2013 State Nutrient Reduction Strategies Web Series

Analyzing NRCS Ag-BMP Effects on Water Quality-A Process for Matching Practices to the Problems

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Cynthia Curtis
Well, I'd like to welcome you all to the fourteenth webcast. Today we have Rick Wilson from Ohio EPA joining us, talking about a recent report. Just to give you a quick orientation, I see you all are using the survey polls just to let our speaker, Rick, today know what agency you're from, to help him kind of gear his talk. If you have questions about any technical difficulties, please put them in the chat box. If you have questions about the presentation, also please use the chat box. What we'll be doing, at the end of Rick's presentation, we'll go through a Q and A session. You can also certainly start -- by clicking on the "Host" button, you can start a private chat with me if there's some technical issue you're having. I'm going to hand it over to Rick real quick here, but I want to point out, before he starts going, that up at the top of the slide presentation screen, if you'd like to watch the entire presentation, take up your full screen, just click on the full screen button and it will expand. I think he's got a lot of data to show us today, and I want you to be able to drill in fully. All right. With that, Rick, I'm going to hand it off to you. Are you good to go?

Rick Wilson
I hope so. Can everybody hear me?

Cynthia Curtis
You sound loud and clear, real good.

Rick Wilson
Great. Thanks. I appreciate everyone sitting in on this today. I was asked a couple months ago by Region 5 to pull out this report and share it with you all. It was -- the analysis was originally done back in 2009, and we posted it as a reference to the initial phosphorus taskforce in 2010. So it's not necessarily recent, but I guess it's still applicable to today's issues. So just a little bit of background about myself, I've been with the Division of Surface Water for 18 years here at Ohio EPA, and 14 of those have been working in the Ag sector of water pollution. That includes working CAFOs, where we reviewed nutrient management plans and also interviewed livestock operations to determine the nuances of the implementation of their nutrient plans. That included learning about cropping systems, fertilizer timing, and associated conservation practices that are related to water quality. During that time, I've done a lot of edge of field runoff and drainage sampling and observing different types of buffers and their relative effect on runoff in the environment. So back in 2009, I transferred into the Nonpoint Source Pollution program here at Ohio EPA, and one of the first tasks that my boss, Russ Gibson -- who, by the way, that was him singing that song from 1995 that you heard earlier, Blue Feather.

Slide: Analyzing NRCS Ag-BMP Effects on Water Quality: A Process for Matching Practices to the Problems

But anyway, my boss asked -- he wanted me to prioritize agricultural conservation practices in the event that we do grant work in that arena. He wanted me to prioritize those practices in a logical way

so we could focus on those practices that were most effective. And I told him early on that that was easier said than done, but I did know that NRCS had a rankings -- a way to rank practices against resource concerns, and so that gave us an idea here of how to approach addressing practices with water quality problems in quite the same way. So I guess I'm going to go ahead here, and we'll see how this goes. I'm really going to try to explain what the process was and how we arrived at a listing of practices that address water quality. So bear with me, and I hope -- if you have questions, please let me know, if not during the presentation, at the end.

Slide: Drainage Areas Map, Ohio Area, and Percentage Land Use Information

So a little background on Ohio, basically we're a state of 26 million acres. Half of it was glaciated; half of it was unglaciated. And that pretty much goes right down the -- in this area here. We have hills on the east side, the southeast side of the state, and then largely flat agricultural land on the west side, so about 13 million acres of agriculture, and about 8.8 million of forest in Ohio. Forest is mostly in the southeast section.

Slide: Drainage Areas and Percentage Land Use Information by Sub Area

Just a breakout of some of the major watersheds or areas of watersheds in the state, you have Western Lake Erie Basin, which includes the Sandusky River and Maumee River; Northeast Ohio, which includes the Cuyahoga, Chagrin, Ashtabula, and Grand Rivers; you have the Muskingum River Watershed, which drains to the Ohio River; the Scioto River Watershed, which drains to the Ohio River; and the Great and Little Miami Rivers on the southwest side. Again, you can see in areas one, four, and five, those are predominantly agricultural areas; this area here, the Eastern Corn Belt; and then you have the -- excuse me -- Huron Erie Lake Plains in Northeast Ohio; and then the Western Allegheny Plateau in Southeast Ohio.

