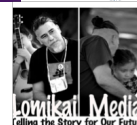




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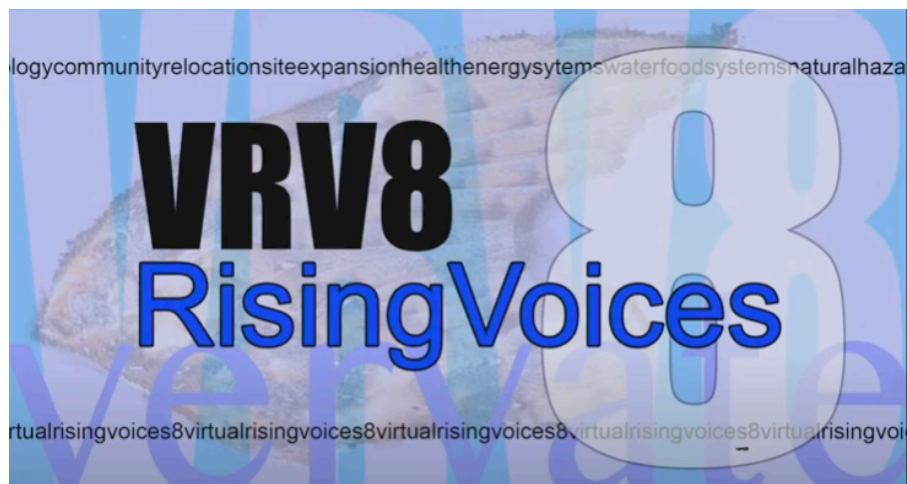
# The Rising Voices Center for Indigenous and Earth Sciences



## Virtual Rising Voices 8 (VRV8) Workshop

### Water Systems Sessions

August 2020



## BACKGROUND AND INTRODUCTION

The [Virtual Rising Voices 8 Workshop Series](#) (VRV8) Water Systems Sessions took place in August 2020. These virtual sessions offer the opportunity for everyone to speak, engage, and ask questions in smaller group settings similar to what would occur in person at the Rising Voices annual workshops. VRV8 is possible due to the technological broadcast network capacity developed by [Lomikai Media](#) and the [Olohana Foundation](#), who had the foresight to develop this capacity over the last few years to prepare for the very situation we find ourselves in with the novel coronavirus and COVID-19. This type of disaster preparedness has enabled our ability to be socially connected while at a physical distance.

[The Rising Voices Center for Indigenous and Earth Sciences](#) (RV) facilitates intercultural, relational-based approaches for understanding and adapting to extreme weather and climate events, climate variability, and climate change. RV supports a growing network of Indigenous, tribal, and community leaders, atmospheric, social, biological, and ecological scientists, students, educators, and other experts from across the United States, including Alaska, Hawai'i, and the Pacific and Caribbean Islands, and around the world. It functions as a boundary network among diverse individuals and knowledge systems, and fosters relationship building based upon mutual trust and respect. It acknowledges the inherent value of Indigenous knowledge systems and Indigenous science, including but not limited to traditional ecological knowledge and adaptive practices and processes, honoring them equally with Earth science.

RV's mission is to center Indigenous knowledge systems in the Earth sciences for more innovative responses to extreme weather and climate change. The vision is more diverse and inclusive Earth sciences to drive a climate-resilient and just world. This includes envisioning collaborative research that brings together Indigenous knowledges and science with Earth sciences in a respectful and inclusive manner to achieve culturally relevant and scientifically robust climate and weather solutions. In doing so, RV seeks to advance science; remove the boundaries between science and society; and create innovative partnerships among collaborators with diverse disciplinary and cultural backgrounds to support adaptive and resilient communities. RV's core objectives include: assess critical community needs in relation to the impact of climate and weather extremes; encourage Indigenous and other youth to pursue a career at the science-Indigenous knowledge interface; and pursue joint research aimed at developing culturally, socially, and economically optimal plans for community action towards sustainability. RV is co-administered by the University Corporation for Atmospheric Research/National Center for Atmospheric Research ([UCAR|NCAR](#)) and the Livelihoods Knowledge Exchange Network ([LiKEN](#)) in partnership with Haskell Indian Nations University, the Indigenous Peoples' Climate Change Working Group, and the National Oceanic and Atmospheric Administration's ([NOAA](#)) Office for Coastal Management.

The fourth VRV8 installment of thematic-focused months was on freshwater and marine water systems. The VRV8 Water Systems sessions considered the group's continued conversations since last year's 7<sup>th</sup> annual Rising Voices water systems group sessions (the full summary can be found [here](#) on pages 18-20). Amongst the various topics that arose from that session, one of

the most important was the urgency to treat water with utmost respect, as a relative and a living being, because water is life and should be treated as such. Issues of data sovereignty, language and institutional barriers, as well as the constant tension between Western perspectives and traditional ecological knowledge – similar to those discussed during the previous months' VRV8 sessions – were also discussed. Characteristics of converging knowledge (intercultural scientific research) were identified and included a reminder of what it means to work in a place-based community, and addressing the need for proceeding at a pace based on the community's needs and priorities, as opposed to following grant timelines that do not align with such. Youth involvement, organizing, training programs for youth and non-Indigenous scientists, and suggested guidelines for the aforementioned were discussed in detail. Rising Voices as a space to support these initiatives was brought into the conversation, especially as it is space that can aid in facilitating difficult conversations, translate language and meanings across disciplines and communities, as well as share the work of others across many branches of knowledge.

Other topics included issues related to water quality and quantity, and institutional barriers. Participants shared the importance of acknowledging Indigenous knowledges and the need to appropriately address the interconnectedness of water access and management across many intersections as a key to Tribal identity and sovereignty, and to push for more legislation and legal ability to assist this process. We were also reminded that these are issues which have been continuously discussed in the water working groups throughout the years. Some last thoughts shared were that we can begin with the why, to what end is the research about water being done, and what is the shared vision of the outcome? We can be prepared to get out of our comfort zone, take responsibility for, and to listen, and to respect sharing stories and trusting relationships, both existing and new.

## VRV8 WATER SYSTEMS PANEL SESSION

The VRV8 Water Systems Panel Session took place on August 7, 2020. The recording of the session can be found [here](#). The panel session was co-facilitated by Melissa Watkinson (Washington Sea Grant) and Karletta Chief (University of Arizona). The panel participants consisted of Joe Hostler (Yurok Tribe Environmental Program) and Natalie Michelle (University of Maine) speaking on marine systems, and Otakuye Conroy-Ben (Arizona State University) and Janene Yazzie (Sixth World Solutions) speaking on freshwater systems.

