8. Water Marketing

- The term "water marketing" applies to natural water only
  - unprocessed, except possibly for onstream storage
  - does not apply to infrastructure
- "water pricing" is a different topic – better applied to wholesale and retail water
- marketers might sell, lease, option, bank, or be original

Water Market “Options”

- also called dry-year options
- The permanent owner of a water right agrees to temporarily give the buyer use of the right if a certain, predefined event occurs.
  - The buyer ordinarily pays an up-front option price,
  - plus possibly a recurring (e.g. annual) fee,
  - and will pay an additional charge should the option ever be exercised.
  - The contract terms set either these payments or the mechanism for their future computation.

Water Market “Banking”

- The term water “banking” is sometimes used in nonmarketing ways, but for clarity, we will only use “banking” when trade is occurring.
  - An intermediary contracts for water rights from some agents, and then agrees to contract from this assembled pool to other agents.
    - thus far, these intermediaries have been public agencies or districts
    - thus far, both sides of this activity have been leases
Foundations of Water Marketing

- Water property must first be assigned, quantified, enforced, and tradable for any of this to happen.
  - Which legal doctrines might qualify? surface or ground?
- Where water rights have not been legally “severed” from land, we do not have true water markets.
  - We might have land-based marketing in these cases for the prime purpose of water exchange, but such transfers are really “water access transfers” since quantified water property does not exist.
  - Water access markets still involve common/state property in water

Achievements of Water Marketing

- Creating gainers out of losers
- Closing the gaps between the MBs of natural water (i.e. econ. eff.)
- Accommodating the differing risk preferences agents have
- Because of these accomplishments, the demands for other scarcity strategies can be reduced, potentially saving money and hardship.

Challenges of Water Marketing

- flow-caused interdependencies with third parties – externalities
- underrepresented demand for nonrival water – public goods
- inadequate private regard for depletion – overdiscounting
- Responding to these challenges leads governments to select institutional blends of markets and administrative regulation.
  - The resulting transaction costs influence all trading – more later on this.
Three basic tool sets for practitioners

\[ V_{1}^{\infty} = v \sum_{t=1}^{\infty} \frac{1}{(1+d)^t} = \frac{v}{d} \]
\[ V_{0}^{\infty} = \frac{1+d}{d} \]
\[ V_{0}^{T} = \frac{v(1+d)}{(1+d)^T} - \frac{(1+d)^T}{d} \]

1. for relating sales value (V) to recurring lease values (v)
   (obtained from Chapter 3’s appendix)

Equivalent Single Price

\[ ESP = \frac{PV(\text{economic terms})}{PV(\text{water terms})} \]

2. for comparing differing contract terms, conservation investments, & other scarcity-fighting options

3. for thinking about "why trade?", price possibilities, net gains, effects of transaction costs, lots of things
A Common Challenge: Return Flow Externalities

- Rights are normally first quantified in law as allowed “diversions,”
- Yet, diverters are more directly affected by their “consumptive use”
- And even converting all rights to consumptive use rights isn’t a full fix as the next graphic can demonstrate.
- Problems tend to stronger for (but are not limited to):
  - transfers from downstream to upstream (3rd party diverters)
  - impacts on instream flows (nondiverting 3rd parties)

Flows ⇒ lots of potential third parties

<table>
<thead>
<tr>
<th></th>
<th>I. Initial Conditions</th>
<th>II. C sells 250af to A</th>
<th>III. C sells 100af to A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streamflow</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>Urban Diversion</td>
<td>-500</td>
<td>-750</td>
<td>-600</td>
</tr>
<tr>
<td>Streamflow (Segment 1)</td>
<td>500</td>
<td>250</td>
<td>400</td>
</tr>
<tr>
<td>Urban Diversion</td>
<td>-400</td>
<td>-400</td>
<td>0</td>
</tr>
<tr>
<td>Streamflow (Segment 2)</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A’s Return Flow (60%)</td>
<td>+300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B’s Return Flow (75%)</td>
<td>+300</td>
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<tr>
<td>Streamflow (Segment 3)</td>
<td>700</td>
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<td></td>
</tr>
<tr>
<td>Agricultural Diversion</td>
<td>-500</td>
<td>-400</td>
<td>0</td>
</tr>
<tr>
<td>Streamflow (Segment 4)</td>
<td>200</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>C’s Return Flow (20%)</td>
<td>+100</td>
<td>+80</td>
<td></td>
</tr>
</tbody>
</table>

