

1-1-2003

The Blind Man and the Elephant: Describing Drought in Colorado

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THE BLIND MAN AND THE ELEPHANT: DESCRIBING DROUGHT IN COLORADO

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I. INTRODUCTION

Drought is the proverbial elephant being described by blind men¹—except in the case of drought the elephant is walking and the blind men are trying to keep up. It is human nature to focus on the pieces of the whole, such as the elephant’s leg or tail because the whole animal is too big to quickly comprehend. In the context of drought, the pieces of the whole include, in no particular order, quantity of precipitation by season, resultant soil moisture storage, if any, ground water use, reservoir storage levels, and spring runoff quantities and characteristics.² Water resources professionals and climatologists examination of these individual elements was responsible in part for statewide confusion regarding the severity of the current drought during the summer of 2002. For example, the Governor declared a drought emergency, implementing the Colorado Drought Mitigation Response Plan in April, based on forecast conditions for the eastern

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1. John Godfrey Saxe, *Parable of the Blind Men and the Elephant*, available at <http://www.wvu.edu/~lawfac/jelkins/lp-2001/saxe.html>.

2. See generally THOMAS B. MCKEE ET AL., HISTORICAL DRY AND WET PERIODS IN COLORADO: PART A TECHNICAL REPORT (1999) [hereinafter HISTORICAL DRY AND WET PERIODS].

plains early in the growing season.³ By contrast, although the snowpack literally evaporated in much of the state during April and May, resulting in little runoff and almost no reservoir fill,⁴ only a few communities adopted watering restrictions relatively early in the summer, including Louisville, Silt and Parachute.⁵ Other cities, such as Denver and Golden, did not formally act to impose water restrictions until middle to late-summer, although both cities adopted voluntary restrictions earlier in the year.⁶

As the character of the 2002-2003 drought became clearer, the reaction to the drought by policy-makers grew in volume, although initially it was largely of the one-note variety—*increase supplies*.⁷ Colorado water law is tailor-made for this type of response: the state constitution guarantees the right to divert,⁸ protects water rights as property rights,⁹ and with a few exceptions, provides little leeway for the legislature or executive agencies to exert “command and control” remedies to drought situations. However, while increasing supply is the most obvious means of responding to drought, no one seriously thinks these plans are an effective response to *this* drought. And, although Colorado law precludes “command and control” actions by the state executive branch to address drought, it does provide for a variety of measures that can be taken by water users.

This article begins by considering the perceptual nature of drought, perhaps the only natural disaster we experience without initially realizing it, as well as reviewing some of the climatological measures used to estimate the elephant. Part II also briefly examines other states’ responses to drought, as well as Colorado’s response through its Drought Plan. Next, the article focuses on the reported stream flow and water rights call conditions in various basins during the 2002 water year to get a big picture of the Colorado elephant. Finally, Part III examines the ability of Colorado’s prior appropriation

3. See Letter from Bill Owens, Colorado Governor, to Brad Lundahl, Chair, Colo. Water Availability Task Force (Apr. 22, 2002), available at www.cwcb.state.co.us/owc/Drought_Planning/Drought_Plan_Activation.pdf.

4. See generally Office of the State Eng’r, Colo. Div. of Water Res., *Colorado Water Supply Conditions Update* May – June 2002 [hereinafter *Supply Conditions Update* “Month Year”].

5. LAND & WATER FUND OF THE ROCKIES, WATER USE EFFICIENCY IMPROVEMENTS: A SOLUTION TO COLORADO’S URBAN WATER SUPPLY PROBLEMS I (2002) (for Silt and Parachute); see City of Louisville, Colorado Homepage, <http://www.ci.louisville.co.us> (Louisville Mayor’s June 2002 Executive order imposing watering restrictions).

6. The DenverChannel.com, *Denver Passes Mandatory Water Restrictions*, June 25, 2002, available at www.TheDenverChannel.com; see generally Theo Stein, *Irrigation Well Owners Notified of Pumping ban*, DENVER POST, Mar. 14, 2003, at B1; Marcos Mocine-McQueen, *Boulder Leads the way in Water Conservation*, DENVER POST, Mar. 11, 2003, at A1.

7. See discussion *infra* Part III on the “Big Straw” and various funding mechanisms being discussed for local community bonding efforts to enlarge reservoirs or build new reservoirs.

8. COLO. CONST. art. XVI, § 6 (stating “the right to divert . . . shall not be denied.”)

9. *Id.* § 5.

system to deal with drought. As of the first part of January, the legislature introduced more than eighty bills addressing the drought. With so many fish in the barrel, this article focuses on two high-profile pieces of legislation that were proposed during the 2003 legislative session and, more importantly, several ways that water users and others were able to mitigate the effects of drought under current state law.

II. DEFINING DROUGHT: ONE MAN'S DROUGHT IS ANOTHER MAN'S SUNNY DAY¹⁰

A. PERCEPTIONS ARE EVERYTHING

We have no good definition of drought. We may say truthfully that we scarcely know a drought when we see one. We welcome the first clear day after a rainy spell. Rainless days continue for a time and we are pleased to have a long spell of such fine weather. It keeps on and we are a little worried. A few days more and we are really in trouble. The first rainless day in a spell of fine weather contributes as much to a drought as the last, but no one knows how serious it will be until the last dry day is gone and the rains have come again. . . .¹¹

There is little question about natural disaster when property has been hit by a hurricane, flood, or tornado; however, one person may experience a drought that his neighbor, under the same physical conditions, does not experience. Consider for example, three farmers in the same neighborhood in the Lower South Platte basin. The location of this example is significant because water supplies on the Lower South Platte are dependent upon both mountain snowpack and plains precipitation. The first farmer is a dryland farmer on uplands, with neither ditch nor ground water rights. The second farms alfalfa using senior surface diversions. The third also farms alfalfa but has junior surface rights, insufficient in quantity, and an undecreed junior well. The dryland farmer relies on properly timed precipitation falling on his land. Thus, even in a year when the Lower South Platte receives average precipitation, if the timing is off, he experiences a "drought" because his supply does not meet his demand. As a dryland wheat farmer, he has few, if any, options to replace natural precipitation.

The second farmer growing alfalfa under one of the senior ditch systems in the Lower South Platte will rely on ditch deliveries for his crop. His water right, if sufficiently senior, can supply necessary irrigation water with little regard to hydrological or climatic conditions. As dryland farmers and owners of more junior water rights feel the pinch of drought, he prospers because of higher crop yields

10. THOMAS B. MCKEE ET AL., *WATER IN THE BALANCE: A HISTORY OF DROUGHT IN COLORADO: LESSONS LEARNED AND WHAT LIES AHEAD* 5 (2000) [hereinafter *WATER IN THE BALANCE*].

11. 1 *DROUGHT A GLOBAL ASSESSMENT* 6 (Donald A. Wilhite ed., 2000) (quoting I.R. TANNEHILL, *DROUGHT: ITS CAUSES AND EFFECTS* (1947)).

and favorable market conditions. This farmer would have a wholly different definition of drought than his dryland neighbor.

The third farmer, growing alfalfa with a combination of junior surface diversions and an unaugmented well, is in a more complicated position. His water supply depends on a host of factors. He is at the mercy of winter mountain snowpack, spring and summer rains, the timing of runoff and basinwide reservoir levels. His irrigation water first comes from the river under his junior water rights. This water will only be available at times of plenty, occurring when snowpack and rainfall are high or when the runoff pattern creates a peak in river flow allowing his water right to come into priority. If rainfall and river diversions do not suffice, he is forced to rely on his well. His wells, like many others in the area, were drilled in response to earlier drought, such as that occurring in the first half of the 1950s.¹² These wells have ample physical water supply, but dubious legal supply.¹³ This farmer has created a particularly Hobbsian choice for himself: (1) if he operates lawfully, he may experience drought even under average precipitation and snowpack conditions, because his water rights are not senior enough; or (2) if he operates unlawfully, he risks being shut down by the water court or the State Engineer's Office ("SEO").

