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DITCH AND RESERVOIR COMPANY PLANNING

Contents

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1. INTRODUCTION and SUMMARY

Better planning capabilities for Colorado's ditch and reservoir companies can help these companies better adapt to changing social and environmental pressures. Unfortunately, Colorado's ditch and reservoir companies are not well positioned to adequately protect their interests with the continuing and substantial pressure for their water resources. Urbanization issues, municipalities seeking ditch company water for urban use, and the increasing cost of doing business in today's regulatory and legal environment, have vastly complicated the matter of running ditch companies in Colorado.

Many ditch companies have not been operated in a manner that approaches the optimal use of their resource base. DARCA believes that many ditch company struggles can be traced to a shortage of resources for adequately dealing with problems, pressures, and opportunities. Additionally, there may be inherent characteristics of some company structures that seriously hinder effective planning strategies including limited resources for better decision making. Few ditch companies have in-house staff such as lawyers, engineers, and planners to help navigate today's complex world. With less clarity in their options, many companies are risk-averse to the point of not willing to explore and embrace opportunities that may be extremely lucrative for their companies.

Ditch companies deal adequately with short term concerns but internal planning rarely incorporates the long term. The directors of ditch companies, shareholders themselves, place primary emphasis on the continuation of water delivery on a seasonal basis. Perhaps, shareholders of the ditch companies may view the ditch only as an entity that allows access to their water right and not as their own business entity that needs to prosper in the coming years. DARCA is advocating that planning activities in the medium and long term be strengthened. Funds need to be set aside to help ditch companies plan for their futures; some ditch companies are cognizant of their needs but need additional resources. DARCA is advocating for funding that would address Colorado's Water Plan (CWP) stated objectives of avoiding the dry up of agricultural lands and keeping agricultural resilient in the face of increasing drought and climatic variability. (Colorado Water Conservation Plan 2014)

2. BACKGROUND

From the national and regional perspective, one of the critical problems facing U.S. agriculture is the explosion of rural residential development and the fragmentation of peri-urban farmlands which are historically the West's best soils and water (statistics on this are frequently updated

from new US Department of Agriculture studies, such as Census of Agriculture (See Hoppe 2014, Hoppe and Banker 2010, Hoppe and Banker 2006. These figures are complicated by the frequent re-classification of kinds of farms (MacDonald, Korb and Hoppe 2013). Financing for studies of land conversion and updates may have affected recent information from states; nationally, see Nickerson et al. 2012; for Colorado, see Colorado Water Conservation Board 2014); but the trends of critical importance are that the best farmlands are subject to extreme pressure for uses with higher short-term value for residential and urban development, leading to rapid conversion of high-quality farmland (Colorado Water Conservation Board 2014; Environment Colorado 2006; see also see, American Farmland Trust, 2006, Esseks, et at al. 2009).

More than 1/4 of Colorado's irrigated land as of 1997 is gone now! That is 857,448 acres… To relate to a good earlier publication, compare 2012 to 2002, because there is a fine report on losses up to 2002 (USDA 2012).

In 2002, there were 2,590,654 irrigated acres in Colorado; in 2012, despite the ethanol and very high feed prices stimulus to bring new land into production, there were 2,516,785 irrigated acres. That's a loss of 73,869 acres… but that was before the drought of 2012. Lost acreage from that is hard to estimate, but may result from not only economic stress from the 2012 drought (Pritchett et al. 2013) but also from consolidation of irrigation on less land with more reliable supply, and from the flood damages to irrigation in 2013 (Colorado Water Conservation Board, Draft State Water Plan Chapter 5.2 Natural Disaster Management).

Please notice that in the aggregate, the changes in "land in farms" are complicated by three factors or more. First, between 2007 and 2012, there was a major and continuing economic recession/depression, and that affected land conversion rates. Second there was continuing stimulus for new farming with the ethanol explosion in corn use, which stimulated turnover of other land into soy and other feed, as feed prices skyrocketed, changing the cattle business and the farming business. And third, land classified as "in farms" also includes land in small but very rapidly increasing "farms" which are not commercial and not lucrative but hobby, retirement, life-style, "horse properties" and other land in rural residential development.

In Colorado, land in "farms" in aggregate increased between 2007 and 2012 by 281,765 acres, but between 1997 and 2012 there was loss of 463,156 acres despite the rural residential development (USDA 2012 Census of Agriculture – State Data; Colorado, p 7). County-level information is probably more valuable for getting a good picture if one can examine it.

Land in large-lot dispersed rural development has exploded, giving the impression that farming is gaining ground, but it is likely that the vast majority is simply residential in parcels 35 acres and larger so as to be exempt from subdivision regulations and until very recently, qualify for a "well by right" for domestic use water supply.

But the picture for irrigated land is clearer: 857,448 acres were lost from irrigation from perhaps the high in 1997 to 2012 alone… This was before the well shut-downs in the South Platte, at the end of a wet period in Colorado, (Pielke et al. 2005). From 1982 to 2012, Colorado lost 684,157 irrigated acres.

Table 1: Changes in Colorado's Irrigated Agriculture

Irrigated Land in Colorado	Acres (USDA 2012 Census of Ag.; CO p 7)
1982	3,200,942
1992	3,169,839
2002	2,590,654
2012	2,516,785

And, the quality of the land is not distinguished, but must be expected to include much of the highest quality land left (Esseks et al. 2009, Francis et al. 2012).

It is important for local food security and local food preferences as well as the vast range of ecosystem services provided by the irrigation landscapes that these high-quality lands are conserved in conditions which will facilitate adaptation to future conditions. One major endorsement of the need for more holistic resource management is the adoption of Integrated Water Resource Management by many agencies and organizations (AWRA 2012). On the sustainability of conventional large monocultural commodity agriculture, see McIntyre et al. 2009, National Research Council 2010, and Walthall et al. 2012).

DARCA leadership seeks to enable more effective land use and resource planning by ditch companies in order to help conserve economically viable small and flexible family farming, as well as the provision of the very important public benefits from irrigation on the land. Farmers frequently lament the problems of family succession of ownership given the profound economic challenges faced by small farming, and may depend on discovering farming systems which are net-profitable and viable in the longer term by not currently competing with global industrial commodity production or very large-scale farming within the U.S. as currently practiced (National Research Council 2010).

