**Summary, Dialogue’s Statewide Meeting, 2016—“Planning: How It Can Make A Difference”**

*In the autumn of 2015, as Dialogue board members grappled with decisions regarding theme, agenda and speakers for the next statewide meeting just a couple of months away, the conference title had already been chosen. “Planning: How Can It Make A Difference?” heralded early notice of the event in the fall newsletter. But sometime between that initial announcement and the actual gathering on January 7, reconsideration took place. The question mark disappeared. A niggling itch, someone’s midnight qualm, brought that label back up for review. Imagine the nuisance—‘There are more urgent things to do! Wasn’t this settled? What difference does it make, the U-turn of two little words?’ But a case was made to eschew doubt, and to confirm instead—on the strength of group experience—that indeed, planning makes a difference. To plan is to have something in mind, and yet, it’s wise to stay open to hope and misgiving. Echoes of that valuable gyroscope turn up again and again in the long summary ahead, because unlike static plan, plann****ing*** *is dynamic, responsive, and always poised for change.*

*Jason John,* President of the N.M. Water Dialogue and a member of the Navajo Nation, has worked for the tribe’s water resource department since 2001. Even after fifteen years, he says, there’s always something new to learn. “I think that goes for everyone when it comes to water, planning and implementation. One of the toughest things we’ve all had to deal with is the *politics* of water.

The Navajo Nation has spent over ten years talking to the State of Utah concerning water rights for Navajo Nation lands there. We recently came to an agreement for 81,000 acre-feet of depletion per year in Utah, and now that agreement has just started making its way through Navajo Nation Council. In that process, it will become very political.” Settlements eventually involve money for projects, and the team at Navajo that deals with water rights tries to “put together a plan that we can stand behind and defend until the very end. That’s what the Utah settlement is. We are requesting just over $200 million in funding for projects that will serve the future for people in the Utah portion of Navajo, to provide water for economic growth…We’ve been planning this for over ten years, and we’re just now beginning the approval process.”

John notes that the San Juan settlement in New Mexico was passed by the Navajo Nation Council in 2004, but wasn’t approved by Congress until 2009. A five-year time span is “quick in terms of a water settlement,” he says, and the Utah agreement is going to “present some challenges. We’re squeezed into a timeframe because there’s going to be a change in U.S. administration. It’s a [presidential] election year, and there may be new faces in Congress, as well. We have to take those political frameworks into account when we’re trying to move a settlement through for implementation, so we’re on a bit of a tight schedule, trying to squeeze what we did in five years for the San Juan into *one* year for the Utah settlement. That is quite ambitious.”

The Navajo Nation is home to “a large political front that desires a lot of information when it comes to water right settlements,” John says, and that can mean controversy between those who believe the tribe is owed “a lot of these rights based on the fact that we were here a long time,” and those who must reconcile technical and legal considerations within the existing policy framework of the Colorado River Basin and the State of Utah. “All of those factors go in and it will become very political as people start to express their opinions about what a water right should be.”

The parallels to regional water planning in New Mexico are not lost on John. As a member of a government staff, and as president of the non-profit Water Dialogue, he knows the concerns of both citizen advocates and state employees. “I share the same situation as the state folks when I’m talking to the Navaho Nation’s public about water planning. People want information; they want us to come out to their area and have a dialogue with them about water now, water in the past, water in the future.” That requires resources and manpower, both of which are in short supply. As advocacy organizations and government agencies put heavier emphasis on water planning, insufficient funding is an issue common to all, John says. “Yes we need more money for planning, but we all should agree on where that money is focused in the future.”

*Senator Peter Wirth*, Chair of the New Mexico Legislature’s Water and Natural Resources Interim Committee, recalls that his paper for Al Utton’s UNM class on Advanced Water Law dealt with a proposed water transfer in the San Luis Valley in the 1980s. A developer planned to drill “super-deep wells” and pipe the water over the Sangre de Cristos to Colorado’s burgeoning Front Range. San Luis farmers managed to stop the move, but “similar concepts are being proposed now in the state of New Mexico,” Wirth observes.

In his early years as a legislator, he served on the House Water and Natural Resources Committee alongside Representative Joe Stell, a strong proponent of the expenditure of $120 million in state funds to retire Pecos Valley water rights in order to comply with the Supreme Court decree in *Texas v. New Mexico*. Wirth calls that “a precedent-setting position for the state to take. Rather than implement priority administration to address the shortage, we simply bought our way out of the problem. We retired water rights and drilled wells to pump water into the river to meet compliance.” Although Stell believed the buyouts “saved perhaps four hundred million dollars in economic development in the Pecos Valley,” the precedent is one the state will “continue to struggle with,” Wirth says, particularly in light of a 2013 lawsuit filed by Texas, involving depletions on the Rio Grande below Elephant Butte. Wirth considers that “the trigger area for water policy in the state of New Mexico.”

Two terms in the House taught Wirth “how difficult it is to do *anything* when it comes to water in the Legislature,” but also, “how we can be pro-active in a water planning scenario.” Now a member of the Senate, Wirth views 2013 as “a really important year at the legislative level.” The state was in the midst of a massive drought, and in his minority response to the Governor’s State of the State Address, Senator Michael Sanchez called *water* the ‘sleeper issue’ we face in New Mexico. It presaged “an awakening” in the legislative leadership, spurred mostly by the litigation in the Lower Rio Grande. “Given the sense that there could be financial consequences—that we could be looking at *billion dollar numbers*—all of a sudden the legislator in charge of stable revenue gets very interested,” Wirth says.

2013 was also the year that Wirth carried two bills dealing with domestic wells. The first was an effort to stop ‘double dipping,’ the practice of selling off agricultural water rights on a parcel and then building housing served by domestic wells. The other was a subdivision bill that had failed after prolonged opposition in the House some years before. Both bills made it through the Senate with support from previous opponents, Wirth notes, signaling “a shift in understanding that we have got to do things differently in this state. Driven by drought and by litigation, we’re in a position where we’ve got to engage.”

In 2015, Wirth was asked to chair the Water and Natural Resources Interim Committee, where water planning was re-emerging as a salient issue. As he studied the 2003 water planning statute, what commanded his attention was “a huge challenge with respect to who we’ve asked to do our water planning, and who we’ve asked to be the entities in charge of implementation.” The statute dictates that the Interstate Stream Commission, in collaboration with the Office of the State Engineer and the Water Trust Board, will prepare and implement a comprehensive State Water Plan. Interstate Stream Commission and Water Trust Board members are appointed “almost exclusively” by the Executive branch, as is the State Engineer. To address that imbalance, Wirth carried a bill to change the makeup of both entities. “What we’ve got is a situation where, you can have huge swings in policy based on who’s in the Governor’s office… Under current statute, the Governor appoints eight ISC members for a term of six years. The ninth member, the State Engineer, is also a Governor appointee. The statute further dictates that all of the state’s irrigation districts be represented on the commission, along with at least one member of a New Mexico tribe or Pueblo. “So when you look at the makeup of the ISC which is charged with implementing the water plan for New Mexico, it’s very concerning to me that the makeup comes from one specific *segment* of water users, and given the Legislature’s tasking of the ISC with water planning, I felt it was important to have a discussion about trying to balance out those appointments.”

The 2015 legislation would have retained a commission of nine members, including the Governor-appointed State Engineer, and authorized the Governor and the Legislature to appoint four members each, all representative of different aspects of water policy and planning in the state. The bill passed the Senate but was not heard in the House. Nevertheless, Wirth thinks it’s the beginning of “an important discussion about how we take the plan and actually implement it…I continue to believe that we need to figure out how to rebalance these critical agencies. It’s not good for state water policy to have wild swings based on who is in the Governor’s office.”

Wirth has other ideas about the implementation of planning and sharing that come from the bottom up instead of from the top down. “In New Mexico we have an incredible legacy in our acequia communities and the model they’ve created for us which is to communicate instead of litigate…It’s so important to get the folks who are impacted around the table, to fashion the remedy themselves. We have a system of water law in New Mexico that’s been based on priority, and the problem is when you try to implement priority, you end up…with winners and losers, and the winners may not be the ones that make the most economic sense…Active Water Resource Management is a real shift from a strict adjudication approach, but I think the only way we’re going to get this to work is if we empower the actual folks around the table to make the decisions.”

