

# What are the on-farm viability consequences from selling water entitlements?

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*HydroWater Society Workshop,*

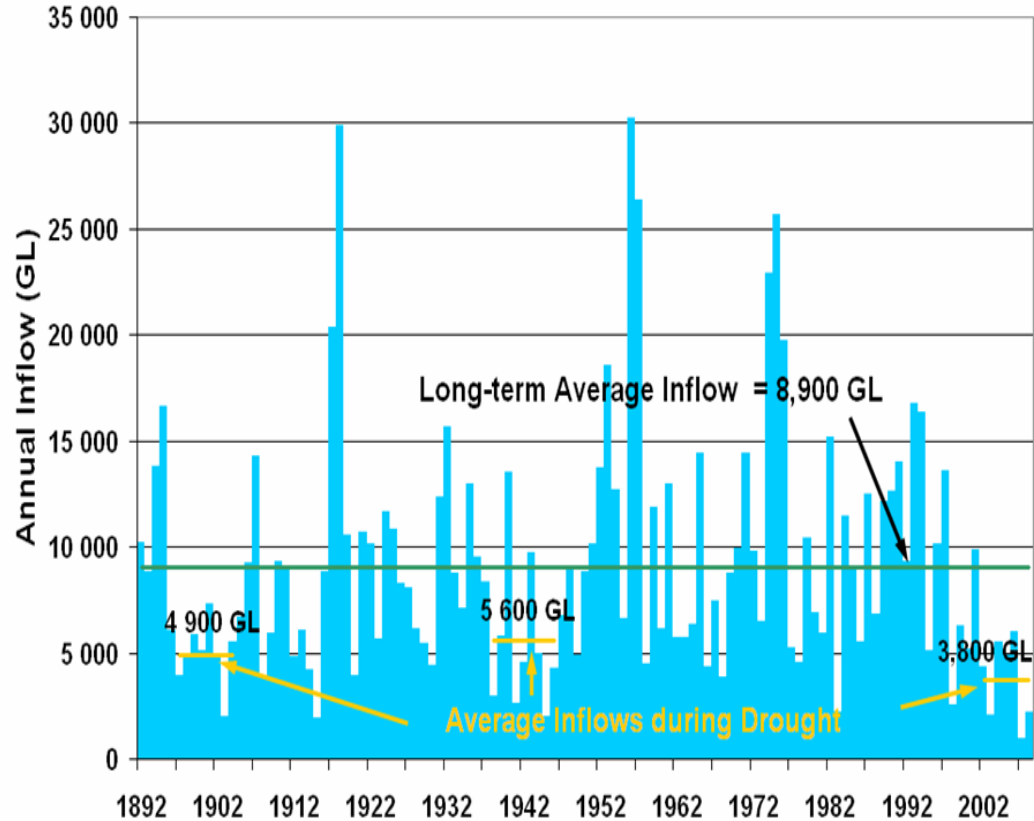
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# Overall Objectives of 3 Key Studies

- Water entitlements represent long-term right to receive water subject to security, regional and seasonal water allocations
- The consequences of the sale of water entitlements on irrigators and rural communities has been a key political issue
- This talk examines the direct consequences for irrigators from selling water entitlements and trade strategy by using three different studies and data sources:
  - 1) SEWPAC data – Directly asks water sellers consequences of water selling: Wheeler and Cheesman (forthcoming) *Economic Papers*
  - 2) ABARES data – Models the impact of current year water trade strategy on irrigation farm viability: Wheeler et al. (under revise) *Agricultural Systems*
  - 3) UniSA data – Models the impact of cumulative five year water trade strategy on irrigation farm viability: Wheeler et al. (under revise) *Agricultural Water Management*

