

Colorado Water Conservation Board

Department of Natural Resources

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South Platte River Drought & Water Supply Assessment Basin Summary

Project Summary

The Colorado Drought & Water Supply Assessment is the first statewide project to determine how prepared Colorado has been for drought and identify measures that will better prepare us for the next drought.

Overview of Basin Summary

This basin summary presents the results of the Drought & Water Supply Assessment Project for the South Platte River Basin (also known as Division 1) for purposes of:

- Supporting local and regional planning efforts
- Presenting the water needs and issues on a regional and local basis

The summary presents selected results of the project based on responses provided by water users within Division 1. A listing of the water users that participated in the survey, by water use type, or segment, is provided in the table to the right. The responses were used to characterize the following key areas of interest with respect to water use and drought impacts within the South Platte River basin:

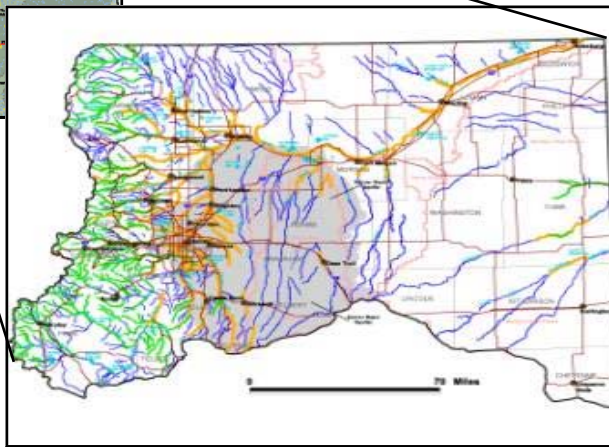
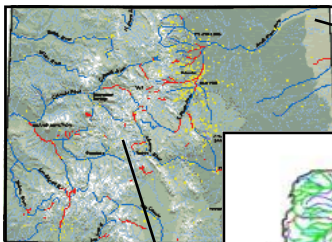
- Current Water Use Limitations
- Current Water Management Planning
- Recent Drought Impacts (1999-2003)
- Future Water Use Planning Issues
- Drought Mitigation Needs

Comparative analysis for many areas of interest are provided in the basin summary to allow for a comparison of the results from Division 1 to the rest of the State.

Basin Overview

The South Platte River drains the north central and north eastern portion of the state, stretching from the continental divide northeast to the Nebraska state line. The South Platte River passes through the most populous portion of the state, the Denver metro area, comprised of nearly 3 million of the state's 4 plus million residents.

The South Platte below Denver transects one of the state's largest agricultural communities. The juxtaposition of the state's greatest population center next to one of the state's largest agricultural business engines creates unique conflicts and challenges. As the population of the area increases, so to will the conflicts.



Basin Statistics and Information

Population

2000	2.97 million
2030 (projected)	4.91 million

Number of Reservoirs and Dams

879

Colorado Legislative Districts

House 1-13, 22-45, 48-53, 60, 63, 65
 Senate 1, 2, 4, 12, 13, 15-35

Survey Participants (Total = 154)

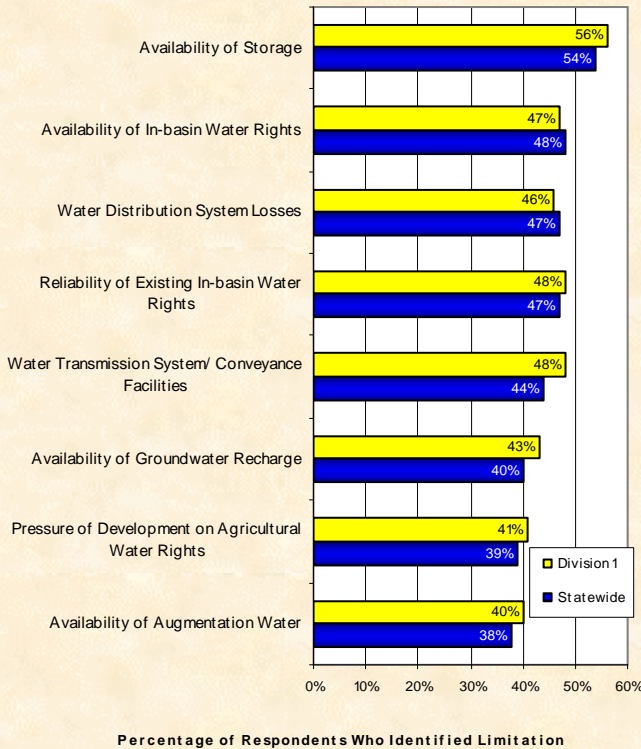
Municipal	97
Agricultural	43
Federal	2
State	3
Water Conservancy District	2
Industry	2
Other	5

