

MINUTES
of the
WATER RESOURCES COMMITTEE
Virtual Meeting (Due to COVID-19)
Host State - Texas
March 24, 2021

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of the
WATER RESOURCES COMMITTEE
Virtual Meeting (Due to COVID-19)
Host State - Texas
March 5, 2021**

MEMBERS AND ALTERNATES PRESENT

ALASKA	Tom Barrett
ARIZONA	Kyle Miller Trevor Baggiore Ayesha Vohra
CALIFORNIA	Jeanine Jones Betty Olson
COLORADO	Becky Mitchell Jeremy Neustifter Scott Steinbrecher
IDAHO	Jerry Rigby Mary Anne Nelson John Simpson
KANSAS	Connie Owen Tom Stiles Kenneth Titus
MONTANA	Anna Pakenham Stevenson
NEBRASKA	Tom Riley
NEVADA	Micheline Fairbank Jennifer Carr
NEW MEXICO	John D'Antonio Greg Ridgley
NORTH DAKOTA	John Paczkowski Jen Verleger

OKLAHOMA

Julie Cunningham
Sara Gibson

OREGON

Tom Byler

SOUTH DAKOTA

Kent Woodmansey
Nakaila Steen

TEXAS

Jon Niermann
Jim Rizk

UTAH

Todd Adams
Norm Johnson
Erica Gaddis
Todd Stonely

WASHINGTON

Mary Verner
Buck Smith

WYOMING

Steve Wolff
Chris Brown
Kevin Frederick

WESTFAST

Christopher Carlson, USDA Forest Service
Paula Cutillo, Bureau of Land Management
Lauren Dempsey, US Air Force
Roger Gorke, Environmental Protection Agency
Indrani Graczyk, NASA JPL. NASA Western Water Applications Office
Heather Hofman, USDA/Natural Resources Conservation Service
Patrick Lambert, U.S. Geological Survey
Elizabeth Ossowski, NOAA/NIDIS
Kevin Werner, NOAA Fisheries

GUESTS

Christopher Estes, Chalk Board Enterprises, LLC, AK
Amanda Long, Arizona Department of Water Resources
Wendy Ridderbusch, CalDesal
Jacqueline Tinetti, CSG West
Bill McCormick, Colorado Dam Safety and Association of State Dam Safety Officials

Kevin Moss, Western Governors' Association
Linda Friar, U.S. Bureau of Reclamation
Steve Higginbottom, U.S. Bureau of Reclamation
Rob Manning, U.S. Bureau of Reclamation
Camille Touton, U.S. Bureau of Reclamation
Marnie Kremer, U.S. House of Representatives
Caroline Sevier, American Society of Civil Engineers
Tanya Trujillo, U.S. Department of the Interior
Lauren Vernon, House Committee on Natural Resources
Matt Unruh, Kansas Water Office
Aaron Snyder, U.S. Army Corps of Engineers
Peter Colohan, Internet of Water, Duke University
Lucas Stephens, Internet of Water, Duke University
Kara Valentine, Nebraska Department of Environment and Energy
Rick Allen, New Mexico Office of the State Engineer
Nathan Chakeres, New Mexico Office of the State Engineer
Kathy Alexander, Texas Commission on Environmental Quality
Jill Csekitz, Texas Commission on Environmental Quality
David Galindo, Texas Commission on Environmental Quality
James Golab, Texas Water Development Board
Kathleen Ligon, Texas Water Development Board
Earl Lott, Texas Commission on Environmental Quality
Kevin McCalla, Texas Commission on Environmental Quality
Brooke McGregor, Texas Commission on Environmental Quality
Kelly Mills, Texas Commission on Environmental Quality
Kimberly Nygren, Texas Commission on Environmental Quality
John-Cody Stalsby, Texas Commission on Environmental Quality
Loreal Stepney, Texas Commission on Environmental Quality
Teresa Wilhelmsen, Division of Water Rights, Utah State Engineer's Office
Adriane Borgias, Washington State Department of Ecology
Lauren Driscoll, Washington State Department of Ecology
Sue Lowry, Interstate Council on Water Policy
Jennifer Zygmunt, Wyoming Department of Environmental Quality

STAFF

Tony Willardson
Michelle Bushman
Jessica Reimer
Adel Abdallah
Ryan James
Cheryl Redding

WELCOME

Committee Chair Mary Verner called the meeting to order. She thanked Texas for hosting and for the beautiful video production shown yesterday [down the Rio Grande as a virtual field trip].