- Therefore, most jurisdictions have established a process whereby proposed trades can gain approval.
- A bureau or agency might be able to do this on its own, but western U.S. states have generally installed a process in which vested and potentially injured parties can voice their displeasure.
- Who is vested?
  - Other diverters? Yes.
  - Instream users? Maybe. Or maybe this is ignored. Or maybe a state agency is assigned to fill this role. Or maybe trades are allowed if they won’t broach minimum streamflow standards. Or...
Real, Live Water Markets

- Four exceptional markets reviewed in text
  - Colorado Big-Thompson Project
  - Texas lower Rio Grande basin
  - California quagmire
  - Australia’s Murray-Darling
- They are unique markets in multiple ways
- They have produced many million$ in net benefits

NCWCD

- created in 1937
- shares; not seniority
- no return flow obligations
  - infers much reduced transaction costs for traders

\[\frac{23000}{af} \times d(0.05) = 1150/af/yr\]
\[\frac{1150}{af} \times 0.00307 = 3.53/1000\text{ gal}\]
**Northern Colorado Water Conservancy District**

*Colorado Big Thompson Project*

---

**across Texas**

*Marketing*

- Surface Water
- Ground Water
  - 1. Convolutions Rights on the lower Rio Grande
  - 2. Canal companies in the upper Gulf Coast
  - 3. Aptive Rights in the rest of Texas
  - 4. Role of Capture, meshing & contracting

*Pricing*

- Wholesale
- Retail

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**LRGV**

- Marketing commenced ~1970
- This part of basin uses correlative shares
- No return flow obligations or impacts
- Sizable population growth has been assisted by this market
- Ag shares have to be converted to municipal quantities
- Municipal purchase rules changed in 2007
California Bank

- a several year drought sparked a policy change that allowed trade
- statewide due to manmade conveyances
- 1991 bank was a lease market brokered by DWR

- sw leasing is no longer unusual in California
- mainly ag-to-urban and ag-to-environment in recent years
- great political sensitivity for secondary effects
Australia Murray-Darling

- previously riparian doctrine
- drought-driven reform
- US severs water rights and land rights; AU unbundles them
- very advanced rights with the usual foundations for leases and sales
- lots of transparency through gov't website & provided data
- futures market has emerged

"Area of Origin" Issue

- Areas of origin are regions (mainly agricultural) from which a water market would transfer water, unless such exports are prohibited.
- Permanently shifting water (or any resource) out of a region may limit that region's future development opportunities.
- Should trade be constrained so as to protect areas of origin?
What should a water market count?

Areas of origin & areas of receipt too?

<table>
<thead>
<tr>
<th>Traders</th>
<th>Other Direct</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs:</td>
<td>Seller</td>
<td>Return flow &amp; water-linked agents such as instream flow users</td>
</tr>
<tr>
<td>Benefits:</td>
<td>Buyer</td>
<td></td>
</tr>
</tbody>
</table>

Should rules be used to protect Areas of Origin?

Examples: “prohibiting harm” or “limiting to 50%” or taxing exports.

Protect?

1. From a large-accounting-stance (areas of receipt included) aggregate efficiency perspective, NO.

2. From a fairness-driven or even a neutral efficiency perspective, MAYBE.
   a. Such rules help areas of origin but harm water right owners, buyers, and areas of receipt.
   b. Such rules limit a scarcity-fighting policy tool.

Ground Water Markets

- ground water ranching
- ground water access contracting
- true ground water marketing of severed ground water rights (Edwards (one deed), prior appropriations, two deed system)