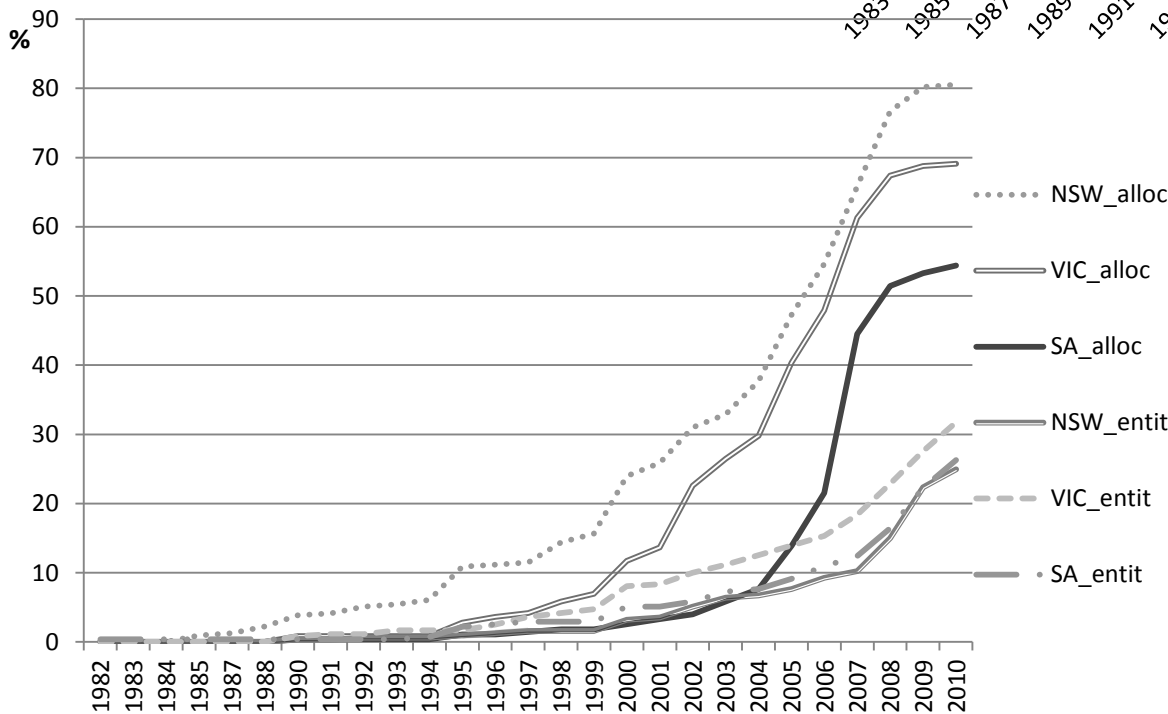
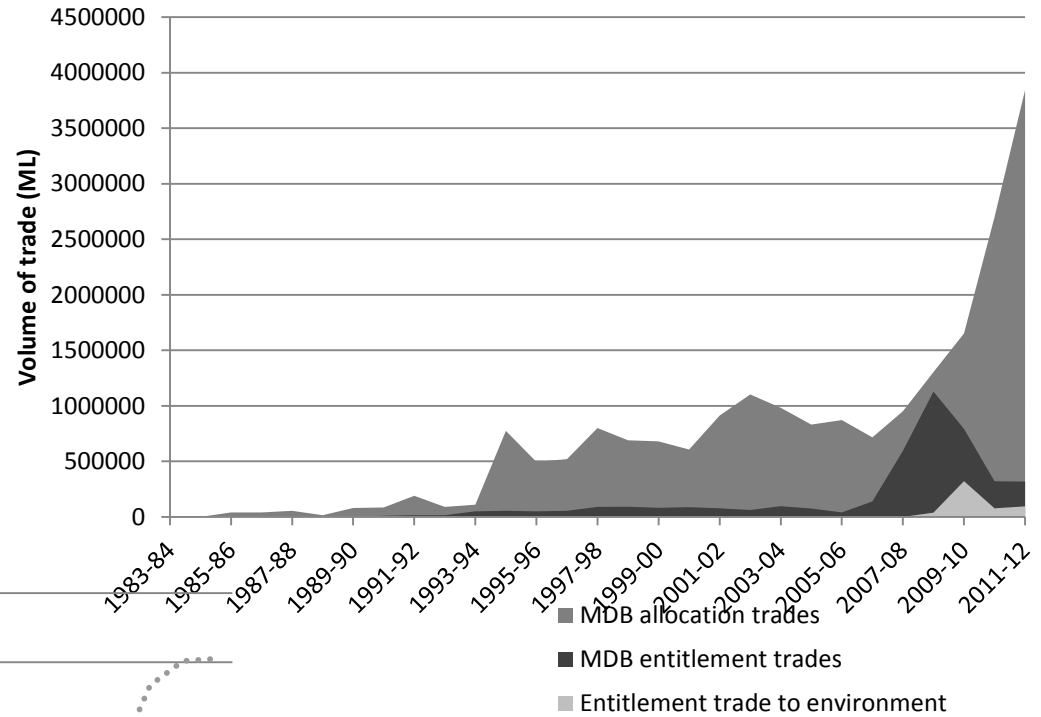
# Background