APPROVAL OF MINUTES

The minutes of the meeting held virtually on October 14, 2020 were moved for approval by Jon Niermann, with Jen Verleger seconding the motion. With no comments being made, the minutes were approved unanimously.

PROPOSED POSITION

Supporting new Probable Maximum Precipitation Standards

Tony reviewed the proposed position. He noted there were a few editorial changes submitted since the Executive Committee met. This issue was raised by Colorado dam safety officials and the Association of State Dam Safety Officials.

Jen Veleger moved approval by the Water Resources Committee. Jon Niermann seconded the motion. There was no discussion or objections. The virtual vote indicated no opposition. The position was approved by the Water Resources Committee to be forwarded to the Full Council.

SUNSETTING POSITIONS

Position #417 – supporting Forecast Informed Reservoir Operations and Innovations

This position is found on page 37 in the digital briefing materials. It has been updated and rewritten. Jeanine Jones commented that two additional “Whereas” clauses have been added to the draft position. The first recognizes that the Corps of Engineers was directed to develop a list of water control manuals on Corps projects, including those where Reclamation projects are involved, and to look at different pilots for forecast informed reservoir operations (FIRO). The second added whereas clause directs that one year after the date of completion of the FIRO research pilot program at Coyote Valley Dam in California, the Secretary shall issue a report.

The Committee Chair entertained a motion, which was offered by Steve Wolff. The motion was seconded by Becky Mitchell. Hearing no objections, the position was approved by the Committee.

Position #418 – supporting Weather Station Networks

Tony Willardson highlighted a recommendation for a minor change at the top of page two with respect to estimating crop water shortages. The Council did some work on Agrimet and other smaller systems that provide observations that are critical for remote sensing work.

A motion to approve the renewal of this position was offered by Becky Mitchell. Jen Verleger seconded the motion. Given there were no objections raised, the position was considered approved.

Position #419 – supporting Water Infrastructure Funding

Tony Willardson related that the recommended changes are found on the first page in the third whereas clause to be more specific and to clarify the need for all the different purposes.

Tom Riley moved approval of the position and Steve Wolff seconded the motion. As there was no discussion and no objections raised, the Committee approved sending this sunseting position to the Full Council.

Position #420 – regarding Integrating Water and Energy Planning and Policy

The only change recommended during the Executive Committee’s review of this position was to remove the acronyms in the eighth whereas clause, as unneeded. There were no other changes to the resolution, so it will remain substantially the same.

A motion to approve renewal of the sunseting position was offered by Jon Niermann. Todd Stonely seconded the motion. Position #420 was approved by the Committee and recommended to the Council for renewal.

Position #421 – supporting Federal Research on Climate Adaptation

There have been no proposed changes to this resolution. The recommendation from the Executive Committee was to move this to the Full Council for approval.

Becky Mitchell offered a motion for renewal, which was seconded by Jen Verleger. Hearing no discussion and no objections, this position was approved by the Committee.

THE FLOODS & PRECIP ACT & PROBABLE MAXIMUM PRECIPITATION STANDARDS

Bill McCormick, President of the Association of State Dam Safety Officials, and also Chief of the Colorado Dam Safety program, discussed the proposed Flood Level Observation, Operations, and Decision Support (FLOODS) Act. First Introduced in the House on December 8, 2020 by Congresswoman Mikie Sherril (D-NJ) and Rep. Randy Weber (R-TX). The Act was reintroduced as H.R. 1438 on February 26. It would establish (1) a National Integrated Flood Information System (NIFIS) to

coordinate and integrate flood research at the National Oceanic and Atmospheric Administration (NOAA); (2) partnerships with institutions of higher education to improve total water predictions; and (3) a committee to ensure coordination of federal departments with joint or overlapping responsibilities in water management. The Act also improves flood risk communications, including flood watches and warnings.

McCormick reviewed Section 12, which calls for a “NOAA Precipitation Frequency Atlas of the United States,” to compile, estimate, analyze, and communicate the frequency of precipitation in the United States. The item of note is the appropriations. Under (b), AUTHORIZATION OF APPROPRIATIONS, there are authorized to be appropriated to carry out this section, from amounts otherwise authorized to be appropriated to the Administrator to carry out this Act, \$3,500,000 for each of fiscal years 2021 through 2030.

