Lake Erie with Jessica D'Ambrosio and Chris Winslow

Joe: One of Ohio's greatest resources is Lake Erie. It's the source of drinking water for millions of Ohioans. It's an economic engine for much of the state and it's one of Ohio's top recreational opportunities. It also faces some problems and one of the biggest challenges is the annual toxic algal bloom. That's a problem not just for the lake but for Ohio's agricultural industry. Today two prominent Lake Erie experts join us to talk about the lake, its challenges and some fixes on Town Hall Ohio.

Intro: This is Town Hall Ohio, home to interesting people, engaging issues and enlightening stories. Town Hall Ohio was a production of the Ohio Farm Bureau Federation working to forge a partnership between farmers and consumers and is supported by Nationwide Nationwide is on your side. Now here's town hall Ohio host Joe Cornely.

Joe: Lake Erie is a lot of things to a lot of folks. A source of sustenance, jobs, fun. For me it's where I want to jump after I go to a Browns game. But today we're going to talk with two folks who can do a great job of helping us all figure out what we need to know about our north coast gem. Jessica D'Ambrosio is Western Lake Erie project director for The Nature Conservancy and Dr. Chris Winslow is the director of Ohio Sea Grant at Ohio State University's Stone Laboratory. Chris, Jessica welcome both of you to Town Hall Ohio.

Jessica: Thank you. Happy to be here.

Chris: Thanks Joe.

Joe: So let's just set the stage let folks have a little bit of background on you and your organization. Jessica tell folks about the Nature Conservancy please.

Jessica: Sure, the Nature Conservancy is the largest conservation organization in the world. We've got offices in all 50 states and more than 60 countries across the world. And our mission is to preserve the lands and waters upon which all life depends and it's pretty hard to argue the fact that humans depend on clean water and agriculture working lands to survive. So the Nature Conservancy has been working with a variety of stakeholders in the Western Lake Erie Basin including the agriculture community since 2010 to find ways to manage nutrients, manage water so that nutrients are feeding crops and not algae. And we also look for ways to put nature based solutions back into the watershed.

Joe: Tell us a little bit about yourself, how did you get into this type of work?

Jessica: Well that's a great question. It's a windy road. But I got into working with agriculture through hydrology and drainage ditches and from my graduate work at Ohio State University.

Joe: Chris Winslow, as we said is the director of Ohio Sea Grant and Ohio State's Stone Laboratory. Chris tell us about those organizations please.

Chris: Yeah, absolutely. Ohio Sea Grant is one of 33 federally funded programs. So we were funded through Noah which is the National Oceanic and Atmospheric Administration. Basically that funding comes in to address issues in Lake Erie from a research and education and an outreach perspective. And then the role that I play with Stone Lab for those that aren't aware, Stone Lab is Ohio State University's island campus up on Lake Erie and we really have the same mission of research education and outreach. Some of that right now is revolving around harmful algal blooms and the nutrient loading issue, but we work on things from pharmaceuticals and personal care products and the water invasive species the dredging issue. We do things from a coastal economic development standpoint and how we can keep the communities around Lake Erie vibrant and successful.

Joe: How about your background, what led you to this point?

Chris: I'm actually a fish squeezer for my training, yes. So we fish biologists affectionate referred to ourselves as fish squeezers, so I get my master's and PhD. working with fish from Lake Erie and how they interact with invasive species. Once joining Stone Laboratory in Ohio Sea Grant really cover all the issues I mentioned earlier including harmful algal blooms and nutrient loading.

Joe: So before we start talking about the harmful algal blooms and other things, talk with folks a little bit about the importance of Lake Erie, Chris. I kind of threw some general comments out about recreation and drinking water and such, but it's your job to work on that lake on a daily basis. Why should Ohioans care whether they have lakefront property or not?

Chris: Yeah, I mean I think you hit on two of the major ones is that recreation-tie. The state's tourism revenues around $40 billion. But Lake Erie alone is just over $14 billion of that. And so if you think about that we have 88 counties of course in Ohio, 8 of those 88 are on Lake Erie and 14 billion of 40 billion come from those eight counties. So it's critically important. About one in 12 people in those counties work in the tourism sector. Safe drinking water, that number fluctuates pretty wildly but it's about 11 million people take their drinking water from Lake Erie. And so you know it's a billion dollar plus sport fishing industry. We've got a robust charter captain and industry in the state. It's critically important for that, it plays a lot of roles.

