Facilitated Discussion for NGO session

BRIAN RICTER: If I can bring Angela and Jonathan and Stuart up here. You all have been extremely patient in holding back questions as we got through all those presentations, and now we're going to unleash you and let you ask these folks any questions you might have. I think they would like for you to come up to the microphones and make sure that we know who you are before you ask your question. I've got some questions stored up, but I'd like to open it to the audience. Anybody who's got one, please come on up. Dave, you're loaded up.

DAVE: All right. Dave Rosgen, Wildland Hydrology. First I want to compliment the presentations this morning. I thought they were insightful, just unbelievable. Angela and Jonathan and Stu and Mike, I go to a lot of conferences and very impressed with your contributions and your dedication and the advancement of this science. I want to compliment you guys for your role I thought very impressive.

My specific recommendation would be primarily with some of the modeling efforts and the prediction of the response of the biological community and the river system to changes in flow, diminished or increased flow. The thing I didn't see in some of these things that I would like to see emphasized that will help a lot is to build in what we saw – you said stream type. The thing we have to look at is not only by stream type but by the stability by stream type, so that as we change stream type and change stability, we change sediment supplies. So sediment is part of the driving variables. It's flow, magnitude, timing, duration, but there is also sediment—the amount, the size, and the nature of the sediment.

The boundary conditions that affect the channel process that affect habitat deals with valley slope, materials in the bank in the bed, riparian vegetation, large woody debris, roughness elements. We can't really change some of those things, but some of them are. The point I'd like to make is the sediment issue is critical because we've had over the years people say, "We're just going to give you a flushing flow. Don't worry about the sediment," and we know what that does in a high [entrenchment?] ratio entrenched stream, it induces deposition, decreases

particle size, increases fine sediment deposition, wipes out a lot of habitat, and blows out banks. So you add sediment supply from bank erosion. We do have the models – practical, fairly accurate models now, better than we had 10 years ago that we can predict bank erosion, we can predict sediment transport, and sediment supply.

I encourage all of us who are working in this arena to build those in, because as we look at changes in flow, we can only simulate that response based on the nature of the stream type and the stability of that stream type in how it responds to those changes. And that's a critical element, I see a lot of influence on flow, which is critical as well as the driver, but the sediment is also the driver. And I would want to encourage us to advance that a little faster, I guess, in terms of to make a response based on flow changes. Thank you.

BRIAN: Excellent, Dave. Thank you. Angela or Jonathan, you want to respond?

ANGELA: I think that's a really good statement, and actually this has been a great conference and I think I'll leave now. I got that from TED Talk.

JONATHAN: Dave, thanks for that comment. I think, and we've talked about this before certainly, being able to think more broadly in terms of the various attributes that shape streams besides flow and using that in a way that allows us to classify systems more broadly I think is the direction many of us are going, absolutely. And certainly, I would say Australia and the work that Angela and many others are doing, you're a couple steps ahead of us from that perspective in this point in time, but we're catching up and I think there's a lot of effort going on nationally as we speak to do just what you're saying, and that your perspectives of course have been out there a long time and we want to make sure that those attributes that you speak about are incorporated in our work.

BOB VADAS: Bob Vadas with the Washington Department of Fish and Wildlife. I like the idea of the water risk because it talks about the uncertainty with businesses, and I'm a little concerned about all the talk about the scientific uncertainty because certainly, the tobacco industry played on it. Climate change deniers are playing on it. And when you start saying, "Well, we're a little uncertain whether the

water's going to run out in 50 or 100 years, that uncertainty gets turned into infinity." So, the whole idea is I think which should be emphasizing robustness rather than uncertainty and talking about the confidence in predictions like Dr. Arthington did in qualitative high, medium, low classes I think was very helpful. And I think the more we use the word "uncertainty," the happier we make politicians who want to see more water out of the streams

BRIAN: Excellent point and tough one. Any of you want to field this one? Probably all of you could in some dimension. They're all jumping at the mic.