An update for the Northwest area of the country has not been completed due to a lack of funding. This has been a historic problem for this program. The NOAA Atlas program has not been updated since 1973 in several western states. The most recent one completed was in Texas in 2018. There is a bit of a patchwork of products and tools.

McCormick also summarized the Providing Research and Estimates of Changes in Precipitation (PRECIP) Act, which was also reintroduced on February 26. It has four main pieces in three sections, Sec. 601, 602, and 603. It includes funding for a National Academy of Science Estimation Methodology (NASEM) study on how to do modern probable maximum precipitation (PMP) estimates, such that each update includes estimates that incorporate assumptions of non-stationarity, and how to improve precipitation frequency estimates. This legislation would also prepare a national guidance document to standardize the regional and local hydro-meteorological reports (HMRs) which are often done by consultants or states.

The older methods were started in the 1940s. At that time, the HMRs did not include climate change. Climate change can't be applied very easily to the storm-based methods. Given climate change, there have been more extreme weather events, and the PMP and HMR need to be modernized. The Corps of Engineers, the Bureau of Reclamation, and the Federal Energy Regulatory Commission are reluctant to approve these for use on their projects, as are the states. Some states' dam safety programs are tied to federal standards, as they have to follow the prescribed federal government standards. So unless they change their legislation or their statutes, a private consultant cannot perform the updates for those states.

He described a joint regional study effort ongoing with Colorado and New Mexico. They partnered with the Corps, Reclamation, and NOAA. They looked at precipitation frequency, the NOAA Atlas piece, and at PMP, at the same time, across both states, so the boundaries match. They also included the NOAA physical sciences laboratory in Boulder, and used their advanced modeling tools with a high-resolution rapid refresh model which included extreme precipitation for dam safety.

A map (on slide 9 of the presentation) depicted high hazard dams (red dots) of 90,580 dams in the United States (taken from the Corps' National Inventory of Dams). The high hazard dams are

significant relative to the potential for loss of life -- if they were to fail. The rainfall piece is so important, because in fact the biggest reason that dams fail is due to inadequate spillway capacities and overtopping failures. Statistically, that's the foremost reason why dams fail.

Of course, all of this comes at a cost. Adding up the numbers for the appropriations in the legislation (see the chart) for the PRECIP Act, the total would be about \$83.5M from 2021 – 2030. If you contrast the cost for the appropriations with the costs as a result of actual damages due to dam failures, they are significant. If we can get better standards that are consistent across the country and avoid those kinds of failures, it would certainly be a good investment

The powerpoint presentation contains a slide that provides a summary of the benefits of the PRECIP Act. It includes: (1) a National Academy of Sciences study to evaluate current best science methodologies including non-stationarity (climate change); (2) consistent and regular updates to precipitation frequency estimates which have, to date, been completed in a patchwork approach across the country due to inconsistent funding sources, so this act addresses that long-standing constraint; (3) improving Probable Maximum Precipitation (PMP) rainfall estimates that are required for design of high hazard-potential dams; and (4) development of a national standard of practice that will allow private contractors to conduct site-specific studies for critical projects in a consistent and repeatable way. The Act also enables NOAA to resume a leadership role and use their best science, state of the practice tools to develop 21st century PMP estimates. Dam engineers across the nation will use those new estimates to design safe and economically efficient new dams and evaluate and modify existing high-hazard potential dams as may be necessary.

There are a number of supporting partners for the PRECIP Act program, which include the American Society of Civil Engineers (ASCE); the Association of State Dam Safety Officials (ASDSO); the Association of State Floodplain Management (ASFPM); and the Interstate Council on Water Policy (ICWP), to name a few.

Caroline Sevier, Director of Government Relations at the American Society of Civil Engineers (ASCE) addressed the legislation. Earlier this month, ASCE released the 2021 report card for America's infrastructure. The report is released every four years, in which they grade 17 different categories of the nation's infrastructure using a simple format. For the first time in over 20 years, the 2021 report card gave the nation's infrastructure a cumulative grade of C minus. This was the first time the score was out of the D range. So while some incremental progress has been shown, there's still a lot of work that needs to be done.

The report card also includes some key recommendations to raise the grades. One of those recommendations is to focus on using new approaches, materials and technologies to ensure infrastructure resilience. This focus on resilience has led to ASCE's strong support of both the PRECIP Act and the FLOODS Act because we see them as low cost solutions overall that the federal government can use to work with the states and local governments to ensure that our floodplain managers or dam safety officials have the data that's necessary for building the most resilient infrastructure.