Slide: Impairment in Ohio Streams

A little bit about what we do here at Ohio EPA is we try to document the causes and sources of impairment in Ohio streams, and we report those in the integrated report every year. So what we did was we looked at some of the major sources or major causes of impairment, and this is just a listing of those. We have three types of designated uses for surface water resources in Ohio. The first one is the aquatic use impairment, and under that, some of the common causes of impairment are hydromodification, habitat modification, nutrients, and silt and sediment. And we also have recreational use impairment, which includes pathogens and, more recent, cyanobacteria toxins. And then drinking water use impairment, which includes pesticides and nitrates. So a lot of these do have agricultural associations, as well, so we thought what we could do is focus on the causes and somehow get back to the practices and see if we could prioritize things or at least get a listing of how those priorities would shake out.

Slide: 5 Common Water Quality Impairment Causes in Agricultural Watersheds: Sediment, Nutrients, Habitat and Hydromodification, Pesticides, Pathogens

So we focused on five of these. We focused on sediment, nutrients, habitat and hydromodification. I guess a lot of people think hydromodification as dams and ditches, but it could also include changes in hydrology in the upper edges of the watershed, including drainage, loss of wetlands, channelization, et cetera.

Slide: 101 Conservation Practices Were Provided in the Ohio-NRCS Field Office Technical Guide (FOTG, Section IV, 2007)

So moving along, the first thing we looked at was Ohio NRCS's listing of Field Office Technical Guide Conservation Practices. So here they all are, but I, of course, don't want to go through each and every one. But back in 2007, there were 101 conservation practices listed in the Field Office Technical Guide. I think there's 103 now.

Slide: 79 Resource Concerns

Then NRCS also has a listing of resource concerns that they compare the practices and how they would affect various resource concerns. And there's 79 nationally defined resource concerns, including those that deal with soil condition, water quantity issues, air quality, soil erosion, fish and wildlife, surface water quality, plant condition, groundwater quality, and domestic animals. So you'll see that a lot of -- some of the resource concerns deal with soil condition and water quality. These, a lot of the times, are related directly to maintaining and improving a productive farmstead. But what we -- beyond looking at just practices or the resource concerns dealing with surface water quality, we thought that if you address some of the 79 resource concerns -- say, for instance, compaction and soil condition -- that addressing that resource concern could also address water quality. And I'll show you how we did that here in just a moment. But the main reason we're here -- a lot of you folks are on the call today is a lot of the most current NRCS initiatives have one thing in common. For instance, the Mississippi River Basin Initiative, the Great Lakes Restoration Initiative, the National Water Quality Initiative all are directly related to water quality and some of the issues that we see with the hypoxic zone and algae issues in Lake Erie, et cetera.

Slide: 3 Examples (Field Office Technical Guide: Section IV: Conservation Practices, Section V: Conservation Practice Physical Effects (CPPE))

This is just an example of three different resource concerns and how NRCS defines them. I didn't want to put all of them up here, but in general, these are the types of -- the way these types of resource concerns are defined. For instance, soil compaction, excessive runoff, flooding or ponding is a water quality resource concern, and excessive nutrients and organics in surface water is a water quality resource concern. So addressing one may affect the other in a positive way or water quality in a positive way or in a negative way.

Slide: A Subjective Evaluation: USDA-NRCS Ohio

So I think I'm getting to my main tool here, which is -- this triangle is a way to guide you around of how we actually did the math behind the listings that we came up with. So you have 101 NRCS practices, conservation practices, and you have 79 resource concerns. So NRCS does regularly -- I wouldn't say every year -- but regularly does this objective evaluation of effectiveness of each practice on each NRCS resource concern, and they give it a ranking of negative five to plus five in Ohio to show like the magnitude of effects. So what we had was one big spreadsheet to start with that NRCS has posted on their website, and so that was a good launching point to work around this triangle here, starting at the top here, moving to the side, which you'll see here in a moment, and then getting some outputs at the end.

