

“Whiskey is for drinking, water is for  
fighting”

Mark Twain

# WATER RIGHTS AND THE ECONOMICS OF WATER TRADING

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# BACKGROUND: WATER TRADING OR WATER MARKETS

- Water scarcity and sometimes prolonged droughts have given rise to different water demand management policies  
Examples: Conservation policies like rationing water use (California, 2015; Texas, 2011) or raising rates for water
- Last three decades have witnessed the emergence of water markets to alleviate water scarcity
- Water markets satisfy the economic principle of efficiency, meaning allocation of a resource towards its highest valued use

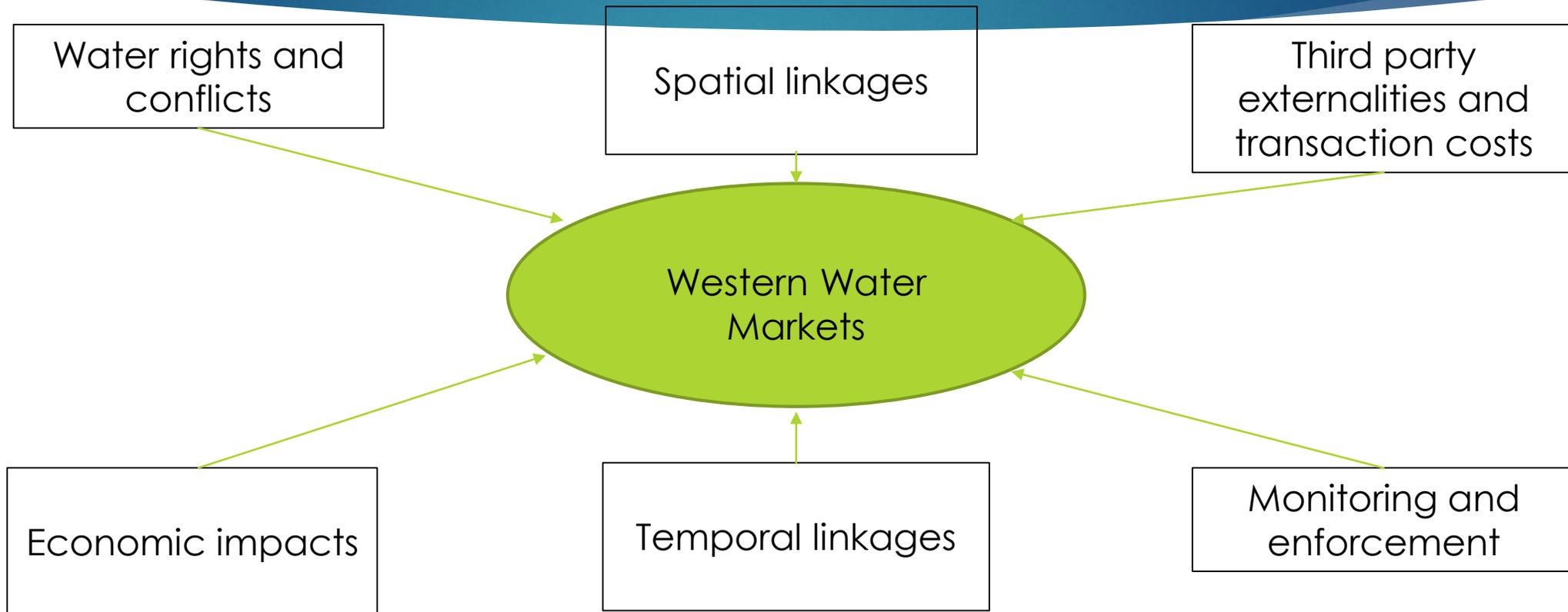
# BACKGROUND: WATER TRADING OR WATER MARKETS

- Water trading across users (municipal, agricultural, environmental) has been common in western United States, Spain, Chile, Australia, Middle East
- Has mitigated drought impacts (Drought water bank, California; Rio Grande Basin, New Mexico; Murray Darling Basin, Australia; Limar Valley, Chile) and raised economic welfare
- But has faced limitations in terms of physical conveyance of water, effect upon other users and institutional impediments, like differing water rights

# WATER RIGHTS IN WESTERN UNITED STATES

- The system of water rights in western US **-prior appropriation-** is one of the oldest and most contentious systems in the world
  - In the prior appropriation doctrine (PA), senior water users or those with first claims to the water starts with a first mover advantage
  - Those with junior claims like downstream water users, often face curtailment of rights during droughts  
<https://www.idwr.idaho.gov/files/news-release/20160518-news-release-2016-10.pdf>
- Seventeen western states have different laws for administering water rights to surface water, ground water as well as conjunctive water rights for both (Idaho) : these water rights have often impeded the efficient allocation of water through markets

# WATER MARKETS AND THEIR EFFICIENT FUNCTIONING



...yet institutional rights **dominate** water trading

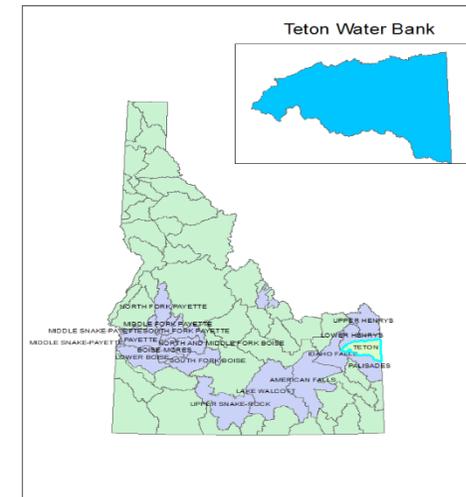
# ARE THERE SUCCESSFUL WATER MARKETS?

