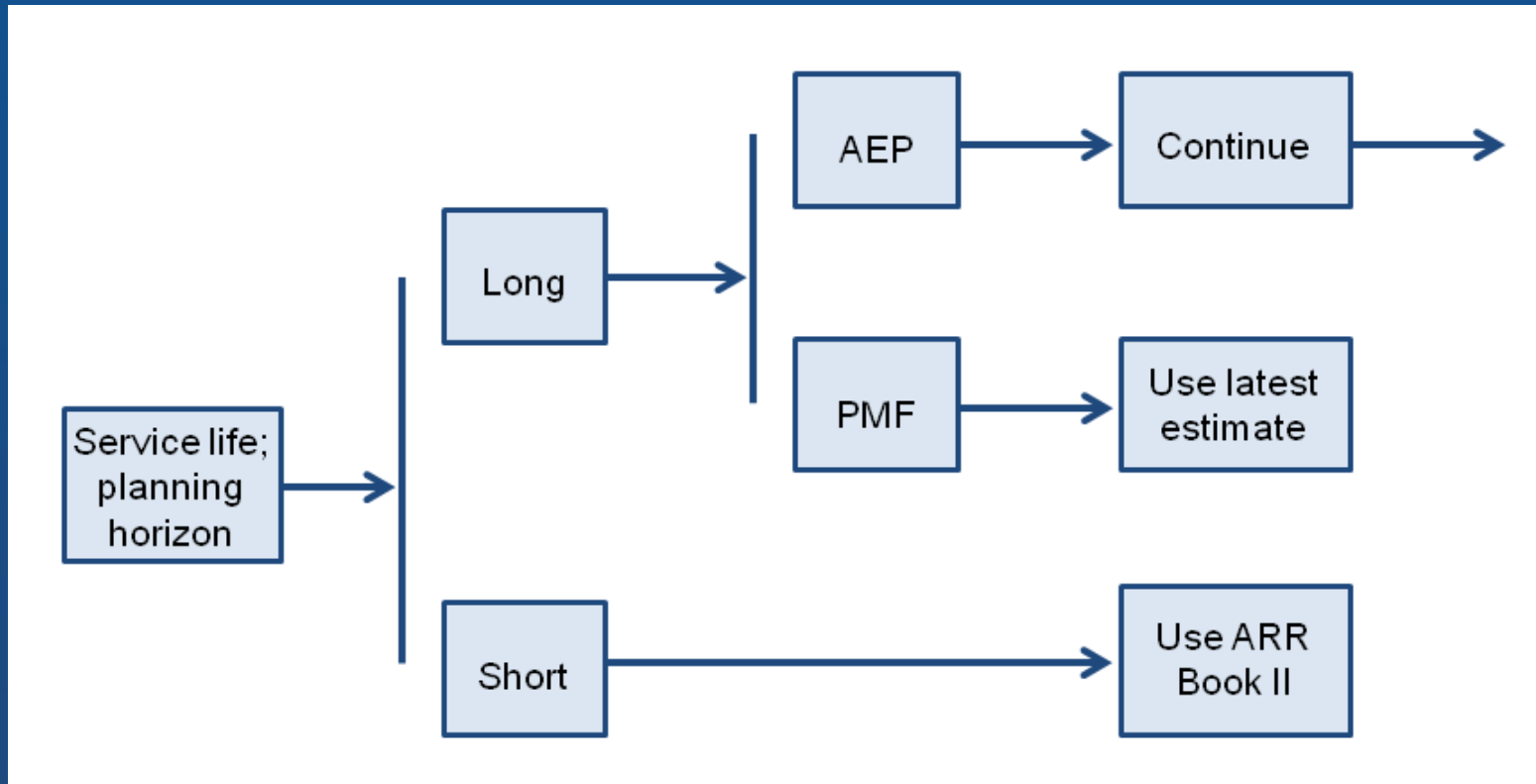
Interim guidelines released in November 2014.

Basis of guidelines is a risk management approach.

