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What Drives Successful Nutrient Reduction Efforts? And How Can Land Grant Universities Support Them?

Transcript

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Cynthia Curtis
Welcome again and happy May, May 1st. Today we have with us Faye Sleeper and Ann Lewandowski from University of Minnesota to talk with us about what drives successful nutrient reduction. This webcast is brought to you special. This is a combined presentation from EPA and NRCS. We'd like to welcome you all. I see that a lot of people have been using the little poll boxes below, and I would just encourage you all to keep using those just so that Faye and Ann could get a little sense about who their audience is, and at the end of their presentation, we will have time for question and answer. If you have any questions during their presentation, please type them in the chat box and I'll be taking us through some questions at the end of their presentation. If you have any technical difficulties, likewise, put it in the chat box and you and I can resolve things on this side.

All right, so without any further delay, I'm going to hand it over to Ann and Faye.

>>Slide: What Drives Successful Nutrient Reduction Efforts? And How Can Land Grant Universities Support Them?

Ann Lewandowski
Thank you, Cyd. Are you able to hear me well?

Cynthia Curtis
Yes, I can hear you loud and clear.

Ann Lewandowski
Great. Welcome all and thank you to our talk today about what drives successful nutrient reduction efforts and how land-grant universities can support those efforts. My name is Ann Lewandowski and I'm here with Faye Sleeper, and we're both with the Water Resources Center at the University of Minnesota.

>>Slide: Presentation

Today we'll talk about two surveys we did a little over a year ago with local water leaders and with state impaired waters agency leaders, and then we'll talk about the results from those surveys.

>>Slide: Overall Purpose

Both of these surveys originated from discussions as we tried to identify the roles of land-grant universities in nutrient reductions to the Gulf of Mexico. And as we started talking about that, we realized we first needed to get a good handle on what is it that drives the implementation of land management practices that successfully reduce nutrient delivery, because those are the pressure points that we could have the most effect on.

>>Slide: Survey: Local Water Leaders

To get a handle on that, we did two surveys. One of them was phone interviews with the local water leaders. These are district people, county people, and so on, who manage water projects of one sort or another. All of these were in EPA Region 5. We had 20 participants in these surveys. When I called these people, I first asked them to describe a successful project, and then asked what drove the success of that project, and then finally, what role can the University play to support that?

>>Slide: Survey: State Impaired Water Leaders

The second survey was an online survey. We asked them open-ended questions. This was directed at TMDL program leaders in the state agencies, as well as some University faculty who were very involved or familiar with the TMDL process. We asked them what is working and what is not working, and we asked that question four times in relation to the four components of the Impaired Waters Process—the standards, the monitoring and assessment, developing the TMDLs, and implementation—and then we asked them again what role can the University play in supporting each of those steps.

>>Slide: Results – Key Drivers (1)

As we talk about the results of these surveys, most of this comes from that first survey of the local water leaders, because that's the one we were explicitly talking about, drivers. When I asked them what drove the success of this project, very consistently, almost every one of them started talking about individuals who were those skilled people who really made things happen. They were people who had good interpersonal skills, and they understood the science, and they were able to stay focused on the long-term vision.

Staying focused on the long-term vision really requires some stability in their positions. As one person said to me, "What you need is a durable, long-term system where you can train the new, young people so they can be confident. You have to give them time to learn and then set them free to do what they need to do with the people in the

community. You need a person who delivers what they promise without too many hoops."

I think this is a real key thing to keep in mind and always ask as University people. Is the way that we do our research and outreach having a positive or negative effect on local skills and capacity? Even if we're not directly doing training, to ask that question of how we're affecting these local skills is the important thing.

>>Slide: Results – Key Drivers (2)

After we had that discussion of the individuals, we asked what are the main drivers or tools that these individuals used to make things happen. I offered four different possible drivers—watershed planning, incentive programs, economic forces, and rules and regulations. They agreed with all of those and added three more—a focusing event, monitoring data, and a targeting process.

There was no particular one of these that came out consistently on top, and there was no consistent sequencing of these that emerged among the successful projects. That is, there are many ways to build success. Now for any particular project, one of the drivers would serve as the initial organizing point and the remaining ones would determine the shape of the project or were the tools to implement the project.

