

University of Colorado Law School

## Colorado Law Scholarly Commons

---

Hard Times on the Colorado River: Drought,  
Growth and the Future of the Compact  
(Summer Conference, June 8-10)

2005

---

6-10-2005

### SLIDES: Interstate Marketing and Similar Economic Approaches

Jim Booker

Follow this and additional works at: <https://scholar.law.colorado.edu/hard-times-on-colorado-river>



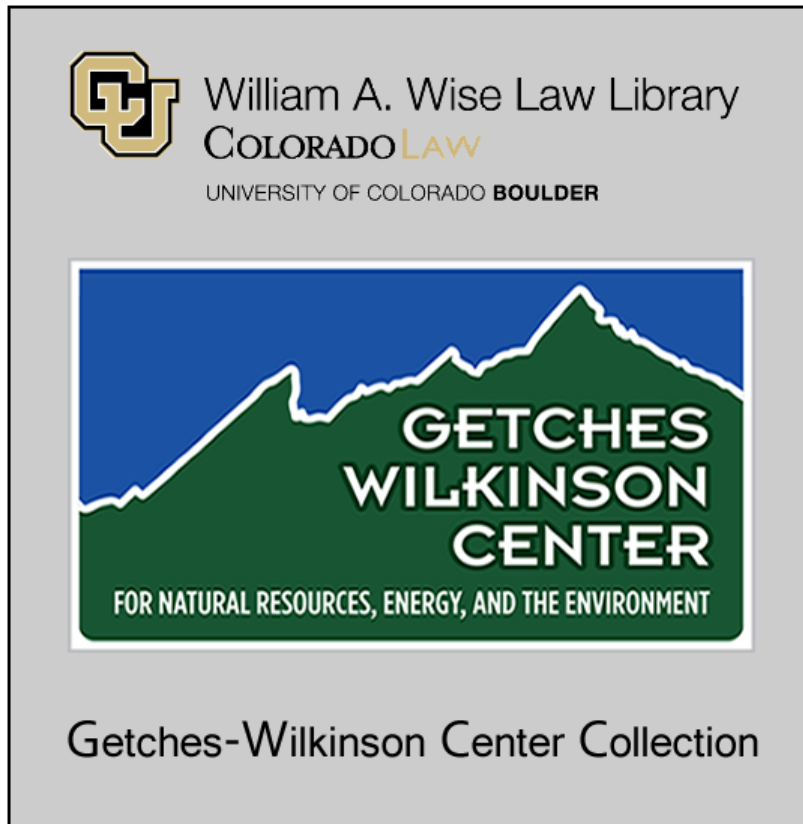
Part of the [Hydraulic Engineering Commons](#), [Hydrology Commons](#), [Natural Resources and Conservation Commons](#), [Natural Resources Management and Policy Commons](#), and the [Water Resource Management Commons](#)

---

#### Citation Information

Booker, Jim, "SLIDES: Interstate Marketing and Similar Economic Approaches" (2005). *Hard Times on the Colorado River: Drought, Growth and the Future of the Compact (Summer Conference, June 8-10)*.  
<https://scholar.law.colorado.edu/hard-times-on-colorado-river/21>

Reproduced with permission of the Getches-Wilkinson Center for Natural Resources, Energy, and the Environment (formerly the Natural Resources Law Center) at the University of Colorado Law School.



Jim Booker, *Interstate Marketing and Similar Approaches*, in *HARD TIMES ON THE COLORADO RIVER: DROUGHT, GROWTH AND THE FUTURE OF THE COMPACT* (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law, 2005).

Reproduced with permission of the Getches-Wilkinson Center for Natural Resources, Energy, and the Environment (formerly the Natural Resources Law Center) at the University of Colorado Law School.



“Hard Times on the Colorado River: Drought, Growth, and the Future of the Compact,” Natural Resources Law Center 26th Annual Conference, June 8-10, 2005



# INTERSTATE MARKETING AND SIMILAR ECONOMIC APPROACHES

Jim Booker

Siena College



or

WHAT IF MARKETS REALLY HAPPEN?



## If markets happen:

- Where does the water go?
- What are the net benefits to the buyers and sellers?
- What are the impacts to third parties?



# Market scope

- Intrastate
- Interstate but intrabasin
- Interstate and interbasin



*The conventional wisdom -*

Clear hierarchy of economic value:

1. urban use
2. lower basin agricultural use
3. upper basin agricultural use



## *Supporting the conventional wisdom:*

Pat Tyrrell

- June 8, 2005

"We can't argue  
dollars with Las  
Vegas."

