

# **Native Waters** on Arid Lands

## Tribal Summit Report: November 15-16, 2017

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**Native Waters on Arid Lands** (NWAL; <http://nativewaters-aridlands.com>) seeks to enhance climate resiliency of tribal communities of the Great Basin and American Southwest by building the capacity to develop and implement reservation-wide plans, policies and practices in support of sustainable agriculture and water management. During the course of this five-year (2015-2020) project, researchers, extension experts and members of tribal communities meet annually at a Tribal Summit to share information related to climate change, climate adaptation, agriculture, water resources, and other topics.

The following report describes highlights of the third annual Native Waters on Arid Lands Tribal Summit, which was held on November 15-16, 2017 at the Nugget Hotel Casino in Sparks, Nevada. Speakers at this year's Tribal Summit included representatives from the Pyramid Lake Paiute Tribe, Quapaw Tribe, Duck Valley Shoshone Paiute Tribe, Washoe Tribe, Pueblo of Nambe, Hawaii, Osage Tribe, Walker Basin Paiute Tribe, Ute Tribe, Yavapai-Apache Nation, Shoshone-Bannock Tribe, Tohono O'odham Nation, Navajo Nation, and the Walker River Paiute Tribe. Other speakers came from agencies, organizations, colleges and universities including USDA-NIFA, the University of Nevada, Reno (UNR), the University of Nevada Cooperative Extension (UNCE), Nourishing Systems, University of Arizona, Utah State University, Ohio University, Menominee College, Desert Research Institute, University of Washington, Arizona State University, Aaniiih Nakoda College, and Navajo Technical University. Summit attendees came from communities and reservations located across the Southwest, Great Basin, and other parts of the U.S. Approximately 120 people were in attendance.



Figure 1. The Native Waters on Arid Lands 3<sup>rd</sup> Annual Tribal Summit was held on November 15-16, 2017 in Sparks, Nevada.

WEDNESDAY, NOVEMBER 15, 2017:

## WELCOME AND OPENING TALKS

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The 2017 Tribal Summit began with an opening prayer and song from **Mervin Wright, Jr.** and **Nik Wright** from the Pyramid Lake Paiute Tribe.

**Bill Payne**, Dean of the College of Agriculture, Biotechnology and Natural Resources (CABNR; [unr.edu/cabnr](http://unr.edu/cabnr)) at UNR welcomed Summit attendees, and spoke about changes, challenges, and ongoing projects at the college. Over the past year, CABNR has been working with UNCE to conduct a study on the feasibility of creating Nevada's first tribal college (location TBD). They are now developing curriculum, including the possibility of a "people of the lands" minor to be housed within CABNR, with courses on land tenure, water rights, sustainable agriculture, natural resource management, economic research and teaching.

**Jim Dobrowolski**, Water National Program Leader from the U.S. Department of Agriculture-National Institute of Food and Agriculture (USDA-NIFA; [nifa.usda.gov](http://nifa.usda.gov)), presented an overview of his agency and their Climate-Water-Agriculture programs. USDA-NIFA is the funding agency for the Native Waters on Arid Lands project, and has a \$1.3 billion budget that is used for capacity-building programs, competitive grants, targeted programs for impending issues, and collaborative agreements with other federal agencies.

USDA-NIFA funds projects related to food and agriculture through their Agriculture and Food Research Initiative (AFRI) funding line, which will launch a new Sustainable Agricultural Systems Program in 2018 with \$65.8 million in new grants for projects that focus on systems-level approaches to increasing agricultural production, productivity and profitability, ensuring nutritional security and food safety, and fostering the bioeconomy for economic prosperity. They will also launch a new initiative on Food and Agriculture Cyberinformatics and Tools (FACT), and increase support for projects related to classical and conventional plant and animal breeding. Dobrowolski encourages anyone who visits DC or has questions about NIFA programs to contact him at [jdobrowolski@nifa.usda.gov](mailto:jdobrowolski@nifa.usda.gov).