Heather Lazrus (NCAR) provided a brief introduction to the session, followed by Melissa Watkinson and Karletta Chief introducing themselves and the questions to be discussed. Melissa is a citizen of the Chickasaw Nation, and lives in Washington – the traditional lands of the Suquamish Peoples – where she grew up having access to salmon, crab, and shellfish, which are a large component of their family gatherings. Melissa currently works at the Washington Sea Grant as a social scientist and has had the honor of working with coastal tribes on projects related to climate change and impacts to the ocean and marine foods and resources that many Indigenous People depend on. She shared that being able to do this work is important to her not only for the people “who are experiencing a decline in some of the

resources and relationships and first foods within our oceans and marine ecosystems...but also for future generations and particularly my nieces who I hope will be able to grow up and enjoy these relationships as I had growing up.” Karletta Chief is a citizen of the Navajo Nation (Diné) and Associate Professor and Extension Specialist at the University of Arizona. She spoke briefly of freshwater systems and how these sources can have different uses – not only as drinking water but also spiritual and cultural uses, and to maintain health and support livelihoods. She spoke of the socioeconomic and political factors, infrastructure in place, ecosystem services and more, which can have an impact on these systems and how her work focuses on working with and bringing together Indigenous communities, scientists, faculty, students, and activists in action-oriented methods to make changes happen.

The following questions were asked and discussed by the panelists:

1. What aspects of marine ecosystems and/or freshwater ecosystems are meaningful in your community?
2. What changes are occurring in the marine and/or freshwater ecosystem and how are these changes important to you, your work, and your community?
3. How does science and sovereignty respond to those changes?

Natalie Michelle, of the Penobscot Nation, began the discussion speaking on marine ecosystems. Answering the first question was difficult because in her community’s “epistemology all of the systems, everything in life is sacred and we are all interconnected.” As such, attempting to focus on a specific system can be overwhelming to answer because everything is sacred and the aspect of holism comes into the equation and, in terms of management, they run into the cultural triage so knowing where to begin can become difficult to answer. Nonetheless, looking at their marine program in terms of management and traditional and non-traditional economic aspects, the shellfish, groundfish in particular, and the porpoise are some of the most important aspects of their community’s marine ecosystems. In particular, the porpoise was used not only for food but it also as part of their ceremonial gatherings and meetings of the confederacy. Shellfish, lobster, and clam harvest are important not only for Indigenous fishers but for the overall economy of Maine. However, even though people’s livelihoods still rely on these shellfish and groundfish, many of these have essentially “been extirpated from the region and much of the groundfish have moved deeper out into the oceans, so people don’t have access to them.” Natalie ended by once more highlighting that when looking at management, cultural triage needs to incorporate the holistic aspect of their epistemology when discussing ecosystems.

Natalie proceeded to speak on the changes and concerns they have observed in the Northeast, beginning by describing the changes brought along by the increase in ocean temperatures.

- With increasing ocean temperatures, they have observed new species coming in while their native species have moved north into cooler waters in the river system.
- Ocean acidification has affected the shellfish’s development of their shells causing them not to form properly, which has in turn affected their survival rate.

- With the loss of habitat, they have had the extirpation of various species, particularly the groundfish.
- The overharvesting by the commercial fisheries is impacting their scallops. While the traditional harvesters, the Native men, saw this years ago and tried to warn the state of Maine, the state would not consider their traditional knowledge and about a year later, the scallop industry collapsed.
- There is pollution runoff, toxins, and red tide that affects the shellfish fisheries, especially the clams, and a lot of the subsistence harvesters depend on the clams for their families. But, often times when the red tide is in, they can't harvest.
- Resulting from the above, there is high unemployment rate, which is also affected by the lack of access to the internet and/or modern technology and transportation, hindering the ability to go to other places to fish and harvest.
- The Tribal citizens can only harvest on the territorial/tribal front, which is only about a two-and-a-half-mile coastal stretch. What makes it a bigger problem is that there is a water treatment center there, so trying to harvest shellfish from those areas can be uncertain and risky.

Speaking more on how subsistence harvesting has been impacted, Natalie further explained that “one of the biggest problems with them is that there's a high rate of poverty there like you've never seen and so a lot of families go without as a result of not having access to these fisheries.” Not only that, “the traditional foods are central to the cultural expression and identity and spiritualism and physical well-being.” When looking at possible solutions to all of these concerns and changes happening, they are working to transmit ecological knowledge to younger generations through their language, and “looking at solutions of ethical harvest and good health through our seven fire prophecies and teachings to revitalize and remember ourselves as part of Mother Earth.” What we need is a greater universal acknowledgement of our own seven generations policy and what that would look like by national and state regulators.

Some of the key activities include environmental justice activities that have shed light on Indigenous rights here to the water systems and its importance to our identity and cultural survival as a nation. The communities have a co-partnership with the University of Maine to provide services and expertise on climate change mitigation and the best science practices in conservation. The Ways Science program recruits youth to become involved in environmental issues, learn citizen science, and to sit down and talk with their elders and learn about the teachings through their cultural species, story song, and ceremony. The Alewives project is very important because a lot of their ocean fronts and waterways have been impacted by industry from pollution and Alewives is a keystone species to the rivers and provide nutrition to the ecology, and an important food source for central fatty acids for neurological development in youth and pregnant women. When doing research on cranberries, an important traditional food source for their people, Natalie had the plants analyzed for their nutrient content and the tests showed they were high in aluminum, which has been connected with cancer and neurological diseases. They have also had a very high increase in nitrogen fallout from the atmosphere so another concern is how that is impacting their carbon sink, the sphagnum bog. “[B]ut it's not how is it affecting these symbiotic systems. These symbiotic water systems such as the stream, the cranberry bog connection because it's the cranberries that supply the sphagnum moss with

nitrogen. It's a symbiotic relationship so how is it affecting that is a good research question for another Indigenous scholar to pick up and start looking at and in these kinds of programs, looking at it from a climate change point of view because it's so interlinked with our culture.”

Natalie concluded, “it’s difficult to get funding for these kinds of projects because the different agencies are so siloed – they don't look at the holistic aspect of our culture when it comes to these studies with the environment.” It needs to be understood that all of these are an important and major part of our food systems, our ecosystems, and our cultural survival. Yet, “it's very difficult applying for funds from here or there because they don't look at those connections and those linkages.” Federal and other agencies should consider all of these connections and consider them when funding Native American projects in the environment.