Water users' differing perceptions of drought extend beyond irrigated agricultural users. Although agriculture uses more than ninety-five percent of Colorado's surface and groundwater; the second most important use by quantity is municipal use, accounting for nearly all of the remaining five percent. Municipal users come in two varieties: (1) water planners and engineers that develop and supply raw water for public or private agencies; and (2) individual treated water consumers. Drought is perceived differently by these two categories of municipal water users. Water resources engineers and planners anticipate multiple droughts every decade, as they track snowpack and snowmelt patterns, precipitation patterns, and reservoir levels. In the last twenty to thirty years, short-term drought conditions, particularly related to reservoir supplies, have never materialized in ways that impacted water users because well-timed and unexpected precipitation breached the looming gap in supplies. This is the goal of water resources engineering, and the water resources engineer who has done a reliable job of developing raw water supplies effectively insulating end-users from short-term drought effects. However, water engineering attempts to predict the future by looking backward at the last worst-case scenario. Engineers' ability to do this effectively has insulated most of the state's treated water customers from drought for the last thirty years. The summer of 2002 set a new water supply worst-case scenario and was so intense that the entire state, including treated water customers, felt the effects of the drought.

12. ROBERT G. DUNBAR, *FORGING NEW RIGHTS IN WESTERN WATERS* 181-82 (1983).

13. See COLO. REV. STAT. § 37-92-305(5) (2002); *Kelly Ranch v. S.E. Colo. Water Conservancy Dist.*, 550 P.2d 297, 302, 305 (Colo. 1976); *Bijou Irrigation Co. v. Simpson*, No. 02 CW 108, slip op. at 13 (Colo. Dist. Water Div. 1 Dec. 23, 2002).

These examples reflect the complex nature of drought, where both perception and impact define the condition. Drought impacts are proportional to a region's vulnerability—a term drought policy-makers define to include social factors, such as institutional and decision-making environments, policy issues, economics, and technology.¹⁴ For example, in a community without water metering, the expectation that water will be available on demand at the tap without regard to cost, increases the community's vulnerability to drought. If expectations translate to behavior, drought can be exacerbated or even "caused" when a more conservation-minded community might not have felt the effects of the dry spell.

The institutional and decisional environment also impacts a community's vulnerability. Existing water law and the level of integrity that water users accord this legal and administrative system can either increase or decrease vulnerability. Some states, such as New Mexico, have a fairly fluid (no pun intended) concept of prior appropriation law.¹⁵ New Mexico is a permit state and theoretically river basin adjudications should precede permit issuance. As a practical matter, most rivers and streams in the state have never been adjudicated; meaning the amounts of water to which users are entitled has never been established.¹⁶ The Office of State Engineer has only sporadic records regarding stream diversions. These institutional elements may make New Mexico more vulnerable to drought, because it is impossible to predict how much wet-water will be available, assuming lawful operations.

In Colorado, by contrast, the constitutional and statutory requirements for obtaining and maintaining a water right mean that water rights holders may have greater awareness of the amount and timing of diversions that may be available during drought.¹⁷ Historical water diversion records are maintained at the State or Division Engineers Offices. Local water officials, responsible for determining which rights have priority and shutting down unlawful operations, can also be an accurate source of information regarding the nature of a water right during drought. On the Front Range, most municipal surface water rights are changed agricultural water rights, and part of the evidentiary showing in a change case includes engineering analyses of water availability during drought conditions.¹⁸ Thus, in Colorado, the institutional impact on drought vulnerability is neutral. The

14. 1 DROUGHT: A GLOBAL ASSESSMENT, *supra* note 11, at 8; Olga V. Wilhelmi & Donald A. Wilhite, *Assessing Vulnerability to Agricultural Drought: A Nebraska Case Study*, 25 NAT. HAZARDS 37 (2002).

15. *See generally* G. EMLÉN HALL, *HIGH AND DRY: THE TEXAS-NEW MEXICO STRUGGLE FOR THE PECOS RIVER* (2002).

16. ALLETTA BELIN ET AL., *TAKING CHARGE OF OUR WATER DESTINY: A WATER MANAGEMENT POLICY GUIDE FOR NEW MEXICO IN THE 21ST CENTURY* 15 (2002).

17. COLO. REV. STAT. §§ 37-80-102(7), 37-84-113; *Georges v. Vahldick*, 421 P.2d 471, 472 (Colo. 1966).

18. *See* Deposition of Mark Koleber, *City & County of Denver v. Thornton*, No. 96 CW 145 (Colo. Dist. Water Div. 1 Aug. 31, 1999) (on file with the author).

Colorado water rights system, when complied with, provides predictability; water rights susceptible to shortages during drought can be determined through engineering analyses, as can those rights reliably delivering water during drought.

Finally, economic and technological factors that influence drought vulnerability include resources available to water users. In a drought such as that of 2002, long-time growers with little operational flexibility, such as the dryland wheat farmer or the junior surface diverter discussed above, likely assessed conditions and decided it was not reasonable to assume they could grow a high dollar crop requiring substantial irrigation. This would likely minimize drought impacts to their operations; but not the economic impact from growing a less valuable crop or no crop. If their operations were economically viable, these same users might have decided early in the year to attempt to purchase augmentation water to improve their chances of growing a crop by pumping ground water out-of-priority.

B. OVERCOMING PERCEPTION: MEASURING DROUGHT

In an attempt to deal with the perceptual nature of drought, climatologists have constructed various types of drought indices and measurements, some objective and some consensus-based, that attempt to define the point at which conditions warrant the label "drought."¹⁹ Objective methods are useful if different types of data are properly incorporated for a quantitative analysis directed at a particular water use, such as agricultural use on the Great Plains. Consensus-based methods incorporate analyses of different types of data, as well as the professional judgment of numerous climatologists, water engineers, meteorologists and so on, interpreting the data.²⁰ In addition to incorporating perception into the analysis, by either focusing on one particular water use, or by involving multiple disciplines in the analysis, consensus-based methods must appropriately measure the time scale being considered. Drought impacts may occur from drought conditions that arise in a few days, such as "flash droughts" climatologists have identified that rapidly materialize on the Great Plains. Flash droughts occur from a combination of depletion of moisture in plant root zones and already dry sub-soil.²¹ By contrast, drought impacts that arise only after months or years of dry conditions require measurement methods spanning a longer time period.²²

19. See Kelly Redmond's article on the various institutional shortcomings surrounding drought indices' development, peer review and refinement. Kelly Redmond, *The Depiction of Drought: A Commentary*, 83 BULL. OF THE AM. METEOROLOGICAL SOC'Y 1143, 1144-46 (2002).

20. Mark Svodoba et al., *The Drought Monitor*, 83 BULL. OF THE AM. METEOROLOGICAL SOC'Y 1181, 1187-88 (2002).

21. Redmond, *supra* note 19, at 1146.

22. Climatologists speak of "intrinsic timescales" in drought indices, which make different measures more or less reliable depending on the time step examined. *Id.* at 1145; see also HISTORICAL DRY AND WET PERIODS, *supra* note 2.

