

Dealing with Drought-Adapting to a Changing Climate

Durango, CO, October 22, 2009

Discussion Summary

Breakout Discussion # 1:

What information, planning strategies, etc. helped, or would have helped, you to better deal with the impacts of the 2000s drought?

Joe Barsugli's Group

Impacts

- Junior water rights: call on the Animas River, first call
- Need for augmentation plan
- Water Conflict by sector: Agriculture, Tribes, Instream
- Fire was a major issue: no waters to fight or mitigate the fire
- Spurred the need for fire management
- Animas, La-Plata River, New Mexico Compact: based on assumptions that 2002 dismantled
- Water quality issues stemming from drought

Needs

- Better prediction of water supplies
- 6- or 12-month climate/water scenarios would be useful for agriculture sector
- Augmentation plans--need the development of storage to offset drought
- Shortage sharing in the future
- Long-term planning needed
- Planning for growth, anticipate growth as input into water supplies

Jeff Lukas' Group

Impacts

- A lot of cooperation among users during the drought
- 1996 was first call on Silverton
- Fire = poor water quality
- Awareness occurred amongst the general population concerning water consumption, however it appears it didn't last long (2 years)

Needs

- Better interpretation of the climate information
- Better seasonal forecasting needed--need a better idea of what is going to happen
- Basin-wide preparedness
- 2002: pure crisis management, reactionary--need early warning
- Increased storage needed--could help with warming trend (differing opinions)
- Basin-wide cooperation--1177 IBCC was a good outcome of the drought

- IBCC gives an understanding of basin and cross-basin supplies

Taryn Hutchins-Cabibi's Group

Impacts

- Livestock and agriculture impacts
- Tree stress
- Summer camp delays based on safety-economic impact
- Dry wells
- Air quality-public health
- Heightened awareness = water conservation
- Aquatic hatches impacted
- Fly-fishing, rafting impacts
- Change in approach in farming sustainability
- Needed to pump water to Pagosa Springs

Needs

- Reserved grazing allotments
- Aquifer status and health assessments
- Municipal back up for dry wells
- Better moisture content and evaporative rate observations/monitoring
- Increase need for public education
- Fire response: formulate response for sediment loading
- Information on how to protect trees that were stressed
- Increased public health resources tied to air quality

Imtiaz Rangwala's Group

Impacts

- Huge wildfires
- Ecosystems with a 500-year disturbance interval were affected
- Urban interface: loss of homes
- Homeowners became aware of fuel clearance around home
- Businesses established to help homeowners
- Fires had impact on water quality because of high rates of sediment coupled with the low streamflows--struggled with water quality, no one wanted to drink water
- Florida River was impacted: fishery crashed due to water quality, high water temperature, still recovering
- How to manage rangeland on US Forest Service land and BLM: drought already takes a toll on rangelands tied to increased temps and low precipitation

Needs

- Grazing stress on top of drought stress: early warning for drought needed!
- Need assessment of changing land use, grazing operations
- Currently it is very difficult to adapt, a reactionary approach: early warning needed

- Best case/average case water supply scenario are no longer viable: need increased awareness and use of other scenarios
- Economic Impacts: Range operators, train, tourism declined, although had increased firefighters
- Dryland farmers in Dove Creek area and Dolores watersheds: need information on when/where to plant. Should you have to ask do you plant at all? If so, when do you irrigate? Do you irrigate early?
- Large-scale ecosystem impacts tied to drought
- Infestation of pine beetles
- Need increase public awareness to regarding fuel management and corresponding insect infestations around property, camping locations: need better information on how to mitigate drought stress
- Public education concerning widespread ecosystem impacts
- Groundwater recharge: very slow to begin, even slower in the drought compounded on the fact that there is limited if at all irrigation recharge: need assessment of groundwater supplies and recharge rates