## KEYNOTE: FEEDING MOTHER EARTH: USING NOURISHING SYSTEM TECHNIQUES TO ENHANCE FOOD PRODUCTION RESILIENCE IN OUR COMMUNITIES

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Keynote speaker **Scott Goode** of *Nourishing Systems: Indigenous Practices* introduced Summit attendees to a method for growing sustainable, nutrient-rich food that combines perspectives of science with indigenous practices that he learned from his grandparents. On his research farm in Central Point, OR, Goode grows crops in large (50') garden beds, separated by composting walkways. Composting walkways consist of a 2' deep trench filled with sunflower stalks and other decomposing plant material, which provide surfaces for fungi and bacteria growth and provide nutrients for the adjoining garden beds. Earthworms create worm castings that add additional nutrients back into the soil. During spring and summer, Goode grows crops in the beds, then places leftover crop residue in the trenches in the fall. During winter, cover crops like fava beans keep the soil surface and microbes healthy and provide material that can be added to the composting walkways in the spring. According to Goode, this farming technique can be used to sequester and mitigate CO<sub>2</sub> levels in a way that could have a large global impact. For more information about his farming methods, contact Scott Goode at [nourishing.systems@gmail.com](mailto:nourishing.systems@gmail.com).

## NWAL RESEARCH HIGHLIGHTS

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On Wednesday afternoon, several members of the NWAL team shared research updates.

- ❖ **Bonnie Colby**, Professor of Agriculture and Resource Economics at the University of Arizona, has been investigating water sharing arrangements among tribal and non-tribal groups, and explained that tribal water rights are quantified through 1) negotiated settlements and/or 2) litigation. One common feature in settlements is a provision for *water leasing*, in which tribes with senior water rights create formal contracts that allow water to be used off-reservation for a specified time period and price. Some tribes also practice *water banking*, storing their water in reservoirs or underground in aquifers to lease out during dry periods. Colby described examples of water sharing agreements from the Gila River Indian Community/Salt River Project, the Colorado River Basin Conservation Pilot Program, the Jicarilla Apache tribe, and the Shoshone-Bannock tribe. She has also been gathering data on western tribes to look for patterns related to revenue sources (casinos, agricultural production, quantification of water rights) and economic activity across reservations. Anyone interested in learning more can contact Bonnie at [bcolby@ag.arizona.edu](mailto:bcolby@ag.arizona.edu).
- ❖ **Eric Edwards**, Assistant Professor of Applied Economics at Utah State University, studies the effect of land tenure and water right structure on economic outcomes and water conservation on reservations. Using the Uintah and Ouray Reservation of Utah as a case study, he is investigating how and why land has moved out of tribal ownership over time, and how irrigation, agricultural production, and income differ between tribal vs. non-tribal parcels. Here, the Dawes Act (1887) allocated good land to the tribe, but subsequent land transfers have moved land out of tribal ownership, resulting in a much smaller reservation with a fragmented boundary. In his research, Edwards compared irrigation rates and techniques used on tribal and non-tribal land on and around the reservation. He found that the irrigation rate was 15% lower on tribal land, and sprinkler irrigation was 20% lower inside the reservation. Next, he will be investigating the economic reasons for these differences. He believes that lessons learned through this analysis will be applicable to tribes and reservations across the west. Anyone interested in learning more can contact Eric at [eric.edwards@usu.edu](mailto:eric.edwards@usu.edu).
- ❖ **Anna Palmer**, a Master's student with the Voinovich School of Leadership and Public Affairs at Ohio University, used the Intergovernmental Panel for Climate Change (IPCC) framework to develop a method for assessing agricultural vulnerability to climate change on Native American reservations in the arid western US. In her research, she gathered data from 72 tribal communities to assess each tribe's exposure, sensitivity and adaptive capacity to climate change. Palmer found that more than half of these tribes had made climate adaptation a priority, and that climate vulnerability assessments were a useful tool in identifying areas of weakness. She also found that securing water rights was an important step for increasing resilience of tribes in arid regions, and that local adaptations for improving climate resilience (building a hoop house, designing an educational program, or diversifying the economy, for example) often have stacked benefits for improving the community as a whole. For more information, contact Anna at [ap744415@ohio.edu](mailto:ap744415@ohio.edu).
- ❖ **Helen Fillmore**, a Ph.D. student at UNR, conducted a needs assessment survey of indigenous stakeholders at last year's NWAL Tribal Summit to learn about priorities for climate adaptation planning and the types of information that tribes and individuals need to plan effectively. Her results showed that for effective climate adaptation planning, the greatest information need is for information related to local climate impacts, followed by food sovereignty and traditional knowledge. Specific data priorities included the need for water quality data, precipitation data, and generalized summaries of water resources and climate information. To obtain information for climate adaptation planning, most survey respondents reported that they utilize tribal

information sources such as tribal natural resource water and land departments, tribal oral histories, and traditional knowledge holders. In the coming year, Fillmore plans to continue her research on climate adaptation planning needs by gathering additional information from tribal members via surveys and focus groups. She encourages anyone who is willing to participate in a survey or focus group to contact her at [helen@nevada.unr.edu](mailto:helen@nevada.unr.edu).

