



Rethinking the Future of the Colorado River

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Colorado River Governance Initiative

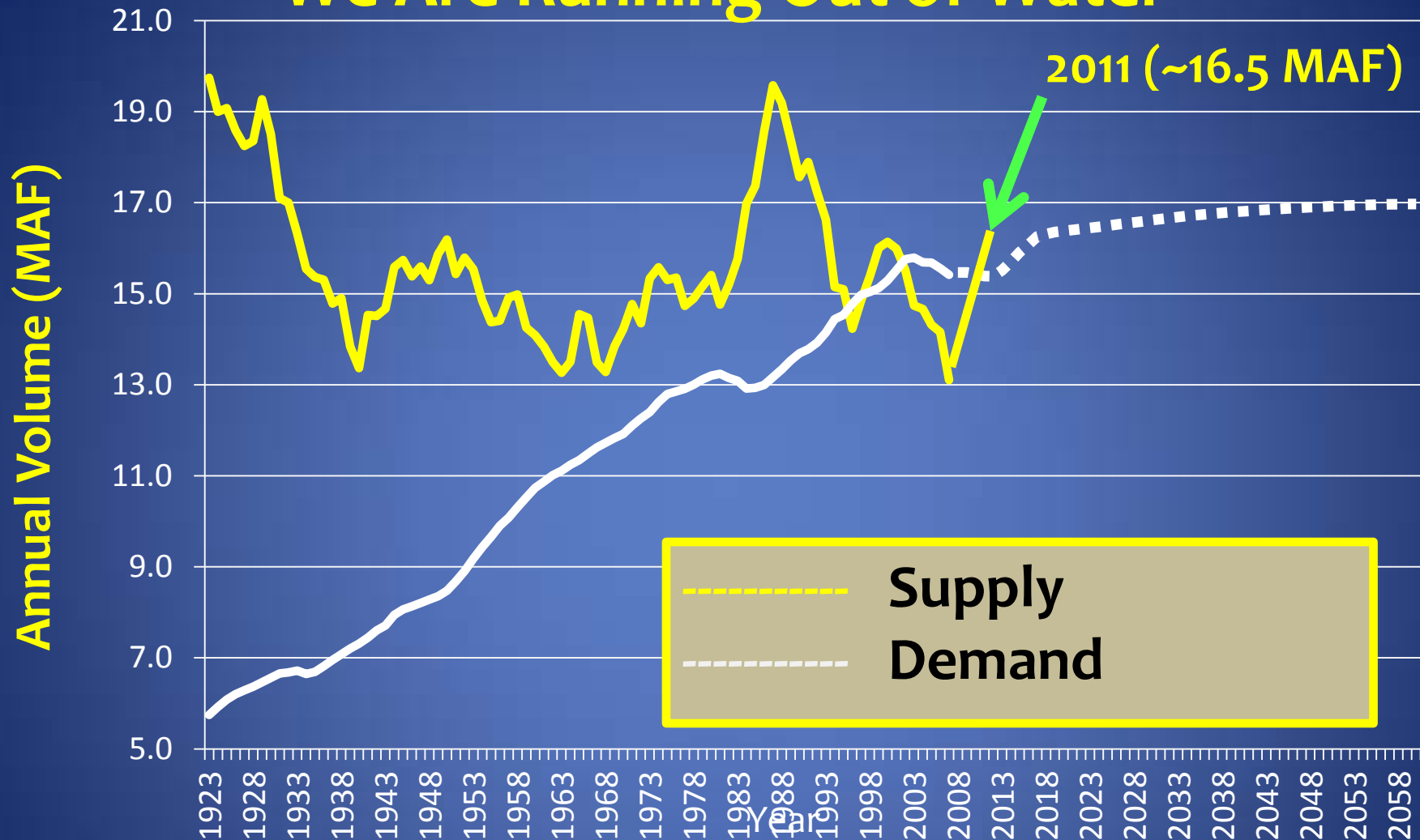
- Natural Resources Law Center project built around the idea that significant *institutional reforms* may be a necessary part of any strategy for managing the Basin's water resource challenges
- *Rethinking the Future of the Colorado River*
 - Dr. Douglas Kenney, (Interim Report. December 2010)



Questions to Consider

- Are we running out of water?
- Does the Law of the River provide adequate guidance for managing our water resources under reduced flow conditions?
- What are the options for addressing the short- and long-term problems that are likely to arise from reduced flow conditions?