Joe Hostler is an enrolled Member of the Confederated Tribes of Grand Ronde, also with ancestry from the Yurok, Tolowa, and Karuk Tribes. He is an Environmental Protection Specialist with the Yurok Tribe’s Environmental Program (YTEP). The Tribe has connections to both marine and fresh water ecosystems as there are Ner’ernerh Coastal Yuroks and Puliklah, or downriver, lower river Yurok, of the Klamath River, the third largest river on the West Coast. The Yurok are California’s largest tribe, with over 6,000 members and a reservation of approximately 57,000 acres, as well as another 40,000 acres of timberland that were ancestrally theirs and which they have been actively re-acquiring. Joe spoke about some of the significant changes they have seen occurring in the last five to ten years, such as a collapse of the kelp forest off the coast, and there has been scarcity of subsistence resources, as well as a decrease in the availability and safety of consuming them:

“[M]ussels are toxic, razor clams have been under quarantine for a few years now so we haven’t been able to harvest razor clams and so a lot of these issues begin to cascade into one another... [U]rchins are exploding the little purple spiky fish that suck up the water on the bottom of the ocean. [T]hey’re eating everything and killing off the abalone which are culturally significant for ceremony as well as subsistence, and then also for the non-native people, the state is really worried about money and the agricultural value of commercial sales of these shellfish, whereas natives are generally more worried about subsistence.”

YTEP monitors shellfish by harvesting them and sending them to a lab where they partner with the California Department of Health to analyze the shellfish and then are able to let the public know whether or not they are safe to consume. Previously, communities would have known when the safe times were to harvest these shellfish but due to changes in the water, their traditional windows are not always the safe times anymore. Reflecting on Natalie’s comments on the holistic nature of ecosystems, Joe explained, the ocean is connected to their lands, and the Redwoods are integral to their culture. The Redwoods rely on fog and this interplays with the kelp forest, so another project they currently want to work on is restoring some of their kelp forests.

Shifting into their fresh water ecosystems, Joe began by speaking of the Klamath – one of the largest salmon fisheries on the West Coast – which has seen a large collapse of salmon, due in large part to the effects of hydroelectric dams. He spoke of how the Yurok Tribe:

“woke up in 2002...[when] we had a major fish kill and within our thousands of years since the beginning of time we had never seen a fish kill like that where 50,000 adult salmon died in the lower river before they were able to spawn and so it was just really heartbreaking and really woke us up that we need to do something, we always say that if the environment's sick then the people are also sick. So, we have to work at trying to help our relations to salmon and plants and animals and the fish, make sure that they're healthy so that we can also be healthy as well.”

Since then, the Tribe has been trying to decommission four very large concrete earthen dams and if successful, it would be the world's largest dam decommissioning. However, the issues reach beyond that, and as Joe explained, underneath the dams there are harmful algal blooms created by the stagnant water, which then create neon-green algae mats. If the river was free-flowing it would still have these algae mats, but they would be less and smaller in size. However, when you have a dam that stops the water it creates a bathtub effect and as you get more inland and away from the coast, temperatures begin to rise, and

“[T]hat stagnant water gets hot and then the nutrient loading from agriculture makes the algae bloom...so all that water flows down river to us and then also coincides when the salmon are running. The fishermen and fisher women are exposed to water at the worst time of the year when the algae are toxic and so one of the byproducts of having the dams is these toxic algae, and one way to solve this problem is to remove the dams...It was supposed to start later this year and then it got pushed back to 2021...[W]e're going to keep fighting these things and trying to make these things correct.”

Joe ended his segment by discussing some of the practices he has put in place during his work. The Tribe tries to integrate Western science with their Traditional Knowledge, and work with their elders on asking and getting guidance from them. They ask about “what the environment is supposed to be like, what it was like within [their] time, and getting guidance about what [they] can share with outside people, [and] what [they] cannot share.” Joe himself is a big advocate for sharing and protecting Traditional Knowledge and finding proper, appropriate ways to share this knowledge. He understands that we have to be careful in what we share, how we approach these situations, and that we must work on building relationships with trust and “working with outsiders in a respectful way so that they can be respectful with us and build that relationship and have that trust so that we can all work together and solve these problems together.”

Melissa spoke briefly on how both Natalie and Joe's experiences were very similar to what they are experiencing in the Pacific Northwest area. Melissa appreciated them both speaking on the wholeness of everything, “the interconnectedness of all of these things as well as just the complexities of everything. There's so many different players and different kinds of impacts that when they're coming all together create this large cumulative effect.” Not only that, Melissa was

also thinking about how the present pandemic and COVID-19 have affected these processes to apply for funding for projects. For example, “in Washington a lot of our economic dependence is on our aquaculture, shellfish and seafood, and with the shutdown and in the global pandemic there's been a really large impact on those systems for tribal fisheries and non-tribal commercial fisheries.” Thus, there is bound to be other impacts that the current situation has brought upon other challenges already being faced.

Karletta followed by transitioning the conversation into freshwater ecosystems. Recognizing the difficulty in separating marine ecosystems from freshwater ecosystems, Karletta introduced Janene Yazzie to talk about the impacts at the community level and how water systems are meaningful in her community, and the importance of community sovereignty, data sovereignty, and sciences. Following, Dr. Otakuye Conroy-Ben talked about her work in the sciences and how she works with her community as it relates to community-university partnerships.

Janene, an enrolled member of the Navajo Nation (Diné), began the conversation by discussing how she developed her own community-based business, [Sixth World Solutions](#), in order to work on building pathways to restore traditional ecological practices in landscape and ecosystem management for the last ten years. Along with Karletta Chief, they have been working in the Navajo Nation with the goal of promoting and nurturing water sovereignty and food security. In the last five years, they have amplified those efforts to work at the international level by working as a sustainable development coordinator for the [International Indian Treaty Council](#) (IITC) and as co-convenor of the [Indigenous Peoples Major Group for Sustainable Development](#), which is engaged in a high-level political forum on the sustainable development goals. From this work and bringing these different issues and intersections together “we helped co-found the first Navajo Nation community-led watershed planning project called the Little Colorado River Watershed Chapters Association which operated from 2012 to 2016.”