In the 1960's, farmers and ranchers on the Great Plains developed one of the most widely known "objective" indices, the Palmer Index.²³ Its internal timestep²⁴ of nine to twelve months is important in its usefulness to agricultural water users. In the most simplistic terms, the Palmer Index involves developing a water balance involving precipitation, various types of sub-soil moisture, evapotranspiration rates, and judgment calls regarding drought severity.²⁵ The Standardized Precipitation Index ("SPI"),²⁶ another drought measure developed specifically for Colorado, evaluates drought intensity, magnitude, duration, and the probability of emerging from an existing drought based on historic data.²⁷

In the late 1990's, the Drought Mitigation Center at the University of Nebraska and National Oceanic and Atmospheric Association ("NOAA") began work on a consensus based drought identification tool that has evolved into the Drought Monitor.²⁸ On a weekly basis, water resources experts and climatologists engage in an on-line information gathering and discussion exercise, incorporating different types of data from across the United States to determine the status of drought conditions nationwide.²⁹

The Drought Monitor identifies drought based on the interest group impacted: agricultural drought, hydrological drought, or fire-danger drought.³⁰ These categories are expansive. Hydrologic drought could refer to a drought impacting only municipal reservoir storage, or it could reflect such insufficient supply resulting in a "social" drought causing treated water customers and visitors to an area to feel the impacts of water restrictions.³¹ Time frame is important in the context of drought consensus tools, just as in determining the character and reliability of drought indices. The Drought Monitor could identify a hydrologic drought in April, but continued drought conditions through August may be required before individual treated water customers would feel the effects.

23. Redmond, *supra* note 19, at 1145. The August 2002 issue of the *Bulletin of the American Meteorological Society* previously referred to is devoted to the topic of drought. See also Richard R. Heim, Jr., *A Review of Twentieth-Century Drought Indices Used in the United States*, 83 BULL. OF THE AM. METEOROLOGICAL SOC'Y 1149, 1150-56 (2002); John Keyantash & John A. Dracup, *The Quantification of Drought: An Evaluation of Drought Indices* 83 BULL. OF THE AM. METEOROLOGICAL SOC'Y 1167 (2002); Svoboda et al., *supra* note 20.

24. Redmond, *supra* note 19, at 1145.

25. Heim, *supra* note 23, at 1155.

26. Thomas B. McKee, Nolan J. Doesken and John Kleist developed the SPI at Colorado Climate Center at Colorado State University. See HISTORICAL DRY AND WET PERIODS, *supra* note 2, at 12-14 (detailing the statistical and technical underpinnings of this index).

27. See Heim, *supra* note 23, at 1160-61.

28. Svoboda et al., *supra* note 20, at 1181-90. Drought Monitor website, at <http://drought.unl.edu/dm>.

29. Svoboda et al., *supra* note 20, at 1182-83.

30. *Id.* at 1186-87.

31. Nat'l Drought Mitigation Cent., *What is Drought? Understanding and Defining Drought*, at <http://www.drought.unl.edu/whatis/concept.htm>.

In Colorado, the State and Division Engineers rely on a tool known as the Surface Water Supply Index ("SWSI"). The SWSI incorporates objective elements of drought indices with subjective evaluations of conditions on the ground by local water officials.³² Like the SPI, the SEO and Natural Resources Conservation Service developed the SWSI for use in Colorado.³³ The SWSI calculations include "snowpack, reservoir storage, and precipitation for the winter period (November through April)."³⁴ Except for the South Platte basin, "where reservoir storage is given the most weight" during the winter, snowpack is the dominant element of the winter SWSI calculation.³⁵ During the summer period (May through October), the SWSI is calculated mainly from streamflows, except in the South Platte basin where reservoir levels are again the most important element.³⁶ These interbasin differences are important to acknowledge. Colorado does not experience uniform wet and dry seasons.³⁷ Each river basin can be distinguished based on the times when it receives the majority of its annual precipitation, and some basins experience intra-basin differences in the timing of precipitation.³⁸ For instance, the San Juan/Dolores basin relies mainly on late summer and fall monsoonal storms³⁹ from the Gulf of California. By contrast, the Upper South Platte, including the Front Range, relies on late winter snows for water supplies, while the Lower South Platte and eastern plains rely on mid-summer precipitation.⁴⁰ These and other items may be the subject of further refinements to improve the SWSI as a tool.⁴¹

32. Office of the State Eng'r, Colo. Div. of Water Res., *Surface Water in Colorado*, at <http://www.water.state.co.us/surfacewtaer/surface.asp>; Keyantash & Dracup, *supra* note 23, at 1175.

33. *Supply Conditions Update March 2003*, *supra* note 4, at 1.

34. *Id.*

35. *Id.*

36. *Supply Conditions Update June 2002*, *supra* note 4, at 1.

37. WATER IN THE BALANCE, *supra* note 10, at 10.

38. *Id.*; see also HISTORICAL DRY AND WET PERIODS, *supra* note 2, at 5-6, 29, 47-49.

39. HISTORICAL DRY AND WET PERIODS, *supra* note 2, at 8, 48.

40. WATER IN THE BALANCE, *supra* note 10, at 10.

41. *Supply Conditions Update November 2002*, *supra* note 4, at 1, 4; *Supply Conditions Update September 2002*, *supra* note 4, at 1, 4.

SEASON OF MAXIMUM PRECIPITATION

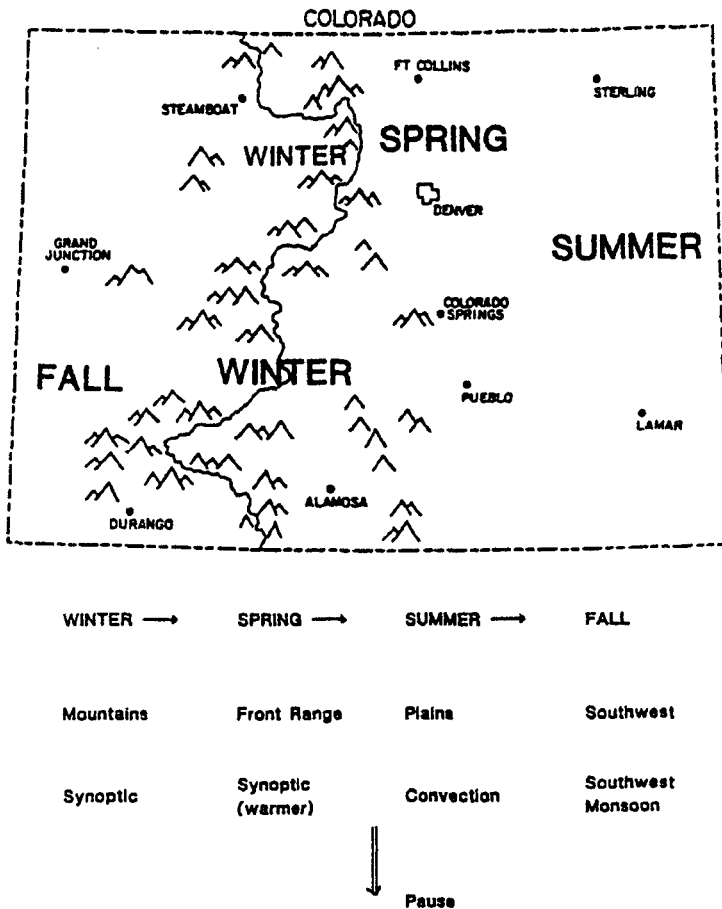


FIGURE 1⁴²

Reliance on historical data for water supply planning and drought mitigation purposes is only as good as the historical data are representative. Reliable instrumental climatic data in the western United States have only been collected over the past seventy to eighty years;⁴³ the time length of the stream flow records is even shorter in

42. HISTORICAL DRY AND WET PERIODS, *supra* note 2, at 49.

43. Connie A. Woodhouse et al., *Drought in the Western Plains, 1845-56*, 83 BULL. OF THE AM. METEOROLOGICAL SOC'Y 1485, 1488-89 (2002). Prior to statehood, the United States Army, at its forts in the region west of the 100th Meridian, collected some meteorological data of uneven quality. National Oceanic & Atmospheric Administration, *Nineteenth Century U.S. Climate Data Set Project*, at <http://www.ncdc.noaa.gov/onlinedata/forts/forts.html>.

many locations.⁴⁴ Broadly, paleoclimatologists rely on indirect environmental measures such as the chemistry of glacial ice cores⁴⁵ and tree-ring analyses⁴⁶ to reconstruct, *inter alia*, the severity of drought and the implications for water supplies.⁴⁷