That reminds Wirth of the San Luis Valley. The water transfer proposal of twenty-five years ago was “dead wrong in terms of the water: the San Luis receives less rain than Phoenix,” Wirth says, and groundwater pumping has put the region in further jeopardy. Not long ago, farmers there asked the legislature to create small, non-mandatory sub-districts with authority to tax water use. Kansas has done something similar via enhanced management areas with self-imposed usage limits.

In New Mexico, the Active Water Resource Management program has two critical differences, Wirth says. First, the State Engineer is at the table, “not as an equal, but with a very big club if [the others] don’t come up with some kind of resolution. It basically empowers the State Engineer to impose an allocation. That’s the kind of threat that caused farmers in the San Luis Valley to say, ‘If we don’t do this, the state’s going to start imposing priorities we don’t like. We’d rather do it ourselves.’” The other difference is the taxing ability, and Wirth says he’s “intrigued by what they’ve done in Colorado. I really think that if you had these empowered local districts, a regional water plan put together by that same district all of a sudden has a whole additional meaning. I’m a huge believer in having regional water planning happen from the bottom up. I know the challenges faced by the ISC, and when we don’t give them sufficient funding, it gets really tough to do that well. We end up streamlining things and that creates issues. As we move forward with the culture of conservation, this is something I think we need to look at.”

**Panel: Knowing the Problem**

*Aron Balok,* of the Pecos Valley Artesian Conservancy District, grew up in Ramah, New Mexico, where “water was a simple concept: we didn’t have any. Our house well was 900’ deep and pumped a gallon and a half per minute, so conserving water was something you never gave a second thought to—you had to.” Not so, Roswell, where he first encountered “water in the desert. The learning curve was steep, and still is.” It’s easy to get lost in the woods when it comes to ‘knowing the problem,’ he says. “It’s relative. Will you have to curtail watering your lawn? Probably. Will you run out of drinking water? I kind of doubt it. You can buy a bottle of water at any convenience store for about a dollar... For eight dollars a gallon, I can provide you with all the water you want. But are you going to take that $8-a-gallon water to water a lawn, or grow hay, or strawberries, or chile? …Water is an economic commodity, a private right, and a public good…how do we decide who gets what?”

The groundwork was laid a long time ago with the concept of prior appropriation, Balok says. “It seems so simple, yet we’re so far from being able to do it...If you have a supply and demand equation, what’s one of the first questions you’re going to ask? *How much do we have?* Can someone tell me how much water we have in New Mexico?” Without exception, the answer is no, and neither do we know exactly how much we’ll *need.* Such is the fallacy of trying to develop water policy.

In the past eighty years, Balok says, there have been at least ten ‘fixes’ to water problems in the Pecos, but each ultimately failed in the face of reality. Most recently, plans and policy failed because of inconceivable drought. “What do you do when it stops raining—not rains less, but *stops raining*? We had to go back to tree ring data to find a period of time that was that dry for that long.” It was a scenario in which even a priority call could not have worked, Balok recognizes. “If we had stopped all the upstream users from pumping groundwater, Carlsbad would have surely gotten its water *when it started raining again.*”

When we “think too far outside the box, we go beyond the parameters that can actually work…You can’t solve the problem of supply and demand without understanding what the supply *is*, and what the demand *is*. Supply is always going to be a variable, so you have to have to come up with some sort of sliding scale—‘first in time, first in right’; priority dates; adjudication. We *have* to get our state adjudicated… AWRM scares me because nobody can put a finger on what [it] is. But, with a backdrop of priority administration, AWRM is the logical decision…If all parties realize they’re facing the real threat of a priority call—that they’ll have to curtail pumping, with maybe millions or billions of dollars worth of economic impact—then they’ll decide to do *something*.” For PVACD, that ‘something’ was doubling the mil levy and using the money to create a water bank. With the threat of a priority call hanging in the background, people came to the table. “*This* is what the definition of AWRM is. Let’s figure out something where senior users remain whole, and juniors can get some water without *taking* it from somebody…We’ve got to work within the realities of the system we have.” In response to a question about how to deal with ‘haves and have-nots’, Balok notes the reason adjudication takes so long is because it’s so thorough. “You have to be sure everybody that has a right gets recognized… Somewhere in time, somebody staked a claim to that ‘property’. When you use water…it’s yours until you dump it on the ground and it soaks in. Then it becomes the property of ‘the people’ again. If it makes its way back to the river and floats downstream, it’s available to the next person to put it to beneficial use.

It’s difficult to get our arms around this private property component of water. As Senator Wirth said, part of it is a money problem. If you want some of the water I have, pay me eight dollars a gallon and I promise you I can provide it for you. I’ll go out and find water, wet water, real water, and deliver it to you, cleaned, purified and put in a plastic bottle if you’d like. It’s a supply and demand equation: if demand is high enough, supply will come out of the woodwork…AWRM is the concept that we’ll allow people to do some horse-trading. If I have a junior right and access to water, and you have a senior right and no access to water, it makes sense for you and I to get together and work something out. I think AWRM has tremendous potential, but where I get to the edge of my seat is when you say AWRM is a system by which we’re going to re-appropriate water, redistribute water, take it from here and move it there. It’s no different from the government saying, ‘We want to build a motel where your house sits.’ You can’t do that with water. I don’t want to see us get to the point where you can take something from someone else because you have a better idea for it. You can have it, but you’re going to have to work out a deal for it.”

*Norm Gaume*, who describes himself as a Water Resources Consulting Engineer, says ‘knowing the problem’ is the first step in clear thinking about anything we do. Gaume was asked to address what several current (and controversial) water development proposals have in common: the Gila River Diversion and Storage Project, authorized by the 2004 Arizona Water Settlements Act; the water supply for the Santolina Master Planned Development on Albuquerque’s west side; and the “scheme” to export groundwater from the San Augustin Plains in Catron County.

“The most striking common factor is that none of them are the result of considered planning,” Gaume says. “We didn’t define a problem; we didn’t define alternatives; we didn’t select a solution…[All three proposals] are really just speculative ideas masquerading as solutions to public problems. They try to shortcut the planning process, they’re [based on] fuzzy problem statements, they rely on fuzzy math, and all of them depend on distortions or suspension of hydrologic reality.” The latter, Gaume declares, “has been my career buzzword…It means knowing the problem, and in New Mexico, it means knowing how the groundwater system works.”

Also common to the three proposals is the fact that they are “pushed by proponents and speculators [seeking] private benefit at public expense.” ‘Knowing the problem’ needs to be done on a collective basis, Gaume says, because “these are societal issues with a public resource that’s essential to us all…There needs to be some consensus if we’re going to get a good solution. We have to define and evaluate alternatives; have clear and transparent thinking and assessment; and then come to agreement about what needs to be done.”

Gaume was able to successfully apply this model two times during his career. As Water Resources Manager for the City of Albuquerque, he used it to refute the ‘infinite aquifer’ myth embraced by proponents of development for decades. Changing that false image involved a technical advisory committee that met over many weeks, and a customer advisory committee of citizens that reached 100% consensus on a policy eventually adopted by the city council. The second example of successful consensus planning occurred when Gaume became Director of the Interstate Stream Commission, and learned that his highest priority was to “find a way for New Mexico to permanently comply with the Pecos River Compact decree.” For fourteen years, the state had been “buying its public compliance with the Supreme Court Decree” and teetered on “a ragged edge of violation.” Through an intensive five-year public process, he says, “we defined the problem: how to get water through the last dam in New Mexico, which happens to have the most senior rights on a river that is chronically short because of upstream pumping. *We worked that out*.” If anyone believes the solution was “a failure,” Gaume says defensively, they don’t understand that the problem was achieving permanent compliance with the decree. Today, New Mexico has a Pecos Compact credit of over 100,000 acre-feet.