Las Vegas \$1/square foot  
turf removal is  
 $\$1/\text{ft}^2 * 43,560 \text{ ft}^2/\text{acre} =$   
**\$43,560 per acre**

*Compare this to your  
favorite per acre  
irrigated land value*





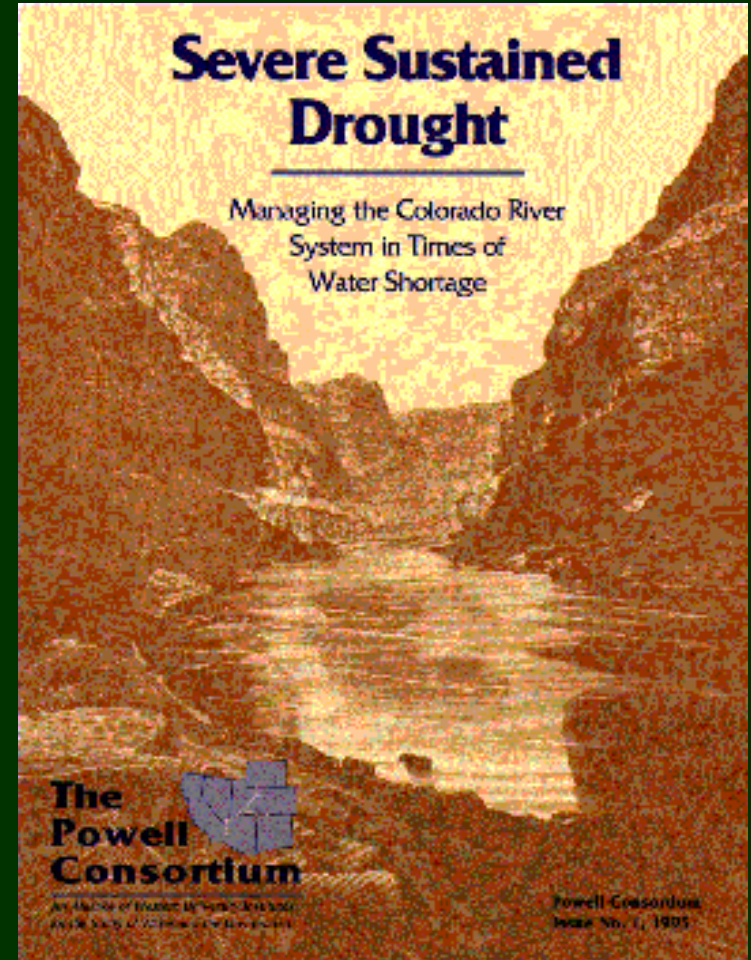
# Market impacts in the Basin



based on

- Journal of Environmental Economics and Management, 1994

and



containing Booker, "Hydrologic and Economic Impacts..."



# Contrasting markets in the Basin



## Idea: *with and without*

- Water use: how does it change *with vs. without* the market?
- Economic impact: what are the net \$ impacts of market transfers (i.e. the difference between *with and without* ?)
- Contrast hydro and other values *with and without* a market.



