Colorado's Water Supply Future

Colorado Roundtable Meeting
Glenwood Springs, Colorado

January 26, 2009

Projects and Methods to Meet Identified Water Supply Needs

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Basin-Wide Water Needs Assessments

- Identify Consumptive Water Needs (M&I and Agricultural)
- Identify Nonconsumptive Water Needs (Environmental and Recreational)
- Identify Available Water Supplies
- Identify Projects and Methods to Meet Consumptive and Nonconsumptive Water Needs

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Path Forward – 2009

- Consumptive Needs Assessment done in Draft
- Nonconsumptive Priority Areas Identified

Focus of 2009:
Projects and Methods to Meet Identified Needs (M&I and Nonconsumptive)

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Status of Basin Roundtable Needs Assessments

Basin	Consumptive Needs Assessment	Nonconsumptive Needs Assessment	Water Supply Availability Assessment
Colorado	• Used SWSI 1 as baseline needs assessment • Demands to 2050 • Energy Study • 10,825 Study	• Developed preliminary priority mapping • Pilot of Roaring Fork for watershed flow evaluation data • Pilot of Roaring Fork site-specific quantification	• Colorado River Supply Availability Study

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Visions and Strategies for Colorado's Water Supply Future: M&I Water Demands to 2050

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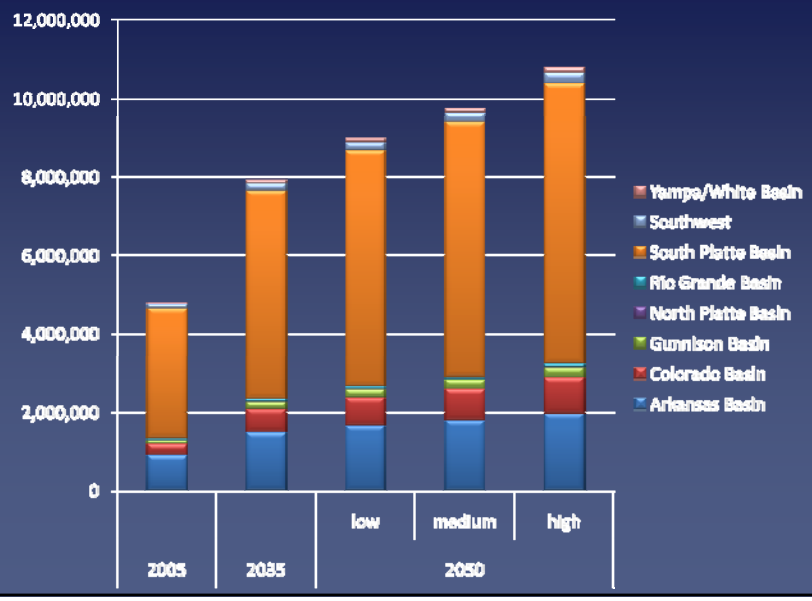
Population Projections



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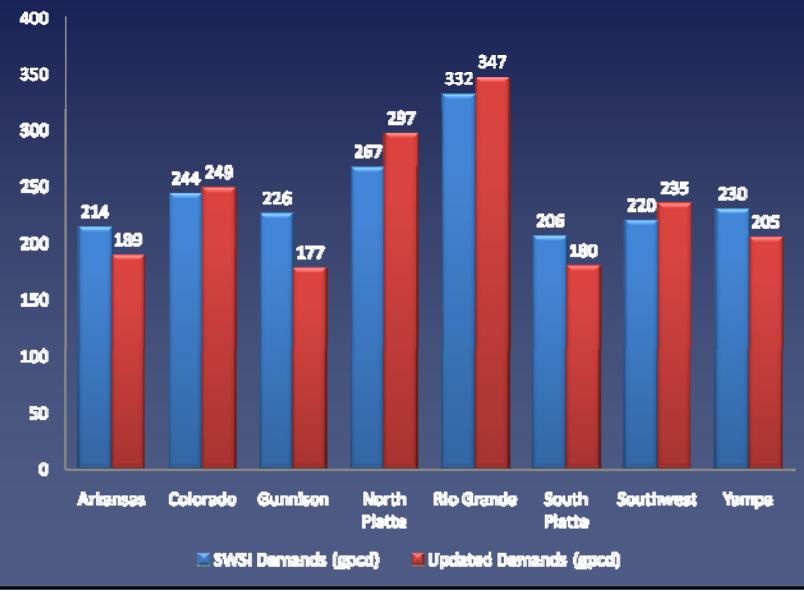
M&I Water Usage Rates by Basin