Janene described how much of the work she has done on the ground has been in the highland arid deserts of the Southwest, “where our freshwater ecosystems are extremely precious and also particularly vulnerable to the impacts of climate change as well as other historical challenges created by overuse, exploitation, and contamination.” During her college years, she had begun to work on the intersection of human rights, Indigenous rights, and climate change. Learning about this from a global perspective made her realize how much all the cumulative impacts of the aforementioned challenges “required us to organize immediately for extensive holistic systems-based planning for effective mitigation and adaptation responses to support the continued survival of our communities and the Navajo Nation as a whole.” With Nation Nation emerging as a hot spot of COVID-19, they have had to carry many of these priorities and issues,

“[T]he continued impacts of climate change and the disappearance of, and overuse, of a lot of water resources here on the Navajo Nation leading to the drying up of a lot of our community wells. And so, our freshwater systems that are really important to our communities include our springs, our rivers, and our lakes and the challenges that are present in restoring our traditional ecological practices are directly rooted in the history



and legacy of colonization which has led to the siphoning off, the monopolization, the privatization of a lot of these freshwater ecosystems...[T]his also translated over time into very confusing jurisdictional and regulatory frameworks that have slowly eroded and taken away community sovereignty.”

However, community sovereignty is key in exercising local authority and control on the management of these resources. In order to have effective long-term management and sustainability, it needs to be rooted in community capacity and makes it even more “important for us to address these things at their root cause and ensure that we're building the capacity of communities that are directly dependent upon them.” While science-based research is important, “it becomes meaningless if it does not have that direct tie to community.” Janene continued to explain how this has been seen when data and research studies continue to accumulate and fill up archives without ever getting translated and made accessible to communities, or it does not get translated in a way that communities are able to use it to “achieve their resource goals and resource sustainability and this is what makes data sovereignty so important.” From working on a spring stewardship project with Karletta Chief and others, most conversations around water and water securities focused on domestic water use and issues of access:

“[T]his is rooted in this over dependence we have on groundwater and the prioritization of pipe water infrastructure as long-term solutions, which ignores centuries of land conflicts and complicated jurisdictional authorities and confusion over who's responsible for the actual management of these resources and have all compounded to lead to the neglect of these important resources.”

With some of the projects that Janene has worked on, including a Gold King Mine Spill study, which is investigating the legacy of uranium contamination in their communities, they have seen “that it's not just about access and use of these water systems but about all of the cultural and spiritual uses of these systems for our communities and for our holistic well-being.” We need to continue promoting water sovereignty and taking care of freshwater ecosystems using traditionally-based practices, restoring traditional responsibilities, and decision-making processes and authorities to conserve the use of water. Further, we need to address water pollution issues affecting these vital resources, including restoration of biological diversity and ecosystem functions, the protection of habitat, and the management of invasive species as well as a lot of wild foods and wild medicines that are often found around these water resources.

For Janene, what has been really helpful is utilizing international human rights standards and especially the [UN Declaration on the Rights of Indigenous Peoples](#) to help restore and enforce these inherent rights. Domestic policy tends to fall short on recognizing and supporting these rights and at its worst, “it intentionally obstructs the application and continued traditional uses of these resources because so much of our infrastructure, so much of our policies and our regulatory authorities are developed to support resource monopolization and privatization, especially on indigenous lands.” For her, it is important to not only understand that it is possible to bring and bridge together traditional ecological knowledges, practices and science with

western sciences but to also remember that “ultimately our very dependence on these systems is not only tied to our physical health but also to our spiritual health as well.” Echoing thoughts from previous panelists, in doing this kind of work, we need to ensure that everything we do must facilitate transference of knowledge from our elder generations to our younger generations:

“As climate change actors and change agents it's become very clear that to take care of the water is medicine because it leads and requires us to also take care of ourselves and of all life. I hope that we can continue to build these types of partnerships and conversations to facilitate best practices and how to best do that and to share information and knowledge across all of our peoples and the water systems that we are tied to and that we come from, so that we can build more effective mitigation and adaptation efforts to climate change but also alternatives to development that really prioritize the preciousness of this vital life-giving source.”

The last panelist to speak on fresh water ecosystems was Otakuye Conroy-Ben who holds a different perspective of these systems being that she works at looking at freshwater water quality at the very end of use. Dr. Conroy-Ben is a wastewater engineer and studies the water quality and the impacts of wastewater pollution on natural systems. She is Oglala Lakota, and also brings in the research academic side and Western science approach. Her work focuses around the [Clean Water Act](#), which is enforced by the [Environmental Protection Agency \(EPA\)](#), and ensures fishable and swimmable surface water as well as other bodies of water. The EPA only mandates that they remove total solids (such as large objects and microbes as well as BOD which is organic waste), and under the Clean Water Act there are no specific provisions for removing targeted chemicals. She also spoke of how the Clean Water Act played a part in the issue in Snowbowl Ski Resort in the San Francisco Peaks, when the ski company wanted to reuse wastewater as a snowmaking source. The water contained many pollutants that can accumulate in soil as well as into traditional medicines and water runoff.

As a wastewater engineer, she looks at “collection systems coming from industrial waste, municipal households, agriculture... and looking at how the pollutants in these waters, which are basically allowed to be discharged into rivers and oceans, impact the natural system.” Because they are dealing with sewage, human pathogens have the potential to be discharged into the environment, and while there is typically a disinfection process at the end of treatment before the water is released, some pathogens may not be completely removed and end up out in the environment once discharged. In previous research, Conroy-Ben looked at endocrine disruptors (organic micro pollutants arising from humans and their practices). It was important to look into these because it has been documented worldwide that these endocrine disruptors are causing intersex fish because they are being exposed to, for example, human hormones and mimics. They have also found antibiotic resistance genes in water that communities may want to reuse for agriculture. Due to this, Tribes in the Northwest “are concerned about wastewater pollution impacting salmon breeding because it is documented that these pollutants can wipe out fish populations...[T]here are tribal communities living along these waterways [who are] seeing

evidence of these micro pollutants entering their waterways because these wastewater treatment plants do discharge to these rivers.”

Speaking specifically to working with tribal communities as an academic, Conroy-Ben explained:

“ [A]s an academic, it's important to build that trust to develop that relationship so I first started working with my Tribe, the Oglala Sioux tribe on the Pine Ridge Indian Reservation, where we're looking at different pollutants in wastewater as well as the treatment through different systems and the impacts on some culturally significant waterways that they use in some ceremonies. I'm also partnering with some other tribes in Arizona and what I'm finding is that it takes time to develop that trust. [T]o not be so... dissemination focused where we have to publish and present. [I]t's important to work with the community and try to understand what their needs are and know that this is for their health, their preservation of environment...[A] lot of the work [and] research I do...doesn't get published but it is for the benefit of the tribe and they're making their own decisions with what to do with the data.”

