Colorado's Water Supply Future

Bill Ritter, Jr. – Governor
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Interbasin Compact Process

Quarterly Newsletter - 1st Quarter 2009

Introduction

Last year Colorado's water community embarked on a visioning process to address the following questions: If we let Colorado's water supply continue to evolve the way it is now, what will our state look like in 50 years? Is that what we want it to look like? If not, what can and should we do about it?

Discussions between the Interbasin Compact Committee (IBCC), the Basin Roundtables, and the Colorado Water Conservation Board (CWCB) resulted in two major conclusions. First, the status quo approach to our water supply challenges will not result in the Colorado we want to see, we need to do business differently. Second, to help Colorado's water stakeholders discuss alternatives to the status quo; the Interbasin Compact Process should pursue two parallel paths: 1) work on a vision statement and set of goals; and 2) evaluate water supply strategies.

In 2008, the IBCC drafted a vision statement and set of goals and discussed water supply strategies that may help meet our state's consumptive and nonconsumptive water supply needs. They agreed on a draft list of demand side strategies and supply side strategies. The March 2009 IBCC meeting and CWCB Board Workshop focused on evaluating three of these – *conservation*, *agricultural transfers*, and *new water supply development*.

This newsletter provides information on these three water supply strategies. It also includes information on the basin-wide water needs assessments, the Water Supply Reserve Account (WSRA) program, and new CWCB staff involved with the Basin Roundtables.

Confluence with Green River. Photograph by Kent Vertrees

Demands to 2050

Colorado is facing significant growth, with our population potentially doubling over the next 40 years. This population growth will drive municipal and industrial water demand. Because of the uncertainty in projecting economic conditions and employment levels in 2050, CWCB developed low, middle, and high population projections (see figure 2). Each scenario reflects unique assumptions for the economy and for each employment sector.

For example, assumptions in the low scenario in the tourism sector assumes slow growth, the mountain pine beetle decimating most lodge pole pines, and climate change causing increased vulnerability of forests to infestations. The high tourism economic scenario assumes a higher growth rate, some forest survival, and vulnerability of forests to infestations is unchanged. Further detail on the tourism, agricultural, energy, government, and many other economic sectors driving population growth will be available in a M&I 2050 Water Demands Report.

Projections for self supplied industrial uses, such as coal fired power plants, snow making, and oil shale, also include a