Slide: Ohio USDA-NRCS Conservation Practice Physical Effects (CPPE), 2007

This is an example of what that large spreadsheet looked like. Just imagine that column going out 79 columns wide and 101 rows deep. An example, conservation crop rotation ranked a 2 for excessive nutrients. Constructive wetland ranked a 3. Drainage water management ranked 1. Filter strip ranked 5 in the NRCS ranking done at Ohio NRCS.

Slide: CPPE Scores Vary State to State

Wanted to mention that, since I guess this is a national webinar, that I did look at conservation physical practice effects rankings at other states. And first I would say not every state ranks their -- does this ranking numerically. There's a narrative ranking that a lot of states still use which includes, like, slight decrease or slight increase, significant or moderate, those types of rankings, so not a numeric way. And I guess I appreciated that in Ohio we had these numbers, so I could do a mathematical analysis. The other thing I should say is every state who does this scoring, the scorings vary from state to state. For instance, here I took nutrients and organics in surface water and took the top ones, sorted Indiana's from top to bottom. Indiana, they indicated -- they told me that they use a committee of resource professionals to engage in what they termed a cumbersome process to evaluate and rank effects. One example that they mentioned was, especially for this topic, nutrients and organics in surface water, they reserve the highest values to practices that change land use without additional inputs. And then other practices would rank below that. In Ohio, the physical CPPE rankings are done by assigning practices to rank to individual state resource conservationists who are most familiar working with that practice, and then they evaluate their particular plate of practices to the 79 resource concerns. So anyway, I also looked -- I didn't see a lot of states that actually do the numeric ranking. There's probably -- there's at least five. I did a survey around the nation of these scores. These scores are actually found in the Field Office Technical Guide, Section 5, for NRCS.

Slide: A Subjective Evaluation: Ohio EPA Division of Surface Water

So the next step was an internal Ohio EPA step, and I want to show you -- we're down to NRCS resource concerns, water quality related. N equals 27 here. What we did internally at Ohio EPA is we took those 79 resource concerns -- a fellow colleague of mine, Greg Sablaak, who works in our TMDL section, we sat down and looked at all the resource concerns and determined that there was 27 -- I guess we could have picked more or less -- but we found 27 that we thought, if you address those resource concerns, whether they be water quality or soil condition or water quantity, might have some effect on water quality, either in a positive or negative way. So what we did was we did a subjective ranking based on our professional and informed opinions, and I guess it was partially objective because we have research papers and things that show value of various conservation practices and various -- and how they relate to water quality impairment, as well. So what we did is we did a ranking between each of those 27 resource concerns against Ohio water quality impairment causes, those five. So what we did was rank from negative one to one on each of those. So for instance, if you were addressing compaction, how would that relate to the sediment cause of water quality impairment? And how would that relate to pathogens cause of water quality impairment?

Slide: Twenty-seven (27) NRCS Resource Concerns Were Identified that, if Addressed with a Conservation Practice, Could Improve or Impair Water Quality

These are the 27 resource concerns we picked. Some ranked -- some, you know, based on looking at each cause of impairment, some of them played a big factor. For instance, I know excessive sediments and turbidity addressed -- if you address that, you're addressing a lot of the water quality causes. So some that were less were those like wind and things like that.

Slide: Cause of Impairment and Examples

Here's an example of how we ranked each resource concern versus the cause of impairment. So this is -- I have a whole list of these, and if someone is interested, I can give you a lot more of the data, what went into this calculation, including this spreadsheet because it does have crossover applicability. But for instance, the resource concern, excessive sediment turbidity, we ranked that a 1; for sediment, a .6; for nutrients, a positive good thing, .7; for hydromodification and habitat, .3; for pesticides, .4. How we did this was Greg and I basically did a blind ranking on our own. We compared

them and argued over some and came to a consensus on the number to use. Are these numbers perfect or right? I would say no. If I had to do it over again, I might have argued harder on some of the issues. Based on things we know now about tile delivery of phosphorus to surface waters, I think we might have ranked some other issues a little bit differently. So will we do this again? We might, but -- and then the rankings would turn out different.

