

MINUTES
of the
WATER RESOURCES COMMITTEE
Doubletree by Hilton Sonoma Wine Country
Rohnert Park, California
June 28, 2017

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MEMBERS AND ALTERNATES PRESENT

ALASKA	David Schade
ARIZONA	Einav Henenson
CALIFORNIA	Jeanine Jones
COLORADO	John Stulp Patrick Pfaltzgraff
IDAHO	Jerry Rigby
KANSAS	Tracy Streeter
MONTANA	Jan Langel
NEBRASKA	Jim Macy
NEVADA	Roland Westergard
NEW MEXICO	Tom Blaine Greg Ridgley
NORTH DAKOTA	Garland Erbele Jennifer Verleger
OKLAHOMA	--
OREGON	Tom Byler
SOUTH DAKOTA	Kent Woodmansey
TEXAS	Jon Niermann Robert Mace
UTAH	Eric Millis Norman Johnson

WASHINGTON

Mike Gallagher

WYOMING

Pat Tyrrell
Steve Wolff

GUESTS

Gary Lippner, California Department of Water Resources, Sacramento, CA
Amardeep Singh, California Department of Water Resources, Sacramento, CA
David Parker, California Department of Water Resources, Sacramento, CA
David Moon, The Water Report, Eugene, OR
Dave Mitamura, U.S. Army Corps of Engineers, Austin, TX
Tom Farr, NASA JPL, Pasadena, CA
Cathleen Jones, NASA JPL, Pasadena, CA

WESTFAST

Kevin Werner, National Oceanic and Atmospheric Administration, Seattle, WA
Becky Fulkerson, Bureau of Reclamation, Washington, DC
Roger Pierce, Federal Liaison, Murray, UT
Cherilyn Plaxco, U.S. Army Corps of Engineers, Little Rock, AR
Lauren Dempsey, Department of Defense, Travis Air Force Base, CA
Chris Carlson, U.S. Forest Service, Washington, DC
Sonya Jones, U.S. Geological Survey, Norcross, GA
Melinda Dalton, U.S. Geological Survey, Norcross, GA

STAFF

Tony Willardson
Michelle Bushman
Sara Larsen
Cheryl Redding

WELCOME AND INTRODUCTIONS

Tim Davis, Chair of the Water Resources Committee, called the meeting to order, and requested introductions be made around the room.

APPROVAL OF MINUTES

The minutes of the meeting held in Nebraska City, Nebraska on April 13, 2017 were moved for approval by Jim Macy. Steve Wolff seconded the motion. The minutes were unanimously approved.

SUNSETTING POSITIONS

Position #366 supports Federal Research and Development of Updated Hydroclimate Guidance for Floods and Droughts. Tony reviewed the proposed changes to the position which are in the briefing materials under Tab C. He noted that NOAA and WGA have had an MOU that is not likely to be renewed. A motion to approve the position with the redlined changes was offered and seconded. There was no discussion on the motion. The motion passed, and this position will be forwarded to the Council for readoption as revised.

Position #367 regarding the Reclamation Fund has been updated to include current numbers and calls on the Administration and the Congress to fully appropriate the receipts accruing to the Fund for their intended purpose. David Schade asked about a number included in a clause. Tony acknowledged that the number will be checked. A motion was offered to approve the position. Steve Wolff seconded the motion, and it was approved. This position will be forwarded to the full Council meeting and recommended for readoption as revised.

Position #368 supports funding for the Water Resources Research Institutes (WRI) and was proposed for readoption. The position seeks to maintain federal authorization and financial support for the state programs. Every Administration for several years has proposed in their budgets to eliminate the federal funding for the research institutes. Tony talked to Sharon Megdal who will be the Chair for the national WRIs' organization, and she said the funding is important to them. It was proposed the position be readopted. There was a motion and second, with no discussion. The motion passed.

InSAR LAND SUBSIDENCE MONITORING PROJECT

Jeanine Jones introduced the topic of land subsidence and noted that in 2014 the California Department of Water Resources received some drought emergency funding and they contracted with NASA to use radar technologies, both satellite based and aircraft based, to monitor land subsidence due to groundwater extraction. The project has been successful and has created a lot of data useful for droughts, but as well as to help local agencies with the Sustainable Groundwater Management Act (SGMA) implementation. The contract has been amended several times and they have expended about \$1.5 million. It has proven to be a useful tool.