We Are Running Out of Water



Supplies include all inflows above Lake Mead. The projected decline is extremely conservative (roughly 7%). Demands assume LB states (and Mexico) seek full apportionments (but no surpluses), and that UB states intend to follow their depletion schedules. (Values are 10-yr running averages.)

The 2011 Water Year

- Water storage has risen by about 2.5 MAF and total inflows have exceeded total outflows by about 3.86 MAF
- Lake Powell is now at ~73% capacity; Lake Mead is at ~50%
 - We have made a dramatic recovery from last year – but will it last?

Current Consumptive Use

- **Upper Basin Use** (~4.26 MAF) (about 1/3 of U.S. use)
 - ~3.7 MAF of consumptive use (~0.7 MAF is out of basin)
 - ~0.56MAF reservoir evaporation
- **Lower Basin Use** (~8.7) (about 2/3 of U.S. use)
 - Excludes Lower Basin tributaries
 - 7.5 MAF mainstem consumptive use
 - 1.2 MAF reservoir evaporation
- **Mexico delivery obligation** (1.5 MAF)
- **TOTAL CURRENT CONSUMPTIVE USE: ~14.46 MAF**

Impacts of Climate Change

- Bureau of Reclamation **CRB Water Supply and Demand Study** (June, 2011) uses a downscaled GCM to estimate 9% drop in flows by 2060, which would equate to about 13.6 MAF/year
 - But the minimum-maximum range is from 10-17 MAF
- Moreover, the **Colorado River Water Availability Study** (CWCB, 2010) *crop irrigation requirements* could increase by as much as 20% by 2040
 - This could dramatically increase irrigation demand (by as much as **1 MAF in the UB alone**) without any increase in production

Environmental Values

- Environmental values will almost certainly limit the options for addressing future challenges
 - Endangered species in both the Upper and Lower Basins
 - The Glen Canyon Dam Adaptive Management Plan
 - The Colorado River Delta

The Law of the River

- 1922 Colorado River Compact
- 1928 Boulder Canyon Project Act of 1928
- 1944 Mexican Treaty
- 1948 Upper CR Basin Compact
- 1956 Colorado River Storage Project Act
- 1963 *Arizona v. California* decision
- 1968 Colorado River Basin Project Act
- 2003 Quantification Settlement Agreement
- 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead

The Colorado River Compact

- Art. III(a): Apportions “*exclusive beneficial use*” of 7.5 MAF of the River to each basin
- Art. III(c): Mexico’s share come first from any surplus and if surplus inadequate, then *half from each Basin*
- Art. III(d): The UB may not cause the River’s flow at Lee Ferry “*to be depleted*” below 75 MAF over any 10 year period
- Art. VIII: *Pre-1922 perfected water rights* (about 2.3 MAF) *are protected* from any call on the River

Mexican Treaty

- Guarantees Mexico 1.5 MAF but provides that –
 - “in the event of *extraordinary drought or serious accident to the irrigation system* in the United States ... *the water allotted to Mexico ... will be reduced in the same proportion as consumptive uses in the U.S. are reduced.*”
 - Mexican Treaty, Article X.

Two Key Legal Issues

- Does the Colorado River Compact impose a “*delivery obligation*” on the Upper Basin to deliver 75 MAF (+7.5 MAF for Mexico) to the Lower Basin over ten years?
- Does the apportionment of the River, which was based upon a *mutual mistake of fact*, bind the Upper Basin?

What does the obligation “not to deplete” mean?