With the support of the Walton Family Foundation and the DARCA Board and membership, as well as indirect support from the University of Colorado, Colorado State University, and substantial expertise from water community leaders across the State and West, DARCA has begun investigations into what kinds of help might support ditch company efforts to retain working landscapes, financially successful family farms, and the iconic and beautiful landscapes that characterize the West for most of the population (see appended note on public support).

3. DARCA'S INQUIRIES IN 2014-2015

Throughout the annual meetings in the past, most of these issues have been raised in different ways, but in 2014-2015, more explicit efforts were undertaken with the benefit of additional funding, the stimulus of the Colorado Water Plan drafting process, and the support of the Planning Committee of DARCA, which met for several months to pursue these issues and develop DARCA positions, which were summarized in the comment submitted to the state of Colorado.

DARCA held four workshops throughout the state in 2014 and presented at its annual convention in February 2015. We had a moderately good return on surveys, considering their intent and use,

but the survey was designed to stimulate discussion, using a posters-and-stars technique on the walls of the rooms where the survey was used, and it is not well suited for statistical analysis. Approximately 60 surveys (See Appendix B) were analyzed along with input from the workshops, the DARCA Planning Committee, the annual convention, and through personal communication.

In short, we proceeded with a participatory planning approach that will be convertible to a traditional Dillman et al. kind of survey, if the investment is warranted, but it may be much more cost-effective to continue with what is essentially a combination of focus-group efforts, a strong advisory committee, and a series of workshops. The participatory planning approach we believe will be effective is one which includes a substantial range of discussion and scenario-building, rather than a near-term set of estimations, and that may be our future course. The investment of participants in finding their own common interests and comparing expectations for their lands and family futures may be much more compelling as an incentive than a technical approach with commentary or external recommendations from agronomists or extension advisors. Once goals or ideas are identified, expertise will certainly be sought, but the experience so far is that we are not yet ready for that step.

We believe that this is itself the most important finding: we need to pursue willingness to work on increasingly feared problems and to overcome a sense that small farming is inexorably doomed to the sale of the land and water to other interests.

The following were particularly dominant topics in the responses received in both the annual meetings, the planning committee teleconferences, and the four workshops held around the state in the summer of 2014.

4. DOMINANT THEMES OF INPUT FROM DARCA MEMBERS

A. DITCH COMPANY SHAREHOLDER EDUCATION

The majority of DARCA members are mutual ditch companies, in which individuals own shares of the company which typically include specified portions of water, sometimes at specified times or rotations, and obligations to pay assessments for upkeep and operations of the water distribution facilities. There are wide ranges of variation in additional enterprises by some of the very large ditch companies, but the majority are solely devoted to providing water delivery and it is this rather narrow view which may foreclose development of more viable and long-term approaches to management of the full set of assets of the ditch companies and their shareholders.

1. Shareholders need to know the rights of ditch companies and what they can and cannot do.
2. The possibilities for ditches to collaborate with other enterprises in unclear.
3. Overwhelming and daunting issues lead to apathy, a major problem.
4. There is a need for education and an understandable approaches to external issues.
5. Ditch company members are conservative, with limited modernization, and also resistance to change.

6. Including outreach ("in-reach"?) to shareholders about what ditches can and cannot do, what other ditches may be needed. Possibilities and opportunities for ditch and collaborative enterprises are not known and have seldom been considered.
7. A comment stating that the need for education, understandable approach to external issues is clearly helpful and needed came from someone noting s/he is not a member of a ditch company. This comment also urged that the overwhelming and daunting issues lead to apathy, a major problem.
8. Another comment noted concern with "conservative members", and history of conservative farming, and from the same person, comments on "very limited" modernization, and "resistance to change".
9. A comment on the lack of information about different crop rotations or ways of farming: "no data in this area".

B. DITCH MANAGEMENT

Management of ditch companies by the board is typically rewarded with a very nominal fee, however, the time commitments may be substantial. Critically, the time dealing with conflicts can radically increase the unpleasant parts of the task, and discourage those with initiative who have other opportunities. This in turn can lead to rapid turn-over which brings newcomers with good intentions but sometimes little knowledge of the systems in action, the legal and management issues, and the conflicts which may or may not be addressed. There is a general sense of disproportionality between the importance of the issues and the historic simplicity with which they could be addressed decades ago. Off-farm employment further limits available efforts and time. Further, dealing with ditch company staff issues can be quite challenging since operating these systems is not at all clear or easily learned, to say nothing of working with a range of individual interests with competitive as well as collaborative interests.

1. Company officials and records often badly need updated technology, security and training.
2. There is a widespread need for professional approaches to the duties of boards, by-law updates and modernization, and insurance management.
3. There are complexities of carriage of water (transfer for non-shareholders) which differ from carriage for shareholders and issues of cost allocation, storage allocations, and management of differences. Colorado law avoids the inefficiency of parallel ditches where possible, as well as the imposition on land-owners of additional rights –of – way, by strongly encouraging carriage, but this is not necessarily simple. Complexities also increase with urban encroachment and other issues noted here.
4. Ditch company staff, attorneys, accountants, engineers may have increasingly critical and technically difficult roles, but are unlikely to be able to provide those services at very low cost.
5. There is substantial appreciation for work by John McKenzie in compiling a model land use code, and attorney Eve Triffo in compiling model by-laws.
6. Recording of rights-of-way is a policy question, with some arguments against formal recording, which DARCA generally believes are no longer persuasive, and there are problems with unrecorded public knowledge, private agreements, and informal operating agreements with agencies, governments.

C. PUBLIC EDUCATION ABOUT DITCHES

There are substantial efforts beginning to improve public understanding of the nature of water rights, rights-of-way, and the safety issues presented by ditches, including some by the Colorado Foundation for Water Education, and in the Colorado Water Plan, but DARCA members consistently wish there were more accessible and available materials for people newly arriving in ditch country. DARCA may undertake an additional outreach development project, following some examples, but we hope to coordinate that with state and agency publicity which would support local information.

Among the topics on which basic understanding is needed from the neighbors, for the safety and well-being of all, the legal situation is prominent and may be counter-intuitive to people from wet areas and those who have no idea how old water distribution is, and why it so often looks like a natural watercourse rather than constructed infrastructure.