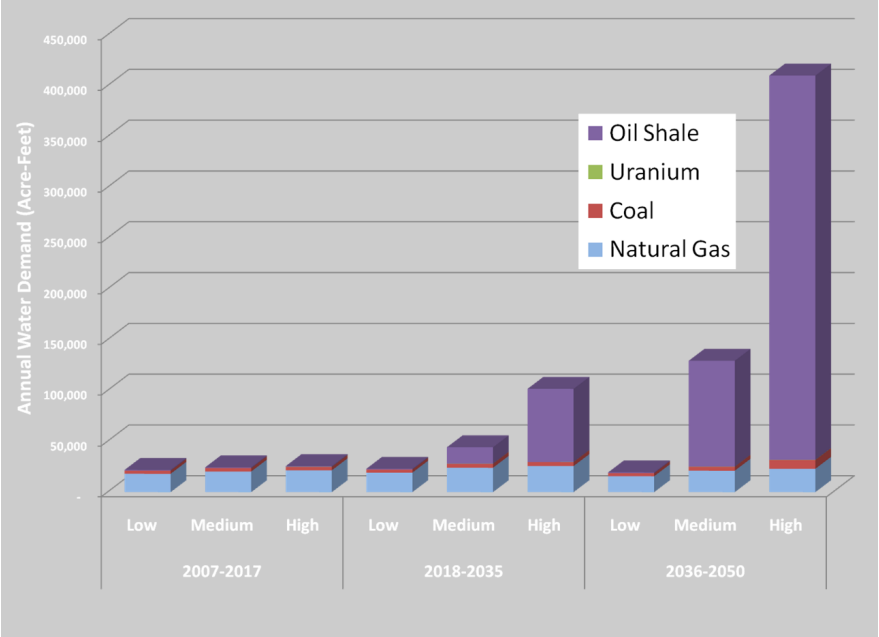


Figure 1. Colorado and Yampa/White Energy Demands Projected to 2050

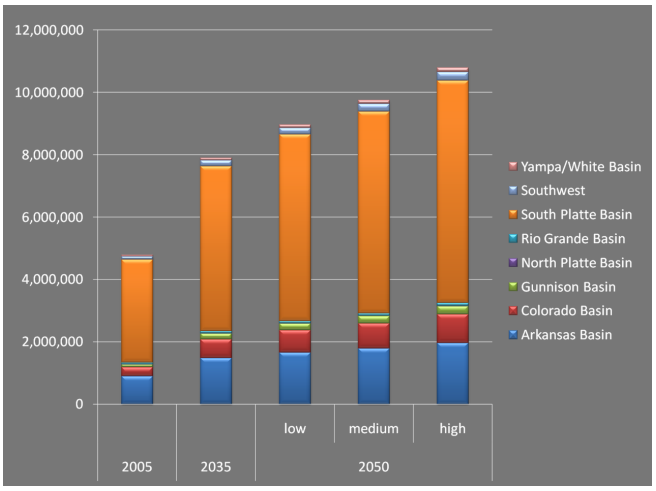


Figure 2. Population projections for Colorado out to 2050

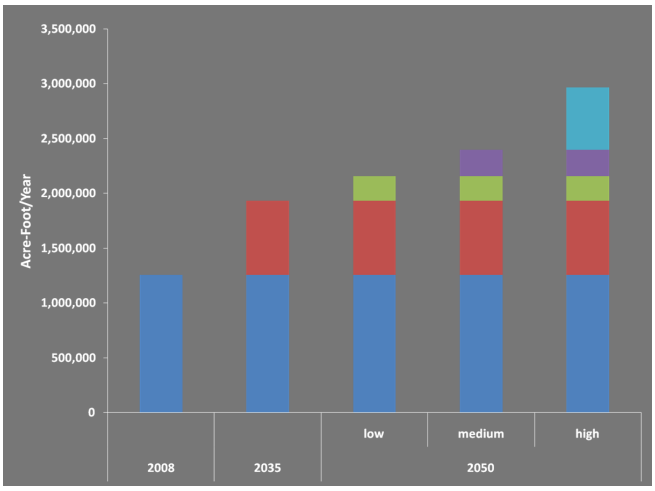


Figure 3. By 2050, Colorado will need up to an additional 1.7 MAF to Meet M&I demands

range. Energy water use, for instance, has the potential to require 25,000 to 400,000 additional acre feet each year depending upon water demands for oil shale (see figure 1). These energy demands have the potential to drive a significant portion of the combined municipal and industrial (M&I) demand projections for the "high" scenario.

Driven by population growth and potential oil shale water demands, Colorado could be facing as much as 1.7 million acre -feet of new M&I demand by 2050 (See figure 3). A portion of this future M&I demand will be meet through identifies projects and processes (IP&Ps) depending upon their successful implementation. CWCB is in the process of developing a database to track the IP&Ps so that the gap can be better monitored. The remaining "gap" will need to be met through broader "water supply strategies" (see figure 4).