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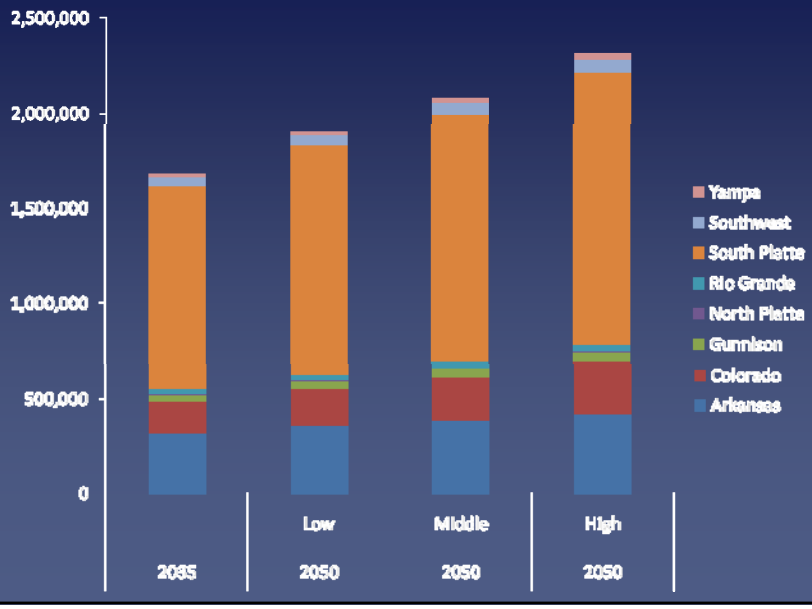
Municipal Water Demands by Basin



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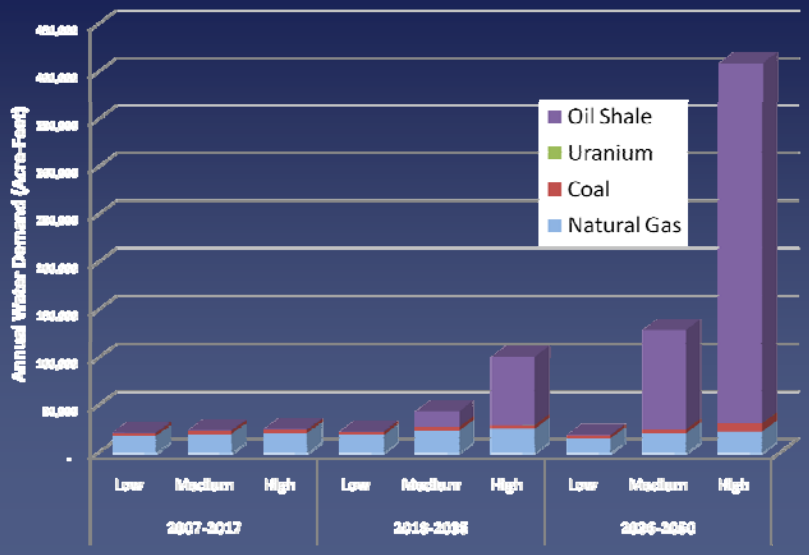
Colorado and Yampa/White Energy Demands



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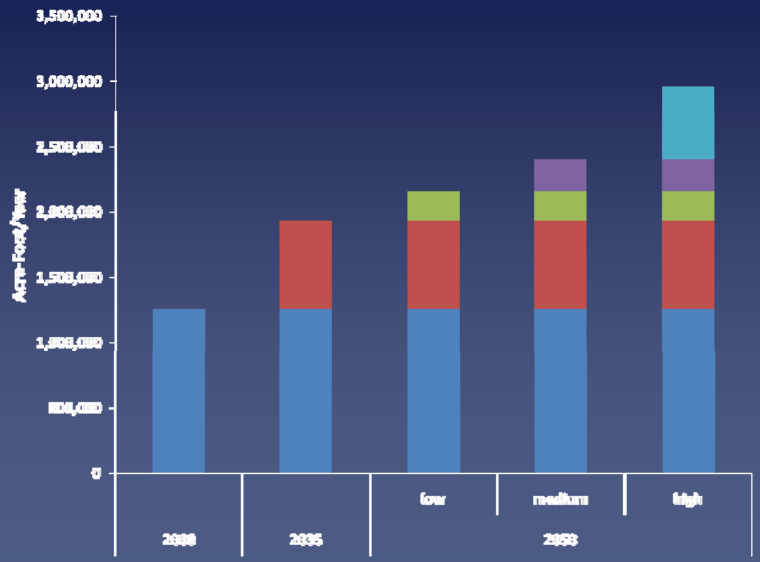
By 2050, Colorado will need up to 1.7 MAF to Meet M&I Demands*



*This does not take into account demand reductions from conservation for future demands

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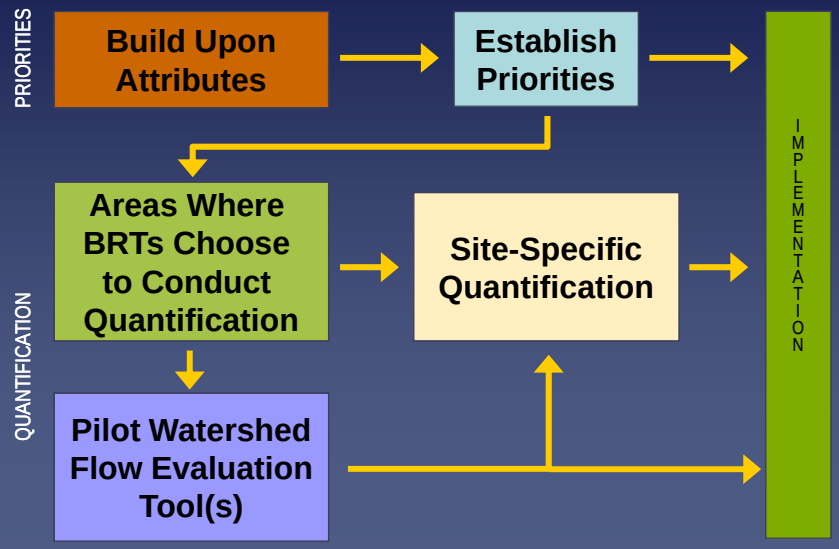
Nonconsumptive Needs Assessment Methodology