- First, the UB’s *pre-1922 perfected rights* (~2.3 MAF) are almost certainly protected by Article VIII
- But the diversion of any *post-1922 rights* could conceivably be enjoined if they cause the flows at Lee Ferry to fall below 75 MAF over ten years
 - The practical effect of a “not deplete” obligation is probably the same as a “delivery obligation”
- What this potentially means is that the UB may bear the brunt of any shortfall caused by drought or climate change

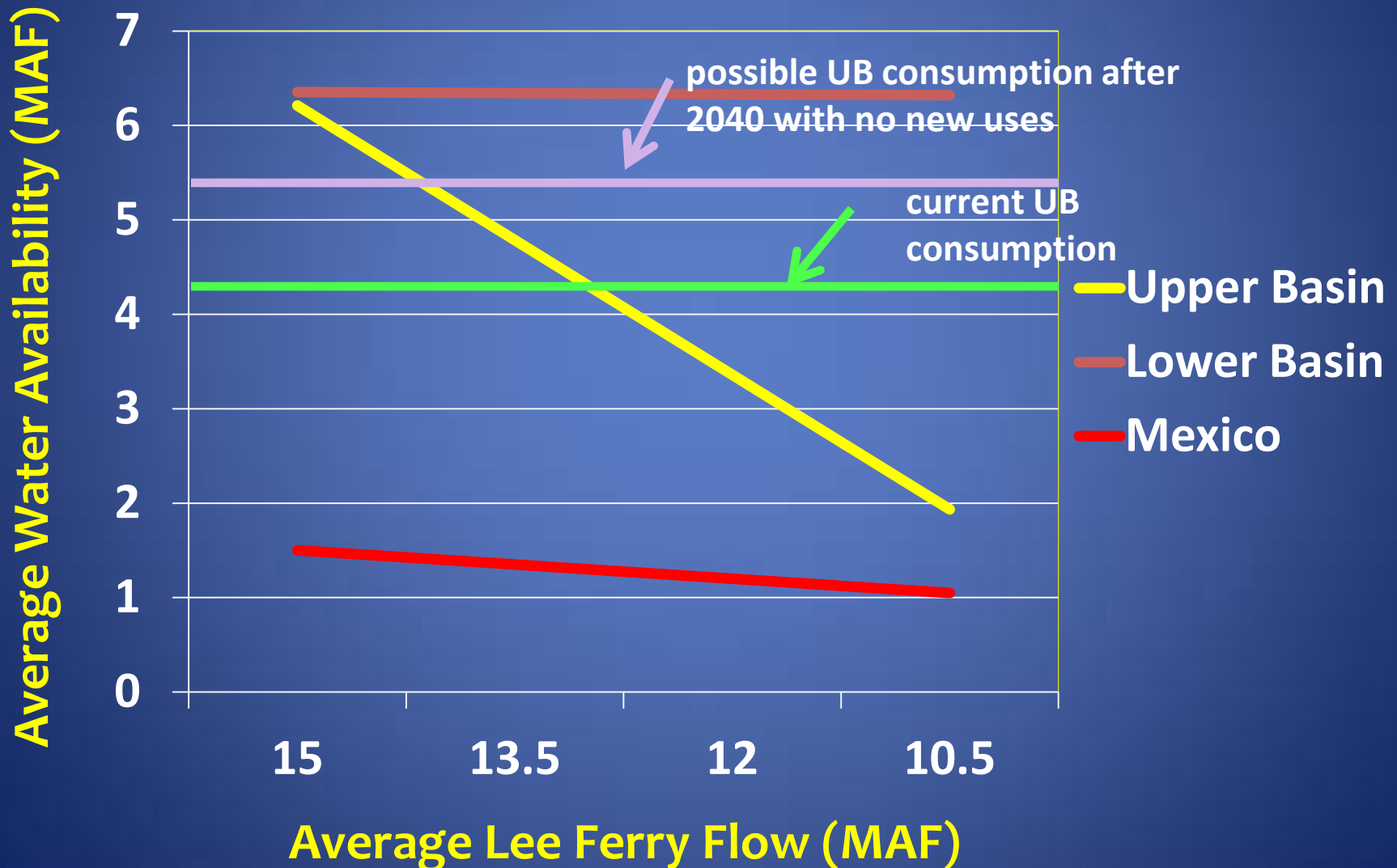
Except for current use, shown as maximum legal rights

