Facilitated Discussion for Provinces and States

CLAIR: I will remind you again that this is all being recorded, so the people that are asking questions, please give your name and your affiliations before you ask the question and direct your question to any one of the panel members. While we are waiting, Tim gave me this note. The happy hour is going to be at 5:30 in where the posters are down here on this level. The dinner is a buffet. It's at 6:30. It's upstairs where we had lunch. So we're open for questions at this point in time to any one of the panel members or all.

BOB: Bob Vadis with Washington Department Fishing and Wildlife again. Anyway, particularly for California but more generally, a lot of the focus being on data collection and stuff, the bigger picture is of concern. For example, like in California, there have been complaints that it's the individual citizens, Joe public, that have to comply with the water restrictions and big industry, including the fracking and agriculture, pretty much (it's at least rumored to be) are exempt from that. So, how much does this data collecting play into how things are actually going to be managed, especially in this drought year?

BEV: Thanks. That's a great question, thanks. Well, in terms of what I'm talking about, I don't know that I can address the first part of your question. But the second part of your question actually is very critical because we just had a water bill pass in November of 2014 which will put an emphasis on flow of data. So it will be critical for that flow data to be technically defensible and sound.

In terms of the work that I'm doing with fish and wildlife, that speaks to that part of your question. In terms of the first part of your question, unfortunately I can't answer that, but perhaps Robert, you might want to field that. So in terms of the second part, what we're doing is going to feed into the water bond, which is requiring flow work. Because of that, we'll have data that is technically defensible and previously we may not have had that level of defensibility.

HAL: Hal Beecher with the Washington Department of Fish and Wildlife. My question is for Todd. In one of your slides, you talked about "this loss of species is bad,"

that was the quote. And then you put a yes by that or a true by that. I wanted some clarification. Is that a statement that you got your stakeholders to buy into? Because your data that you presented didn't really relate to what is basically a value statement. So I'd like to get your comments.

TODD: Yes. I think we were able to certainly document to folks that loss of native biodiversity is good. It is a value judgment and then the data that we had just supported that statement. So obviously we had to deal with a lot of issues with regard to not only non-native species but species that don't rely on streams and rivers. So until the very last meeting with all of the commissioners prior to promulgating new water management act regulations, I had people standing up and saying what about the pumpkin seeds, you hate my pumpkin seeds. And so, for everyone but him, we were able to establish that obviously we don't hate native biodiversity but we're looking at species that need flowing water in streams and rivers. And so, focusing on that subset of native biodiversity and documenting the reduction was what was indicative of alterations to what we were using as a surrogate for ecological health, which was the fish community.

SPEAKER: Over here.

JIM PACHECO: It seems like Washington is controlling the questions. Jim Pacheco, Department of Ecology, Washington. Two questions. Number one, we have hunting fees for elk. We have property taxes for land management, police, fire. Does anybody—this is kind of rhetorical—charge for water. We all know it's a valuable resource and we all know its limit. We are expected to manage a resource, but does anybody charge for that resource?

DENNIS: I'll give you the answer and then I'll give you my opinion. Mississippi, if you drill a well over six inches in diameter, you need a permit. For us, we got state fish in lakes. We're in water we need a permit, $10 for ten years. So, we got to put it in the public paper and all that other stuff. But the question to me is it's a public resource managed by the state, owned by the state, held in public trust for the citizens of the state, and they can't give up that trust. Okay? Because it's a

public trust. So you and I, water's delivered to my home, it's treated. I use it, I pay for it, I pay a sewer fee. Todd drills a well. He bears the cost of drilling the well but he's using a state resource and he's using it for free. And we're not even metering Todd. We don't even know how much he's using. My opinion is we need to start talking about charging people for water use, even if it's a beneficial use.

JIM: The second question is for Texas. How are the "senior" [unintelligible] existing groundwater users in their territory affected when you develop a GCD?

SPEAKER: I think the rules of the GCD may vary by each one of those polygons. But basically, historical uses are brought in as long as they're reasonable amounts of use. So for, example if somebody historically used 1,000 acre feet of water for 1,000 acres of irrigation, that might be considered a reasonable use, and so that's brought in and they continue to use that amount. So in a sense, they're grandfathered in.