One of the most well-known tree-ring reconstructions, by Stockton and Jacoby, demonstrated that the seventeen years of data relied upon by negotiators to the Colorado River Compact composed the wettest period in 450 years of the Colorado basin.⁴⁸ Compact allocations were thus based on anomalously high values.⁴⁹ Recently, climatologists at NOAA in Boulder, Colorado, reconstructed Boulder Creek stream flows from 1703 to 1987⁵⁰ and suggested several uses for such data in Colorado water planning.⁵¹ Results from tree-ring investigations suggest that lengthy and severe droughts are a standard feature of Colorado Front Range climate.⁵² NOAA suggested that municipal water supply planning incorporate paleoclimatic data because such data could provide perspective to the results obtained from using historical flow data, involving at best seventy to eighty years of instrument records.⁵³ The scientists also suggested modeling with paleoclimate data to simulate whether or not a given reservoir supply will be sufficient during the magnitude of droughts suggested by paleoclimatic records.⁵⁴

44. Shaleen Jain et al., *Multidecadal Streamflow Regimes in the Interior Western United States: Implications for the Vulnerability of Water Resources*, 107 J. GEOPHYSICAL RES. 1 (2002).

45. David L. Naftz et al., *Ice Core Evidence of Rapid air Temperature Increases Since 1960 in Alpine Areas of the Wind River Range, Wyoming, United States*, 107 J. GEOPHYSICAL RES. 1, at X-1 (2002).

46. This is also known as dendrochronology. See Jain et al., *supra* note 44, at 1-2; Woodhouse et al., *supra* note 43, at 1485-86; Ramzi Touchan & Malcolm Hughes, *The Role of Dendrochronology in Natural Resource Management*, USDA FOREST PROCEEDINGS RMRS-P-13, at 277 (2000).

47. See Jain et al., *supra* note 44, at 1-2.

48. CHARLES W. STOCKTON & GORDON C. JACOBY, JR., LAKE POWELL RESEARCH PROJECT BULLETIN: LONG-TERM SURFACE WATER SUPPLY AND STREAMFLOW TRENDS IN THE UPPER COLORADO RIVER BASIN 38 (1976).

49. *Id.* Apart from the portions of the river the states to the Compact received, the Stockton study establishes that the states were apportioned a total volume of water that could be expected only a small fraction of the time. Water allocation, whether by adjudication or equitable apportionment typically proceeds from average conditions, rather than extreme conditions. The results of this over-allocation continue to be in the news. See Dean E. Murphy, *Failed Deal in California Cuts Water for Nevada*, N.Y. TIMES, Jan. 2, 2003, at A10.

50. See STOCKTON & JACOBY, *supra* note 48, at 38; Jain et al., *supra* note 44, at 2; New Mexico State Engineer Tom C. Turney, Comments before the Association of Commerce and Industry (Mar. 22, 2002) (transcript available from the New Mexico Office of State Engineer).

51. Jain et al., *supra* note 44, at 6.

52. STOCKTON & JACOBY, *supra* note 48, at 38.

53. *Id.* at vii, 38.

54. *Id.* at vii, 41; See also Jain et al., *supra* note 44, at 1-2 (discussing how analysis first identifies certain periods of years in the paleoclimatic record as "flavors" of stream flow, either wet, dry or very dry, then a given integrated reservoir storage level is assumed against three or more demand scenarios to determine whether the reservoir

Today, the City of Boulder is cautiously assessing paleoclimatic data as a basis for water supply and city drought planning.⁵⁵ Even if water resources professionals determine that paleoclimatic data are useful for planning, the use of such data by the water resources community at large will likely depend on whether the methods and conclusions survive the scrutiny of the Colorado water courts under the rules of evidence.⁵⁶ Water planning and water adjudication typically work hand-in-hand in Colorado, and planning methods that will not support water rights decrees are not likely to be adopted.⁵⁷ However, another possibility is that our water planning has proceeded under unusually wet conditions, and the historic data relied upon to determine an average stream flow condition is actually unrepresentative.⁵⁸ The New Mexico State Engineer suggested that the current drought in the Rio Grande basin actually reflects “average conditions”⁵⁹ instead of drought conditions. If that holds true region-wide, there will be no need to turn to paleoclimatic records, as each year of the drought will provide new instrumental data with which to reconfigure our previous assumptions about historical water flows.

III. PUTTING THE MEASUREMENT TOOLS TO WORK

A. DROUGHT PLANNING

If the availability of drought measurement techniques controlled state planning in response to drought, it seems likely that all states would have comprehensive drought plans. In fact, based on 1996 statistics, only about twenty-seven states have drought plans.⁶⁰ Whether to create a drought plan is a state decision⁶¹ based on a complex mix of social, economic, political and climatic variables.⁶² State drought planning takes many forms, and arises in part from the legal framework (if any) regarding rights to use water.⁶³ For example,

storage will meet demands under a variety of climatic conditions. Jain et al., conclude: “Indeed, this allows us to tie the multidecadal flow regimes and temporal changes in the *pdf* to potential impacts on managed water resources infrastructure.”)

55. 2 HYDROSPHERE RES. CONSULTANTS, CITY OF BOULDER, COLO. DROUGHT PLAN: TECHNICAL INFORMATION AND ANALYSIS DRAFT 18 (Feb. 5, 2003).

56. See, e.g., City of Golden v. City of Arvada, No. 98CW448, slip op. at 5-6 (Colo. Dist. Water Div. 1 June 13, 2001). The court rejected the expert testimony offered in support of the SEO’s opposition to Golden’s application.

57. See generally Park County Pres. Coalition v. Columbine Assoc., 993 P.2d 483 (Colo. 2000).

58. See Turney, *supra* note 50, at 2.

59. *Id.*

60. Donald A. Wilhite, *State Actions to Mitigate Drought: Lessons Learned*, 33 J. AM. WATER RESOURCES ASS’N 961 (1997).

61. See Donald A. Wilhite, *Drought Planning: A Process for State Government*, 27 WATER RESOURCES BULL. 29 (1991). In other countries, such as Australia, the federal government takes the lead in drought planning.

62. Donald A. Wilhite & Steven L. Rhodes, *State-Level Drought Planning in the United States: Factors Influencing Plan Development*, 19 WATER INT’L 15, 16 (1994).

63. Compare the drought plan case studies as described in Donald Wilhite’s report.

California's drought plan provides for state agency purchase of surplus municipal or agricultural water for its banking program;⁶⁴ such an approach would be questionable, at best, under Colorado law.⁶⁵ Drought plans may incorporate assessment programs, drought indices described previously, conservation programs, emergency response programs, and water augmentation.⁶⁶ However, at least one commentator concluded that state responses are too heavily weighted towards reaction to drought emergency, rather than preparation to avoid drought-related impacts.⁶⁷

Since 1981, Colorado has had a state drought plan in place that has been described as "comprehensive."⁶⁸ The current Colorado Drought Mitigation & Response Plan incorporates Monitoring, Assessment, Response and Mitigation.⁶⁹ Monitoring is an ongoing activity incorporating data from the Palmer, SWSI, or SPI indices.⁷⁰ Drought severity triggers the next steps in the Drought Plan.⁷¹ In April of 2002, the Governor announced a drought emergency, based on the severity of drought conditions.⁷² The Governor based the drought emergency on the SWSI analysis conditioned by the DWR which launched the state from "normal conditions" under the Drought Plan to "Phase 3," meaning the SWSI index was between -2.0 and -3.9.⁷³

B. OF LOW FLOWS AND LESS STORAGE

The Governor's early announcement proved to be correct. By May of 2002, the SWSI index bottomed out in the San Juan/Dolores and the Yampa/White River basins. The recorded values were -4.1 and -4.0 respectively. These were the lowest SWSI values reported since the indices' inception in 1981; the lowest possible values SWSI algorithm is -4.2. These water short measures were repeated statewide. By May

DONALD A. WILHITE, DROUGHT MITIGATION TECHNOLOGIES IN THE UNITED STATES: WITH FUTURE POLICY RECOMMENDATIONS 32-48 (1993).