Scenarios (includes evaporative losses)	Upper Basin	Lower Basin	Mexico
Current use (MAF)	4.26	7.5 (+1.2 surplus)	1.5
16.5 MAF	7.5	7.5	1.5
15 MAF	6	7.5	1.5
13.5 MAF	4.5	7.5	1.5
12 MAF	3.3	7.5	1.2
10.5 MAF	2.3 ^[1] (plus evaporative losses?)	7.15	1.05

^[1] Pre-1922 perfected rights

The Upper Basin Squeeze

Assumes LB evaporation/losses of 1.2 MAF/year; 0.56 MAF from UB



Mutual Mistake

- Interstate compacts are also contracts, and contracts are subject to being reformed by a court if they are based upon a *mutual mistake of fact*
- The Colorado River Compact almost certainly meets this test
 - The intent of the parties was *to divide the River equally* between the Upper and Lower Basins but it was written from the mistaken assumption that at least 16.5 MAF was available to divide among the parties
 - *The UB could ask the Supreme Court to reform the Compact to reflect the intent of the parties*

Mutual Mistake Claim

- While the UB has a compelling argument regarding a mutual mistake, it is not at all clear that the Court would actually reform the Compact to reflect what it might find to be the original intent of the parties
- It could instead use its authority to *equitably apportion the River*
 - Such an apportionment would most likely *protect the historic proportional uses* of the parties, but the outcome is highly uncertain

Management (non-exclusive) Options

- Business as usual
- Adapt to new conditions
- Augment existing supplies
- Litigate
- Negotiate

Business As Usual

- If current projections hold, we are likely to face a *shortage in the Basin of at least 1 MAF by the middle of the century*
 - The LB will first lose all surplus supplies
 - The UB will then bear the brunt of any additional shortages
 - What then?

Adapt

- Adapting could mean reducing consumptive use but reductions could be achieved with modest reforms
- A substantial portion of Colorado River water is still used for irrigated agriculture
 - Innovative **water transfers** could allow the Basin states to thrive even as they dramatically reduce consumptive use
 - **Water Transfers for a Changing Climate** (NRLC Report to NOAA, June, 2011) proposes **defining water rights in terms of consumptive use and allowing that amount to be freely transferred**

Other Adaptation Strategies

- Building on the success of the 2007 Interim Guidelines, the parties might further improve and coordinate the management of the system
- More and better water conservation
- Avoid actions that could exacerbate our ability to address future shortages
 - *Should we ban all future transbasin diversions?*

Augment Existing Supplies

- Given the unused storage capacity, the substantial and increasing losses to evaporation, *major new storage projects seem unlikely*
- *Conjunctive management and use of tributary groundwater* could still hold some promise but complex state-federal legal issues will have to be resolved

Litigation

- If UB fails to deliver full obligation, would the Lower Basin sue to curtail Upper Basin use?
 - Would Upper Basin defend on grounds of mutual mistake when the Compact was negotiated?
 - Are we really ready to throw out the Compact?
- If the Basin's water supplies continue to be stressed will endangered species or other environmental issues trigger litigation?

Negotiation

- The parties have shown a remarkable willingness to work together in recent years
- But the really hard choices have yet to be made
 - If the predictions for future water supplies come true we will not have adequate water to satisfy what the parties currently see as their entitlements
- Reducing consumption holds promise but the parties are likely to resist such efforts

Closing Thoughts

- The GCMs suggest that Colorado River flows are *likely to be lower than current flows*
 - At the same time, increased temperatures will increase evaporation and evapotranspiration, which means *we will need much more water just to maintain current uses*
- The Colorado River Compact was negotiated on the basis of a mistake and that could form the basis for a legal challenge, or a defense to an Lower Basin lawsuit
- Practical solutions are available but the longer we wait, the greater the stresses we are likely to face
 - It will be harder to reach any agreement if water levels dip dramatically

Thank you

I welcome your questions and comments

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