In contrast to these models, the Gila, Santolina and San Augustin proposals all focus on what Gaume calls an *ostensible* problem, and whatever is being “pitched” as its solution. The first filing for a dam in the wild upper box of the Gila was made in 1916. The Bureau of Reclamation and the State of New Mexico were both involved, and after a hundred years without success, Gaume characterizes the mindset as, ‘Let’s keep trying! Wall Street will finance anything.’ “We *could* have approached [the situation] by saying, ‘We have a windfall from Senators Domenici and Bingaman that can be used to support *any* water supply project in the four counties of southwest New Mexico. What’s the *best* use we could make of that funding to solve as many problems as we can in this poor area of the state?’”

In the case of Santolina, the ‘problem’ involved a speculative purchase by a foreign-owned bank of undeveloped West Mesa land with no water. The ‘solution’ was to get the Albuquerque/Bernalillo County Water Utility Authority to agree to provide service, and then to seek a public subsidy in order to proceed with the project. “Claims that were made as to the adequacy and resilience of Albuquerque’s water supply simply aren’t true,” Gaume insists, and the impact of importing water to Santolina from existing sources—i.e., converting urban water conservation savings to growth—deserves public discussion. At the very least, ABCWUA’s water budget and extensive network of USGS monitoring wells could have been used to “get a best fit for the Albuquerque community.”

The proposed transfer of water from the San Augustin Plains also involves a speculator, one who purchased undeveloped land in Catron County with the hope of pumping groundwater from that essentially closed basin to the more lucrative, water hungry Rio Grande. The proposal “ignores hydrologic reality,” Gaume says, with serious repercussions, because in the Middle Rio Grande, “we’re depleting more water than we have legal entitlement to.

Can we change the way we’ve been doing business and accept a plan for hydrologic reality? If we can’t, we are inviting the chaos of the Lower Rio Grande’s Supreme Court litigation to cross the perfect dividing line of the Compact boundary at Elephant Butte Dam. We *have* to comply. Why aren’t we talking about it, and why don’t we have leadership that’s engaged in these issues?” What would it take to deal with this realistically? “Not speculators,” warns Gaume, but real leadership, reformed planning, and perhaps a change in law. “If we live within our supply, we can comply with the Compact, and if we comply with the Compact, we can isolate the chaos in the Lower Rio Grande.”

The *real* problems that must be dealt with in the middle basin include allowing municipalities to purchase pre-1907 water rights to reduce river depletions caused by groundwater pumping: preventing irrigation on ‘dried’ lands using MRGCD waterbank water; and dealing with the “excessive” number of existing pumping permits (including some claimed by ABCWUA) that do not have the water rights to back them up. “We need to be talking about real water and real water rights,” Gaume says, because outside of compliance with the Pecos Compact and the “mess” in the Lower Rio Grande, the most intractable issues the state faces are those that are pending in the Middle Rio Grande.

To the list of factors he sees as common to the Gila, Santolina and San Augustin proposals, Gaume adds that they all rely on “questionable professional services. I was taught as an engineer that the code of ethics is important, and that engineers are obligated to tell the whole, relevant truth. Even if they don’t know the details, they have to point out the issues. It’s a matter of ethics, and I would say that the ethics behind some of the work associated with these three projects…is questionable.”

*Virginia Necochea*, Executive Director of the Center for Social Sustainable Systems, says her thinking has been “shaped by water experts who took the time to impart that knowledge to me and my community.” An educational researcher in the field of race studies and cultural foundations, Necochea heads ‘SESOS,’ which “strives to protect traditions and ways of life” in her community, the Valle de Atrisco in Albuquerque’s South Valley.

 “My work on water began with my very great respect for the river and the acequias as important lifelines,” she says. In cooperation with the South Valley Regional Association of Acequias, SESOS has “revitalized” five historic acequias: the Armijo, Arenal, Atrisco, Los Padillas and Pajarito. “It’s our aim to continue to reconnect families to this amazing resource in our backyards. We believe that by protecting and honoring acequias, and water resources in general, we’re ensuring the continuation of land-based traditions such as small farming.” Issues of concern for SESOS include urbanization, assimilation, loss of culture and traditions, long-term drought, and climate change.

Necochea acknowledges that over the past year and a half, her work “went to a different level” due to “the monster called the Santolina Master Plan.” Her opposition to the enormous planned community arises from “a very deep place within. I can’t help but think about all those elders and community members who will suffer the most impact” if the highly contested development is built. Local resistance to growth on the far west mesa is not new: think SunCal, and Westland. The13,700-acre parcel was once part of the Atrisco Land Grant, a fact that is “hard history for the community,” Necochea admits. “Why are we worried? One word: water.” Santolina’s developers have promised there is “enough,” but the projected 14,380 acre-foot per year requirement amounts to “a new Rio Rancho, or 150% of Santa Fe’s water supply for an equivalent population, or 300% of Intel’s water supply during its record peak.”

That amount is unavailable for two reasons, Necochea says, quoting former City of Albuquerque and Interstate Stream Commission engineer Norm Gaume: the City/County water authority doesn’t have the water rights necessary to serve the development, and the region’s existing consumptive use already exceeds the legally available supply. “Neither Bernalillo County nor the Water Authority have provided a basis for finding that water for Santolina is physically available,” yet the County has approved Level A of the Master Plan. “In the Valle de Atrisco, there are thousands of irrigable acres,” Necochea notes. “

The enormous cultural and capital value of water rights and irrigable land are irrefutable. In contradiction, the South Valley is considered one of the poorest areas in Albuquerque. The contradiction is that our area has these precious water resources…If Santolina is built, [not to mention the eight other substantial developments pending in the Albuquerque area,] the water will have to come from existing users—farmers and irrigators in the mid-Rio Grande valley. There is no unallocated water in the basin.” Every year, irrigators face a struggle when it comes to sufficient flows, Necochea says, so “when we have commissioners and policymakers and developers tell us there’s plenty of water, it’s a disrespect to our community…The impacts of providing this water will not be felt within the boundaries of Santolina, so the developers…don’t care.”

Necochea says when she first read the Dialogue’s mission statement, she was struck by the fact that all the work for which Santolina’s opponents have been highly criticized—“this work of standing up for our communities and trying to protect water resources,”—is a manifestation, a “putting into action” of Dialogue’s vow to ‘promote wise stewardship and ensure the availability of water resources for future generations of New Mexicans.’ “I can tell you, as someone who is working on the front line, to just have educational forums or community town halls is not enough…Santolina is not only about a development being proposed for [Albuquerque’s] west side. It’s symbolic of a larger battle that many communities are facing across the state, across our nation, and globally…This work connects back to what we’ve been taught by our elders; this work is about the seven generations to come…

In legislation and policy development, unfortunately, much of the work is about *present* time.” Necochea cites the scientific reality behind a well-known *dicho*: ‘What affects the upper part of the river, will affect the lower part.’ All water *work* is connected, too, she says, just like the system that impels it. “Water planning on any level stands to make the greatest difference if it truly integrates the needs and voices of those who continue to be left in the margins: the poor, the historically disenfranchised, those that will be most impacted by [proposed] change, and those on the front lines. They have to be present, and they have to be extended “an equitable share” in the decision-making. Toward that end, Necochea pleads for “a statewide alliance that refuses to remain neutral, a water-and-land-based alliance…that will not be afraid to take a stand.”

**Reports on Recent Studies**

*Ken Peterson,* a hydrologistand modeler with the New Mexico Water Resources Research Institute, says withdrawals that constitute the “administrative [water] supply” are very well known and reported every five years, but that is only a piece of the picture. The total physical supply is *not* as well known, and represents a much larger portion of the overall water budget than “the human part.” Total administrative withdrawals vary annually according to availability, but they are less variable than actual precipitation or evaporation. Peterson says estimates of evapotranspiration are “fairly unreliable still,” and modelers are trying to devise ways to “capture” that variability and temporality.

Other western states, specifically Oregon, Utah and California, use water assessment programs to enhance water administration and planning. Oregon converts point flow data into temporal and spatial maps to better visualize the data; in California, regional water balances/supplies have been developed into a common platform; and in Utah, estimates of water right diversions per well aid USGS in mapping sub-area groundwater levels.