JIM BURROUGHS: Jim Burroughs with the Oklahoma Department of Wildlife Conservation. My follow-up on the previous gentleman's comments, I also have two questions I'll get to in just a second. I am by no means an expert, but I agree with the fact we ought to be charging for water. In Oklahoma, in reservoirs which I spent a lot of my tenure with OEWC there working on reservoirs, you have to have a water use permit and a water storage permit to withdraw from the reservoir. The court charges for that storage permit. They charge water there. I don't know why we can't do the same for streams.

My question is for Dennis if he's feeling well enough from the flu to recover and answer my question. This question kind of goes along with the same topic. Dennis, you gave the example of the new procedure in Mississippi of an oil and gas industry wanting to withdraw. I called the EQ, they tell me how much they can withdraw. [Unintelligible] thinking how that would apply in Oklahoma. A lot of the fracking industry there is for Western Oklahoma. It's away from Oklahoma City, where all these administrative offices are. Do you have any

way… does the state have a way to monitor how much they're actually using? Or they're just telling you that they're abiding to their permits?

DENNIS: Well, I didn't state that, but yes, that's one of the requirements that the DEQ told me, and that's something new, that they're monitoring the pumping requirement, they report the pump their actual usage, and they go to surprise inspections. And Ron [unintelligible] he told me he goes down on weekends and they're complying, okay? Now, I hope you realize that Mississippi -- anytime you use a presumptive standard, we don't have data. We don't sample streams in Mississippi. We have a limited staff. So we made a huge assumption that more water is better. I'm fairly certain that the literature everything -- how many times did you hear 10 percent, 15 percent in this conference so far? But we don't have any data, okay? But we just made this assumption that more water is better and if you can limit use, you're going to be better off.

JIM: Next question's pretty straightforward, I think. For Kevin, you -- still Jim [unintelligible] I thought he didn't [unintelligible], it's fine. It's okay. Kevin, Texas seems to be pretty conservative with their surface water rights up to the limit where they're not even issuing any more service permits, if I understood correctly. Why are they not that way with groundwater? Is it just because the lack of acceptance with the connectivity between those two?

KEVIN: No, there's considerable connectivity between the two. Groundwater is considered a private property right, and if there's political reasons why, it just hasn't been able to be brought into the realm of reality that groundwater and surface water are connected.

SPEAKER: It's not an issue of the science of proving they are connected. It's just more of the land or rights issue.

SPEAKER: Yes.

SPEAKER: Private property perspectives.

SPEAKER: Other questions? I've got one for both Ron and Andrew in their standard setting approaches for these large areas in those two provinces, two-part question. Have

you circumvented the public input in developing these strategies? Secondly, have you been challenged to show that there really is protection with what you're proposing?

ANDREW: Essentially, the public input has largely been constrained to major water billing projects that BC's water use planning. So the public was really important in forming the advisory team that took in the science information from fisheries technical committees, and I would be one of those members to then forward their preferred flow regime to the water controller's office for considerations.

The presumptive standards that I spoke to very briefly in that complicated table are largely based on actual fish responses to flow, and so essentially, the feedback that we get from people that fish or are concerned with environmental flows in general, if you have wildlife interest. Essentially, they're going to report back on lake systems or river systems where the fishery no longer exists. And so, with a wee bit of sleuthing or forensic inspection, you can look at, well, we've been allocating water for a long time in some of these areas, and so the present flows on these [unintelligible] systems are definitely substandard. So you have this link between poor fisheries or loss of fisheries that directly link to flows that are well below a [unintelligible] fish flow standard.

Then of course going in the other direction, you can look at systems where we have healthy fisheries and you can look at given the number of sites that we do have long-term hydrometric data on, you can be fairly convinced that all the variable flow requirements in need for the entire year for the persistence of that population are present. So, there are two parts to the public input. One, kind of a cursory first part would be as we move that desktop approach forward, there will be a level of public consultation as those move forward.

That's kind of the cursory answer. To answer your question I'll say truthfully I would say yes, I think that public input part has been omitted from the desktop approach. I won't say that's a good thing, but what we're looking at is if there's a public input that we need, the water for life strategy in Alberta says that water

management plans that incorporate public input and stakeholder input be developed for the whole province. I think that's the right way to go. And the desktop approach that I talked about truly is an interim approach as I see it. So if there's outcry saying yeah, this basin, we should have water management plan that involves public input, has all the stakeholders at the table and develops that, that's the right way to go.

