Water Rights in the American West

October 18, 2012
Water

- What makes water special:
  - Rival in consumption
  - Difficult to exclude others
  - Variation in natural supply
  - Difficult to transport
  - Essential to life
Acequias

- Communal Irrigation Ditches
- Spanish Colonization of Nuevo México—1598
- Law of the Indies
  - Water is sacred and should not be denied to those in need
  - Common Property
Incremental Changes

- New Mexico Territory laws
  - Initial legislation protected *acequias* and put local customs into statute form
    - *De facto* rights became *de jure*
  - Initial Territorial Legislature is dominated by Hispanics
Water Landscape Alters

- Anglo-American settlement increased
  - Arrival of the railroad in 1878
- Legislative body split more evenly and sometimes dominated by Anglos by 1895
- Three laws undercut the ability for acequias to flourish:
  - Irrigation corporations (1887)
  - Acequia organization constraints (1895)
  - Prior Appropriations and Centralization (1905)
New Mexico Water Code

- 1905 legislation establishes the water code
  - Makes water a private right based on the prior appropriations doctrine
  - Creates the territorial engineer to centrally administer water rights
- Bill passed Council by only 6-5 margin
  - 5 votes against represent counties which contain 66-77% of the acequias in the state.
Prior Appropriations

- “First-in-time, first-in-right”
- Water rights are personal property, bought and sold separate from land
  - Diversion
  - Beneficial Use
- Usufruct—Own the right to use the water
- In contrast to the Riparian Doctrine
  - Landowners may use water from streams on their land in any amount which does not deplete other landowners supply
Prior Appropriations

- Calls on the river
  - Senior right holders make a “call” from junior right holders

- Irwin v. Phillips (1855) California
  - Prior Appropriations established in mining camps
- Coffin v. Left Hand Ditch Co. (1882) Colorado
  - Transbasin diversions
Prior Appropriations

- Economic Benefits
  - Investment Security
    - Incentive to undergo costly investment
  - Efficiency
    - Water can be bought and sold in the market
    - Water moves towards its highest value
- Concerns
  - Lack of “environmental value”
  - Equity and Fairness
Federal Involvement

- Push to settle and develop the American West
  - “Rain will follow the plow”
- Homestead Act (1862)
- Desert Land Act (1877)
  - Title contingent on irrigation
- Carey Act (1894)
- All struggled to some degree due to lack of water (Coman 1911, AER)
Powell

- General John Wesley Powell
  - USGS Surveyor
- Suggests Montana forms counties based on hydrographic basin boundaries
- “Left to themselves [...] settlers would choose their lands ‘for personal gain rather than for common interest.’”
- Sundry Civil Bill—Irrigation Survey (1888)
  - Withdraws “irrigable” land from settlement
  - 850,000,000 acres withdrew from entry
- Proposed government control and assistance in water management
Compacts

- Political borders bisect water basins
- Water Law is at the state level
- Colorado Compact (1920)
  - Upper Basin (Colorado, New Mexico, Utah, & Wyoming) owes 7,500,000 af to the lower basin (Nevada, Arizona, and California)
- Rio Grande Compact (1938)
  - Colorado, New Mexico, and Texas
  - Amount due depends on the annual flow
Bureau of Reclamation

- Established in 1902 by federal legislation
- Projects targeted beyond the scope of private enterprise
- Today, largest wholesaler of water
  - 10 million acres of irrigated land provided for
  - 600 dams and reservoirs
  - Helps states meet compact obligations
  - Provides important storage for reliable water supply
Bureau of Reclamation

- Critiques
  - Subsidization of western agriculture
    - Farmers repay the *principal* costs over 10 years
    - Electricity production offsets some costs
  - Environmentalists
    - Destroying habitats with dams
    - Silt and water quality
    - Evaporation
Glen Canyon
Glen Canyon and Lake Powell

- 1956-1966 construction
- $272 million (1963 dollars)
  - Around 74 million in interest not paid
- 27 million acre feet of storage
- 186 miles long
- 161,390 acres of surface area
  - 1.5 million af per year evaporates
Water Markets

- Efficiency
  - “Water flows up hill towards money”
- High Transaction costs
  - Must not be injurious to other right holders
    - Consumptive vs. diversion
  - Difficult to transport
  - Must meet beneficial use hurdle
Water Markets

• Beneficial Use
  • In stream flows are now recognized
• Social vs. private benefit
  • Externalities
  • Free riding
• Speculation
• Urban vs. Ag prices for water
Howe & Goerman (2003)

- Institutional setting matters
- Transfers must be approved by a water court (on a basin basis) or the State Engineer
- South Platte
  - Some transfers occur under the water court
    - 1979-1995 87% from ag to urban
  - Alternatively, some transfers occur within the NCWCD which provides water from the Colorado-Big Thompson Project
    - 260,000 af of supplemental water from the Western Slope
    - No court approval, all transfers are within the district
    - Homogenous units
    - low transaction costs
Figure 2. Distribution of Native South Platte Transfers by Size.
(Median: 367.17; Mean: 3,425.31)

Figure 6. Distribution of NCWCD Transfers by Size (1979 to 1999).
(Median: 16.8; Mean: 34.00)
Howe & Goerman (2003)

- Arkansas Valley—depressed economy, increasing sales to larger cities
  - 88% to out of basin users
  - Discontinuous and large transfers—economies of scale in constant transaction costs
Figure 2. Distribution of Native South Platte Transfers by Size.
(Median: 367.17; Mean: 3,425.31)

Figure 8. Distribution of Native Arkansas Valley Transfers by Size.
(Median: 366.82; Mean: 6,199.09)
Howe & Goerman (2003)

- Bigger indirect losses from Arkansas transfers than in the South Platte Basin
  - Out of basin transfers and lack of other employment opportunities
  - Path dependency—Future growth is now unlikely

- Social costs should be considered in approval
Groundwater

- Conjunctive Management (Colorado Case)
  - Water Rights Administration and Determination Act of 1969
  - Recognizes ground and surface water are connected
    - Holes in the bucket
  - Wells were, and remain, largely unregulated
    - *De jure vs. de facto*
    - Difficult to establish a low cost regulation system
  - State Engineer shuts down a number of wells
San Luis Valley Case

- Aquifer provides more reliable supply
- Over 3000 wells established in 1950’s
CHANGE IN UNCONFINED AQUIFER STORAGE
WEST CENTRAL SAN LUIS VALLEY

MONTHLY CHANGE

5 yr. running avg.

CHARGE IN STORAGE - ACRE FEET

YEARS

DRAFT - April 2, 2012
Data through March 8, 2012

Prepared by Davis Engineering Service, Inc,
For Rio Grande Water Conservation Dist.
Sub-District 1

- Two (three) goals
  - Replace depletions to surface water
  - Reduce depletion of the aquifer
  - (Do it themselves)
- Revenue
  - Fee on pumped water ($5-$75 per acre-foot)
  - Admin Fee
  - CREP fee
- Reduces pumping (marginal private cost increases)
  - Internalizes the externality
- Provides funding to leave land fallow (out of production)
  - Coasian bargaining for ecological system
- Possible due to increased knowledge
  - Rio Grande Decision Support System