Additional Projected In Basin Municipal/Industrial Water Supply at 2030 (based on SWSI)

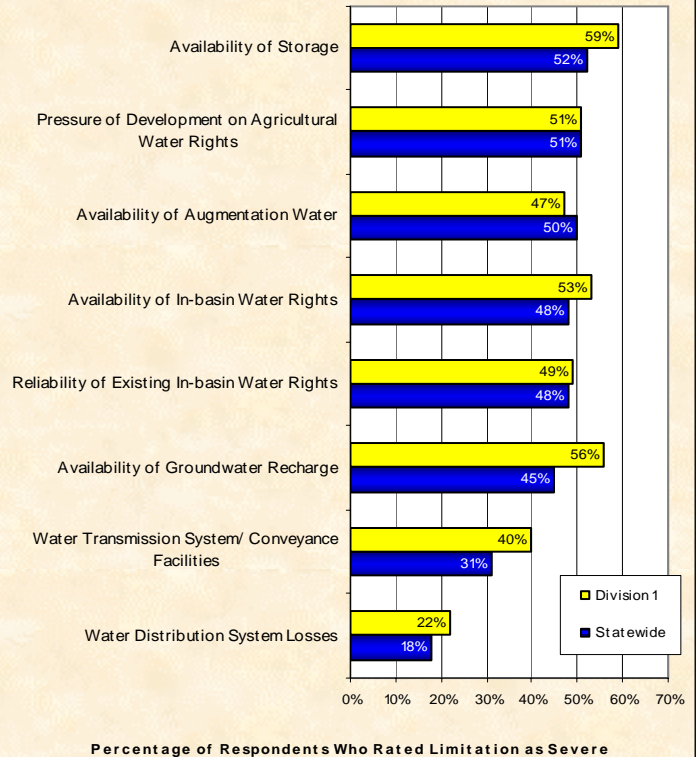
409,500 acre-feet

Current Water Use Limitations

Water Supply Limitations
Division 1 Compared to Statewide Responses



Severity of Limitation
Division 1 Compared to Statewide Responses



The two graphs presented above in combination indicate what are believed by Division 1 water users to be current water use limitation within the basin, and the relative severity of the limitation. For example, more than half (56%) of Division 1 water users believe that the current availability of storage limits current water use. Of these water users, nearly 3 out of every 5 view this limitation as severe. In both cases, these responses are similar, if not slightly higher than indicated by the balance of the state. A more significant difference was seen with respect to groundwater recharge, which was believed to be a more severe limitation within Division 1 (56%) as compared to the rest of the state (45%). The results from the statewide survey are provided for comparative purposes in both graphics.

Current Water Management Planning

Water Supply Master Plans:

- 47% of Division 1 water users have a water supply master plan vs. 43% of the water users statewide.

Drought Management Plans:

- 48% of Division 1 water users have drought management plans vs. 40% of the water users statewide, which may be indicative of the significant number of large water utilities and municipalities in this basin.
- Division 1 water users utilize different drought management tools than water users in the rest of the state, which may be attributed to the higher percentage of municipalities contained in this basin compared to other divisions.

(Continued on page 3)

Key Water Planning Definitions

Water Supply Master Plan: A comprehensive plan in which a water management entity or planner will address technical and political issues related to providing sufficient quantity and quality of water for identified or projected demands.

Drought Management Plan: A plan in which a water management entity or entities or planner identified the measures and responses needed to prepare for, monitor, and mitigate the effects of drought

Water Conservation Plan: A plan that outlines how a water management entity or planner will improve water use efficiency over the long-term and how the efforts fit within their overall water supply and demand management efforts.