Slide: Ohio EPA-DSW Calculated Output: WQ Effectiveness

So here we are. Here's the full monty on the triangle. What we did was we have the Conservation Physical Practice Effects matrix crossed with the how does the resource concern relate to water quality problems matrix that we've developed here at Ohio EPA, multiplied those across, and here's the formula there, or my attempt at trying to describe it, whittle it down to one formula. But it was a summation of A times B for each cause and added 27 times for each resource concern. Then we had a normalization factor that I'll describe here in just a second. But what it did was it generated lists by cause of practices to address those and a value for each one that you can look at.

Slide: Spreadsheet Screen Shot

So this spreadsheet is for spreadsheet geeks. I know it's probably not something that is going to jump out at you and you'll understand it right away, but basically let's look down here at the critical area planting and for habitat and hydromodification. To get to that value of 17.2, what was done was there was a ranking of, for instance, cell AD 10 times cell AD 4, and again for AC 10 and AC 4, all the way down to column B. Those were added together, and then they were multiplied by a normalization factor up here, AG 4. And basically, what that is was a factor to make the end values between sediment, nutrient, habitat, pesticides, and pathogens somewhat closer together because when we did our internal ranking here, practices to address pesticides and pathogens didn't receive as many points in a positive direction. So it's just a normalization factor to bring the values closer together. It doesn't change the way things were ranked out.

Slide: Analysis of Effectiveness of Ohio NRCS Practice Standards in Addressing Five Leading Causes of Water Quality Impairment

So all of that analysis in a few strokes of a spreadsheet to get those formulas established got us some lists. That report is published on Ohio EPA's website, and this is the link to find that. It was published in March of 2010, and basically what it provides is three pages of explanation that's probably better than what I'm trying to say here today. But it's in writing. It's about three pages long. And then there are seven tables, one list for each of the five causes of impairment and a couple that kind of combine all of them if you're looking at a way to address multiple causes of impairment.

Slide: Nutrient Practice Ranking by Points

So the big -- how did they rank out? These are how practices ranked out. The points, I should say, are -- really don't mean a lot as far as the magnitude of their value. It's more important, I think, to look -- and when you see the report, or if you look into the report, I actually give a ratio of the value of, for instance, 11.4 to 14.6, how something would rank against the top ranked practices, top ranked practice. But the top five nutrient practice rankings include two land type of practices, pasture and hay planting and conservation crop rotation, and three edge of field buffer practices. I wanted to mention that, at a recent meeting up Northwest Ohio, the Hancock County District Conservation, Matt Heitkamp indicated that in their current Blanchard River Watershed Initiative through NRCS to address issues for nutrients in the Western Lake Erie Basin, one of their most popular adopted practices -- through incentives, of course -- is conservation crop rotation, which I think was good to hear in that that is a key at addressing soil health and hopefully increasing water retention in the fields. A couple of the other practices that ranked out, prescribed grazing was 6th, cover crops ranked

out 11th, constructive wetlands ranked out 18th, structure for water control, a popular practice in a lot of Midwest sates these days, ranked out 58th. And a couple -- and then some of the practices that deal more with water quantity ranked out -- open channel, 68; underground outlets, 70; subsurface drain, 86; and the last two, 100 and 101, were surface drainage and field ditches, mains, and laterals. So I guess that's one thing that I've noticed in my career here is a lot of the water quality practices that we're trying to get implemented in the ag landscape are those that really are trying to mitigate the negative effects of artificial drainage, full respect that those are installed to generate good yield and productive farming enterprises, so we need to work at ameliorating those effects with practices for water quality.

Slide: Sediment Practice Ranking by Points

Sediment practice rankings, critical area plantings ranked on top, at the top, largely, mostly, I would assume, because you're addressing a known area with a known source of sediment and directing all your energies there. Tree and shrub establishment are some of the best erosion controls at or near stream sites. And then, again, 5, 6, and 7 were other edge of field buffers. You might know that it's missing 2 and 3 here. 2 and 3 ranked out to be abandoned mine land practices that I didn't think were applicable to this discussion, so I left them out. Some of the others ranked out -- 12 was cover crop; 13, a tie for 13, was conservation crop rotation and sediment basin; WASCOB ranked out 11th; and then at the bottom end, again, 99 and 100 were surface drainage and field ditches and laterals. Open channel also ranked out about 64th.