It's not going to happen at the same pace that we're see the population grow and the allocation of water increases in Alberta. So I truly meant that this desktop approach is an interim approach. The right way to do it is to get those true water management plans or that full stakeholder input water management plans across the province. That will take time. The second question you asked Clair was have we seen input or criticism that the desktop approach is not protective enough. And the answer to that is yes. And it's actually kind of refreshing, kind of getting punched on one side of your face from why are you saying no, we need water, and then quite recently the Alberta Fish and Game Association wrote in a letter saying that we don't feel that the Alberta desktop method is protective enough of some of our important grayling streams. And you get punched on the other side of the face, but it's nice to be balanced and it was really refreshing to see that input coming. And it deals with the uncertainty of the method I approach is. So we know that with absolute certainty not at all, yet there has been input on that conservative side as well.

CLAIR: Any other questions? Come on, come on. Okay, over here.

SAMANTHA: This is Samantha from Oregon DEQ. We talked a lot about flow protection, but in states like Oregon, we're completely allocated, sometimes over-allocated. What have each of you done in your respective states and provinces to get more water instream, more flow restoration?

TODD: So the context for the presentation that I gave had to do really with focusing on not making things worse. So I understand where the question comes from is, were you making it better? And what we had to try to discuss with everyone to be

as non-threatening as possible with, for example, the water supply community was focus on that don't make it worse part. But there's always opportunity to make specific improvements. For example, herring [unintelligible]Leila is over here from DER, and she was involved with a project where for the first time in four years, they got herring back in a river because they worked with the water supplier and the community, provided stream flows in river reefs that hadn't had them, and got herring back in that river for the first time, as I said, in four years.

The message I tried to carry in the water policy arena was we're not against restoration. If you want bring in ideas and work with communities and work with people to try to get restoration in certain reaches, then that's something that we are very interested in. It might not be putting more water in, but having that water be in better condition, I'm working on that project to remove three dams and replacing a [unintelligible]in a brook trout stream. The stream has a well on it. It's got some flow impact. But it also has some really interesting protection that's kind of unique. Their permit says if you get below EDF, you can't pump that well. So it's got a little bit more of a unique permit condition written into it.

And across the state especially DER but lots of other folks are removing dams. We're changing the way people install [unintelligible]. So we're improving and restoring habitats to some extent, and sometimes it's even flow. We usually get our bigger bang for flow restoration through improvements and efficiency or when a water supply gets contaminated and they can't use it anymore. But I understand the question, and we do make incremental changes to improve habitat as well just trying to hold the line in certain cases too.

ANDREW: Alberta responded to that one for the South Saskatchewan basin, which is close to the new licenses highly allocated basin. There are a couple of approaches to getting water back. One is it's written in that act that the way to get it back is through license transfers. And in the act it's written that there could be a 10 percent hold back on license transfers. So for license transfers from one use to another, the province or the crown in Canada can hold 10 percent of that license. Some people have done some calculations, and unless it's a really big license, the

smaller ,licenses they would need to change a few hundred times before that 10 percent really added up to anything. So that's probably not going to be really effective.

Perhaps the most effective one though is the potential for some of those license transfers to go from a water use to an instream flow use. There are rules around that can be done and who can hold a license. An individual can't hold a license for the river, but it could go to, again, a crown reserve then count it again. But one of these crown reserves. And so a license could transfer from a water use to a reserve. And with the fisheries act that Keith was talking about this morning and the concept of offsets, there is always, I guess to tie back to Lance's presentation this morning, you look for opportunities when they present themselves, and the change in fisheries act and offsets could open a potential for some of those transfers to go that way.

CLAIR: Right over here.

RON: Ron from British Columbia. There have been very limited attempts to actually restore flows on systems where we have status of fully allocated or over-allocated water state. So there have been a number of small projects where folks have actually gotten involved in developing storage for strategic releases during low flow period. Of course, there is the larger aspect of that, as I mentioned earlier. The BC Hydro water use planning exercise, where again, through major efforts at 19 locations around the province, there has been some major changes in some cases to fall in a partial flow restoration limited by the social values on a given system. But on a practical standpoint, a more broad scale, in BC, as a result of the fish protection act and also the water sustainability act, we now actually have an ability to curtail water use during a declared drought state.

