6-10-2016

SLIDES: The Colorado and Murray-Darling Panel Discussion

Brad Udall

Learning from Drought Crisis in Federations: Tools and Institutions for Dealing with Water Scarcity and Sustained Droughts

The Colorado and Murray-Darling
Panel Discussion

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Climate Change is Water Change

- Too Much
- Too Little
- Wrong Timing
- Wrong Form
- Wrong Quality

POLICYFORUM

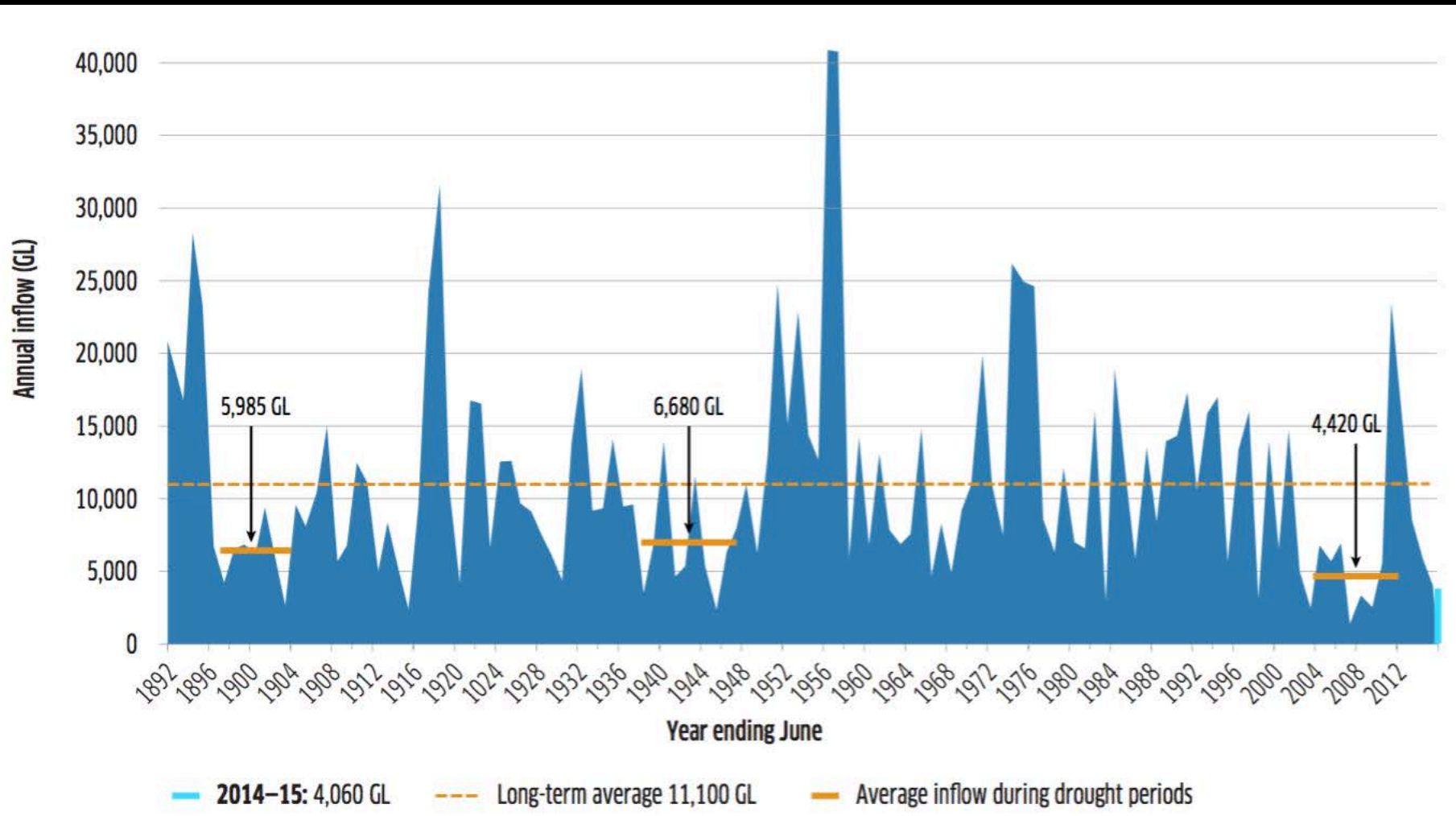
CLIMATE CHANGE

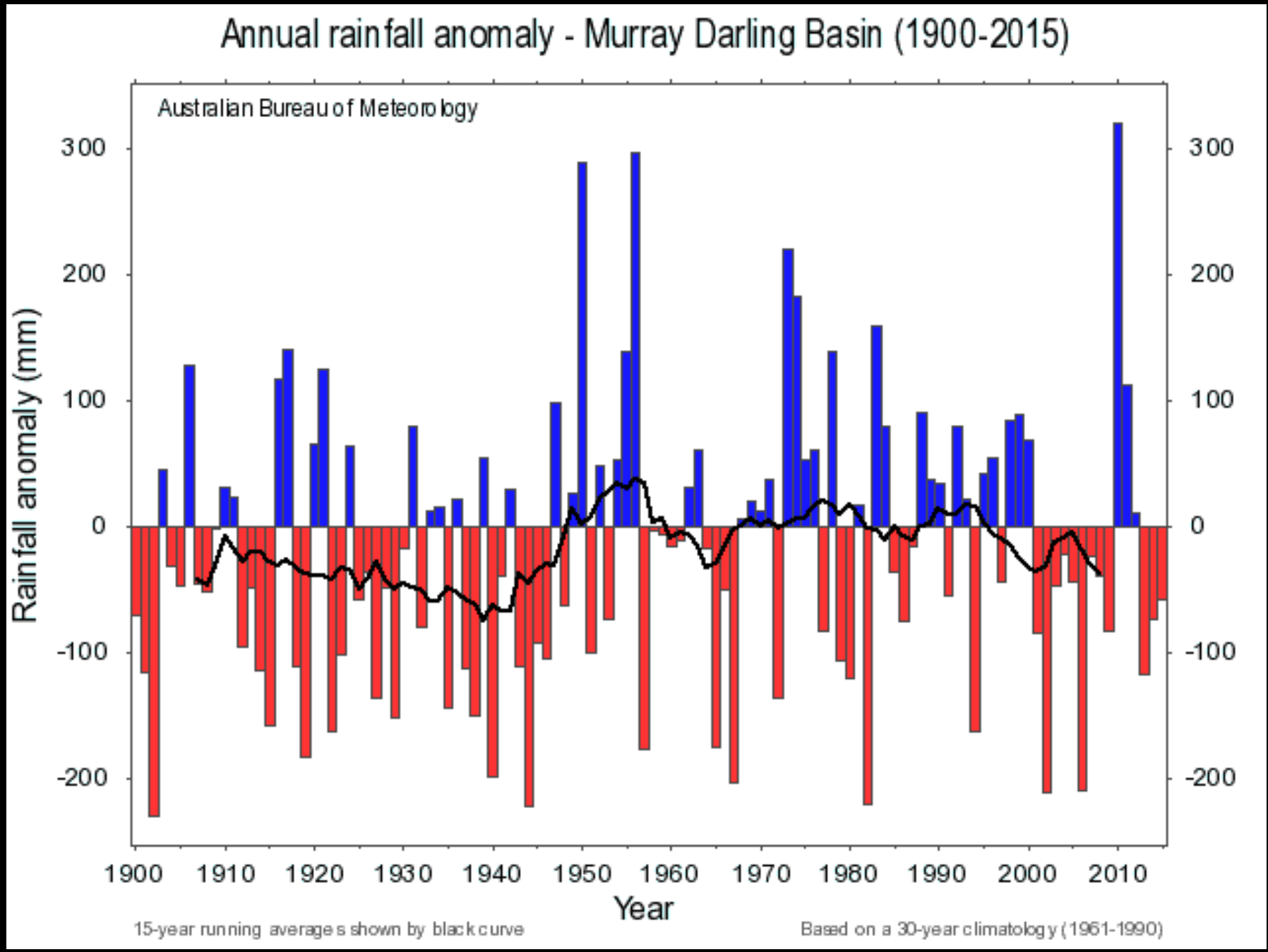
Stationarity Is Dead: Whither Water Management?