1. Rights of way clearance, safety, access, crossings and the limits on encroachment and access for ditch operation, as well as limits for safety (e.g. children, pets, and siphons and culverts) are critical issues.
2. Water rights as a kind of property in the West are simply new to many arrivals, and must be made clearer.
3. Water quality issues arise in the form of both urban and industrial drainage unwanted and often illegally dumped into ditches, which by their nature intercept natural drainage paths, and additional issues appear in more conscious vandalism, dumping, and mistreatment of ditches by persons who appear to be knowingly acting without legal rights. A third more tractable problem appears with ignorance about the role of ditches and misuses for disposal of yard waste, mistreatment of trees and controversies over bank-stabilizing vegetation.
4. Homeowners associations, subdivisions, education and design failures, and general disregard of ditch rights and functions are particularly problematic where local governments fail to impose legal requirements or even mistakenly approve inappropriate choices, bad design, and damage to rights of way and access. The costs imposed can be substantial, and the delay in repair or remedy can also be destructive, sometimes on the encroachers' interests as well as the irrigators' interests.
5. A radical increase in the number of shareholders may suddenly occur where irrigated land is converted to subdivision; in a bad case, this can create a significant number of shareholders who are ignorant of critical issues and rights.

D. DITCH COMPANY PLANNING MUST BE GOOD, OR…

There has been so little ditch company long-range planning that there is fear that it could be disastrous, and similarly, fear that without a very good job, poor planning could be worse than none. There were several variations on this idea, and some additional concerns are also noted here.

1. Allocation of effort to planning is a luxury when you are barely doing day-to-day operations.
2. No institutional capacity is available, and the group does not inherently work well in new ways.

3. It is simply not appropriate for ditch companies to plan; this is up to the farmer as a business person. These comments reject the idea of the use of the ditch company assets for multiple purposes and sometimes reject the idea of collaborative farming efforts; some rejected this on value grounds such as being against socialism.
4. Similarly, there were some "not applicable" and similar responses to "resources" questions about cooperation or collaboration among farmers (see tabulation)
5. "Preconceived ideas" were reported as a problem that prevents groups from new thinking.
6. There is fear of risks from ideas about income possibilities, and some suggestions were made orally that competition might be a source of discord and conflict.
7. There was strong agreement on the need more planning for the water management future, but the level at which planning could or should take place is not clear from some of the supportive statements.
8. Barriers to planning include lawyers and misinformation as well as costs; there were mentions of incorrect but vehement assertions.
9. Aging infrastructure is driving the need for planning in some ditches, because failure imposes bigger expenses. But another comment said that it is hard to know where to spend, and planning might not make a difference with lower and uncertain incomes.

E. DITCH COMPANY PLANNING WOULD BE INAPPROPRIATE INTRUSION IN PRIVATE BUSINESS AND AFFAIRS

Similarly to Section D just above, some respondents were quite strongly opposed to ditch company efforts in areas which were said to be private business. (This indeed reflects the ambiguous nature of the ditch company as something like an enterprise, and something like a utility.) There was a comment that of course neighbors help each other with equipment breakdowns, but this did not seem to be linked to a proactive effort to collaboratively purchase or manage capital equipment or experiment with new farming systems. This may be an avenue for discussion, given the increasingly appreciated problems of loss of agricultural input suppliers where too much land goes out of production.

F. DITCH COMPANY INFRASTRUCTURE AND MODERNIZATION FINANCE

Where companies have been treated solely as a utility to be operated at least cost, cumulative costs may be quite difficult just as economic factors challenge small farming along with competition for the land and water rights.

1. Complications with encroachment, etc. are terribly challenging for ditches "swallowed up" by urbanization; significant legal expenses may be required to maintain the facilities and their safe operation.
2. Alternative and grant funding sources needed for small companies – e.g. for companies which are far smaller than some of the very big ones and ones with federal support.
3. Access to long-term funding may be very important and may be very difficult; other infrastructure is commonly financed with 30 year bonding, for example, but that capacity is not available to mutual ditch companies. (Federal project and some other kinds of districts have some different capacities but also often different limitations on management and transferability of water and land.)

4. Assessments on shareholders of ditches may barely cover day-to-day operations and not at all cover modernization or large capital projects.
5. Biggest concern is lack of financing for infrastructure which would enable new possibilities where they are wanted, but cannot be capitalized. Low-cost capital is needed for many projects facing sharp cost increases.

G. TAXATION ISSUES AND TAX BASE ISSUES

There are serious farm and ranch issues of estate taxation and succession planning, and with the application of agricultural tax rates, and also some technical issues which DARCA has noted.

1. A comment that ditches should organize to change the 85/15% rule for exemption from federal income tax as a Section 501(C)(12) organization.
2. Municipalities' costs in litigation are financed by taxes and water rates, and may be reduced by legal staff available to water providers or cities. Ditch companies have no such advantages. Further, costs for water supply for cities may be covered within low-cost bonding finances as well as water charges and tap fees.
3. Expansion is needed for a mutual ditch company exemption from county property taxes without regard to where the water goes now; taxation may be affected by the final use of the water, and that may disadvantage the continuation of traditional uses.

H. PUBLIC OFFICIAL EDUCATION AND AGENCY EMPLOYEE EDUCATION

Ditch company management has become substantially more complicated and interactions with agencies and land owners increasingly cost time and money over issues which have been clearly settled in the past. DARCA's model land use code illustrates many solutions, but it is not yet the standard and may be the subject of part of an outreach campaign which DARCA may undertake. Presently, we heard the needs for several issues to be approached.

1. Education: There was a recommendation to create a DARCA Guide for local governments and land use agencies and a source of helpful information for them. Local official turn-over is widely noted, but there is also turnover among federal officials such as those employed by the US Forest Service which interacts with many ditches.
2. Consistent turn-over of officials and regulators who know nothing about ditch company rights, obligations, rights of way, etc., and ditch company needs costs time and money in re-establishing workable relationships and education about the local systems and access needs.
3. Public official and government refusal or failure to act or enforce rights is profoundly difficult because one is forced to expend private funds and effort to seek public enforcement of rights, usually against other private parties with significant financial capacity.