- In 2007-08 the Federal Government committed \$3.1 billion to buy back water entitlements from willing sellers over 10 years in the MDB (Restoring the Balance)
- Guide to the Basin Plan (Oct 2010) calls for an initial 3000-4000 GL for environment (27-47% cuts to consumptive use)
- Given community views, the goal of the Basin plan changed to 2750GL
- Final version of Basin Plan tabled in parliament 26 Nov 2012 – and as at June 2013 SA, VIC and ACT had signed the intergovernmental agreement



Source: Connor (2010)

# Water Trade Adoption Over Time



# Study Information Sources

- UniSA randomly irrigator sampled surveys ( $\approx 1,300$  from 2010-11 to 2011-12)
- SEWPAC surveys (520 surveys of water entitlement sellers and 7,591 offers to sell water from 2007-08 to end 2011) from mid-term review of program
- ABARES irrigation farm surveys (3,428 from 2006-07 to 2010-11)



# Study 1): Profiling Farmers Who Sell Water Entitlements

- At the end of 2011, 3,150 irrigators (or 20%) across the MDB had sold water to the Cwlth
- At least 10% more irrigators have tried to sell water
- Of those who sold water:
  - 30% sold all water and left farming
  - 10% sold all water and stayed farming
  - 60% sold some water and stayed farming
- Of the farmers that sold part of their surface water – 50% said there was no impact on farm production
  - Overall, around 80% of irrigators who sold part of their water had not changed their farm set up, crop mix, or full time employee numbers since selling water, but 40% had increased their on-farm irrigation efficiency. The decrease in irrigated land was offset somewhat by the increase in dryland area.
- Of the farmers that sold 100% of their surface water – 70% said there was impact on their farm production
  - These farmers make on average, double the amount of changes on-farm that partial sellers do. They tend to decrease irrigated area and employment much more , but they also were more likely to rebuy water entitlements.

# Reasons Why Farmers Sell Water Entitlements

	No sale or sale held up	Sold some water still farming	Sold all water still farming	Sold all water and left farming	Total Water Sellers
<i>Respondents</i>	69	312	50	158	520
Reduce debt	28%	36%	32%	15%	29%
Improve farm income, viability	26%	23%	22%	19%	21%
On-farm investment	3%	10%	6%	4%	8%
Exiting farming	16%	4%	16%	38%	16%
Surplus water	7%	13%	2%	6%	10%
Age	6%	3%	6%	6%	4%
Death or divorce	3%	2%	0%	5%	3%
Other	12%	9%	16%	6%	9%