Let me give you one example from a particularly optimistic interviewee. I picked him out because he was pretty unusual. When I would start the interviews and ask, "Describe a successful project to me," most people had to think hard and decide, well, do I really know this was successful? There was mixed feelings about whether they had a really strongly and obviously successful project. But this gentleman was feeling pretty good, like they were finally making progress and finally having an effect. His first driver, I would say, was the targeting. They systematically identified problem areas using GIS, using field data, and so on. They identified the areas that had enough of a problem to be worth fixing, and enough of an opportunity for improvement. So that targeting process was the first thing.

Then the next thing was to focus on those landowners who were in those problem areas, and that, of course, requires the really strong interpersonal skills. In addition to those, they used rules and regulations very judiciously, they found funding that was essential to making it happen, and the data was important. When farmers see the data and how they rank out relative to other farmers and landowners, and when they understand they don't have to treat all of their fields, then they are much more amenable to changing their practices. So that data and communicating that was important to these projects.

>>Slide: Key Drivers: Watershed Planning

I'm going to go through these seven now in a little more detail, but I wanted to give you that overview of how all of these different drivers fit together in a project.

Watershed planning, most people agree, this is pretty essential to staying on task. The process of the planning was useful for building partnerships and securing funding and prioritizing, giving the project structure and in communicating to generate support.

>>Slide: Key Drivers: Incentive Programs

Incentive programs were absolutely necessary. Nothing happens without funding, but it played a couple different roles in the process. In some cases, these programs were used early in the process to motivate and to build partnerships, but sometimes it was used later in the process. After the partnerships were built, the incentive programs were used as an implementation tool after they knew what their goals were.

>>Slide: Key Drivers: Economic Forces

Economic forces are a huge driver and everybody acknowledged that, but also acknowledged that it's not the end-all determinate of behavior. Sometimes people get very discouraged that they can't overcome the price of corn, but it is not the end-all and some people stressed that. It's also the driver that project managers have the least control over.

>>Slide: Key Drivers: Rules and Regs

Rules and regulations. People had mixed reactions to this. It's a useful tool, but has to be used carefully. Rules and regulations can have unintended consequences, they can impact partnerships, negatively sometimes, but on the other hand, people really value fairness, and so they want some kind of regulation of bad actors and they're open to that. Also, in some cases, people mentioned that fear of regulation was a motivator.

>>Slide: Key Drivers: Focusing Event

A focusing event was mentioned in a couple of cases. What I mean by that is real acute water quality concern or maybe there was a highly publicized festival or some kind of event that really triggered widespread awareness and galvanized action. It made it into the media, that kind of event. News can be really powerful, but not necessarily for the long term.

One example was the St. Joe Watershed, which is in Indiana, Ohio, and Michigan. Before there was any water plan or anything else, there was this public concern about flooding. There was concern about Ft. Wayne's drinking water. There was concern about habitat quality. There were several different concerns, so individuals from pretty diverse perspectives came together and said we need to do something. That's what drove those efforts.

>>Slide: Key Drivers: Data

Data was a driver that I didn't expect to come up, but arose in several cases. If the data is available and it's understandable, the citizens and landowners will be looking for it. In Minnesota, I had one person say, "If you bring the information forward, it's hard for people to argue with you." In Ohio, there's a river watershed that has a really good

history of monitoring data, and it's reached the point where they'll get calls from farmers saying, OK, how are things looking this fall? What's the data coming in saying? The contractor who's collecting this data, he gives regular presentations and people attend and show up and are looking for this data, so it really has one central thing that people can be looking for.

My impression by the end of these interviews is that data is really underutilized for this purpose. In fact, monitoring and assessment, in general, was inadequate across all these projects. I say inadequate for the purposes of developing effective projects and for the purpose of determining impacts. Only about half the projects had enough water quality monitoring to be able to measure changes.

>>Slide: Key Drivers: Targeting

The final driver was targeting process, or focusing efforts for effectiveness. It's kind of like watershed planning. The whole process of identifying and prioritizing opportunities can help organize and motivate project activities. This was interesting because it also came up with the state agency people. They were interested in more research and more understanding of how can we focus our efforts more effectively. That was one of their highest interests as well.

>>Slide: TMDL Process

We talked about TMDLs as a driver, and it was not a primary driver in any case, and for a couple of reasons. One reason was often the local staff were not closely involved. Obviously, in a lot of cases, there's just not the nutrient standards, or there are limited nutrient standards development, so they're not really relevant to some of these issues. However, even when it wasn't a primary driver, people did use the TMDL reports to gain access to funding, to help focus and plan their implementation, and as a data source to help them communicate with the public.