I. LAND USE PLANNING

Ditch companies vary quite widely in their level of interaction with local (city, county, federal) land use planning processes. Generally, getting involved is time-consuming, and contentious, and ditch officials may be placed in socially unpleasant conditions where they are forced to

defend rights that have been overlooked or may be disregarded. There are also complicated value questions about land use planning per se; some DARCA members regard it as undesirable interference, while others regard it as a necessary social process in which one must defend one's interests. The shareholders themselves have complicated positions concerning their potential for staying in farming and potential need to sell; this is a primary motivation for DARCA involvement with planning issues. The "right to farm" laws help in some places, but ditches are collaborations and if a majority or sufficiency acts, all members can be affected directly and indirectly by changes in the hydraulics of ditch operation as well as input and output markets, traffic and neighbors, and other changes.

1. A great deal of land use planning is not done with ditch issues in mind; ditches complicated attitudes about land use planning, right to farm vs right to sell, etc…
2. Increasing ditch rider response time to problems can result from development, and access complications; potential liability threats may increase radically and may not elicit appropriate insurance and safety policies.
3. Municipality roles in conserving agricultural operations and conditions could be much greater than they are, and municipal ownership of farmland need not be limited to short-term anticipation of terminating farming and removing irrigation. Open space and recreational values are increasingly recognized, but not so well implemented.
4. The municipal taking of ditch company easements by condemnation was noted as an additional concern that may pose serious legal challenges and costs with risky outcomes.

J. WATER QUALITY AND POLLUTED WATER INFLOWS

As ditches are approached by urbanization and industrial activities (including mining and energy development), inflows may change character as well as timing where there is unintended or negligent drainage into irrigation supplies. The water quality requirements may be ultimately enforced at some point but private enforcement is likely to incur very high costs, and the agriculture may be adversely affected in quality or salability of products as well as flexibility of use. Some ditches that have been highly "urbanized" have had trouble getting enforcement of standards already applicable. Additional issues were mentioned.

1. Failure to fiercely defend against inflows and pollution may be a "slippery slope" problem in which proving damage from cumulative situations can be very costly and may be out of reach without strong local government support.
2. A few ditches are very involved with local/watershed groups on water quality and all development reviews, including some where there are few farms left, but many are not involved and fear adverse consequences or controversy.
3. Cumulative impacts and thresholds may suddenly impose problems which were not seen or considered threats until standards are crossed or damage is serious. Monitoring to avoid creeping degradation is costly and may be needed but may also need local government collaboration.
4. Regulatory uncertainty and inconsistency with politics of growth or "free markets" thought to imply freedom to impose costs on others may be cultural obstacles.
5. A hydrologic conditions, seasonality, and local run-off conditions change, storm water and storm anticipation issues must be taken much more seriously. Action before a flood can assure, for example, that trash racks are clean and kept working rather than serving to

collect debris and block culverts, defeating designs for safety. But, whose burden is that? Whose should it be?

6. Similarly, ditches in the past were designed with points of failure, sometimes called "blow-outs" to release very high flows which would further damage the ditch. These points were located under conditions which may have changed substantially, increasing the need for re-design and collaborative redevelopment in some places. This may be well beyond the capacity of a small ditch company.

K. WATER SUPPLY, DROUGHT, CLIMATE

There is increasing concern over climate variation and weather extremes, changes in flow seasonality, and drought frequency, duration, and severity. The irrigators are especially concerned with how the following issues are affected.

1. Reliability and investment issues, for both new investments and replacements.
2. Water supply and reliability to continue existing irrigation practice appear to be increasingly worrisome even where water rights were said to protect farmers in the past.
3. Water competition poses enormous challenges for irrigation – municipal growth, rural residential development, energy development and changes in water quality after other uses are all threats to continuing farming and to new investments for long-term capital.
4. Municipal competition also interacts with the aging farmers/lack of succession problem for families who fear that they are literally betting the farm on factors far out of control.
5. Urban population growth demanding water supply is often seen as the source of all problems."

L. WATER LAW

There are structures in Colorado water law which are felt to strongly favor both the cities and the wealthy. This is a large subject with a substantial literature, but DARCA membership pays close attention to water law issues, and has been both fearful of changes that may adversely affect them, and supportive of stronger defenses against threats to their interests. The pursuit of alternative means of water management has been closely followed by DARCA (throughout the 2003-forward Statewide Water Supply Initiative and the HB05-1177 creation of the Basin Roundtables and the Interbasin Compact Commission, and now through the development of the Colorado State Water Plan. Among the issues particularly mentioned were:

1. The benefits and problems of the no injury rule, affecting both the efficiency of applications and conveyances, and the costs of change (which are low to object and seek to defend against a change, but may be quite high to seek a change; creating an asymmetry of capacity in who can afford to act in what ways).
2. There is also fear of efficiency, in the belief that conversion to more efficient irrigation which uses less water threatens loss of water rights by abandonment. Unused water rights are seen as being at great risk, and this is legally reasonable. Legislative responses, at this time of writing, have again failed except in a limited range of pilot programs for experiments with alternative mechanisms for water transfer.
3. Alternative water transfer mechanisms (ATMs) are detailed in the Colorado State Water Plan, as well as at length in other works, available through the Colorado Water

Conservation Board and DARCA, but without elaboration the common element is allowing transfer of water on some new basis, which may be intermittent from a piece of land, or partial from a water right, but there has not yet been a full trial of allowing a permanent partnership of ownership. Municipal acquisition of water rights from ditches has allowed continuation of irrigation in some places for some specified terms, as lease-backs, and in some cases due to failed plans, but there have been very limited efforts allowed to develop creative new systems. DARCA members are not in agreement on whether this is good or bad.

4. One mechanism garnering increasing support is a water bank strategy in which water can be temporarily re-allocated without loss of ownership or the fear or forfeiture for non-use. An earlier experiment in the Arkansas Valley was not adequately funded or developed, and was not suitable (the consultant on this project has strong views, which are not endorsed or rejected by DARCA).
5. Public-private partnerships in ownership and flexible water management are slowly gaining support but are not widely endorsed or rejected by DARCA members. The lack of clarity in how new systems would work is an important obstacle for serious evaluation.
6. DARCA members in some cases support a bill allowing flexible marketing, (HB15-1-038) which has again failed, but got farther in 2015 than 2014.
7. EPA, federal water law, and the Endangered Species Act as enforced or not were mentioned as barriers to ditch company modernization, new storage, and changes of operations.