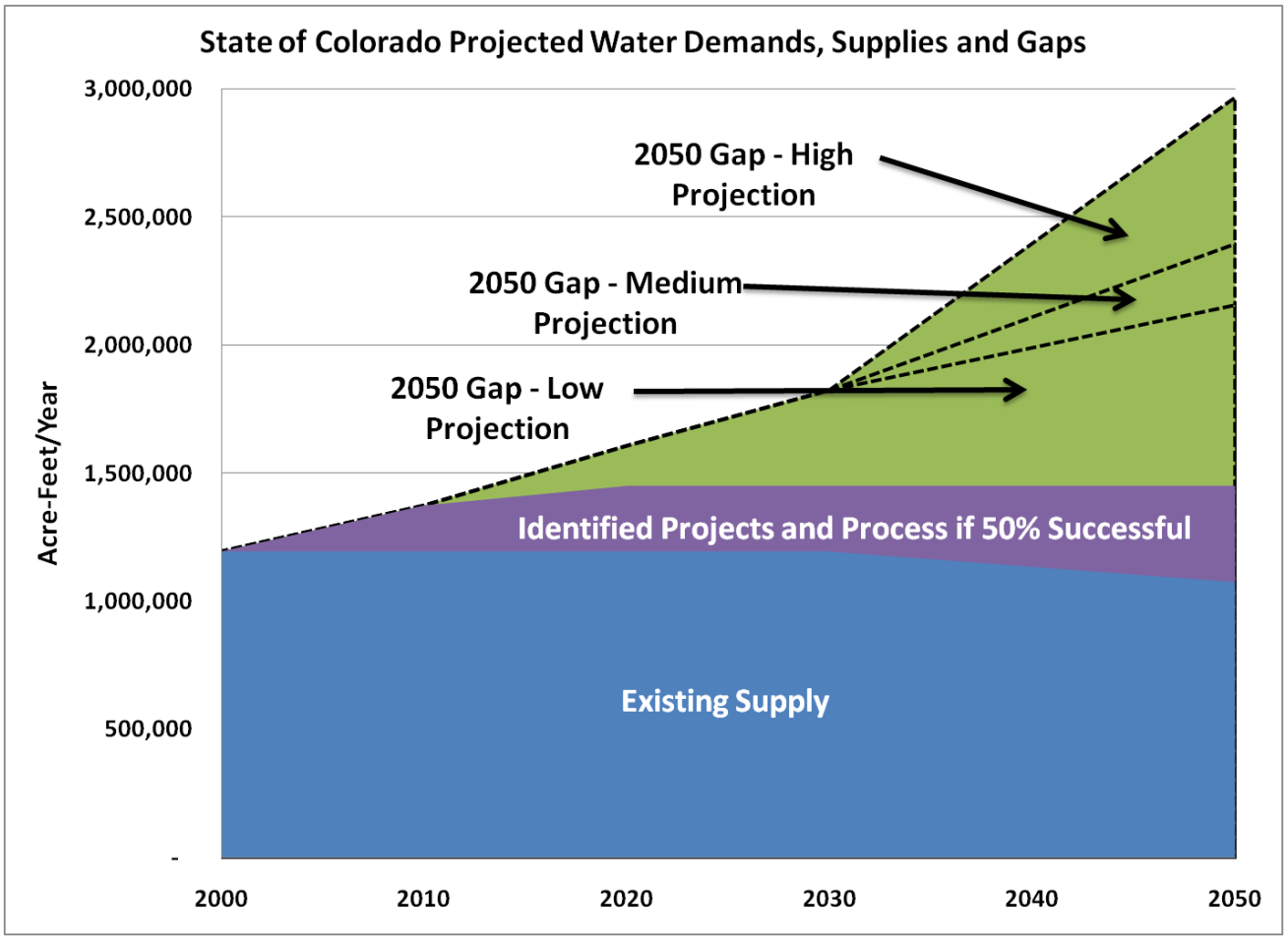


Figure 4. State of Colorado Projected Water Demands, Supplies, and Gaps

Water Supply Strategies

The strategies to meet the 2050 M&I gap will need to rely on a combination or "portfolio" of solutions. Colorado will not be able to rely on a single strategy or project to meet our future needs; rather, we will need a mix of 1) conservation, 2) reallocation, and 3) new water supply development.