64. Wilhite, *supra* note 60, at 966.

65. Colorado law provides for individuals, including state agencies, to hold water rights for beneficial use. However the Colorado Water Conservation Board ("CWCB") is the only agency that may hold instream flows for the benefit of the people. State agencies are not otherwise authorized to "hold" water to provide for emergency or other uses. See COLO. CONST. art. XVI, § 6; COLO. REV. STAT. § 37-92-103(4) (2002); *but see* The Arkansas River Water Bank Pilot Program of 2001, COLO. REV. STAT. §§ 37-80.5-101 to -107; H.B. 1318, 64th Leg., 1st Reg. Sess. (Colo. 2003). Governor Owens signed H.B. 1318 on June 4, 2003 to extend the Arkansas Banking provisions statewide.

66. Wilhite, *supra* note 60, at 965 tbl.1.

67. *Id.* at 967.

68. See *generally id.*; WILHITE, *supra* note 63.

69. COLO. DEP'T OF LOCAL AFFAIRS, DIV. OF LOCAL GOV'T, THE COLORADO DROUGHT MITIGATION AND RESPONSE PLAN 3, 11 (2001), at <http://www.dola.state.co.us/oem/Publications/publications.htm> [hereinafter COLO. DROUGHT PLAN].

70. See *supra* text accompanying notes 20-41.

71. See COLO. DROUGHT PLAN, *supra* note 69, at 22 fig.2.10.

72. Letter from Bill Owens to Brad Lundahl, *supra* note 3.

73. See COLO. DROUGHT PLAN, *supra* note 69, at 22 fig.2.10; *Supply Conditions Update April 2002*, *supra* note 4, at 1-2.

2001, the South Platte basin, which obtains much of its water supply through snowmelt and depends on reservoir storage for reliable supplies, had an average snow pack of only 23% and reservoirs were between 82% and 93% capacity. Even more ominous at a time when snowmelt runoff has typically begun, flows below the Denver Metro area at the Kersey Gage were one-tenth of normal—235 cubic feet per second (“cfs”) versus 2,486 cfs.⁷⁴

Other basins experienced conditions as severe as those in the South Platte and the San Juan/Dolores Yampa/White basins. In the Rio Grande, snowpack was six percent of normal, and unseasonably warm and windy weather conditions in most basins effectively evaporated what little runoff might have come down the rivers.⁷⁵ However, the Rio Grande and San Juan/Dolores basins rely more heavily on summer monsoonal precipitation,⁷⁶ so these basins entered the growing season with at least a possibility that summer rains would be sufficient. That possibility did not materialize.⁷⁷

In a typical year, snowmelt runoff satisfies water users through the first part of June in most basins in Colorado. By April of 2002, many senior water rights holders were already placing calls for water; calls that, in some cases, had not been made in over fifty years.⁷⁸ Many of the calls were at the top of the watershed, complicating water rights administration and impacting users throughout the basin. Two calls came in the Gunnison basin; one for Gunnison Tunnel water, and another to satisfy the rights of the Redlands Power Canal. These calls were indicative of an extraordinary shortage of water at a time of year, when even in a relatively dry year, water was usually plentiful.⁷⁹ The repeated calls by senior users were detrimental to crops in the Upper Gunnison basin.⁸⁰

The lack of stored water also impacted water rights holders. By July, Lemon Reservoir was shut down, with only ten percent of its capacity remaining.⁸¹ Vallecito Reservoir had only 18,000 acre-feet of its 125,000 acre-feet capacity. On the Lower South Platte, where irrigators rely heavily on stored water, major plains reservoir levels were about sixty one percent of normal.⁸² The SEO predicted that the plains reservoirs would be empty or very near empty by the end of August. By August, the reservoir storage situation was worse than

74. *Supply Conditions Update June 2002*, *supra* note 4, at 4.

75. *Supply Conditions Update May 2002*, *supra* note 4, at 5.

76. *WATER IN THE BALANCE*, *supra* note 10, at 9.

77. *See Supply Conditions Update June-September 2002*, *supra* note 4. However, by September, the Durango area had received precipitation and one stream gage near the Four Corners recorded a flow of 16,000 cubic feet per second. *Supply Conditions Update October 2002*, *supra* note 4, at 9.

78. *Supply Conditions Update May 2002*, *supra* note 4, at 6.

79. *Id.*

80. *Supply Conditions Update August 2002*, *supra* note 4, at 8.

81. *Supply Conditions Update July 2002*, *supra* note 4, at 9.

82. *Id.* at 3.

predicted.⁸³ Not only were the major plains reservoirs empty except for dead storage, the outlook for refilling the reservoirs was quite poor, affecting the ability of junior ground water diverters to operate out-of-priority. Without adequate reservoir storage available to augment depletions (including winter precipitation to recharge water shortages from winter depletions) the SEO predicted that the junior wells would not be allowed to pump during the 2003 season.⁸⁴ In the San Juan basin, reservoir storage may have benefited from the region's September monsoonal moisture and the few calls for irrigation water to finish their crops.⁸⁵

While the shortage of water was alarming and extreme, the situation for water users was not as dire as it could have been. In fact, the summer of 2002 was also remarkable for the generosity of certain senior water users. In the Colorado basin, the Shoshone Power Plant has two of the most senior calls on the river above Grand Junction; the 1902 senior call sweeps the river when it is in priority.⁸⁶ By May of 2002, the Shoshone Plant's calls had been almost continuous since August of 2001⁸⁷ and the plant voluntarily reduced its call to preserve upstream storage. While this move was made out of the plant's self-interest to ensure maintenance of hydro operations, it had a beneficial effect on other water users whose calls could not come into priority due to the size and seniority of the Shoshone call. In July, the Redlands Power Canal negotiated an agreement with the United States Bureau of Reclamation, United States Fish and Wildlife Service, Colorado River Conservation District and Redlands Power Authority to reduce its demand in exchange for reimbursement of lost power revenues. This agreement avoided simultaneous calls from the Gunnison Tunnel and the Redlands Power Canal.⁸⁸

As of February 2003, the SWSI indices forecast continued drought across the state. With Colorado facing another year of drought and no water reserves left, the question remains: what can we do about it?

IV. "IN COLORADO, WATER RUNS TOWARDS MONEY"⁸⁹

By its terms, the prior appropriation system, if properly administered, is designed to deal with drought. In its simplest formulation, prior appropriation ensures that users who are entitled to water receive water, based solely on their priority date.⁹⁰ Once a water right is decreed, the water official must diligently administer it by the

83. *Supply Conditions Update September 2002*, *supra* note 4, at 1, 3.

84. *Id.*

85. *Supply Conditions Update October 2002*, *supra* note 4, at 9.

86. *Supply Conditions Update May 2002*, *supra* note 4, at 7.

87. *Id.* The plant placed a call on the river consistently since August 2001, except for a two week period in November and December of 2001, when the plant was down for maintenance.

88. *Supply Conditions Update July 2002*, *supra* note 4, at 6.

89. *No Drought of Ideas*, DENVER POST, Dec.1, 2002, at E6 (quoting Governor John Love).