Tom Farr of NASA's Jet Propulsion Lab (JPL) provided a description of how radar satellites are used to make maps for the State. They are using a technique called interferometric synthetic aperture radar or InSAR to monitor and measure surface deformation at one-half inch sensitivity. Groundwater is becoming a more important part of water resources supply and management. Knowledge of the groundwater level is not uniformly available. Wells provide some monitoring capability, but there are political and practical difficulties.

JPL is trying to provide information products that various levels of the community can use to understand what is going on in the aquifers. They have been concentrating in the Central Valley for the last couple of years. Tom emphasized that one aspect of subsidence is the quality of the subsurface geology. Not everywhere is as susceptible to subsidence or aquifer compaction due to the geology. There is an elastic type of subsidence which comes and goes with the seasons, and this is seen in parts of the Los Angeles basin as evidenced when the groundwater is recharged and withdrawn. The area experiences longer term subsidence as groundwater is withdrawn unsustainably. He showed the famous picture of Joseph Poland near a pole which depicts the subsidence in the San Joaquin Valley from 1955 to 1977.

The InSAR technique is basically a satellite or an aircraft passing over an area periodically and acquiring images. Scientists look at the difference between the images and they can detect changes in the ground surface based on the wavelength of the radar. They can see fractions of an inch of motion based on the wave coming back from the ground at each point. The measurements of change are combined to create a time series enabling one to see a time frame of what is going on at the ground level to create a map of ground movement. His presentation included San Joaquin Valley subsidence maps. The colors on the map indicate the amount of change in the land subsidence. The pictures show the difference in subsidence from 2007-2011 and May to December of 2014.

In the Central Valley there are two main subsidence bowls that have been recognized for some time. The southern bowl is near Corcoran, and the northern one is around Oneida. The Oneida subsidence bowl started appearing in the early 2000s. A lot of tree crops had been grown there. The red colors indicate about 30-35 inches of subsidence over a 4-year time frame (2007-2011). In the Corcoran area, there was rapid subsidence from 2007-2011, and it then leveled off.

In 2014 data, the Tranquility area started showing a new subsidence bowl developing. Drought has increased the rate of subsidence in the area. They have been using a newer dataset collected by the European Space Agency satellite known as Sentinel 1 that is acquiring much more data and much more frequently. This data shows that over the Central Valley subsidence in the area has increased. They also have data that shows the affects of subsidence on the canals. At the present time there is a plateau in the subsidence data, and scientists are not sure whether there is actual recharge in the area or if farmers just stopped pumping. Preliminary data shows a rebound of several inches, but they are not sure if this is a function of geology, hydrology, or pumping, and they want to understand why.

Cathleen Jones, also with NASA JPL, uses aircraft radar that is called Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR) for airborne sciences. They use this data from the aircraft much as the data gathered from the satellite, although this is in higher resolution. They focus in on infrastructure and look at movement that is either directly on the infrastructure or in close proximity. Thus, the buckling of the California Aqueduct is apparent.

The aircraft flies two lines to collect data along the length of the valley in the vicinity of the California Aqueduct. A startling impact to the aqueduct shows 15 inches of subsidence less than a half mile from the aqueduct. This occurred primarily within a five-month period from June to October in 2014, in the middle of the drought. There was an onset of rapid subsidence identified and the State was contacted. The State surveyed the area and confirmed the subsidence. Jeanine Jones interjected that this new subsidence amazingly coincided with the installation of a 1,500 foot deep agricultural production well with a pumping rate of around 1,000 gpm. The bullseye plot helped identify the location of the pumping.

JPL has continued to look at that spot, and as horrifying as 15 inches of subsidence was during that time period, on a new scale there are now 26 inches of subsidence near the aqueduct. About five miles of the Aqueduct has subsided more than 10 inches. Due to this situation, scientists are looking at other hot spots for similar issues. Similar, but much smaller hot spots show up at three different locations along the aqueduct.

The Delta is the most critical water resource in California. They look at seepage, cracks, and slope instability on levees and canals, in addition to the aqueduct. The Delta has over 60 reclaimed islands surrounded by 1100 miles of levees. It collects run-off from approximately two-thirds of the state via the Sacramento and San Joaquin rivers, and supplies water to about two-thirds of the residents of California and to the agriculture of the California Central Valley.