Peterson believes the Dynamic Statewide Water Budget is “New Mexico’s answer” to keeping up with trends in planning because it “synthesizes water supply-and-demand information from across the state into a single tool, to provide information on water sources and use at a variety of spatial scales.” The model  “pulls together” the cutting-edge science being done by multiple agencies and universities around the state. The NM Bureau of Geology, New Mexico State, USGS and the Office of the State Engineer are collaborating in a statewide assessment of recharge to groundwater. New Mexico Tech, along with NMSU, USGS and WRRI, is also conducting a groundwater recharge study. A statewide, remotely-sensed evaporation/transpiration assessment is being done by NM Tech and NMSU. USGS is working on surface flow statistics. Modelers are also incorporating “water use information” as reported by the State Engineer.

The Dynamic Statewide Water Budget is a systems dynamic model, “an approach to modeling complex systems over time using *stocks* (storages); *fluxes* (the movement into, out of, or between stocks and/or external sources); *internal feedbacks* and *timing delays*.” The Water Budget includes four stocks: *land surface* (moisture stored in soils, plants and other surface waters that cannot be directly used); the *surface water system* which includes rivers and lakes that can be impounded or diverted for human use; the *human storage and distribution system*, or water in storage in manmade impoundments such as reservoirs and irrigation canals; and the *groundwater system*, which is water in aquifers that can be extracted by riparian vegetation or by people. The model incorporates ten fluxes that connect water movement between stocks and external sources. They are: the *atmosphere*, *precipitation*, *runoff from land surface* as calculated by the appearance of flows between stream gauges; *surface water in-and-out* at a given spatial scale as provided by USGS stream gauges; *groundwater in-and-out*, a category that is “currently largely unknown”; *groundwater evapotranspiration*, a calculation based on the ET estimate for riparian vegetation; *human use* as calculated by a systems model that includes nine separate OSE water use categories (public water supply, domestic, irrigated agriculture, livestock, commercial, industrial, mining, power, and reservoir evaporation); *recharge*, for which the model currently assumes a steady-state, long-term, ten-year moving average based on base flow, groundwater ET, and groundwater in-and-out flows, “a fairly large assumption,” Peterson admits, but one that will eventually be improved by the work being done at NM Tech and NMSU; *surface water ET,* a physically-based estimate of open water evaporation from rivers; and lastly, *surface water-groundwater* or net sum losses from surface water to groundwater, calculated from a variety of sources.

The model has four major spatial scales: the seven major river basins (San Juan, Lower Colorado, Rio Grande, Central Closed Basin, Pecos, Canadian and the Texas Gulf); the sixteen water planning regions; the thirty-three counties; and the whole state. “You can select a river basin, change the start and stop times for the model to run, get a value for that time period, visualize some of the fluxes and storages through time, see their typical variability, and look at human use data through time for the nine categories,” Peterson says. There’s also a mapping model, and links to both metadata and PDF reports from which data has been drawn. First year accomplishments include the completion of mass balance calculations for the river basins and the state as a whole, and making the model available online at the NMWRI website. WRRI has also met with stakeholders to “address their needs and get a better handle on what we might need for model deliverables.” Future work will include incorporating water planning region and county information, and quantifying and displaying “some of the uncertainties associated with the model’s outputs” so that users will be provided with a more realistic “range” of effects. As Peterson says, “Right now this is just an historic model, but we plan to push it into the future and add some user-based assumptions and manipulations to make it a more useful planning tool.”

*Phil King*, Professor of Civil Engineering at NMSU, quips, “Chaos is something you’re not so aware of if you’re in the street, floating along *with* it.” That’s a reference to the hydrologic reality of the Lower Rio Grande, which King and several other resource experts studied at the behest of the State Legislature in 2014 [see “Learning to Live With Less Water,” *NM Water Dialogue*, Spring, 2015). After a year of what King would like to think was “rock bottom drought,” the Rio Grande in southern New Mexico had water in it for only forty-seven days, and EBID farmers made do with an annual allotment of 3.5 inches rather than the usual three feet.

One “deliverable” of the requested supply and demand assessment was “a coherent list of vulnerabilities” the LRG faces, to help with policy formation at the state level. King believes what the “interdisciplinary and inter-university group” learned has already aided decision making at the *local* level.

One product of the study is a timeline showing changes in region’s groundwater levels, beginning in 1916 with the commencement of the Bureau of Reclamation’s Lower Rio Grande Project. From that point to 1950, the lower basin enjoyed “a full water supply.” Then, from 1951 to 1978, drought became the rule. “Before, you had this very repeatable cycle of water [levels] coming up in the irrigation season and dropping off in the winter,” with an average water table depth of around seven feet below ground surface. That changed with the extended drought, and residual effects on groundwater levels persist to this day. As King explains, there was “very little groundwater extraction in the valley” prior to the 1950s. Then, as the decade-long drought and its accompanying reduction in annual reservoir releases began to take a toll, people in the LRG started drilling wells. Even after the very wet 1980s and 1990s, *g*roundwater levels did not resume their pre-1950 elevations. During the *current* drought, bigger and more numerous modern wells have rapidly created a “cliff” effect, with “drains going dry, and river conveyance efficiency going down very quickly.”

King calls 2011 “the last really decent year.” In each of the following years, the LRG saw reservoir releases of below 400,000 acre-feet, just as in the 1950s drought. Worse, King notes, from what can bee seen in the long-term hydrologic record, “it really doesn’t get this wet very often,” meaning that the present-day deficiency pales in comparison to the Southwest’s more standard fare. “Whether or not you buy the notion of climate change, there are bigger and better droughts out there than what we’re seeing…Something’s going on that’s very different now.”

For example, Natural Resource Conservation Service monthly forecasts for spring runoff are based on “statistical models that assume the future will behave like the past, [and that] given snow pack levels and temperatures and whatever’s going on out in the Pacific, the system will behave as it did in the past. It *doesn’t*.” Recently, optimistic forecasts early in the year have even given way to predictions of “negative runoff,” meaning the model is “outside its range of function.” Other statistics show there was less precipitation during the drought of the 1950s than in the present drought, but that today’s average temperature is “significantly warmer.” The LRG now has “fewer cold days, fewer days below freezing, fewer days below 25˚F, and more days above 95˚, above 100˚, and above 105˚.” The growing season has been extended “by several weeks,” King points out, “so not only do we have access to all this plentiful groundwater, we have higher potential evapotranspiration, and higher potential depletion, even if we’re growing the same crops as before.”

The region’s vulnerabilities include the “delusion” that conditions will return to those of the 1980s and 90s, King says. “I don’t see that as a very likely scenario…The difference between available water and potential evapotranspiration is the real critical factor.” Declines in well productivity in the LRG are already affecting agriculture, and land fallowing will increase. The introduction of saline water into the freshwater aquifer is also likely. Such effects will be felt unequally across the region, with “spatial as well as temporal components.”

King references “great plans” being made for development at Santa Teresa, including an inter-modal railroad station where containers from deep-water ports like Long Beach, Houston and Mazatlán will be brought for sorting and redistribution, an industry that could induce a population of 150,000. Although “paper water rights” to serve such growth seem sufficient, King warns “not a lot of *wet* water goes with it.”

There are bigger “legal vulnerabilities,” King acknowledges, referring to the Supreme Court case Texas filed in 2013. “You have to understand there is a strong connection between surface water and groundwater. You can’t have EBID administering surface water, and the State Engineer administering groundwater, and imagine for an instant that the two are completely separate resources…You could get away with that in the 1990s, but you can’t get away with it in the 2000s.”

Recommendations for counteracting the list of regional risks begins with *reducing the region’s average annual depletion,* “to get it more in line with this arid climate we live in.” Along with the belt-tightening, managers and policy makers need to *maintain enough flexibility to respond not only to periodic drought and shortage, but also to take advantage of wet periods*. That necessitates “better integrated management of the two-resources-that-are-the-same.” Practices such as artificial recharge, (which King likens to “digging through the sofa cushions for change when you’re really broke,”) can essentially “get people thinking more like desert people,” even though the gains in actual water may be comparatively small. Brackish water could offer an additional (although expensive) supply, but importing water from elsewhere isn’t an option because most places are “as water short as we are.” King considers the supply and demand assessment a useful exercise because it has already led to “incremental” reductions in depletion in the Lower Rio Grande, with policy changes to follow.