Late last year, the Senate passed the FLOODS Act, but since it was December, there was not enough time to take the Act to the House. It has been introduced again this year in the 117th Congress as H.R. 1438. The PRECIP Act is H.R. 1437. Each currently have 12 cosponsors from both sides of the aisle. They each have 11 democrats and one republican supporting the legislation. And, as Bill mentioned, both pieces of legislation include the appropriations piece.

In the Senate. Senator Roger Wicker from Mississippi, who is the Ranking Member of the Senate Commerce Committee, and Senator Peters (D) from Michigan, reintroduced the FLOODS Act earlier this month as well(S. 558). The PRECIP Act will be introduced in the Senate later this year.

As we look toward the next steps, the House Science Committee is currently trying to get both bills scheduled for a markup this spring. And at this point, we are not really anticipating any hearings on the legislation.

I just want to reiterate that, while these do come with an \$83 million price tag over a 10-year period. In the grand scheme of Congress, that's actually a very low cost. States are already having to voluntarily find this funding, which is creating a bit of this patchwork of standards. We believe that the federal government does have a role here, to be working with the states and providing the states with the tools that are necessary in order to gather together this critical data to ensure that all of our nation's engineers have what they need when they're planning and designing our nation's dams and levees.

AGING WATER INFRASTRUCTURE ACCOUNT

Camille Touton, Deputy Commissioner of the Bureau of Reclamation addressed the Committee and commented that she's glad to be among friends. She stated that she appreciates her continued working relationship with the WSWC. She has returned to working with the Department of the Interior and is looking forward to working with Tanya Trujillo who serves as the Principal Deputy Assistant Secretary for Water and Science and oversees the Bureau of Reclamation, as well as the United States Geological Survey.

Camille said: "We are full steam ahead." Secretary Haaland joined the Department last week. There will be more to come as more of our leadership team comes on board.

The Biden-Harris Administration has three main, general priorities: COVID-19 economic recovery, racial equity, and climate change. Reclamation with its mission fits squarely within those priorities. In delivering water and power, Reclamation is absolutely key to economic recovery.

With respect to drought, infrastructure, and next steps, as many of you know, every Thursday NOAA releases the weekly drought outlook. Last week's drought outlook showed 70% - 76% of the West is in drought compared to 25% last year. I don't have to tell this group what the drought looks like in the West.

You may have seen yesterday that within the Central Valley Project in California, allocations were held at 5% pending improved hydrology. And, as many of you know, we are conservative in our hydrology allocations, which are usually based off of the 90% exceedance. Unfortunately, we experienced a double whammy due to a combination of events. In February, when the allocation was made, there was a huge storm. However, for the remainder of February and into March, precipitation was dismal. We had 100,000 acre-feet less inflow into all of our reservoirs. Due to low reservoir carryover storage from last year, we've had to rollback the allocation to 5% to get through this year and moving forward.

In the Klamath River Basin, inflows into Upper Klamath Lake were the lowest on record. The situation there affects listed endangered species and our tribal trust responsibilities, and it is one of the first projects built by the Bureau of Reclamation. Trying to balance all the needs in an incredibly dry water year has been challenging.

And that's not the story just for California, or for Oregon -- it's across the West. I am confident that although it is tough, Reclamation has years of experience working in partnership with the states in managing water in the West. We are considering the tools our constituents need to get through these tough water years and water decisions.

Regarding infrastructure, Congress provided Reclamation with a new authority for a revolving-like fund for aging infrastructure, otherwise known as the Extraordinary Maintenance Fund, for facilities that are owned by Reclamation but are transferred works [operated by non-federal partners]. Guidance has been updated and sent out. The key with the fund is that appropriations are needed in order to actually fund maintenance projects. Reclamation is working to set up the program so that should appropriations come from Congress, we will be ready to go and move forward on those crucial projects.

Other programs Reclamation is focusing on include: safety of dams and rural water in tribal water rights settlements. We're also looking at infrastructure in general, within our existing authorities, and also soft infrastructure, such as Open Water Data, Agrimet, Forecast Informed Reservoir Operations (FIRO), Indian water right settlements and the WaterSMART program. We want to ensure that those grant programs and studies continue.

The FY2022 budget process should be made public soon.

