

Regional Water Planners Panel Discussion

Randy Kirkpatrick, San Juan Basin

Randy Kirkpatrick received a BS and an MA from New Mexico State University in agricultural education and public administration. Since the late 1980s, Randy has worked with water issues, and participated in the drafting of the original Regional Water Planning Template. In 1989 he became actively involved with the San Juan Water Commission, and in 1994 became the Executive Director for the Commission. Randy is Immediate Past President of the Colorado River Water Users Association and is currently serving as the Secretary/Treasurer of the New Mexico Water Resource Association. He serves as San Juan Water Commission representative on the following committees: Ad Hoc Committee for the New Mexico State/Regional Water Planning; Animas-La Plata Operation, Maintenance and Replacement Association; Animas-La Plata Project Construction Committee; Bureau of Reclamation Managing for Excellence; New Mexico First; New Mexico Water Dialogue; San Juan Basin Regional Water Planning; San Juan River Recovery Implementation Program; and Western Coalition of Arid States.



My history on regional and state water planning began before the tenuous development of the Regional Water Planning Template. During that process, I was fortunate to have time to survey many planning efforts in the West, which led to the original outline for the template. Twelve dedicated persons and I spent the next 13 months in the development of the original Regional Water Planning Template with the assistance of Interstate Stream Commission staff.

The current administration pushed for the very critical State Water Plan in about the same time allotment. It involved two broad public efforts, one in Socorro, as a Town Hall meeting that was well done, and the second in Albuquerque that was done without adequate time for participants to recognize truly the concept of complete planning. There were numerous regional meetings as well. While the result was an adequate first step in the form of a policy document to guide some Office of the State Engineer activities, it was not and is not what will lead the state to a truly sustainable water

supply. No one means to be overly critical, but the financial and human resource demands for this effort are greater than has ever been dedicated to the process.

Our most recent update/review did not include a public exchange and simply followed a well designed program. The problems with the update were not due to the planning staff's effort but to the lack of resources available to develop a realistic plan. Good things will come from the effort, as in the first attempt, but the return on the investment is disproportionate when the investment is too small.

Planning must address a number of elements to reach its ultimate goal, which is a sustainable water supply for the citizens of New Mexico.

1. Hard data – The best data must be used primarily regarding supply/demand, with awareness of realistic strategies to achieve the balance among interests including the environment, health and well-being, and socio-economic stability.

2. Institutional bias – Institutions, particularly governmental agencies, assume and are granted authorities and develop processes that eventually become unwritten rules. These unwritten rules can become challenges to change. In some cases, they take on their own realm of importance to staff and leadership. Successful planning must overcome these and the inevitable “because we always did it that way.”
3. Cultural resistance – Many are guilty of this, probably including myself. Agriculture has always done it one way, which is the basis for most of our water law. Cities have done it another way and feel their uses are more important. Environmental purists want it all to meet their beliefs, based on fact or feelings, and so it goes...
4. Legislative good intentions – Protectionism and politics can create unforeseen consequences, many relate to the two previous positions; some will or have been judicially corrected. It must be recognized that water is not optional on either side of most issues. Quoting Phil Mutz’s first and best advice to me, “Be careful, you may get what you ask for.”
5. Lack of authority – Water planning consists of more than one plan: the State Water Plan, Regional Water Plans, Water Development Plans (40 Year), Conservation Plans, and efforts related specifically to water quality. We need one comprehensive water plan that can be integrated into the other non-water plans that we all undertake with authority given locally, regionally, and statewide for the plans’ elements.
6. Implementation – My bookshelves contain more than a half dozen water-related plans, most of which are not doing more than holding my bookshelves down. But with certain actions, they could become reality. Our first regional water plan in the San Juan Basin, prepared in 1981, led to the creation of an organization, a strategy, and funding, although no state funding. Let’s look at the largest single result, other than my having a job.

SCOPE OF WORK

San Juan Basin Comprehensive Water Supply and Needs Study and Update to San Juan Regional Water Plan

Introduction

The purposes of the San Juan Basin Comprehensive Water Supply and Needs Study (Study) are to:

Water Supply

1. update the water supply analysis of the San Juan Regional Water Plan by extending historical data through 2008.
2. extend water supply projections through 2050 taking into consideration variability and statistical risks associated with climate change projections of water supply
3. estimate the water supply impacts of climate changes using existing climate model results.
4. estimate water supply variability and statistical risks of various supply scenarios through 2050 based on existing non-climate change studies, such as tree ring or other paleo climate studies results.