M. STATE WATER PLAN

DARCA members are quite concerned with the State Water Plan as a means of facilitating more loss of irrigation water, though there is also some hope that the plan can improve conservation by cities and perhaps result in lower outdoor water use and other sources of competition with irrigation. There is a great deal of resentment that cities have grown as rapidly as they have and are apparently willing to continue as a pro-growth policy, though DARCA also includes members who favor such policies. One particularly thorny issue is "streamlining" – shall permits for changes and new facilities be made easier or not? On one hand, ditches have been faced with enormous costs and delays seeking to expand their systems or upgrade aging facilities. On the other hand, making it easier to take water away from agriculture is not seen as helpful for conserving the farming way of life which many DARCA members revere and pursue at very high personal costs. There is no single position, but enabling small operations to work more effectively would be supported.

N. ECOSYSTEM EXTERNALITIES/BENEFITS FROM DITCHES

DARCA members seldom mention this, but in discussions where it was raised, there was some agreement that the qualities of environment which irrigation provides are public benefits that are being enjoyed without charge, rather than properly appreciated and compensated. Some discussions concerned non-monetary respect and consideration such as good law enforcement on encroachment and rights of way as a minimal appreciation. There was also some discussion of how the farming and water distribution has attracted people who love the qualities which they then threaten and disrespect. That usually led back to the need for public education. (The concepts of ecosystem values and beneficial externalities are not commonly discussed in those

terms, but the basic ideas are appreciated.) There was no single DARCA position beyond the comment that support for those values would be timely, appropriate, and should be undertaken.

Planning Considerations for Ditch Companies

1. **Importance of Planning**
    a. What is the purpose of your ditch company or what is its mission or vision?
        i. Most ditch companies believe their exclusive purpose is to provide water to farmers and shareholders; however, should these companies look beyond the ditch, for greater opportunities in leases and buy-and-dry alternatives? Should the company have a goal of making a profit and enhancing shareholder value while making water available to its farmers as inexpensively as possible? Is the mission of your ditch company to have a viable organization 100 years from now?
    b. What does prosperity mean to you? For your ditch company, community, agriculture, your family.
2. **Who is doing the planning for your ditch company?** Do you have an obligation to plan in the short run, medium term, and long run? Do you spend your time on big ticket items Do you spend time on planning?
    a. Board of Directors
        i. Makes the decisions for the benefit of the ditch company and shareholders
        ii. Requires competent management
        iii. Need board members with perspective, experience, and skills
        iv. Duties of a board member – follow the rules, be loyal to the company, and exercise due care
        v. Examples of poor planning
            1. Hasty decisions
                a. Some decisions can be carried out quickly
                b. However, some require much deliberation
            2. Lack of preparation. Do you have the information that you need? Is the info user friendly and clear?
            3. Lack of asking questions, especially when things are unclear.
            4. Lack of review and understanding of a decision and its effects, both intended and unintended.
        vi. What does your ditch company spend its time on?
            1. Water law
            2. Real estate law – easements, oil and gas
            3. Corporate law – ditch companies are corporate entities
            4. Contracts
            5. Employees, contractors
            6. Taxes, filing requirements, administrative

7. Government regulation compliance

b. Experts
   i. How do you select them?
      1. Search? Recommendations? Friends?
   ii. Engineers
      1. Sought out qualities: Good listener, determine what is really needed, cost effective approach.
   iii. Lawyers
      1. Sought out qualities: Water expertise, identification with the water community, value concept and heritage of ditch companies, explore new ideas, diplomat, business acumen, long range goals, be able to pick fights that you can win.
   iv. Accountant or Secretary
   v. Business Planner
      1. Sought out qualities: anticipating and acting versus reacting, looking for emerging opportunities, looking over the hill, taking a fact and converting into a vision.
      2. Who is the business planner at your ditch company?

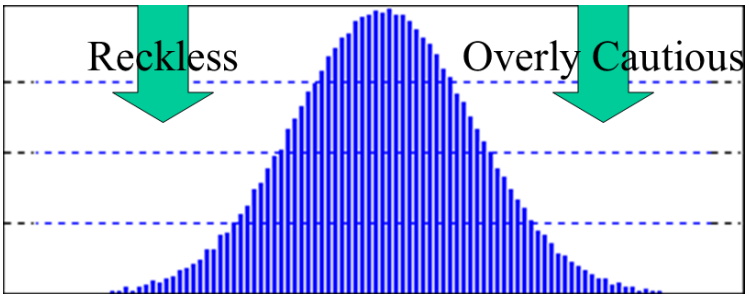
3. Problems and Opportunities
   a. Double edge sword

4. Problem solving technique
   a. Does the problem have one or many solutions?
   b. Answers to solutions - First a people solution (psychological and sociological), then engineering, finally legal.
   c. How do you arrive at decisions?
      i. System approach, ad hoc, traditional response?

5. How do you develop expertise?
   a. Education, training
   b. Learning from your neighbors

6. Are you willing to make the hard decisions?
   a. Are you willing to explore solutions that may be unconventional, require work, or may not appear to be instantaneous?
   b. What do you do to get help with hard decisions?

7. Paralysis of Action
   a. Why?
      i. Fear of the unknown?
      ii. Fear of liability or risk?



APPENDIX B: Questionnaire

Thank you, DARCA Members and others! Colorado is quickly moving toward the first State Water Plan,(www.coloradowaterplan.com) and DARCA (the Ditch and Reservoir Company Alliance – www.darca.org) wants to represent ditch company and irrigator interests in commenting on the State Water Plan, and DARCA also wants to help ditch companies look forward. How can ditch companies better plan for their futures?

DARCA is holding a series of workshops with its members this summer to discuss why it is important for ditch companies to control their futures well as possible, and what is wanted.

"If you're not at the table, you're on the menu!"

Ditch companies own very valuable water and land, and that land is disappearing into "development" very quickly, while the water is bought for urban growth. But there is also counter-pressure as people are becoming aware of how much local agriculture helps with beauty, local foods that are fresh and wholesome, local economies, and the benefits of working ecology, sometimes called "ecosystem services" which are of great benefit. People love to be near farming (mostly) and are increasingly willing to pay for open space, conservation, and real estate near these amenities, but the race is not going well for keeping the land in farming, so far…

Ditch Companies are special. Because they are groups that already work together and may be able to do many new things together, these remarkable sets of people may be the key to changing the trends of water and land in the West being lost to farming, perhaps forever, and changing the trend of losing farm families and farm futures.