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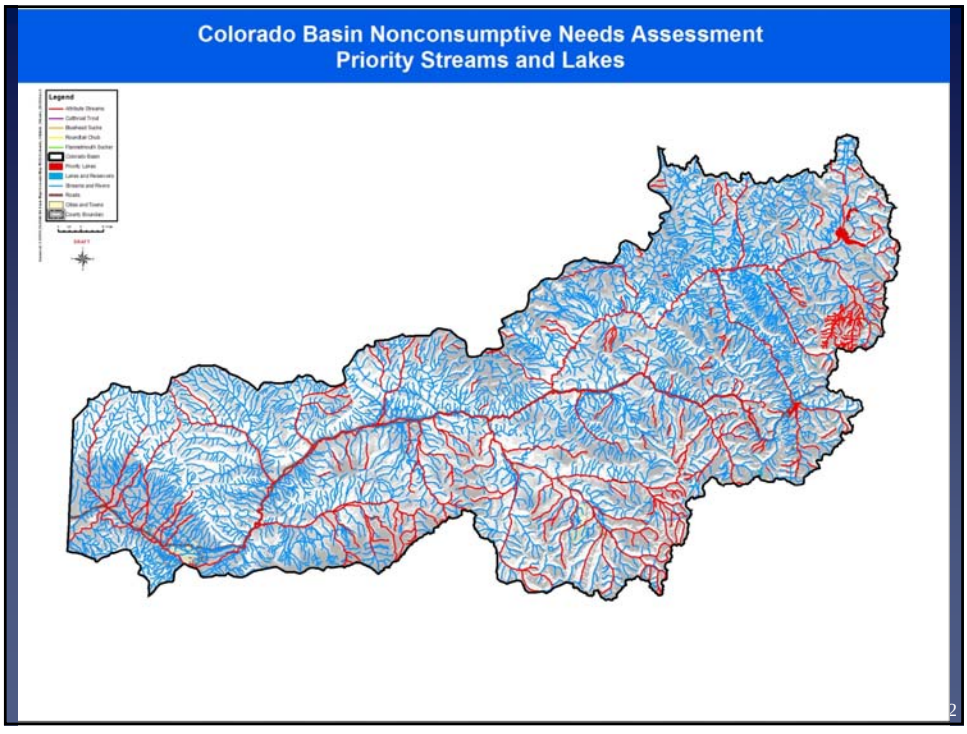

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Roundtable Action Items

- Implement quantification efforts
- Identify projects and methods for priority areas

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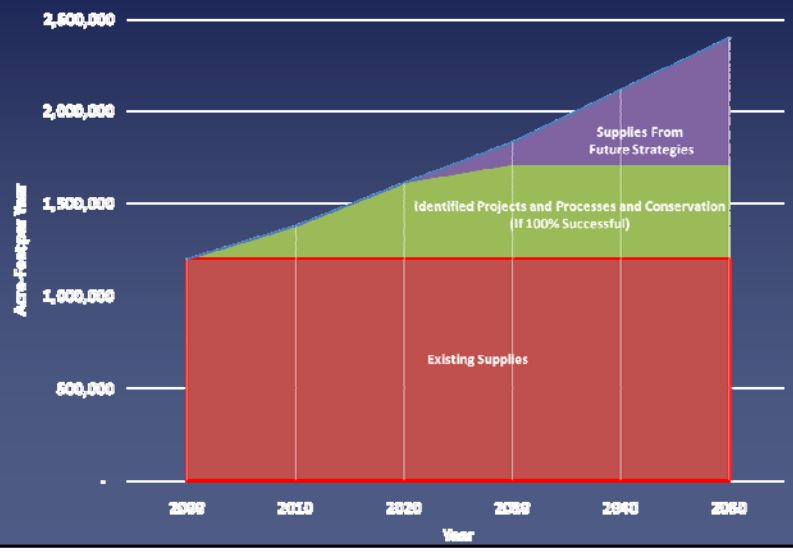
State of Colorado Projected Water Demands, Supplies, and Gaps



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Colorado IPPs

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Major Identified Projects and Processes in Colorado Basin Counties

County	Estimated Demand Met by Identified Projects and Processes and Additional Conservation (AFY)	Identified Projects and Processes
Eagle	12,500	• Existing supplies • Agricultural transfers • Ruedi Reservoir contracts for augmentation of surface or alluvial groundwater diversions • Eagle River process
Garfield	11,700	• Existing supplies • Agricultural transfers • Ruedi and Wolford Reservoir contracts for augmentation of surface or alluvial groundwater diversions
Grand	3,200	• Existing supplies • Upper Colorado River Process (UPCO) to identify needs and potential solutions

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Major Identified Projects and Processes in Colorado Basin Counties (cont.)

