

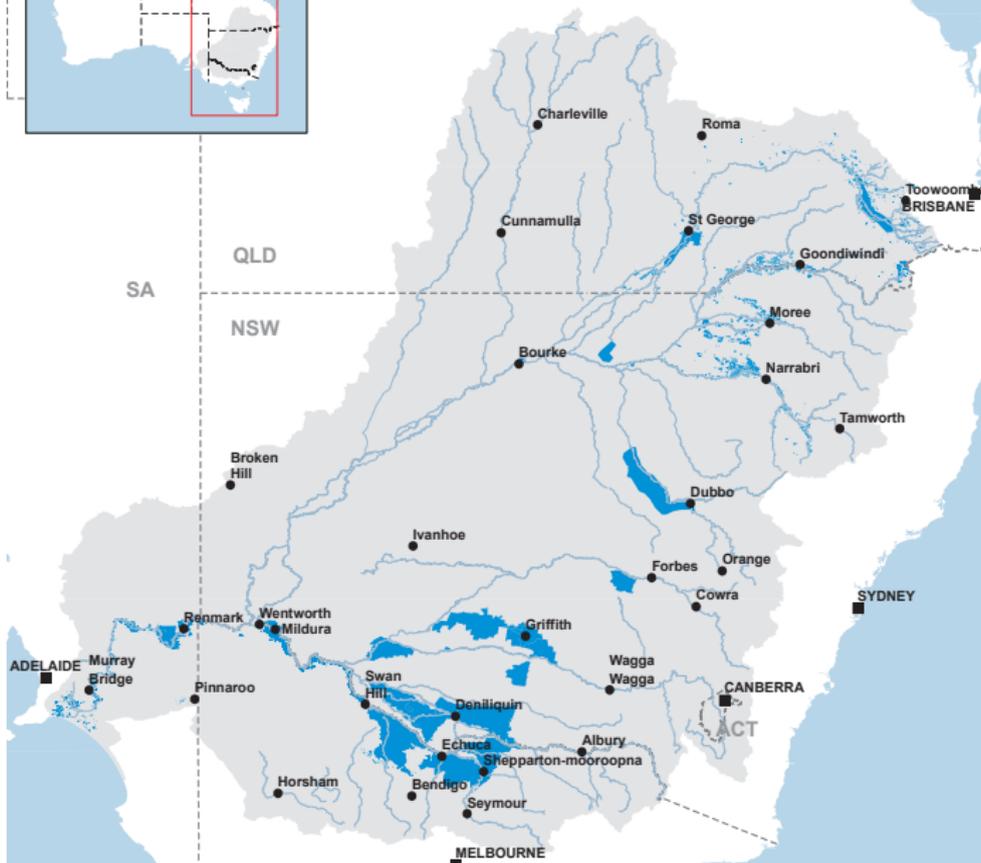
# Water property rights and markets in the Australian Murray-Darling Basin