# Contrasting markets in the Basin

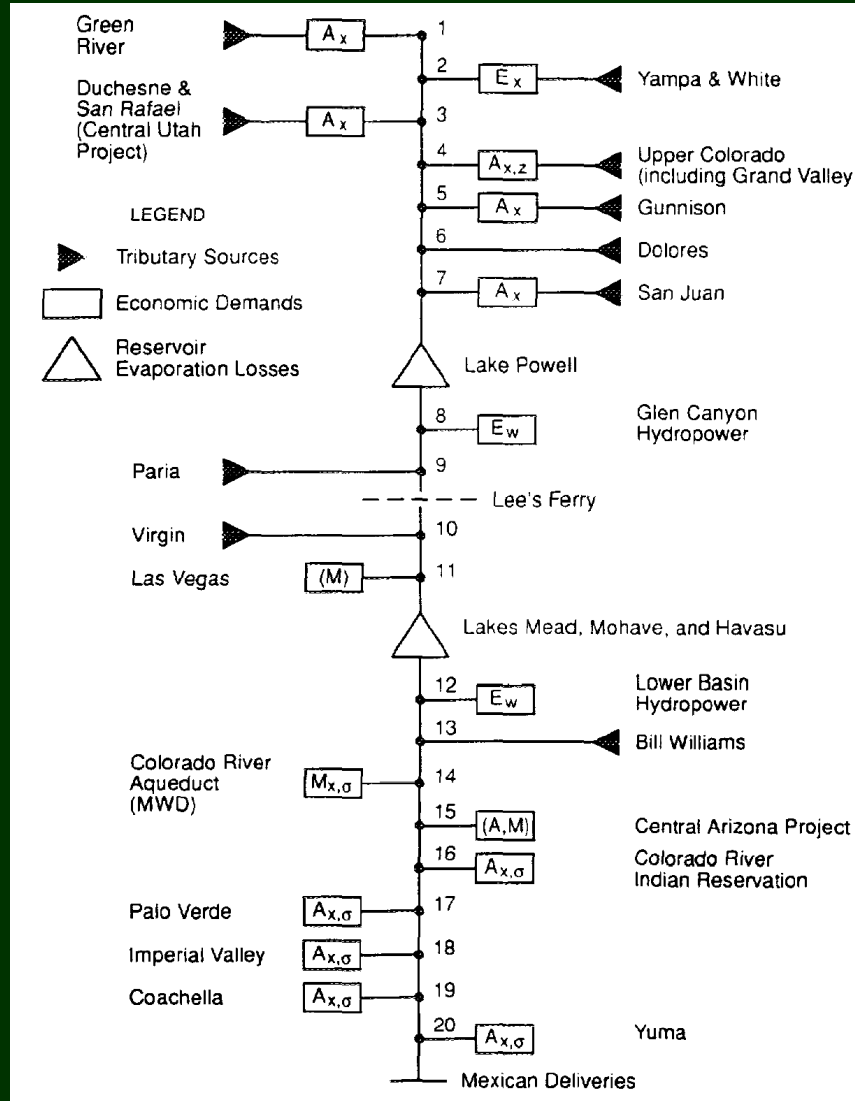


One scenario:

- 10% level of historic 10 year Lee Ferry mean (almost identical to Stockton and Jacoby median: 13 maf)
- Current (not future) depletion schedule



# The Model





# Contrasting markets in the Basin



## Intrastate

- Ag to urban transfer within states
- \$128 million
- hydro benefits unchanged

## Interstate

- Ag to urban transfer within state
- \$130 million
- hydro benefits unchanged



# Preliminary conclusion

Intrastate markets do virtually as well as interstate markets in maximizing the beneficial use of basin water



*An unconventional wisdom -*

A simpler hierarchy of economic value in  
basin consumptive uses:

1. urban use
2. agricultural use



# What did we leave out?

1. Las Vegas future demands
2. Hydropower, salinity, and other instream values.





# Power producers enter market



## Intrastate

- Ag to urban transfer within states
- \$128 million
- hydro benefits unchanged

## Interstate

- Ag transfer to lower basin
- \$190 million
- hydro (and salinity) benefits increase



*The bottom line - clear hierarchy  
of economic value:*

1. urban use

2. instream use (hydro, water quality, ...)

==>

3. lower basin ag use economically favored  
over upper basin ag use



# More results



Differences from "law of the river" are shown  
all data in 1989 million \$

	<b>Institution</b>	<b>Use</b>	<b>All</b>	
Current historic (13.0 maf/yr)	<b>Intra use</b>	93	69	"Old river"
	<b>Inter use</b>	94	88	
(JEEM 1994)	<b>Inter all</b>	72	138	
Current tree ring (11.7 maf/yr)	<b>Institution</b>	<b>Use</b>	<b>All</b>	
	<b>Intra use</b>	172	132	
	<b>Inter use</b>	178	93	
	<b>Inter all</b>	161	159	
2010 historic (13.0 maf/yr)	<b>Institution</b>	<b>Use</b>	<b>All</b>	"New river"
	<b>Intra use</b>	656	558	
	<b>Inter use</b>	657	560	
	<b>Inter all</b>	643	634	
2010 tree ring (11.7 maf/yr)	<b>Institution</b>	<b>Use</b>	<b>All</b>	
	<b>Intra use</b>	675	576	
	<b>Inter use</b>	693	515	
	<b>Inter all</b>	662	604	



# Elephants in the room

- High cost of new supplies
- Beyond overappropriated: overused
- How much can we use



# High cost of new supplies

Neglecting market opportunities leads to:

1. Multibillion dollar schemes like Nevada's Virgin/Muddy River proposal.
2. Trying to use a desalting plant on agricultural return flows: Yuma.