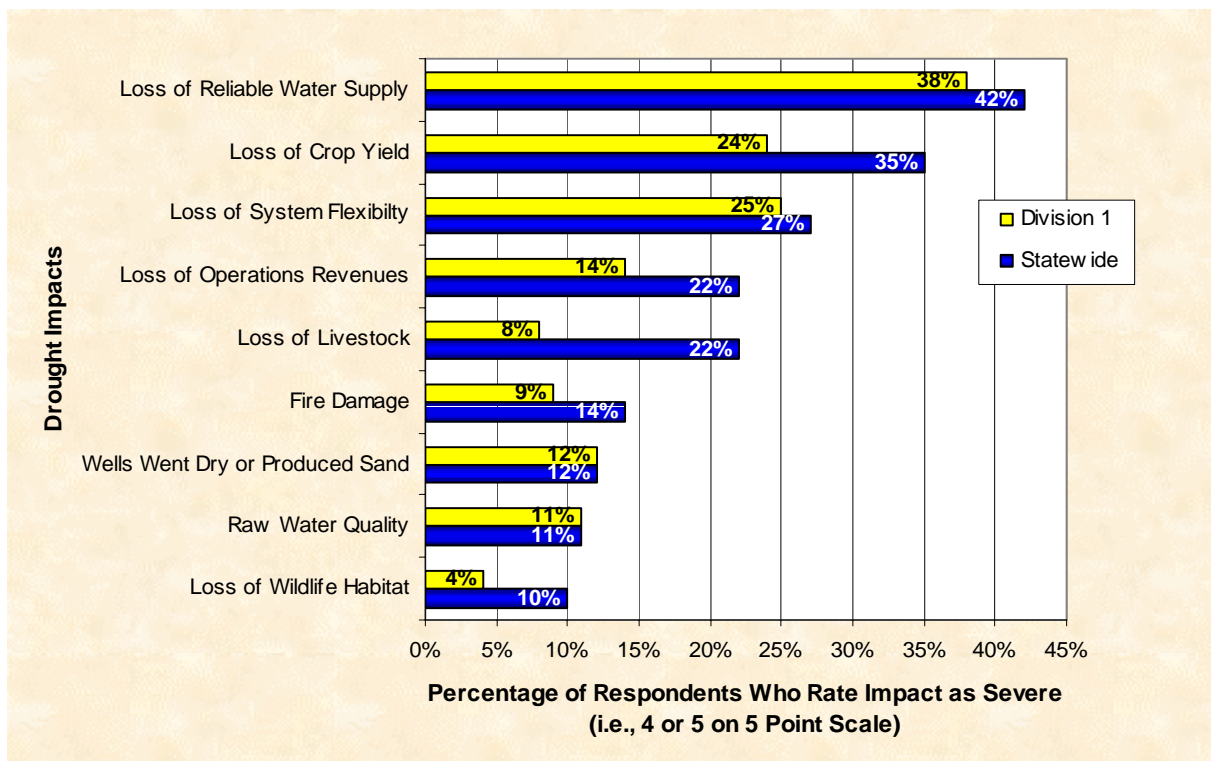
Current Water Management Planning (continued)

- A comparison of the most significant differences between drought management tools used by Division 1 water users vs. statewide follows:
 - More have emergency water supply agreements (33% vs. 26%)
 - More have fines for excess water use (46% vs. 35%)
 - More have lawn and garden outdoor watering restrictions (56% vs. 45%)
 - More have substitute water supply plans (41% vs. 30%)
 - More use operation/cooperative agreements (55% vs. 47%)
 - More have landscaping controls (38% vs. 28%)