Comments & Questions:

Tony Willardson: I appreciate your reference to Open Water Data. We have our Water Data Exchange (WaDE). Adel and I have a discussion planned tomorrow with the Bureau of Reclamation.

Mary Verner: You mentioned a revolving-like fund. Would you please elaborate on this compared to the more familiar revolving fund?

Camille Touton: The intent of Congress for the Extraordinary Maintenance Fund, aging infrastructure account, is as these extraordinary maintenance project loans are paid out, those payments would go into this account, versus returning back into the traditional Reclamation Fund model. So in that sense, it's not going back into the Reclamation Fund, which sits in the Treasury and has to be appropriated. Instead, it goes back to this specific Extraordinary Maintenance Fund that we can then loan out for other projects without congressional action.

Tony Willardson: We just had a discussion with Bill McCormick, who is the President of the Association of State Dam Safety Officials and also Chief of the Colorado Dam Safety program. He talked about the need for better information and he noted forecast informed reservoir operations (FIRO). Can you mention a bit about what Reclamation's role might be?

Camille Touton: I was just in a meeting with the U.S. Army Corps of Engineers and we discussed FIRO. The pilot project at Lake Mendocino was a great success story. Our folks are engaged in that process. The Corps is working on other pilot projects in other regions, including in Southern California at Prado Dam. Reclamation is looking at how to engage in that process. Internally, we are soliciting input from our reservoir operations people and have provided some funding to look at FIRO-like operations. We're looking at how we can operate our facilities better to maximize their effectiveness given a changing environment and also maximize water supplies. This is definitely one of what I call our soft tools. Also, we have deployed an Aerial Snow Observatory (ASO) in the Central Valley, which is essentially flying over the snowpack using Light Detection and Ranging (LIDAR) remote sensing technology to be able to get a more accurate determination of snow depth and to help provide planning tools to inform decisions.

Chris Brown: You mentioned aging infrastructure and the Extraordinary Maintenance Fund. Would you please have someone share that link with us?

Camille Touton: Yes. Absolutely.

Tony Willardson: We have appreciated Interior's support of our WestFAST team. We hope it and the Water Subcabinet will continue under the Biden Administration.

Camille Touton: We had a conversation with the Water Subcabinet. The dialogue is important and we want to make it actionable so we can work on things together.

IMPROVING SUBSEASONAL TO SEASONAL FORECASTS

Jeanine Jones addressed two topics related to subseasonal to seasonal (S2S) forecast efforts.

A. Weather Research and Forecasting Innovation Act of 2017 (P.L. 115-25)

Jeanine Jones' comments built on previous agenda item reports. You've heard the acronyms FIRO, ASO and S2S mentioned today. The WSWC supported enactment of the Weather Research and

Forecasting Innovation Act of 2017. A requirement of the Act was that the National Oceanic and Atmospheric Administration (NOAA) submit a report to Congress identifying ways to improve sub-seasonal to seasonal precipitation forecasting, which the research community like to call “S2S” forecasting. S2S forecasting is beyond the timescale of a typical weather forecast. Weather is forecasted out about two weeks with most of the skill level in the first week. S2S means forecasting the weather from several weeks out to perhaps a year or so. The Act defines it as going out to two years. NOAA released its report to Congress on improving S2S precipitation forecasting at the end of last year.

B. WRFIA Report to Congress – Pilot Projects

One of the recommendations in the NOAA S2S report to Congress was for a number of pilot projects and specifically one in the western United States to support water management. We are now pursuing appropriations in order to get the pilot projects going. She thanked Tony for the work he has put into that effort.

Many of NOAA’s programs suffer from a lack of investment over the long term. The National Weather Service’s Climate Prediction Center (CPC) began making S2S outlooks in the mid-1990s. The skill of those outlooks has not improved in large part due to a lack of funding to invest in the research. Meteorologists use a metric known as the Heidke skill score (HSS) as a way to measure how good their forecasts are. That can range from minus 50 to a positive 100, meaning that the forecast was perfectly accurate. A zero would mean they did no better skill than predicting average weather conditions for the time period of interest. Right now, at the national scale, the HSS aggregated over the forecasts that CPC has done is eight. So remember, scale of minus 50 to 100 and the current skill is eight. That tells us that there is a lot of work to be done to improve our predictive skill.

