## Institutional Facilitated discussion

Tony Willardson: Thank you, Lauren and all the directors. We've had a very quick windshield survey of drought planning in the US and Canada. Questions for the panelists? Maybe I will start with one. Timeliness was raised as an issue, what is the biggest challenge to implementing these drought plans? Any volunteers?

Jonathan Kohr: I might add that with the drought agreements are the early unknowns of where the money will be allotted. We have many different counties and many different tribal entities with interests in water use, so everyone is vying for a piece of that pie to make sure that the monies are available in their watersheds. I find that difficult and it is figured out through a process, but it is still a difficult climb.

Jason Persinger: I think it's really just, at least in the upper mid-west states and particularly in Missouri, the hydro-illogical cycle that Christopher was talking about this morning. In a lot of ways, historically in Missouri, there's been a perception that at times, we've had too much water. You know there is a revised version of the cycle where we had both high flows and drought at the same spot. From there you'd go to concern and think, it's really like drought, concern, rain, we're good, more rain, this is awful. Then eventually you get back to drought and it's maintaining the initiative to do something at times when we aren't facing drought.

We seem to have a short term memory in a lot of the Midwestern states. Most of the time, we seem to have water. We haven't had historically the kinds of issues that you guys have had out West. It's hard to maintain that focus that, "This is something that we need to be working on." This is important even in times where we have plenty of perception or we have too much. That seems to be the hardest thing. From the feedback I got from the other states in the region, it seems to be a very common problem. It's not just a Missouri symptom. That's a very common symptom.

Tony Willardson: Anybody else?

Rich McCreary: Okay great. There's a couple things. One is that we have this tool. It's the fish protection order that we can enforce, but we've only used it once. What we're trying to do is achieve a lot of the big things that we're talking about in this conference, which was to encourage the users to conserve when required and to really be prepared. We have to be careful because the users interpret that in different ways. In some cases, we're moving up from level one to level two to level three. If you're too heavy handed with your stick, what level three means is water like hell because they're going to come and shut us off. That's not

where we want to go. We want people to take the level seriously and try to implement the restrictions appropriately. That's where we try to give them flexibility. If they can demonstrate that they're reducing use, we're not coming with an order, because the other thing is managing expectations.

You come through with an order, because the country is really, really dry. Even the natural streams are hurting. You come in there and you lay an order down, or you may not, but we say we're trying to prevent a bad situation from getting worse. It's not going to turn a bad situation into a good situation. We have to manage the expectations.

Another big challenge we have is that we have the Okanogan basin, so we use a broad brush for painting with our drought levels. We'll paint the whole Okanogan basin level three. I'm not sure if there are a half a million people that live in three different cities in that basin. A lot of them have very secure water supplies. They don't need to reduce, it's only the streams that aren't backed by storage where we're having the drought. This is a big thing that we're working through to try to get the restrictions matched up. “Hey, if you spent ten million bucks on developing storage systems, you keep watering full speed when we're in a drought because you’re good.” We're working a lot on that and trying to match the granularity of the ratings and restrictions to where they count.

Jonathan Kohr: I'll just add something quick, the other thing I like to stress with difficulty is monitoring. We definitely need heavy monitoring because we had a major drought in 2015 and even the previous year in '14 was pretty bad. It did not quite meet all of the drought requirements, but we, our team were out measuring flows in 2016, after the drought. Everybody is, "Okay, we're done. Good snowpack and everything." Well, the water table had dropped off so we were still seeing majorly low, in fact we had lower flows on the non-drought season afterwards than we did in 2015. That made it difficult for people to buy in and say, "Well, it's not really a drought, we don't need to do anything." Monitoring was very effective in that case.

Tony Willardson: Virgil?

Virgil Moore: Several of you talked about restricting take of fish by sport anglers. Some of them were afternoon closures because of heat, while others were closures because of literally shooting fish in a barrel, I guess you would say, from the photos up there. Do you believe that these are science-based or are these fair chase restrictions and social closures intended to spreading the pain across users?