Neal Hughes

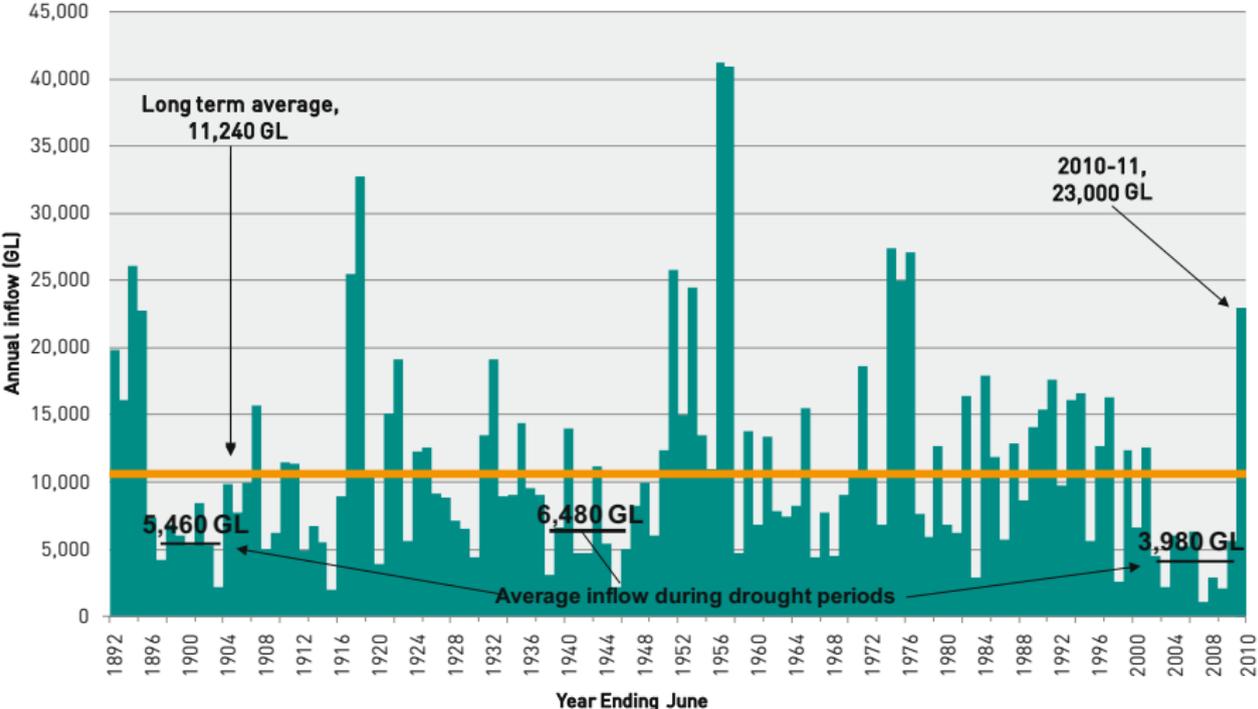
Sir Roland Wilson Foundation scholar - Australian National University  
Australian Bureau of Agricultural and Resource Economics and Sciences