As far as future work, she is looking at working with other tribes where wastewater discharge is occurring, and considering other indicators to be tested. For example, she recommends looking for caffeine, which is a good indication that that waterway is polluted by wastewater. They should also test for hormones, antibiotic resistant genes, and drugs of abuse, because they have been finding tramadol, cocaine, and methamphetamine in culturally significant waters. In regards to the pandemic, testing is underway in several tribal communities where “we're looking at a wastewater influence as well as the effluent to see if we are, we will likely find coronavirus in these waterways,” and they are going to figure out what is the best way to treat this and other pathogens:

“[W]hat is meaningful in what I do is that I'm looking at the fate of wastewater pollution in tribal communities. [S]ince these are not regulated pollutants, there's going to be no money going to these efforts and so that's where I see my place in this community is. [W]hat changes are happening at the tribal level, what I think we're going to be seeing is accumulation of these pollutants in wastewater, impacted water which is basically every surface water source. And how does science and sovereignty respond? I think it's important to just get more water testing done in tribal communities. There's a lot of this testing going on in non-tribal communities and this is a very underserved area looking at these pollutants...[I]t's a matter of taking the time to work with communities and working with the environmental offices, the wastewater directors, on getting a clear motivation and getting a good understanding of what is out there, what Western science can offer but also what can the community offer to academic researchers.”

Having addressed the main questions posed to the panelists, the session moved forward to answer questions posed by participants during the discussion.

## **How do we address the way that Western scientific funding silos prohibit Indigenous holistic views for research and restoration?**

Natalie responded, “they need to burst themselves into tribal epistemology and a lot of the federal agencies probably don’t have the time to do that because it takes a commitment in order to really understand our perspectives.” Nonetheless, she continued, how we get them to come around to understand that our perspectives on ecology are a holistic perspective is an important aspect, and we need to ensure that some of these “science-based cultural research efforts have to be focused towards that understanding.”

Janene followed by discussing that in her experience being a community partner in many research projects, “it’s not so much about having to change the funding institutions themselves but of just doing it, just implementing it and bringing in those community partners, bringing in those indigenous researchers that already have that understanding of the cultural, socioeconomic context in the communities that they are working in.” She suggested frameworks and opportunities in her international work that could be used domestically, such as re-appropriating terms that are intended to mean the same thing as holistic systems approach but that do not necessarily translate into that in actual work. She expressed how restoring biological diversity and the importance that it holds for climate change adaptation and mitigation have created doorways and pathways for increased recognition of traditional ecological knowledge, practices, and Indigenous-based sciences:

“We need to continue to push for advancement in recognition of that domestically here, particularly in the United States, [and/or] in other developed nations...but we really need our advocates, our scientists, our policy makers to work for that type of recognition here. I think Rising Voices is an incredible example of how that has worked in identifying different opportunities, to expand definition, to open those doors for traditional knowledge holders and community-based participatory research in every aspect of addressing environmental or science environmental concerns or science-based approaches to addressing and understanding those concerns...We just need to continue to commit towards building off of that progress and ensuring that these things are done in a specific way that honors the cultural knowledge and the context of the communities that this research is being conducted in.”

Joe Hostler responded saying he believes it is a bigger, long-term question with two tracks to it: on one end, there is systematic change that needs to happen which can take a long time, but on the other end, climate change is coming up on us already and we need to address these changes right now, “[S]o, one thing that we’ve been able to do or tried to do is just piecemeal. [For example], take a small research project over here, small research project grants here, put them together and just kind of have this umbrella type thought process that’s more holistic in a sense and then just trying to tackle it piecemeal within a Tribe.” He explained that they are limited in capacity, are short-staffed, have minimal funds, amongst other things, so can be more like a puzzle; trying to put together different research projects and making them work together, “We’ve been doing little pieces here, pieces there and then once we [get] a big grant we’re able

to put it all together and then the implementation part comes. But I think it's just trying to be adaptable and creative Indigenous people. [W]e're adaptive and so [we] just have to keep being adaptive."

Melissa shared that to support systematic change, "we need to fund and support Indigenous Peoples as leaders and scholars in this work...acknowledging that traditional knowledge and Indigenous Peoples are scientists in our own very important ways." In her own work, led by Melissa Poe and which addresses ocean acidification, they are partnering with four coastal treaty tribes in Washington State. She is implementing her own lens of Indigenous scholarship as an Indigenous scholar while continuing to think on how she can make sure that "I'm implementing my own protocols and best practices for working with Indigenous Peoples and ensure that's also incorporated as part of the overall plan for working with tribes." She is proud of the implementations and has "observed that community-based participatory processes where tribes own the data, they are leading those decisions that are made, and they're participating in leading the conversations." It is these types of projects, as well as those on which the panelists are working on, which can shift how to bring Western science and Indigenous Knowledge together. Even more so, she has gratitude for participants on this session and Rising Voices members who are leading a lot of those efforts and working on making this happen.

**Is it possible to reintroduce native fish and other species in our water systems if we remove dams and restore our water systems? And what happens when we're at a point where a lot of these native species might already be close to extinction?**

Joe explained that for his community, he is unsure if they will be able to restore them or not, but he thinks that "part of it is just managing in a crisis, just trying to help those that are still around." He knows that there are species on the tipping points so they are just trying to hold on to them, "trying to help our relatives, our non-human relatives survive as well." If they build these habitats, the fish are resilient and could come back. They have been inspired by what they have seen in Washington State and the Elwha Dam, where the dams were torn down and the fish returned to where they used to be, "It had been like 100 years or generations, many generations for a five-year life cycle for a fish, but they're there and it's inspiring that nature is resilient and if you give nature opportunities, they'll come back." Joe concluded that as humans, we have a responsibility in our relations to help them help themselves, in a sense. Natalie followed by adding that since COVID-19 began, she has noticed that the air and water have become clearer. Ocean temperatures are cooler because everything has shut down, and even a green crab infestation that they would normally get around this time of year is nowhere to be seen. Whether or not this is due to temperatures cooling down is unknown to her, but what she does know is that the ocean and lake waters have been clearer, and the air has been cleaner as well.

**Could this restoration of freshwater systems support not only the reintegration of their native species, but perhaps even of native species, terrestrial plants, or traditional foods that communities might rely on?**

Janene began by providing an example of such a case in Ganado where there's a creek that runs through Black Creek. During their community work, they collected oral histories and stories of beavers that used to live here, and of "different things that people used to learn from and draw from in terms of our creation stories, and how we gained knowledge and built knowledge off of observing other species and creatures and their habits and behaviors." However, that is now gone and they find themselves dealing with generations of youth under the age of 15 who had no idea that beavers ever existed in their community. Restoring those stories and bringing back what those relationships look like was very healing. Seeing the physical reintroduction and bringing back plants and animal species can be an indication of something being restored to its healthy natural state. But it can be more complex than that in considering invasive species:

"[T]hat the looking at plants and animals as invasive is also a Western construct and that we, our traditional knowledge systems dictate that plants and animals and ecosystems themselves are living, moving like independent entities and that these entities themselves aren't restricted to any man-made borders. [O]ur understanding of geology and geography and that with invasive species, maybe the goal is not to completely restore habitat back to its pristine natural state, which is like a white western conservationist view of nature, but to look at how did we just restore the balance with what life is there?"