CLAIR: Real quickly, then I'll pass it down to Dennis. The low-hanging fruit would be to try to identify water rights or land that has groundwater pumping and seed voluntary donations or otherwise acquire as rights. The long-term approach which we are implementing in a number of watersheds is to build either a land

trust or a watershed alliance to have the property owners engaged in protection of their watershed. The key thing about taxes is that 97 percent of the land is private property, and so in order to do conservation [unintelligible].

DENNIS: Okay. One thing that I know of is there is a water management district in the delta, and that's the reason we have the huge decline in the aquifer. They actually used to drill two new wells. And they're taking groundwater and they're putting it into the Sunflower River to provide 100 cfs at a certain time of year because they don't want the river to dry up and encourage them to see if [unintelligible]. The next thing that's happening is we are in a restoration project, okay? So they can't use the groundwater anymore. It's more difficult to use the groundwater. So let's have an inter-basin transfer of water on one river system to another.

Okay. For restoration, we're going to bring more than we need for restoration and allow the farmers to use surface water. That's the next one. And probably the most promising thing is we always talk about withdrawing water from the stream and limiting water from the stream. Well, if you can use water more efficiently, there is less you have to withdraw from the stream or surface water, even groundwater. So there's a big program in the delta region with moisture meters in fields looking at crop yields. And so far, the data is showing that by using moisture meters, you can cut your water use for irrigation by 50 percent and still achieve the same crop yield. So if this is proven out, water use could be reduced by 50 percent.

CLAIR: We have another question over there.

MARK: Hi. Mark Hartle Pennsylvania Fish and Boat commission. This question is for Todd. Can I borrow 10 bucks?

TODD: No problem. I got you.

MIKE: Thanks. You've been involved with a comprehensive and I guess not particularly nimble stakeholder group where you've presented them with flow-ecology relationship and they adopted these five protection levels and zones. What's your next step, and how would you go about it?

TODD: We've spent the last two years working on private projects with certain water suppliers going over permits that are going to be issued – all permits are issued within a basin at the same time. So then the rotation goes from basin to basin. So they're dealing with everybody, which is good because the flow alternation estimates are [cumulative?], so everybody gets to see who is upstream and downstream of who and what the alteration levels look like. So we are involved in a process with all of the permit holders to look at things like where they have co-water [cold water?] resources and if they can optimize to reduce impacts to trout streams in the summer if they have multiple sources and really still developing mitigation strategies.

And to focus specifically on the uncertainty of it, where we've been focusing a lot on the scientific uncertainty and [unintelligible] right along next to us has been implementation uncertainty, where if we're not diligent all the way through the process, then decisions can be made that make all of our cool science things kind of useless. So mitigation, for example, if you stay within your category, I indicated that you have to do more mitigation if you change the category. But if my same $10 counts for mitigation, it's $20 for changing the category. Who really cares? Right? So you have to kind of keep up with that. And the steps are going to continue forever, and it's likely that the regulations that were promulgated are going to be challenged in your future. So that's the next step is to keep fighting for it.

SPEAKER: Another question up here.

JON: A quick one for Kevin. This is Jon Kohr from Fish and Wildlife, Washington State. So those white squares of conversation districts where they are not -- is the agency working with those, anybody to get conversation district in those areas? And then second part, how does your agency work with all those different -- we work in Washington State with conservation districts, but it looks like you have many within a watershed. So I would just be going, "Agh!"

KEVIN: We've done some work with some areas to provide some ecological information. Basically to get those white areas filled, it requires people that live in that area to petition for new legislation to add a groundwater conservation district to that area. But we haven't done enough reaching out to those folks in those white areas to do that. Good question. Thank you, Jon.

SPEAKER: Follow on to Kevin. Have you actually set aside your reservations under the eFlow policy?

KEVIN: No, there has been no set asides or reservations under that eFlow using the eFlow standards or allocation process. The legislation actually contemplated that there would be set asides, but the commission decided that having special conditions in new permits met the intent of protecting those environmental flow standards for meeting those standards.

SPEAKER: Any other questions? Ian?

IAN: Ian [Chisholm], Minnesota. To what degree have any of you tied surface and groundwater together in your permitting? And if you have done so, how are you dealing with wetlands – the loss, the surface drop for wetlands, and the change in time and all that stuff?

KEVIN: I think I was pretty clear the answer is no.

SPEAKER: Plan four in BC through the new legislation as of last year but not active at the present.