JONATHAN: Nobody wants to go there, right? I think that's a very good perspective, primarily because the more information we provide on uncertainty, the more can be used against us, in a sense. I think that's what you're getting at. But keep also in mind that a lot of the work we do is driven by the stakeholder interests. And I didn't mention this during my talk, but ultimately, we're driven by a stakeholder community that's very vocal, of which there are many here in this audience tonight. And we address their needs in a way that best suits the types of models that they're going to use information for. All I can say to your question is if you're asking for uncertainty boundaries around information that's important to you, we would like to provide that. But if it decreases your ability to defend the work that you're doing, then it might be a direction that we should try to minimize.

STUART: I think hanging out with Dave and that hat is making me think of cowboy analogies. So my answer to this is that as a conservation movement, we have been bringing knives to gunfights for too long, right? And the reason we use the word "risk" is I'm trying to appeal to people on terms in which they understand. I recognize that there's a potential to run roughshod over the terminology and therefore the response, but I find in the conversations it quickly turns to opportunity and quickly turns to vulnerability. That's the thing I find fascinating about working with the private sector on water is that they actually get to the realization that if they game it too much that their risk increases. And again, that may not bear out everywhere, but it's certainly bearing out a lot of places I work.

So I don't know that it leads you to conclude that we will follow a path dependency on response.

I think it leads to a whole new bunch of new conversations that are useful because I think we have to be honest here. We have to widen the pool of people that care about water if we're going to get what we want ultimately. Because if we just continue to talk to ourselves and fight the battles in our ways, we'll get some success, but I think the opportunity here is to kind of leverage some other ways of getting success. So I think that's why the terminology is used, but I take your point.

BRIAN: Yeah, I just wanted to jump in here. I also take the point. There was a time period where a handful of us were testifying in Congress on watershed ecosystem processes and climate change and that sort of thing, and the natural inclination of a lot of scientists is to talk about the things that they're uncertain about, the things that they're not really comfortable with that they don't feel they want to stand on any particular statements. And it was really difficult but ultimately successful to get them to spend 90 percent of the time talking about what they know and what they're confident about, and that was just really, really important, because their natural inclination was to do the inverse of that. So, excellent point.

TOM: I'd just be cautious, Brian, about being certain about things that you're uncertain about because that's a sure way to undermine your credibility in the long term.

ANGELA: I think it's a very important point. As ecologists, we're trained to express uncertainty and error bars and doubts about whether or not we've verified a hypothesis. It's our training. I think we're going to get onto increasing difficulty with this issue because we are changing flow regimes, we're changing climate, we're changing temperature. We have a whole raft of pressures on systems, and it's going to be increasingly difficult to be certain about the outcomes. I think the systems are going to shift in ways that we're starting to see, that there will always be some ecological surprise. And I think we need to open that up so that there's a wider audience understands what the difficulty is, what we're all facing,

uncertainty about the future because of those multiple changing pressures. That's why I want everything to be monitored furiously and forever.

BRIAN: All right. Over here, please.

LISA: Hi. My name's Lisa Gordon. I'm with the Environmental Protection Agency out of Atlanta, Georgia. I loved the presentations on the corporate portion of this today, that's something that we don't get to think about very often. As you guys bring this information to corporations and municipalities and other groups for protecting the water going forward, one of the things that's happened for us in the southeast is that the more nervous people get and the more clear people get about how water affects their bottom line, there's a lot of water grabs. And so we get a lot of on our end, we suddenly see after every drought new applications for reservoirs. People want to keep that water close to them. They want to put in new groundwater wells deeper and deeper.

And we like to work on the prevention side of things, not just restoration. So for us, prevention is preventing some of those new dams to go in when they're not necessarily needed. I'm curious to know if as you guys are working with corporations if you have a part of your communication package is to try to convince them not to just grab more water or to privatize water as a way to secure their water future for their bottom line.

MICHAEL: You want to throw in a question on nuclear power or genetically modified, I'll take them all at once. Working with corporations is slippery. I'm not going to pretend. It is really slippery. In the same way that I'm trying to game things, they're always doing the same. It's in their DNA, perhaps.

"Water grabs" is a term that I hear – I think again you've got a US context here or North American context, excuse me, where your water rights systems are very, very different than a lot of places I work in. So I don't necessarily see a lot of that per se, but I do in the sense that you see agricultural expansion and concessions going out to mining and all these other things. So the systems get over-allocated because of not very good due process of handing out permits in law. So I wouldn't say it's grabbing as much as it's just kind of business being business. I

say to people all the time, risk isn't real unless we make it real. Physical risk, yeah. They can feel that. But reputational risk, regulatory risk, we've got to continue to make sure that on the one hand we work constructively with the private sector to try and take this thing forward, but we need watchdogs more than ever.