Janene added that as we continue moving forward and given more opportunity to exercise community sovereignty and restoration of traditional knowledge systems, we will be able to confront these seeming contradictions. And along with this, we will be able to find that balanced pathway and that perhaps, "there's some wisdom in the understanding that maybe our goal and our objective should just be to restore balance with what life is already present."

Melissa shared an example of how she has seen this balance happen on its own in Washington State. There, they have a lot aquaculture and they have both native oysters and other oysters that have grown well in those areas, and which are more popular for commercial uses due to their slightly larger size. However, what they have observed is that those oysters which have not been traditionally grown, or raised in that region, are being more heavily impacted by ocean acidification and changes in the ocean environment than native oysters. So, in a way, she is seeing some kind of balance coming into play as native species show more resiliency than those not used to this region.

Karletta followed by speaking on what resiliency means for our communities and how the resiliency for communities and marine as well as freshwater ecosystems has different meanings:

"[I]t includes all these different factors we mentioned that is holistic from our cultural and spiritual values, the ecosystems, and the way we use the land and the natural laws that exist within our communities that are held by the traditional knowledge holders. Resilience in our communities has a very different meaning and like Janene was saying

the return to balance and recovery is also part of that resilience which is not the same as others would try to define outside of our community.”

Karletta concluded by returning to an important point brought up earlier, in that we must remember that we have our own definitions, our own ways of knowing, our own life ways and concepts of resilience that need to be recognized at the global and international levels. Even more so, that the work that is done to deconstruct the policies will often fit these definitions and our own ways within our Indigenous communities.

In conclusion, Joe spoke about climate adaptation planning and how something that was really helpful for him was to understand time scales and realizing that “sometimes the work that we do, we don't even see the benefit of that. [W]e do this work for future generations...we may not even see the benefit of it for ourselves and our lifetimes but the idea is that we do the work with that hope that in the future it will be better.” As Indigenous Peoples, we are always optimistic, and that after everything we have been put through, you have to stay optimistic. Realizing that time scales are different and that there must be selflessness in the work we do because “the work that we do is not always for our own benefit but for the future as well.”

Janene followed by sharing that for her, it is especially important that every scientist and researcher, especially non-Native scientists and researchers, “understand that regardless of the perceived objectivity of science, there are underlying assumptions and biases that can come out in conceptualizing what the problem is when looking at environmental issues.” For a successful partnership to be truly successful, there should not only be a respectful equal decision-making partnership, but there also needs to be an understanding that “it is the inherent rights of indigenous peoples to build their responses, their approaches, their methodologies, their decision-making processes off of their unique world views which are place-based specific.” Questions that should be present from the beginning should include: What is the research for? What is it supposed to be like accomplishing?

“Most scientists are trying to accomplish some sort of beneficial change to a problem, a resource problem that they're seeing but there is, [and] there has been history of research being done for the sake of knowledge that has not always led to a beneficial impact to the communities. There's a lot to be learned from indigenous peoples who are conserving and stewarding and taking care of 80% of the world's remaining biological diversity. To go into those partnerships and relationships with any type of assumption that marginalizes or erases the contribution of those knowledge systems is to start off with at the wrong foot [and] perpetuating cycles of violence and of erasure that have further marginalized Indigenous Peoples to this point and we cannot afford those cycles.”

Natalie expressed that a big question for many non-Native scientists is on how do they validate Indigenous knowledge? Indigenous knowledge is always evolving, it is not stagnant, “and our knowledge base comes from various understandings within our communities, significant kinship ties or clan systems, or even gender systems have different knowledges about a specific

resource and a different view on it.” She believes that to answer that question of validity of Indigenous science is to go out there and make it purposeful to get these different views and perspectives on natural resources. “[J]ust follow the basic scientific guidelines of qualitative research and you will get your answer instead of trying to take a snapshot trying to quantify it” because that knowledge and science cannot be quantified.

Reflecting on his work with Karletta Chief among others on [Guidelines for Considering Traditional Knowledges in Climate Change Initiatives](#), Joe added that developing guidelines could be useful for building relationships and collaborating with Tribes. Further, non-Native scientists need to understand that building relationships will not happen overnight. Persistence is important because it is going to take time to build those relationships. There is this idea of timelines that grants must follow but “Tribes often don't think in a grant timeline. [T]hey don't think in a two, three, five-year timeline. [W]e're thinking generational, or longer term. So as a researcher you may not have a project that that the tribe is available to work at right now but that doesn't mean in the future they won't.”

Otakuye expressed that researchers take a step back and develop those relationships. But most of all, you have to make sure that “you have the right people on the project, make sure you have your approvals, [and] make sure you know what their data dissemination policies are.” When she goes into projects involving water, she does not go with the intention of collecting or analyzing for anything she is not supposed to, and she understands that the water belongs to the Tribe. She also understands that any data collected from that water sample belongs to the Tribe and researchers must understand that.

## CLOSING REMARKS

Melissa thanked all speakers for their time and the enriching conversation provided, appreciating the examples provided around the different experiences and similarities of their communities in different parts of the world related to marine and freshwater ecosystems. Karletta concluded the session by thanking panelists for sharing their important work and sharing the following brief summary:



“We talked about the importance of water systems for our culture subsistence activities and then prioritizing traditional epistemology, traditional knowledge, the importance of involving our elders all the way to our youth, deconstructing Western international policies, and the use of science in these contexts that prioritize Indigenous values and life ways...I want to also thank all of those across the nation and the world who joined us today in this virtual Rising Voices water session today. On behalf of Rising Voices, I want to send well wishes of health, safety, and blessings to you, your family, your



communities and we look forward to discussing this further in the working group water sessions. Thank you.”

## VRV8 WATER SYSTEMS WORKING GROUP SESSION

Building from the [Water Systems Panel Session](#), the VRV8 Water Systems Working Group Session ([part 1](#), [part 2](#)) on August 21, 2020 was designed to continue the conversation on sharing the importance of the changes happening to freshwater and/or marine ecosystems, and thinking about how science and sovereignty respond to these changes. Even more so, thinking about what the participant’s vision for collaborations and partnerships needed looks like, and how Rising Voices as a boundary organization can support these efforts and weave together policy, science, and practice to find the best solutions possible.