County	Estimated Demand Met by Identified Projects and Processes and Additional Conservation (AFY)	Identified Projects and Processes
Mesa	14,800	Existing supplies Agricultural transfers Ruedi and Wolford Reservoir contracts Jerry Creek Reservoir
Pitkin	8,500	Existing supplies Ruedi Reservoir contracts for augmentation of surface or alluvial groundwater diversions
Summit	8,200	Existing supplies UPCO to identify needs and potential solutions
TOTAL	58,900	

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Detailed Identified Projects and Processes for Colorado Basin

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Eagle	Eagle River Water and Sanitation	0	U	Provider for Vail, Eagle-Vail, Beaver Creek, Edwards, and Avon.	John Currier
	Gypsum	0	N	Have Storage contracts (Eagle Park, Green Mountain and Wolford Mountain) plus historic consumptive use credits. Working on developing 500 AF of storage above water treatment plant.	Tom Zancanella, consultant to Gypsum
	Mid Valley Metropolitan District	0	U	Serves unincorporated area between Basalt and Carbondale. New developments must bring water – usually Ruedi contracts or agricultural dry-up.	John Currier
	Unincorporated areas in Eagle County not served by a Water District	0	U	Should be able to purchase Ruedi contracts.	John Currier
	Minturn	0	U	New development is required to bring water. This is usually agricultural water that is irrigating the land to be developed.	John Currier

* Y = Yes; N = No; U = Unknown

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Garfield	Basalt Water Conservancy District	0	U	Provides augmentation water for unincorporated areas, usually via Ruedi and Green Mountain Contracts.	John Currier
	Battlement Mesa	0	Y	Have adequate water rights for buildout – senior water rights and Ruedi contracts	John Currier
	Carbondale	0	U	Have alluvial Roaring Fork alluvial wells requiring augmentation. Can use existing, unused Ruedi Contracts for future augmentation.	John Currier
	Glenwood Springs	0	U	Existing water rights and unused Ruedi Contracts, if needed.	John Currier
	New Castle	0	U	Recently constructed an intake from the Colorado River. New developments must bring water – usually Ruedi contracts or agricultural dry-up.	John Currier

* Y = Yes; N = No; U = Unknown

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Garfield (cont.)	Other Garfield County and unincorporated areas	300	N	Some areas will purchase water from Basalt and West Divide Water Conservancy Districts, to the extent available. Other areas will need to dry-up agriculture and develop storage.	John Currier
	Parachute	0	U	Should be able to use Ruedi contracts.	John Currier
	Rifle	0	U	Have Ruedi contracts.	Michael Erion, Resource Consultants
	Silt	0	U	Developers are required to bring water for new development. Any remaining gap should be able to be satisfied by Ruedi contracts.	John Currier

* Y = Yes; N = No; U = Unknown

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Grand	Columbine Lake Water District	0	U	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Fraser	159	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Granby	5	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Grand County Water and Sanitation	497	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Grand (cont.)	Grand Lake	0	U	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Hot Sulphur Springs	41	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Kremmling	18	Y	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	CDM survey response
	Unincorporated areas in Grand County not served by a water district	200	N	Assumed at 5 percent of increased demand.	

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Grand (cont.)	Silver Creek (Sol Vista)	18	Y	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	CDM survey response
	Winter Park Recreation and Winter Park Water and Sanitation	7	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Winter Park West	19	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Mesa	Clifton	0	N	Existing water rights and will continue to acquire Grand Valley Canal shares as needed. Some customers use ditch water for irrigation.	Dale Tooker
	Debeque	0	N	Have existing Ruedi Contracts.	Tom Zancanella, Consultant to Debeque
	Grand Junction	0	N	Service area limited by Ute WCD and nearly built out. Have adequate water rights for buildout	CDM survey response
	Palisade	0	U	Cabin Creek Reservoir. Ute WCD will serve most of the Mesa County area.	—
	Ute Water Conservancy District	0	Y	Existing water rights. Also serves Fruita and most of unincorporated Mesa County. Many customers have ditch water for landscape irrigation.	CDM survey response

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Pitkin	Aspen	0	U	—	—
	Basalt	0	N	Physical supply met by alluvial groundwater. Have existing consumptive use credits and Ruedi contracts.	John Currier
	Snowmass Village	0	U	Have adequate water rights. Would like additional flows for environmental and recreational purposes. Snowmass Creek in stream flow right an issue and may require storage upstream of the instream flow.	John Currier
	Unincorporated Pitkin County	0	U	Can purchase augmentation credits through Basalt WCD. May need small onsite storage to replace depletions to local water rights.	John Currier

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Summit	Breckenridge	0	Y	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Dillon	0	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	CDM survey response
	Silverthorne	0	U	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Frisco	0	U	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Summit (cont.)	Blue River	0	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Copper Mountain	0	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Keystone area	0	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	A Basin	0	U	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study

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Detailed Identified Projects and Processes for Colorado Basin (cont.)