**Panel: Regional Water Planning---Emerging Issues**

*John Brown*, of the Middle Rio Grande Water Assembly and the NM Water Dialogue, believes the first “emerging issue” is a structural one, that involving “who and what constitutes the water planning regions.” The 1987 state statute that allows regions to “plan for their own water future” includes no further instruction about what that means. “How was it to be determined that a self-defined region has sufficient hydrological and political interests in common to make water planning feasible? What sort of structure could assure that all significant stakeholders [are] adequately represented?”

Brown recalls the NM Water Dialogue (in its previous incarnation as the NM Regional Water Planning Dialogue,) was created to answer those and other necessary questions. In 1994, a committee of Dialogue volunteers and Interstate Stream Commission members developed a ‘handbook’ to aid regional planning committees in compiling their individual water plans, but “scant attention was paid to the broader purposes of regional water planning. Regional planners were to document water needs, showing disparities between current supply and likely future demands, and suggest strategies for reducing or eliminating the ‘gap’ between them. These alternatives, plus information on economic projections, legal issues, demographic changes, etc., were to be compiled into a regional water plan, to be accepted by local jurisdictions in the region, and finally by the Interstate Stream Commission.

But acceptance did not imply endorsement or approval. There was no guarantee that a regional plan (or any elements of that plan) would ever be carried out by the agencies responsible for developing and providing actual water for users in the region. Moreover, with the acceptance of a planning document, it was commonly assumed that the regional entity would have finished its work, and would probably disband.” Funding for developing regional plans had always been “intermittent and often inadequate,” Brown concedes, but when it came to plan implementation, financial aid was downright nonexistent. “Once accepted by the ISC, state support ended, and no ongoing role for the [planning] entity was envisioned.”

The last water plan was completed in 2006, and a decade later, a new ‘round’ of regional water plan ‘updates’ is underway. The ISC has either had to “resurrect remnants” of the former planning groups, or muster “a new crop” for steering committees that have “the unenviable task, along with a stable of ISC consultants, of achieving the requisite level of ‘stakeholder participation’ needed to validate changes to the current plans, and to produce enough consistency to enable [their integration] into a state water plan. But regional water plans still stand largely decoupled from the actual process of governing, developing, allocating, managing and protecting our water resources under conditions of great and increasing uncertainty...” No surprise, then, that enthusiasm for water planning has waned, given end-product documents that “nobody owns or has a responsibility to implement.” Brown says that “benefits to participation are elusive, while the costs in time, energy, and opportunities foregone may be substantial.”

Instead, he favors “planning as a tool of governance,” a phrase borrowed from resource journalist John Fleck. The principal output of the current plan update process—“to ratify a list of projects to be proposed for funding by the various water management and provider agencies within the region”—*could* be useful, Brown thinks, depending on “the degree to which a multi-stakeholder planning process actually informs decisions in setting regional priorities.” To achieve that goal, planning at the regional level would need to happen “in closer synch with the agencies and actors that open and close the valves,” and by “paying attention to the design of the institutional arrangements for making that happen.”

Planning has an edge, Brown says, because it can account for those critical intangibles “that markets ignore as ‘externalities,’ including the loss of ecosystem services and other costs we all bear as a society.” Other refinements might tend toward decentralization, more sharing of responsibilities, promotion of a broader and more representative set of stakeholders, and expanding opportunities for collective learning, cooperation, coordination and partnerships. However, such a collective, (with participation by all the governmental and private agencies that provide water; those that regulate it; and “the full range of those who use it,”) can hardly be called a ‘steering committee,’ Brown says. “Successful governance of shared resources needs to operate in a nested fashion, in a bunch of different scales, and once you have the governance piece down, *then* you can do planning to deal with specific problems.” Governance that occurs on a single-agency scale and/or clings to a non-cooperative approach “engenders conflicts and inefficiencies,” so Brown suggests geographic boundaries as a “likely starting point.”

The 2003 State Water Plan analyzes water resources on the basis of hydrological basins, yet relies on “regions” as foundations for planning. “Current regional boundaries ought to be subject to adjustment, to better reflect political and hydrologic realities,” and rather than ‘steering committees,’ water planning entities might better be thought of as ‘Regional Coordination, Policy Review and Advisory Boards,’ with permanent standing. [For suggestions on possible structure, authority and function of such entities, see the ‘Governance Study’ page on the NM Water Dialogue website.]

*Sharon Hausam*, Planning Program Manager with the Pueblo of Laguna and a Dialogue Board member, remembers that “drivers for and barriers to participation” was a topic of much interest at last summer’s gathering of regional water planners at Sevilleta. The Governance Study Group, formed as a result of that meeting, has since drafted a series of ‘issue papers,’ with recommendations for improving state and regional planning efforts.

“One of our beliefs related to governance is that it’s useful to have the participation of people who will be affected by decisions,” Hausam declares, and although it’s good to help stakeholders understand why an issue is important and how they can become involved, “it’s equally as important to *receive* information *from* stakeholders, to learn more about the situation from people who live with it everyday, and to get new ideas for solutions that may work in the real world.” Additionally, “effective participation increases support for project implementation, and can also build relationships for future collaboration.”

Interest in a topic is the main motive for participation, Hausam points out, and beyond the fact that water is crucial to all, it is connected to “other values that we as individuals may or may not hold, such as the rule of law, property rights, quality of life, economic wealth, sovereignty, religious and traditional practices, cultural identity, environmental responsibility, family relationships, collaboration and agreement, and equity.” Hydrologic, environmental, political, legal and financial “threats” also engage public interest when it comes to water. Why, then, “with all of these risks to something fundamental to our survival and closely tied to basic values, would people *not* participate in regional water planning?” Part of the answer is that so many other concerns compete for stakeholders’ attention, and while individuals may be worrying about health or finances, and governments may be focused on failing schools or issues of corruption, “when most of us turn on the faucet in the morning, water usually comes out. The threat doesn’t seem imminent.” Those who *are* concerned may not know how they can participate. “If we asked random people on the street what they knew about regional water planning, we might get some funny responses. Most wouldn’t know what we were talking about, much less how they could get involved.”

Regional steering committees bear some of the blame. If the convening entity fails to include all stakeholders, perhaps believing a certain group is already represented when it is not, then “certain voices may not be heard.” Even when stakeholders *are* specifically invited to participate, they may decline. “If meetings are held at a bad time of day, or they conflict with other meetings; if they are [held] at an inappropriate or inconvenient location; or if people don’t have transportation or child care, stakeholders won’t attend. Those are classic reasons for low participation from the general public, but they can affect any stakeholder group in regional water planning. Farmers can’t always take time away, depending on the season or weather. Rural or tribal participation may take up half the day for a short meeting in a [distant] urban center, or some stakeholders may find corporate office facades—and the money and power behind them—a bit off-putting.” And there is no guarantee that an individual will come to another meeting after attending the first, particularly if the “fundamental issues and values of that stakeholder are not acknowledged, or there is no opportunity for dialogue that would help bring them to light.” Planning discussions often avoid the ‘elephant in the room,’ such as water rights, climate change, water deficits, or the fact of tribal sovereignty. Then too, meetings may be “structured for people who’ve been involved in the process all along,” making it difficult for newcomers to get up to speed.

Hausam suggests this could be one problem with a “fast-moving ‘update’ of regional water plans.” Also discouraging are agendas that can’t be changed to include something significant; a group’s tendency to stray from the issue at hand; or an individual who repeatedly dominates or disrupts meetings. And regardless of the type of opportunity for participation, if people “don’t feel they are being heard, or don’t trust that their input will be incorporated, they are less likely to stay involved. [They’ll] also hold back if they don’t think the planning process will make a difference.” People may also choose not to participate because “they have other ways of having their goals met. Tribes, for example, as sovereign governments, might not really *need* to participate in a state-driven regional water planning process, although, if regional planning is structured well, it could create an opportunity for collaboration on inter-jurisdictional projects, benefiting both tribes and their neighbors.” The state *does* recognize the need for participation, “but in order for [it] to be successful…there needs to be a true commitment to it at the start of the planning process.”