# Study 2): Current Water Trade Strategy on Farm Viability – ABARES data

- It investigated the relationship between buying and selling water entitlements/allocations and farm viability (net farm income, rate of return) by broadacre, dairy and horticulture in the southern MDB and northern MDB
  - *Net farm income = f(Input variables (including water ownership and volume received) + land + labour + capital + debt + output receipts + water trade strategies + time + climate variables + region)*
- Farm viability was most positively associated with the volume of water allocations received rather than water entitlement ownership
- Selling a higher volume of water allocations was a consistent positive and significant influence on farm viability.
- No significant relationship between current year water entitlement sale trade strategy and farm viability was found (coefficients often negative)
- Buying water entitlements was often found to be negative and significant on current year farm viability



# Study 3): Cumulative Water Trade Strategy on Farm net Income – UniSA data

- It investigated the relationship between buying and selling water entitlements in the past five years and current year net farm income in the southern MDB, using two sets of data:
  - Cross-sectional Dataset of pooled irrigator surveys from 2010-11 to 2011-12 (around 1,300 records)
  - Panel dataset of irrigators from 2008-09 to 2011-12 (around 400 records)

*Net farm income = f(Input variables (including water ownership and volume received) + land + water trade strategies + time + climate variables + region + industry)*
- Selling water entitlements in the past five years was found to be a negative but only weakly significant impact on current year net farm income
  - No evidence at all found in the panel-data analysis
- Buying water entitlements in the past five years was a positive and significant on current year farm viability

# Conclusions from all Three Studies:

- **Sold Part or all Water – Stay Farming:**
  - There are both positive and negative impacts that arise from the sale of water entitlements:
    - Impacts in the current year tend to cancel each other out
    - However, over time there may be a very weak negative impact from the sale of water entitlements (while over time the purchase of water entitlements drives greater net farm income)
    - The other evidence that suggests the need for long-term studies is that other UniSA studies indicate that there is a path-dependence in selling water – once farmers are on a downsizing, contractionary path it does influence future behaviour
    - Further research means that a panel dataset over at least 5+ years would be required for conclusive evidence.

# Final Seasonal Water Allocations in the Southern Murray-Darling Basin

Year	High reliability entitlements					Lower reliability entitlements			
	Vic Goulburn	Vic Murray	NSW Murray	NSW Murrumbidgee	SA Murray	Vic Goulburn (low)	Vic Murray (low)	NSW Murray (general)	NSW Murrumbidgee (general)
1998-99	100%	100%	100%	100%	100%	0%	100%	93%	85%
1999-00	100%	100%	100%	100%	100%	0%	90%	35%	78%
2000-01	100%	100%	100%	100%	100%	0%	100%	95%	90%
2001-02	100%	100%	100%	100%	100%	0%	100%	105%	72%
2002-03	57%	100%	100%	100%	100%	0%	29%	10%	38%
2003-04	100%	100%	100%	95%	95%	0%	0%	55%	41%
2004-05	100%	100%	97%	95%	95%	0%	0%	49%	40%
2005-06	100%	100%	97%	95%	100%	0%	0%	63%	54%
2006-07	29%	95%	69%	90%	60%	0%	0%	0%	10%
2007-08	57%	43%	50%	90%	32%	0%	0%	0%	13%
2008-09	33%	35%	95%	95%	18%	0%	0%	9%	21%
2009-10	71%	100%	97%	95%	62%	0%	0%	27%	27%
2010-11	100%	100%	100%	100%	67 %	0%	0%	100%	100%
<b>LTAAY</b>	<b>0.95</b>	<b>0.95</b>	<b>0.95</b>	<b>0.95</b>	<b>0.9</b>	<b>0.35</b>	<b>0.24</b>	<b>0.81</b>	<b>0.64</b>
<b>LTAAYP</b>	<b>0.82</b>	<b>0.82</b>	<b>0.82</b>	<b>0.82</b>	<b>0.77</b>	<b>0.22</b>	<b>0.11</b>	<b>0.68</b>	<b>0.51</b>