Slide: Habitat and Hydromodification Ranking by Points

For habitat and hydromodification, again, critical area planting came out on top; edge of field buffers at 2 and 3 and 5; and again, tree establishment. So you're starting to see that some -- a common thread here on some of these practices. Constructive wetlands, for instance, however, only ranked 28th. Cover crops ranked number 20. Streambank protection ranked 25th. And obviously, streambank protection is good for habitat and things like that, so I guess there's opportunities to look again at some of these rankings, both at Ohio EPA's perspective and also NRCS or, moreover, maybe working cooperatively to, I guess, look at each other's methods and maybe improve things.

Slide: Pathogens Practice Ranking by Points

Next, pathogens, number 1 came out waste treatment lagoon; 2 and 3, pasture and hay planting and herbaceous cover. Use exclusion, obviously it's a good practice to keep animals from contaminating streams. And then conservation crop rotation came up again as a top practice. Others for pathogens, riparian forest buffer came out 6; manure transfer, 7; nutrient waste utilization came out 8 and 9; prescribed grazing, 10; waste storage facility, 11; constructed wetland, 14; subsurface drain came out 94; surface drainage came out 99 and 100 again.

Slide: Pesticides Practice Ranking by Points

For pesticides, the top practices came out to be tree and shrub establishment and riparian forest buffer, conservation cover, filter strip, and conservation crop rotation. 6 was pasture and hay planting; 7, pest management; 8, prescribed grazing. So those are all pretty obvious ones where you're trying to put something to stop the runoff from getting into the stream and making it into public water supplies.

Slide: Sediment + Nutrients + H&H

So sometimes, especially in Ohio in agriculturally dominated watersheds, sediment, nutrients, habitat, and hydromodification are all listed in our TMDLs as causes of impairment. So, I don't know -- I

thought it would be interesting to look -- to add some of these together and see which ones ranked out at the top for all three of them since they're commonly -- common problems we're trying to tackle all at once. So top eight here, critical area of planting; 2 through 4, edge of field buffers; 5, another buffer practice; 6, pasture and hay planting; 7, conservation crop rotation; and 8, prescribed grazing. So these really came out -- I think they ranked out -- they're pretty self-evident, I think, but it was an interesting exercise.

Slide: Applied Example: Lake Erie Nutrient Reduction-Loss Creek Watershed (#NUTRI11-GLRI-01)

So I was also asked how we have applied this analysis in our work here at Ohio EPA. So we have a few Great Lakes Restoration Initiative grants here at Ohio EPA that we're involved with. One example that I thought we could share was the Lake Erie Nutrient Reduction Project, which is in the Loss Creek Watershed and, you know, to describe it best, I guess it's right there in North Central Ohio at the headwaters of the Sandusky River, which is a tributary leading to the Western Lake Erie basin and some of the issues up there. So what we did is we targeted at a 12-digit HUC, so in this particular case, it's a 15,000-acre watershed based in the Upper Sandusky TMDL. Causes of impairment include flow alteration, nutrients, organic enrichment, dissolved oxygen, and siltation. An idea of the land use here, we've got two-thirds of it in row crop, I guess a sixth of it in forest, nine percent developed -- there's a couple small towns in the watershed -- and your normal farming community in that area. So in that watershed, what we had was a grant that offered three options to the farming community to implement nutrient reduction practices. One was a reimbursement for reducing P risk through the installation or implementation of new or expanded conservation practices. And that was a -- it's basically, a lower P index score, we would reimburse them for implementing practices that would lower their phosphorus index score. And we used a modified phosphorus index in this case where we provided additional deductions to the score for practices that were implemented. Currently, the Ohio P index only has a deduction if you have a filter strip installed, and we thought that other P reduction practices should also be reimbursed to farmers -- or farmers could be reimbursed for reducing their risk. We also provided cost-share incentives for practice installations.