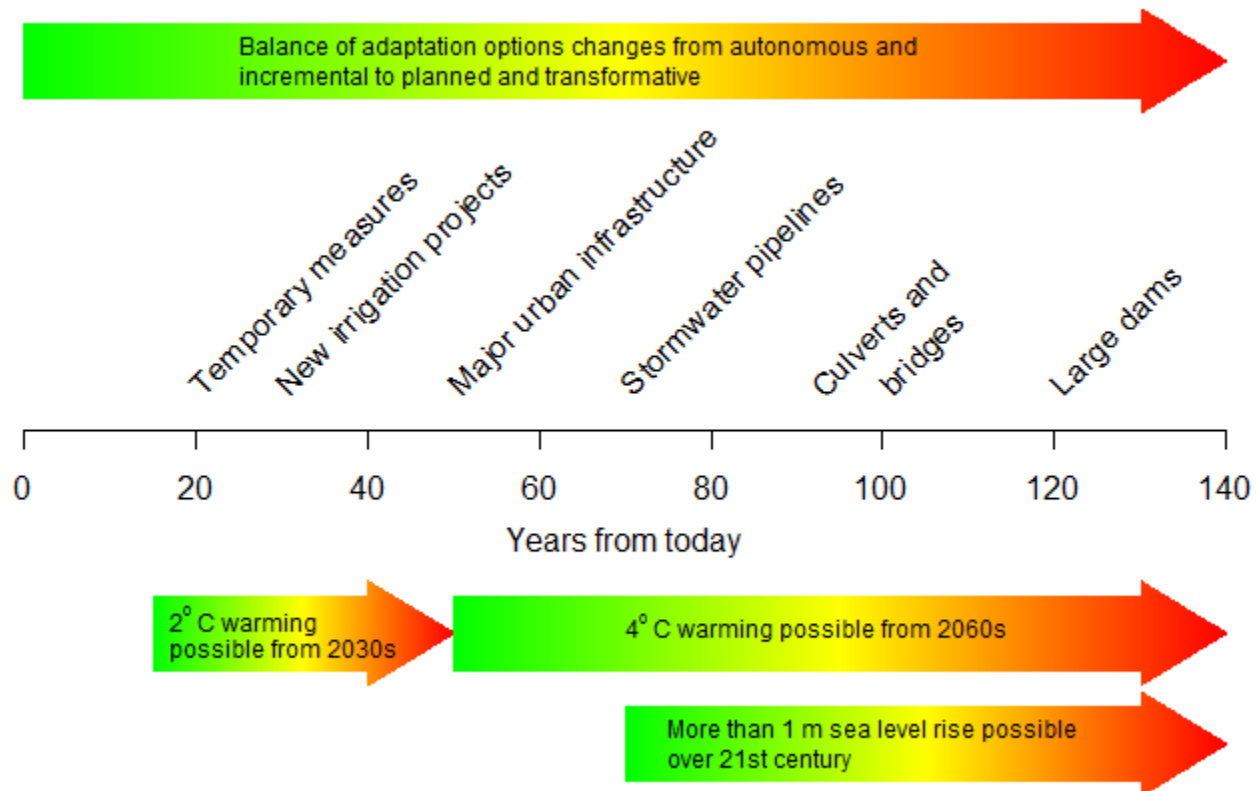
Includes application of guidance.



