Drought, Climate Change, and Colorado's Policy Discussion: Participation or Procrastination?

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1. The State Creates New Policy Discussion

Water, drought and even climate change policy problems are attracting attention, but policy response in the Western US is not yet clear.[1] This presentation describes unease over the pace of discussion about rules of the game while play proceeds. In Colorado, as other Western Prior Appropriation water law states, the right to use water is a saleable private property right, though transfers may not injure other water rights (generally, see Getches 1999). Anyone may discuss the impacts of water transfers (e.g. Howe and Goemans 2003, Western Water Policy Review Advisory Commission (WWPRAC) 1998), and the legislature may debate bills on impact mitigation (about 20 since 1988), but meanwhile, business goes on.

Public participation in Colorado water issues increased dramatically with two innovative state-sponsored processes: the State-wide Water Supply Initiative, ("SWSI") and the Interbasin Compact Committee/Colorado Water for the 21st Century process ("HB1177" process). There are extensive websites for these, with reports, meeting minutes, and legislative actions, so this extended abstract will not elaborate. Please see < cwcb.state.co.us/IWMD/Pubs.htm > for SWSI postings, including the Phase 1 report. For information on the Interbasin Compacts, and Basin Roundtables, please see <www.dnr.state.co.us/> and select "Interbasin Compact – Water for the 21st Century". Previously, public participation in Colorado water issues had been almost entirely reaction to projects or regulatory actions. Water supply is planned by water providers, and in general the city council is the client, and because it is a competitive private market, dealings and prices are often secret (Olinger and Plunkett 2005, Nichols et al. 2001).

Water planning in Colorado changed in response to denial of permits to build the Two Forks Reservoir, decided in 1990, amid a great deal of frustration (see Rhodes, et al. 1992 for thorough description). Rapid population growth in the unusually wet 1990s sharpened anticipation of supply problems (WWPRAC 1998, SWSI 2004, Pielke et al. 2005). By 2002, there was serious multi-year drought in progress and supply problems even for the very large water providers. The General Assembly (Colorado legislature) made several changes in water law to facilitate transfers, and fund the Statewide Water Supply Initiative process (SWSI). " *In Colorado, the need for wise management of water and the equitable rights to its beneficial use led to the creation of a legal framework of water rights that is a model for the arid states of this nation. Known as the Prior Appropriation Doctrine, this system has served Colorado citizens for over a century of growth and prosperity. It will continue to provide the foundation for water administration and allocation for centuries to come. But new forces and relentless change compel us to more completely understand and efficiently use our water resources, and complement our tradition with both new approaches and contemporary tools.*" (SWSI Phase 1, Exec. Summary.)

[1] New in 2008: Following Governor Ritter's Climate Action Plan, excellent science was applied in "Climate Change in Colorado", from the Western Water Assessment and NOAA, requested by Colorado Water Conservation Board; at: < http://cwcb.state.co.us/Home/ClimateChange/ClimateChangeCOReport.htm>. The information in support of policy is as good as it can possibly be.

The SWSI was not intended to establish or support a state water plan (compare California Department of Water Resources 2005). In Colorado, it is often asserted that "prior appropriation is our water plan", and thoughtful people have argued that incremental market-driven change is better than centralized planning, often speaking in emotional terms of local right to choice. (For simplicity this abstract will not cite who, which meeting and when; most of this is based on direct observation and notes made by the author if not cited.) "Private property!" is treated as negation of the idea of planning (Jacobs 2003). Colorado has no significant support for growth management planning (Godschalk 2004), though "smart growth" as a term is in vogue. The water rights held by a farmer are frequently more valuable than the rest of the operation and assets, and one frequently hears, "It's my 401(k)!". In a period of agricultural economic stress (with the recent exception of the ethanol boom),[2] this is very serious business. Water providers frequently insist that getting water as cheaply, quickly, and securely is their job, (e.g. in SWSI meetings) though it is fashionable to talk of cooperation and collaboration. There is not and will not be state water planning here.[3]