**Yes!**

- Big Thomson Project (NCWCD), Drought Water Bank (CDWR), Rio Grande Basin (NM-CO-TX)
- These markets included large scale regional water trading with transactions involving high prices in some cases (Brewer et al. 2006; Libecap, 2011)
- While most successful water markets centered around surface water trading, ground water trading is at its nascent stage
- Conjunctive water rights (seniority based appropriation rights regardless of source of water) have added to the complexity

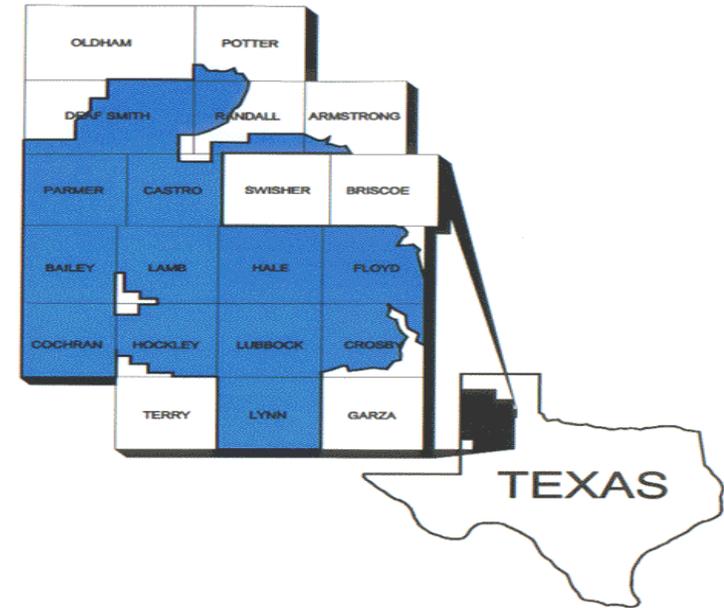
# SOME FINDINGS ON WATER TRADING: IDAHO

- Prior appropriation (PA) rules in surface water and groundwater – state has recently implemented conjunctive rules for administering water rights
- Water trading shown to raise economic welfare (Cobourn et al., 2016; Elbakidze et al., 2012) under PA based rights
- However, studies fail to capture dynamic interlinkages between surface and groundwater as junior groundwater rights are curtailed
- A Nash bargaining solution between groundwater and surface water users offered in a recent study (Cobourn et al., 2015)



# SOME FINDINGS ON WATER TRADING: TEXAS

- Surface water allocation in the state follows *prior appropriation* (PA), while *rule of capture* (English Common law) governs groundwater
- Intrastate water marketing has been popular through decades (*water ranching*, for instance)
- The most successful water trading experienced in the Lower Rio Grande Basin (drought related agricultural to municipal water trading) and in the Edwards Aquifer region (environmental water trading)
- An analytical version of a groundwater permit trading was shown to be economically efficient, even within a rule of capture doctrine (Ghosh and Willett, 2012)



# SOME FINDINGS ON WATER TRADING: NEBRASKA

- Dependent upon the High Plains Aquifer to a large extent and has recently pioneered groundwater trading in western United States
- No formal groundwater markets but hundreds of informal trading has occurred (Brozovic and Young, 2010)
- Studies have demonstrated economic benefits from water trading in the Republican River Basin (Palazzo and Brozovic, 2010; 2014)
- Unlike Texas, groundwater is regulated by Natural Resources Districts which specify the extent of trading when there is stream depletion involved
- Trading benefits estimated usually over a 50 year horizon factoring in stream depletion



# WATER MARKETS AND RELEVANCE FOR DROUGHTS

- Many western states have benefitted economically through water markets
- Water trading has mitigated drought impacts in many cases (Grafton et al., 201; Hanak & Stryjewski, 2012)
- Yet concerns remain about transaction costs, spatial externalities and most importantly, about the institutional structure allocating water
- Prolonged drought sometimes not the most important factor for water traded (Brown, 2006; Regnacq et al., 2016) but has given rise to spot markets (Westwater Research)

# CONCLUDING COMMENTS

- So, are water markets going to be useful under institutional constraints?  
Yes- if designed and implemented effectively with less transaction costs and more attention to spatial and hydrological externalities  
No- if a century old system of institutional rights still make market transactions difficult
- Economic solutions?
  - Have more participants, incorporate hydrological constraints into water market economics and do not believe in “one size fits all”

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