*neal.hughes@anu.edu.au*

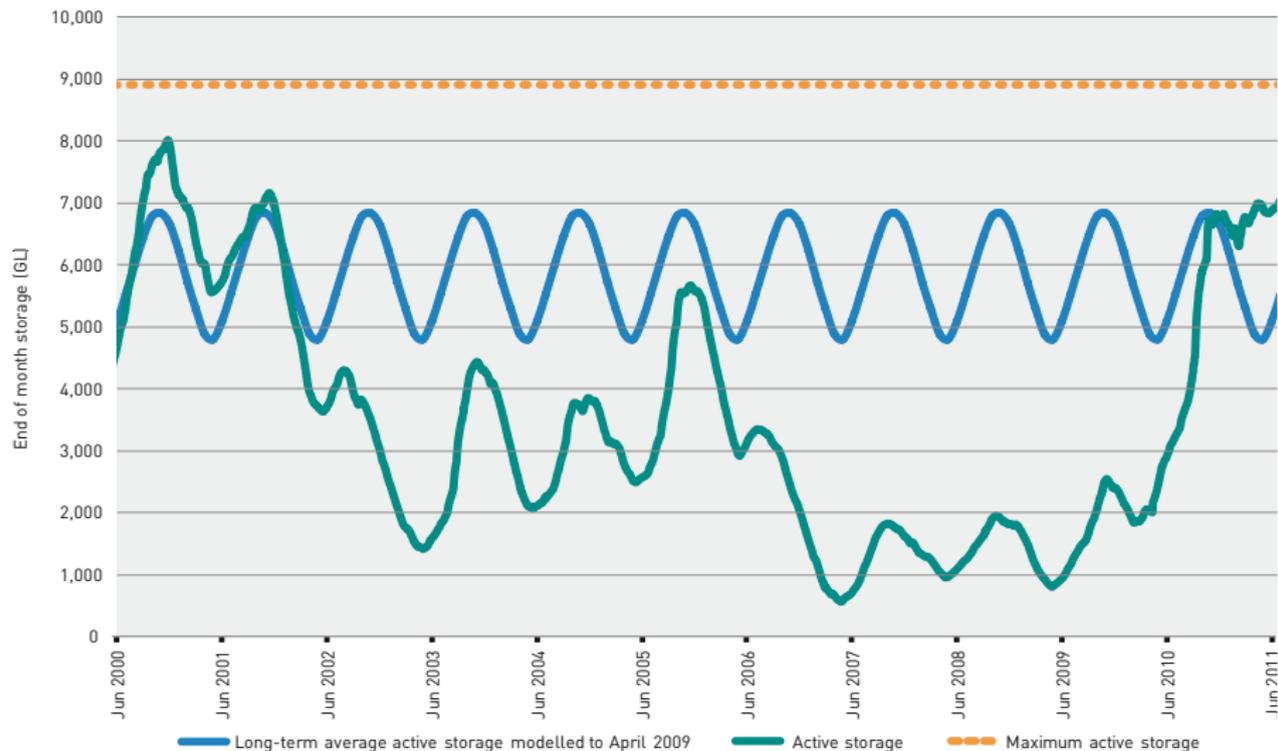
July 29, 2013



# Inflow



# Storage

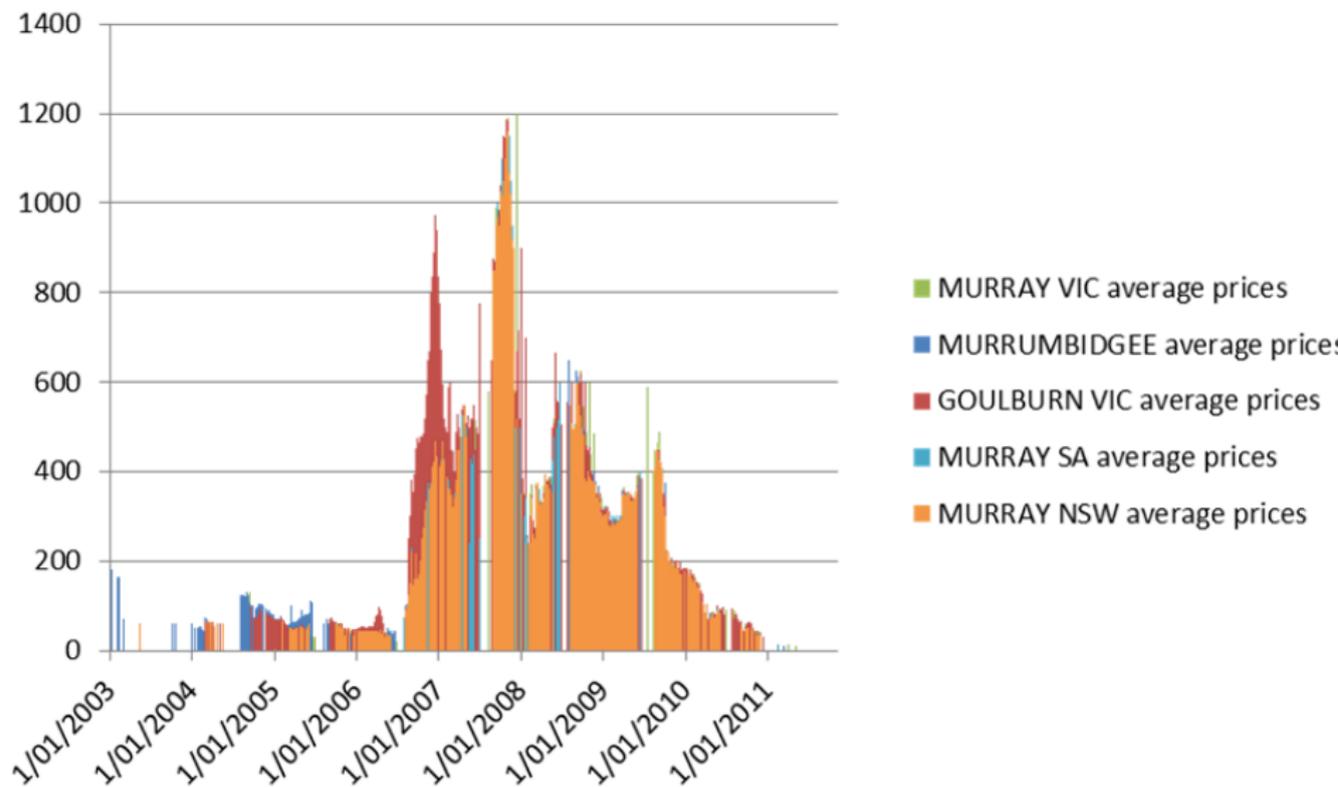


# Water property rights

- Water access entitlements
- Annual allocations
- Property rights reform
  - ▶ Separation of water rights from land
  - ▶ Better security, water monitoring and accounting
  - ▶ Reduction in barriers to trade

# Water markets

\$AUD per ML  $\approx$  1.34 \$US per AF



# Water markets

Figure 2.27: Significant interzone allocation trading in the southern MDB, 2008–09



# Murray-Darling Basin Plan

- Historical context...
- 2007 federal government intervention
  - ▶ The Basin Plan
  - ▶ A 10 billion implementation program (buybacks, infrastructure)
- The Basin Plan
  - ▶ 'Environmentally sustainable' limits on extraction
  - ▶ Goal: an independent scientific process
  - ▶ Estimate environmental water needs from the bottom up

# Murray-Darling Basin Plan



# Murray-Darling Basin Plan

- The 2009 'Guide', released to unpopular reviews
- Some problems..
  - ▶ Limitations of scientific knowledge