## CLIMATE ADAPTATION PROGRAMS

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In a session on climate adaptation programs, **Chad Marchand** from Colville Confederated Tribes discussed the University of Arizona's climate adaptation programs. **Chris Caldwell**, Director of the Sustainable Development Institute (SDI) at the College of Menominee Nation, provided updates on the Indigenous People's Chapter of the 4<sup>th</sup> National Climate Assessment. **Maureen McCarthy**, program director for the Native Waters on Arid Lands Project (University of Nevada, Reno and Desert Research Institute) provided information about the Tribal Lands Chapter of the 2nd State of the Carbon Cycle Report. Climate adaptation resources that were mentioned during this session and might be of interest to Tribal Summit attendees include:

- ❖ The Native Nations Climate Adaptation Program (NNACP): <http://www.nncap.arizona.edu/>
- ❖ The Southwest Climate Science Center: <http://www.swcsc.arizona.edu/>
- ❖ The Center for Indigenous Environmental Resources (CIER): <http://www.yourcier.org/>
- ❖ The Indigenous People's Chapter of the 4<sup>th</sup> National Climate Assessment: <https://www.globalchange.gov/nca4>
- ❖ The Tribal Lands Chapter of the 2nd State of the Carbon Cycle Report: <https://www.carboncyclescience.us/state-carbon-cycle-report-soccr>
- ❖ Summary report from the Tribal Leaders Summit on Climate Change: <http://www.nncap.arizona.edu/projects/tribal-leaders-summit>
- ❖ Southwest Tribal Climate Change Assessment Report (2017): <http://www.nncap.arizona.edu/projects/2017-Southwest-Tribal-Climate-Change-Assessment>

## SESSION 1: GROUND-SURFACE WATER – MULTISTATE WATER ALLOCATION CHALLENGES

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Session 1, *Ground-Surface Water*, explored water allocation challenges among tribes located along state borders. In this session, co-chairs **Staci Emm** and **Vicki Hebb** asked speakers to discuss 1) the status of their tribe's water resources, 2) how the tribe coordinates with different jurisdictions on water rights and water use, 3) how a multi-state geographic location impacts water rights issues, and, 4) future planning efforts for ground water or surface water rights. A video recording of this session is available on YouTube (<https://youtu.be/yfke5ucZcZs>).

- ❖ **Summer King**, Environmental Specialist from the Quapaw Tribe of Oklahoma, Kansas, Missouri and Arkansas, described her tribe's efforts to clean up the Tar Creek Superfund site, a former lead and zinc mine located within her tribe's jurisdiction. Challenges include cleaning up old mine tailings, contamination with lead, zinc and cadmium, land subsistence, and abandoned mine shafts that need to be filled.
- ❖ **Reggie Primo**, Chairman of the Water Resources Board for the Duck Valley Shoshone-Paiute Tribe (Idaho/Nevada border), described his tribe's water resources, water storage infrastructure, and irrigation projects. The Duck Valley Tribe recently received a water rights settlement award for a case that dates back to 1989, and were awarded \$6 million in grants from the Regional Conservation Partnership Program (RCPP) and NRCS.

- ❖ **Norm Harry** (Environmental Director) and **Susan Jamerson** (Environmental Coordinator) from the Washoe Tribe of California and Nevada described the tribe's land and water resources, and water rights issues. The tribe has four communities located on fragmented lands near the Carson River, and currently faces challenges related to the impacts of new development in the Carson Valley on water quality. They discussed a problem occurring in parts of Nevada where mining companies are obtaining temporary water rights for exploration and pumping significant quantities of water with a huge impact on groundwater and springs. They also discussed challenges related to the Leviathan Mine Superfund site, which releases acid mine drainage into a creek that passes through some of the Washoe Tribe's allotments and into the Carson River.

## SESSION 2: TRADITIONAL KNOWLEDGE AND ECOLOGY – BUILDING AGRI-CULTURAL RESILIENCE THROUGH TRADITIONAL VALUES

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Session 2, *Traditional Knowledge and Ecology*, explored ideas about how traditional knowledge can be used to increase resilience of tribal communities to climate change. In this session, moderator **Karletta Chief** (University of Arizona) asked panelists to reflect upon 1) how traditional values are implemented in agricultural practices, farming, ranching and forest management, 2) how traditional values enhance resiliency in their communities, and 3) how these values can be transferred to other communities. A video recording of this session is available on YouTube (<https://youtu.be/-hpiRZTe8bl>).