Slide: Loss Creek Watershed Project Example

So in the Loss Creek project we had -- including in the modified P risk portion of it, we had 13 practices eligible that farmers could either be reimbursed for reducing P risk or provided money for cost share with. Some of the ones -- I guess what I have here is a listing of the eligible practices, how they ranked out in this analysis that I just described for nutrients, and how many have been implemented or installed to date. So you'll see that pasture hay planting, conservation crop rotation, filter areas or recharge areas, and riparian forest buffer, we haven't been able to get any of those installed yet. Nonetheless, the conversation is out there, and they're being promoted. It might take more time to get more folks in tune to that. Conservation crop rotation, I still have hope that we could get some, and even a riparian forested buffer in one part of the watershed. But a lot of folks updating their plans to include some of the notions in the 4R campaign. Mostly adopted, we have ten different projects covering 450 acres of cover crops in the watershed. We had three different farming enterprises change some residue and tillage management, one new grass waterway, and one new manure storage facility to be installed this summer. And down here, we have eight drainage water management structures have been adopted. And if you note on the effectiveness ranking, drainage water management and structure for water control ranked out 58th and 44th. I guess, looking ahead, or if these rankings would be looked at again, I guess there's been a lot more acknowledgement that we're losing phosphorus and dissolved phosphorus through tile systems, and by reducing the volume of water released from fields, you can also substantially reduce the load to the lake, to Lake Erie. So these are being widely promoted in Northwest Ohio, and -- but I think if you look at some of the rankings received back in 2007, maybe those could be looked at again. More importantly is these are

being installed to improve, for instance, the issues with tile. For instance, tile ranked out 86th and 70th as far as how they ranked out for affecting nutrient problems, and they received pretty low values, at that. But one thing we wanted to look at was tile inlet controls, blind inlets, and that's actually included in those standards for underground outlets and subsurface tile. So there's actually a practice that's addressing surface inlets to tile systems that is good for water quality and takes away some of those impacts associated with surface inlets. And I guess that's one thing I wanted to mention in this, is that some practices do have additional considerations for water quality that it makes ranking conservation physical practice effects difficult when you have -- when you have a practice inside a practice that addresses the water quality concern like, for instance, blind inlets does.

Slide: Powell Creek Nutrient Reduction Project

One other project we're working on that's a little bit behind the Loss Creek projects, it's just getting started this year -- they've had a lot of interest in this watershed, the Powell Creek Watershed, which lays mostly in Defiance and Putnam counties in Ohio. This is a targeted watershed project. It's actually three HUC-12s covering 63,000 acres. There's the northern part of the HUC, southern part of the HUC, and then the lower part of Powell Creek. Powell Creek then runs into Auglaize River at Defiance, Ohio, and then on to Maumee River up -- further up, downstream, excuse me. So from the Powell Creek -- Powell Creek has a TMDL largely related to the impairment causes of direct habitat alterations, flow alteration, nutrients, organic enrichment, and siltation. Keep in mind, this area of the state is very, very, very flat, has a lot of agricultural ditches, deep ditches, surface drains, heavily tiled. It's a lacustrine clay type of area, which is ancient lake bed up above Lake Erie. Land use in this watershed, 82 percent, so it's highly agricultural. And the only forest that you see is largely in the lower section and some along the tributary itself or the creek, northern and southern Powell Creek.

Slide: Another Example of Practice Rankings and Agricultural Projects: Powell Creek Nutrient Reduction Project

So we're working with Defiance County and also Putnam County to get interest on cost-share for a number of practices. And in this case, we have just deliverables in the grant. The deliverables include cover crops, drainage wetlands, erosion and sediment control, nutrient management and whole farm conservation planning, grass waterways, vegetative buffer areas and strips with focus on treating runoff versus conservation cover, drainage water management, and tile control structures. So we agreed with Defiance County Soil and Water that these are practices that would do well to address some of the nutrient concerns in this watershed, also discussed on how things could be promoted. We had a really good discussion on drainage wetlands. In fact, I understand the Soil and Water Conservation administrators are working with two landowners right now on wetlands, which is good news. Whole farm conservation planning, the idea here was the Soil and Water Conservation District would meet up with farming enterprises and look at their entire operation and identify, hey, you have some issues here at the edge of your feed lot, and you have some erosion here at the edge of your field, and address -- based on that audit or visit with that farm, apply the appropriate conservation practices where they could do the best for that farming enterprise. They've got a lot interest in drainage water management structures. They're on target for getting 38 of those installed under this grant. Also, cover crops, they're on target -- at least they've told me in our most recent discussion that they're on target -- for, what is it, 2375 acres of cover crops in this watershed. So sort of what I've described in this chart here is, on the left, the project deliverables; in the center, applicable practices that can get at those deliverables; and how they ranked out as effectiveness for nutrients in the analysis I performed.