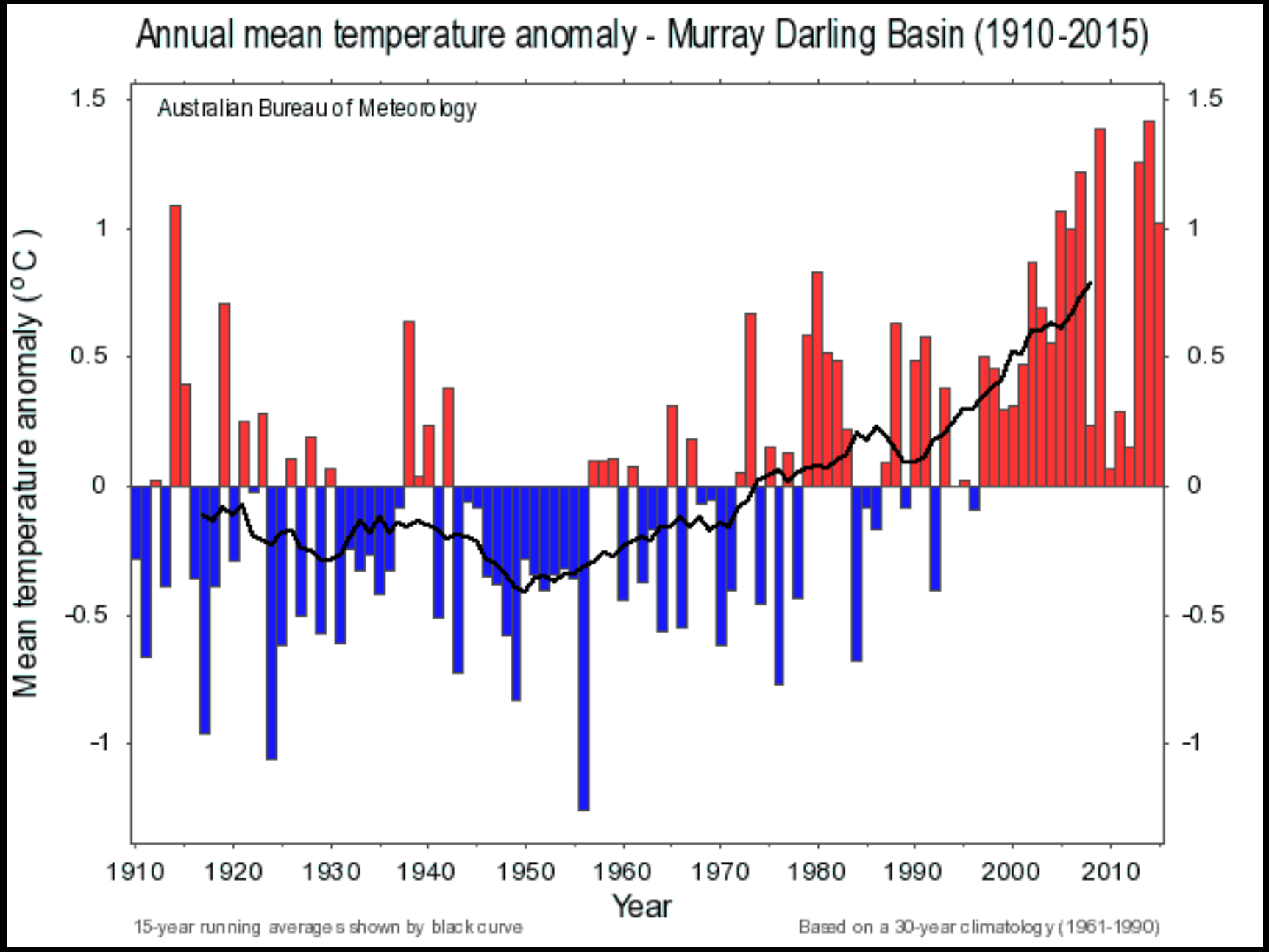
Climate change undermines a basic assumption that historically has facilitated management of water supplies, demands, and risks.

