

# **Charting the Future of the Colorado River's Undeveloped Waters**

Presentation to the  
**1995 COLORADO WATER WORKSHOP**  
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by  
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## INTRODUCTION

Sharing this panel with an environmental group representative and a representative from one of the thirsty Lower Basin states provides an incisive microcosm of the more immediate and substantial challenges facing the state of Colorado in managing its water supplies and protecting its future development opportunities with respect to the Colorado River!

The Colorado Water Conservation Board (CWCB) has proven its willingness to be open-minded and resourceful in the recognition and accommodation of new values and uses for the water resources of this state, and is making bold moves in several new directions. However, there is an incredible amount of data and science, politics and law which comes into play as we address this topic, and I want to make it clear that the information I will share with you today is still being checked for accuracy and completeness, and that the opinions or conclusions I will discuss are my own unless I specifically indicate otherwise.

## HOW MUCH "UNDEVELOPED WATER" IS THERE IN COLORADO?

**1922 Hydrology & the 1922 & 1948 Compacts.** The amount of water in the Colorado River at Lee's Ferry (the dividing line between the Upper and Lower Basins) was overestimated by the negotiators of the 1922 Compact among the 7 states which comprise the Colorado River Basin. This is old news, or no news at all! However, whether there are 16+ million acre feet (MAF) to be allocated among the 7 states, as estimated in 1922, or less -- maybe only 13 MAF, it requires a quick historical review to place Colorado's apportionment and the implications of the more recent hydrologic records into perspective.

The 1922 Compact was supposed to provide the Upper and Lower Basins approximately equal shares of the supply, and the established allocation was intended to be permanent. Politically, the 1922 agreement among the states was important as a means to reduce the Upper Basin states' opposition to Lower Basin plans to build Hoover Dam with funding from the U.S. Congress. In 1948, Colorado and the other Upper Basin states entered into another Compact apportioning the Upper Basin's allocation. The state of Arizona, which lies primarily in the Lower Basin, was allocated 50 thousand acre feet (KAF) and the unquantified remainder was apportioned according to the following percentages: Colorado = 51.75%; New Mexico = 11.25%; Utah = 23.00%; and Wyoming = 14.00%.

To make a long and complicated story relatively short and simple, the way the largest Colorado River storage facilities are operated by the Bureau of Reclamation (in consultation with the states), each year the Upper Basin delivers 7.5 MAF to Lee's Ferry plus  $\frac{1}{2}$  of the 1.5 MAF which the U.S. promised to Mexico in 1944. Our estimation of the amount apportioned to the state of Colorado is greatly complicated by the fact that we are allocated a percentage of an unquantified remainder! The 3 Lower Basin states resorted to the U.S. Supreme Court to quantify the allocation of their 7.5 MAF (4.4 MAF for California + 2.8 MAF for Arizona + 0.3 MAF for Nevada).

**Today's Hydrology & Colorado's Apportionment.** Using the best hydrology data available, it now appears that there may only be about 6.0 MAF available to the Upper Basin states on a long-term basis, taking drier years into account, and given the manner in which the major reservoirs are being operated. This estimate was derived by the Bureau of Reclamation in 1988, and suggests that **Colorado's apportionment is approximately 3.079 MAF** (i.e., 51.75 % of 5.950 MAF -- which is what remains of the 6.0 MAF after Arizona gets its 50 KAF from the

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exceeding our interstate allocation.

**How Much "Undeveloped Water" in Colorado?** Half-a-million acre feet sounds like a lot of consumptive use. It is. Can you imagine how much infrastructure it could take to be able to use that much water? Can you imagine how much regulation and litigation so much construction could generate? Would you be surprised to find out that a lot of the necessary infrastructure is already built? Well, it is!

As the *ad hoc* Compact Development Projection Workgroup was beginning its deliberations, it considered various ways of predicting the quantity and location of future development within the 7 basic subbasins of the Colorado River in Colorado. Naturally, the Workgroup considered the influence of economic and regulatory factors, and it was suggested that new uses could most easily develop where there is infrastructure in place with unused capacity. So we have been working on the list of the existing projects with capacity in excess of current uses and the projects which are expected to be complete and ready for use in the near-term (e.g., we are including the Wolford Mountain Project, and phase I of the Animas-La Plata Project). What we are seeing, based on the best data we have reflecting average yield at buildout, is that Colorado is a lot closer to full utilization of our Colorado River supplies than we have been thinking.