Quite frankly, without a significant investment in improving the research and improving models, and getting the high-performance computing resources that are needed to support the modeling effort the forecasting isn’t going to improve anytime soon. For those of us who spend a lot of time working on drought, we would very much like to have better forecasting. The bottom line is a NOAA report to Congress is out. It recommends a pilot project, and we’re trying to get funding for it.

Questions:

Peter Colohan: I was formerly with NOAA for many years. Has there ever been any discussion on the integration of snow? I worry about the non-integrated nature of those observations.

Jeanine Jones: The outlooks that NOAA does for S2S are for precipitation and generally not making a distinction for snow. We at the California Department of Water Resources (CDWR) have been supporting our own interests. This year we included a snow component. I mention that because the University of Arizona has a uniquely comprehensive snow data set that it uses to develop a forecast which ingests information from multiple observing networks, primarily from frankly, our California cooperative snow surveys and the Natural Resources Conservation Service (NRCS). The NOAA observing network is, shall we say, less focused on mountain snow for runoff forecasting purposes, and

more, shall we say, relevant for the Eastern and perhaps the Central parts of the country for river transportation and other purposes. So more specifically, to your question, while CDWR and the NRCS collaborate on our activities and data collection with respect to snow, I'm not familiar with an effort that attempts to bring in the NOAA dataset.

Tony Willardson: To follow up with Peter's question and the integration of water information, we had a discussion about the silos among the federal agencies and the data that they collect and the work that [we] do in a number of different areas. The other thing I would mention is that we got a positive response today about a Dear Colleague letter. We'll be working with Representative Grace Napolitano's office, and we would ask that each of you encourage your representatives to sign on to this effort to get funding for S2S.

CORPS ALTERNATIVE FINANCING EFFORTS

Aaron Snyder, U.S. Army Corps of Engineers, Program Manager for Alternative Financing, used a powerpoint presentation that is posted on the WSWC website. He noted that the Corps is focusing on alternative financing tools, innovative funding partnerships, and trying to deliver projects and infrastructure differently under two key programs.

The first is the Public-Private Partnership (P3) Pilot Program to deliver projects faster and give non-federal sponsors more control in the process. The P3 program has delivered federal cost savings of \$350 million and accelerated delivery of some projects by 13 years. Our pilot has three projects in the program right now. He mentioned each project. In each case, the Corps is being assigned a specific piece of the project to deliver and the non-federal sponsors are being assigned a separate section to focus on and deliver. The non-federal sponsor is able to design, build, construct, and oversee their piece without the traditional oversight from the Corps. It is about sharing responsibility and putting the locals in more control. This has resulted in substantial cost savings. The delivery of a final project is being accelerated through this program as well.

The Corps Water Infrastructure Financing Program is a federal credit program. A small amount of federal funds supports a much larger amount of non-federal infrastructure investment. In the last appropriations bill, Congress gave the Corps a \$12 million appropriation that can result in up to \$950 million worth of loans that support \$1.9 billion worth of infrastructure. Congress only appropriates money to cover the estimated loan losses for projects. The remaining loan amount is borrowed from and repaid to the Treasury.

The FY21 Corps' appropriations bill provides funding for "safety projects to maintain, upgrade, and repair dams" owned by non-federal entities and included in the National Inventory of Dams.

Concerning program features, the minimum project size is \$20M. The goal for this program is only to facilitate up to 49% of the cost and then you'll have to find other mechanisms for the remaining 51%.

The benefit of the federal loan program is that it should be cheaper than alternatives. The interest rates are locked at a fixed rate and the fees are low. There are flexible financial terms.

WIFIA cost savings are shown on slide #8. WIFIA loans must be repaid using dedicated non-federal sources of repayment, which could be from non-federal taxes, fees, or various other sources.

TEXAS STATE WATER PLANNING, FINANCING AND INFRASTRUCTURE

Kathleen Ligon, Special Advisory to the Executive Administrator of the Texas Water Development Board (TWDB) shared a powerpoint presentation focused on flood science related activities. The Board addresses state water planning, financing and infrastructure in Texas and is a sister agency to the Texas Commission on Environmental Quality (TCEQ). TWDB has been in existence since the 1950s.

As background, pre-2015 very few TWDB employees worked on flood protection planning. In 2015, there was a big policy shift in the agency. The Blanco River, which runs kind of between Austin and San Antonio, a little to the west, flooded. It is a sleepy little river and the National Weather Service (NWS) didn't forecast anywhere near the amount of rain that fell. There were no gauges upstream of the town of Wimberley to tell anyone that this massive wall of water was coming. The tragedy is that the flood occurred during the night. Several hundred homes were lost and about 13 people died.