I still need Greenpeace to beat people up in order to do my job. I really do. Greenpeace has done a great job of beating up companies in China that then come to us and say, "Okay, how do we fix this problem?" And without them doing that they wouldn't be coming to me. So we still need people kicking companies hard, but we need to -- I think the point is that having a dogmatic position for or against corporate involvement is going to be counterproductive eventually. We've got to find a balance. But it can't be a [unintelligible] we need both sides. And the EPA, you've been handing out some pretty big fines on some of these guys, which is really shaking up what they're thinking about too, so that helps.

STUART: Yeah, I think transparency is really important, and that's one of the outcomes of the stewardship stand. Of course there will be those who don't engage in the water stewardship stand, and that's where we need peer pressure to bring them into the system.

The other issue that we are grappling with constantly is how we bring in the small to medium operators because they are often the ones who go under the radar yet certainly in agriculture are significant water users on a collective basis. I think that's why we're working with things like collectives such as irrigation programs and so on so we can bring in a lot of those smaller operators into the system. I know from my own case, during the drought at home, just watching everybody around the area putting in new dams, it's just absurd. And then the flow through the river is significantly reduced. So we've got to find ways to bring the small-medium operators into a system like this.

DENNIS: Dennis Riecke, Mississippi Department of Wildlife, Fisheries, and Parks. I'm interested to know in your experience if water efficiency, water sustainability, is that being discussed in such multinational funding banks such as the USAID the

International Monetary Fund, IMF, things like that? When they're considering funding projects, are they taking water risk into consideration?

MICHAEL: Yeah. So IFC, International Finance Corporation, DFID, USAID, DGIS, the Dutch development agency, AUSAID which was called WASAID because the government killed it, all of these institutions really do exactly as you say. So the criteria going in, so the IFC is the equator principles with banks and they have all these different criteria. That asparagus I showed you was actually an IFC investment. Were you in the audience when they presented that? And the IFC guys kind of slunk under the table. It was pretty -- it really shut down the way they invested in agriculture for a couple of years. So there's a tremendous amount of work going in on safeguards around exactly as you say. If you look at IFC investment in India over the last couple of years, huge amounts of money have gone in on drip irrigation systems, shifting irrigation systems, et cetera. So it's becoming a very big part of development assistance and around public-private partnerships with companies' supply chains.

On the flip of that, I'm not sure that all of it is necessarily socially or hydrologically desirable. I think they're putting in some pretty poor irrigation systems in some areas, but nonetheless, to your point, yes, there is a tremendous amount of money going into that. Comparative with other investments in the portfolios, I don't know. But they do pay attention it.

STUART: Just quickly, it was interesting. When we first started water stewardship, it was part of the result of an approach by a major financial institution. I had been working with, the Forest Stewardship Council for a while and I was talking to a wholesale banker, so an institutional banker who said, "Yeah, we understand forest stewardship. What we need is something like that for water because we don't understand water risk, and we don't understand its implications for our lending policies." So that was actually a major driver in the development of this system. They come and go, but organizations such as the IFC, which Michael has mentioned, I spoke in an IFC seminar in Shanghai just week before last, and a big

focus there on how to engage the textile industry in good water stewardship in China. So, yeah, there's a lot of stuff going on.

BRIAN: Stuart and Michael, I want to rewind back to the question about companies that they're starting to feel the threat, the vulnerability, the risk of scarcity, and so oftentimes, their advocacy is directed at the supply side, you need to grow the pie bigger so that we'll all have more. It seems to me that, Stuart, your case study from the Kafue, where you're bringing stakeholders together, some of whom aren't going to necessarily benefit from the action made being proposed by another stakeholder in another company that somehow facilitating that conversation is an essential part of this, getting to basin plan, shared visioning, that sort of thing. I think it would be helpful for you to say something about who brings that conversation together, how do you catalyze that kind of a conversation when it doesn't exist, and if the government isn't taking the proactive steps to be the convener. So how does, for instance, WWF, how do you try to deal with that situation?