90. COLO. REV. STAT. § 37-92-501 (2002).

terms of its decree.⁹¹ Water officials lack authority to independently assess which users should receive water during times of shortage. Thus, even if a water official believes that municipal users would be better served by water delivery than a downstream senior agricultural user unable to finish a crop because of water shortage, he must deliver the water to the downstream senior.⁹²

In the summer of 2002 there were few overt water disputes,⁹³ with the notable exception of the South Platte basin where the State Engineer's attempts to adopt rules regarding operation of unaugmented wells started a huge water fight.⁹⁴ However, the magnitude of the shortage in Colorado in 2002 and lack of winter snowfall during 2002-2003 led to the introduction of over eighty bills addressing water issues at the beginning of the 2003 legislative session.⁹⁵ Consistent with the peculiar physics of Colorado water law, several of the bills involved water running literally uphill toward money.⁹⁶ Several others proposed changes in the authority of state water officials which would have created a parallel system of SEO quasi-adjudicated water rights to the detriment of the entire system.⁹⁷ At least one bill involved conservation,⁹⁸ two others involved "basin of origin" protections,⁹⁹ and another, sponsored by Speaker Lola Spradley, would have given the water judge explicit authority to consider the effects of water quality in a change case.¹⁰⁰ The following sections take a closer

91. *Id.*

92. *See* Town of Sterling v. Pawnee Extension Ditch Co., 94 P. 339, 341 (Colo. 1908).

93. In fact just the opposite, there was extraordinary cooperation. *See supra* text accompanying notes 86-89.

94. *See* Bijou Irrigation Co. v. Simpson, No. 02CW108 (Colo. Dist. Water Div. 1 Dec. 23, 2002) *aff'd in part and rev'd in part*, 69 P.3d 50 (Colo. 2003).

95. *See* Colorado General Assembly website, at http://www.state.co.us/gov_dir/stateleg.html.

96. *See* H.B. 1001, 64th Gen. Assem., 1st Reg. Sess. (Colo. 2003); S.B. 110, 64th Gen. Assem., 1st Reg. Sess. (Colo. 2003). Both involve appropriations for water projects, including the "Big Straw," which would move water from the Utah state line to the Front Range.

97. *See, e.g.*, H.B. 1001, 64th Gen. Assem., 1st Reg. Sess. § 2 (pre-amended) (Colo. 2003) (proposing to amend statutes to grant the SEO with approval power regarding "replacement plans" to allow out-of-priority diversions without a water court decree during a "drought."); S.B. 73, 64th Gen. Assem., 1st Reg. Sess. (pre-amended) (Colo. 2003) (proposing to provide the SEO with authority to allow out-of-priority diversions from junior wells without requiring a plan for augmentation approved by the water court).

98. *See* S.B. 87, 64th Gen. Assem., 1st Reg. Sess. (Colo. 2003) This bill was the last surviving water conservation measure the 2003 General Assembly considered; on April 23, 2003, it was postponed indefinitely. Despite the worst drought in the state's history, all introduced conservation measures were either actually killed, or effectively killed (such as the "indefinite postponement" of S.B. 87), including as Representative Weissmann's H.B. 1120, 64th Gen. Assem., 1st Reg. Sess. (Colo. 2003), which after its first hearing was sent to the Committee on Military Affairs, a sign of certain death for natural resources bills.

99. H.B. 1233, 64th Gen. Assem., 1st Reg. Sess. (Colo. 2003); S.B. 115, 64th Gen. Assem., 1st Reg. Sess. (Colo. 2003).

100. H.B. 1146, 64th Gen. Assem., 1st Reg. Sess. (Colo. 2003). This bill was

look at two types of legislation considered this term in the Colorado General Assembly: appropriations aimed at building water storage facilities, and statutory changes proposed to “fix” perceived problems with the prior appropriation system. Neither type of legislation proved useful to address water shortages brought about by the 2002-2003 drought. We will also look at statutory solutions to drought impacts that municipal diverters employed that had been adopted by the General Assembly prior to its 2003 session.

A. LEGISLATION

As in past droughts, the legislature has determined that one solution is to build more storage projects.¹⁰¹ The legislature discussed several storage and water supply-spending bills during the 2003 legislative session. Among them, the legislature adopted Senate Bill 236, which requested voter approval to float \$2 billion in bonds for reservoir construction as a part of a so-called “drought package.”¹⁰² Another was the \$500,000 feasibility study of the “Big Straw” contained in Senate Bill 110, also approved by the legislature and signed by the governor.¹⁰³ The Big Straw would move Colorado’s entitlement under the Colorado River Compact upstream from the Utah state line to the Front Range.¹⁰⁴ Critics have suggested that the power needs for such a project could not be provided by conventional power plants, making the project infeasible.¹⁰⁵

The Big Straw feasibility study was part of Senate Bill 110, a kind of omnibus water appropriations bill that also provides three million dollars for a Statewide Water Supply Initiative¹⁰⁶ allowing for an investigation of water supply needs for the state over the next thirty years.¹⁰⁷ Senate Bill 110 initially contained \$190,000 for a study into

defeated. The exchange and augmentation plan statutes already explicitly require such consideration. COLO. REV. STAT. §§ 37-80-120(3), 37-92-305(5) (2002); *see also* City of Thornton v. City & County of Denver, 44 P.3d 1019, 1024 (Colo. 2002).

101. Congress passed the 1902 Reclamation Act on the heels of a crippling drought that covered most of the west between the 1880’s and 1890’s and the Colorado Big Thompson Project in 1937 at the end of the 1930’s drought. DUNBAR, *supra* note 12, at 48-51, 57.

102. *See* S.B. 236, 64th Leg., 1st Reg. Sess. (Colo. 2003). *See also* Press Release, Office of the Governor, Governor Signs SB 236, Initiative to “Save Colorado’s Water” (June 5, 2003), <http://www.state.co.us/owenspress/06-05-03b.htm> (describing the Governor’s views regarding this legislation and its companion bills, H.B. 1318, H.B. 1320, and H.B. 1334).

103. *See* S.B. 110, 64th Gen. Assem., 1st Reg. Sess., § 15 (Colo. 2003).

104. Arthur Kane, *Panel OK’s Big Straw Study*, DENVER POST, Feb. 6, 2003, at A12; Arthur Kane, *\$500,000 Reinserted Into Bill to Examine Big Straw Issue*, DENVER POST, Mar. 4, 2003, at A6.

105. Telephone Interviews with Greg Hoskins, Member, Colo. Water Conservation Bd., and Attorney, Hoskins, Farina, Aldrich & Kampf (Nov. 26, 2002 & Dec. 2, 2002); *\$500,000 Reinserted Into Bill to Examine Big Straw Issue*, *supra* note 104, at 1 (describing operational costs to move water over the mountains at “\$186 million a year”).

106. Statewide Water Supply Initiative “SWSI” not to be confused with the SWSI index conducted by the Division of Water Resources.

107. *See* S.B. 110, 64th Gen. Assem., 1st Reg. Sess., § 14(1).

stream flow yields from United States National Forest Service lands.¹⁰⁸ This arose from discussions within the water community about two studies that have been conducted in northern Colorado and southern Wyoming on “selective clear-cutting” to maximize winter runoff.¹⁰⁹

These types of storage and supply bills may make sense and, except for the dramatic nature of the Big Straw, appear to be an attempt to fund local water supply planning. Yet, in effect, these bills are wholly unresponsive to the current drought. Even if the projects contemplated by these appropriations are built, they will not be of any assistance for at least ten years.¹¹⁰ On the other hand, because of the legal requirements to decree storage rights, providing funding for increased water storage projects should promote planning on the part of water users,¹¹¹ perhaps the best defense against drought.¹¹²

Another category of legislation proposed during the 2003 legislative session sought structural changes to Colorado’s prior appropriation system. The most prominent of these proposals was offered as Senate Bill 73, in which the legislature drafted as a response to the Division 1 Water Court decision invalidating the SEO’s 2002 South Platte River Proposed Rules (“2002 Proposed Rules”) governing the operation of out-of-priority tributary wells.¹¹³

The 2002 Proposed Rules would have continued the SEO’s long-standing practice of approving “replacement plans” for junior wells rather than refusing to administer junior wells out-of-priority until the well-owner obtained a decreed augmentation plan. Over thirty parties, including senior vested agricultural and municipal water rights from all over the South Platte Basin, objected to the 2002 Proposed Rules because the rules disregarded the statutory and constitutional requirements of obtaining a water right to operate out-of-priority.¹¹⁴ The Division 1 Water Court agreed, and used the language within the Supreme Court’s decision *Empire Lodge v. Moyer*¹¹⁵ to invalidate the rules.¹¹⁶ In *Empire Lodge*, the Supreme Court ruled that only a decreed plan for augmentation could create the right to divert water out-of-

108. \$500,000 Reinserted Into Bill to Examine Big Straw Issue, *supra* note 104.