County	Major Provider	Remaining Gross Gap (AF)	Supplies Beyond 2030*	Notes	Source
Summit (cont.)	East Dillon Water District	0	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Snake River Water District	0	N	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Buffalo Mountain /Mesa Cortina	0	U	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study
	Unincorporated areas in Summit County not served by a water district	505	N	Assumed at 5 percent of increased demand.	—
	Eagles Nest	0	U	Existing water rights and UPCO process assumed to provide for future demands. There may be a gap if the UPCO process does not result in new supplies.	UPCO Study

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Potential Future Colorado Basin Water Management Options

Project	Sponsor	Type of Project	Additional Storage (AF)	Additional Yield (AFY)	Project Purpose and Notes
Gulch Reservoir	NCWCD, Denver Water	Additional Storage	Not Available	Not Available	Multi-purpose
Lining	None	Water Conservation	Not Applicable	Not Available	Reduce salinity in return flows.
Return Project	CWCB	Additional storage, pipeline, pumpback	Not Available	250,000 to 750,000	250,000 to 750,000 AFY total project size. Project could provide for multiple needs in several basins.
	None	Additional Storage	200,000	Not Available	Multi-purpose.
Tamarisk Removal	None	Control of non-native phreatophytes	Not Applicable	Not Available	Would benefit junior water rights.
Pumpback	Denver Water	Additional storage, pumpback	Not Available	Not Available	Could benefit Denver Water and Grand and Summit Counties.
West Slope storage in East Slope reservoirs to leave water on West Slope in dry years	None	Additional Storage	Not Available	Not Available	Could ensure additional flows on West Slope.
Dominguez Project	None	Storage	Not Available	Not Available	Project could benefit multiple users.

* Water Supply Reserve Account Grants in place

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Roundtable Action Items

- Review and update IPPs and base options

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Development of
Water Supply Strategies

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Elements of the Visioning Process