Water Conservation Plans

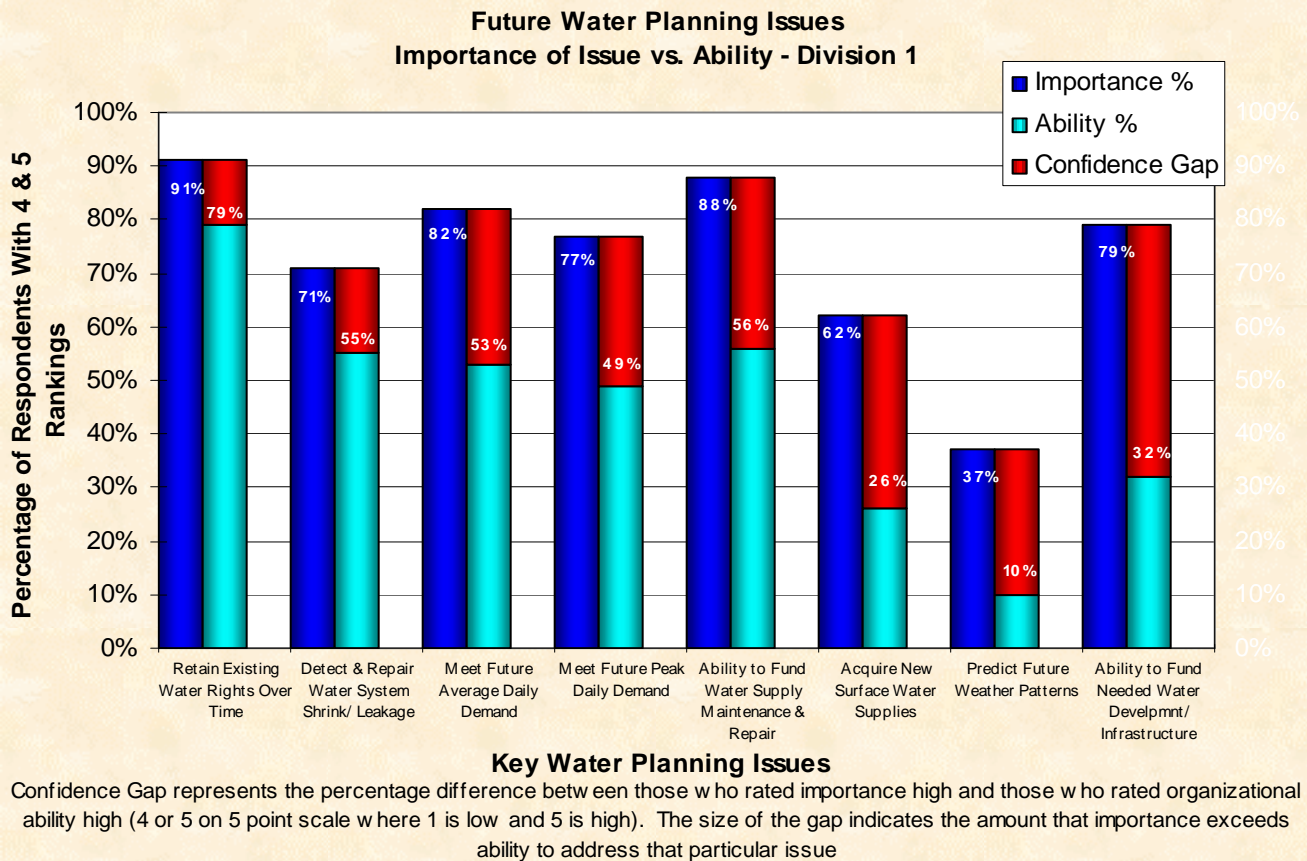
- Division 1 has about the same level of water conservation planning as the rest of the State (37% vs. 40%)
- Tools utilized for water conservation (Division 5 vs. statewide)
 - Metering (73% vs. 62%)
 - Pricing (41% vs. 31%)
- Best tools for water conservation (Division 1 vs. statewide)
 - Public education/involvement (29% vs. 25%)
 - Water conservation pricing (18% vs. 12%)

Recent Drought Impacts (1999-2003)



Division 1 water users indicated that although they were impacted by the recent drought, the severity of the impacts were less than the severity of the impacts noted by other water users statewide. Loss of reliable water supply severely impacted 42% of water users statewide, whereas about 38% of water users in Division 1 indicated that they were severely impacted. This trend was consistently represented by the Division 1 water user responses in all categories of drought impacts, with the exception of loss of system flexibility, well production and raw water quality, which were represented to be the same, or nearly the same, as was indicated by the other water users in the state.