Joe: Jessica your thoughts, clearly you've devoted this part of your career to it you must feel it's important.

Jessica: Sure I get the benefit of working with Chris and his team at the lake but also up in the watersheds. My office is based in Defiance, Ohio. And for us the lake kind of represents connectivity. So Defiance is where the Maumee River, the Tiffin River and the Auglaize all come together at one point. Historically we put a lot of pressure on the lake from our watersheds and the lake is a fighter- it keeps fighting back. It symbolizes resiliencey. It symbolizes connectivity.

Joe: So you mentioned that connectivity and the waters that eventually drain into the lake. Do most people recognize that what happens in the northern part of Hardin County, that’s where I'm from so I know that the northern part of our county drains north of the southern part drains to the

Ohio River, but do folks really think about that connectivity, that what may happen in a Kenton or Lima or wherever impacts up into the lake?

Jessica: I think ourselves and our partners have done a really good job of trying to drive home that point specifically over the last few years with our outreach and education and really understanding that the decisions you make on your individual plot of land or your individual farm really do impact your neighbors downstream, their neighbors, all the way down to the lake. I think our awareness and willingness to accept that we are connected and that we are responsible has improved greatly over the last few years.

Joe: From an academic perspective would you concur, are people generally aware enough or do we need to wrap that part of it up like TNC trying to get done.

Chris: No, I think Jessica hit the nail on the head. I think we are and I would actually say that I think the agricultural community is even more aware than the general public. I really do think those farmers on our landscape have been the original stewards of the land and I think they understand what they're doing in their in their field actually impacts receiving water bodies. But even from a connectivity from a water standpoint, I think a lot of the issues that we're dealing with in Ohio and across the country, you're seeing better connectivity across communities to the researchers to the state agencies. I think you see more communication now and connectivity now than you ever have before.

Joe: You know one of the things in terms of government involvement in these kind of things we've always done things by the township and by the county and so on and there seems to be, especially in the water space. I don't want to say ignoring, but not setting up our practices based on arbitrary political lines but trying to mimic Mother Nature in terms of addressing it, Chris.

Chris: No it's a difficult challenge. I mean Lake Erie's shared by two countries and three states and within those states multiple counties so it's not a trivial discussion as to figure out when that water crossed boundaries. How do you deal with it? So there are groups in place for that right now. Federally there's what's called the IJC or International Joint Commission. So it's researchers from the Canadian side and the U.S. side that talk on a regular basis to talk about waters that cross that country boundary. But for Lake Erie specifically there's what's called the Lake Erie Commission and that's led by all the directors of all the state agencies so we're trying to make sure that that connectivity exists at the state level so we can kind of manage the differences across the county and city.

Jessica: Right. And one of our roles is because we can cross state lines with our project, we go to Indiana, Michigan and Ohio. We try to communicate what's happening at each state at state level and try to get better communication going, get people talking to each other. And I think it's been working fairly well so far.

Joe: So if somebody walks up to you on a street corner and goes I know you work for the Nature Conservancy and you specialize in the Western Lake Erie Basin. How does it do it? Give us just your 30,000 foot view of how's Lake Erie doing.

Jessica: How's it doing? Well it's still the best place in the world to catch walleye and yellow perch. So it's still the most productive lake ecosystem that we have of the Great Lakes. It still supports, as Chris mentioned earlier, a multibillion dollar recreation and tourism industry. So it's still a place to come to have a good time with your family, find a place for recreation. It's still as you mentioned in your introduction the gem that we have today.

Joe: So if it's still all of this it's not perfect. Correct?

Chris: Correct. So I agree with Jessica I mean there are a lot of positive things about the lake. When we talk about the lake from a chemical standpoint. So things like chemicals that are associated with industry people have heard of lead and PCBs and mercury and that sort of stuff. Lake Erie is far better than it was in the late 60s early 70s so we're seeing a tremendous success story from a chemical pollutant standpoint into Lake Erie. And we have a great robust fishery as Jessica alluded to before. What we're actually dealing with in lake areas more...it's too productive and that's kind of the point is that we've got we need to have algae in the lake more specifically green algae not the cyanobacteria we're dealing with now. We need to have those green algae because they support the food web that drives this great fishery. In recent years pushed that productivity too far and when I say productivity I mean we're putting too many nutrients and fertilizers into the lake.