So that's some of the drivers we found. I'm going to turn this over to Faye to talk about some of the roles of the University.

>>Slide: Results – University Roles (1)

Faye Sleeper
Hello. Again, I want to remind you, most of what I will talk about is from the survey where we talked with local units of government, local implementers. At the end, I will talk briefly about some comparison of university roles with what the state and university folks said in that survey.

The key results—and I'll talk about each of these, probably are not too surprising—to conduct research, to provide training for local staff—and if you think about the Extension role, that fits in quite nicely—deliver education and outreach, and to implement watershed work. When I saw that, I was a little surprised, but I'll explain that.

>>Slide: Results – University Roles (2)

First, under research, local specialists really want to understand agricultural systems. They really are hoping universities will help develop practical and effective, profitable, and region-specific solutions. Some of the ideas that they came up with were to really better understand alternative crops, especially perennials, cover crops, nutrient management. Those are some of the areas that the folks that we interviewed said would be really helpful for them. Also to define a best-managed landscape. How many acres, for example, are needed to be in perennials and non-crop land versus more traditional crops?

A third area under agricultural systems research is to further understand the hydrology of pollution. An example of this is why don't phosphorus or nitrogen levels decline when practices change? What are the lag times? What are the thresholds? Are we targeting well? Are other sources coming in?

The last major area under agricultural systems research is solutions to hydrologic challenges and really developing practical, effective, and region-specific. Examples of research that is happening now that people identified were bioreactors, two-stage ditches, wet filter strips. Those are the ag systems research.

Another area is social science research. I will come back to that throughout this part of the presentation. There's really a need for understanding what factors influence farmers when they're making decisions that relate to land management choices. Once we have that understanding, how do we design more effective programs and policies? The university role is really in doing the social science research, to underlie more effective programs and policies.

Monitoring and assessment methods. Really they talked about targeting and focusing resources and that's not real surprising. That seems to be a trend that we're moving toward. Just scattering best management practices across the landscape isn't as effective as targeting. Another example was edge-of-field monitoring. What are the methods? Is there a standard methodology? What are effective systems for monitoring edge-of-field?

A third area of research that people wanted in the monitoring and assessment arena is methods of measuring the impacts of BMPs, Best Management Practices, and to quantify those at various scales, so there's a scale component to this.

Finally, wanting to have universities kind of push the envelope on assessment science. One example is assessment methodologies based on biological science. The universities need to lead in that.

One or two people mentioned some of these other topics that are listed, the literature reviews, the value of crop land, and policy and program impacts.

>>Slide: Results – University Roles (3)

The second major role for universities is to train local staff. Again, that whole idea of behavior change. What motivates people? How do you influence change, not just individually, but in a watershed or in a lakeshed?

Another area in effective watershed planning, local staff often enter their jobs and they really haven't been trained in project management. What are the funding opportunities? How do you engage the community? How do you actually implement? The University could have an outreach role and a training role in watershed planning. I think we assume that if someone is hired by a local unit of government, that they know that, but we're not all trained in all aspects of our work when we first start.

The last is capacity building that the universities can train local staff in how to help citizen groups build capacity. Again, coming back to the need for some social science.

>>Slide: Results – University Roles (4)

The third area for universities is to deliver education and outreach. One large area was agricultural producers. A number of people mentioned that universities are in a unique position to communicate with a broad range of stakeholders, that often they are perceived as more neutral than other entities, and that universities should use that strength.

Also, universities should build strong partnerships with agency and industry to increase the consistency among messages. This consistency of messages is really important, not just within the University, but as different entities go out and deliver information to farmers. They also said that demonstration sites are an important form of education, so we should continue with that.

Finally, and this applies to Extension personnel and faculty, is that the Extension messages and methods are too siloed right now, and that we really need to get out of our silos and deliver water quality information hand-in-hand with agronomic information. I think that's something that may take some rethinking, but makes sense, and we did hear that.

I want to talk about the community. Sorry, I flipped the slide too soon. In advance of actually doing the watershed work, there was a sense that it would be really helpful to have University come in and actually design education and outreach efforts to prepare the community, even before the watershed work starts. Universities are trusted in terms of their information, and they can kind of prepare the way, or lay the groundwork for local and state agencies to come in.