Following the SWSI innovation of basin roundtables with wide interest group representation, and similar structure was instituted in the 2005 legislation creating the Interbasin Compact Process. " Water users, water managers, governmental and nongovernmental organizations, and citizens have worked hard to help ensure that their interests are addressed when making water-related decisions. This dynamic has challenged us all to identify new approaches and collaborative solutions. This is the backdrop behind the collaborative Colorado Water for the 21st Century Act. This Interbasin Compact process is based upon the premise that Coloradans must work together to address the water needs within our entire state. The Colorado Water for the 21st Century Act creates a framework to encourage dialogue on water, broaden the range of stakeholders actively participating in the state's water decisions, and creates a locally driven process where the decisionmaking power rests with those living in the state's river basins." (Overview of process, <www.dnr.state.co.us/>). The substantive authority is, however limited to assessing basin supply and demand, and establishing policy, but there is no authority to impair or interfere with contracts or the right to contract for water (C.R.S. 37-75-102).

2. The problem: here comes trouble, but we're not looking (in public).

The SWSI did a superb job, and identified the "gap" between water supply and water demand in Colorado in 2030, with some severe limitations on the study. One was taking at face value the water provider claims of supply projects and processes in progress, however probable their success(SWSI reports, and forthcoming Phase II reports). [4] Another was not considering climate

[2] By the middle of 2008, it had become clear that agricultural input prices were rising faster than output prices; USDA, 2008b, Farm Income and Costs: 2008 Farm Sector Income Forecast, in ERS/USDA Briefing Room, Accessed 22 September 2008, <http://www.ers.usda.gov/Briefing/FarmIncome/nationalestimates.htm>, and with land prices rising to capitalize the new income potential expected, the net usable gain for farmers was shrinking fast. It is not clear that agricultural security has been much improved.

[3] It is also still unclear that a role for the state in addressing the public interest is forthcoming, however that is defined. It may have been the intent to find that in the Interbasin Compact Committee, which is as of December 2008 engaged in “visioning”, but the outcomes and effects are not yet clear. This may be the beginning of defining a consensus, but there remain important questions about the suitability of this process for intake and use of technical information in many fields, as may be needed to go beyond only reaction to what is presented.

[4] The author was informed at the Arkansas Basin Roundtable that needs assessments for each basin would not question water provider claims, and there is no apparent evidence that needs assessments are

change and cumulative impact limits on water transferability. The 538 page 2004 report uses the word "climate" 35 times (thank you, Adobe Acrobat ™ software!), but long-term climate change is mentioned only in one table as a factor that might increase or decrease water availability, and in regard to only two river basins; this may reflect extensive comments on climate change issues (available from author) to those two basin roundtables. Even with those limitations, the report showed that competition for water will sharply increase. The SWSI project used interest-group representation, following contemporary planning practice. The "bottom-up" process did a great deal to legitimate the project and the results. In Phase II, state-wide technical round-tables were also convened with interest representation, to identify issues and answers in three particular areas (alternatives to agricultural "buy-and-dry"; conservation and efficiency potential, and priorities for recreational and environmental needs; a fourth group was to specify alternative means of meeting the gap; final reports should be posted before July 2007).

Increasing public concern with severe impacts on local economies from which water has been transferred underlies conflict in water issues (see SWSI report, Howe 2000, WWPRAC 1998); local and regional environmental impacts are also a concern (SWSI). There is no "new water" left, in practical terms, so agriculture to urban transfers will be needed. The extent will be affected by more than urban growth and the normal factors well-described in SWSI. There will also be serious impacts on supply and demand – scarcity – from climate change, including increased drought. There will very likely be reductions of transferable agricultural water because of cumulative impacts that will achieve legal force under the Endangered Species Act, (ESA) or Total Maximum Daily Loads (TMDLs) of pollutants or water quality standards. Cumulative impacts are not examined in water transfers in Colorado, and only very recently has there been authorization for a Water Court (which must adjudicate almost all changes of use of water rights) to even consider any impacts of a large transfer on anything except other water rights. Meanwhile, with each transfer away from rural and agricultural uses, the water landscape changes, and cumulative changes increase.

"The rules governing water transfers from agriculture to municipal uses are one place the ESA's pressures will surely be felt." (Doremus 2001: p 410.) Colorado, Nebraska and Wyoming have just finished agreement on a very expensive plan for Platte River Recovery (Bureau of Reclamation 2006). There are other examples, including Colorado River ESA programs, California Bay-Delta programs, Columbia River Basin programs, Rio Grande programs… The SWSI study does not ignore the ESA, but Colorado does not invest much in early detection and warning for forthcoming ESA problems, and in fact, water leadership may regard the ESA as a nuisance to work around (my interpretation from Colorado Water Congress annual meetings 2001, 2002, 2004, 2005, 2006, 2007 – attended and notes reviewed for this presentation).