Slide: Summary Items

So I guess that is most of what I wanted to share with you today, some summary items, just to wrap it up. First, improving water quality associated with agriculture and agricultural land use is a priority nationally, and it's always a priority in the Division of Surface Water, and I know it's a priority in Ohio for NRCS, as well. Not all NRCS conservation practices focus on improving water quality. And there is a real need to match water quality problems with the appropriate agricultural BMPs that can do the best at reducing the nutrient and nutrient-laden sediment losses that we experience here in the Midwest and, I guess, nationally. And this approach is just one way to do it. It was a math project from me and my colleague, but I guess it does -- it did show a lot of interesting outcomes and really made me think of ways to use it in our day-to-day work here and even -- and I'm glad we're getting a chance to share it with NRCS and other folks here from other states here today. So with that, I appreciate everybody's attention. And one last thing my boss asked me to include is our mission is clear. We help people do good things for Ohio streams in our program here. So with that, I'll turn it back to you, Cyd.

Slide: Ohio EPA Section 319 Grants Program

Cynthia Curtis
All right. Thanks a lot, Rick. It was a really interesting presentation. If people have questions, you'll see a chat box at the bottom of the screen. Please feel free to start typing your questions in there. Before I start taking -- it looks like a few people are entering in some questions. One thing, you mentioned drainage water -- different controls around that came up a lot, and you mentioned that, based on new information, you might have changed some things about that. Can you say a little bit more about the changes you were thinking about making?

Rick Wilson
Well, I guess what I would look at is we do understand that, I guess, now there's been a lot more discussion and acknowledgement that phosphorus is moving through tiles. In Ohio, anywhere from 25 to 75 percent of the annual load in agricultural watersheds comes from tile systems, so -- and that's year-to-year dependent, rainfall dependent. So obviously, addressing tile systems and how interrupting that flow path with things at the edge of the field, such as more effective hydraulic buffers or drainage water management structures, wetlands, things that reduce that overall volume would be great, or things that would treat that water such as -- and I know there's been some new practices come out for bioreactors and things like that. But I guess, you know, looking back, and with a few more years experience and looking at how we ranked those four years ago, I thought, I wonder why I ranked that that way when I, you know, I've had different experiences otherwise or since then. So that's the best I can say for that.

Cynthia Curtis
Okay. Thank you. Let's go -- one of the first questions is from Santina Wortman: Rick, have you looked at how this ranking compares to load reduction model estimates?

Rick Wilson
No, I haven't, but that is an interesting question. I'm trying to think of how I would do that. That would be an interesting thing to do. Thanks, Santina.

Cynthia Curtis
Next question is from Wayne Anderson: To some degree, your top practices might arguably be seen as not relevant to particular agricultural areas. Have you considered a practicality factor for these practices?

Rick Wilson
Well, yeah, of course you're right. I guess we considered that when we were engaging in discussions with Crawford SWCD and Defiance SWCD. This is a practicality and what are farmers -- A, what are they interested in currently, and B, what could we sell them? So those are very practical questions. But I guess more importantly, there's the idea that you can still promote practices that would be effective. And that's not to say they'll be adopted or accepted in the community at large, but there's still -- I think there's a responsibility on all our behalves to promote practices that would do the most to reduce runoff volume and rate and -- which is really what's associated with water quality pollution and nutrients.

Cynthia Curtis
All right. Thank you. So one question I also had is you were talking about working with the SWCD and the counties. How did the analysis that you did -- how did you approach it with them? How did it change the conversations that you had?