A similar kind of airborne radar is currently used in a pilot study in the Sacramento –San Joaquin Delta, and in addition to subsidence, they looked at seepage, slope instability, cracks in the levees, and other concerns that the technology allows them to see. Cathleen emphasized the kinds of things that can be seen with this technology by using an earthen levee in the Sacramento Delta as an example. This particular levee is the most rapidly subsiding and moving area in the levees in the entire Sacramento Delta. She showed a picture of a crack in a grassy area that isn't visible while just driving by, but SAR makes the down-slope movement apparent, and it is moving at a rate of about 3-4 inches per year.

Today NASA JPL has an aircraft that is a prototype for a NASA mission planned for launch in 2021. It is called the NASA-ISRO Synthetic Aperture Radar (NISAR) mission. NASA pioneered this instrument technology. They will have full coverage of the United States with this mission, and will have repeated land coverage every twelve days. It does not have quite the same resolution as the UAVSAR aircraft. She drew attention to the [website link](#) that shows all of the possible applications for which NISAR can be used in the future. Beyond looking at levees, dams, and aqueducts, they can look at oil spills, coastal erosion, wildfires, and a broad range of other issues.

U.S. GEOLOGICAL SURVEY WATER AVAILABILITY & USE SCIENCE PROGRAM

Sonya Jones, Coordinator of the U.S. Geological Survey's Water Availability and Use Science Program addressed Council members relative to the Water Mission Area, which consists of four programs: (1) Groundwater and Streamflow Information Program; (2) National Water Quality Program; (3) Water Availability and Use Science Program (WAUSP); and (4) Water Resources Research Act Program.

She addressed the water budget structure noting that FY17 cooperative matching funds are allocated among three programs to support cooperative work with States, municipalities, and Tribes. The National Water Quality Program's share is \$17,231,000 while WAUSP received \$12,397,000 and the Groundwater and Streamflow Information Program received \$30,299,000 for an overall total of \$59,927,000. The USGS has many partnerships and collaborative efforts and receives reimbursements that make it possible for them to do their work. The biggest source of reimbursable funding comes from state and local entities.

There are about 8,000 total streamflow gages across the country, with 3,664 active streamflow gages throughout the western United States. Sonya expressed thanks and gave a shout out to those already involved in the National Groundwater Monitoring Network. The announcement for the awards (grants) will be released soon. Currently there are ten western states participating in the network, and given this participation, they have been able to double the amount of information on national groundwater and water quality information in groundwater. If the states not participating have an interest and want USGS to visit with your state agencies, the USGS would be happy to do that.

In FY2017, the Groundwater and Streamflow Information Program received some additional funding from Congress. There was a \$500,000 increase in Cooperative Matching funds for Indian water rights; \$160,000 new funds for Unuk River, Alaska streamgage and water quality data collection; a \$700,000 increase for Water Hazard's response capacity building; and a \$700,000 increase for the National Groundwater Monitoring Network (NGWMN). In the last couple of years, when Congress has given these increases, they have been very specific about what they want done with the funds.

In Sonya's program, the Water Availability and Use Science Program, the 2015 water use compilation is underway. This is done every five years. They are trying something different this year to get the information out quicker, and that is they will be publishing the data for the report this year. The compilation of the trends report will be completed in FY2018.

The Water-Use Data and Research program (WUDR) grants will be awarded in the coming months. The selections have already been made, and they are in the process of completing the administrative materials.

New in FY17, they have started some regional groundwater studies that are research-level studies for the California Coastal Basins and the Colorado Plateau. They are using metamodeling in basins that don't already have groundwater models.

The 2017 increases for this program were \$2M for Mississippi Alluvial Plain Aquifer and \$1M in the Cooperative matching funds, specifically for water use. Sonya extended a big thank you to the Western States Water Council for your letters to Congress supporting the increased funding.

She brought to the groups attention the National Brackish Groundwater Assessment. This is the first national assessment since 1965. Understanding brackish groundwater supplies can help determine whether they can supplement or replace taxed freshwater sources in water-stressed areas.

The National Water Quality Program has several priorities for this year. They have not received any additional funding this year, but they did see some redirection of the funding within the Cooperative Matching Funds program.