Water Needs

5. update water needs based on current data on irrigated acreage collected by the State of New Mexico
6. update the domestic water needs based upon current and forecasted population growth using United States Census Bureau and State of New Mexico demographer information
7. extend water needs for municipalities and industrial uses by adding historical uses through 2008 to the existing data set from the San Juan Basin Regional Water Plan
8. summarize and quantify existing water rights.
9. summarize water needs through 2050

Implementation

10. review and update the San Juan Regional Water Plan implementation strategies
11. prepare an implementation plan for meeting projected basin-wide water needs.

Climate Change and Water Supply

No study of climate change impacts to northwestern New Mexico, in particular the San Juan Basin, was identified in preparing this scope of work. Three studies examine climate change impacts to water supplies of the Rio Grand in New Mexico. They are:

1. WATBAL, a model that estimates changes in streamflow and water availability (Yates, 1997).
2. Rio Grande Hydro-Economic Model (RGHE) simulates six climate change scenarios (Ward, et al 2001).
3. Upper Rio Grande Water Operations Model (URGWOM).

Climate change impact study of the Rio Grande as part of UGWOM, a RiverWare based model of the river, was a New Mexico specific study that also considered climate change impacts to water supply. These model results are not deemed directly applicable to the San Juan Basin.

However, much of the water supply for the San Juan Basin in New Mexico originates in southern Colorado. Western Water Assessment (WWA), a collaborative effort of the Cooperative Institute for Research in Environmental Sciences at the University of Colorado and the National Oceanic and Atmospheric Administration's (NOAA) Earth System Research Laboratory (both in Boulder, Colorado) has conducted extensive research in climate change impacts to water supply, including that of southern Colorado.

WWA's research has relied on two principal global climate change models, the Canadian Model (Canadian Centre for Climate Modelling and Analysis, a subset of Environment Canada) and the Hadley Model (Met Office Hadley Centre, United Kingdom). Additionally, results of models by NOAA and Goddard Institute for Space Studies were used. This research would be the basis for this proposed study's analysis of climate change impacts to the water supply of the San Juan Basin.

Paleo-climate

Several paleo-climate studies have been conducted to assess the prehistoric water supplies of various regions of the United States. Most notably are studies completed by NOAA which included evaluation of tree rings within the San Juan Basin in Colorado. Results of NOAA paleo-climate changes will be used to assess impacts to the Animas and San Juan Rivers water supply.

Climate Change and San Juan Basin Supply

There are numerous methods to consider water supply changes associated with climate change. Initial WWA studies present information in terms of ranges of effects. Generally, in the San Juan Basin area the effects of climate change are:

1. An increase in precipitation in the San Juan Basin is reported by the Hadley Model and a mix of increases and decreases reported by the Canadian Model.
2. With increased temperatures, runoff will occur earlier than currently occurs and snowpack at lower elevations will decrease.
3. Less water will be available during peak demand summer months.
4. The irrigation season and peak demands will increase with increased temperatures.

The effects on the water supply of a specific water right holder could vary considerably. Earlier runoff may make storage more important and provide more opportunities for those entities with storage rights to capture water. Conversely, an extended irrigation season may delay the traditional start of the reservoir filling season as senior water rights continue to divert water for application to beneficial use through the autumn. Extended irrigations season may mean more crop production (i.e. 5 alfalfa crops instead of 4) which necessarily requires more water. If the rights are senior enough, this may result in less water for junior water rights holders.

TASK DESCRIPTIONS

Task 1 – Early Climate Change Assessment

An early climate change assessment will evaluate the climate change models and apply their findings directly to San Juan Basin supplies. This may be as simple as determining the percentage reduction or increase to the basin in aggregate. This task could be accomplished relatively quickly and provide some limited understanding of impacts anticipated from climate change on a basin-wide basis. This early assessment could not adequately evaluate the impacts to specific water rights.

Product: Memorandum report on basin-wide impacts to water supply from climate change as reported by existing models. (Completed)

Task 2 – Historical Data Collection and Extend Study Period

Starting with existing data sets from the San Juan Regional Water Plan, the project team will collect and extend streamflow gage data and other water use data through 2008 for use in projecting water supply and demands. Data will be collected on a monthly timestep for evaluating water rights vs. water supply under historical, climate change and paleo-climate change scenarios.

Product: Electronic files of extended data

Task 3 – Collection and Analysis of Monthly Climate Change Model Results

The results of two climate change models associated with the San Juan Basin will be collected and summarized to provide a more robust and comparative analysis. The goal will be to develop a reasonable monthly climate change estimate in water supply that could be used to project the basins supplies through 2050, using a replication of historical data. This may require the use of statistical comparisons of historical water supply data and climate changed water supply projections to develop a future projection. Because the climate change models report ranges of effects, the water supply average in 2050 will also reflect a range of responses.