Koren Nydick's Group

Impacts

- Agriculture and food production impacts: lower yields and the socioeconomic tensions tied to lower yields
- Drought caught everyone off guard: better preparedness as a result of the drought
- Well-run-dry scenario: hauling water opened eyes concerning the benefit of obtaining water from the tap
- Increased incentive to built more storage and buy more water rights
- Fish hatcheries destroyed
- Aesthetic beauty of area impacted
- Tourism dollars lost: economy hinges on tourism
- Air choked with smoke = people do not come; had impact on all tourism sectors
- Hopefully diversification across the tourism sector to help deal with drought impacts

Needs

- Better agriculture diversification efforts: less water intensive crops, better crop management techniques, approaches
- Farmers took advantage of the fact that water had always been there
- Increased conservation: conservation is King!
- Better diversification of economic community tied to tourism sector
- Increased education, better preparedness

Breakout Discussion #2:

What will be the most difficult (top 5) and important challenges climate change will pose for Colorado in the future?

Joe Barsugli's Group

- Loss of biodiversity, specifically aquatic due to runoff timing, warming temperatures
- Agriculture and demand of agriculture water: pressure from other sectors on agriculture water
- Broader water use implications: where is municipal and industrial (M&I) going to get water from? Agriculture? Conservation?
- Energy sector impacts: oil shale and solar development and the resulting water implications
- Instream flow versus human needs: How is this going to play out?
- Trans-basin diversions: decreased water supply leading to conflict over instream flows

Imtiaz Rangwala's Group

- Future of ski industry: No longer economically viable?
- What will happen to large population centers surrounding these dry/hot areas? How will this manifest? Will more people move to the mountains as a result of warming temperatures?
- Agriculture: larger growing season but increased pressure on water availability
- Changing regimes for agriculture and ranching practices
- Energy production: hydraulic fracturing, coal-fired plants--what is the future of these industries?
- Colorado River Compact: will there be a call due to increased pressure on water supplies?
- Migration of tropical diseases and species such as Africanized bees
- Public health/tourism issue from fire/smoke

Koren Nydick's Group

1. Pressure for water availability causing pressure to develop more reservoir storage
 - a. Increased pressure for trans-basin diversion
 - b. Less usable storage tied to earlier timing of snowmelt
 - c. Impacts on ecology: potential for die-offs, landscape change
2. Fire, longer fire season, die-offs?
 - a. Fire mitigation costs: air quality, tourism
3. Agriculture: the issue of feeding ourselves and the economy

- a. Possible effect on the fruit industry in southwest CO
 - b. Shorter time span for growing irrigated crops tied to earlier snowmelt
- 4. Public health impacts: heat stress
- 5. Adaptability of our culture and associated social and political consequences: different sectors have a more flexible mentality with regard to adapting to a changing climate

Taryn Hutchins-Cabibi's Group

Weren't able to rank top 5

1. Variable streamflow; changes to growing season
2. Diversity across all sectors: ecosystems: interconnectedness of systems: sectors are related
 - Water quality issues
 - Higher energy demands, higher costs associated with treating energy plants
 - West slope versus east slope conflicts
 - Need to examine current water allocation system
 - Increase in fires: public health implications, impacts to soil quality and health which would then feed into water quality: cyclical, compounding nature
 - Increasing energy demand

Jeff Lukas' Group

- We don't do a good job of planning right now: planning for an uncertain future! Long-term planning needs to incorporate different scenarios: past no longer reliable
- Need for increased water banking and storage to balance out supply and demand
- As runoff timing shifts, and demand timing does not shift: less overlay between the two: Increasing gap in timing, ties back to increase storage
- Increasing fire danger
- Wetlands, fisheries, game species: impacts to habitat and carrying capacities
- Economic and demographic projections will be less certain: less reliability of the past to use as barometer for the future

Wrap-Up to Breakout Discussion # 2

- Where will populations shift as temperatures increase?
- What will be the determining factor for shifting populations? Increasing temperatures? Water availability? Economic reasons?