STUART: So I will give you an example from work we did in Kenya very early. Like Michael's explaining, these early examples that kind of set everything off. We were working in a place in Kenya called Lake Naivasha. It's a very important part for European cut-flower industry. Every Valentine's Day there was always an article in the papers in Europe saying your flowers are killing the hippos. It was one of those dogmatic stories about the impact of the flower industry. And actually, when you went to the river basin and you looked at it, it was clearly not the case that that was the whole story. There was a whole bunch of inappropriate land use, upstream farming, downstream farming, over-allocation, efficiency issues, et cetera. And you're right, Brian. The government wasn't empowered to bring that group together, and we did. So the civil society brought together a whole bunch of people to have that conversation about the future of the lake. And the way in which we got government involved is after doing the studies, it was the water and the economy work, we explained to the government that 10 percent of Kenya's foreign exchange came from this tiny little lake, that the flowers and the green beans and all the things that then went to Nairobi and then went through

trucks and through airplanes and then got sold in the Dutch flower auctions was 10 percent of their global economy.

So you get that wrong and you're impacting Kenya Inc. is the way we described it to the water. All of a sudden, it wasn't talking to the water minister. We went to treasury with that. And then treasury went to the water minister and said, "What's going on here? Why aren't you empowering the people?" So, suddenly, the water user association that was in Kenya -- Kenya actually has a pretty good water law, and with reserve. It's really on the books, but they really couldn't implement it. But this was helping them to implement it. So to your point, yeah, a lot of times you've got to step in and take a shot at it, and sometimes they don't want you to do that. Michael knows working in China is a really tough spot. You do not tell the government what to do in China.

So you're not sitting there constructing these things. You're finding other very different ways. But in many environments, you do play that role of [?], but it's not taking over that role. If anything, it's about how do you incentivize not just the private sector but in this case the public sector. And I think that's a point worth making here that, again, in a lot of the environments I'm working in, the public sector has not kept pace with that rapid rise of interest in the corporate sector. They have not kept pace with that. So they really don't understand private sector risk. Michael knows we got a tremendous amount of work to do to kind of frame that understanding of the connections between the two. I can go on forever on that one.

ANGELA: I would like to know why we have not invested in labeling all the food products that we buy with how much water they use in their title developmental chain. Why don't we label water use the way we label nutrients and energy and flavoring and so on? On every can, every product.

BRIAN: I think you have a couple of gentlemen sitting next to you that would like to take a shot at that answer. Michael? This is pretty much to the heart of a lot of discussions in the Alliance for Water Stewardship about labeling.

MICAHEL: And certainly I think it was interesting. When we started off, we had a workshop, and a number of the companies said that we're not interested in labeling. But as the system grows and the brand recognition starts to grow, the interest in labeling starts to come out. And as you would all know much better than I would, water is a complex topic and having a single measure on water on a label, some are going to work out how to game that system. So the thought of a water stewardship label gives you the opportunity to have a much more comprehensive assessment of the water performance around those four outcomes I mentioned. And I think that's what we will start to see, mainly on shorter supply chains. So we have a lot of interest from the wine industry, horticulture, those sorts of things around labeling.

Probably less interest from the steel industry and water stewardship certified hot-rod steel or something, but the shorter supply chains, I think we will start to see labeling. And that's another reason why we're investing a fair bit in understanding that brand and how to communicate it simply because if we're going to communicate water stewardship, you've got to hit that bull's eye straight off.

TYRELL: I have a question. Thanks for the good presentation. I especially enjoyed the corporate aspects of this. But I had a question for Stuart. I am Tyrell Webber. I'm a post-doc at Oregon State. So I'm just wondering, you showed the water risk filter, and as soon as I saw it, I thought, "Well, there's these hot areas where we want to do better that are over-allocated, but then you have these yellow and green areas that look like the places I want to go to." I guess I wonder do you see companies or are we just going to equally allocate everything or degrade those areas that aren't yet, or I guess are you monitoring? Is that updated to account for that?