P. C. D. Milly,[1*] Julio Betancourt,[2] Malin Falkenmark,[3] Robert M. Hirsch,[4] Zbigniew W. Kundzewicz,[5] Dennis P. Lettenmaier,[6] Ronald J. Stouffer[7]

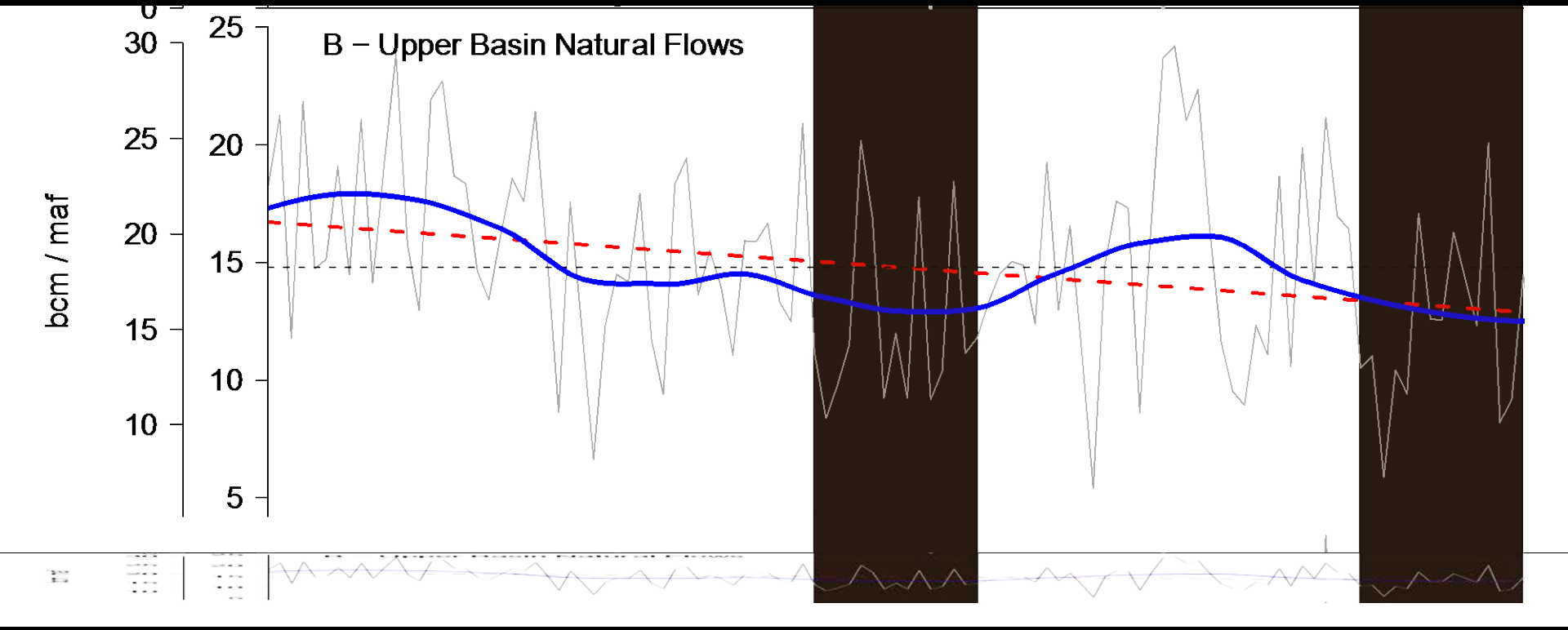
River Murray Natural Flows



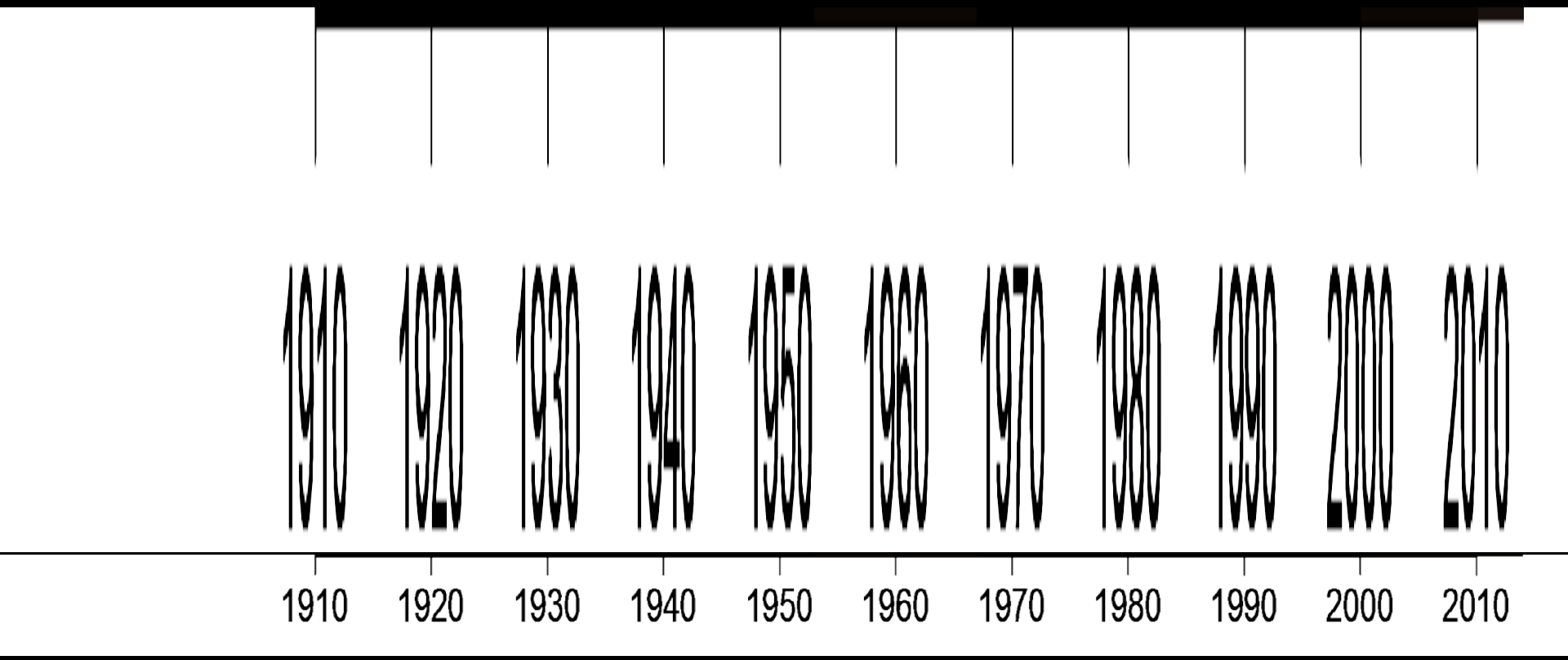

Annual rainfall anomaly - Murray Darling Basin (1900-2015)
Australian Bureau of Meteorology
Rainfall anomaly (mm)
300
200
100
0
-100
-200
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
Year
15-year running averages shown by black curve
Based on a 30-year climatology (1961-1990)


Annual mean temperature anomaly - Murray Darling Basin (1910-2015)
Australian Bureau of Meteorology
Mean temperature anomaly (°C)
1.5
1
0.5
0
-0.5
-1
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
Year
15-year running averages shown by black curve
Based on a 30-year climatology (1961-1990)

