Arkansas Basin Roundtable
Meeting of March 10, 2010
Meeting Notes

Roundtable Business

Chairman Barber called the meeting to order at 12:37 pm. Members and visitors introduced themselves. Twenty four (24) members were present. The agenda was reviewed.

Public Comment: John Wiener introduced David Yates, from NCAR (National Center for Atmospheric Research). They are putting together a project titled "Possible Futures, Possible Climates for the Arkansas Basin: Achieving Desirable Outcomes." Building a bridge between scientific information and decision-maker needs to meet challenges through local participation. They would like to do this study here in the Arkansas Basin if possible.

A motion was made by Tom Verquer and seconded by Jim Broderick to approve the minutes of the February meeting. The motion passed unanimously.

Gary discussed the possibility of meeting in Salida in June and having a joint meeting with the Gunnison Basin Roundtable. The meeting will be Monday, June 7th, rather than the regularly-scheduled date of June 9th.

Subcommittee Updates

Education/Outreach Committee to be formed.
The South Platte Basin Roundtable has been going out and having public meetings, rather than providing written documentation regarding their progress. Each Roundtable has a mandate to do outreach. Per Perry Cabot, this roundtable has already done a good job in the eyes of PEPO (Education Committee). Perry could spearhead the organization of public meetings. He would need a volunteer in each of three possible locations that would help organize the meeting. Perry would minimize the time commitment needed from volunteers.

Non-Consumptive Needs – SeEtta Moss
SeEtta announced the Arkansas River Basin Forum, which will be held April 6th & 7th.

Reed and SeEtta attended a statewide meeting on non-consumptive needs. They reviewed Phase I of Water Needs Assessment – maps have been completed by all roundtables. Talked about where to go from there. They were asked to fill out a form that described what had been accomplished thus far. Gov Ritter wants to get Phase 2 done in 2010.

The committee is continuing to meet on risk assessment.

DSS Update will be monthly from now on: Lindsay Griffith, from Brown and Caldwell is the Project Manager.
They are starting the DSS creation process with a Needs Assessment Task. Lindsay handed out a questionnaire/comment sheet. She would like Roundtable members to each fill one out. They will also be holding stakeholder meetings in the basin.

IBCC Report

Jeris: The IBCC met last Friday.
Jay: Alex Davis has taken the position of director of IBCC committee. The committee has been talking about the following: meeting the gap at 2030 and 2050, how to move current IPP projects forward, impediments to projects, moving forward in the federal nexus takes a long time, the vocal minority, selective-type education, educating small groups first. conservation - 20% was determined to be achievable in Jay's small group. The IBCC meets again in April.

WSRA Grant Requests – Review and Approval

Flaming Gorge Task Force Assessment – Gary Barber

The application is for: Assessment of viability and protocol to convene the initial meeting of a Flaming Gorge Task Force.

Phase One: (April to October, 2010) Identify, interview and engage key stakeholders, Basin Roundtables and sponsoring entities to assess the viability of a Flaming Gorge Task Force. The Assessment will review constituent agendas, supply alternatives, demand management, environmental impacts and project development strategies to determine if a collaborative task force model is viable.

The grant asks $20,000 from Basin Funds. The Metro Roundtable has already committed $20,000 from their Basin Funds. A presentation of this potential project was given at a previous meeting, and the feedback was that the roundtable asked Gary to take the application to other roundtables first to see whether it would be supported there.

The proposal is to do an Assessment Only. Identify folks that have a stake or an opinion. End up with a recommendation.

The Task Force itself would be a separate process if it moves forward. Expect a second WSRA grant request, including a Statewide funding component. Phase II would be to convene a Task Force of water stakeholders to achieve consensus on a Development Plan for the Flaming Gorge project.

This grant application request was approved by the Roundtable by consensus.

Updates by applicants to the Roundtable – Jay Winner

The Needs Assessment Committee has discussed the possibility of de-authorizing grants that are not being used. The next step would be to ask Todd Doherty which grants have had no action yet taken on them.

PRESENTATION

Climate Change – Western Water Assessment - Jeff Lukas, Joe Barsugli

Climate and Hydrology: Learning from the past and planning for the future in the Arkansas and Colorado River Basins.

Western Water Assessment is a joint program of the University of Colorado and NOAA. The mission of the program is to identify and describe vulnerabilities to climate variability and change, and develop information that assists decision-makers, in Colorado, Utah and Wyoming.

Outline

Overview of Winter 09-10

October and December were particularly cold in the Western US. Most of the planet was warmer than normal.

The Past 100 – 200 Years

Comparison to (1971-2000) average already includes some warming compared to the longer-term record. The difference between climate variability and climate change was explained. Colorado's statewide temperature has warmed approximately 2°F since 1970.