With respect to the 2018 President's budget request, it reduces funding to the Water Mission Area budget by \$30.143 million. The USGS Water Mission Area prioritized: (1) monitoring; (2) assessments, and (3) research. In addition to preserving monitoring, they preserved and protected the cooperative matching funds, too. Changes to the Groundwater and Streamflow Information Program include reductions to the National Research Program (\$1.54M) and the National Groundwater Monitoring Network (\$1.70M).

The changes in funding levels to the WAUSP program were laid out in Sonya's presentation, which is available on our [website](#). She specifically pointed out elimination of \$1.5M to the Water Use Data and Research program, since authorization for that program expired a couple of years ago. This budget also eliminates the Water Resources Research Act Program (\$6.488M), which is of interest to your member states.

Questions:

Tony Willardson: You mentioned a couple of authorizations for grants have expired?

Sonya Jones: Yes, for both the National Groundwater Monitoring Network and the Water-Use Data and Research program (WUDR) grants.

WaDE UPDATE AND OTHER WATER DATA DEVELOPMENTS

Sara Larsen provided an overview of several topics. Concerning the Water Data Exchange (WaDE) program, no new states have been added into the portal although they have been working to develop partnerships with other groups such as the Consortium of Universities

for the Advancement of Hydrologic Science, Inc (CUAHSI), the Aspen Institute, the National Aeronautics and Space Administration (NASA), and the U.S. Geological Survey's (USGS) Office of Water Information. Sara has been working with the USGS Office of Water Information to adapt the WaDE platform for Amazon web services so they can get the aggregated water use data available using web services. This has been a fruitful effort.

Sara noted that the first document under Tab K in the briefing materials relates to the WSWC's Water Information and Data Subcommittee (WIDS), which was formed to oversee and direct data-related efforts. They plan to reconvene the subcommittee to discuss the possibility of holding a Water Information Management Symposium (WIMS). This group will help decide the topics that would be addressed during that symposium. That group will also oversee development of the partnerships and funding opportunities. The WSWC partnered with the Utah Division of Water Quality, Utah State University and California's Department of Water Resources for another potential Exchange Network grant to pilot some sensor-based continuous monitoring data. It was submitted in November 2016, and unfortunately due to the grant funding hiatus, announcements have not yet been made.

Last August, the WSWC and the California Department of Water Resources co-sponsored a workshop on Irrigation Management Information Systems (IMIS). These are weather station networks that can also supply information about crop water requirements. Jeanine Jones explained the benefits California has received from their system (CIMIS), such as the kind of crop yield increases and water savings and many other benefits. They have built some amazing tools.

A meeting was convened to look at other irrigation weather station networks to find out if there might be a possibility of technology transfer or leveraging what CIMIS has developed for some of the other states, and how they might become more interoperable. We explored how the networks gather their data, perform quality control, how they share their information. We found: (1) there are issues with funding for many of the networks; (2) there are many different metrics being used; and (3) there is a potential for interoperability, but several things need to occur before these different information systems and software applications can communicate, exchange data, and use the information between networks. An executive summary from the IMIS workshop has been included under Tab K in the meeting briefing materials.

Jeanine commented that part of the reason for trying to determine if the effort was worthwhile is that the California Department of Water Resources has developed this great agricultural weather station network and have also partnered with the University of California at Davis to use Landsat data to basically interpolate or extrapolate trends. They have a platform that could potentially be expanded to other states if the ground truthing were available. Given that data programs are never at the top of the budget list, Jeanine did not expect that other states would have wealthy programs, but it surprised her how poorly funded the Bureau of Reclamation's program is. The Bureau's Agrimet manager is Jama Hamel.

Sara has also been working with the Aspen Institute on a Dialogue Series on Sharing and Integrating Data for Water Sustainability. They wanted to develop a policy document that would help move the open water data movement farther down the field. The findings and summaries from that meeting are also contained in Tab K. This document contains a link to the Aspen Institute's final report.

The WSWC recently received a description of a Department of Energy initiative for cataloging the Energy-Water Nexus State Policy Database. This draft database provides an extensive source of key information about state-level water policies and programs that are relevant to energy systems in the United States. They have hired a contractor to go and scrape the websites to gather this information into a database. The point of the Federal Register notice is a request for information. So please look at the portal, look at what is listed for your state, and get back to them with comments on how they can make this better by August 4th. This looks like a pretty thorough compilation. This is the kind of thing we intended WaDE to host.