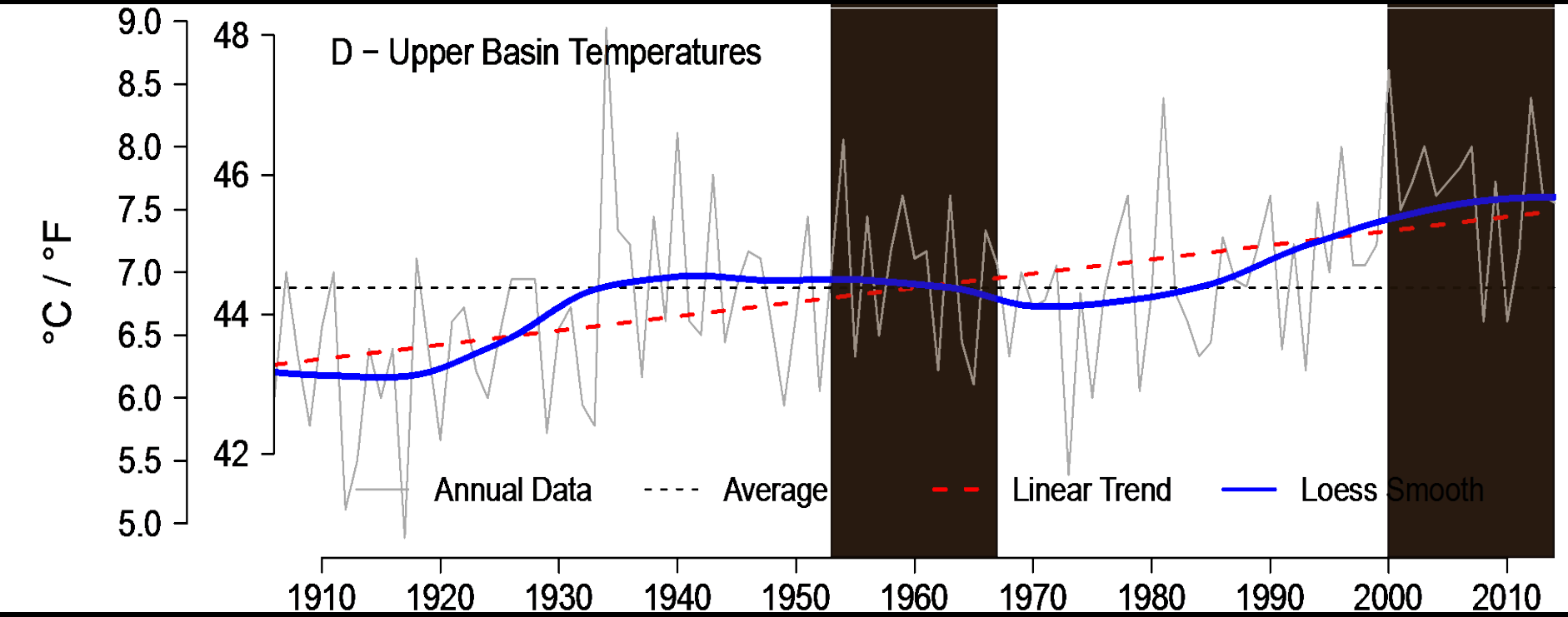
Colorado River Natural Flows



Colorado River Precipitation



Colorado River Temperatures



Australian Climate Change Risk Model

MANAGING WATER IN THE MURRAY-DARLING BASIN UNDER A VARIABLE AND CHANGING CLIMATE

Dealing with climate change in the 2012 Basin Plan and into the future

Water, April 2015

I Neave, A McLeod, G Raisin, J Swirepik

THE MURRAY-DARLING BASIN PLAN FAILS TO DEAL ADEQUATELY WITH CLIMATE CHANGE

Water, September 2015

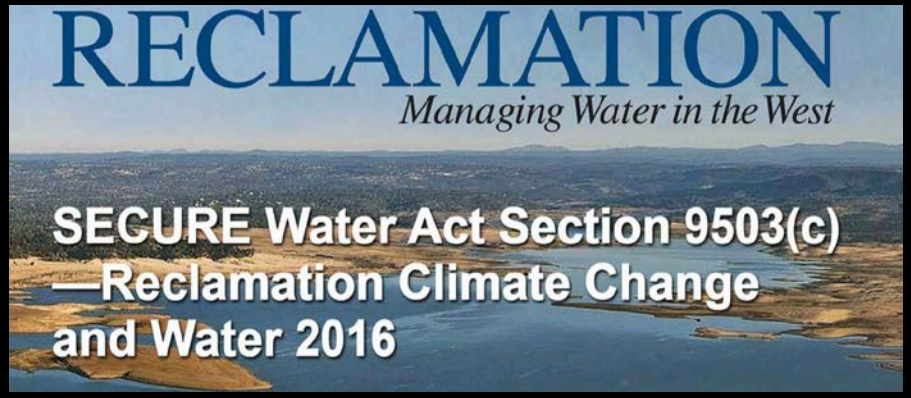
Our April issue featured a technical paper titled 'Managing Water in the Murray-Darling Basin Under A Variable And Changing Climate'. The paper caused a bit of a stir and created dispute among Australian scientists. In this opinion piece Jamie Pittock, John Williams and R Quentin Grafton from the Australian National University state their case.

Colorado River Compact III(d)

“The States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of this compact.”

US Climate Change Approach

- Federal Planning and Modeling
- Fixation on Median Model Results
- Next to nothing on Extremes
  - MDB Failure
  - CRB Failure



Question of the Day

- Is it time for the Colorado River Basin states to discuss where climate change flow risk should fall outside of III(d)?
- My answer:
  - Absolutely YES.
  - Climate Change Impacts already being felt but not acknowledged outside of hand waving
  - III(d) wholly inadequate
  - Part of Structural Deficit is a Climate Change Problem