Brian Murphy: Well as I can tell you from Connecticut's perspective, regarding a blue ribbon fishery that we have in the west branch of the Farmington River, it's science based. When the water is starting to warm up as the flows drop, fishers and the trout are going into the smaller tributaries. Yeah it's like shooting fish in a barrel, so we needed to close these areas. We haven't done it often, but certainly recognize that often fisherman are policing themselves. A lot of the fisherman came to us before we were out there noticing it, saying, "Fish are going up into these tributary areas." We definitely had “buy in,” because it's one of our most important fisheries within the state. When the water gets low, and gets warmer, fish are going to try to find some cooler areas. That's just the biology of the animal. I think we did have had a lot of good response and being very respectful not to put a lot of pressure on the resource.

Lauren Makowecki: Yes, there's a big trade off with social trust for sure. Like Rich mentioned, heading into that red zone when the regulatory kicks in, we really try to take that first opportunity in a medium risk zone to make it an education and outreach opportunity. We try to get people to take ownership of those streams and understand the conditions and implications. The high risk, and we don't want to go there, because as I said, social fall-out for closures, but there are instances when part of that high risk category involves species at risk or the DO is just really low. Some of those triggers sometimes require closure but really trying to use those as education opportunities instead.

Jonathan Kohr: Yeah, within Washington State, it was pretty interesting because we had the anglers that got shut down and were complaining and saying, "Wait a second, you're letting gold dredging happen which is at least as detrimental compared to what we're doing, catching a few fish in the creek." Therefore, we had to take action to work with gold dredgers too and conduct the same hoot hour restrictions. It was not based on water temperatures alone, even though there is science out there that says increased water temperatures create higher disease rate and lower oxygen. We actually looked into creating our own science, which included passage with minimum depths so fish could move from one pool to another to get away from the predation or get away from warmer temperatures. This minimum depth criterion is what we created along with the temperature monitoring for restrictive use and subsequent regulation.

Tony Willardson: Okay, one, two more questions and then we'll get to our break quickly.

Michael Lilly: Michael Lilly with GW Scientific. Again, I appreciate the panels efforts. On Tuesday, Tom Annear talked about one of the purposes of our laws is to bring certainty. From what I saw the panel represent over Canada the US, how are we dealing with uncertainty? In terms of drought management, what are the major

challenges that you are seeing with uncertainty? Are you seeing it go away or are you seeing challenges that we need to still find solutions for?

Jonathan Kohr: Before you go can you clarify certainty? Do you mean certainty with flows, certainty with fish numbers? Certainty with water availability? All of the above?

Michael Lilly: All of the above, it's all tied together.

Jonathan Kohr: I am passing for now then.

Brian Murphy: Just to give a little bit of background here, when I was preparing the presentation, I looked through drought management plans for our region. The management plans have a good administrative process, and a process with trigger levels. When you start looking within those drought management plans, and some of them are pretty long, you can put in keywords to search. Let's put in fish. Let's put in aquatics, Let's put in wildlife. Those drought management plans don't have a lot of specifics about actually protecting resources. So then I started to say, "Well, what's actually happening on the ground?" And really it's droughts are good for being able to go through administrative processes but when we have resources that are under stress, you need to be protecting these resources before you really get into the drought conditions.

That's what I tried to stress in my presentation. When we have the opportunity to comment on these withdrawals or diversion permits, either groundwater or surface water, we have to make sure that if there's an impact, we have to mitigate for those impacts and protect in streamflow requirements. We can't be waiting for a drought to happen for this to be deployed. We have to do this on a normal, regular basis here within the regulatory process. I think that's the takeaway. There are inherent protections in a lot of these plans, but it's what you do in your everyday business, when your environmental agency can protect those resources through your regulations.