This doesn't mean that all of the infrastructure is already in place. We will clearly need additional infrastructure (with all the usual permits and financing, *etc.*), and it goes without saying that capacity isn't the same as actual use. However, Colorado's economy and communities continue to grow, and there is a lot less uncertainty about our ability to utilize Colorado's full allocation than many people have been thinking. There aren't sufficient "undeveloped waters" in this state to warrant a reevaluation of the basic allocations which have already been agreed upon. It is Colorado's position that the existing allocation was intended as a permanent allocation, and that there is ample water (7.5 MAF) allocated to the Lower Basin that the states of Arizona, California, and Nevada can reasonably be expected to meet their respective needs without looking to the waters allocated to the Upper Basin under the 1922 Compact.

### **HOW SHOULD THE FUTURE OF UNDEVELOPED WATERS BE "CHARTED?"**

The basic allocation embodied in the 1922 Compact was intended to allow development in the Lower Basin states and in the Upper Basin states to proceed at a rate which best suited their respective communities and economies. The Upper Basin states recognized that the Lower Basin states, especially California, were ready to divert substantial supplies of water from the Colorado River, and that development in the Lower Basin was likely to occur much sooner than in the Upper Basin. It was our understanding that the compact allocations would avoid a rush to develop uses for water in the Upper Basin at a rate that would be faster than our communities and our officials could accommodate in an orderly manner. Within these basic interstate allocations, market forces and local planning and land use decisions should govern the rate and location of development and the future of undeveloped waters.

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Upper Basin; if there really were 15 MAF in the River and 7.5 MAF for the Upper Basin, and if the Upper basin states could avoid contributing to the Mexican Treaty requirements, then Colorado's 51.75 % would be approximately 3.855 MAF).

Much of this water is already being used in Colorado today, primarily for irrigation. As you would expect, we divert considerably more water from the Colorado River for irrigation in drier years (i.e., when rainfall -- not snowmelt or reservoir storage -- is low) than in wetter years. Therefore, when we consider the extent to which Colorado is currently using the water supplies allocated for consumptive use in this state, we use a concept called "**maximum adjusted consumptive use.**" In essence, it represents the amount of consumptive use which would occur if every subbasin experienced dry year conditions at the same time. Of course, this reflects a set of hydrological conditions may not occur very often at the same time, but it shows that we are closer to the day when we will be fully using the supplies allocated to Colorado than many people have been thinking. This awareness is important for any discussion of this topic because it places the concept of "undeveloped waters" in the state of Colorado into a more realistic context.

The CWCB and the Division of Water Resources are in the process of refining the data which supports the calculation of the "maximum adjusted consumptive use," and we are still coordinating with an *ad hoc* "Compact Development Projection Workgroup" (convened in December 1994 by the CWCB) in the preparation and peer review of our current estimate, but I'd like to show you some of the numbers, so that you get a better understanding of the concept.

BASIN	AGRICULTURE	EXPORTS	M & I	EVAPORATION	TOTAL
Little Snake	14.9 KAF	0	0	0.5 KAF	15.4 KAF
Yampa	89.4 KAF	0	18.9 KAF	4.5 KAF	112.8 KAF
White	54.3 KAF	0	7.0 KAF	1.5 KAF	62.8 KAF
Colorado (mainstem)	548.5 KAF	627.5 KAF	38.4 KAF	47.1 KAF	1,261.5 KAF
Gunnison	462.0 KAF	3.0 KAF	14.7 KAF	17.9 KAF	497.6 KAF
Dolores	67.2 KAF	0	3.5 KAF	7.3 KAF	78.0 KAF
San Juan	230.0 KAF	4.3 KAF	11.4 KAF	13.9 KAF	259.6 KAF
CRSP Evaporation				341.1 KAF	341.1 KAF
STATE TOTAL	1,466.3 KAF	634.8 KAF	93.9 KAF	433.8 KAF	2,628.8 KAF