Finally, local offices really would benefit from having materials and programs that they can adapt and that they don't have to start from the beginning, and making those materials user-friendly for communities.

>>Slide: Results – University Roles (5)

I'm now going to talk about implementing watershed work. This was a surprise to me, but there was a mixed message on this. Some people said we would like to contract with universities for different parts of the project. In some cases, to do the whole project, but in most cases, to do parts of the project such as the monitoring, or the modeling. Others said the university is too expensive, they're not practical enough, they focus too much on research rather than getting the job done. So there is a divided opinion on what the university roles are in implementing.

I think this will probably come down to university, state-by-state, and probably with individuals. If they find one faculty that is helpful, they will use that person, whereas, other people they don't. We all see that in our work.

In terms of the types of implementation, again providing the social science expertise. Providing tools such as tracking the application or sales of fertilizer to help with the targeting. For some it's doing the modeling or doing monitoring, and for others it might be actually developing the plans.

Finally, the comment was that we should design university-led projects. So if a university leads a project, the university has to be aware of the impacts of the person-to-person contact. That's essential.

>>Slide: Local vs. State Responses: Research

Now I want to move to just a brief overview of the comparison. We heard some from the state leaders in terms of the University roles and I'll just go through a few of these.

First of all, both local specialists and state specialists said that we need research related to targeting. We need to better understand the pollutant dynamics and developing methods for identifying key treatment areas. It's about effectiveness and efficiency and funding.

In terms of agronomic research, that was really emphasized by local managers and not as much by the state. They want to know what are the cropping systems that are both profitable and environmentally sound?

In terms of bridge-building, again, both emphasized the value of universities in facilitating bridge-building among diverse stakeholders, but if you drill down a bit, their emphases were different. State specialists wanted better Agency-University communication, so University staff would really understand the regulatory framework, whereas local specialists were interested in increasing the consistency of messages from various sources. So there was a difference in the bridge-building that they wanted.

Another key was that local specialists wanted researchers to include them in research design. They feel like they have quite a bit of local experience that could provide some insight as researchers are designing and conducting their research.

Both surveys talked about monitoring standards and assessment. These were identified more by state specialists and more in the traditional sense of monitoring standards and assessment.

Local specialists really focused more on the social science, how do you monitor, how do you assess in the social science arena.

Last, tool development. Local specialists especially appreciated practical decision-making tools rather than research models.

>>Slide: Summary and Conclusions

In summary of both components of our work, the importance of individual leaders, as Ann talked about. You need a person with interpersonal skills, communication skills, who also has technical expertise.

Of the other drivers, it really varies from watershed to watershed, location to location. One driver can be primary and the others are supporting, but there is no predominant primary driver across all watersheds, and that TMDLs are not a primary driver.

In terms of the university goals, the research and training, and again involve locals in designing it. Training programs should address both the social and natural sciences. From the local perspective, they would like more research in agricultural systems.

>>Slide: Thank You

Finally, we wish to thank the US Environmental Protection Agency and the National Institute of Food and Agriculture with USDA and also the Great Lakes Regional Water Program, who supported this project.

With that, we will turn it over to our moderator, Cyd, for questions. We do have a URL up and we will leave it here, for if you want to actually read the two reports. Thank you.

Cynthia Curtis
Great. Thanks a lot, Faye and Ann. Again, just reminding people, if you have any questions, type them in the chat box. I've got a couple for you both, but let's start with a question from H.L. And I forgot to change my screen here.

>>Webcam: Ann Lewandowski and Faye Sleeper

There we go. All right. The first question for you comes from H.L. It's: How about revisiting the LGU fertilizer recommendations for different crops. Did your respondents feel they could better manage nutrients without compromising yields and productivity?

Ann Lewandowski
I don't remember any concerns about the existing recommendations. I think more what I heard was problems with inconsistency, that some people within Extension might talk more about the recommendations from an agronomic standpoint and others from the water quality standpoint, and they didn't necessarily disagree, but they would emphasize different practices, or the supporting practices, tillage or whatever. They might get different messages from the water quality versus the agronomy people. And there were inconsistent messages from the consultants outside of the university, versus what the university was saying. So those kinds of inconsistencies were more of a concern than the actual existing recommendations. Does that answer the question?