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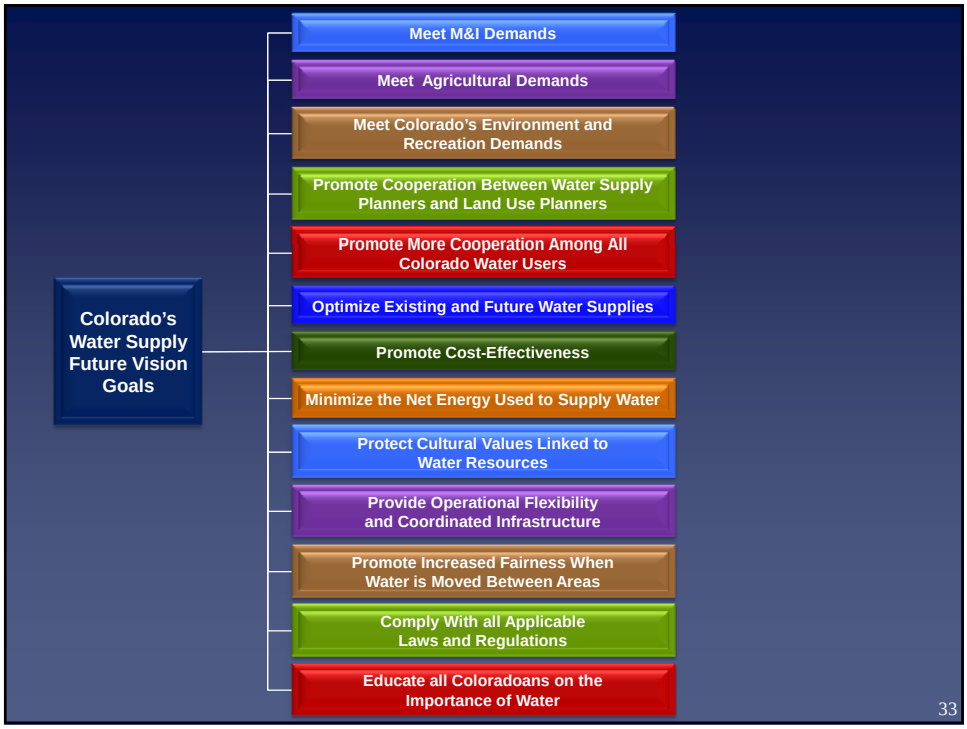
Colorado's Water Supply Future Vision Goals
Meet M&I Demands
Meet Agricultural Demands
Meet Colorado's Environment and Recreation Demands
Promote Cooperation Between Water Supply Planners and Land Use Planners
Promote More Cooperation Among All Colorado Water Users
Optimize Existing and Future Water Supplies
Promote Cost-Effectiveness
Minimize the Net Energy Used to Supply Water
Protect Cultural Values Linked to Water Resources
Provide Operational Flexibility and Coordinated Infrastructure
Promote Increased Fairness When Water is Moved Between Areas
Comply With all Applicable Laws and Regulations
Educate all Coloradoans on the Importance of Water
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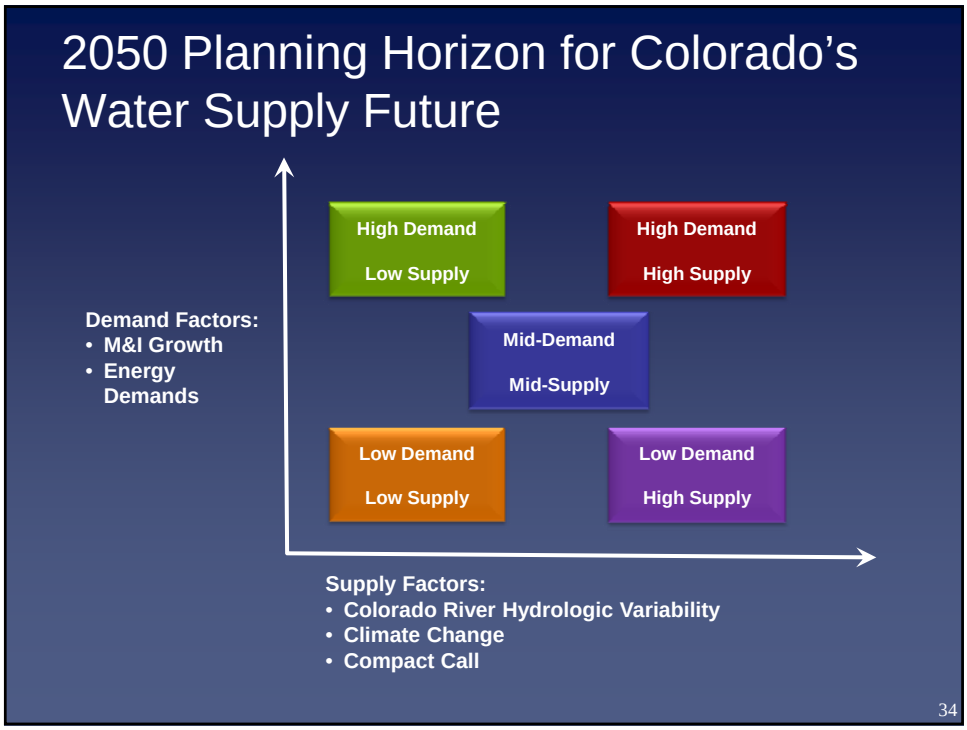
2050 Planning Horizon for Colorado's Water Supply Future
Demand Factors:
• M&I Growth
• Energy Demands
High Demand Low Supply
High Demand High Supply
Mid-Demand Mid-Supply
Low Demand Low Supply
Low Demand High Supply
Supply Factors:
• Colorado River Hydrologic Variability
• Climate Change
• Compact Call
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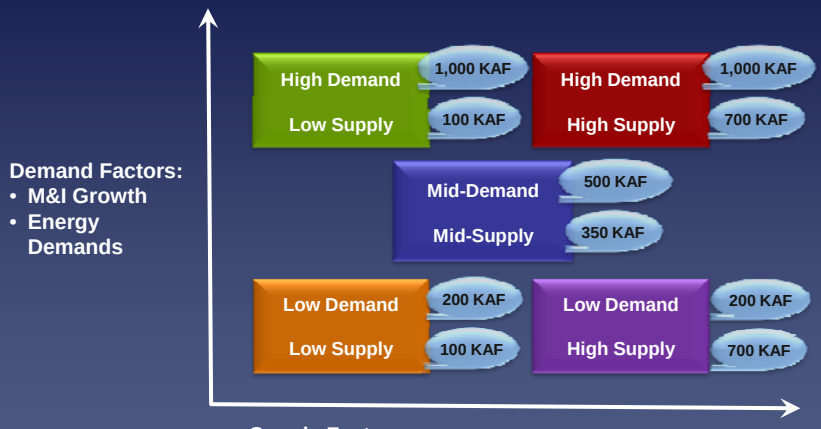
2050 Planning Horizon for Colorado's Water Supply Future



Demand Factors:
- M&I Growth
- Energy Demands

Supply Factors:
- Colorado River Hydrologic Variability
- Climate Change
- Compact Call

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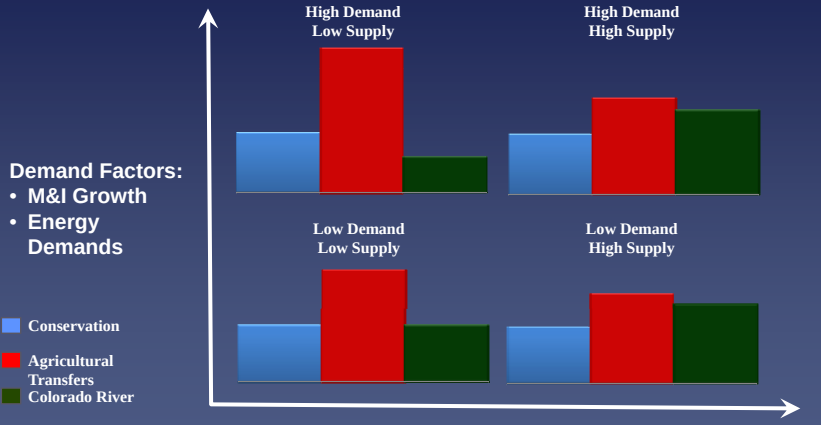
2050 Planning Horizon for Colorado's Water Supply Future



Demand Factors:
- M&I Growth
- Energy Demands

Supply Factors:
- Colorado River Hydrologic Variability
- Climate Change
- Compact Call