To support that commitment, Dialogue’s Governance Study Group recommends establishing a new and permanent form of regional planning entity, as noted earlier by John Brown. Such entities could “specifically support more participation,” says Hausam. “A permanent organization at the regional level could be a focal point for stakeholders, serving as the main point of contact for anyone interested in water issues. If regional water planning entities were not limited to cycles of water plan updates, they could take more time to seek out stakeholders, use best practices for informing the public, create more forums for participation, and keep people engaged by formally acknowledging their input. Permanent regional water planning entities could also broaden the scope of their meetings to encourage more dialogue, discuss a wider range of values, and build relationships and a process of social learning. If [such permanent entities] are fully recognized by the state, participants will believe their voices are being heard.”

The Governance group also suggests the state “initiate formal consultation with tribal governments, with explicit discussion of improvements that might support tribal participation, perhaps considering a different form of tribal representation on the new water planning committee. Some regions have had success with an ‘observer status,’ that supports tribal attendance and discussion without requiring full commitment to the final plan.”

Finally, Hausam says, whatever form regional water planning entities take, they need work collaboratively toward implementation of the projects, programs and policies listed in the plans. “That would give real meaning to regional water planning, and encourage active, ongoing participation.”

*Dagmar Llewellyn*, a hydrologist with the U.S. Bureau of Reclamation, highlighted a number of federal programs that foster “water management planning,” and offer assistance to regional water planning groups “in figuring out what the water supply is going to be in the future, and how we can address growing gaps between supply and demand.” These programs dovetail, she says, with the purposes of the day’s Dialogue meeting in that they encourage institutions to become more nimble and systems to become more resilient, they offer opportunities for federal assistance in funding, and they look to “enhance the dialogue through cooperation and coordination” via partnerships between Reclamation and local water management entities.

According to a series of recent articles in *Ecology and Society* examining climate change throughout the West, the Rio Grande is the “best example of how climate change-induced flow decline might sink a major system into permanent drought.” Even if the annual average precipitation stays the same in the future, says Llewellyn, echoing previous speaker Phil King, “temperatures are already higher, and that has a dramatic impact on the demand for water. The use of water by crops, by riparian systems, and by humans—all of those go up dramatically. There’s more of a gradient from liquid water into the atmosphere because of that temperature, and the relationship is exponential.”

A directive “from high up in Reclamation” has prompted the incorporation of climate change planning into all of the agency’s activities, Llewellyn says. Under a Department of the Interior program called WaterSmart, Reclamation conducts river basin studies, administers water efficiency and Title XVI water reclamation and reuse grants, is starting a brand new program on drought resilience, and offers water conservation field services. One component of the basin study program is the Westwide Climate Risk Assessment, which makes projections about growing gaps between water supply and demand in the major western river basins. That “scientific picture of what the future might look like is then used to partner with local entities, to plan for coming changes [through] adaptation and resilience-building activities.”

Another component of the program, the Landscape Conservation Cooperatives, are “landscape-level applied science activities” carried out in partnership with Fish & Wildlife Service and other entities. Reclamation, Sandia National Labs, and the U.S. Army Corps of Engineers cooperated to produce the Upper Rio Grande Impact Assessment, a document that has become “a fundamental basis” for understanding what the future might look like in *this* basin. “There are huge amounts of uncertainty,” Llewellyn admits, “and we’re continually updating our assessment, but at least it’s a starting point for discussion.”

WCRA recently issued a report that characterizes how various water demands might change throughout the west, given increases in temperature. “That report explicitly developed projections for changes in evaporation rates at Elephant Butte Reservoir, and for agricultural lands upstream and downstream.” Updated hydro-climate projections have just come out for the eight major river basins in the western United States, based on the most recent set of worldwide climate model projections. “We’re continually updating as new information becomes available,” Llewllyn says, but the hydro-climate report already highlights two big future challenges for New Mexico: runoff averages and reservoir storage are going to be adversely affected statewide. “We’re trying to set the stage for the adaptation and planning work that needs to be done to rise to these challenges.”

In its 2016 SECURE Report to Congress, Reclamation summarizes the River Basin work done over the past five years throughout the western U.S., highlighting both the difficulties and opportunities created by altered climate. For instance, projections for southern California and the Rio Grande basin suggest “an increased frequency of intense rainstorm events,” and thus, prospects for harvesting and storing a greater amount of stormwater runoff. Collaborative effort is a hallmark of Basin Study programs, Llewellyn reiterates. An assessment of water supply and demand in the Santa Fe basin was completed in conjunction with the City of Santa Fe, and now, with funding under Title XVI, the city is embarking on a water reuse program. Another study, to assess possible agricultural adaptations, is underway in the Pecos basin, in partnership with the Interstate Stream Commission. Also, the Middle Rio Grande Conservancy District “has stepped up to lead an effort to…look at projected gaps between supply and demand [in the MRG], and to…develop resilience-building measures and adaptations.”

Other projects and planning efforts going on in the basin include Landscape Conservation Cooperatives for the Southern Rockies and Desert LCC that will examine system management through the lens of both physical and social sciences. The Mid-Region Council of Governments has incorporated RG basin climate change projections into transportation and land use planning for the Albuquerque area, and USGS has a WaterSmart program—the Upper Rio Grande Focus Area Study—to examine “the groundwater component of a water budget for New Mexico, dovetailing with the work WRRI is doing.”

Not least, the U.S. Army Corps of Engineers is trying to “bring together in one coordinated program” all of the federal entities working on climate change and planning in the Rio Grande basin at large. Under the 2010 America Competes Act, Reclamation is fostering development of ‘adaptation strategies’ through prize competitions for desalinization, evaporation suppression technology for reservoirs, and better forecasting tools and communication. Work is also being funded at the National Center for Atmospheric Research on short-term forecasting; a pilot project is underway to look at reservoir management flexibility on the Rio Chama to improve resilience of the entire RG river/reservoir system; and there are efforts to improve irrigation efficiency on the Middle Rio Grande Pueblos. Climate change projections are also being “incorporated into all of our ESA and NEPA activities, so that our characterization of the impacts can be more in line with what we really expect the basin to look like in the coming years.”

*Laura Paskus*, a journalist who covers Western land, water, wildlife and energy issues, has just began a new project with New Mexico In Depth, a non-profit media organization that posts its content to a website, and shares it with various print, online, radio and television partners.

At last year’s Dialogue statewide meeting, Paskus heard Dr. David Gutzler speak on what warmer spring temperatures will mean for New Mexico’s snowpack. After talking with other agencies and experts, she interviewed Gutzler and his students to learn more about the research they were doing. The result was a piece on the “challenges of predicting streamflow from snowpack.” Paskus’ goal is to “write something that will resonate with people and make them suddenly really interested in water issues…Every story I write, I think this is *it*, this is the time, everybody’s going to snap to attention and everything’s going to change!” Alas, not so far.

 In 2015, El Niño produced heartening rains, a “great ski season,” water in storage, and a mid-Rio Grande that “didn’t dry until the beginning of September, as opposed to June or July,” Paskus says, but research into some four hundred river basins throughout the Northern Hemisphere suggests that the Colorado and Rio Grande basins are among the most vulnerable when considering future water supply in a warming world. “This is the kind of thing that should be in the local news, right? Because this was a really big year for climate change!”

After the Paris Agreement last December, Paskus spoke with climatologist Jonathan Overpeck, who called the year “an eye-opener.” Says Paskus, “I talk to people all the time about the most depressing things you can possibly imagine: climate change, species going extinct, rivers being dried, farmers losing livelihoods they’ve had for generations, tribal communities worried about their water—but when a scientist like Overpeck calls something ‘*pretty* *scary,’* I come to attention.”

In New Mexico, she adds, “we already know what drought looks like. The Rio Grande has dried almost every year since 1996 for some pretty long stretches south of Albuquerque. This is New Mexico’s largest river, and it dried! When editors try to tell me that water is not an interesting story, or not an easy story for people to understand, I think that’s a total load of crap.” Recently, Paskus went out “on salvage” with Fish & Wildlife Service and the Corps of Engineers. “When the river dries, there are these puddles, and as the day wears on, it gets warmer and warmer, and the puddles get smaller and smaller. They’re seining all these puddles, looking for silvery minnows. No matter what you think of the minnow or its worth as a species, or even big, ugly non-native carp, when you see these puddles shrinking, and thousands of fish flopping in the mud, I don’t think that’s what a river is supposed to be like. It’s something the public should understand.”