Cynthia Curtis
Well, H.L., if you have a follow-up, certainly add on. I will say I had a slight variation on that. What I was wondering is, based on your interviews, do you have any recommendations? Because I was hearing the importance of consistency of message, but I've also heard in other of these, the importance in telling people what they're interested in. What's the message that is most relevant to them? Are there any additional thoughts that you have on how to bridge those differences and not blow people away?

Ann Lewandowski
Well, I think we have to get a lot better about mixing those messages. You start with what their concerns are, and then you show how your concerns mesh with that. The example I gave from Wisconsin, they start with the farmers' concerns and they listen to their concerns, and they also made clear that they don't have to do treatment on every field on their farm. They just need to focus it on particular problem areas. I don't have a good answer to that, but I think that's an important question we need to get better at answering so that both the agronomists and the water quality people are both giving both messages at the same time.

Cynthia Curtis
Great! Well, it looks like we've got a few different people typing. Here we go. Eric Hurley asked: If a watershed program is considering whether to spend more money on cost sharing versus more money on people for technical assistance, what advice would you give?

Ann Lewandowski
You're not providing easy questions.

Cynthia Curtis
I can promise that.

Ann Lewandowski
I don't know how you can get away without either. I think it depends on the situation. Like I said, there's not a single driver. The technical assistance, I think—and this is my personal perspective, not what I was hearing from the survey—is that the technical

assistance has been neglected in recent years. Boy, I think it's a local answer is what I would say is what I was hearing.

Cynthia Curtis
So you mean it will vary depending on the locality?

Ann Lewandowski
Right, yeah. And cross share, the money is essential, but it also isn't going to solve everything. We can't come up with enough money to do everything, so there has to be that balance of other drivers as well.

Cynthia Curtis
Thank you. Next question comes from Matt Gluckman: Did respondents indicate how TMDLs could become more of a driver?

Ann Lewandowski
No, I'm trying to think about this. I guess the one answer I did hear was more local involvement. In those cases where the TMDLs were done by state staff, and didn't involve the local people as much, then the TMDLs just didn't have much value. Do you have anything to add to that, Faye?

Faye Sleeper
I would add that as we develop more nutrient standards, that might change the answer. It may not, but the fact that we don't have nutrient standards everywhere for phosphorus and nitrogen plays into that.

Cynthia Curtis
All right, thank you. Next question is from H.L. again: Did you hear any reference to water quality trading, if producers you interviewed were willing to participate in it?

Ann Lewandowski
There was one discussion of it, but it was somewhat preliminary, so no. To the extent people mentioned that it was pretty preliminary. The producers said it wasn't on their radar yet, but some of the planners were starting to talk about it. So I'd say it sounded pretty preliminary to me.

Cynthia Curtis
OK, the next question is from, oh, I am sorry, Jeb, but Jeb Carsgard: Great talk. Based on the interviews, did the interviewees indicate a preferred way of interacting with the University? Field events, one- to two-day workshops, fact sheets, meetings, etc.

Ann Lewandowski
All of the above. Like with regard to fact sheets, they wanted some help. Sometimes they're doing local materials and then they would really like to take advantage of what the University has done so they're not starting from scratch when they make their own materials. That was one example. They wanted better quality Extension materials in

some cases, in those cases where they weren't really designed for the audience very well. But all of the above. Oh, and research as well. They wanted to interact with the University on research. There were some people that said those University folks are really losing a valuable resource by not talking to us, and working with us, and taking advantage of our local knowledge. They want interaction in all those ways, both research and outreach.

Cynthia Curtis
Great! I have a couple of other questions here for you. At the end of your presentation, you talked about locals being very interested in practical tools versus research models. Do you have any examples of what would one of your interviewees consider a practical tool as opposed to a research model?

Ann Lewandowski
Well, I'd have to highlight the Wisconsin Manure Advisory System. I'm probably getting the name wrong, and I'm sure there's somebody in our audience who could give me more details. But it's a very timely tool where farmers can get up-to-date information about water saturation and precipitation forecasts and so on, so that during the spring season, they can get good and useful advice on when they should be applying their manure, because it's a really critical runoff period. So here's something that they can use very quickly and easily and designed well. I got a lot of excitement about that one from a couple people from Wisconsin about how effective that was.

Cynthia Curtis
Great! Thank you. Another question for you. One of the suggestions you had mentioned was a way to more integrate delivery of agronomic information along with water quality data. What do you see as the obstacles to integrating those two pieces together?