Conservation is a critical component for meeting Colorado's future water needs, but it is not a panacea. Conservation is explicitly identified as a water supply strategy for meeting the gap, so that it can be compared with other strategies. Water savings by basin were calculated if municipalities enacted savings of 20%, 30%, and 40%. Conservation practice tables (see figure 5 and 6) were created for each basin, identifying how much water each practice could yield by basin. Future technical work will help determine how conserved water can be used to meet future demands, how conserved water can be shared to help meet the "gap," and confirm the cost of conservation measures. Initial estimates indicate that conservation practices are significantly less expensive than other strategies.

Four new water supply development projects were assessed. A Flaming Gorge concept, Yampa concept, and Colorado River Return "Big Straw" concept were assessed at 100,000 acre-feet and 250,000 acre-feet. A Green Mountain Pump back concept was also examined as an example of a smaller project. Future work will take into account water court and permitting fees associated with these projects. In addition, the IBCC requested an examination of additional smaller projects.

Four options examining both lower South Platte and Arkansas pump backs were

Colorado Basin Example

Conservation Measure	Preliminary Projected Savings at 2050
Turf Replacement	12,900 AFY to 25,900 AFY
Leak Detection Programs	5,800 AFY to 9,700 AFY
Toilet Rebates	6,000 AFY
Conservation Orientated Water Rates	2,500 AFY
Washer Rebates	1,900 AFY to 4,500 AFY
Cooling Towers	190 AFY to 1,500 AFY
Rebates for Landscape Retrofits other than Turf Replacement	400 AFY to 1,200 AFY
Residential Landscape Audits	400 AFY to 1,300 AFY
Residential Indoor Audits	300 AFY to 800 AFY
Submetering in Multi-family Housing	300 AFY to 1,000 AFY
Commercial Landscape Audits	200 AFY to 700 AFY
Commercial Indoor Audits	100 AFY to 500 AFY
Total Project Savings	31,600 AFY to 56,200 AFY

Figure 5. Conservation practice table, CO Basin.

South Platte Basin Example

Conservation Measure	Preliminary Projected Savings at 2050
Turf Replacement	104,300 AFY to 208,600 AFY
Leak Detection Programs	35,200 AFY to 58,600 AFY
Toilet Rebates	53,100 AFY
Conservation Orientated Water Rates	20,400 AFY
Washer Rebates	15,400 AFY to 36,400 AFY
Cooling Towers	1,540 AFY to 12,200 AFY
Rebates for Landscape Retrofits other than Turf Replacement	3,100 AFY to 10,000 AFY
Residential Landscape Audits	3,500 AFY to 10,400 AFY
Residential Indoor Audits	2,100 AFY to 6,300 AFY
Submetering in Multi-family Housing	2,800 AFY to 7,800 AFY
Commercial Landscape Audits	1,300 AFY to 5,000 AFY
Commercial Indoor Audits	700 AFY to 3,300 AFY
Total Project Savings	267,000 AFY to 432,000 AFY

Figure 6. Conservation practice table, South Platte Basin.

Green Mountain Concept

Benefits	Impacts	Mitigation	Potential Opportunities
Reduces loss of irrigated acres in South Platte and Arkansas Basins	Potential for increased compact call	Wolcott Reservoir for future west slope demands	Delivery to North Fork of South Platte upstream of Denver Metro area for gravity delivery to Denver Water customers and other water providers
Utilization of Colorado's Colorado River compact entitlement	Additional in-basin storage		
Additional flows in Upper South Platte	Diminished flows in rivers below proposed diversions with potential increases in TDS and other water quality impacts		Protect or enhance Blue River flows
Could be coordinated with Grand County streamflow management	Phosphorus levels in Dillon Reservoir		Exchanges for additional flows in Colorado headwaters
Potentially additional Grand Valley water supplies	Green Mountain Reservoir levels		Multi-purpose storage for endangered species and other Colorado Basin needs
Maintain Dillon Reservoir Levels	Green Mountain Reservoir/Wolcott Reservoir Swap		
Additional water supplies for the upper Blue River			Ability to exchange water for Summit County Municipal and Industrial purposes
Blue River flow enhancement			Recreation component for Wolcott Reservoir
Additional west slope supplies			
Potential abandonment of some Eagle River rights			