Paskus is not lulled by the current El Niño. She knows acute dryness will be back. “Scientists talk about this as being ‘hot drought’,” she says, and aside from rivers, the forests suffer, too. Conifer die-off has occurred in the Four Corners area and in the Jemez; even the Sandias contain some 9,000 acres of dead or dying trees. “We know there are all these impacts from climate change and from warming. It’s not just water supplies and water quality; it’s forest fires, dust, erosion, impacts to recreation, tourism, public health, endangered species, wildlife, and infrastructure.”

In one paper published late last year, the authors looked at four western river basins—the Klamath, the Bay Delta, the Colorado and the Rio Grande. “They pointed to the Rio Grande as the one facing the greatest challenges as warming continues.” That’s due, in part, to rising temperatures, but also to the way the river has been managed and fully allocated. Paskus was struck by three of the paper’s conclusions: across the west, snowpack and snow-fed systems will continue changing; dry spells will lengthen in most regions; and very heavy precipitation events will occur.

“Those three points reminded me of a trip I took a few years ago to the Gila. I’d been covering the Arizona Water Settlements Act and the state’s proposed diversion,” and at one vantage point, she looked down on a river that contained “a few hundred cfs.” Three weeks before, however, the same spot had endured flows of 30,000 cfs. “That floodplain was just *smooshed*,” she says, “demolished. It was doing what a floodplain is supposed to—spreading out that water.”

In thinking about those predicted west-wide impacts of a warming climate, Paskus wonders how “realistic it is to put a diversion on a river like that, as dry spells lengthen and extreme rain events increase.” As a former archaeologist, too, she thinks about how people in the past adapted and changed, or not, and how people in the future will look back on us.

At a talk by Dr. Eric Blinman on past adaptation in the Southwest in the face of big climatic changes and drought, she found herself taking pages of notes. Later, she distilled them down to four points: cultural expectations are abandoned with difficulty; people try to persist until too late; social conflict and breakdown make the economy worse; migration is the ultimate solution to climate change. “Here in New Mexico, we *know* what’s coming…The thing that I think continues to hold New Mexico back—and maybe holds all of humanity back—is political will…Talk about solutions,” she says, “even if it makes people mad.” She also entreats governmental entities to communicate with reporters. “Some agencies are great, and I’m grateful for the access you’ve given me to your experts. Others are not so great, and [that’s] not helping to serve the public.”

**Panel: Report and Updates from the ISC**

*Deborah Dixon*, Director of the Interstate Stream Commission, recalls an in-flight conversation she had with a seatmate from California. It was right after the Governor there had announced a 25% cut in water use, and the lady was very upset because it meant she could no longer wash her own car—she’d have to take it to a carwash. “I got on my soapbox about how we need to protect the water supply for future generations,” Dixon says, but the lady said, “That’s not my problem.” “Who is going to take care of it if we don’t?” Dixon wondered. “I don’t know,” the woman retorted. “Stinks for *them*, doesn’t it?”

Satisfying demands “that we think we have” is very complex, Dixon acknowledges. Besides the experts, the professionals, scientists, and the government, it has to include “those who have something at stake.” Solving the state’s water issues also involves “processes, good leadership, lots of communication, and undoubtedly, some policy changes.” Dixon praises John Brown’s observation that “we are all fallible learners.” “We need to live by continuous improvement,” she says, and that applies to the regional water planning process currently underway.

Statute requires a review of the State Water Plan every five years. In 2013, Dixon says, “We’d been in severe drought for at least three years. We’d had population growth and all these predictions of climate change, and it was time to update the plan. Also because of state statute, we needed to incorporate the regional plans into the state plan. That necessarily meant it was time to update the regional plans…Each of them has unique needs, unique demands, and they established unique assumptions,” all of which made their integration into a state document difficult. “So as we began this new endeavor to update [both the regional and state plans] we also determined to update the process,” Dixon explains. The “first round” was finished last summer, and since then, the state has been reviewing the work for accuracy, consistent informational formatting, etc. Now, halfway through the process, drafts for eight regions have been “completed and returned to the steering committees,” with three more ready for release in the coming week.

One recommendation of the Dialogue’s Governance Study Group is for formal acknowledgement of public comments, and Dixon says ISC staff met with regional planners at Sevilleta last summer, and more recently, with members of the Governance group to discuss possible changes to the water-planning program. “As an agency, we’ll continue to talk, and listen, and we look forward to improving this process. After all,” Dixon observes, “this is only the second time in our state history that we’ve worked on updating water plans.” As to criticism that the latest process is “top down,” she says, “I think we all know that. When the state recognized it needed to update the water plans, there were no active [regional] committees that were ready to get going right away. We were very interested in following our mandate…and we were looking [to improve] the process. From lessons learned [the first time around], we improved the process as we thought was appropriate, which was to try and make the plans consistent. We adopted a lofty schedule to update all sixteen regions at the same time [because] we had limited funding, and limited staff resources to facilitate those sixteen regions, and we knew that the regions had zero funding from the state to support their participation. It’s a challenge, but we’re on a schedule to complete the updated regional plans by 2016, and [to have them] accepted by the Interstate Stream Commission by the end of the year.

Will it be a plan that is going to add value and be implemented in ways that solve all our problems in New Mexico? Obviously not. We *hope* they add value, and that the process is inclusive of stakeholders in each of the regions. The goal of setting steering committees was to get those stakeholders involved…I think we’ve done a decent job collectively, but again, there’s always room for improvement.”

In response to another comment—that there needs to be “more participation from tribes, Pueblos, nations and acequias”—Dixon says the state has both the resources to do these things and a mandate through the State Tribal Collaboration Act. “We have met with the All Indian Tribal Council, we present regularly to the New Mexico Acequia Association, and we’ve been participating in Acequia Association workshops, all in an effort to provide more education and communication. We’ve offered formal consultations, and we’re trying to collect individuals from the nations, tribes, and Pueblos so these steering committees will have names to contact…It’s up to the tribes and Pueblos whether they’ll participate, in what way they’ll participate, [and whether] their information will be integrated into the State Water Plan.”

Dixon says the ISC is also considering regional boundaries, but that “it’s not time to make those changes yet.” The state is also open to the topic of governance, and how to “improve our effectiveness. We don’t want to be just checking off a box…Hopefully someday, regional and state water plans can play a larger role in the funding process. We need to expand our planning horizons, and to look for long-term sustainability of the state’s water resources, beyond some of the assumptions we’ve made in this second round.” Right now, however, the focus is on completing regional updates and integrating them into the state plan by the end of 2017.

*Angela Bordegaray*, Water Planner for the Interstate Stream Commission, says relative to the theme for Dialogue’s 21st annual meeting, planning has already ‘made a difference.’ “It’s hard to measure and quantify the value of planning, but for some reason, we all know it’s important. In the regional arena, planning helps educate each other [about] issues and what our neighbors might do to resolve water challenges. That’s perhaps the greatest value right there. I’ve heard all day about the need for collaboration and inter-jurisdictional coordination. You can’t *do* that unless people know what’s going on and are communicating with each other.”

She believes the “greatest service the ISC planning program has provided to the state in the last year and a half” has been to convene people anew in the effort to learn about water. Between February and June of last year, the ISC sponsored at least two meetings in each of the sixteen planning regions, led by teams of hired facilitators and hydrologists. Sixteen draft updates were the result, the ISC has reviewed them over the past few months, and Bordegaray says the agency is “on track” to have all of them released back to the regions by the end of January. (Copies of the released drafts are available; contact the ISC if you’d like to have a plan e-mailed to you, or information about your regional steering committee.) “All of the meetings have been inclusive,” Bordegaray declares. “They’re open to everyone.”