Joe: Back up a step because I want to I want to talk about that. That's a big part of what we want to cover is agriculture's role in the challenge you just mentioned Chris, but talk a little bit about the fact we said the 60s and everybody knows about the Cuyahoga River catching on fire and blah blah blah and we've largely addressed those. Just kind of walk us through what it took to transform the lake from when it I guess arguably could have been called its worse to where it is now.

Chris: Yes. It was considered the dead lake in the late 60s, early 70s but that's where you had things come around that were, like the first Earth Day. And EPA was established and the clean water act came online. All of those started coming in line in the early 70s. And what we really had to do out of the gates was lower our phosphorous into the lake. So the issue we're facing right now with high phosphorus was something we faced before. Historically though it was coming from what we call in the scientific world, point sources. So actually coming out of pipes that empty into the lake. So it took us a tremendous investment in wastewater treatment plants to get them to remove phosphorus. Another thing that happened in that same time period that many of your listeners may remember is we banned phosphates from laundry detergent. And so pulling those sorts of things out of the water. So that kind of helps from that late 60s, early 70s through the 90s where we didn't have these large harmful algal blooms.

Jessica: I might add to that too we also had some pretty strong incentives for the agriculture community to change a farming system or reduce erosion potential that would carry phosphorus with it. So those all of those things contributed tremendously.

Joe: To simplify this in a minute. I want to go from point source to nonpoint source. So Chris help us understand why it's different fixing point source issues and nonpoint source issues.

Chris: So just too kind of get an idea just in the Ohio waters of the western basin of Lake Erie, you're talking about 4.2 million acres and when you add in Indiana and Michigan you're up around seven million acres. So the scope and the magnitude of where those nutrients are coming from is just so gigantic, it's huge. Where if you know the point sources I mean you can literally take a boat drive up a river and see a pipe coming in and a pipe coming in and you know what industry or wastewater treatment plant that might be associated with or what septic tank that might be associated with. So just identifying point sources is far easier than it is to try to wrap your brains and wrap your activities on a nonpoint source pollution problem.

Joe: I think it's safe to say that since August the 2nd of 2014, something that was on the minds of farmers jumped to the top of their concern list and that is when the mayor of Toledo told close to half a million people don't drink the water and agriculture is playing a part of that problem. And more importantly helping to fix that problem. We're going to discuss that when we continue our conversation with Jessica D'Ambrosio. She is the western Lake Erie project director for the Nature Conservancy. Dr. Chris Winslow from Ohio State University. We'll be back right after this.

Joe: Welcome back to Town Hall Ohio and we welcome back into the studio our guest Dr. Chris Winslow director of the Ohio Sea Grant and Ohio State's Stone Laboratory. Jessica D'Ambrosio Western Lake Erie project director for the Nature Conservancy. Before the break we started to talk a little bit about the nonpoint source pollution challenge that Lake Erie has and the fact is that because so much of the western Lake Erie Basin is agriculture, that is one piece of the problem that the lake is now experiencing. So Jessica for the non-farmer listening right now, how does the amount or type or timing or my usage of fertilizer 50, 60, 90 miles from Lake Erie ends up meaning the potential for a toxic algal bloom in the lake.

Jessica: Sure, well the easy answer is that what we apply it to the landscape whether that's on our farm fields or whether it comes from suburban areas as many sources as we talked about in the watershed. The easy answer is that water is the car the nutrients drive to get to the lake. And so when it when we apply phosphorus and fertilizers to the ground, water helps to help them sink into the ground into the soil. But also if we get too much water that excess water can carry any amount that's not used by a growing plant or that's not incorporated into the soil can carry it over the surface of the landscape as surface runoff. We do have evidence now through our science that we've been studying in the watershed that we do know that phosphorus is also carried through the soil through water and leaves out through our tile drains and into our lakes and rivers. And so once it leaves our landscape either through surface pathways or subsurface pathways it can get into our ditches, our rivers. And then that is the direct pathway to get to the lake.

Joe: Yeah it leaves the field, it gets in the ditch, goes to the stream which goes to the river which goes to the lake, probably ought to back up just one step. Since we're talking about toxic algal blooms, Chris you explain that algae is important but go a little bit deeper in what's a toxic algal bloom.