Every ditch is different, every group of farmers is different, every place is different… but maybe there are some kinds of tools and techniques that DARCA can help supply that would work for many places. Maybe not. We want to know what to do to help.

The workshops we are holding and other efforts are to identify impediments to planning

- The survey lists **possible barriers to planning – what gets in the way?** And to getting involved with planning.
- **In each set, please rank** the ones you feel are most important – for Parts I & II, please check the boxes, and give the most important or highest priority item a "3", the second most important a "2", and the third most important a "1".

Any notes and comments are very welcome, of course, and the survey should not take too long and it would help tremendously to know what you think.

Please feel free to contact John McKenzie, Director of DARCA, or John Wiener, researcher at CU working with DARCA on this project.

John McKenzie Tel: 970-412-1960 <john.mckenzie@darca.org>

John Wiener Tel: 303-492-6746, Mobile: 303-717-6809; john.wiener@colorado.edu

Barriers to planning – What gets in the way?	**Not a concern**	**Big concern**	**VERY big concern**	**PLEASE RANK from – Most important is No. 1 (or 3 stars on the wall at workshops)**
We have not considered a role for the company/district in planning for more than water distribution.	☐	☐	☐	
We feel that this would be an inappropriate or unwelcome intrusion in private business and affairs.	☐	☐	☐	
We feel that talking about the long term could make members unhappy and perhaps increase conflicts.	☐	☐	☐	
We don't think our group can work together in new ways.	☐	☐	☐	
We do not think we can make a difference by planning.	☐	☐	☐	
We think it would be too expensive to get involved in planning.	☐	☐	☐	
We do not know of an example where a group made a successful planning effort.	☐	☐	☐	
We do not have good information on how to do it, such as information from Extension.	☐	☐	☐	
We don't have good information on what we might want to consider, such as different crop rotations or ways of farming.	☐	☐	☐	
We know there are varieties of farming we might consider but we don't think we can afford to make changes, or get them financed.	☐	☐	☐	
We fear that we are just facing economic forces too big to deal with, in the value of land and water for non-farming uses.	☐	☐	☐	
Lack of control over input prices (e.g. fertilizer) is a problem.	☐	☐	☐	
Lack of control over energy prices (fuel, pumping) is a problem.	☐	☐	☐	
Lack of control over financing (e.g. only short-term but not long-term financing) is a problem.	☐	☐	☐	
Lack of attractiveness of farming to the family is a problem.	☐	☐	☐	
Increased costs and risks from weather and climate are problems.	☐	☐	☐	
Decreasing reliability of water supply is a problem.	☐	☐	☐	
Do you have a long-range goal or vision for your area?	☐	☐	☐	
Do you have planning for farmer succession or next generation, new farmers or similar issues?	☐	☐	☐	
WHAT ELSE GETS IN THE WAY? Please let us know your thoughts! Please use back sheet.				

Which resources would be most useful for planning?	**Yes – we have and use this**	**Do not have this or do this**	**Want to do this**	**PLEASE RANK FROM 3 TO 1 – Most important is 3, next 2, then 1.**
Good basic mapping of the ditches, laterals, topography, rights of way, diversions, soils, drainage, wetlands, forest areas, etc.?	☐	☐	☐	
A geographic information system?	☐	☐	☐	
Electronic headgate controls, or flow measurement, operating, SCADA or remote gauge reading tools?	☐	☐	☐	
Looking at land use possibilities or ways for individual farms to collaborate or reduce risks together?	☐	☐	☐	
Would there be interest in cooperating on crop timing or crop mixes to meet market opportunities?	☐	☐	☐	
Are there collaborations or deals for sharing equipment or farming resource (e.g. implements etc.)? Rotations across farms?	☐	☐	☐	
Does the board or shareholders talk with local governments about existing land use zoning or planning?	☐	☐	☐	
Do you work to influence or affect local plans for development or programs or policies to influence development?	☐	☐	☐	
Would you be more active with DARCA involvement, to help bring specialist knowledge or help you get that?	☐	☐	☐	
Working with local or regional watershed groups or plans?	☐	☐	☐	
Knowing about water quality issues in your source water or potentially affecting the streams or riparian areas to which your irrigation contributes return flows?	☐	☐	☐	
Are there Endangered Species or Threatened Species issues related to your source or where return flows go?	☐	☐	☐	
Would it help to have some sort of planning process with professional facilitation such as businesses use?	☐	☐	☐	
Have you held discussions on planning for the water management future?	☐	☐	☐	
Would your group like to work with outside landscape design professionals or USDA people on land and farming choices?	☐	☐	☐	
Is there discussion about activities across farms? Such as diversification of crops, or livestock? Agritourism?	☐	☐	☐	
Other tools, information, or resources are needed or wanted? Please use back sheet.				

Please write us about anything we should know or how we can help? And give us your contact information if you would like a reply. THANK YOU!!!!

APPENDIX C: A message to DARCA members regarding public views and planning issues, before the workshops and 2015 annual meeting.

[NOTE: DARCA leadership communicates often, with an active website, but we also wrote several additional messages about the planning issues and the state water plan. This one may be of interest to others as well.]

Generally, a great deal has been happening with more than 100 meetings held by Basin Roundtables and others, including more than 60 meetings by the staff of Colorado Water Conservation Board with various organizations. Since May, there is a new large document on "Statewide Outreach Status Update – May 2014" that describes that activity (as of May 2014), an update on News and Updates (June 2014), and an update on Draft Framework (dated 08 May 14). The Water Plan is more solidly based in a sense of urgency than it has appeared in the past, due to the dramatically bad weather in 2012 and 2013, and the ending of discussion about climate variability and change for almost everyone.

In the "Water Plan Update" (a 2 page flyer), the staff wrote:

> The 27 members of the IBCC, representing every water basin and water interest in Colorado, have agreed that unless action is taken, we will face an undesirable future for Colorado with unacceptable consequences. The IBCC has reached consensus on a number of actions that Colorado must take in the near term to secure our water future. These include conservation, alternative methods of utilizing agricultural water that doesn't [sic] result in the permanent dry-up of farmland, and support for water projects that meet certain factors [sic].

There will be a document and an on-going process henceforth, and the folks at the table will hear each other better than they hear those who don't come forth in some way.