Lastly, Sara commented on the Bureau of Reclamation's Water Information System (RWIS). Reclamation has been working on this through the Open Water Data Initiative for some time. RWIS is their release of the data, and it was made available about a month ago. Sara demonstrated some of the capabilities of the system. Reclamation has asked for feedback, so look at the website and provide your comments.

Jim Macy thanked Sara for attending the Exchange Network's Leadership Committee meeting and coordinating with them.

ARIZONA'S ANNUAL WATER USE REPORTING SYSTEM

Einav Henenson of the Arizona Department of Water Resources (DWR) used a powerpoint presentation to describe how Arizona has digitized their annual water use reporting system information.

Arizona has about 7,000 groundwater rights that need to be reported on in their annual water use report. Because there are many different types of reports and different types of water users, there are about 50 different forms. Thus, it could get pretty tedious for the staff to process the information and enter all of the data, as well as for water users to provide the information.

They have found many benefits for both the customers and the staff from making the forms and the data available electronically. The customers have 24/7 access to the online reporting system and the ability to file from anywhere with internet access. The filer receives an instant receipt as well which contains all of the information the customer provided and the date and time of submission. It is also very beneficial for the filer to pay online. The system actually requires them to pay their fees before they submit the report. This process has saved the staff a lot of time. When they receive the report online, it does not have to be scanned as it is already in the database and no data must be manually entered. This has also reduced human error.

Arizona DWR began the reporting process online with the Active Management Areas in 2007. They used an external security gateway that required a password and a login, and at that time only three of the simplest forms were available online. Although the data was going directly into the database, all of the receipts and records had to be scanned. There were about 112 reports submitted online, and less than \$500 received.

In 2008, they added another set of reports, so they increased the number to around 600, with fees of about \$3,000 collected. Before 2009, DWR printed and mailed all of the reports to each water right user. In 2009, mass mailing of documents to water users was no longer necessary. Customers could print the documents online or call if they needed the forms.

In the year 2010, there was a major budget reduction and reduction in staff. They went from 25 employees to 15. This was another reason it became very important to automate the system.

In 2011, they removed the customer login requirement, which the customers really appreciated. In 2012, the digital reporting system was improved. The records went directly to the digital records, DocuShare. They included a barcode that could be scanned, which saved the staff a lot of time. They also added a button which opened the image record without causing the customer to go to another website to look for specific rights, etc.

Then 2013 was an important year for agriculture, and they added an agriculture reporting schedule for farmers pumping groundwater. Due to this, there was a large increase to the fees collected online. There were not a lot of major improvements to the system in 2014. Pop ups were addressed in 2015. The information technology division removed the pop-ups for customers, which saved staff time walking customers through the process of disabling the pop-up blockers, and getting compatibility.

Industrial forms, specifically for turf-related facilities, were added to the system in 2016. Turf-related facilities as you can imagine use a decent amount of water, especially in Arizona. The amount of fees collected online jumped to \$195,000.

The internal fee disbursements were automated. Each person that uses water pays a fee, however it is disbursed into several different funds. Through the automation, the staff no longer needed to deal with the payments made online as the funds were directly paid into the various categories.

Einav pointed out that in 2007, with 25 full time employees, they were able to enter 95% of the data of all reports received by November. In 2016, with 8 full time employees, the same information was completed by June, which is five months earlier than that in 2007, with less than one-third of the task force. Thus, it saves a lot of employee time and effort.

As far as lessons learned, they started small, so it has been easier to fix things as they go and not affect too many water right holders. Small adjustments to the system, such as removing the pop-ups and password and login proved to be really useful. It is really important to have the customers be happy with the system, but it is also important to look at how the staff can improve their work by reducing the processing of tedious information. They have added Help documents and Frequently Asked Questions pages to the website, which saves staff time in answering phone calls, and makes it easier for customers to get questions answered after business hours as well. There are still improvements to be made, yet the work to date has definitely been worth it.

QUESTIONS

Greg Ridgley: You mentioned one of the benefits to the Department is reduced human error in entering data. Humans can still type in the wrong data inside a web form. How do you achieve that benefit with online submission?