Chris: Absolutely. So you can think of the critters that live in the lake doing the same thing your plants do in your yard. So you'll have your daisies come up early in the spring and that'll switch

to a different species of flower and through the season you have different flowers blinking on and blinking off. The same thing happens in the lake. Right now if you went on the lake there's organisms and they're called diatoms that are growing and they turn the water kind of brown or golden because that's the color of that organism. Then those will give way into what we call green algae. Green algae are of course as we say, green in color. There's not a toxic strain of green algae that exists at Lake Erie but it's at the end of July through October that those green algae start giving way to cyanobacteria. So it's a type of algae that has the ability to produce toxins. So it's a specific organism that grows in there for Lake Erie it's primarily micro cysts and it produces a toxin called microcysten but it's not there all year round. Just like your flowers, they have an ideal time to grow in the season and then a time where they tend to die off and so when we talk about these toxic algal blooms at a certain period of the year in Lake Erie and those organisms have the potential to produce toxin.

Joe: So part of my job here at Farm Bureau as I watch this issue religiously, it's the first thing I Google in news every morning, Ohio algae. Help folks understand there's a lot of discussion. What we hear most often about Chris is the size of the algal bloom and the projected size of the algal bloom and we've just started getting the 2018 projections. Is there a correlation between size toxicity, other dangers?

Chris: So right now we can look at the rain that goes into the water or that comes into the Maumee and the nutrient concentration of that from the beginning of March to the end of July and that gives us an idea on how big the bloom is going to be, but to come to your question is does bloom size and toxicity match. The answer is no. We have grants going on right now actually. Dr. Justin Chalfant at Ohio State is on one of those grants and we're working on that ability to predict. We now know that the toxicity of bloom seems to be related to nitrogen. It also seems to be related to light levels in the lake and it seems to be related to genetics. So you have to have a certain number of genes in those little cells that produce the toxin. You have to have a certain number of genes for them to do that. And so now we know nitrogen light and genes tell you how toxic can be, we're getting to the point where maybe in two to three years we should be able to predict not only size but toxicity.

Joe: We're chatting about some of the challenges of Lake Erie and agriculture's role in helping to perhaps fix many of those challenges. Dr. Chris Winslow from Ohio State is with us. Jessica D'Ambrosio with the Nature Conservancy. We've only got about a minute and a half here so we won't get into all of this Jessica, but help me start to shape up the next part of the conversation. John Q, Citizen in Ohio, fertilizer from farms causes toxic algae algal blooms in the lake, just stop fertilizing. It's not that simple. Help us understand some of the complexity of if we know it's fertilizer why can't we just make it go away?

Jessica: Right. Well I think it's important to remember that phosphorus especially, phosphorus and nitrogen are naturally occurring essential nutrients in the environment and plants need both of those to grow and survive. Phosphorus especially is limiting for plant growth so if it does not have enough it the plants will not grow and therefore our crops will not grow. So simply to stop applying fertilizer especially phosphorus could in many cases mean that we don't have a growing crop or we don't have a crop that makes it to high enough yield to produce a nice corn yield or soybean yield for the end consumer.

Joe: We're going to talk more about the issue of toxic algal blooms in Lake Erie and what farmers are doing to help figure out ways to mitigate that difficulty. Our guests in the studio, Jessica D'Ambrosio of The Nature Conservancy. Dr. Chris Winslow from Ohio State Sea Grant. We'll be back in just a couple of moments with more on Town Hall Ohio.

Welcome back to Town Hall Ohio where we are talking about Lake Erie and agriculture in Ohio, its role in helping Lake Erie be its best. To tell that story we have with us the director of the western Lake Erie project for the Nature Conservancy Jessica D'Ambrosio. Dr. Chris Winslow is with the Ohio Sea Grant in Ohio State's Stone Laboratory. So I want to try to make this as concise as I can back in the late 70s mid 70s, Chris. Farmers in Ohio and around the country were told we've got to stop erosion. Public policy said that's a good thing. And by stopping erosion we keep productive soil in place and we keep the nutrients in place. So we did that, farmers adopted and adapted. And here we are several decades later and there's a lot of conservation tillage on the ground. And yet within the last 10 years, the problems of fertilizer leaving farm fields and getting into the lake have increased. So help me understand why we are seeing this. I guess we just don't know everything yet. Is that right? Is that a good way to say it?