Melissa Watkinson (Washington Sea Grant) opened the session by acknowledging “the life that water brings to us in our communities and in all of the work as we are going to be spending some time today discussing our own experiences with water.” During this time, participants were asked to reflect on water in their lives.

Heather Lazrus (NCAR) and Julie Maldonado (LiKEN) provided a short introduction to the session and its purpose, and Heather followed by providing a brief summary of last year’s Rising Voices 7 water systems working group session, which can be found at the beginning of this report. Melissa followed by thanking the panelists who participated in this month’s panel session, and providing an overview of the questions answered. She also introduced participants to a trailer for a film titled “[Olympic Coast as a Sentinel: Tribal Communities on the Forefront of Ocean Change](#)”, which shares the perspectives and experiences of the collaborative work of the many partners working together on the tribal resiliency to ocean changes in Washington State. The film will premiere on September 24, 2020 in the [River and Ocean Film Festival](#).

The following questions were discussed in each of the breakout groups:

1. What aspects of marine ecosystems and/or freshwater ecosystems are meaningful in your community?
2. What changes are occurring in the marine and/or freshwater ecosystem and how are these changes important to you, your work, and your community?
3. How does science and sovereignty respond to these changes?
4. What are the collaborations and partnerships needed -- and how can Rising Voices as a boundary organization support such collaborations -- to weave together the separate policy, science, and practice strands to support marine and/or freshwater ecosystems?

## FRESHWATER ECOSYSTEM BREAKOUT GROUP

Karletta Chief facilitated the freshwater ecosystem breakout group and opened the conversation by sharing that growing up in Navajo Nation, she did not have access to freshwater until college. To her, “water is sacred to her cultural identity, family, community and nation.” However, water

is also scarce so not everybody is connected to it. Water is a right for all people, and that sharing a foundation of respect for water is important. Participants shared stories about growing up without running water and having to haul water, but of how good it tasted, about the sacredness of water to them and their community, and the close ties between water and health. Concerns over community water pipe systems and the resulting effects were shared, and concerns over water pollution and the colonial historical processes that have affected and depleted local water systems. Itzel Flores Castillo Wang (LiKEN) shared her memories of growing up in northern Mexico and once playing in clear water, which is now polluted, affecting people's lives and livelihoods, and reflecting that "the history of water is very important to finding solutions." Several participants shared their appreciation for water after moving from wet to arid climates with limited access to freshwater; how some communities especially in arid regions are experiencing limited access to water, water quality, and pollution, impacted the local economy and residents' health, and with more reliance on water infrastructure, climate considerations for water accessibility is very important.

With arid regions in particular continuing to get drier, there have been discussions in the Southwest of a mega-drought occurring and how to deal with that, especially agriculturally. One of the methods discussed, for example, is dryland farming techniques, but there is also curiosity of learning about water capture techniques. An example was also shared that some communities are using in Uganda, where they have boreholes and are using pump systems economically designed to help with water security. Interests were shared around rural water system sovereignty and the solutions existing within Native communities and knowledge systems, as opposed to Westernized technology.

Considering how science and sovereignty have responded to these changes, participants expressed concern that especially in academia, scholars have limited respect and value for Indigenous Knowledge. It is challenging to collaborate at the federal level in response to climate-induced changes in Native communities because they are sovereign nations but are still under the US government rule. Nonetheless, seeing more Native researchers in Rising Voices and other organizations and spaces, and with more up and coming advocates, provides hope.

For the types of collaborations and partnerships needed to weave together the separate policy, science, and practice strands to support water systems, participants shared that it is important to look around the world for solutions and adaptations. It is useful because many people utilize resources they have around them, not what they can import. We also need more funding for Tribal communities. Rising Voices is the space where we can form connections and foster solidarity amongst Native Peoples. It is important to establish a presence and be loud because solutions can be shared, and we can learn from each other. We need more things like this to exist. It was proposed that maybe NCAR/UCAR can write letters of endorsement for people who participate in Rising Voices to help employers take Indigenous scientists seriously, and for people to be able to write this under their experience in their resumes.

## **MARINE ECOSYSTEM BREAKOUT GROUP**

Melissa Watkinson facilitated the marine ecosystem breakout group, and opened the conversation considering what aspects of water systems are meaningful in participants' communities, what changes they have observed, and how that has impacted their communities. Participants shared concerns about the impacts of rising ocean temperatures on coastal communities and the marine ecosystem, such as coral die-offs, bleaching, permafrost thaw, and how that also affects weather patterns inland. With the ocean-holding heat affecting the land, some communities in coastal Alaska are experiencing buildings falling into the ocean from erosion and permafrost degradation; as permafrost degrades, it releases organic matters, carbon dioxide, and methane. The warming of the water in Alaska has also affected salmon populations and there has been an increase in algae, which causes poisoning in some plants. And due to the decrease in sea ice, which protects the land, there have been more frequent storm surges and more coastal erosion. For some villages in the Arctic coast of Alaska that are culturally dependent on the Bowhead whale, the loss of sea ice and the thin ice has made it too dangerous to risk going out to harvest these larger marine mammals. There are also concerns about climate-related impacts and diseases. In Siberia, for example, permafrost degradation unearthed some diseases that had been frozen from years ago. Further drilling in the Arctic has been approved, which is further adversely affecting the roads and the tundra, which is already not freezing as hard due to climate change.

Some of the issues observed off the coast of Washington State have been ocean acidification, and Indigenous fishermen have observed less abundance of healthy shellfish and salmon. However, this decline may not only be due to climate change but could also be from foreign ships in the boundary of United States' waters that are overharvesting salmon. This is a critical issue for communities who depend on catching and selling seafood as part of their livelihoods, and for social, cultural, and economic aspects of their community. Similarly, communities in Hawai'i have seen a decrease in the amount and size of large fish, due in part to overfishing, and also an increase in plastics in the ocean due in part to the currents from Japan bringing them in. Further, tourism has had an effect on the reef system, especially due to the use of sunscreen, which contains oxybenzone that settles onto the reef and kills it; one challenge was that this had to be scientifically proven before a ban went into effect. This is a broader issue in itself: science working too slowly when solutions are needed now, not later.

In terms of science and sovereignty, the importance of bridging Indigenous ways of knowing with Western systems was raised and the importance of traditional stories in this, but it was also acknowledged that there are challenges in funding and data sovereignty. Further, Indigenous Knowledges are much older than Western Knowledge, and yet there is so much rich data that is dismissed as anecdotal, or as folklore, but we need to return to these traditional ways of knowing. We need to coexist and participate in the environment, as opposed to controlling it. Ecosystems need to be supported, grown, and enhanced, and people need to understand that it is all connected, and that what is happening in the ocean affects land as well.