# Cost of new supplies vs. market options

**Table B. Summary of annual costs of two alternatives for providing replacement water from a national accounting perspective. Assumes 78,000 acre-feet produced annually, the average of two potential Yuma Desalting Plant yields given in Department of the Interior (2003).**

Alternative	National cost estimate (annual)	Risk of substantially greater costs	Implementation risk	Flexibility	Secondary economic impacts	Environmental impacts
Forbearance agreements	\$3 million	<i>low</i> – large existing acreage of lower valued crops	<i>moderate</i> – institutional procedures not yet in place	<i>high</i> – temporary agreements	<i>moderate</i> – local loss of related economic activity	<i>low</i> – small reduction in flows to Cienaga
Restarting Yuma Desalting Plant	\$25 million	<i>high</i> – track record of much higher costs; extensive pretreatment requirements; vulnerability to energy cost increases	<i>high</i> – updating of complex, older technology required	<i>low</i> – costs to maintain plant in ready reserve are greater than costs of forbearance agreements	<i>moderate</i> – temporary construction impacts; ecotourism impacts	<i>high</i> – loss of Cienaga wetlands



## Elephant #2: Beyond overappropriation

“Estimated consumptive uses of the Basin’s water between 1996 and 2000 averaged over 19 MAF per year.”

- Larry McDonnell, *The Water Report*, Issue #16, June 15, 2005; see also Kenney, *Conference Primer*, p. 4.



# Colorado River System Consumptive Uses and Losses Report 1996-2000



## COLORADO RIVER SYSTEM

Upper Basin	3,759	3,633	3,702	3,538	3,953	3,717
Lower Basin Mainstem	8,028	8,101	7,621	7,977	8,222	7,989
Lower Basin Tributaries	2,827	2,488	2,465	2,368	2,391	2,508
Other	2,024	1,974	1,759	2,154	2,102	2,003
<b>TOTAL</b>	<b>16,638</b>	<b>16,196</b>	<b>15,547</b>	<b>16,037</b>	<b>16,668</b>	<b>16,217</b>

## WATER PASSING TO MEXICO

Treaty	1,500	1,700	1,700	1,700	1,700	1,660
Minutes 218, 241, and 242	112	89	114	79	108	100
Regulatory Waste	5	1,173	3,018	1,194	337	1,146
<b>TOTAL</b>	<b>1,617</b>	<b>2,962</b>	<b>4,832</b>	<b>2,973</b>	<b>2,145</b>	<b>2,906</b>

<b>COLORADO RIVER SYSTEM GRAND TOTAL</b>	<b>18,256</b>	<b>19,158</b>	<b>20,379</b>	<b>19,010</b>	<b>18,813</b>	<b>19,123</b>
--	---------------	---------------	---------------	---------------	---------------	---------------