Einav Henenson: That is true. There can be human error on the customer side as well as on the staff side. The online reporting helps on the staff side as we don't translate the information incorrectly. It does not address customer errors.

Tony Willardson: Einav, can you mention the fees you collected? Were these groundwater pumping fees?

Einav Henenson: Yes, these are groundwater pumping fees, and it depends on the different Active Management Areas as the fees vary. These go to the water quality fund, conservation, augmentation and research funds. There are some late fees collected as well.

David Schade: Did you set up a lot of validation so that the right information goes into the right format? How did that work out?

Einav Henenson: I did not build that. It would be awesome if I could! There is a lot going into making sure that the form is sending the right information to the right database screens. Others can provide you with the more technical aspects, and I would be happy to connect you with our IT managers.

Michelle Bushman: Are there ways to automatically populate some of the fields with information the Department already has?

Einav Henenson: Yes. We do have that available. Whenever customers use the online reporting and tap their rights, the wells they have reported on in previous years show up.

Thank you so much.

CALIFORNIA DATA EXCHANGE CENTER

David Parker with the California Data Exchange Center (CDEC) and the California Department of Water Resources (DWR) addressed the group. The CDEC objectives are to collect and disseminate realtime hydrologic and weather information. They also provide a centralized database for easy user access. Additionally, the staff provide a lot of application and system administration for DWR and the Division of Flood Management.

The primary CDEC uses include a database for setting up an early flood warning with easy to monitor river levels during the flood season. They provide a lot of information for high water events and monitor water quality in the rivers in the Delta.

CDEC supports functions within flood management such as water supply forecasting, reservoir operations, water management, river forecasting, snow data collection and other areas such as this.

They have real-time data collection with continuous collection of information and data through a satellite dish. There is data exchange from 567 stations and they work with federal, state and local public agencies. Data dissemination and access to the information is available through a centralized hydrologic database.

CDEC is working with the different federal agencies that have their own data collection systems. Information is transferred electronically on a real-time basis. Currently, they have over 500 stations that they collect data from in this manner. There are a lot of applications that deal with data analysis and results. They support water supply, river forecasting and flood operations, and snow surveys. Through the internet they can provide the information in many different formats such as tabular graphs, maps, images, and real-time application.

The website address is: <http://cdec.water.ca.gov>. They also have an intranet website for their public safety agencies. It is not uncommon for the website traffic to reach 500,000 page views per day. During certain events, they can have up to one million page views per day on their website.

Mr. Parker addressed the Flood Emergency Response Information Exchange (FERIX) system. FERIX pulls real-time hydrologic climate data together along with flood control systems, levee vulnerabilities, and levee inspection information into one interface.

They collect a lot of information from the local agencies about the status of the levees, the status of the maintenance, and any activities on their levee system. They have also included the DWR flood system inspection reporting. In addition, flood operations center incidents are included in the reporting. Whenever there is levee seepage, a breach, or any type of flood control system incidents, they are reported and the system provides access to that information. Another product of FERIX includes snow water content and levee vulnerabilities.

CDEC staffing includes seven programmers that handle application development, data management, and system administration. Currently, one GIS specialist handles the data management within the GIS system. The annual budget is \$1.8 million.

QUESTIONS

Tony Willardson: California is unusual in that you collect your own snow survey information. NRCS also collects soil moisture data. Does the state gather soil moisture information as well?

David Parker: We are starting to gather soil moisture information as well. We have been adding that to the snow sensors. The California Department of Forestry and Cal-Fire also have a collection of soil moisture data.

Tom Byler: You mentioned collection of real-time data. What does that mean for you? For us, it is not instantaneous.

David Parker: A lot of them are instantaneous, especially with satellite data. The satellite data reports every hour, and there is 15-minute data for that.

NOAA-WEST ACTIVITIES

Roger Pierce, WestFAST Liaison, reported that NOAA-West is an organization set up within the National Oceanic and Atmospheric Administration (NOAA) itself. The WSWC most often works with the National Weather Service (NWS) and NOAA research and fisheries divisions.

Roger indicated that each of the line offices have representatives that all work together in a team just for the western United States. Since the Weather Service is broken into six regions, there are six different teams that coordinate among the line offices.