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Water Supply Strategies

- Water Conservation
- Agricultural Transfers
  - Conventional and alternative transfers
- Development of New Supplies
  - New Storage
  - Transbasin

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Water Conservation

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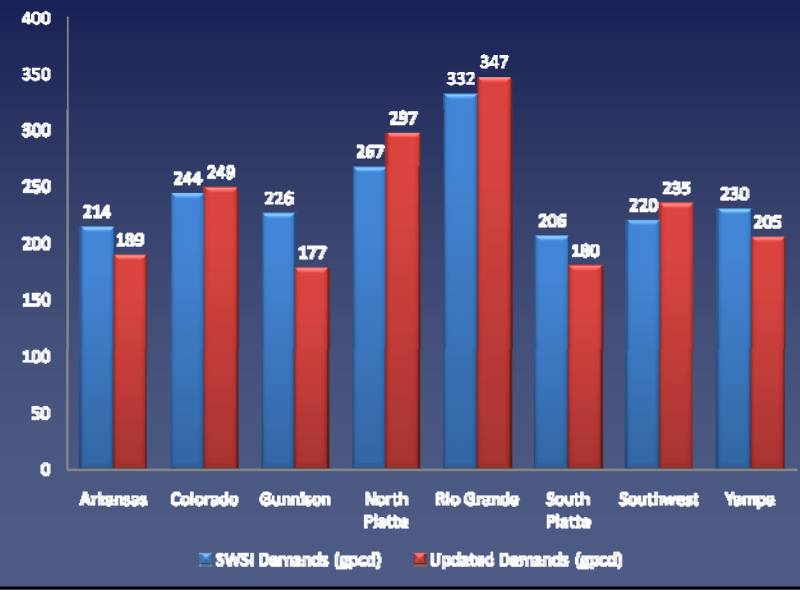
M&I Water Usage Rates by Basin



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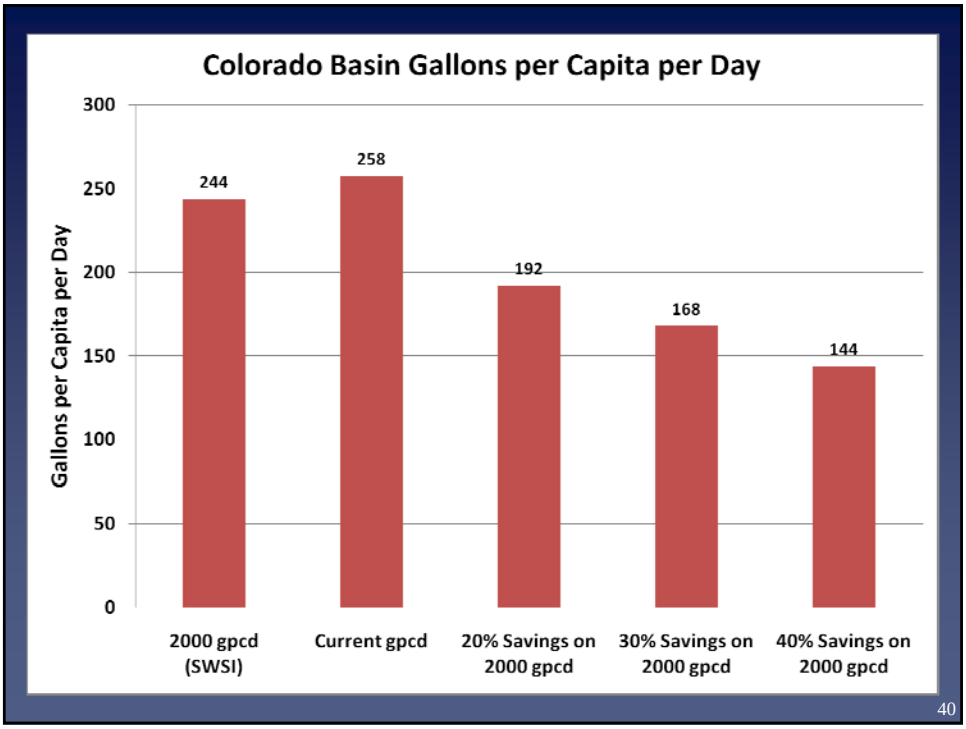