109. Chuck Troendle, Address at the Colorado Drought Conference: Managing Water Supply and Demand in Time of Drought (Dec. 4, 2002).

110. Melinda Kassen, Perspective, *A Smart Response to the Drought*, DENVER POST, Mar. 9, 2003, at E1; Telephone Interview with Greg Hoskins, *supra* note 105.

111. To obtain a water rights decree, including a storage decree, applicants must show the water court that there is need for the water, that the project will not injure vested rights, that it is not speculative, and that it can and will be completed in a reasonable time with diligence. COLO. REV. STAT. § 37-92-305 (2002).

112. Although a conservation-minded user-community doesn’t hurt either. See Mocine-McQueen, *supra* note 6.

113. See generally OFFICE OF STATE ENG’R, AMENDED RULES AND REGULATIONS GOVERNING THE DIVERSION AND USE OF TRIBUTARY GROUND WATER IN THE SOUTH PLATTE RIVER BASIN, COLORADO: ORDER OF THE STATE ENGINEER (2002) [hereinafter 2002 PROPOSED RULES].

114. *Bijou Irrigation Co. v. Simpson*, No. 02CW108, slip op. at 1-2 (Colo. Dist. Ct. Water Div. 1, Dec. 23, 2002).

115. *Empire Lodge Homeowners’ Assn. v. Moyer*, 39 P.3d 1139, 1143 (Colo. 2002).

116. *Bijou Irrigation Co.*, No. 02 CW 108, slip op. at 9.

priority.¹¹⁷ The Water Court found that the SEO had no authority, through replacement plans or by any other means, to determine the right to divert water out-of-priority.¹¹⁸ Responding to the SEO's request for an expedited appeal, the Supreme Court set an accelerated schedule of briefing and oral argument and on April 30, 2003, affirmed the Water Court's invalidation of the rules.¹¹⁹

Senate Bill 73 as introduced in January of 2003 was designed to validate the 2002 Proposed Rules.¹²⁰ As introduced, the bill would have significantly changed Colorado water law by vesting for the first time in the executive branch authority to carry out administrative adjudication of tributary ground water for out-of-priority diversions through "replacement plans."¹²¹ However, after intensive negotiations, the adopted version of Senate Bill 73 dropped the change in SEO authority, instead providing Division 1 tributary well-owners and others who had operated under the SEO's "replacement plan" scheme an additional three-year grace period to file for an augmentation plan with the Water Court.¹²² During the three-year grace period, these well owners could continue to operate under administratively approved "Substitute Water Supply Plans" ("SWSP").¹²³ The statute recites "intent" on the part of the General Assembly to limit to three years the time for unaugmented well owners to file for an augmentation plan, there is no effective means to prevent subsequent legislatures from continuing the exemption.¹²⁴

Colorado Revised Statute Section 37-92-308(3) imposes on SWSP applicants who have not already filed for a plan for augmentation in Water Court minimum statutory requirements regarding the SWSP request. Section 308(3) applicants must provide detailed information regarding the wells to be operated out of priority, the nature and location of augmentation sources, historic use analyses when surface augmentation rights are involved, consumptive-use calculations using the Blaney-Criddle method, projected number of acres and crops to be irrigated.¹²⁵ The new statutory provision also imposes on the SEO the task of making detailed findings of fact regarding the proposed SWSP, including ensuring that stream depletions caused by out-of-priority well pumping are replaced in time, location and amount, requiring

117. *Empire Lodge Homeowners' Assn.*, 39 P.3d at 1143.

118. *Id.*

119. *Simpson v. Bijou Irrigation Co.*, 69 P.3d 50, 55 (Colo. 2003). Ironically, the Supreme Court announced its decision on April 30, the same day the Governor signed a much negotiated and amended S.B. 73.

120. *Compare* S.B. 73, 64th Gen. Assem., 1st Reg. Sess. (Colo. 2003) (pre-amended) with 2002 PROPOSED RULES, *supra* note 113. Much of the language is verbatim.

121. *See* S.B. 73, 64th Gen. Assem., 1st Reg. Sess.

122. S.B. 73, 64th Gen. Assem. 1st Reg. Sess. (Colo. 2003) (signed by Governor Owens on April 30, 2003) (to be codified at COLO. REV. STAT. § 37-92-308(3)).

123. *Id.* § 37-92-308(3)(a).

124. *Id.* ("The general assembly finds that this three-year period is a sufficient amount of time to develop augmentation plan applications for these wells, and there shall be no subsequent extensions of this deadline.")

125. *Id.* § 37-92-308(3)(b)(I).

that the depletions to be replaced include out-of-priority well pumping that began any time after January 1, 1974, and avoiding expansion of use by imposing volumetric limitations where appropriate on direct-flow augmentation sources.¹²⁶

Because section 308(3) SWSPs are not filed contemporaneously with a Water Court application, the provision also includes notice provisions, requiring the SEO to maintain a mailing list of “interested persons” for a nominal fee.¹²⁷ Whether the notice is constitutionally sufficient remains to be seen.¹²⁸ Senate Bill 73 also provided for a contested case hearing on the merits of the SWSP proposal; review of the SEO’s decision is made *de novo* to the Division 1 Water Court.¹²⁹

Insofar as the adopted version of Senate Bill 73 avoided vesting in the SEO authority to adjudicate water rights, the adopted version avoided a crisis with regard to the Colorado prior appropriation system. However, the seriousness with which SWSP applicants under section 308(3) address themselves to developing plans to meet the statutory requirements, as well as whether the SEO limits consideration to those SWSPs that are facially valid under statutory standards, will determine whether or not Senate Bill 73 achieves the compromise intended by the parties to the negotiations.

The most troubling aspect of section 308(3) is that its adoption disregards existing statutory provisions, specifically Colorado Revised Statutes section 37-92-308(4) adopted in 2002, that accomplish much the same ends but only require that the out-of-priority well operator file for a plan for augmentation in the Water Court. Section 308(4) relief was available to well owners during the 2002-2003 drought calling into question the need for section 308(3) legislation at all. As the examples in Part I of this paper suggest, junior water users are disadvantaged by their place in the priority system; however, Colorado law (unlike other western states)¹³⁰ provides maximum flexibility to water users to operate out-of-priority through plans for augmentation and exchanges, thereby vesting some value to junior water rights if they obtain a court-decreed augmentation plan. Protecting the operations of a group of junior well owners rather than ensuring out-of-priority operations properly replace depletions owed to the river as well as decreed senior water rights undercuts the integrity of the prior appropriation system.

126. *Id.* § 37-92-308(3)(c).

127. S.B. 73, 64th Gen. Assem. 1st Reg. Sess., § 1 (to be codified at COLO. REV. STAT. § 37-92-308(3)(b)(II)).

128. Mailing list notification likely raises due process problems, as the notice provided to vested water rights holders regarding application and decision-making regarding SWSP’s probably does not meet the standards required by *Mullane v. Cent. Hanover Bank & Trust Co.*, 339 U.S. 306, 313-16 (1950).

129. S.B. 73, 64th Gen. Assem. 1st Reg. Sess., § 1 (to be codified at COLO. REV. STAT. § 37-92-308(3)(b)(IV)).

130. *See, e.g.*, WYO. STAT. ANN. § 41-3-106 (Michie 2001) (regarding the terms under which exchanges may operate).