Kevin Werner is unique as he has worked at more of the line offices across NOAA than many people. Through this, he has a unique working knowledge of NOAA-West and also due to his working within WestFAST.

Roger noted that a special position has been created for Kevin on the WestFAST team since he has been working with the WSWC a great deal and is familiar with many of the states' issues. He is likewise on the NOAA-West team. Veva Dehaza works with many of the climate and drought issues in the West.

NOAA-West held a meeting recently. They hold a team meeting every 18 months, and they look ahead for projects for the next two years. Those on the team all know each other, and so they are the first point of contact and have good coordination. The team is made up of division chiefs, regional directors, and meteorologists in charge. Projects and programs of interest are: SeaGrants, supporting coastal programs leveraging across all of NOAA, Drought

Early Warning Systems (DEWS), the National Integrated Drought Information System (NIDIS), as well as Seasonal to Sub-seasonal Forecasting, which has an impact across all of the NOAA line offices.

Roger highlighted the need to build on the Weather Bill (HR353): to ensure requirements are in place to meet federal, state and local customer needs; to work with NOAA/National Weather Service Climate Prediction Center to improve the quality and usability of their forecast products; to support the research community; and to support work with other drought and drought-related programs, such as NIDIS and DEWS.

CDWR/WSWC S2S MAY WORKSHOP REPORT

Tony Willardson reported that a series of workshops on sub-seasonal to seasonal precipitation forecasting predictabilities have been held, with the most recent in May in 2017. He noted there is a lot of the physical science that remains to be understood. Tony commented on the monster El Nino that was predicted in 2017, but that did not occur in California.

Drought is a state that never really “ends,” as some place in the West always seems to be afflicted. There are tremendous opportunities if we were able to improve our predictive capabilities. The National Academies of Science issued a challenge – stating that in ten years we will be able to use long-term predictive capabilities similar to the way we use the 5-10 day weather forecast reports. That will take a significant commitment of resources. The WSWC has written a letter expressing concern and support for the importance of S2S forecasting. The President’s budget calls for a 30% cut to such programs. There are challenges with the modeling, especially due to orographics.

The WSWC continues to support work in this area. There will likely be another workshop next year. This is included in the Water Resources Committee work plan.

2017-2018 WORK PLAN

Tom Byler turned the time to Tony Willardson to review the Committee work plan items, which are included in Tab H of the briefing materials. Tony noted there is funding in the budget both for USGS and for NASA for work on Landsat 9, which is essentially a rebuild of Landsat 8. One of the challenges NASA has is looking at future requirements and anticipating what the technology may be, and how we can continue to gather the data for decision making. Many of the other activities have already been discussed during the course of the meeting. Infrastructure needs are important to the new Administration and to WGA. We continue to stress the importance of water infrastructure. It may be useful to update the information on each of your state’s water development programs and how they are funded and financed. Jeanine Jones would like the Council to update the groundwater recharge projects and programs reports that we have written since many changes have taken place.

There were no other thoughts or suggestions expressed. The work plan can be flexible in terms of the order of priorities. There was a motion and second to approve the work plan as amended in the document under Tab H in the briefing materials. The motion carried.

SUNSETTING POSITION FOR 2017 FALL MEETINGS

One sunseting position will be before the Committee at the Fall meetings. It is Position #372 in the form of a letter regarding the proposed U.S. Forest Service (USFS) directive on groundwater resources. There will likely be no USFS enthusiasm to bring up the issue again. We have encouraged the Forest Service to continue to work with the states. The national directive did not approach the unique legal structure in the West. One size does not fit all.

Pat Tyrrell added that when we were talking about different ways states can handle their relationship with the Forest Service – there was the MOU with Wyoming and the compact with Montana. At the time, the MOU with Wyoming was due to expire December 16, 2016. That has been refreshed for another five years. Pat expressed thanks to Chris Carlson and to his western forester counterparts. This year, Wyoming will be working to update an agreement with the Bureau of Land Management. The agreements are working for Wyoming.

Jerry Rigby commented that the Management Subcommittee discussed the upcoming meeting and sunseting positions. Institutional memory goes with the dispensing of positions sometimes, and it may be better to address the issues in some fashion so that it is on our radar in the event the matter comes up at a later date.

OTHER MATTERS

There being no other matters, the meeting was adjourned.