Chris: Joe that's a great way to say it. I mean that's the nature of science. I mean we conduct experiments and learn answers but we come up with just as many questions after coming up with answers. And so I guess what I would say first is that yeah when we went to no-till it was because we thought that the phosphorous was attached to the soil and if you could keep the soil on the field you can keep the nutrient on the fields. We now know that a lot of phosphorus leaving those fields is leaving as it dissolves. And so it doesn't necessarily have to be attached to the soil particles it can be running off the surface dissolved or even as Jessica mentioned earlier penetrating the soil and running off through our tiles. So those are some of the things that we know are different than before. We now know that when you switch to a no till that you're placing a lot of that fertilizer right on the surface of the soil which is susceptible to runoff from future rain events we definitely do not want to go back to the era of tile or I'm sorry of pillaging and plow. We don't want we don't want that sediment rolling off because we know sediments and issue we're still going to provide nutrients what we're actually asking farmers to do now is what we call subsurface placement. So either for the farmer and the listening in its injecting or bending those fertilizers and putting them in very specific places but still not disrupting the soil surface very much. Even our phosphorus issue we were using manure for a long time to get to our nitrogen requirements not thinking that the manure also carried phosphorus with it so we would have additional phosphorus application on top of there. So there are just things that we're learning about the process of growing crops that are changing the way we used to do things since the 70s.

Jessica: Right. And I'll just add to that we used to think that phosphorus was a bank and we fill it up and fill up your bank and it stays around and the crops need it. Now we know that because there is this dissolved component that is more bio-available and it does go with the water more easily that is causing some problems. We are seeing now that the total phosphorus or that particular part of the particular part that's tied to soil that part of the phosphorus is either staying even or even declining in the watershed or in the concentrations where is that dissolved fraction is increasing.

Joe: So Chris mentioned some changes in farming practices of incorporating the fertilizer into the ground so it's not leaving it on the surface but not completely turning the soil over. What else are we starting to see in terms of farm management practices that have some potential? What are some of the things that you've been paying attention to, Jessica?

Jessica: Well the Nature Conservancy has been an early partner with the 4-R Nutrient Stewardship Certification Program and that is a program that focuses on the four Rs of nutrient management. So the right source, at the right time, in the right place, in the right amount. We do think that that works and we have seen evidence that if we put the nutrients where we need them when we need them we can still maintain our yields and reduce our actual application of phosphorus onto the field.

Joe: There's also some work being done at the two stage ditch, TNC and Hardin Soil and Water and others started working on a long time ago. Tell us the concept there.

Jessica: Sure. So that's a specific practice but it's really one of a suite of practices aimed at managing the water aspect of the farm field and so if we can slow down the water, capture it, slow it down, slowly release it back into the watershed, it hits a vegetated area is able to infiltrate the soil. So in a way it could treat the water or keep sediments in place that may have particulate phosphorus tied to them. So it's a way that we can reconfigure our drainage ditches to function more like natural streams but still give us that drainage benefit and reduce the sediment and nutrients that are flowing through them. So it's one of a range of practices that we call edge of field practices or downstream practices.

Joe: So Chris if we know that managing the flow off of the field helps and we know that applying fertilizer in a more deliberate manner helps. And we know a couple of other things, why don't we just do that? Why don't we just fix the problem tomorrow?

Chris: Yeah. Again we've got tons of acres that are in play. Some of the things that we're asking the agricultural community to do are new things. So it's always tough to have that learning curve to do new things and some of them the perception is that they're cost prohibitive to put some of these things in play. And some of them are kind of expensive activities a two stage ditches are not cheap but it's very effective. The placement of wetlands is also one that's there. But what I would say is that the issue is that to put these things in place farmers have to put an investment and they have to trust that what they're going to do is actually going to (work).

Joe: We're going to continue this conversation with Jess D'Ambrosio and Dr. Chris Winslow when we continue on Town Hall Ohio.

Joe: We're talking about agriculture and Lake Erie with two folks who do this for a living. Jessica D'Ambrosio is with the Nature Conservancy. Dr. Chris Winslow is with the Ohio State University. Chris I had to cut you off because of the break there. But I'd like you to follow up. You made the point that we know some things, not everything but we know some things that are probably going to help. Farmers are considering or beginning to implement them. But when you get into some of the bigger ticket items you got to be sure they work. So how are we doing in

Ohio at conducting the research and getting the information out that gives farmers some certainty that there are things they can do that will help the lake without putting themselves out of business?