STUART: When we launched the water risk filter, we got it in the neck from an NGO who had exactly that question. They went right for us. And I'm going to give you the same answer. There is no evidence that that's how they are using the tool. The tool at this point has been used truly as a way to understand… even 5 years ago, a major company—I won't name them—but a huge company that everybody in this

room knows, we had a conversation about this. And we said, "All you have to do is put all of your sites in the tool," and they said, "We don't know where those sites are." They didn't have a list of their operations in one list. It's phenomenal. So you've got to understand that they're still using it to figure out where they even have supply chains. It's enlightening to them because they're saying, "We get asparagus from there and we got this from there? What the hell are we doing about this?" And so it's not into the gaming yet, it's not into the whole thing of saying, "Oh, we'll just move our operations there." On the flip of that, we are hearing from companies that actually do consider this when they start to think about sinking capital. When Intel or somebody wants to build a big factory in China, they do consider because their investors are saying, "Will you have orders in 20 years if you build there?" If I'm going to give you $2 billion to build your plant, can you guarantee me that you're going to be able to pay back that loan with the water situation?

So they're getting that kind of thing – looking at it from that perspective. But from a lot of the green areas—and US scientists know this better than me—are not places you can just stick your straw on the river or build a farm. So it's not being used in that way.

BRIAN: There's another flip side to this that I think a lot of -- when people see a water scarce situation, water shortages like are happening in California today, that there is a very common public perception that there are some water users there that just shouldn't be there. They should go away and the problem would resolve itself. But there is a counter side to that, and I wonder if either of you or both of you can say something to that, about some of the advantages of keeping companies in the game.

STUART: So again, when we put the risk filter out there, you see these bright red spots, and so as an investor, you look at the bright red spots and go, "Okay, are you telling me to dis-invest from this place?" and actually quite the opposite, you're saying no, actually, these are the places you need to engage even more. So we have been able I think quite successfully to turn those red areas not into places of moving

out of but rather the places you need to go start to do. And as Michael's saying and as the market's telling us, if we can start to create incentives around good stewardship, then companies would be compelled -- they won't feel the need to move out some of these places. They can show their credentials through doing good as opposed to feeling a need to leave.

Having said that, there are clearly some places where companies need to get the hell out of town, there really are. California is shining a light on, through the water footprint story, about is it really the best opportunity cost, for example, to be growing alfalfa for China. It's a good question. So these things are real. And I hear other questions coming up now. "Why are we using so much land to grow non-nutritional crops?" I'm hearing that in Africa a lot around sugar expansion, and that's going to become a real issue as we start to reconcile food security concerns with corporate supply chains. Again, that's just going to play out in numerous ways. But these are the kinds of things we see happening that reflect that. Thank you.

MICHAEL: Just to emphasize, that was a philosophical question that we grappled with very seriously in developing the water stewardship standard. Is the standard about telling people that they shouldn't be there, or should we not recognize good performance in bad catchments? And the thinking was we need to provide recognition and encouragement to people to perform well and better, even if they're in a bad catchment, and hopefully realize that maybe they shouldn't be there or shouldn't be thinking about expanding operations because they start to understand. And that actually came out in the Ecolab issue, not so much on water quantity but on water quality. It reverberated all the way up the management chain to the CEO, who had a bit of a "oh shit, you mean we're in such a bad catchment there?" And so, that really encouraged the senior management to take an interest in catchments where they were starting operations.

BRIAN: With apologies to Angela and Jonathan, I think everybody is intrigued by the novelty of some of the ideas that Stuart and Michael had brought. Because there's nobody at the microphone and because I have promised… you are at the

microphone. We're going to give you the last question, and then we're going to let you all go off to lunch. Okay.

MICAHEL: Just to clarify where I was trying to go, because I don't think I said it really well. It's almost like you can use the ratio of scientific versus business uncertainty to prioritize where you might be more successful with your negotiations. You might also use it as a way to say where you have a high ratio of scientific uncertainty relative to the business risk or whatever that might need places where you need to go collect more data. So I think that understanding the uncertainties is good, but when we talk to the public and politicians, I think we should just be focusing more on talking about robustness. If we're not really robust, then probably that's somewhere where we might want to back down a little bit.

BRIAN: That's a great closing note. Some of these individuals came from the other side of the planet, so I think a big round of applause is in order.