Ann Lewandowski
Well, it's as much us at the University in our own silos, and it's hard for individuals. You get on your own mission and it's hard to integrate the other missions. So what is a barrier to that?

Faye Sleeper
I think that we're seeing more and more in Extension, at least here at the University of Minnesota, some cross conversations between water specialists, the people in community vitae, and the agronomy specialists. Really, having those conversations and getting to know people. I think the barrier has been, as Ann said, people have operated in their own discipline and they haven't gone across disciplines. I think Extension can continue to encourage that kind of cross-fertilization.

Ann Lewandowski
Yes, and not just the outreach, but the research. Think about all the research goals. There's agronomic research that, well, we'll kind of consider the water quality impacts as well. And then there's water quality research and, oh, we'll kind of calculate the

economics of it as well at the same time. It's very rare to get a research goal that states we are going to increase production and we are going to reduce nutrient runoff, or whatever the case may be. So designing research that truly aims at both is another challenge we need to work on.

Cynthia Curtis
Good! I feel like since you started answering this question, I'll ask again. It looks like this report came out in September and I'm just curious, at the University of Minnesota, what have you been doing to shift practices or adapt to what you're learning from these interviews?

Faye Sleeper
I can talk a little bit about what we're doing in Extension. I am personally reaching out to people I don't know across Extension. Ann and I are developing a watershed specialist training and we've really collected people from a number of disciplines to make sure that we have integrated information. That isn't just agriculture, but also the urban systems, too. Personally, my supervisor actually has all of these programs, so we talk about ways that we can integrate more, working with other program leaders. I think the shift has been happening, we're just more focused on it now. So I think really giving focus to it.

Cynthia Curtis
Great! Are you going to add anything to that, Ann?

Ann Lewandowski
No, that's great. Well, maybe I will. Now that you asked. The watershed specialist training that Faye mentioned really does focus on a lot of the social science skills that some people were asking for. That is one of our emphases out there.

Cynthia Curtis
Good! I had another question. Let me find it. And we have a couple of new questions. H.L. had mentioned the water quality index for agricultural runoff and Frank was asking where it could be found, so H.L., would you mind typing the URL in the chat box? If you have it handy, that would be fantastic. While that's going on, I do have another one for you. You interviewed, several of them kept pointing to it's always one key person that has these qualities that really drives the success of a group. Have you looked into or do you have any thoughts on how do you get that one person, how do you keep them, or at least increase the critical mass of those one key people so it's not so single person dependent.

Ann Lewandowski
Before I answer that, I remembered one more point that I didn't make, and that is that one particularly successful project made the point that they had these high quality leaders. Ideally you want one of them from each of the stakeholder groups. So you want that kind of leadership from the local government unit, whatever that is, from the ag group, whoever that might be, from the environmental organization, whoever that might be. So if you can have those multiple leaders, that's ideal.

How to keep these people? There is a stability issue. How do we fund these people? How do we make sure their positions are reliable so that they can settle into a location? Or some time when the staff is turning over frequently. If they're funded on grants, that only lasts two years. It's really hard for people to build a relationship. So that's a question that the policymakers and the funders and decision makers at the higher levels really need to appreciate the value of these qualities. Do you want to add something, Faye?

Faye Sleeper
Yeah, I would say it is also important in our educational institutions, and I see this is very different than when I went through the University, that there are more integrated programs available now. So you start to develop that when people are at the University. I think a big challenge is, especially for local leaders, their pay scale is often less than a state agency or county or they want to move. We're a much more mobile society. So it is a challenge, particularly at the local level.

Cynthia Curtis
Great! Let's see, it looks like a couple people are typing at this point, so I'll wait and see if there are any other questions that come through. But at this point, I want to thank Ann and Faye for another very informative presentation. You can see that their URL is available at the bottom of this PowerPoint and I can get people additional information and put them in contact with you if they have any additional requests.

I also want to remind people again, we wound up with a little bit—normally our webcasts are 6 weeks apart, but we had a little bit of a flurry of opportunity here, so we jumped on it. Our next webcast will be May 29, and that's Michelle Perez from the World Resource Institute, talking about her recent study on trading in the Mississippi River Basin.

OK, and H.L. provided a little more contact information on water quality index there. Thank you, Ann, thank you, Faye, for a very informative webinar.