Changes in water quality from transfers and associated management are another source of cumulative impact problems. In pursuit of water quality affected by non-point-source pollution and changes, Total Maximum Daily Load standards are increasingly imposed; see <www/epa.gov/owow/tmdl/intro.html> for the basics. The traditional and entrenched separation of water quality issues from water quantity issues has limited consideration. But, as changes cumulate, trouble is coming (Doremus 2001, notes this, for example). Salinity increases may

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not being conducted with respect to climate change (for consumptive or non-consumptive needs). This casts some doubt on the value of these assessments and the logical sequence of steps in the Interbasin Compact Committee process.

prompt down-stream states to seek standards; there is already a huge and expensive effort on the Colorado River to reduce salinity (www.usbr.gov/dataweb/html/crwq.html).

Climate change will interact with cumulative impacts and non-planning.[5] In 1992, Rhodes et al. observed (p. 11) that the science *then* showed there could be "large changes in the regional and seasonal distribution of precipitation and runoff…". 15 years later, the IPCC Fourth Assessment confirms previous assessments, adding new empirical evidence from observed change as well as improved modeling. "It is very likely that hot extremes, heat waves, and heavy precipitation events will continue to become more frequent" (Working Group I Summary for Policy Makers, p 16), with changes in run-off, droughts, snow storage of water, decreasing snowpack in the Western mountains of North America with reduced summer flows, and warmer and fewer cold days and nights, and more hot days and nights (Working Group II Summary for Policy Makers). Specifically for the Western US, there is a huge literature on hydroclimatology, but the point for this argument is how little expectations have changed (for more older views, see AWRA volumes, Adams Ed. 1999, and Herrmann Ed. 1992, on climate and water supply).
For the Western US, integrated assessment of "best case" scenarios for climate change described by Barnett et al.(2004) shows that current water management systems are already seriously threatened. Edmonds and Rosenberg's group report that under <u>all</u> scenarios, irrigation water use declines, even with strong growth in yields and no fossil fuel constraints on energy or agricultural inputs and without additional competition for water (Edmonds and Rosenberg 2005: 155, and Rosenberg and Edmonds 2005). [6]

Western agricultural water is in trouble from climate. Earlier climate impact assessments for the U.S. Global Change Research Program (Gleick et al. 2002, Ojima et al. 2002, Reilly et al. 2002, 2003, Wagner Ed. 2003) strongly support increased flexibility in management and anticipate stress. We also face additional risks from more severe and frequent extreme events (Kim 2005). The East side of the Rockies is one of the areas of strongest agreement among the models (Ojima et al. 2002) and there is no apparent change in the forthcoming IPCC 2007 reports (<www.ipcc.ch/>. In fact, expectations of trouble for this area are stronger than ever. There are still different views of climate change or its implications, such as those of Colorado State Senator Harvey, who said, on April 27th, 2007, "I believe there is a concerted effort by many environmentalists in the world to do us harm because they don't want us to have the greatest country in the world be the United States." Professor William Gray said, "This is driven by the scientists getting money to study it." (Hartman 2007). The USDOI "Water 2025 Initiative" originally announced as joint with USDA does not apparently mention "climate", though drought appears 15 times in the 2005 report (<www.doi.gov.water2025>).

The Colorado Water Congress (<www.cowatercongress.org>) is "the stomping ground of the water buffaloes", and has had great success influencing water related bills in the legislature and as the voice for Colorado water in federal affairs. It offers, in my opinion, the best view of water

[5] This paragraph predates the Climate Change in Colorado report (supra, note 1), but it may have some interest because the new information is confirming, not much changing, the old information. It may be a few more years or longer before fine-scale modeling can resolve (sorry) questions of precipitation increase in mountains, albeit with changed seasonality, but increased temperature effects on water demand in all uses is not open to serious question.