Jonathan Kohr: In terms of certainty, I'll just use an example with the city of Vernon. They have a lot of reservoirs and the reservoirs also feed one of the most important coho, chinook, and rainbow trout streams. When it's populations are not good, the users of that water want to know when we're going to step in and impose restrictions. We're working closely with them and what we have is – we've got basically drought flow levels that go year round that are linked to the quantity that they have in storage. In a good year, we'll have our flow target set at “x” and in another year we'll have our flow target set lower if it's a dry year. What we're trying to do is, I guess, is share the pain a little bit better than we have in the past. We're trying to make sure all the levels are set so they know when we

expect them to start imposing water use restrictions, and if they can achieve those targets, then we're going to just step back and let them go ahead. We're hearing loud and clear from the water user community that there's too much uncertainty in the way we're doing it right now. It's pretty basin specific.

Dennis Riecke: Dennis Riecke, Mississippi Department of Wildlife Fisheries and Parks. Each state and province has instream flow levels or minimum stream flows. Do you think that having that is a reason for a lot of states believing that they don't need a drought management plan, because they have a protective level? Is it just a "use/no use" situation once you reach that point? [inaudible 01:29:41]

Tony Willardson: I can't speak for Mississippi or the East, but I do think that in the West there has been a feeling in some states, at some period of time, that we don't need a plan because we have the Appropriation Doctrine. It is first in time, first in right and whoever has a senior right gets the use of the water and that's our plan. However, water is pretty complex. From my minor in economics, it's a complex mixed good with both public and private aspects. You know, that's a real challenge, I think, when we come to balancing public and private uses. We probably don't do a great job if we just set one arbitrary level and don't take into account all of those impacts. Maybe I can turn that question around a little bit. How are we doing when we try to balance our economic and our environmental interest? Is that a harder question?

Jonathan Kohr: We have products out there such as trust water that Andrew spoke of. We have ways of dealing with that and to answer Dennis's question, I just say no. I mean, we have enough entities that know the value of any water above the instream flow rule(s) that it's still valuable and we still need that education because it's just an instream flow that keeps populations from being at risk and so anything above and beyond is helpful. We need to recognize that and we need to educate people on that. Yeah, the answer is no in our state from what I have experienced. Others may have more input from other states in our region.

Tony Willardson: Others on the panel?

Lauren Makowecki: We have something called a "water for life" plan that was formalized by the provincial government of Alberta a number of years back. There are three pillars of economic, social, and environmental values that relates to how we manage our water… our water bodies, rivers, lakes, wetlands. We need to keep our waters healthy for economics, then for our social well-being and the third one is, or let's say the first one is ecosystem health. In a lot of our regional planning, a number of different agencies, not just fish and wildlife, are involved. This aquatic, healthy aquatic ecosystem pillar has become a component in a lot of

the planning. We've also pushed a lot on the idea, wherever we can, that we don't work with minimum flows. We're really pushing the flow regime and trying to help people understand the entire flow regime. I think Rebecca referred to it in her talk, that we could help with just that, natural resiliency over time.

Rich McCreary: I guess when I think about it, it sounds like a heavy-handed approach with just setting the line. If you're above the line you're good, if you're below the line, you're off. What we try to do is recognize in any area of land or any county, there's going to be a variety of sources. You're going to have somebody with a "deep pack" or their source is secure. Some people are from a connected aquifer, and that use is important. Some people are using water from storage, you know, and that is secure during drought. Other people are taking from base flow. We want to be careful that we're not coming in and removing the incentive for people to build resilient systems and economics are important.

The interesting thing is if there is an order and that rancher is shut off, there's no compensation from the government for his losses. When we go to an order, we have to go to the minister with, "This is how much water they're using in this watershed. This is how the ecosystem is going to benefit from this order and this is the price tag. This is the estimated economic loss." We have to put that number there for the minister to know. It was interesting, because our minister in 2015 when we had the order, he is a rancher. He is elected by the ranching community, so we have to brief him on all of that information. In British Columbia, you lose your rights and you're not compensated for it, so it's politically a very risky situation.