  - ▶ Legal debates
  - ▶ Communication issues
- A revised approach...
- Basin plan passed in 2012
- Now the hard part begins: implementation
  - ▶ Acquiring environmental water
  - ▶ Environmental watering decisions
  - ▶ Designing property rights / market rules

# Water storage rights

- The storage decision
  - ▶ release water now or store for the future
  - ▶ smoothing supply for consumptive users
  - ▶ a yield-reliability trade off
  - ▶ satisfying 'lumpy' environmental demands
- Problems with centralised storage management
  - ▶ Incomplete information
- Water storage rights
  - ▶ Allow users to hold private storage reserves in public storages
  - ▶ Allow water to be reallocated across time

## Spill event 2012, Murumbidgee river



# Storage externalities

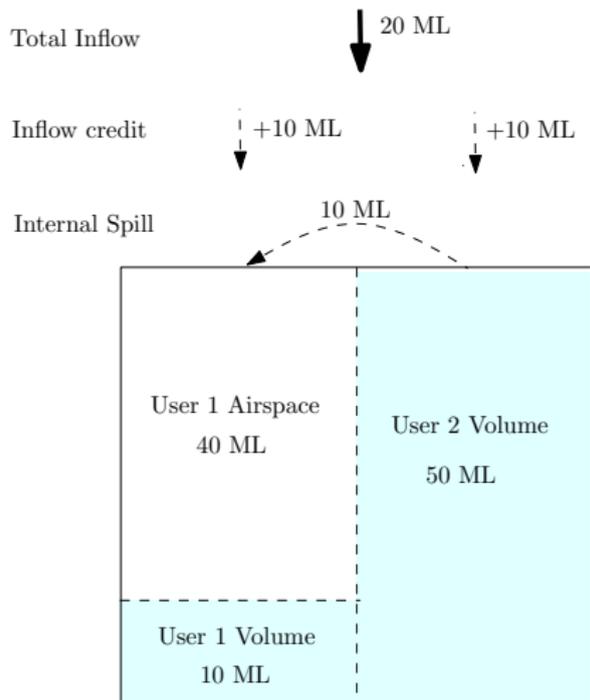
- Water storage rights need to internalise the constraints of storage
  - ▶ The storage capacity constraint (spills or flood control releases)
  - ▶ Evaporation losses
- Otherwise an inefficiently large volume of water will be stored
- And there will be external effects on other users