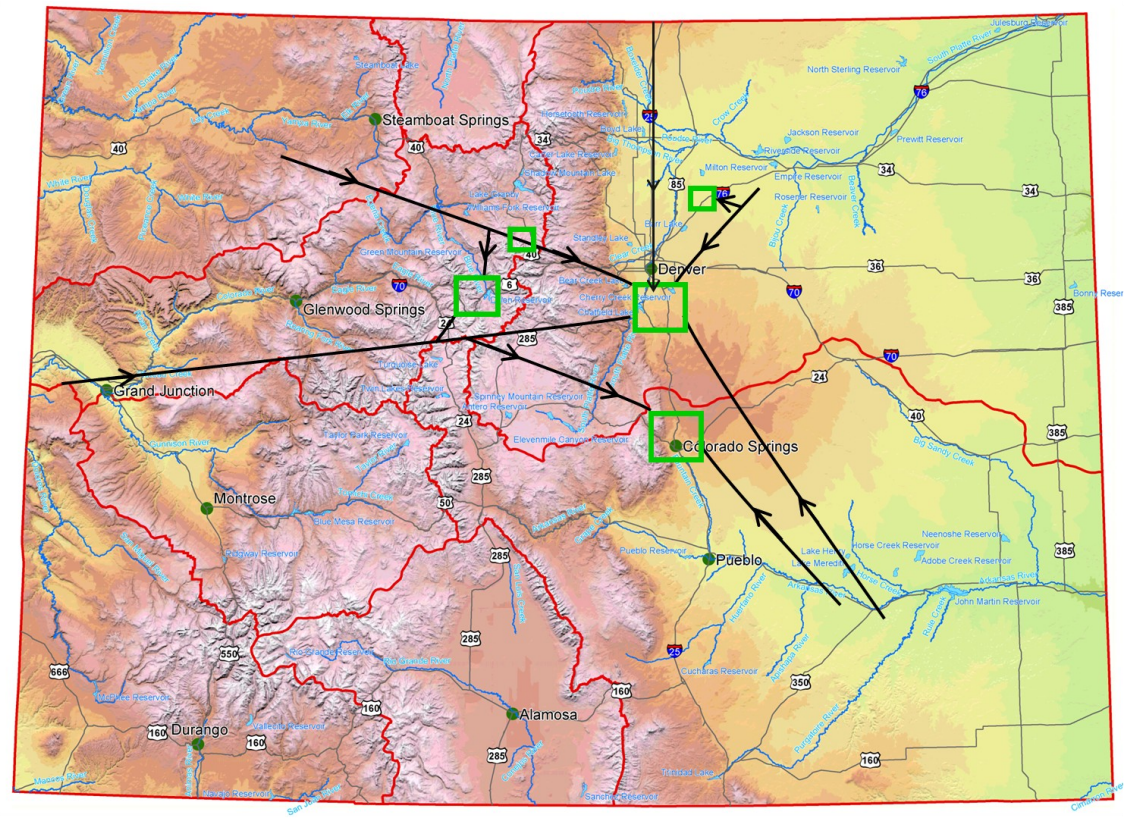
Figure 7. Draft Green Mountain Concept benefits, impacts, mitigation, and potential opportunities table.

Green Mountain Reservoir

analyzed at the 100,000 and 250,000 acre-foot levels. Future work will look at the feasibility of purchasing agricultural water rights in the middle and lower reaches of the Arkansas and South Platte Rivers and pumping the water to the Denver Metro area for M&I use. The team will examine the costs to deliver potable water to the place of use including: purchase of water rights, change of water rights in water court, development of storage (reservoir or aquifer recharge), water treatment (advanced and/or conventional), pump/ pipeline/right of way expenses and permits (county, state or federal). The feasibility of pumping water associated with alternative methods such as rotational fallowing programs, use of lower water demanding crops or deficit irrigation (applying some amount less than full or historical consumptive use over the growing season programs) will also be looked at for a source of water supply for these strategies.