KEVIN: So new surface water that can be shown to be directly connected to surface water is treated as a surface water allocation, other groundwater sources not. That's still being developed. Sorry, your second part to your question? Oh, wetlands, the approach or desktop approach I talked about incorporates some lakes, and we include wetlands, and there are wildlife biologists who are quite adamant about [unintelligible] swans, certain breeding bird areas so that we've connected that into that desktop approach for wetlands as well.

TODD: We haven't had much problem linking surface and groundwater. We have pretty thin soils, and folks pretty much understand that there's a direct connection in most of our watersheds. But again, we're largely groundwater driven, but everyone does understand that groundwater and surface water are related. We have with regard to wetlands, one of the things that we did to reduce that pressure is to dredge and fill most of them long before now. But as far as specific study, the Cape Cod and islands have a lot of [cattle] hole ponds and specific with regard to studying withdrawal and impacts of those, water withdrawal close to those [cattle] hole ponds, which are just sandy lenses -- you've got [unintelligible] in largely sand-driven systems. You can really watch pond levels fluctuate. And so that's been researched. Before permits are issued, that's certainly one of the things that's has be addressed is to what level you're going to impact water levels in those ponds. Most of the rest of our ponds are in [unintelligible] they're dams. We have very few natural ponds, if that was kind of one of the things that you were looking at in the rest of the state. Most of our natural ponds are on the cape.

SPEAKER: I'm not sure, so I'm going to defer to Ron to answer it if we've ever linked groundwater and surface water permits. We do not. And I don't think we consider wetlands.

SPEAKER: I'd like to follow with my flippant response.

SPEAKER: Yeah, and my flippant response too. We do have a couple of other permits that are very tied to wetlands impacts. Very specific – specific well locations and specific wetlands. So they do address in some of our larger wetlands very specifically those permit implications for the wetland too.

SPEAKER: So just to follow up a little bit…

IAN: I want to interject. When I asked a question about wetlands, I was looking for your standard. So if you're talking about a stream flow depletion factor, that tie between the groundwater pumping, what level of impact do you allow to that surface water when you say, "Okay, that's enough," or "You can't have that water. It takes too much"?

KEVIN: Well, perhaps there are a couple of spring systems in the central Texas and San Marcos springs and Comal Springs. So those could be considered wetlands that require some flows to maintain endangered species. And, really this was the genesis of groundwater conservation in Texas was the lawsuits related to the Edwards Aquifer and the endangered species in the aquifer as well as in the spring systems. I don't know if there were some recommendations or, actually, spring flow levels determined through a very complex process involving many, many stakeholders and science committees, the Edwards Aquifer recovery and implementation plan. So that, in a way, would be how we have done some connections between groundwater permitting and surface water spring flows.

CLAIR: Any other questions?

SPEAKER: Just one more thing for Ian. For us it would be site-specific evaluation of that wetland system that's affected by that well. It's not a statewide policy driven thing. And to be more broadly clear, our statewide policy doesn't preclude DEP from doing site-specific analyses in any area. It doesn't say, "Oh, you're only at three. You're going to four. Go ahead and pump whatever you want." They can write specific conditions into any permit. Our statewide policy is a screening tool, much as many people have talked about until now. But impact specifically, wetlands would be addressed at a site-specific evaluation for each of the permit applications.

CLAIR: Any question?

ROCHELLE: Hi, I'm Rochelle Labiosa EPA. I had a question about communication between instream flow programs and state or provincial water quality programs. It seems like there might be some similar goals in terms of some of the biological and physical integrity. Now, I was wondering if there is communication there to see if there are ways to harmonize or leverage tools and approaches, thinking maybe biological metrics, bio-criteria, reference criteria.

BEV: In California, we do have really good lines of communication for that type of thing with our state water resources control board. Robert Holmes from

Department of Fish and Wildlife frequently would go to different round table meetings and do presentations on different types of tools and things that he is working on but also particularly with the benthic macroinverts. There is quite a high level of communication because in California we are developing bio-objectives or bio-criteria. The way we've done that communication is by opening ourselves up into doing presentations and other types of entering into their sort of round table meetings and things like that. And usually, if you can come with something that's a tool, they're really happy to have you present on that.