These numbers are derived from the Bureau of Reclamation consumptive uses and losses report for 1981- 85, and have been adjusted by the CWCB staff. You will be better able to understand specifically what goes into these calculations when the Workgroup's report is available (next month, we hope), but the bottom line is that we are now estimating Colorado has developed and is presently able to use approximately 2.6 MAF of its Colorado River water supplies. Based upon this calculation, you can see that there is approximately another 0.5 MAF (i.e., 3.1 MAF - 2.6 MAF = 0.5 MAF) which we can expect to use in Colorado without

*No inclusions allowed*

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consideration - but not at the expense of the basic allocation codified in the "Law of the Colorado River."

The massive investments we have made in building reservoirs, negotiating compacts, protecting water rights and in the other trappings of water allocation are serving us very well. We enjoy a large measure of security as a result of those investments, and I submit that sustaining "our prosperous way of life" is our goal today. This security may be temporary, if population growth continues unconstrained, but it has begun to enable us to include the needs of other species and communities, along with our property rights and our free market philosophy, among the primary factors which will "chart the future" of the Colorado River's undeveloped waters in accordance with the basic allocation among the 7 states.

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**Can the Finite Resources of the Colorado River Support a Growing Population, Irrigated Agriculture, and Endangered Species?** We are convinced there is plenty of water in Colorado to meet these needs. There is clearly enough water allocated to Colorado to meet the needs of our growing communities without taking water away from irrigated agriculture. This does not mean there won't be local shortages, that some municipalities won't continue efforts to purchase agricultural water rights, or that some irrigators won't continue to look for opportunities to cash in on one of their most valuable assets. It does mean, however, that we can accommodate both growing communities and continued agricultural production if we are diligent in making efficient use of existing supplies and infrastructure, and if we carefully develop additional infrastructure in the right places.

Is there enough water to protect and recover endangered species, too? The CWCB is convinced that the 4 species of fish which are currently protected under the federal Endangered Species Act can be recovered and removed from federal protection by carefully managing those waters of the Colorado River in excess of our basic apportionment which originate in our state. Let me explain: the best estimates currently available indicate that, on a long-term basis, approximately 10.7 MAF of Colorado River water originates within the state of Colorado. This means that approximately 7 MAF ( $10.7 \text{ MAF} - 3.1 \text{ MAF} = 7.6 \text{ MAF}$ ) which flows across our borders into neighboring states in the Colorado River Basin doesn't belong to us.

The CWCB is supporting the Recovery Program for Endangered Fish Species of the Upper Colorado River Basin, and its counterpart in the San Juan River, through the use of that 7 MAF in conjunction with Colorado's Instream Flow Law and other management measures (e.g., leases, cooperative agreements). The fundamental premise for the CWCB's support for the Recovery Programs is that the endangered fishes can be recovered, while development of our full apportionment proceeds. In essence, we propose to manage the resources allocated for consumptive use in other states to "mimic the natural hydrograph" in Colorado to recover the endangered fishes without impairing our development opportunities. Similar efforts to protect other aspects of the River's ecosystem and to maintain related recreation and tourism activities should also be possible without taking water supplies away from efficient irrigation or other uses in Colorado.

In its documentary film about Hoover Dam, the Bureau of Reclamation asserts that our goal in managing the resources of the Colorado River has been to "sustain our prosperous way of life." When the United States began to settle the West, this arid - to - semi-arid part of the world was perceived as hostile and ruthless. We have made great investments to increase the reliable yield of our water supplies, and the sustainability of our prosperity has become relatively secure. This security has fostered a greater sense of comfort and confidence within our communities, and enabled us to see our relationship to our semi-arid environment in different terms. We still place people first, but we are finding the capacity to care for and protect native fish and wildlife, too.

So our paradigm may be shifting, because 75 years ago the only significant consideration as we began our allocation of Colorado River water supplies was human needs. Today, endangered species and other environmental protection priorities are getting important