Chris: No absolutely. I had the pleasure right now with help from University of Toledo to manage a bunch of money through the Ohio Department of Higher Education. And when I say a bunch of money we're talking about 50 some projects to a tune of about $6 million. But that's what we're trying to do is it what we're trying to encourage farmers to soil test because variable rate technology helps us a lot with the commercial application of fertilizer. As far as how to manage your field, what we don't know for every field across the landscape is which BMP or best management practice is the best at reducing phosphorus on a particular field. So we need to be able to go out and tell the farmer that based on your soil type in the slope of your fields and your phosphorus levels, what kind of practice could you do that lowers your input of phosphorous to this system? That research is there but again there's so many unique situations across the watershed. The land that drains into the lake that there isn't a silver bullet. And if people think you know the general public that there's one solution to this problem that's not the case.

Jessica: Right. And I think that is to drive that point home that was one thing that struck me when I started working with farmers and with farm advisers and in the Western Lake Erie basin is how complex agriculture really is, farm system and also how diverse it is. So we have a lot of options and tactics that could work but they don't work the best everywhere. And so our job is to try to find out using the research and working with the folks on the ground to figure out what works best where and how do we how do we make those things possible for farmers so it doesn't break their bank. It does give them, keeps them in business and then when they can't control certain things in the watershed or certain some of that complexity where do we put nature based solutions throughout the watershed to help build in that resiliency.

Joe: So how do you find farmers are at accepting this? What's the reaction when you say you know I know you've done it this way for your entire life? Maybe dad and grandpa, but how does it go over working when you say we've got some things to figure out?

Chris: I think we've seen positive survey results come back. About a third of farmers already have best management practice on the field or are ready to pull the trigger right now. There's about a third that want to be part of the solution but they want to know which one for their field again. And then there is about a third that that aren't at the table quite yet but there's in my mind two reasons for that. The first one is either, they don't think it's their field that's contributing or they know it is but they're not confident that the things we're going to ask them to do will make a difference. But that clearly two thirds of the farmers that I interact with on a regular basis know that some of the nutrients are tied to them and want to be part of the solution.

Joe: So Chris says farmers are interested, you're nodding your head yes, we're learning some new tools and techniques that are going to work. When I frankly read the newspapers, some newspapers, or see some television, it doesn't seem that way. Just a general thought on how the media's covering all of this, Jessica.

Jessica: Oh well a general thought is I think the media has been doing a pretty poor job of covering this. I think they've been doing a great job of bringing attention to a very serious issue and a very chronic issue. I think they can do a better job of talking more about what options are available to agriculture and helping the folks who aren't in agriculture understand the complexity of the system a little bit more. I think we talk about agriculture as a big "A" in the media and we forget that it's made up of a bunch of individual people and families. The average farm size in Ohio is just about 200 acres trying to make the best decisions that they can to both stay in business but also try to do the right thing.

Chris: You know I would agree. I mean you can't call a farm a farm a farm or a farm. We're seeing that you know in some instances you know maybe 40-ish 50 percent of the fields are providing 78 percent of the nutrients so there are places that are what we call quote unquote hotspots and those are places that farmers really don't need to change anything they're doing because they're not a source of nutrients. What we need to do is identify those spots but not in a punitive fashion, not to penalize those fields that are contributing phosphorus but to rally the resources there to help that farmer, help that unit be part of the solution.

Jessica: I work on the ground with farmers all the time at our field days and events that all the stakeholders put on in the watershed and the number one question I get is what can I do. And then shortly followed up with how I can do it. Help me figure out how to do it.

Joe: We have a project here at Ohio Farm Bureau our Blanchard River demonstration farms network where we're trying to answer some of those questions that come to the Ohio Farm Bureau website (ofbf.org) and type in Blanchard River and you can learn a little bit about some of the work Farm Bureau is doing there. We'll be back to wrap up our visit with Jessica and Chris right after this.