The process for finalizing the updated drafts begins with their return to the regions, where facilitators and hydrologists will “continue to do outreach to stakeholders who might not be there.” A new round of meetings will begin with a “recap” of the update process, purpose, timeline and milestones, and a second meeting will follow some four-to-six weeks later, with a third meeting in another four-to-six weeks. Steering committees and interested stakeholders will review the plans, “working specifically on the chapters related to public involvement and implementation strategies to meet future demand.” Beginning this summer, the ISC will again appraise the draft plans, and “ideally, all of them will be accepted by the end of 2016.” Guidelines for making comments, and for input to the strategy chapters, have been “structured so that it’s doable within the timeframe.”

*Tom Morrison*, a hydrology consultant with the Office of the State Engineer, says ISC planner Angela Bordegaray asked for “a way to estimate the water supply for each of the sixteen regions. We also needed a forecast for the water supply fifty years into the future,” all of it to be done within a two-year timeframe, and on a limited budget. The work team included Dominique Cartron from the staff of D.B. Stephens, Joanne Hilton, and Amy Lewis.

“We started by looking at the existing plans. Most of them utilized a water budget approach, [showing] inflows, outflows, recharge and discharge. That was really good information, but it lacked one important thing, and that was *institutional constraints*. What are the water right limitations? For much of the state, we’ll have a huge physical supply, but the *legal* limitations only allow you to use a fraction of that. As an example, you may have an aquifer several thousand feet thick, but all the wells in the basin are maybe two hundred feet deep. In New Mexico, we protect those wells. We’re not going to allow drawdown to dry up those wells within a certain time period, so you really can’t access all that other water unless you fix the impairment problem.

In addition to the legal issues, we also have physical constraints. We have drought to consider, and we have the issue of declining water levels. In both of these [scenarios} we needed to determine the water supply. So we had to come up with a method to include the legal limitations. The entire state is not adjudicated, only a part of it is. We have water right permits and lots of paper water rights, but people aren’t using those and we were really at a standstill there. But then we went back to the concept of ‘beneficial use defines your water right.’

We needed a plan that we had available data to support for whatever type of calculations we wanted to do. We decided to use the *2010 Water Use and Categories Report* that the State Engineer published in 2013. It’s the most recent data set we have, [and it] also had the advantage that for many parts of the state, we were near to the average…in using that information, we thought we were capturing a normal supply for most of the state.

Water use data is very important because it defines what the water right is—not officially; we didn’t assume that these were water rights. That’s something the State Engineer and the Courts do. [Instead,] we figured ‘they’re using it, it’s physically available, and it’s legally available.’” The first “problem” the team encountered concerned “drought supply in surface water systems.” After reviewing climatological data and numerous studies, they found no quick, consistent method for determining the physical water supply during a drought. They looked at stream gauges within a region, and at gauges on the mainstem of rivers during the period of historical record, and selected those that had “the minimum flow, the lowest flow for a certain year.” They then compared that to the 2002 flow at the same gauge to come up with a ratio. “We multiplied that ratio times the 2010 basin water supply, water use. Essentially, we looked at the worst drought we have, according to our gauging record, and we assume that that’s going to occur for a fifty year time period…Definitely, there’s more room for improvement, but for our purposes, we felt it was a reasonable way of handling the question of how much water do we have in a drought.”

The other problem the team had to deal with was declining water levels throughout the state, in other words, says Morrison, “a loss in supply. When you have a drawdown, it can either be caused by existing pumping, or by drought, so we had to address both of those situations. For basins in which we had a groundwater flow model, we wanted to use the most up-to-date information…We [predicted?] water declines in 2060, assuming the continuation of 2010 diversions, [and] compared that to water declines in wells. We looked at well records and information from our database, and came up with the median water column—the water column that sits in a well. Not all of that water is available. You’ve got to put a pump in the well and that takes up some room, so even if you get a water column of one hundred feet, maybe only seventy feet of that is useable. At the Hydrology Bureau of the State Engineer’s Office, we have criteria for determining the allowable drawdown to prevent impairment, and we used that. So we had the 2060 water decline, and we had the allowable drawdown, and from that we were able to compute the percentage of wells that would go dry, would fail. We simply multiplied that percentage times the 2010 water supply, and came up with the loss in the aquifer due to water level declines due to diversions…For the basins with no models—these are the mined basins, or those with no large river—we used water level decline data [to predict] what the 2060 water level decline would be, and used it to come up with the shortage …For the drought groundwater supply, we again used our flow models, and predicted the drawdown in 2060. If we had a drought between 2020 and 2040, we simply cut off the recharge in our models for that twenty-year period. We calculated the drawdown in 2060, and compared that with the allowable drawdown, and came up with the percentage of wells that would go dry or lose production.”

Morrison acknowledges that “a number of assumptions were made. We *had* to make assumptions. Some of them could be replaced with more rigorous work, and we’re hoping in the future we can do a much better job of estimating the water supply for the state.”

*Marquita Russel*, Chief of Programs at the New Mexico Finance Authority, says that for the past twenty years, the agency has been “a major funder of public infrastructure projects around the state,” with fifteen different funding programs, including one that supports water, planning, and bringing wastewater services to areas without such systems. Russel offers insight into “some of the processes that the Water Trust Board uses to prioritize projects, and how regional water plans might play into its recommendations.”

Created in 2002, the Water Trust Board is a diverse, sixteen-member body that reviews water projects and makes recommendations to the legislature on how to spend an annual $20-to-$40 million in state severance tax monies on “everything from the source of water to the use of water,” including Endangered Species Act projects and implementation, watershed restoration and management projects, flood prevention, water conservation, water treatment, and water storage.

Russel says the board has “made some policy changes over the years, in order to make funding more accessible or more easily understood. We went through a series of policy and rule amendments. We made it much clearer to potential applicants what criteria we would use for evaluating applications. One of the elements that came up was whether or not the project was urgent to meet the needs of a regional water plan that had been accepted by the Interstate Stream Commission. That [criterion] has been in statute since 2003, and wasn’t a new element, but it was difficult in light of the changes, and the renewed energy around regional water planning—how you might do that, because a regional water plan is much more involved than a list of projects….Right now, the statute says we have to give priority to those projects that are urgent to meet the needs of a district with an accepted water plan, and for the last couple of years, we’ve given a minimum amount of five points, because it’s not really clear that we can do what the statute has asked us to, given the framework for water planning. That’s not to say that it’s not important.

Planning in general is important to the Water Trust Board because we’ve got to be certain that the projects we’re able to undertake are going to serve the needs that were purported in the applications, and to make sure that the projects themselves will serve more than just the community that applies [without] negatively impact the others.” For 2016, the Water Trust Board and the ISC looked at sixty applications and will recommend that the legislature authorize funding for forty-two of them. “We’ll probably only get to about twenty, which is unfortunate because they’re all quality projects,” Russel says.

Other things the Water Trust Board looks at when considering an application is whether federal or local leveraging is available, whether planning is sufficient to complete the project, and whether it can be implemented within the projected timeframe. Some forty or fifty points are based on what kind of a project it is, Russel explains, and whether it serves “critical health and safety needs, including fire and flood prevention, and safe drinking water.”

Under the Water Project Finance Act, the Water Trust Board is also empowered to “help review the State Water Plan,” a clear signal legislators intended there to be a connection between the funding of projects, and state and regional water plans. Outside of the Water Trust Board, the Finance Authority provides grant dollars to “local government units—communities, retooled domestics, Soil & Water Conservation Districts—for a variety of different planning documents.

The Water Trust Board does require that if you’re going to apply for funding, you have to have a planning document that’s recent, within the last five years, so we will allow, through the Local Government Planning Fund, up to $50,000 to help entities with preliminary engineering reports. We fund water conservation plans, master plans, comprehensive plans, portions of asset management plans, metropolitan redevelopment plans and economic development plans. Not all relate to water, but they do relate to the need for coordination between planning and financing.”

**A Conclusion for the Time Being**

Just as the last minute word juggling in Dialogue’s Statewide Meeting title portends, *planning* embodies the opportunity to think again. The message that citizens and scientists and legislators and funders and technical people have all underscored here is that we must resist entombing what we know in concrete. We have to be willing to revisit, revise, and perpetually tweak even the best of our statistics, assumptions and processes. Stasis is the equivalent of surrender. For tomorrow’s sake, we need that ‘ing’ at the end of ‘plan.’