The IBCC and CWCB members were asked to help further develop these strategies by providing feedback on their benefits, impacts, mitigation, and potential opportunities. A table outlining the benefits and impacts of the Green Mountain Pump back concept is shown as an example (see figure 7). The members were asked to develop similar tables for each strategy, and use the tables to solicit feedback from their roundtables and other constituent groups.

In general IBCC and CWCB board members indicated that the conservation, agricultural transfer, and new supply development strategies, while not perfect, were a significant step forward in helping to identify potential solutions. Additional refinement in costs, development of the benefits and impacts tables, the addition of several smaller projects, and compiling "portfolios" of solutions will constitute the next phase of the strategies development.



Representation of agricultural transfer and new supply development strategies being analyzed, and the "gap" areas they could meet.

WSRA Project Highlight
Fountain Creek Vision Task Force

APPLICANTS:	Pueblo and El Paso Counties
BASINS:	Arkansas
TOTAL WSRA FUNDS:	$75,000 (Basin Account)
MATCHING FUNDS:	$58,074

DESCRIPTION:

The Fountain Creek Vision Task Force's completed strategic plan recommended an entity with the authority to implement that plan. Commissioners in El Paso and Pueblo counties, all the cities and towns in the watershed, and the Lower Arkansas Valley Water Conservancy District entered into an intergovernmental agreement that paved the way for the creation of the Fountain Creek Watershed Flood Control and Greenway District. Senate Bill 09-141 is awaiting the Governor's signature establishing the district which, if it receives support from the voters of El Paso and Pueblo counties, has the authority to raise taxes to support its efforts. This will lead to restoration of Fountain Creek, an integral part of the Pueblo County 1041 permit recently approved for the Southern Delivery System. The Task Force consisted of over 200 members from various entities and communities in the watershed that represent a wide range of interests. The Governing Board of the new District has adopted the detailed "Strategic Plan for Fountain Creek Watershed" which identifies current conditions and needs along with methods and projects for addressing those needs for funding and long-term management of the watershed, water quality, flooding and storm water management, municipal water supplies and return flows, land use planning and development, recreation, wetlands, agriculture, and outreach.

Fountain Creek

Recently Approved Water Supply Reserve Account Applications
November 2008—March 2009

Name of Water Activity	Basin Account	Statewide Account	Total Request
Arkansas Basin Total Grants March 07- March 09	**$783,781**	**$2,918,287**	**$3,702,068**
Colorado Basin Total Grants March 07 - March 09	**$850,171**	**$2,227,900**	**$3,078,071**
Colorado Basin Grants Nov. 08 - March 09			
Feasibility and design assessment of off-channel reservoir sites in the Crystal River water shed	$40,000		$40,000
Battlement Reservoir #3 Dam reconstruction to enhance recreational & environmental opportunities	$80,000		$80,000
CO Basin Nonconsumptive Needs Quantification	$315,171		$315,171
Southwest Basin Total Grants March 07- March 09	**$757,000**	**$2,240,000**	**$2,997,000**
Southwest Basin Grants Nov. 08 - March 09			
Water System Well, Treatment System & Dist. Upgrades	$50,000		$50,000
Water System Master Planning	$100,000		$100,000
Molas Lake Ditch Rehabilitation and Diversion Structures	$95,000		$95,000
Lower Blanco River Restoration Project	$100,000		$100,000
Ditch Loss, Hydropower, and Monitoring Improvement Program	$100,000		$100,000
Gunnison Basin Total Grants March 07- March 09	**741,025**	**961,660**	**$1,702,685**
Gunnison Basin Grants Nov. 08 - March 09			
Lake San Cristobal Outlet Structure Modification--Phase III		$120,960	$120,960
Ridgway Ditch and Lake Otonawanda Improvement Project	$109,500		$109,500
Juniata Reservoir Spillway Modification	$97,000		$97,000
Ag Water Needs Assessment and Water Supply Analysis	$120,560		$120,560
Metro Basin Total Grants March 07- March 09	**$893,136**	**$200,000**	**$1,093,136**
Metro Basin Grants Nov. 08 - March 09			
Lost Creek Aquifer Recharge and Storage Study	$80,000		$80,000
North Platte Basin Total Grants March 07- March 09	**$849,715**	**$311,027**	**$1,160,742**
North Platte Basin Grants Nov. 08 - March 09			
Monitoring the effects of weather conditions on the evapotranspiration in N.P. river basin	$50,409	$50,409	$100,818
Rio Grande Basin Total Grants March 07- March 09	**$669,950**	**$2,617,400**	**$3,287,350**
Rio Grande Basin Grants Nov. 08 - March 09			
Rio Grande Reservoir Multi-Use Rehabilitation: Refinement & Enhancement of Res. Reoperation & Optimization Model	$100,000		$100,000
South Platte Basin Total Grants March 07- March 09	**793,111**	**1,260,269**	**$2,053,380**
South Platte Basin Grants Nov. 08 - March 09			
Lost Creek Aquifer Recharge and Storage Study	$80,000		$80,000
Central South Platte Wetland Partnership	$150,000		$150,000
Yampa Basin Total Grants March 07- March 09	**454,572**	**248,835**	**$703,407**
Yampa Basin Grants Nov. 08 - March 09			
Sandwash basin coal bed methane production depletive effects on water resources	$20,000	$98,835	$118,835