The legislature met and immediately gave the TWDB special funding to do some new work. They put together a flood viewer on the internet so anyone can monitor flood gauges. They also started the Texmesonet.org. It collects a lot of data, including soil moisture data. The NWS was a useful partner in determining where flood gauges were needed. They also performed a State Flood Assessment. It was during this time that Hurricane Harvey hit. This was a "Biblical" event. It broke the record for the highest rainfall in the U.S. (previously held by Hawaii).

The flood efforts in the state were really in a big mess. Texas needed better flood mapping, planning, and mitigation. They also needed state support for mitigation projects.

TWDB chose to work on a base level engineering model which was comprised of LiDAR (surface topography of the earth), hydrology and hydraulics. This basic engineering model tells where the floodplains are. Most of the state of Texas does not have basic information that is reliable. This is purely the science piece.

As of last year, Texas had acquired 100% base LiDAR data across the state. They hope to have base level engineering done by 2024. TWDB has worked with a number of federal partners in getting the flood science effort off the ground.

One can view the base level engineering data at this website: www.InFRM.us/estBFE. There is a new website under development that shows more up-to-date information.

TWDB is working with the U.S. Geological Survey (USGS) on a flood decision support toolbox. One of the things uncovered in the state flood assessment, was that there is no framework to actually do planning. Efforts are now underway with stakeholder groups to propose projects. On the mitigation front, we received about \$780 million to do projects through the Flood Infrastructure Fund. Under a state statutory imposed deadline, the first flood planning effort is to be done by 2024.

Sue Lowry: You mentioned more gages were added for flood warning purposes. Are they operated year round, or only during significant flow events?

Kathleen Ligon: These are USGS gages, so they are operated year-round. There are other kinds of gauge technologies available, but for the most part, our gages are USGS gages.

John Paczkowski: Are those gages funded by USGS or by the state?

Kathleen Ligon: We have a cost sharing agreement where we pay for part of them, I believe. If you need more information, I can put you in touch with the folks that actually know the numbers.

Mary Verner: Jeanine Jones commented that in Washington multiple entities are sharing the cost of LiDAR. Does the TWDB completely fund and conduct all of the LiDAR work?

Kathleen Ligon: I believe the LiDAR work is mostly purchased by the state. It is expensive.

Mary commented that Hurricane Harvey has not been forgotten. It was a significant event.

WADE 2.0 UPDATE & DASHBOARD DEMONSTRATION

Adel Abdallah, Program Manager for the Water Data Exchange (WaDE) commented that the program was established in late 2011 to help streamline water rights and administration data from the states to federal agencies and the public. We are working on sharing data for aggregated water budget estimates, site specific use and withdrawals, and regulatory overlays. We are working on a centralized western streamlined data service for various datasets. We're helping the USGS in their efforts with the National Water Census to summarize how much water is being used and for which categories in the United States.

We work with each of our member states' agencies to map their data into a standardized data system that we've developed over the past decade. We have a secure way to share that data with researchers and the public through our dashboard. We're integrating this dashboard and our data with other national data services such as USGS, the Environmental Protection Agency, Bureau of the Reclamation, and the Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI). Water rights data from each of the western states has been imported. New Mexico will be sharing their priority dates data, which is interesting since New Mexico has some of the oldest water rights (Spanish colonial rights) in the West.

We're working on a second set of data related to aggregate water budgets or water use data and estimates that the states roll out at the watershed or county level. Aggregation data is the aggregate of water use over a given space over a span of time. This includes water budget information, withdrawal information or consumptive use data in a state defined boundary, typically either political boundaries or river basins. We will continue importing more data. It will be exciting when federal agencies and the public can use the data.

As a final step in building the WaDE prototype dashboard that would allow state agencies, the public, and federal agencies to tap into state data, we have created some fictional personas or use cases. Frank the farmer -- any farmer or homesteader in the entire western U.S. could be looking for water right information. They may want to look at upstream or downstream structures or streamgages that affect their water rights, and so forth. Maggie the river basin manager -- may be concerned with any river basin in the West. She could be interested in high level insights that span many states. Gary the governor -- could be interested in supporting the water initiatives in the West, such as helping integrate data across state agencies. Laila the researcher -- could be interested in data for the entire western United States. These fictional personas will be fleshed out more fully and refined in the coming months.