- ❖ **Keri Johnson** from the Osage Tribe of Oklahoma is part of a network of traditional corn growers working together through an international project called Braiding the Sacred ([Braidingthesacred.org](http://Braidingthesacred.org)). He believes that traditional values are inherent in his tribe's approach to agriculture and living, and that the tending of the land, the tending of crops, and the cooking of food can be a healing and connecting force between individuals, generations, and tribes.
- ❖ **Anna Eichner and Scott Goode** from Nourishing Systems are working to develop and promote sustainable farming techniques based on indigenous practices. Anna is documenting indigenous farming techniques and learning to read the land. Scott believes that it is important to learn and share information about indigenous farming practices, even outside of indigenous communities, because these methods can be used to heal damaged soil and sequester CO2 from the atmosphere.
- ❖ **George Toya** from the Pueblo of Nambe described the way of life and farming that he learned from his grandparents, and his tribe's farming program. The tribe grows and provides food for the community at no cost, and used seeds that were provided by elders to start a seed bank. George believes that it is possible to bring back a lot of traditional values, morals, culture by enlisting the help of elders to engage and teach the youth.
- ❖ **Laurel James** from the University of Washington and the Yakima Tribe of eastern Washington is interested in traditional values in forest management, and asked the group to consider whether resiliency was the act of managing, or a response to management. She thinks that we need to consider differences between modern and traditional practices, and how past actions impacted the resources that we have today.
- ❖ **Neil Mortimer**, Chairman of the Washoe Tribe, discussed aspects of his tribe's traditional homeland, resources, and ecological knowledge that have been lost. Mortimer believes that family is a key component of traditional values, and he asked questions about how to find balances between traditional values and modern life, and how to convey that knowledge back to young people.
- ❖ **Kalani Souza**, a native Hawaiian practitioner, joined the conversation via Skype to discuss the importance of food security for people on island nations and reservations. He is working to use indigenous



methodologies to get people to prepare for extreme weather events, and tries to promote values passed down from grandparents.

Follow-up discussion focused on themes of resiliency, sharing values across communities, finding opportunities for cross-cultural exchange, and how NWAL and research institutions can support communities.

## THURSDAY, NOVEMBER 16 (DAY TWO)

### KEYNOTE: TRIBAL WATER RIGHTS

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On the second day of the 2017 Tribal Summit, Attorney **Wes Williams, Jr.** from the Walker River Paiute Tribe spoke about tribal water rights, including an overview of the prior appropriation system and the history of important water law and water rights court decisions. He discussed an ongoing groundwater rights case involving the Agua Caliente Tribe of Cahuilla Indians, which at the time was under consideration for hearing by the Supreme Court. Williams also answered a variety of water law questions from the audience.

### SESSION 3: ECONOMICS AND WATER

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Session 3, *Economics and Water*, explored economic development strategies and livelihood development in agriculture. In this session, moderators **Kynda Curtis** and **Eric Edwards** from Utah State University asked panelists from a variety of agriculture and water-related economic development projects to describe their work, impacts that it has had on their reservation/nation/pueblo, and challenges that they have faced. A video recording of this session is available on YouTube (<https://youtu.be/rhTVougXjcw>)

- ❖ **Jerimy Kidd** and **Latashia Redhouse** of Ute Tribal Enterprises ([utelcc.com](http://utelcc.com)) described their work with the Ute Bison Project, which raises and maintains the second-largest herd of free-roaming Bison in the US. Bison provide a source of healthy meat, income, jobs, tourism benefits, and are culturally important to the Ute tribe.
- ❖ **Buddy Rocha, Jr.**, Economic Development Director for the Yavapai-Apache Nation, described a new vineyard project that his tribe has initiated with help from the USDA and Northern Arizona University. Grapes are proving to be a drought-tolerant, high yield crop and are doing well in that region.
- ❖ **Elese Teton**, Tribal Water Engineer from the Shoshone-Bannock Tribe, described water marketing projects in which the tribe leases unused storage water and uses the revenue to fund their water resources department and various improvement projects on the reservation.
- ❖ **Kynda Curtis** discussed opportunities for using food tourism and agricultural tourism as a source of income for reservations. She believes the trend toward tourism based on exploratory eating, drinking, local food, food souvenirs, and food-related activities (e.g. wine and ale trails, farm stays, pick-your-own produce farms) have potential to bring in new sources of revenue for tribes.

### SESSION 4: TRIBAL RANCHING AND CONSERVATION PRACTICES

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Session 4, *Tribal Ranching and Conservation Practices*, tribal speakers discussed successes, challenges, barriers and solutions for expanding economically viable ranching on Native Nations. Session chairs **Trent Teegerstrom** and **Randy Emm** asked speakers to share the top conservation practices that they use in their operation,

vulnerabilities, needs, and whether they feel that their water supply and water quality is stable. A video recording of this session is available on YouTube (<https://youtu.be/qLyxfKXlsUg>).