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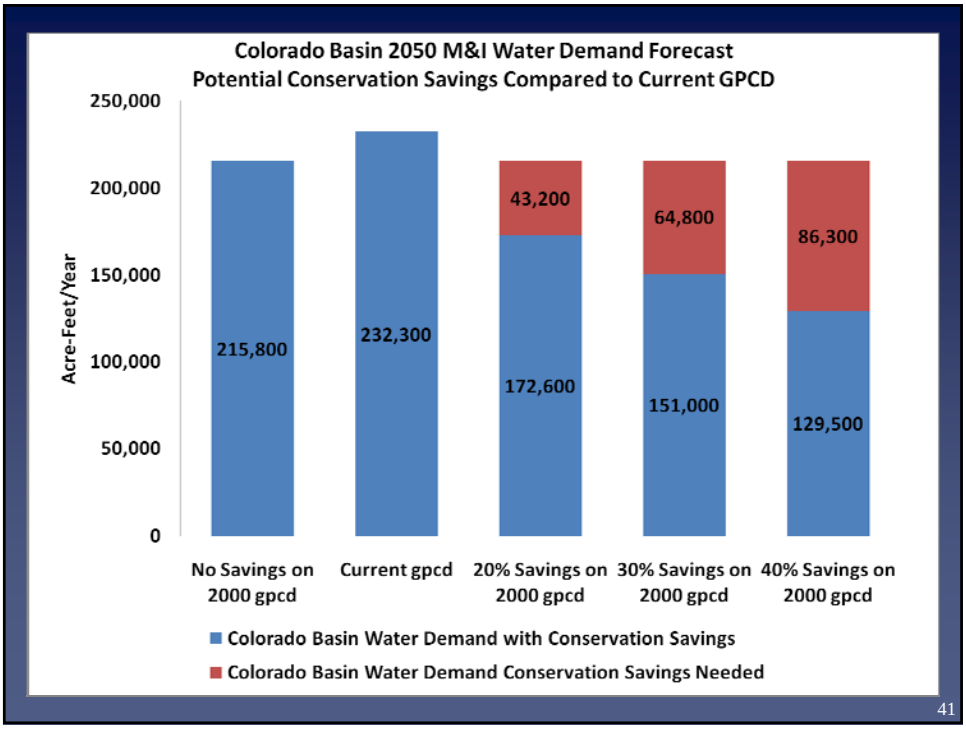

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Ag Transfer Strategy

- Lower South Platte Transfer
- Lower Arkansas Transfer

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Development of New Water Supplies

- Green Mountain Concept <100,000 acre-ft
- Yampa Concept >100,000 acre-ft
- Flaming Gorge Concept >100,000 acre-ft

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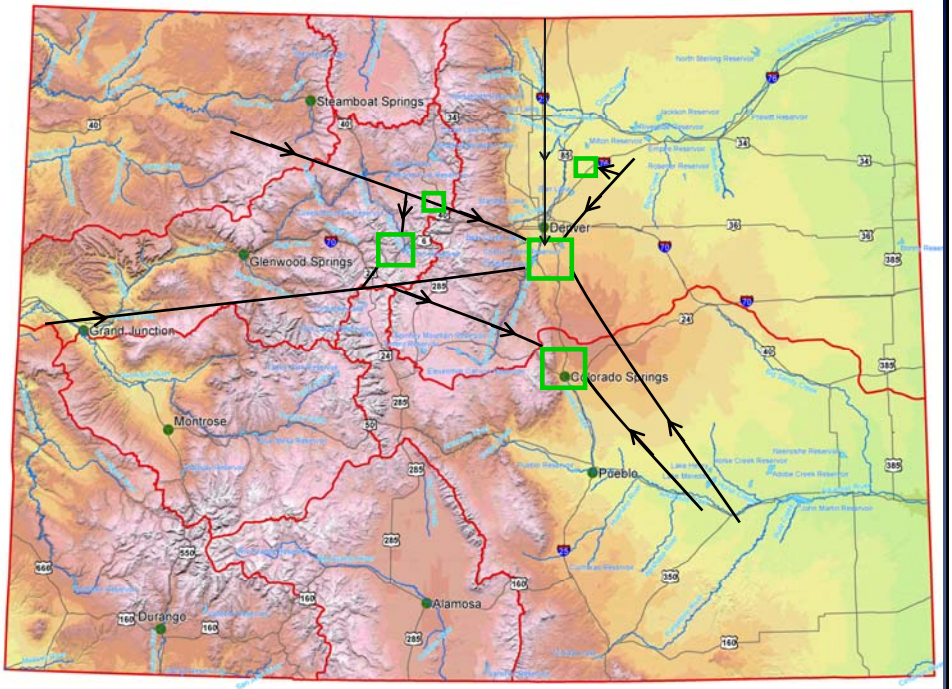

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Risk Management Strategies

- West Slope Water Bank
- Compact Delivery via Blue Mesa
- Conjunctive Use of Denver Basin Aquifer
- Timing/Phased Development

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Proposed Technical Work – 2009

MEETING 1

- Present status of needs assessment (SWSI I, "Other appropriate sources," task orders, WSRA studies)
- Present demands to 2050
- Discuss projects and methods for meeting in-basin needs (SWSI IPPs, SWSI base options, other projects identified since SWSI)
- Review nonconsumptive basin maps final product (attributes and priorities)
- Present approach to evaluating water supply strategies

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Proposed Technical Work – 2009

MEETING 2

- Refine demands to 2050
- Screen projects and methods for meeting identified needs
- Discuss next steps on nonconsumptive priority areas (quantification and/or implementation strategies)
- Discuss progress on evaluation of water supply strategies

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Proposed Technical Work – 2009

MEETING 3

- Discuss progress on nonconsumptive quantification and implementation strategies
- Discuss progress on projects and methods for meeting identified needs and evaluation of water supply strategies
- Discuss integrating needs assessments with Colorado River supply availability preliminary results

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Proposed Technical Work – 2009

MEETING 4

- Present draft results of nonconsumptive quantification and implementation strategies
- Present draft results of projects and methods for meeting identified needs
- Present draft results of evaluation of water supply strategies

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