Future Water Use Planning Issues



The above figure compares the relative importance of a selected future water planning issue (as identified by water users) (dark blue) with the ability of water users to address the issue on their own (light blue). The difference between the importance of the issue and the ability of the water user to address the issue is identified as a gap (red), with the size of the gap indicative of where water users may require assistance in the future. To illustrate the meaning of the gap analysis, consider “retaining existing water rights”. This issue was rated as the most important issue by Division 1 water users. These same water users indicated that roughly 4 out of every 5 have the ability to address this issue with in-house resources. To this point, there was a gap of 12% between those indicating that this issue was important and those that believed they had the ability (e.g., resources, staff, funds) to address this issue. Conversely, the funding of water supply development was identified as an important issue by nearly 80% of the water users, with only 32% indicating that they had the ability to address this issue; thus identifying a 47% gap between need and ability. Large gaps (i.e., 40% or greater) were not identified for any other future water issue.

Key Water Projects Definitions

Structural Projects for Drought Mitigation: These projects relate to the construction of capital improvements such as dams, pipelines, pump stations, treatment and transmission facilities, and wells. Increasingly, structural projects also include water reuse and conjunctive use projects, rehabilitation or upgrades to existing facilities and management of water consuming vegetation.

Non-Structural Projects for Drought Mitigation: These projects do not necessarily include construction, although limited earthwork or stream restoration may be involved. Non-structural project components include the development and implementation of efficient water supply and demand management tools or methods, allowing water owners, planners and managers flexibility in operating or managing their water resources.

Need for Structural Drought Mitigation Projects

Type of Project	Statewide Need	Division 1
New storage for surface water	40%	44%
Large-scale/multi-basin projects	24%	31%
New aquifer storage recovery	21%	26%
New storage for groundwater	19%	25%
New or Upgraded Pipelines	33%	37%
New or Upgraded Water Distribution Systems	33%	34%
Lining of Ditches	19%	13%

Like every other part of the state, Division 1 water users identified various structural projects as effective means to mitigate the effects of drought in their basin. As in nearly every other basin, creating new surface water storage facilities ranked as the single most important method to mitigate the effects of drought; however, the overall need was felt to be more acute in the South Platte basin than in other portions of the state. Other popular structural projects that Division 1 water users believe would mitigate the effects of drought are listed in the table above, as are those identified by water users statewide.

When asked to **prioritize** the structural projects that would best mitigate drought impacts, Division 1 water users listed the following projects (in order of priority):

- New storage for surface water
- New storage for groundwater (which includes aquifer storage recovery systems)
- New or deepened wells
- New or upgraded water distribution systems

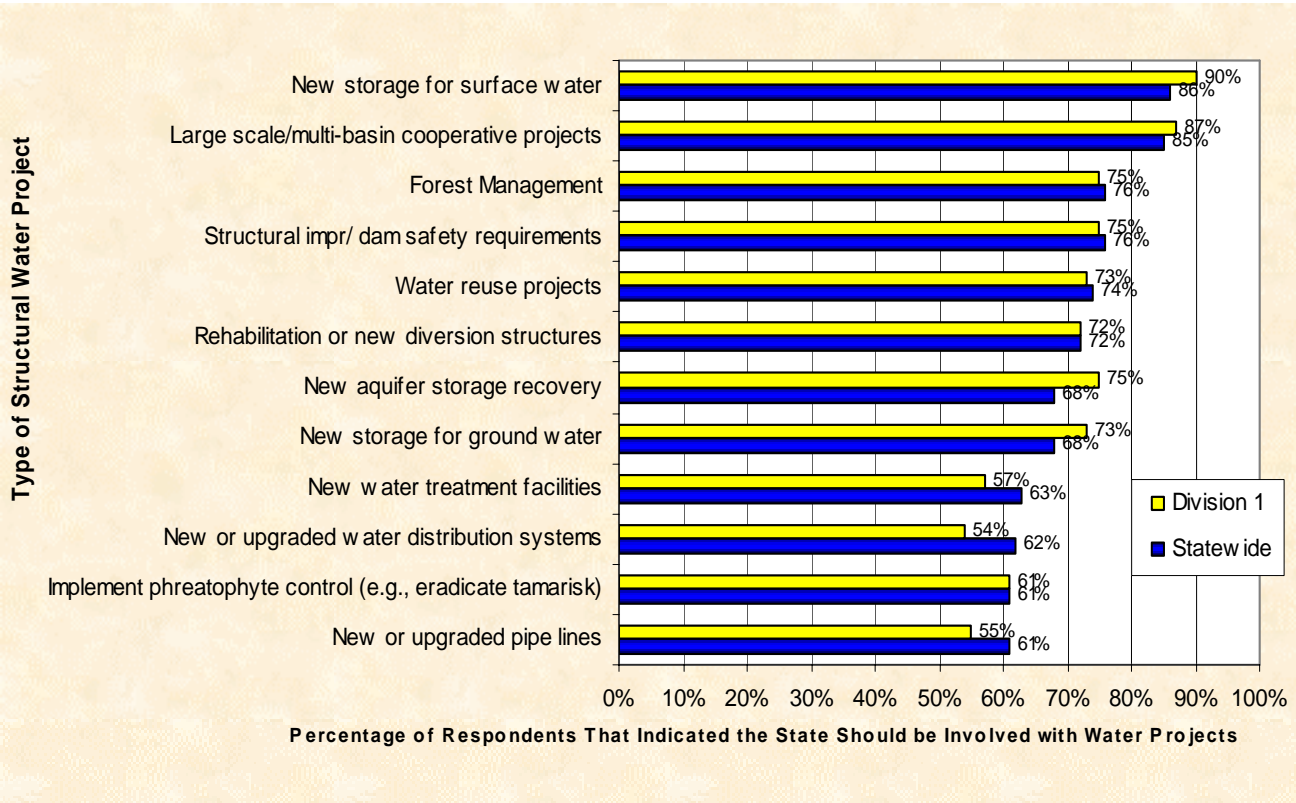
Although water users statewide agreed that new surface water storage was of the highest priority, they did not see as great a need for groundwater storage and new wells as did water users in Division 1.