Intrastate Water Management & Development Staff

Meet the fully staffed IWMD section of the Colorado Water Conservation Board. The section works to help provide an adequate water supply for Colorado's citizens and the environment.

Eric Hecox is the Section Chief and he is responsible for coordinating and directing the work of the section.

Todd Doherty is a program manager and is responsible for technical assistance and program management related to Colorado's future water supply needs, and in particular agricultural, municipal and industrial needs as well as the water supply reserve account management. The basin roundtables that Todd supports are the Arkansas, Gunnison, and South Platte.

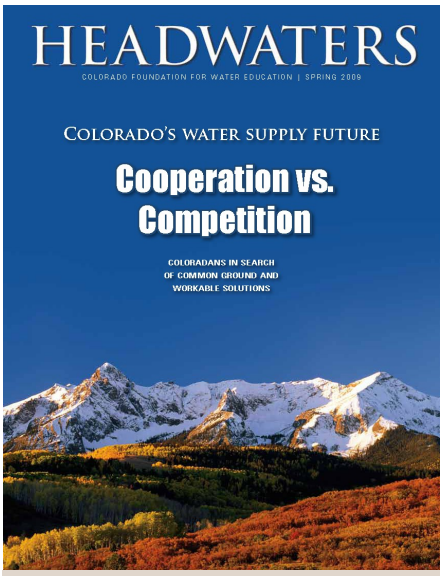
Jacob Bornstein is also a program manager and is specifically responsible for technical and project management for Nonconsumptive, energy, and land use related water supply needs. The basin roundtables that Jacob supports are the Colorado, Metro, and Yampa/White.

Greg Johnson is a water resource specialist and his responsibilities include managing projects funded through the water supply reserve account and assistance on tracking projects and methods for meeting Colorado's future municipal and industrial water needs. The basin roundtables that Greg supports are the North Platte, Rio Grande, and Southwest.

Dori Vigil is a program assistant for the water supply reserve account.

Viola Bralish is the administrative assistant to the IWMD section and handles the logistics and activities of the Basin Roundtables and IBCC.

IWMD Staff L-R back row Greg Johnson, Viola Bralish, Jacob Bornstein. L-R front Dori Vigil, Eric Hecox, & Todd Doherty. Photo by Kevin Moloney



Available Now
Colorado Foundation for Water Education **Headwaters Magazine** issue on the Interbasin Compact and Roundtable Process.

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