- ❖ **Homer Marks, Sr.**, a rancher from the Tohono O'odham Nation in Arizona, described the operations of the Gu Achi Livestock Association ([Guachidistrict.com/livestock-association](http://Guachidistrict.com/livestock-association)), which was founded in 1962 and runs cattle on 293,025 acres. Conservation practices and projects include windmills, charcos (ponds with culverts) for water, a solar-powered well pump, fencing projects to better manage livestock, seeding with native grasses, and more.
- ❖ **Bill Inman** from the Navajo Nation's Padres Mesa Ranch ([padresmesaranch.com/](http://padresmesaranch.com/)) discussed livestock health, management and marketing strategies that have been successful on their ranch. He shared tips for producing high quality meats that he thinks will be useful to other ranching operations. He believes that Native American beef producers have a unique story behind their products that can be a valuable tool for marketing. He pointed out that it's not just about the number of animals but the quality of the animals.
- ❖ **Randy Emm**, a rancher from the Walker River Paiute Tribe and UNR's Native Programs Coordinator, discussed challenges associated with accessing and using water on the 350,000-acre Walker River Indian Reservation. The Walker River tribe has the first water rights on the river but are the last ones on the system. Conservation practices include land-leveling, pipelines, fencing and river restoration projects.
- ❖ **Marquel Begay** from the University of Arizona, Dine College, described a water use plan for Tsaile, Arizona, a 162,000-acre region with approximately 132 farmers and 150 ranchers. A water hauling survey showed that the average user used 232 gallons of water per day; 50% for livestock, 38% for domestic use, and 13% for agriculture.

## KEYNOTE: BAYOU BLUES: THE STRUGGLE FOR SELF-DETERMINATION ON THE LOUISIANA COAST

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Patricia Ferguson, Faculty Director of the Indian Legal Program (ILP) at Arizona State University, described challenges for tribes living along the Louisiana Gulf Coast, where coastal flooding has displaced native villages. The flooding, which has been compounded by climate change, is also the result of a series of man-made changes in the environment, such as the re-routing of the Mississippi River during the early 1900s and exploration by oil and gas companies. Today, many of the native communities that remain are working to adapt and develop options for relocation, while still retaining a connection to their original lands, and facing challenges related to land-loss, hurricanes, lack of federal recognition, and other issues. A video recording of this keynote is available on YouTube (<https://youtu.be/ZWXgCkOaETQ>).

## TRIBAL EDUCATION FORUM

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The final session of the 2017 Tribal Summit was a tribal education forum, in which moderator John Phillips asked speakers to present examples of tribal higher education, research and partnership models that build the capacity of institutions and faculty to support tribal student success in college and tribal communities.

- ❖ **Meghan Collins** (DRI/NWAL) introduced the overarching goals behind NWAL's Faculty Research Partnership Program, which seeks to build capacity for STEM education at Tribal Colleges and Universities (TCUs) by connecting students and faculty from TCUs with faculty from research institutions like DRI in support of original research projects.

- ❖ **Richard Jasoni** (DRI/NWAL) and **Brian Grebliunas** (Aaniiih Nakoda College) described the pilot run of NWAL's Faculty Research Partnership Program, which took place during summer 2017 at ANC. Jasoni, Grebliunas and a student (Joel Doney) worked together to develop and carry out a research project focused on irrigation management for crop production in a community garden at ANC. They felt that it was a successful experience with many benefits for the student, the school, and all who were involved.
- ❖ **Steven Chischilly** (Navajo Technical University) discussed opportunities for students at his school, where he was involved in the creation of a 4-year degree program in environmental science and natural resources. He described field trips and internships that students can participate in as part of his program, including an internship with the Army Research Laboratory in Maryland. He also shared a video produced by some of his former students who are now pursuing graduate degrees at the University of Georgia.
- ❖ **Helen Fillmore** (UNR) described the results of a needs assessment that she administered at the 2016 FALCON conference to learn opportunities and challenges related to TCUs and climate adaptation planning. Top priorities included increasing funding to TCUs to support teaching, research, and outreach on climate science and adaptation, and supporting ongoing development of Tribal College and tribal agency professionals. Enhancing food security, and strengthening tribal economies were also high priorities. The results of her study will be published in a paper that is currently in review.



Figure 2. The Native Waters on Arid Lands team, following a team meeting in Reno, Nevada. November 14, 2017.