Tony Willardson: Other questions? This is like in church, waiting for someone to speak up. I will give you another question then. As I mentioned I co-chair the National Integrated Drought Information System Executive Council. One of the things that we've discussed, and the WSWC is working with the California Department of Water Resources to encourage more research into drought prediction. Now, the U.S. National Oceanic and Atmospheric Administration can give us maybe a good five to 10-day forecast, from the National Weather Service. They're working on two to three weeks forecasts. If you had a three month, reliable forecast, three months to six months, how would that change your decision making? What kind of lead time do you need with some of the decisions that you have to make?

Jonathan Kohr: I'm going to refer that to you, Jeff. You want to come up here and answer that? Because you're the drought plan coordinator for Washington State and I think you could answer that better than I could.

Jeff Marti: Well, that would be kind of a Holy Grail to have that much lead time in knowing that you were entering drought conditions. In some respects, I think snowpack is a very good tell of what your water supply conditions are going to be. Obviously, there are lots of examples where you're in great conditions or lousy conditions in January or February and you have a miracle March or a reversal of the situation that you were in, so you can always have those surprises. I think having better probabilistic forecasts available at longer timeframes would certainly be desirable. I would also say that as much as I know about the research that's going on, that's probably going to be a long time in coming. The more prudent thing would be to put more of your resources into drought preparation.

Jonathan Kohr: Agreed, I just thought we actually had drought plans that we do have coordinated efforts that far out. We are just revising our drought plans, and one of the things we looked at was, "Okay, given that you have such a short lead time, what are things you can do administratively to streamline your response?" One of those concepts is, if you look at other first responders like firefighters and flood responders, they do things like staging the equipment, staging resources that's ready to go. In drought response, our equipment is kind of bureaucratic stuff sometimes. Its legal agreements, it's contracts. Things that facilitate the flow of money and resources, so why not have those kinds of agreements pre-staged, ready to go, detailed plans, work plans, things that your agency would focus on in terms of drought so it is ready to deploy the minute that we meet our trigger.

Christopher Estes: That leads me to wonder then, you pointed out that you have the mechanisms in place, but do you have a set aside of money like your fire suppression folks or fire folks would have so you can deal with drought or do you have to wait until the drought happens and then go ask for the money?

Jeff Marti: In 2015, we did not have a contingency fund available and that was a big challenge for us because in our state our legislature meets every year but one year's a long session, and one year's a short session. That year they had a long session. They didn't get out of Olympia until June 30th, and that's when we got our budget. By that time, we're already several months into drought conditions, so this year part of our major legislative strategy is to work with the legislature to get a permanent drought contingency fund in place so that in the event we enter drought conditions we could have that money provide certainty around planning and response. Then since we only have (for now), drought fairly infrequent (every few years or five to 10 years), we'd like to be able to use that money for long term contingency projects as well. So part of our strategy is to get a combination drought, climate change, resiliency fund that we could use

outside of drought years for longer term projects and then in a drought year have some discretion to direct that money in a more targeted fashion. The Jonathan Kohr make things happen approach.

Jonathan Kohr: I just wanted to say I've heard it called a rainy day fund and I didn't know if that was appropriate or not.

Jeff Marti: It's a sunny day fund, in Washington State.

Tony Willardson: Well, I want to thank you all and all the panelists. Just one comment. I've heard questions raised about certainty. We've also heard, or I've heard mention that the law is behind the science. I raised the question about drought prediction and in that case, I think the law is probably ahead of the science with respect to the Appropriation Doctrine. It was intended to provide certainty because we had no way of predicting from year to year what water we were going to have. With that, please help me thank our panelists and all those that have participated. We're on break and please be back here promptly at 3:15 pm. We have three great presentations and we want to be out of here by 5:00 pm so they can set up for our dinner.