The project team will collect monthly data effects of climate change and extrapolate the model results to the San Juan Basin Rivers (Animas, La Plata and San Juan). This analysis will not simulate storage or other human diversions but will use assumptions that the gages at the state line with Colorado are proportionally reduced. The exception will be the effects on the Animas River that will impact Animas-La Plata Project (ALP) water supplies. The effects of climate change on supplies at the Durango Pumping Plant will be extrapolated and applied to ALP supplies.

Product: Summary of Climate Change Model Impacts on Natural Water Supplies

Task 4 – Water Right Quantification

Using the San Juan Decree, the Cielo Report, New Mexico’s WATERS database, and research of state water rights files, the water rights of the San Juan Basin will be compiled in a summary report. Because water rights are not always quantified in acre-feet, the project team will quantify the rights based on historical monthly usage or irrigated acreage described by the right. To avoid concerns or inaccurate perceptions that the San Juan Water Commission is trying to adjudicate rights, the non-municipal rights will be aggregated by subbasin and listed by type (i.e. agricultural, industrial, other). Municipal rights will be summarized in more detail and provided to the members of the Commission for review and concurrence. If confidentiality is needed, the Commission can direct that the municipal water rights quantification also be aggregated to avoid details of specific rights being published.

The purpose of quantifying water rights is to determine the seasonal variation effects of climate change based on priority of water rights.

Products: 1) a summary report of the water rights of the San Juan Basin

2) quantification of the rights on a monthly timestep

3) aggregation of agricultural rights by subbasins as defined by the San Juan Regional Water Plan

Task 5 – Population Projections and Extension of Demands through 2050

The 2000 U.S. Census Bureau data was used to develop population and water demand projections for the San Juan Regional Water Plan. This study will eventually use 2010 U.S. Census data to update the projections. This means that completion of this task will not be accomplished until the 2010 data is available in 2011. In the interim, the projections of population and water demands will be mathematically extended from 2044 (planning horizon for the San Juan Regional Water Plan) to 2050 using results from the San Juan Regional Water Plan in order to provide initial study results.

Products: 1) extension of water demands from 2044 to 2050.

2) re-assessment of population projections and demands incorporating 2010 census data.

Task 6 – Paleo-climate Changes

The results of NOAA paleo-climate study results will be collected and evaluated to assess the statistical frequencies of extreme and prolonged droughts in the San Juan Basin. Paleo-climate results are annual values and cannot be used to assess monthly timestep water supplies. However, the increased period of record will help assess the potential for severe droughts in the basin, including those that extend over several years.

Product: Section of report.

Task 7 – Comparison of Historical, Climate Change and Paleo-climate Results

Three scenarios of water supply will be compared with projected future demands at the year 2050. The comparisons will be made on a single-year basis representing the projected average monthly demands in 2050. The ranges of dry, normal and wet years for extension of historical data will be compared with

demands. These dry, normal and wet year comparisons will be modified by the results of climate change models to provide a statistical range of dry, normal and wet years. Paleo-climate statistics will be summarized but not used to compare with projects 2050 demands.

Product: Three sections of a report describing the results of comparing 2050 demands against historical supplies, climate change modified supplies and paleo-climate statistical supplies.

Task 8 – Implementation Plan

The implementation and drought contingency plans as included in the San Juan Regional Water Plan will be re-visited and discussed with stakeholders to determine their continued applicability to the conditions described by this study. As needed, additional implementation strategies will be developed and those that are no longer considered viable by the Commission will be deleted from inclusion in the plan.

Product: A section of the comprehensive water plan describing implementation strategies to meet projected demands.

Task 9 – Public and Stakeholder Outreach

Throughout the study at key milestones, the study purpose, methodology, and/or results will be presented to the public and to stakeholders. The purpose of this outreach will be to incorporate information from the public and/or stakeholders that may improve the study and provide better overall results. A secondary purpose will be to provide opportunities for the public and stakeholders to learn about the study and develop an understanding and acceptance of its process and findings. Re-establishment of the citizens advisory council used in preparation of the San Juan Regional Water Plan is a possible option of accomplishing this outreach.

Products: 1) Collection of stakeholder findings, minutes of meetings and other public input.
2) Participation in 10 stakeholder or public meetings over an 18 month period.

Task 10 – Preparation of draft and final Comprehensive Plan

Two drafts and one final version of the Comprehensive Water Plan will be developed. These documents will undergo review by the Commission and other stakeholders, as defined by the Commission.

Products: 1) a web based version of the draft and final master plans
2) 30 paper copies of each draft and final document