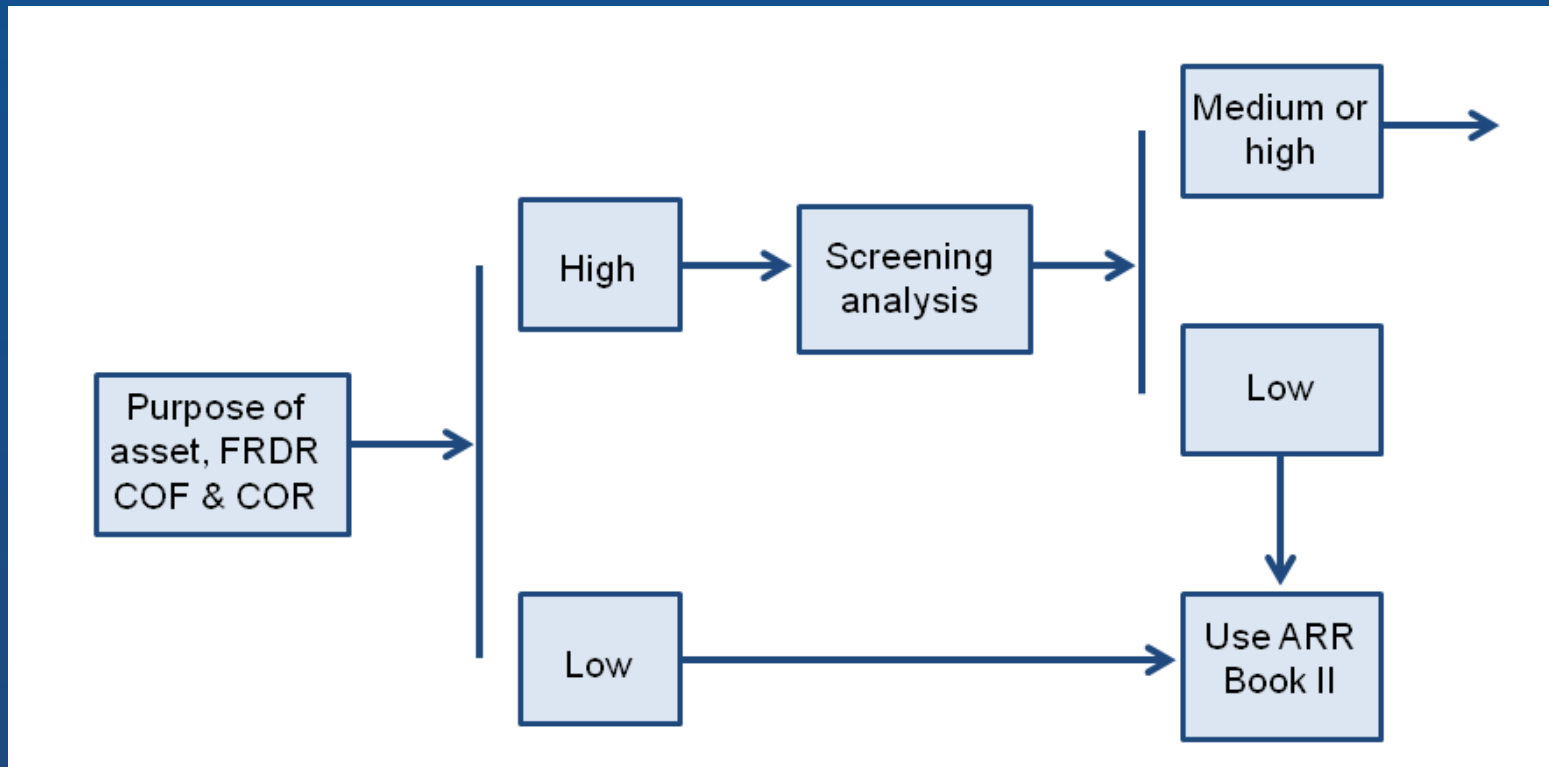
Decision Tree 1 – Service Life



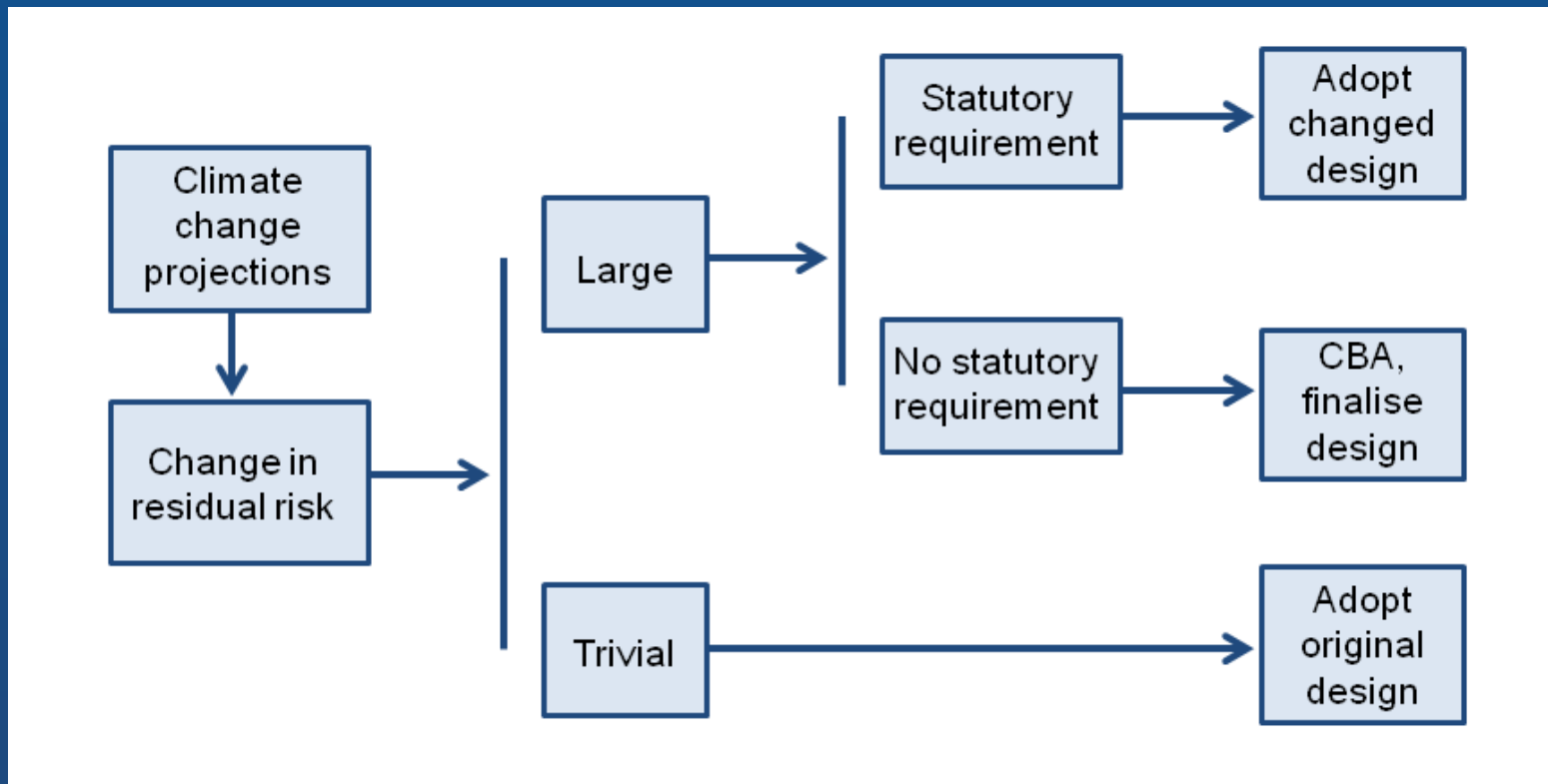
Typical Service Life



Decision Tree 2 - Hazard



Decision Tree 3 - Importance



Guidance

Full details of guidance can be downloaded from www.arr.org.au

Included in the guidance is an early recommendation of likely impacts on IFD – this will change when further research is completed.

This guidance will be included in ARR.

TERMINOLOGY

Terminology

Desire is understanding by

Flood Professionals;

Community Members; and

Other stakeholders.

Current terminology does not achieve this.

Terminology

Proposed terminology has

- a) Clarity of meaning;
- b) Technical correctness; and
- c) Practicality and acceptability

Terminology

Two terms should be used –

Annual Exceedance Probability

Expressed as $y\%$ AEP for more frequent events, e.g. 1% AEP

Expressed as 1 in Y AEP for extreme events, e.g. 1 in 10^6 AEP

Exceedance per Year

Expressed as x EY, e.g. 4 EY

Terminology

EY	AEP (%)	AEP (1 in x)	ARI	Use	
6	99.75	1.002	0.17	WSUD	
4	98.17	1.02	0.25		
3	95.02	1.05	0.33		
2	86.47	1.16	0.50		
1	63.21	1.58	1.00		
0.69	50.00	2	1.44		Stormwater/pit and pipe design
0.5	39.35	2.54	2.00		
0.22	20.00	5	4.48		
0.2	18.13	5.52	5.00		
0.11	10.00	10	9.49		
0.05	5.00	20	19.5	Flooding	
0.02	2.00	50	49.5		
0.01	1.00	100	99.5		
0.01	0.50	200	199.5		
0.002	0.20	500	499.5		
0.001	0.10	1000	999.5		
0.0005	0.05	2000	1999.5		
0.0002	0.02	5000	4999.5		
					Limit CRC FORGE
					Extreme risk /Dams

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Thank you