B. EXAMPLES OF MUNICIPAL WATER USERS' MEANS OF MITIGATION

Municipal water users are likely to be hit hard by continuing drought.¹³¹ Unlike agricultural water users who can change, reduce or abandon crops, utilities have an obligation to provide water at the tap for customers. In the 2003 legislative session, there was little legislation directly addressing the municipal shortfall.¹³² Section 308(3) is a statutory amendment to an already flexible statutory provision, section 37-92-308, designed to provide for temporary operation under SWSPs during the pendency of an augmentation plan case.¹³³ During 2002, numerous municipal users took advantage of the operational flexibility offered by section 37-92-308, particularly through sections 308(4) and 308(7).

Section 308(7) provides for "emergency" relief when water supply conditions are likely to affect "public health or safety."¹³⁴ During 2002, cities were required to take official steps to demonstrate a water emergency. For example, the SEO has determined that a city is under the "emergency" provisions if it has imposed watering restrictions.¹³⁵ Emergency relief lasts ninety days, a provision which is designed to avoid long-term injury to other water rights on the stream.¹³⁶ This limitation arises because of a concern that injury to other water users will result from the long-term operation of an "emergency" SWSP.¹³⁷ When applicants file water rights applications with the water court, they are published in a monthly "resume"¹³⁸ providing notice to all other decreed water rights on the stream of the pending water rights application and opportunity to challenge the application.¹³⁹ The basis

131. See Marsha Austin, *Water Restrictions Expected to dry up Nursery Business*, DENVER POST, Feb. 12, 2003, at A9; see also Joey Bunch, *Denver Water Eyes Crack Down Proposal*, DENVER POST, Feb. 11, 2003, at B1 (reporting that reservoir levels are likely to be forty-five percent of normal by April of 2003).

132. Excepted is Senator Linkhart's conservation measure. S.B. 87, 64th Gen. Assem., 1st Reg. Sess. (Colo. 2003).

133. H.B. 1414, 63rd Gen. Assem., 2nd Reg. Sess. (Colo. 2002) (codified at COLO. REV. STAT. § 37-92-308). Section 37-92-308, like Senate Bill 73, was itself a response to a court decision, *Empire Lodge Homeowners' Ass'n v. Moyer*.

134. COLO. REV. STAT. § 37-92-308(7). Senate Bill 73 extended the emergency provisions to agricultural augmentation wells included in a SWSP request under section 308(3) or 308(4).

135. See Office of the State Eng'r, *Policy 2002-2, Implementation of HB 02-1414 (Section 37-92-308, C.R.S. (2002)) Regarding Substitute Water Supply Plans* (July 2, 2002); see also Letter from Kenneth W. Knox, Chief Deputy State Eng'r, to Karen Wogsland, Water Res. Administrator, City of Thornton (Jan. 17, 2003) (approving Emergency TSSP for the City of Thornton); Telephone Interview with Karen Wogsland, Water Res. Administrator, City of Thornton (Feb. 15, 2003).

136. It is possible that water rights may be injured in the interim, and the SEO is supposed to examine the proposed emergency SWSP to determine qualitatively whether such injury may occur; he may deny the emergency SWSP on this basis.

137. See COLO. REV. STAT. § 37-92-308(7).

138. *Id.* § 37-92-302(3)(a).

139. *City of Thornton v. Bijou Irrigation Dist.*, 926 P.2d 1, 24 (Colo. 1996). Note, however, that the burden of proof remains on the applicant, both to demonstrate that the resume provided sufficient notice, *Stonewall Estates v. CF&I Steel Corp.*, 592 P.2d 1318, 1320 (Colo. 1979), and that the application should be granted.

of the emergency provision was that the water court adjudication process can be lengthy and in the midst of an emergency, water users needed a means to provide for shortages.¹⁴⁰ By making “emergency” relief truly temporary in nature, the injury to decree-holders and possible takings issues may be mitigated.

Cities may also obtain SWSPs under section 308(4), provided they first file with the water court. By contrast with emergency relief provided under section 308(7), the relief awarded under section 308(4) is not available until an applicant files his water court application and receives statements of opposition. Water rights applicants can then make application for a SWSP to the SEO, who is required by section 308(4) to give notice to all those who filed statements of opposition in the water court.¹⁴¹ Objectors to the water case have thirty days to file comments on the SWSP.¹⁴² Although not required by statute, the SEO may hold an informal meeting with the objectors and the applicant to attempt to resolve differences over the SWSP operation.¹⁴³ However, the statute provides that no presumption attaches to the SEO’s determination regarding injury or non-injury from operation of the SWSP, and objectors are not limited or bound by their comments filed with the SEO when it comes time to litigate the water court case.¹⁴⁴ Section 308(4) provides temporary relief insofar as the water court decree following adjudication (and appeal, if any) replaces the SWSP.¹⁴⁵ However, this type of SWSP alone would not address the emergency needs of cities, so the corollary provision in section 308(7) is helpful.¹⁴⁶

Interruptible supply contracts with agricultural users are another useful means for municipalities to increase their water supplies. In most cases, these types of arrangements will work only if the municipality owns shares in a particular ditch company;¹⁴⁷ because many metro area municipalities own shares in ditch companies, this is not usually a hurdle.¹⁴⁸ When the arrangement is between ditch company members, the agreement is often nothing more than a letter agreement in which the agricultural user agrees to forego his diversions in exchange for consideration.¹⁴⁹ A municipal user to

140. COLO. REV. STAT. § 37-92-308(1)(a).

141. *Id.* § (4)(a)(III).

142. *Id.*

143. *Id.* § (4)(a)(IV).

144. *Id.* § (4)(c).

145. COLO. REV. STAT. § (4)(a).

146. *Id.* § 37-92-308(7).

147. Most ditch company operating rules do not allow water to be leased to those who are not “under” the ditch or who do not own shares in the ditch. *See, e.g.,* By-Laws of the Colorado Agricultural Ditch Company, art. III (Amended Dec. 15, 1990) (on file with the author).

148. Telephone interview with Mark Koleber, Director of Water Resources, City of Thornton (Feb. 4, 2003).

149. *See, e.g.,* Interruptible Water Use Contract between Boulder Creek Farms Inc. and the City of Boulder (Apr. 17, 1998) (on file with the author).

paying the ditch member's dues or assessments represents a common form of consideration in 2002.¹⁵⁰

A more complicated type of contract may arise if the city wants to put in place the right to "interrupt" the irrigation use of water to obtain supplies during a drought.¹⁵¹ One contract used by the City of Boulder in the 1990's provided for notice to the irrigator in November of the likelihood that it would interrupt irrigation supplies; then, prior to May 1, if Boulder determined it wanted to use the irrigation water, it was required to pay the irrigator's assessments.¹⁵² If it determined that it needed the irrigation water after May 1, the contract required Boulder to compensate the irrigator for any losses caused by being unable to complete his crop. The contract also required Boulder to obtain any decrees required to use the water in ways not contemplated by the irrigators' decrees.¹⁵³

This amounts to a contract that provides for the right of temporary eminent domain. In locations where water is available, this type of municipal planning could be easily accomplished. However, last summer along the Front Range, there was little water available for decreed agricultural rights leaving little incentive to engage in these types of arrangements.

V. CONCLUSION

Drought arises from patterns of both climate and water use. The drought of 2002-2003 may be the most severe since Anglo settlement of Colorado, although paleoclimatic records suggest it is neither severe nor unusual. Colorado's current water rights laws provide a means to address drought. Yet, implicit in the combination of "drought" and "prior appropriation" is the possibility that not every water user will get his or her water. Both agricultural and municipal water users have ample flexibility under the current statutes to obtain water supplies, including resort to emergency and temporary operations under section 37-92-308 of the Colorado Revised Statutes.

150. *Id.* § 3.

151. *Id.* § 4.

152. *Id.* § 4.3.

153. *Id.* § 4.5.