One related consideration was the idea of going back to traditional place names to better understand and protect ecosystems. This can be a challenge with some of the knowledge and

information about place names lost or mixed up without the transferring of knowledge due to colonial histories and harms. It is important to create and enhance the relationships that do still exist as a place to start. Further, Indigenous languages can inform critical knowledge about places, which Indigenous cartography and Indigenous stories can support.

In terms of collaborations and partnerships, a key concern is the cultural appropriation happening that leaves Indigenous scientists not only having to prove their knowledge but also their identity. Participants shared that we need more collaboration between Indigenous and Western groups, and considerations for legal actions by Tribes and other sovereign nations against entities that have destroyed ecosystems or have not adhered to treaties, including how they can be held accountable financially.

Some of the questions that emerged from this breakout discussion include: How does the land, air, and water interact? Are places with Indigenous place names on maps made by colonial settlers reclaimable, and can we protect them from being developed? How do we respectfully share stories, with permission to share, to make that knowledge applicable? How do we show whose knowledge counts and is valued, and what is important? How do we decolonize publishing systems, and education systems? How can we bring in Indigenous technologies to solve current problems?

### **BREAKOUT GROUP REPORT-OUTS AND CLOSING REMARKS**

Following the breakout sessions, Karletta Chief and Melissa Watkinson provided summaries of the main topics that emerged from their breakout groups.

Melissa began by giving a summary of some of the high-level thoughts and takeaways discussed in the marine ecosystems' breakout group. Much was discussed in terms of the shared experiences around what's happening that has impacts to our communities, what is changing in the ocean, and learning how all of these systems are interconnected. Some of the specific examples shared were:

- The rising ocean temperatures are affecting marine species, which are migrating further north, and increases intensity of hurricanes, as well as the effects on inland weather patterns. With the changes in temperatures, there is less of a return on salmon and other marine species, food species, that Tribes and Indigenous Peoples have a close dependence on for social, economic, cultural, and ceremonial purposes.
- A main concern discussed in the Arctic region was the melting of ice due to rising ocean temperatures. This has made harvesting of marine species a more dangerous and treacherous experience for Indigenous communities. It is also leading to more opportunities for foreign ships to come in, which in turn is causing political, social, and health concerns, as well as the sea ice melting and exposing potential diseases and gases that have been under ice for a long time.
- Human-induced harms are also impacting marine ecosystems, such as chemicals from sunscreen in the ocean harming the coral reefs in Hawaii. Therefore, how can policies shift more quickly to respond to local community members' observations in relation to the marine ecosystems around them?

The breakout group discussed the resilience of Indigenous communities and their knowledge-based and ability for creating solutions for some of the harms mentioned above. Some of the questions that emerged from this include: How can we shift the use and reliance on Western systems and technology to Indigenous systems? What can our language tell us about what is happening, or what has previously happened, in different place-based areas that Indigenous communities are relying on, and are also experiencing impacts from climate change within the oceans? How can Indigenous stories and Indigenous cartography help shape our response to some of these systems? We need to call on our colleagues to take action around whose knowledge counts and whose knowledge is valued in these processes, and take hold of the opportunity to shift academia and the ivory tower to make space for Indigenous voices and Indigenous Peoples. With that, Melissa ended by putting forward the challenge for us all to consider and act upon: “How can the systems everywhere, from funding organizations, grants, and timelines, and who's hired and who's retained – how can all of this shift so that we can continue to have a growing number of Indigenous Peoples and voices and knowledge being centered around how we are experiencing and responding to changes within the ocean?”

Karletta Chief provided a summary of the conversations shared within the freshwater ecosystems group. There was a diversity in perspectives, experiences, and locations represented in the group, including Indigenous participants from the Great Plains, Southwest, and Latin America, as well as participants coming from academia that were working with Indigenous communities in community outreach and education, tribal climate change work, and water technologies. Participants shared about their work in terms of why they do it, how it is meaningful based on their own upbringing, their values related to water and the protection of water, and what water means to them and their community, especially as it relates to their identity as Indigenous Peoples. In regards to what their communities are experiencing, changes occurring in freshwater ecosystems, and suggestions to aid in these changes, the following were shared:

- Lack of water and how climate change is changing the availability of water, such as through drought – local droughts and mega droughts – and how it has impacted agricultural uses. The importance of dry land for farming along with finding ways to respond to these changes by harvesting rainwater, and thinking of other capture systems.
- Local water systems have been depleted through climate change but also through overuse of the water. This has impacted water quality and really impacted people's lives and livelihoods.
- Water treatment systems need to be redesigned to account for the climate-driven water quality changes.
- Learn from community examples around the world for potential examples that can be adapted to or inform the local context.

Considering how science and sovereignty can be used to respond to these changes, a majority of the time Indigenous work in these communities is not valued in academia. Karletta Chief spoke on how scholarship with Indigenous communities on water, and generally all sciences, tends to not be considered as cutting-edge research or cutting-edge technology; there is a dire

need to change that paradigm in academia. We need to keep pushing to make ourselves known and make it so that Indigenous knowledge and participation are recognized and given value. It is also important that this does not become an overburden on Indigenous students, scholars, and scientists to always be that voice and the one doing the advocating; support should be provided for their voices to be elevated without them being the ones doing all of the labor.

This is where the importance of Rising Voices in educating those in academia to understand the value of working with Indigenous communities, and to support the scholarship and outreach that is conducted around Indigenous water as important and highly valuable, takes place. RV can bring in those academic individuals to participate and be educated about the changes occurring in Indigenous water, as well as supporting in forming those connections and fostering solidarity among Native people, Indigenous and academic partners, because these solutions need to be shared. Indigenous technology, science, and knowledge are cutting edge and extremely valuable, and should be considered as such; RV is that organization which can further support and amplify these voices.

Karletta concluded the VRV8 water systems session with the following:

“Thank you again for all of those who joined us virtually and as I said in my language, water is life, and as I sit here next to the San Francisco Peaks, which are to my people, Diné people, really important for our sense of place and where we've come from. It is raining here and we've had high [record breaking] temperatures and...within our communities we've been hoping and praying for rain. It's a real blessing to have that be a way to close this out and knowing that our prayers were answered for rain and to break this streak of heat that's been going on in Arizona. With that we know that we are blessed in our connections with our Indigenous brothers and sisters and friends. It's been wonderful to have this conversation about water is life and I wish to you and every one of your family and loved ones, safety and health and protection, especially during this unprecedented time.”