Need for Non-Structural Drought Mitigation Projects

Division 1 water users identified the need and/or benefit of non-structural projects for drought mitigation, mirroring in many ways the response of water users statewide. However, the Division 1 responses indicate a slightly greater need for public education programs and improved water conservation methods than did the rest of the state. Technical support is not as broadly supported by Division 1 in comparison to the balance of the state.

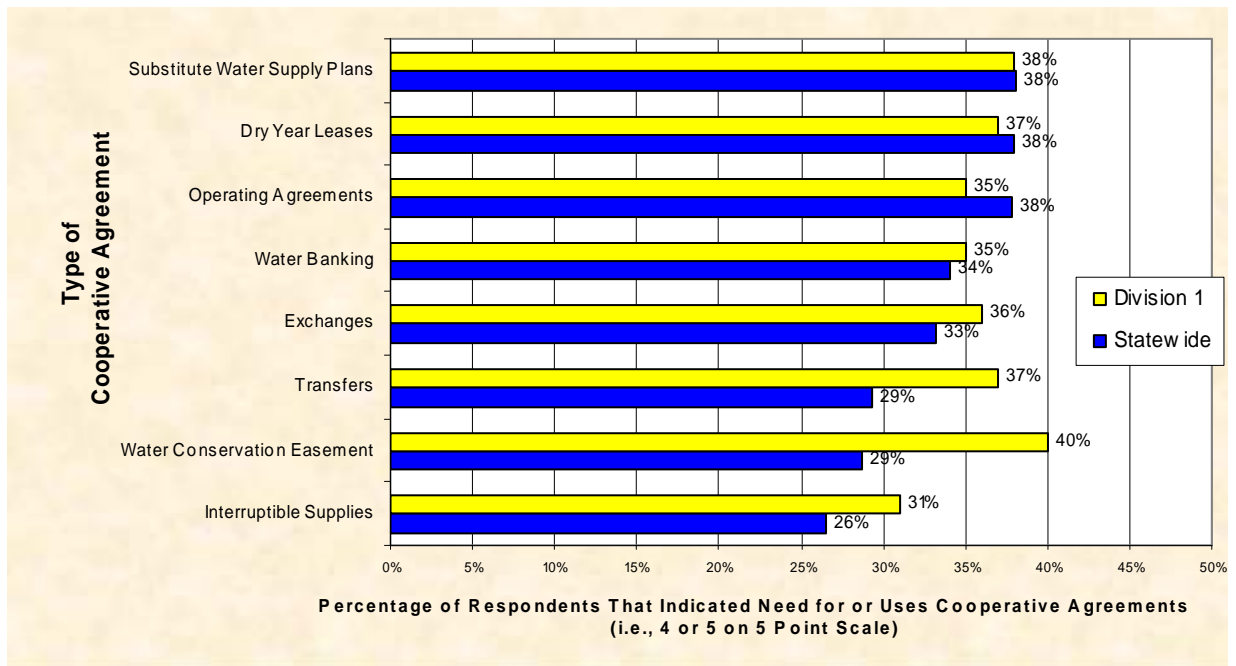
Non-Structural Project	Statewide	Division 1
Public education & awareness	46%	48%
Improved water conservation methods	46%	48%
Technical support in water supply planning	43%	38%
Technical support in drought & conservation planning	42%	37%
Improved water conservation measurement methods	29%	31%