# Alternative water property right systems

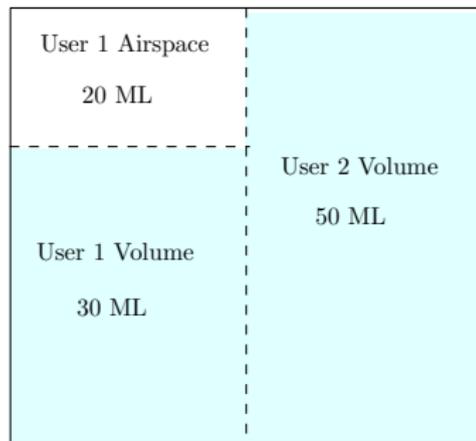
- Annual allocation plus carryover rights
  - ▶ Carryover allocation between years
  - ▶ Subject to limits / spill rules
- Capacity sharing
  - ▶ Users hold percentage shares in capacity and inflows
  - ▶ Users manage their water accounts independently
  - ▶ Daily water accounting, losses and reconciliations...

# Capacity sharing: 'internal spills'

Initial balance

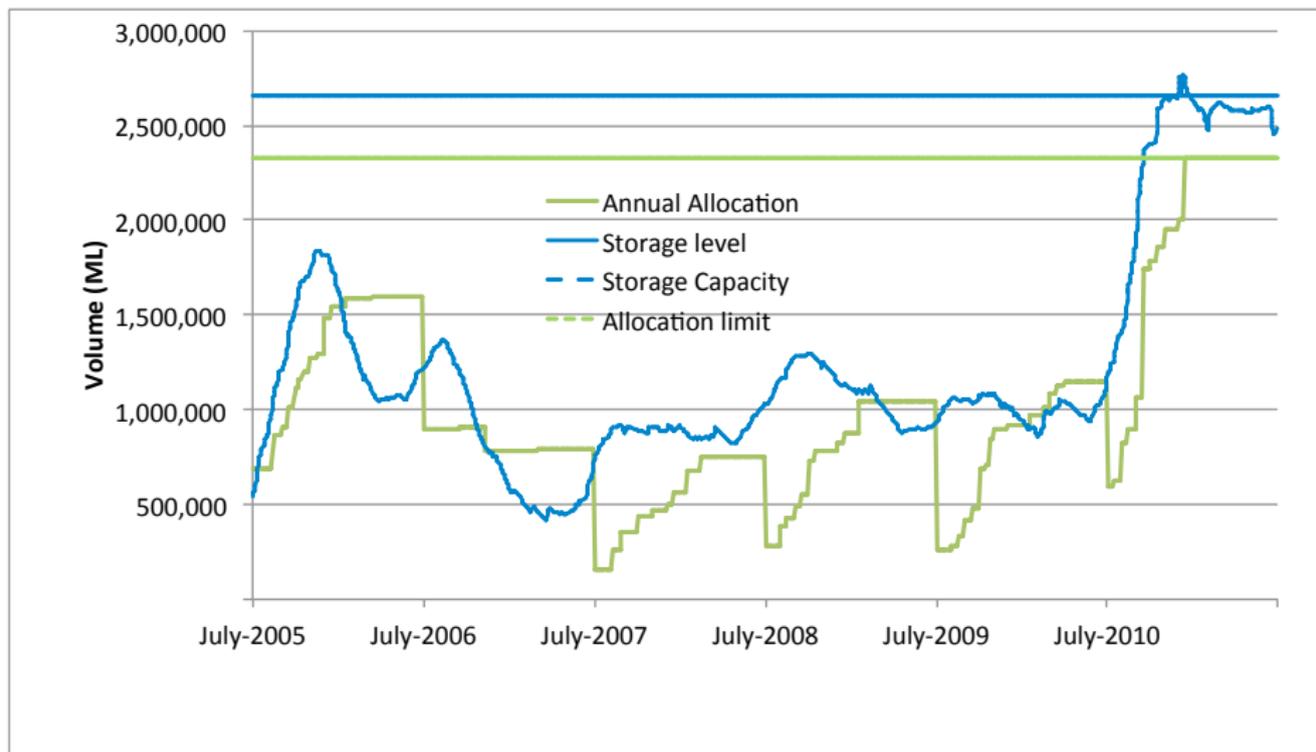


Updated balance



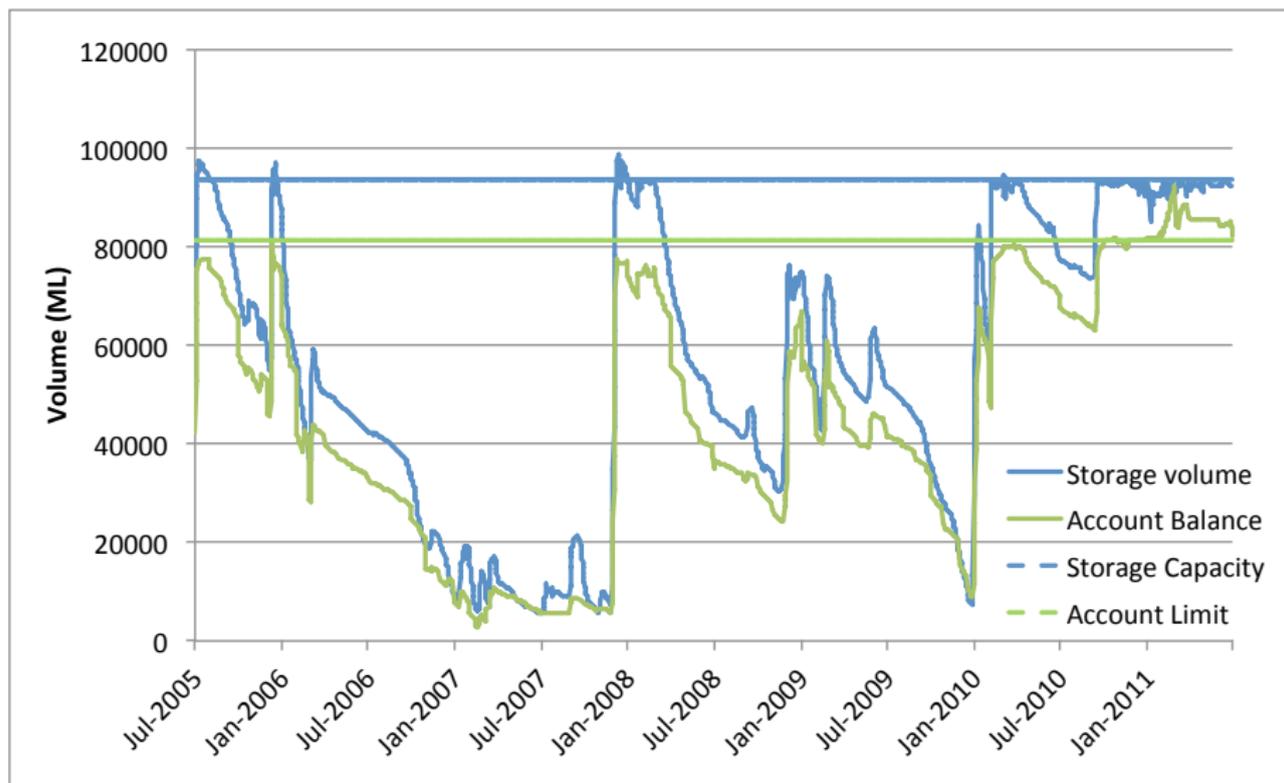
# Annual water use accounting (carryover)

Figure: Murrumbidgee availability, allocations and storage 2005-06 to 2010-11



# Continuous water use accounting (capacity sharing)

Figure: St George allocations and storage 2005-06 to 2010-11



# Water property rights research

- Need to understand the effects of externalities
- Designing property rights / markets for environmental water holders