Sources of variability include:

- Wetter years tend to be cooler than dryer years
  - Less solar input when cloudy
  - Dry soil heats up faster than wet soil

Observed climate and streamflow variability

- Statewide Precipitation, 1900-2009
  - 2002 was the driest year between 1900 - 2009
  - 2000 – 2002 2nd driest 3-year period (after 1954-1956)
  - 2000 – 2004 4th driest 5-year period (after 1930s, 50s, 70s)
  - 2000 – 2009 5th driest 10-year period (after 1930s, 50s, 60s, 70s)
- Swings are much wider than with temperature. The wettest years were in the 1910s.
- Annual streamflow as a function of climate:

Variation in streamflow is mainly driven by variability in water year precipitation (timing does matter)
Temperature, humidity, and winds affect evapotranspiration, and thus flow.
In the headwaters and upper basin where groundwater is not a large influence, Annual flow = Precipitation – Evapotranspiration.
Arkansas and Colorado River natural flow trends are very similar.

Tree-ring reconstructions of streamflow

In order to put observed flow records in a longer-term context, tree ring growth can be observed.
In dry climates, tree growth is limited by moisture availability, so, a dry year leads to a narrow growth ring, and a wet year leads to a wide growth ring.
Like streamflow, tree growth integrates both precipitation and evapotranspiration; ring-widths can be used to estimate streamflow.
The Arkansas River at Canon City, observed and reconstructed flow, 1896 - 2002 matches very closely.
Colorado and Arkansas annual flows have been reconstructed since ~1500. By the tree-ring record, low flow years such as 2002 look like 50 – 100 year events.
Low flow records are mirrored in Ark Basin and Colorado River Basins.
Colorado River data goes back to 762 ad. There was a global multi-decadal drought in the mid-late 1500s.

The Future

The big picture of global climate change

The Greenhouse Effect: the atmosphere keeps more of sun's heat near the surface. Water vapor is the most important natural greenhouse gas. Without greenhouse gases, the planet would be approximately 50 degrees colder than now, a frozen planet.
We are increasing the heat-trapping capacity of the atmosphere by adding greenhouse gases like CO2. CO2 levels right now are one-third higher than any time in the past 1 million years.
The doubling of CO2 over natural levels will increase global temperature by ~2°F. Water vapor feedback will magnify this warming, but how much is unknown
Increases in fossil fuel emissions, atmospheric CO2 concentration, and global temperature all mimic each other. Overall, temperature has raised 1.4°F between 1850 - 2010 globally.

Climate change projections for Colorado

Temperature

There is much greater year-to-year variability in Colorado temps, although trends since 1900 are similar. It's not possible to judge the global picture by what happens locally in a given year.
Global climate models simulate the complex interactions among the land, oceans, and atmosphere.
Climate models have improved in their ability to simulate the climate. A number of climate models are available from different research groups and countries. It is very important to compare results from different models, and to consider multi-model averages.
Climate models project Colorado will warm by 2.5°F by 2025 and 4°F by 2050 relative to the 1950-1999 baseline. These figures are based on a multi-model average of 22 climate models.
Nearly all model runs project between 2°F and 7°F of warming by 2050.

Precipitation

Precipitation projections for Colorado result in an unclear picture. Model projections do not agree whether annual mean precipitation will increase or decrease in Colorado by 2050. Colorado is in a zone of small projected precipitation changes, and weak agreement between models. All models project continued high year-to-year variability.

Water Cycle

Regardless of future precipitation trend, the following impacts are expected given increased population and additional warming:

Lower percent of precipitation stored as snowpack
Decreased snowpack
Earlier peak runoff

Higher water use
Reduced runoff
Increase in drought severity
Reduced groundwater recharge
Higher evapotranspiration
Higher stream temps
Higher plant water use
Higher evaporation
Less lake ice
More severe droughts between rains

Streamflow projections for Colorado

Joint Front Range Climate Change Vulnerability Study
Basins: Ark, South Platte, and Colorado River above Cameo
Funding: Water Research Foundation
In collaboration with: Western Water Assessment, CWCB
Results will be released Spring 2010 (tentative)
Simple Sensitivity Model – comparing how changes affect different basins differently.
Changes applied uniformly across the basin to the historical precipitation and temperature records.
Hydrology models used to simulate natural streamflow under changed climate.
South Platte more responsive to temperature and precipitation changes than the other basins.
Arkansas River Basin shows similar or less sensitivity compared to the Upper Colorado.
The drier basins are more sensitive to changes. These studies of the Upper Colorado consistently project earlier runoff peak & much reduced summer flows with warming.

Study is available for review at their website: http://wwa.colorado.edu

Planning for an uncertain future

Anticipate changes: The future climate will likely be substantially different than the past.
Use scenario-based planning incorporation projections to evaluate options rather than just using the historic record.
Expect surprises and plan for flexibility and robustness in the face of uncertain changes rather than counting on one approach.
Plan for the long haul. Where possible, make adaptive responses and agreements "self-tending" to avoid repetitive costs of intervention as impacts increase over time.
Even if we don't consider climate change projections; we would still want to prepare for future drought conditions more severe than in 2002 and the 2000s.

Review of the next meeting's agenda

Meeting was adjourned at 2:44 pm.

Respectfully submitted,
Jay Winner