Support for State Involvement in Structural Water Projects



Support for state involvement in structural water projects is significant, both statewide and within Division 1 as indicated in the figure above. State involvement appears to be most welcome related to large projects, such as new surface water storage, water reuse, and large scale/multi-basin projects. Forest Management support is another area where state involvement would be welcome by about 3 out of every 4 of those Division 1 water users responding to this survey.

Need for Cooperative Agreements



Need for Cooperative Agreements (continued)

Cooperative agreements are becoming increasingly important within Colorado, creating flexibility within the otherwise rigid prior appropriation system. Cooperative agreements provide the means to allow for temporary transfers of water between uses, and allow for the more efficient use of water in periods of water scarcity. For example, agricultural users can utilize cooperative agreements to allow for the temporary lease, exchange and/or transfer of water to a needy municipal entity, when the limited availability of water may have impacted crop yield or production. In this way, the agricultural community can find sources of revenue while municipalities find emergency and/or short term water supplies in dry and drought years.

When compared to the statewide response, Division 1 water users indicated more need for or use of cooperative agreements especially with respect to transfers, water conservation easements, and interruptible supplies. Division 1 mirrored the statewide response in its support for state involvement in the use of cooperative agreements for all categories.

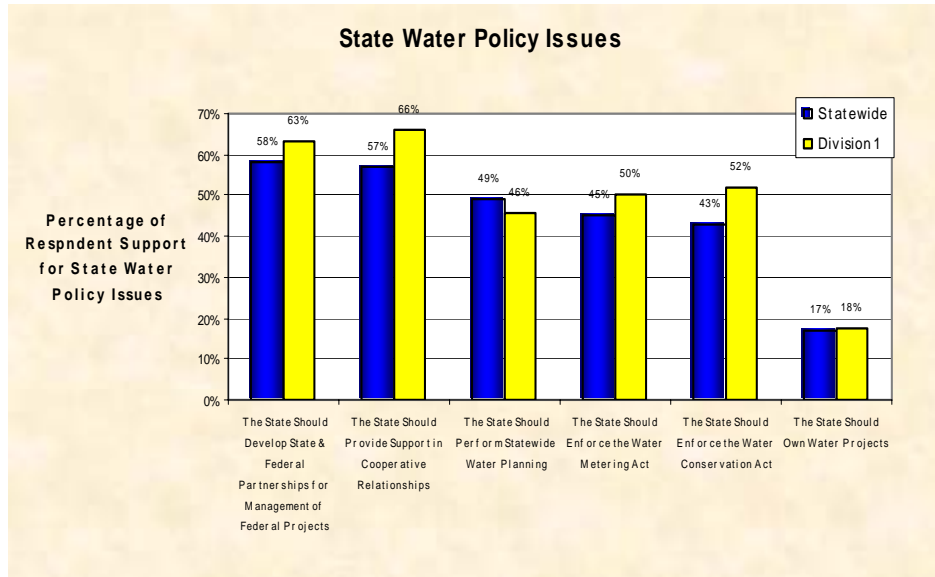
Summary of Results for the South Platte River

The South Platte River basin contains nearly 3/4 of the state's population and produces about one half of the state's agricultural products. The basin's water users rely on a combination of groundwater and surface water to support water demands. Municipalities, special districts, agricultural users and industry produce groundwater from the Denver Basin aquifers. In addition, agricultural water users in the lower portions of the South Platte produce groundwater from tributary aquifers and alluvium that lie adjacent to the river and its tributaries. Water users in the basin also rely on transmountain diversions to bring about 450,000 acre-feet of water into the Front Range from west slope river basins (chiefly the Colorado River main stem) annually. The combined use of surface and groundwater provides operational flexibility to water users in Division 1, however, the existing resources are stretched in times of water shortages.

