Agricultural Water Conservation: Angles Colorado Water Institute is Investigating for Colorado and the Colorado River Basin

Reagan Waskom, Colorado Water Institute
2014 Colorado Water Congress Annual Convention
What does Ag Water Conservation mean?

- Decreased crop consumptive use
- Increased crop water use efficiency
- Improved irrigation application efficiency
- Increased irrigation water diversion and delivery efficiencies
- Reduced water use or evaporation through adoption of conservation measures and new technologies
- Increased capture and utilization of precipitation
Ag Water Conservation Related Projects

- Agricultural Water Conservation Clearinghouse
- Addressing Water for Agriculture in the Colorado River Basin
- Moving Forward on Ag Water Conservation in the Colorado River Basin
- Agronomic Feasibility of Deficit Irrigation of Hay as Part of a West Slope Water Bank
- BOR Colorado River Basin “Next Steps” Ag Water Conservation and Transfers Committee
2011-2013 USDA Project

Addressing Water for Agriculture in the Colorado River Basin

- Project Team – Faculty from the 7 CRB Land Grant Universities
- Working with Ag water users and managers to explore how we can increase Ag water security to maintain productivity
- 60 Interviews: what are the pressures on your water and how are you responding to them?
- Survey of 3 Colorado (Delta, Garfield and Mesa) and 3 Arizona counties

Information about the project can be found online at www.crbagwater.colostate.edu
Animas River
Central Arizona Project
Coachella Canal
Colorado River mainstem
Crystal River
Dolores River
Gila River
Green River
Gunnison River
Little Snake River
North Fork River
Pine River
San Francisco
San Juan River
San Miguel River
Spanish Fork River
Virgin River
Yampa River
Increased efficiency and water conservation

BUT

Concern about varying incentives and disincentives:

- Water rights laws & historic consumptive use
- Technical production factors: climate, soils, crops cultivated, irrigation technology type
- Return flow considerations

From the Interviews, one response to pressures
## Ag Water User Survey

Preference for Meeting Future Ag Water Supplies

<table>
<thead>
<tr>
<th>Preference</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water conservation and efficiency</td>
<td>79</td>
</tr>
<tr>
<td>Public policy that supports keeping land/water in ag</td>
<td>76</td>
</tr>
<tr>
<td>New storage infrastructure</td>
<td>46</td>
</tr>
<tr>
<td>Expansion of existing storage infrastructure</td>
<td>45</td>
</tr>
<tr>
<td>Improved ag management practices</td>
<td>39</td>
</tr>
<tr>
<td>Technological innovations</td>
<td>35</td>
</tr>
<tr>
<td>Alternative water transfer methods</td>
<td>11</td>
</tr>
<tr>
<td>Deficit irrigation</td>
<td>5</td>
</tr>
</tbody>
</table>
2013-2016 USDA Project

Moving Forward on Agriculture
Water Conservation in the Colorado River Basin

- CSU Faculty and Staff Project Team
- Learn from Ag producers what conservation methods are likely to work in their area and what changes to surrounding factors may be needed for ag water conservation to be fully effective
- Work with Ag water stakeholders in the basin to identify and address the challenges and barriers for ag water conservation

Information about this project can be found online at www.crbagwater.colostate.edu
Moving Forward on Agriculture
Water Conservation in the Colorado River Basin

Project Activities

- Pilot Projects – upper (No Chico Brush) and lower basin
- Case studies for university curriculum
- Document and analyze the legal, economic, and social barriers and potential impacts related to ag water conservations
- Expand Ag Water Conservation Clearinghouse
  www.agwaterconservation.colostate.edu
- Undergraduate and Graduate student training
- Project website – www.crbagwater.colostate.edu
- Workshops with Extension specialist and agents, irrigation districts, ag producers, tribal partners, and other Land Grant Universities in the CRB
- Basin-wide symposium
Ag Water Conservation: Opportunities and Challenges

Challenges
- Legal
- Financial
- Environmental
- Political
- Social

Opportunities
- Improved crop production
- Conserved water for additional beneficial uses
- Partnerships
- Financial incentives
Benefits from Improvements made in Energy and Water Conservation

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Percent of Farms Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upper CRB</td>
</tr>
<tr>
<td>Improved Crop Yield or Quality</td>
<td>59%</td>
</tr>
<tr>
<td>Reduced Energy Cost</td>
<td>16%</td>
</tr>
<tr>
<td>Reduced Water Applied</td>
<td>47%</td>
</tr>
<tr>
<td>Reduced Labor Costs</td>
<td>41%</td>
</tr>
<tr>
<td>Reduced Fertilizer or Pesticide Losses</td>
<td>15%</td>
</tr>
<tr>
<td>Reduced Soil Erosion</td>
<td>37%</td>
</tr>
<tr>
<td>Reduced Tail water</td>
<td>34%</td>
</tr>
<tr>
<td>Other</td>
<td>16%</td>
</tr>
</tbody>
</table>

*USDA FRIS 2008*
# Barriers to Adopting Water or Energy Conserving Practices

<table>
<thead>
<tr>
<th>2008 FRIS Data</th>
<th>Percentage of Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upper CRB HUC 14</td>
</tr>
<tr>
<td>Investigating improvements not a priority</td>
<td>42%</td>
</tr>
<tr>
<td>Risk of reduced yield or poor crop quality</td>
<td>4%</td>
</tr>
<tr>
<td>Physical field/crop condition limits system improvements</td>
<td>9%</td>
</tr>
<tr>
<td>Improvements will not reduce costs enough to cover installation costs</td>
<td>13%</td>
</tr>
<tr>
<td>Cannot finance improvements</td>
<td>27%</td>
</tr>
<tr>
<td>Landlord will not share in cost</td>
<td>2%</td>
</tr>
<tr>
<td>Uncertainty about future availability of water</td>
<td>7%</td>
</tr>
<tr>
<td>Will not be farming this operation long enough to justify improvements</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>28%</td>
</tr>
</tbody>
</table>
Co-Chairs

Ken Nowak, Bureau of Reclamation
Tina Shields, Imperial Irrigation District
Reagan Waskom, Colorado Water Institute

Phase I

Prepare a report that quantifies current ag conservation efforts and transfers (both in and out of the basin)

Document programs that have been successful to date

Document future plans of conservation and transfer activity

Estimate potential savings from existing plans

Phase II

Will be established from Phase I baseline information
Contact information: reagan.waskom@colostate.edu

Project Website: www.crbagwater.colostate.edu