There are a lot of differences between the basins and some are reflected in the reports on outreach. Obviously, the small North Platte situation is far from the Metro and South Platte in most terms, but DARCA people may be pleased that agriculture and avoiding buy-and-dry are strong preferences where people were asked to comment. The Arkansas Basin did the most detailed reporting of a "clicker poll" which produced very good reporting of results, by area of the polled person and preferences from each area.

The take-home message is that there is a lot of support for keeping irrigation, and not much opposition, but we do not know if this is the result of those being present when asked already being in favor, or those present having new appreciation with new information, or if those not present would have been disinterested.

One way to go is to accept that there is no way to substitute for real scientific – and expensive – polling that is truly objective, and then experiments that validate claims of will to pay for things such as benefits from being near open space. Without a cheap substitute, a lot of economists use measures such as statistical analyses that sort out being within some distance of open space, and these efforts find that people do pay extra for that… The real estate industry markets carefully.

Given the uncertainties, DARCA might decide to go ahead with all these claims of support and claims that people really do want irrigation to continue and buy-and-dry to be reduced or stopped. In addition, the people who say so are those who care enough to comment or be counted in some way, and that is important. DARCA should seriously consider taking the apparent support at face value and working on comments without arguing over that.

Colorado State University (CSU) POLLING: A note: In the past, public support has been strong, but may be slipping a bit: Here are some highlights from the Colorado State University public polls which are repeated every few years; this is from 2012 report on 2011 polling:

> "Overwhelmingly (86%), respondents indicated that the presence of ranches, farms and agriculture was moderately to very important to the quality of life in Colorado. Figure 2 shows that this is a noticeable decrease from the last few years, however—from 96% in 2006 and 95% in 2001. (Emphasis added!)
> "… almost 98% mentioned that maintaining water and land in agriculture was very or moderately important, and 80% would support purchasing development rights to maintain those lands. (Emphasis added!)
>
> "… Further, since providing water to agriculture can mean constraints on other uses of water, respondents were asked which uses of water would be their top priority in a dry year—lawns and landscaping; rafting and fishing; agriculture; and maintaining in-stream flows. . . . 77% indicated that agriculture should be the top priority for water allocation in a dry year (similar to previous years' responses), while 9% said in-stream flow levels should be the top priority (significantly less for this category than in prior years—18% in 2006; 17% in 2001; 23% in 1996. Both lawn and landscaping and rafting and fishing were seen as low priorities for water use (between 2% and 3%—consistent with previous years). (Emphasis added!)
>
> "… A majority of Coloradans felt that it was very important to protect Colorado's agricultural land and water for a variety of reasons (Figure 5) including food and fiber production (70%), followed by maintaining open space and wild-life habitat (63%), and maintaining jobs and businesses related to agriculture (61%). Only 34% thought that maintaining Colorado's western heritage was a very important reason for protecting agricultural land and water. (Emphasis added!)
>
> "… When asked about their interest in Colorado foods (Figure 6), more than 90% of Coloradans would definitely or probably buy more Colorado products if they were labeled as such or were more available. In a follow up question about whether they purchased Colorado products when shopping or eating out, 6.5% said "always" and 37% said "most of the time". Emphasis added!)

Source available: webdoc.agsci.colostate.edu/DARE/ARPR/ARPR%2012-01.pdf -- Sullins et al. 2012: Colorado Attitudes About Agriculture and Food: 2011 Executive Summary.

REFERENCES

American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, 2011, Position Statement on Climate Change. Madison, WI: American Society of Agronomy et al.; https://www.agronomy.org/science-policy/issues/climate-change; And see Crop Science Society of America, 2011, Position Statement on Crop Adaptation To Climate Change. Madison, WI: Crop Science Society of America <www.crops.org>.; Accessed June 2014

American Water Resources Association, Policy Committee, 2012, Case Studies in Integrated Water Resources Management: From Local Stewardship to National Vision. Middleburg, VA: American Water Resources Association. www.awra.org

Baveye, P.C., D. Rangel, A.R. Jacobson, M. Laba, C. Darnautl, W. Otten, R. Radulovich, and F. A. O. Camargo, 2011, From Dust Bowl to Dust Bowl: Soils and Still Very Much a Frontier of Science. Soil Science Society of America Journal 75(6): 2037-2048.

Colorado Water Conservation Board, 2014, Colorado's Water Plan: Draft, December 2014. Denver: Colorado Water Conservation Board. < http://coloradowaterplan.com/> (accessed 07 March 2014).

Craig, R.K., 2010, A Comparative Guide to the Western States' Public Trust Doctrines: Public Values, Private Rights, and the Evolution toward an Ecological Public Trust. Ecology Law Quarterly 37: 53- 198.

DeLong, C., R. Cruse, and J. Wiener, 2015, The Soil Degradation Paradox: Compromising Our Resources When We Need Them the Most. Sustainability 2015, Vol. 7: 866-879. (doi: 10 3390/su7010866.) (Open Access).

Environment Colorado, 2006, Losing Ground: Colorado's Vanishing Agricultural Landscape. http://www.environmentcolorado.org/reports/colorado-forest-project/colorado-forest-project-reports/losing-ground-colorados-vanishing-agricultural-landscape

Esseks, D., Oberholtzer, L., Clancy, K., Lapping, M., Zurbrugg, A., 2009, Sustaining Agriculture in Urbanizing Counties: Insights from 15 Coordinated Case Studies. University of Nebraska, Lincoln. Available through American Farmland Trust website at <http://www.farmland.org/resources/sustaining-agriculture-in-urbanizing-counties/documents/Sustaining-agriculture-in-urbanizing-counties.pdf>.

Francis, C.A., T.E. Hansen, A.A. Fox, P.J. Hesje, H.E. Nelson, A.E. Lawseth, and A. English, 2012, Farmland Conversion to Non-agricultural Uses in the US and Canada: Current Impacts and Concerns for the Future. International Journal of Agricultural Sustainability 10(1): 8-24.

Gordon, E. and D. Ojima, Eds., 2015, Colorado Climate Change Vulnerability Study. Boulder, CO and Fort Collins, CO: University of Colorado and Colorado State University.

Hatfield, J.L., 2013, North American Perspectives on Potential Climate Change and Agricultural Responses. Pp 33- 55 in Hillel, D. and C. Rosenzweig, Eds., 2013, Handbook on Climate Change and Agroecosystems, Vol. 2: Global and Regional Aspects and Implications. Joint Publication with the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America. London: Imperial College Press.