[6] It is important that these studies showed loss of irrigation water even with increased precipitation, as the relative competitive advantage of irrigation versus dryland farming changes. Integrated assessments are done using carefully linked sets of “best available” models of the different elements, including economic as well as climate elements, and many others.

politics an outsider can get, and in a private competitive oligopsony, almost everyone is an outsider. I must add my respect and affection for most of the "buffaloes", who have largely done great and ethical public service. This group is an important barometer since water providers look to the largest and most professional providers for guidance (Rayner et al. 2006).

In 2005 there was one mention, which sank with no apparent impact, of climate change as a factor in water issues in Colorado. (by John Stencel of the Rocky Mountain Farmer's Union in a Water Congress panel discussion of a couple dozen water leaders). Before that (2001, 2002, 2004) I heard no mention. In 2006, there was almost a mention, but not quite. In 2007, in sharp contrast, there were four presentations on climate change (and others at other meetings).

Drought planning and response is also part of the picture. In federal policy affecting individuals, US Department of Agriculture the report of the Agricultural Water Security Listening Session meeting (Dobrowolski et al. 2005) acknowledges climate change. Before that was a report in 2004 with glancing mention, and before that a study in 1996 (Schaible Ed. 2004, Schimmelpfennig et. al 1996). Increasing frequency of drought as part of climate change is generally agreed (IPCC), but policy results in USDA programs may not have appeared yet.[7] As far as policy affecting water providers and public agencies, there is acute awareness of the science in NOAA research, and the National Drought Mitigation Center, and the new National Integrated Drought Information System (forthcoming, recently authorized)[8], but implemented action is harder to judge. The most important change in thinking may be acceptance of "paleo-drought" studies as basis for believing that climate can be different; (see CLIMAS, Climate Impacts Group, and Western Water Assessment projects <www.climate.noaa.gov/cpo_pa/risa/> ; SWSI Phase 1 report). This is not public acceptance of climate change, although for some it may have helped response to the Drought centered on 2002 (Pielke et al. 2005 define that event in severity). Generally, drought responses (e.g. relief, disaster assistance, see USDA for press releases, for examples) are for restoration of prior conditions, which must presume "things will get back to normal", warranting minimal change to conditions and trends (see USDA's "Farm Bill 2007 Theme papers" for great information). Response to drought is not response to climate change if it is restoration to vulnerability, but it might serve other purposes.

3. The black box of water deals in Colorado.

So, trouble is coming, in cumulative impacts and in climate change, and in their ugly and inexorable interactions. And, in water policy, we're not looking like we're looking. Why not? And so what? Not publicly acting does not mean that nothing is happening. We're talking more than ever about changing the rules, but the game is still on. *There is no "no action alternative"*.

Water sales are not public, despite the public interests involved. There is public notice in Colorado only when a change in use or place or timing of use of water rights is sought. The water may be legally committed with no public disclosure. And the price paid may never be public knowledge, which means that price discovery is profoundly skewed. Compare this to real estate, which is also utterly place-specific. People read about house sales in the Sunday papers, and the prices paid are public. There are good reasons for that, and why they don't apply to water is a mystery to me, except that water is treated as personal rather than real property (but there are still tax consequences of sales). Water providers are audited for quality, but not for quantity; why not? (Dr. Edna Loehman's question.) SWSI indirectly notes impending problems

[7] As of December 2008, there are signs of change, but this statement has not been reviewed or updated.
[8] See <www.drought.gov>, the new website; it is very rich in information sources.

for frighteningly large numbers of residents whose water supply is not secure (e.g. mining depleting groundwater), and this has been a concern for decades, but the state does not plan.

In the oral presentation there will be some fun with dramatic renditions of stories from newspaper coverage of secret deals, pre-dawn meetings and deliberate misinformation on prices paid, by public officials. Please read the Olinger and Plunkett 2005 stories of how secrecy and competition are sharply affecting water markets, and also affecting costs and benefits. "If a whole lot of money ends up in someone's pocket, it probably wasn't an accident." And, "if you are winning, you probably like the rules."

4. Participation?

Judging by the standards for planning exercises and development of public policy with public participation, the SWSI and the HB 1177 processes are remarkably good. The "state of the art" recommendations when they are published are in the "Green Books" from the International City and County Management Association (So et al. 1986, Hoch et al. 2000; Burby 2003). In part, the whole problem of water policy and water planning in Colorado has been treated as a policy formation process: we have this very high growth of demand with a limited supply (ignoring in public some problems), and we have not "solved" the water supply problem or built any big storage, so we have a policy problem. Some see the lack of public support for big storage as the problem, but others see the resistance and public distaste for de-watering large areas of agriculture as the problem (how large the areas will be is another problem). And public support for very expensive projects is needed, especially in a very severe fiscal situation. So, the SWSI and HB 1177 processes serve important goals of legitimation (Johnson et al. 2006) and policy re-discovery or development. This is a very good set of goals.