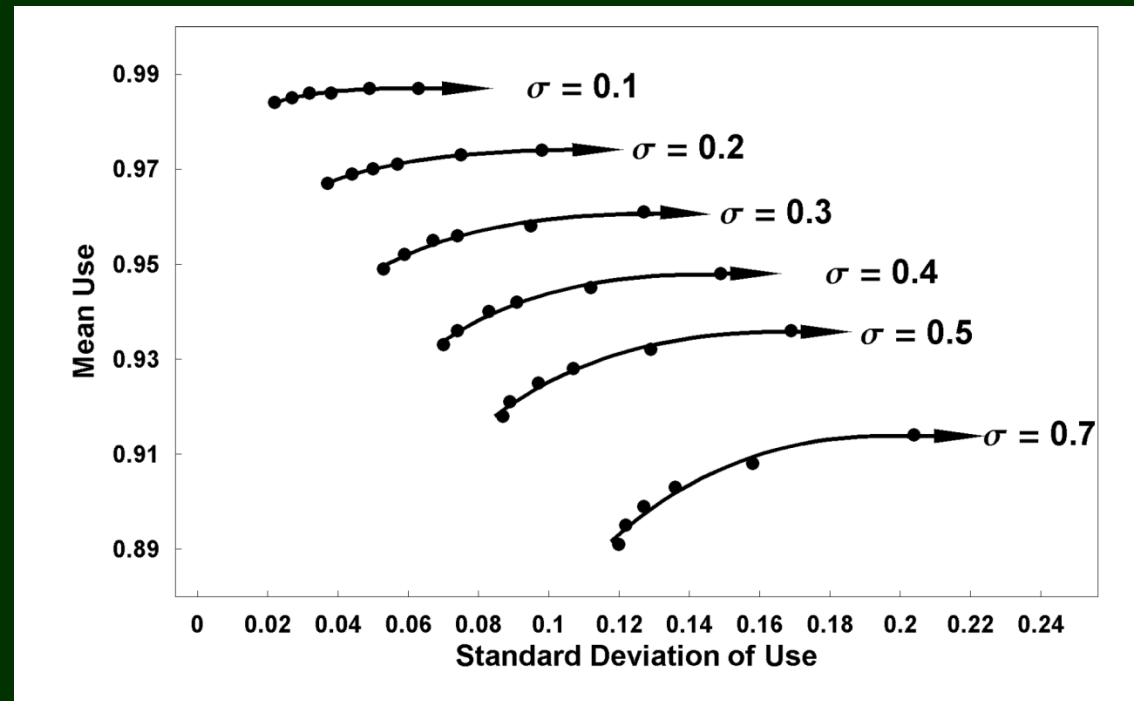


# Elephant #3: How much use is possible?

It depends.

How much variability in use will we accept?

Maximizing use may require *reducing* reservoir evaporation





# It depends on storage

System storage for  
"basinwide" use

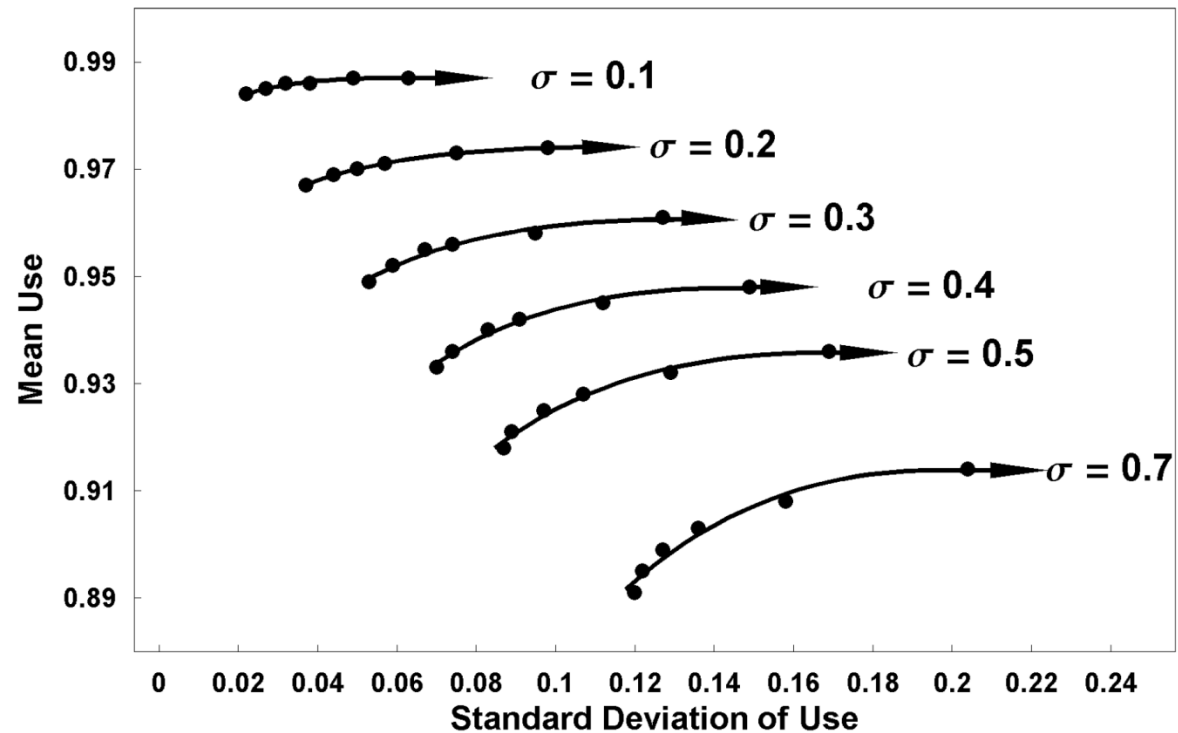
(largely carryover)

Headwaters storage  
supporting local use

(largely to reshape  
seasonal flows)



It depends on the willingness  
to accept shortages



Maximizing use may  
require *reducing*  
reservoir evaporation  
-- by *storing less*  
(Booker, 2005)

Increasing risk of shortage ==>



# What have we learned

- Many new water demands can be met by intrastate markets (but Nevada...)
- Instream uses (e.g. hydro) suggest benefits of an interstate perspective
- New storage has a water cost