Joe: Welcome back to Town Hall Ohio, we're talking agriculture here and water quality specifically up in Lake Erie. Our guests Dr. Chris Winslow of Ohio State and Jessica D'Ambrosio with the Nature Conservancy. So we've been talking a lot about farmers and their interests and what they need to know and want to know how they can help. Jessica I want to start with you. Also what may happen with the lake can be largely policy driven. State lawmakers and such are going to get engaged. Others may want to. So if you were to advise whoever's going to say well we need a new bill or we need new regulations or we need a new philosophy, what are some of the tips that that you would share with that policy maker?

Jessica: Well I think it's important first to understand that the voluntary programs that we have in place have done a very good job if I can use this analogy of stabilizing our patient or patient is the lake. So we've done a very good job of making the lake stable. Based on what we're putting into it currently and I think what we can do, I would advise our policymakers to come up with some constructive policies and align that with funding that also help us treat the root causes of the chronic illness. So we've stabilized the patient how can we then now take the next step treat the root causes of the illness and cure the disease.

Joe: Chris your thoughts on if you were king for a day and got to make all our state's policy on water quality what would be some things that you would feel are important to think about?

Chris: Yes I mean definitely a policy is a tool in the toolbox. When you use that tool you've got to make sure that the farmer can afford to do it monetarily but also temporarily. There are some things that we're asking farmers perhaps to do that it's just not feasible within the planting season or the growing season and so we need to do if a policy is put in place it needs to have support for that farmer both monetarily and make sure they have enough time to implement those.

Jessica: Right, and that support comes from being constructive enabling farmers to be able to make decisions and being flexible enough to say, OK well I know there's a bunch, a range of options available to me. How can I choose from this range of options that best fits my system.

Joe: I want to go back and also address what I fear is a common public misperception that we can fix this quickly. I don't care if all of the solutions are regulatory or all of the solutions are voluntary or it's a mishmash of both, can we make any kind of educated guess Chris based on trends on when we're not going to have to talk about toxic algal blooms in Lake Erie ever again.

Chris: Right. So the lake itself can recover overnight. So what the worst boom on record was 2015, it was a wet year. In 2016, it was a dry year and there was no bloom. Same thing happened in 2011, bad Bloom. 2012, a drought year, no bloom.

Chris: So if you can shut off the phosphorus go into the lake today it goes away tomorrow. The issue is that it's two things we've got to control the phosphorus that's in our fields and finding those hotspots. But water right now when we see a low bloom year it's because we had a dry winter. And so that's not a solution. We can't just shut off the rain. So when we approach this, the heavy lift is there are places that have high phosphorus that we need to address and some of those places might take some years. And we're in a context of global climate change with increased severity of storms and increased frequency of storm.

Joe: Go little deeper there. The fact that you know when I was growing up in nice inch and a half rain every week 10 days was exactly what the crop needed. And now we get three inches in two hours.

Chris: So this is the context we're in right now. It is just a period in this region of the country where we're going to see more severe and frequent storms and as Jessica said, if the phosphorus is high in the field but there's no way to get it from the field to Lake then you don't have an issue. But we are in a context right now where we do have a mechanism to get it there. So this shouldn't always just be a nutrient - meaning phosphorus and nitrogen issue - this is a water management issue too and a lot of those best management practices we're recommending to farmers or how to keep the water in the field but yet not sacrifice yield.

Jessica: Yeah and I would go a step further even on that and say it's a whole system management so it's managing the nutrients in the field, it's managing the water at the edge of field and just downstream. But it's also managing places within the watershed where we can put nature based solutions back so when we can't control certain events, like these large storm events that are happening more frequently, there are control devices if you will in play the wetlands the flood plains, those nature based solutions that build in that resiliency.

Joe: Real quick, where do folks learn more about the Nature Conservancy and your western Lake Erie stuff I assume there's a website somewhere?

Jessica: Sure, you can go to nature.org/WLEB or nature.org and the 4R certified Web site is 4rcertified.org.

Joe: Ohio State, Chris Sea Grant have a specific web site?

Chris: Yeah probably the easiest way is just to search for Ohio Sea Grant and HABS. So HABS and that will take you to our information we're we have all of our factsheets.

Joe: Chris Winslow from Ohio State. Jessica D'Ambrosio of the Nature Conservancy. Thanks to both of you for joining us on Town Hall Ohio.

Ending: Town Hall Ohio is a project of the Ohio Farm Bureau Federation. It is brought to you with the support of Nationwide. Nationwide is on your side. Join us again next week for Town Hall Ohio.