Strategies for Addressing Water Supply Variability

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Risk: Variability in Water Costs

Costs incurred to:

• acquire dry year supplies
• coordinate regional drought response
• comply with water quality regs
• meet electricity demands
• address conflicts
Drought Preparedness

- fine-tune reservoir operations
- groundwater recharge and recovery
- authorize dry-year surcharges: urban and ag
- negotiate to firm up dry year supplies
Dry-year Option Contracts

• ownership of water right remains with original water user
• compensation for lost crop revenues, disruption of farm planning
• terms and timing for notification to cease irrigation
Example of Dry Year Option

MWD S. California and Sacramento Valley irrigators

- district-to-district arrangements
- $10/af to district to secure option
- $90/af to farmer to exercise option
Example of Dry Year Option

MWD S. California and Sacramento Valley irrigators

• over 100,000 af transferred in 2003
• farmers shift from rice to less water intensive crops
• farmers shifted from surface to groundwater (???)
Dry Year Option Contracts

• cost of options needs to be justified by increased reliability provided
• dry-year options *much* more expensive (on a per af/year basis) than outright water rights purchases
• useful way to introduce water trading
“Leasing water allows farmers to see how markets can work without obliging them to make permanent transactions. Leasing is a great way to test different approaches…”

- spokesperson for Deschutes Water Exchange, Oregon
Regional Water Bank

legally authorized arrangement for:

• storing water to be used in the future
• temporary water transfers
• need flexibility in river operations and reservoir or aquifer storage
Regional Water Bank

functions:

– coordinate negotiations
– standardize units of water traded
– standardize trading procedures
– reduce transaction costs
– match buyers and sellers
Water Banks Around the West

Several established banks:
• Idaho, Snake River
• Arizona, intra- and inter-state
• Texas
• California, many regions and purposes
Water Banks Around the West

newly emerging:

• Oregon – Klamath Basin
• New Mexico – Pecos Basin only (so far)
• Nevada – proposed
• Colorado
Klamath Basin Water Bank

- accumulated 60,000 af for 2003
- water acquired for fishery needs
- high prices in 2002, approx $300/acre
- in 2003, approx $188/acre (still exceeded farm land rental rate)
- 2004: seeking 75,000 af
- will use bidding mechanism, not fixed price
Arizona-Nevada Interstate Water Banking

- small pilot program in place for several years
- new agreement provides up to 200,000 afy storage for Nevada in Arizona aquifers
- cumulative storage for Nevada may not exceed 1.2 maf
- long, complex federal-state negotiations
Arrangements To Firm Up Supplies: Spot Markets

- one-time lease of specific quantity
- low (and relatively certain) transfer costs
- price negotiated between lessor/lessee
- no change in ownership of water right
Spot Markets: Examples

Texas Lower Rio Grande Valley
• well-defined surface water rights
• diligent monitoring/enforcement
• 10-20% of water traded “normal” years
• 30-40% of water traded in dry years
• ag-to-ag, ag-to-urban, ag-to-mining
Spot Market: Snake River Basin, 2001

- 400 farmers agreed to fallow 150,000 acres so the electric power and water could be re-directed.
- Payments averaged $485/acre (better than crop returns even in good years).
- All agreements finalized in just 2 weeks
So, where’s the flexibility in western river basins?

The infamous American bank robber, Willie Sutton, was once asked why he robbed banks. Sutton replied, somewhat perplexed by the question: “Banks are where the money is.”
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<th>Irrigation’s Consumptive Use (MAF/year)</th>
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Negotiating to use agricultural water

- new federal Farm Bill in 2002
- tens of billions of dollars in programs for U.S. agriculture
- payments are *in addition to* low cost water and power for many ag districts
Effects of the 2002 Farm Bill

- enhances profitability of irrigated crops
- contributes to larger irrigated acreage and water use
- more expensive to bid water away from ag use
Strategies to reduce ag water use

- fallowing irrigated acreage
- “deficit” irrigation
- improved delivery systems, irrigation mgt
- changes in crop mix
Example: fallowing ag land

- City of Aurora and irrigators in Arkansas Valley, southeastern Colorado
- 1 year lease for 12,600 af, paying $436/af
- City will charge a drought surcharge to cover costs
Bargaining With A Sellers’ Consortium

- useful where transfers out of local agriculture controversial

- City of Aurora and 146 irrigator shareholders in Highline Canal

- MWD of S California and Imperial Irrigation District

- MWD of S California and Sacramento Valley districts
Examples: Seller’s Consortium

• Utah, 1980, power company bought 45,000 acre feet of water in rural Utah
• all members of four local irrigation companies invited to participate
• each allowed to sell 20% of their water
• active trading in “options to sell”
• no one left out, reducing divisiveness
Example of Land Fallowing Agreement

- MWD S. California – Palo Verde Irrigation District, 2003
- 7-29% of district land fallowed annually (max 26,500 acres)
- 25K to 111K water for urban needs
- one-time sign up payment: $3,170/acre
- annual payment: $550/acre fallowed
Example: land fallowing

San Antonio area of Texas, 1990s
• solicited offers to fallow land temporarily
• irrigators submitted bid per acre
• 20,000 acre feet acquired
• half auctioned to municipal water users, remainder used for ESA needs
Water Acquisition Tools

can structure acquisitions in a variety of ways to:
  – address dry year needs
  – establish price
  – negotiate transfer terms
Case-by-Case Negotiated Acquisitions

advantage: tailor to meet specific needs

disadvantages:
  – conflict over perceived “secret deals”
  – perceived inequities
  – higher transaction costs
Standing Offers

- widely-used mechanism
- publicize a fixed offer price
- advantages: Simplicity, low transaction costs
- difficulties: setting correct offer price
Standing Offer: California Drought
Water Bank

• 1991, offered farmers $125 per acre-foot
• acquired 820,000 acre-feet
• only wanted 655,000 acre feet
• BUT rapidly acquired water

• 1992, offered $50 per acre foot
• acquired 154,000 acre feet
Albuquerque Standing Offer Purchases

Average Price ($/AF) vs. Volume (AF)

Year: 1987 to 2004

- Price
- Volume

Data points show fluctuations in average price and volume over the years.
Auctions and Bidding Mechanisms

• used in Australia, Spain, increasingly in US

• advantages:
  – does not require setting offer price
  – public, transparent process
  – can reflect current market conditions
Auctions and Bidding Mechanisms

• disadvantages:
  – lack of familiarity with bidding system
  – need careful design to thwart collusion
  – rules and procedures need to be clear
Example: bidding to fallow land

San Antonio area of Texas, 1990s

evaluated irrigator’s bids based on:
  – types of crops
  – types of irrigation system
  – commitment to dry land farming
  – bid price per acre
Example: bidding to fallow land

- Klamath Water Bank soliciting bids for 2004
- farmers submit bids in $/acre fallowed
- water savings estimated based on crop and soil data
- bids accepted based on lowest cost per acre-foot of water “saved”
Summary: firming up dry year supplies

*Not* simple or inexpensive – but many innovative examples worldwide

Establishing dry-year acquisition program:

- open process, community outreach
- secretive acquisition plans = high costs

Plan in advance of need!!
He made arrangements in advance of need!

Why is this man grinning?