ROBERT HOLMES: Thanks, Bev. This is Robert Holmes, California Department of Fish and Wildlife. Bev actually presented a couple of slides that showed how we're trying to link our flow assessment with the water quality assessment report card format. It's a pilot project that we're working on in our central coast region and we're looking at 20 streams. This is the first real -- I put feelers out across the [unintelligible] and I couldn't find anybody that had actually made that link. It's really important in California -- we've got the drought, we've got over-allocation of water resources as high as -- some reports, it's five or six times over-allocation of what actually is present.

One of our pilot projects, we go out and do a lot of IFIM studies. The criticism of that is that well, you're not really branching out. We're a limited program, a program of one statewide person. And so, a part of our goal is trying to get data that we can use from all the other groups that are out there collecting data. A lot of times they're getting funding through some sort of grant project and they're going to add in a little instream flow component to it. It's typically not the focus of the project, and our goal is to be able to say, "Okay. Well, if you're going to do that, we're not telling you how to do the study. But if you're going to do this particular method, here's how we can make it comparable to the other types of ways that we're collecting the data in the state."

So, the first step that we're talking here about is linking with the water quality world, that's really an important step. In our state recently, we had a state water board meeting where the public was asked to comment on the list of impaired

water bodies and also the 303-D list and then the 305-B, which is the water quality assessment list. And I would say probably 90 percent or 95 percent of the comments that were received were all you guys have got to start looking at flow. You got to get flow in there and you got to figure out how to do it. That's kind of where we're taking the initial step. Data quality is right at the core foundation of that. Every time our management comes to that, they always come immediately to me and say, "Tell me about the data quality here." And if our engineers and biologists question it, it's going to end right there. We think yeah, it's good, then it goes out. We have no control over where it goes beyond that.

SPEAKER: Okay. We've heard this morning primarily about impact studies and site-specific things, afternoon standard-setting kind of approaches. And there's been a lot learned, particularly in the latter part of the arena with standard setting at the state and provincial levels. I'm going to toss something out right now that's maybe very controversial. We know we've talked a lot about going from setting standards to requiring site-specific, very detailed analyses. Basically most every approach still is the habitat is the currency. On the other side is dollars. And so, we really should be looking at alternatives and different, various things rather than just reacting to what the project purposes. But since habitat is the currency, how many of you here are using some kind of habitat suitability criteria in your work? Okay, you heard Dave Ruskin say this morning that we're doing -- we're teaching people to do the same thing we used to do, the professors, myself being one of them.

Why are we still going out site-specifically, Gary, to every site to develop habitat suitability criteria when we've [unintelligible]? Back in the '80s, this was vitally important. We didn't know that much about them. We now have a lot of information, particularly on salmonids. But still we go out site-specific [lies?] and gather new data. Remember, the habitat suitability criteria are inputs to the habitat models. This whole program has been critiqued for years by the academicians and the modelers that we never calibrate the biological components of our models. So, why are we still going out and getting site-specific data with

the belief that if we have great information that goes in, that's got to be good? We should be looking at the output validating our models by spending the time, going into the field and testing the output to see what the fish think about the model. Are they being distributed as our model says they are, starting with the best information available?

Some of the work Tom Hardy is doing, you're validating the habitat output, not spending all the time on the input. So, think about that. Why are we still doing? Just because you learned how to do it 20 years ago, why are we still doing it? That's just food for thought. Does anybody want to respond to that, or we want to go drink? I'll let Gary talk about it. Gary has been a big proponent that you must always get site specific HSC.

GARY SMITH: Yes, and no. Okay. Why do we have site-specific HSC? Gary Smith, Cal Fish and Wildlife and retired. I've been retired almost 11 years. In situations where we do not have information—for example, steelhead down the [unintelligible] River, we don't have any information where we could extrapolate it to the big survey. So yes, we need site-specific data there. Now, your comment about validation, I agree with it 100 percent. And we did that on the Klamath River. Tom Hardy did it. I was speaking with Governor[?] [unintelligible] a little earlier today and recommending that he do exactly that. I talked to Dudley Reiser this morning after his presentation and inquired if they were going to do that on the Susitna, and he said yes, they were. Given time, given resources and if you do not have the information, you need site specific, or you need to test something with respect to transferability. And once you do run your PHABSIM, get your WUA, you should go back out and take a look and see if your output and the fish are in agreement. With 1D, that's difficult; with 2D, it can be done rather easily.

CLAIR: We're ready for a break, I think. So remember, the social hour is where the posters are, but the banquet is upstairs, where we had lunch, at 6:30. Please socialize until 6:30, and then go upstairs.