Hoppe, R. and D.E. Banker, 2010, Structure and Finances of U.S. Farms: Family Farm Report 2010 Edition. Washington, D.C.: USDA ERS EIB No. 66.

Hoppe, R.A. and D.E. Banker, 2006, Structure and Finances of U.S. Farms – 2005 Family Farm Report. USDA ERS Economic Information Bulletin No. 12, USDA: Washington, D.C. and on-line.

Hoppe, R.A., J.M, MacDonald, and P. Korb, 2010, Small Farms in the United States: Persistence Under Pressure. EIB No. 63. Washington, D.C.: U.S. Department of Agriculture.

IPCC, 2014: Summary for Policymakers. In: Climate Change 2014: Impacts, Adaptation and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastandrea, T.E. Bilir, M. Chatterjee, K.L. Ebis, Y.O. Estrada, R.C. Genova, B. Grima, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32. : https://ipcc-wg2.gov/AR5/report/full-report/ (accessed October 2014).

Lukas, J., J. Barsugli, N. Doesken, I. Rangwala and K. Wolter, 2014, Climate Change in Colorado: A Synthesis to Support Water Resources Management and Adaptation; Western Water Assessment, University of Colorado at Boulder. Denver: Colorado Water Conservation Board. < http://cwcb.state.co.us/environment/climate-change/Pages/main.aspx> (accessed 07 March 2015).

MacDonald, J.M., P. Korb and R. A. Hoppe, 2013, Farm Size and the Organization of U.S. Crop Farming. Economic Research Service E.R.R. No. 152. Washington, D.C.: U.S. Department of Agriculture.

MacDonald, J.M., P. Korb and R. A. Hoppe, 2013, Farm Size and the Organization of U.S. Crop Farming. Economic Research Service E.R.R. No. 152. Washington, D.C.: U.S. Department of Agriculture.

McIntyre, B.D., H.R. Herren, J. Wakhungu, and R.T. Watson, Eds., 2009, Global Report: International Assessment of Agricultural Knowledge, Science and Technology for Development, by the International Assessment of Agricultural Knowledge, Science and Technology for Development Project. Washington, D.C.: Island Press. (Also available at: http://www.agassessment.org/).

National Research Council, 2010, Toward Sustainable Agricultural Systems in the 21st Century. Washington, D.C.: National Academies Press.

Nickerson, C., M. Morehart, T. Kuethe, J. Beckman, J. Ifft, and R. Williams, 2012, Trends in U.S. Farmland Values and Ownership. Economic Information Bulletin No. 92. Washington, D.C.: USDA Economic Research Service. http://www.ers.usda.gov/Publications/EIB89/EIB89.pdf

Nickerson, C., R. Ebel, A. Borchers, and F. Carriazo, 2011, Major Uses of Land in the United States, 2007. USDA ERS: Economic Information Bulletin No. 89. Washington, D.C.: USDA.; See also: http://www.ers.usda.gov/ChartsOfNote/Default.aspx?mode=detail&id=350; See also: http://www.agcensus.usda.gov/Publications/2012/Online_Resources/Ag_Atlas_Maps/ for locations of kinds of farming now, and http://www.ers.usda.gov/data-products/urban-influence-codes/documentation.aspx#.U6KXFSimWns

Pielke, R.A., Sr., N. Doesken, O. Bliss, T. Green, C. Chaffin, J.D. Salas, C.A. Woodhouse, J.J. Lukas and K. Wolter, 2005, Drought 2002 in Colorado: An Unprecedented Drought or a Routine Drought? Pure and Applied Geophysics 162 (2005): 1455-1479.

Pritchett, J., C. Goemans, and R. Nelson (2013). Estimating the Short and Long - term Economic & Social Impacts of the 2012 Drought in Colorado. Retrieved from http://cwcbweblink.state.co.us/WebLink/0/doc/172871/Electronic.aspx.

Richter, D. DeB., et al., 2011, Human-Soil Relations are Changing Rapidly: Proposal from SSSA's Cross-Divisional Soil Change Working Group. Soil Science Society of America Journal 75(6): 2079-2084.

U.S. Department of Agriculture, 2012, Census of Agriculture, http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_State_Level/Colorado/

Walthall, C.L., J. Hatfield, P. Backlund, L. Lengnick, E. Marshall, M. Walsh, S. Adkins, M. Aillery, E.A. Ainsworth,C. Ammann, C.J. Anderson, I. Bartomeus, L.H. Baumgard, F. Booker, B. Bradley, D.M. Blumenthal, J. Bunce, K. Burkey, S.M. Dabney, J.A. Delgado, J. Dukes, A. Funk, K. Garrett, M. Glenn, D.A. Grantz, D. Goodrich, S. Hu, R.C. Izaurralde, R.A.C. Jones, S-H. Kim, A.D.B. Leaky, K. Lewers, T.L. Mader, A. McClung, J. Morgan, D.J. Muth, M. Nearing, D.M. Oosterhuis, D. Ort, C. Parmesan, W.T. Pettigrew, W. Polley, R. Rader, C. Rice, M. Rivington, E. Rosskopf, W.A. Salas, L.E. Sollenberger, R. Srygley, C. Stöckle, E.S. Takle, D. Timlin, J.W. White, R. Winfree, L. Wright-Morton, L.H. Ziska. 2012. Climate Change and Agriculture in the United States: Effects and Adaptation. USDA Technical Bulletin 1935. Washington, DC. Available at <http://www.usda.gov/oce/climate_change/effects_2012/CC%20and%20Agriculture%20Report%20%2802-04-2013%29b.pdf> (accessed March 2013).

Wiener, J.D., 2014a, Increasing Water Supplier Leverage on Land Use; a presentation to the Universities Council on Water Resources Annual Meeting, Boston, MA., Available at www.colorado.edu/ibs/eb/wiener/

Wiener, J.D., 2014b, Out of Town but Not out of Trouble: Becoming Unconventional: Adaptation Issues for Small Agriculture. A Webinar for the National Adaptation Forum, and posted at www.colorado.edu/ibs/eb/wiener/.

Please SEE ALSO DARCA's Comments to the State Water Plan at www.darca.org.