"When planners use consensus-building principles and techniques, they increase the likelihood that the resulting plans, programs, and public policy will be successfully implemented. … When planners design, run, or participate in successful open, collaborative, participatory, and consensus-building processes, they make the machinery of democracy work better. Sometimes consensus building is used as a lubricant for making traditional democratic representative decision-making mechanisms run more smoothly. At other times it works as a solvent for dissolving impasses and conflicts between interests." Klein, 2000: 423. As consensus building, the process is especially valuable for combining the consideration of goals (what are the needs?) with means (what could be done?), and allowing them to influence each other, rather than treating the ends and the means as separate in the technocratic tradition. Goals are "evolving, contested, and inextricably linked with alternatives." (Willson et al. 2003: 361). "Discussion is the essential link between analysis and decision-making." (Willson et al. 2003: 366). "Planning well done organizes hope, enhancing our abilities to imagine our communities as we might yet really live in them, while planning done poorly diminishes what we imagine we can do, weakens our hope, and discourages action…" (Forester 2006: 447).

The stated intent of the legislation and discussions of the projects and meetings of both SWSI and the HB1177 roundtables make clear that this is the goal – to create water policy with consensus as much as possible, to enable and implement actions and escape gridlock and reduce social and other damage. Is that sufficient? Most of the literature suggests that planning success depends in part on having meaning, as in influence on the outcome. The SWSI was entirely advisory, and the HB1177 groups are expressly given no power to impair any water right or ability to enter agreements or contracts… (C.R.S. 37-75-105(3)). There will be no obvious

immediate impact, and meanwhile, parties seeking deals are continuing with business as usual. It is five years after the Drought of 2002 (at its worst), and we're talking in new ways about policy, but is that all that is happening?

5. Procrastination?

Who is affected by delaying change in the rules, or resolution of conflicts, whatever it may be, including perhaps no change? There are three important hidden factors affecting the perception of scarcity and the perception of value of agricultural water. Markets work well only with sufficient information, and the secret competition and non-disclosure of prices in water sales almost certainly injures the many small non-engineer non-lawyer non-broker sellers more than the very few highly-professional water departments of big cities. Disregard of cumulative limit problems is disregard of scarcity-increasing situations which should affect perception of future values. And, treatment of climate change and impacts as a political option rather than science similarly delays the market's recognition of factors that affect water values. If all of these factors did not seem beneficial to buyers and hurtful to sellers, it would be easier to suppose that this was not a known situation. Cities are known to be examining water supply needs in climate change (e.g. American Water Works Association Research Foundation projects, and other efforts), but this has not been well publicized (author's personal knowledge from participants in those projects) though it does not seem to be highly confidential. And there is just no credibility to the idea that some of the best water engineers in the world are not paying attention.[9]

As well as changing prices and perceived values from public recognition of these factors, changes in the rules of the water game will almost surely include increased costs for mitigation of social impacts in areas of origin, and increased costs for revegetation and soil management in formerly-irrigated lands (cost information has so far not been revealed to me despite frequent requests; this is business…).

City water rate-payers have voted to spend about $3.8 Billion in 110 elections in Colorado on open space, conservation, farmland preservation, and related projects (see "Conservation Vote" on website for Trust for Public Land), to say nothing of private contributions through NGOs, but municipal officials may still regard their mission as "get it as cheap as possible". Professor Doremus wrote in 2001, "The link between three highly controversial issues in today's American West, water, urban population growth, and the protection of endangered species, has become impossible to ignore." (2001: 361). This was probably the only error in that article. Policy will change, perceptions will change, and prices will change, but when? If we are committed to markets instead of planning, why not well-informed working markets? Why not now?

[9] In fact, in several conferences in 2008, private sector engineers have given excellent presentations which demonstrate how seriously their clients are taking climate change; one example is the Governor's Drought conference: http://cwcb.state.co.us/Home/GovernorsDroughtConference/>.

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