In fact, the greatest drought impact observed by basin water users was the loss of reliable water supply—ground and surface water combined. The loss of reliable water supply caused municipalities and special districts to implement outdoor water restrictions, which significantly reduced their operating revenue. Water scarcity also forced the SEO to restrict groundwater use in tributary aquifers along the lower South Platte.

Although a substantial amount of water supply, drought and water conservation planning goes on in the South Platte basin, in part since that is where the majority of the state's largest water utilities and purveyors are, there are many communities that are either small or growing or both that do not have the skills or resources to plan for periods of water scarcity. In addition, some of the communities that do plan do not necessarily utilize all the tools—e.g., measures and programs—that they may have available to them. This dichotomy of the “haves (i.e., those established large-scale water users) and the have nots (i.e., small, rapidly growing communities that lack planning resources)” influences what water users believe is the role for the state with respect to water projects. With respect to non-structural water projects, many of the larger communities do not need general technical assistance from the state. They instead see a need for the state to address some of the “thornier” issues related to the cost benefit of water conservation measures and programs, and improved water conservation methods. They also see benefit with state support of funding and facilitation of large water projects. Conversely, some of the smaller users are looking for general technical assistance in drought planning, water conservation and water supply planning, as well as funding support for small and large projects. Of course there are a number of water users that do not want any support from the state, however these entities are in the vast minority.

Since the summer of 2003, municipalities and special districts have improved their public education prowess related to drought response and management. In particular, many entities have been successful in regulating outdoor water use and implementing alternative water pricing programs. Municipalities, special districts and agricultural entities have benefited from the exchange of short term water supplies utilizing cooperative agreements. However, the South Platte basin will continue to lead the state in new arrivals, and with the new arrivals, new challenges will continually arise related to balancing the water use needs of competing interests.



Major Objectives for State Water Policy

- Improve water availability and reliability statewide

Areas of Practice to Achieve the Major Objective

- Improve public understanding and knowledge of state water and water resources issues
- Support infrastructure needs of water users and suppliers
- Support technical assistance needs of water users

Initial Implementation Steps Proposed by the CWCB

- Examine need for new policies related to how CWCB provides public information and education, technical assistance and infrastructure support
- Improve the role and relationship of public information and education efforts by the CWCB with the DNR and the Governors Office.
- Evaluate, improve, and coordinate the role and relationship of public information and education efforts with those being conducted by local water authorities, utilities, users, and suppliers.
- Evaluate, and where appropriate, engage alternative funding sources and mechanisms to provide resources for programs water users identified as being needed.
- Evaluate and support enhancements to and funding for improving the SEO water administration tools related to tracking annual water use, stored water, well and water administration, and diverted water by water users.
- Revise and update CWCB Strategic Plans to ensure performance of the identified implementation tasks and activities occurs.
- Examine internal budgets and organizational structure to determine how to best achieve desired objectives.
- Evaluate means to fund public information and education, infrastructure construction and maintenance, and technical assistance programs in conjunction with sustaining and expanding the construction fund.
- Coordinate use of other state resources (e.g., DoLA, SEO, etc.) and affiliates (e.g., Colorado Foundation for Water Education) in supporting needs identified by Colorado's water users.
- Continue to support the development and use of the CDSS tools, especially with respect to understanding and characterizing basin hydrology, firm yield, groundwater-surface water interactions (including augmentation water and groundwater recharge programs), and water supply development needs.
- Continue to support development and implementation of the Statewide Water Supply Initiative (SWSI) as it relates to the identification of areas with critical water management issues, water development projects, water supply and demand imbalances, and infrastructure needs; and the development of a sustainable process for maintaining inter and intra-basin communications.
- Continue development and the appropriate allocation of resources to the Office of Water Conservation and Drought Planning in providing technical assistance to covered entities, evaluating submitted water conservation and drought plans, administering fund programs, and disseminating information to the public.
- Integrate the results of this project, and other relevant projects, into the SWSI, Bureau of Reclamation Water 2025 Project, and other state and regional water planning efforts.
- Provide appropriate resources to continue to develop and administer opinion surveys of Colorado water users relative to important water issues, and to create a temporal database related to drought and water supply impacts, limitations, planning needs and projects.