Rick Wilson
I wouldn't say we directly pointed directly at this analysis, but, you know, using as -- in our minds as a way to get at, really, the need to address the runoff or drainage water. That's where it comes from. So you're looking at ways to store water in the field, ways to store water at the edge of field, and to effectively buffer runoff and drainage water. We had really good discussions on existing buffers and how they work during larger runoff events. For instance, there's a difference between filter strips and conservation cover buffers. One is designed to disperse runoff. The other is not. Both keep planting from going on at the edge of the field, so they have benefits there. But when we get our load of runoff during just a handful or ten significant runoff events every year, there's a real need to effectively buffer, store, treat that water that's causing the highest amount of loading into our streams. So really, the discussion was -- it was more about the discussion on why did these practices rank high, and then how can we get these practices or practices like them implemented? For instance, with wetlands, a lot of folks in Northwest Ohio, they kind of -- you lose their attention when you start talking about how wetlands could be beneficial. But when you talk about water storage or water harvesting, that changes the dialogue a little bit more because I think they get that load is associated with volume. And if you reduce volume and provide the necessary incentives to do that, we might gain -- get more attention and more people looking into those types of things. I hope we do.

Cynthia Curtis
All right. So it sounds like you need to be versatile in phrasing things in many different languages. All right. This question is from Tom Davenport: Was any thought given to the availability of the necessary technical assistance to establish the practice in particular filter strips and sizing them to address water quality?

Rick Wilson
Well, I guess the first idea is to get the idea to -- at the local level, to ask, "Do you think these things are working to stop runoff during some of our bigger runoff events? Are they filtering things?" And once you get into that conversation, you go into, well, what is practical to actually design? That would take land aisle production at the edge of the field. That would cause a bump at the edge of my field that I'd have to plow around. And so really what it did was it helped us understand, yeah, there might be a technical service gap there because of, you know, programs aren't really huge in our county offices. But also, it got the discussion going on, well, what could we install other than something like a more effective buffer? And it really got down to drainage wetlands or conservation basins or whatever they want to be called in this part of the state, but what could actually be implemented to effect more volume reduction? And a lot of the discussion in Ohio is, well, let's improve our soil structure and our soil health so that the soil can store the water. Nonetheless, we still have a lot of new, introduced drainage systems, both surface drains and subsurface drains, going on throughout this region, as

well. So I'm just hoping you get the message both ways that, yes, there are practices that are going to help you with your yield and ensure a good yield, but also there are practices out there, and programs to incentivize their adoption, that can really affect or ameliorate the negative impacts to water quality associated with drainage. I hope I answered your question, Tom.

Cynthia Curtis
He is nodding his head yes, so you're good. All right. So you were talking a little bit about using this with different counties. You gave a couple of different projects. How are you seeing this going in the future? Like, you were talking about noticing things and how you might have shifted factors. Are you looking at adapting this report at all?

Rick Wilson
I'm not, but I might be told to. There's probably opportunities out there to work together with ag agencies, and maybe we can get some more good out of it. I would think that would be a good thing.

Cynthia Curtis
Great. Good.

Rick Wilson
And I'm glad I'm not on camera.

Cynthia Curtis
I forgot to move you over. It's not too late. I'm glad you got it off. There you go. All right. So just answer this one -- okay. There was a question from Jeanette March (ph) about have you developed any outreach and education material related to the work you've been doing?

Rick Wilson
Not necessarily. It's mostly been used as an internal tool here for our program and our TMDL program. Like I said, this was done in 2009, and we've used it as behind-the-scenes information for us internally. But thanks to the good people of Region 5, they remembered we did it and asked us to present on it, and I guess I'm glad we did.

Cynthia Curtis
Good. I'm not seeing any other questions roll in right now, so we'll give people a couple of minutes while we wrap up. One thing, I want to let people know that our next nutrient strategy ag focus webisode will be on August 21st, and that is with Kerryann Weaver on wetlands -- I'm having a complete brain cramp right now -- on a wetlands supplemental guidance model that she'll be discussing. And when I remember the actual title, I'll say it. And if you have any other future questions, you can certainly e-mail me and I will direct them to the person here. And also, at the end of this webcast, when I close the browser, it will launch into the actual document that Rick has been referring to throughout his presentation. I'll send out an announcement of the future and upcoming webcasts. We have two on the books and a couple more that we're working on scheduling between now and the end of the calendar year. So I want to thank Rick, again, for an excellent presentation and thank you all.