The WaDE program is integrating with the Geoconnex system to work towards building a Google-type search engine for water data across the United States.

Adel encouraged member states to look at funding available through USGS Water Use Data Research (WUDR) grants, and the WSWC is looking at taking advantage of USGS Applied Science grants, where they help facilitate the states in sharing their data, and enabling regional insights.

WaDE is coming up on a decade of work and Adel summarized different phases of the work (See slides for next steps).

Next, Ryan James gave a powerpoint presentation and live demonstration of the WaDE prototype dashboard.

Comments:

Tony Willardson: I can foresee a future where the state engineer's office could sit down at a laptop and look at all of the existing water rights and be able to take a water transfer application or a new application for use, and compare what the impact might be within a basin, and maybe do a quick screening of those requests before going into more detailed field investigations and public notice and comment processes. So I think there are a lot of opportunities moving forward for how this can help many of our members with their day-to-day activities.

Roger Gorke: A new name for this tool might be called the "Water Cool Tool."

WESTERN GOVERNORS' ASSOCIATION (WGA) POLICY RESOLUTION

Kevin Moss, WGA Policy Analyst commented that this was his first WSWC meeting. Ward Scott left the organization a month ago and Kevin has taken over the water portfolio responsibilities. Kevin also handles WGA's agriculture, energy, electric vehicles and air quality work.

WGA is getting ready to update two water policy resolutions: (1) 2018-08, Water Resource Management in the West; and (2) 2018-12, Water Quality in the West. Both the water resource management and water quality resolutions will be advanced together as they're pretty well aligned. The Water Resource Management in the West resolution is water and wastewater infrastructure focused and focuses on states' authorities and responsibilities with respect to managing that infrastructure. It also includes a good deal of discussion of state data needs, forecasting opportunities and things of that nature.

WGA will start the formal process of updating these documents. This is a good time for all of you to deal directly with your Governor's offices. We like to coordinate our policies with WSWC, but we also like to be a megaphone on behalf of western states with Congress and the Administration, EPA and other regulatory agencies so that western states have a strong voice at the federal level.

He mentioned the role of the Staff Advisory Council (SAC) members in each Governor's office. WGA's SAC is comprised of one designated point person in every state. Those people tend to be either the Federal Affairs Director based in DC, or some sort of natural resources policy director or advisor. If you need to find out who your representative is, please feel free to reach out.

Kevin looks forward to working with and appreciates WSWC members' technical expertise.

DRAFT FY2021-2022 WATER RESOURCES COMMITTEE WORK PLAN

Chair Mary Verner noted this is found on page 86 in the digital materials. This does not need to be approved until the summer meetings. There will be time to further discuss and approve the Committee work plan at our next meeting.

Tony Willardson gave a quick review of the topics included on the proposed draft work plan. Water data and availability has been emphasized in a number of areas. We continue to work on a number of federal and state western water observing systems and our support for those systems, including S2S forecasting. We are intent on continuing to work on another area where Jeanine Jones has helped us as the lead, and that is moving from research to operations (R2O) and technology transfer. We have specifically been working with NOAA and the National Atmospheric and Space Administration (NASA) on these efforts. It is anticipated we will be able to hold an in-person meeting with those agencies in Washington, D.C. this fall.

We have heard about flooding events and other extreme weather events. Item number five on the Committee workplan encompasses drought, the National Integrated Drought Information System or

NIDIS, and extreme weather events. I was interested to hear from Bill McCormick earlier today about proposed legislation that would create a flood or a national integrated flood information system patterned somewhat after the drought work that has been done.

We are hoping to begin to update information we have worked on in the past on groundwater recharge projects, programs and policies. Item number seven in the work plan is western water infrastructure projects and program funding. The WSWC has summarized state funding in the past. As you know, an infrastructure package from this Administration is expected at the federal level. We look forward to participating and expressing the interest of western states there.

We just adopted a resolution which renews our interest in energy and water resources and integrated management, which is item number eight, and that's everything currently on the Water Resources Committee's work plan.

As always, we appreciate your thoughts and direction regarding priorities. There is a lot for us to do and we never seem to get to the end of our list of things to do.

SUNSETTING POSITIONS FOR 2021 SUMMER MEETINGS

[Position #423](#) – Rural Water Supply Project/Infrastructure Needs will be taken up at the summer meetings.

There being no other matters, the meeting was adjourned at 11:30 a.m.