Agricultural Modeling Team (AMT) Meeting

October 11th
09:00 AM – 11:00 AM
Meeting Materials

Summary of Actions and Decisions

Decision: The AMT approved the September 2024 meeting minutes

Action: Tom will reach out, offline, to members not present and get their votes on using Plant Available Nitrogen to determine the acres of grains with manure.

Action: Tom will reach out to non-present voting members and to those who requested additional information, to get their votes on modifying the manure spread algorithm to create a fourth group by Friday, 10/18.

Action: Tom will reach out to members not present to get their votes on using the proposed statistical framework to determine long term crop yield trends.

Action: Tom will follow up with members over email and work to reach a consensus on the incorporation of poultry industry data sources into CAST nutrient calculations by Wednesday, 10/16.

Post Meeting Follow up:

Decision 1: Should the acres of Grains with Manure should be determined using Plant Available Nitrogen?

Passed by consensus- The new method will be employed for Phase 7.

Decision 2: Should the manure spread algorithm be modified to create a fourth group as shown in this presentation?

No consensus was reached - No change will occur from Phase 6 regarding the application curves for manure.

Decision 3: Should this new statistical framework be used to determine long term crop yield trends?

No decision was made – Data reviews are under way meaning the topic will be revisited in November.

Decision 4: Should new data sources from the poultry industry be incorporated into nutrients calculations in CAST?

No consensus was reached – There will not be an implementation of the proposed item. Data from Phase 6 will still be used.

Meeting Minutes

Statement of purpose:

To evaluate the crop yield and loading rates/ratios in CAST and discuss potential alternatives for Phase 7.

Decision items:

1. Approve the September minutes
2. Announcements:

- October tree plantings (Alliance for the Chesapeake Bay).

Decision: The AMT approved the September 2024 meeting minutes

Introduction/Recap: 09:00-09:10 [10 min (Zach Easton, Virginia Tech)]

Zach provided a quick recap of the AMT progress to date as well as the groups timeline.

Manure applications in CAST 09:10- 09:40 [30 min (5 min presentation 25 min discussion) (Tom Butler, EPA)]

Tom recapped the changes made to the acres and manure applications in CAST agricultural Land Uses. The group was asked if they approve of these changes for Phase 7 development. Decisional.

Decisions:

- ***Should the acres of Grains with Manure should be determined using Plant Available Nitrogen?***
- ***Should the manure spread algorithm be modified to create a fourth group as shown in this presentation?***

Discussion

James Martin: As you consider these decisions, here in Virginia, we really think there are issues more related to how we determine crop need, particularly with hay and pasture, than there are with exactly how we spread according to these decisions. We asked the Bay Program to pull some data for us and run a what if of changing just hay, initially. Obviously if you increase the crop need for hay, it wouldn't necessarily change where it is in the sequence or how it's applied, but as you continue to apply manure across the crop groups, more would be going on hay acres. So, I just wanted to share that concern that we have and that what if scenario for folks to understand that there may still be more discussion to come as we make these decisions about other components, crop need in particular, that play into these decisions.

Tom Butler: Thanks, James, that's really well put. I appreciate you saying that, and I wanted to see if anyone else had any further comments or clarifications on any of it.

Ken Staver: The left axis here is percent application to crop goal. When you look at CAST output, there's a category that says crop need. Is that the same? Is that what the left axis is?

Tom Butler: Our terminology is messed up, and I should have corrected it. It's worth discussing so we get the terminology right, but I believe those are synonymous things. Jess can also jump in if I messed that up.

Jessica Rigelman: Yes, that's right.

Ken Staver: When you look at CAST, the crop need for leguminous hay and for soybeans for N are 4 or 5 pounds per acre, because they fix N. We don't ever apply manure that way, so I am just

kind of wondering how that fits in. Soybeans, especially, are just about half of our row crop acres in the watershed. It's the second biggest row crop acres in the watershed.
Bill Keeling: That doesn't make sense that the need is 4 pounds for soybeans. We should be looking at what's needed to produce the crop. Yes, a good percentage of that may be supplied by fixation for the crop, but that's not the need. The need isn't the difference between what's fixed and what's not fixed. It's what's needed to produce the crop, and that's why Virginia has been saying that hay and pasture, not the leguminous hay, but other hay and pasture, the need has been greatly mischaracterized. If you look at what tall grass/ orchard grass can actually utilize in terms of hay and pasture, they can utilize a whole lot more that what we are currently simulating. Thus, that would be skewing things to potentially higher runoff for hay and pasture than there should be.
Mark Dubin (in chat): Question - these application rates are based on year 1 manure N plant nutrient availability? Not including mineralized N for year 2 and 3, correct?
Gary Shenk: This goes to the terminology thing. You are probably right about the crop need, but what we have labeled as crop need in CAST output and what we have labeled in crop goal here, is the expected application including the reported nutrient management. That number was derived as what people expect at the county scale to be applied and not necessarily the need to produce a crop.
Bill Keeling: So, you're saying nutrient management has been accounted for in the front end? If so, then why are we giving credit on the back end?
Gary Shenk: Nutrient management is accounted, so there's an expected application for nutrient management and a higher expected application for non-nutrient management. When you take the spatially weighted average of those two things by crop, you get the expected application for crop in a county. That's what we have labeled as need or goal.
Bill Keeling: Isn't that muddying the water on the benefit of nutrient management? Shouldn't we be using a non-nutrient rate unless a nutrient management has been reported?
Gary Shenk: Yes. I may have said that incorrectly, but that's exactly what we're doing to calculate the expected application for full season soybeans, as you see here. The expected nitrogen application is 20% higher if nutrient management is not reported.
Tom Butler: Ruth, I think you might have a slide that's helpful for these terms so we get the terms right in the figure. I have crop goal and crop need.
Jessica Rigelman: You are looking at the expected application rate or expected pounds.
Ruth Cassilly: The first term there was what Gary was talking about, and it's kind of what we were referring to as the crop need. It's the expected application which factors in the amount of nutrient management acreage that is reported. If you look at the second term, the expected application rate, that is adjusted for a factor to account for acres not under nutrient management. So that is used in the first calculation that you see at the top. Then there's the recommended application, that's what comes from the land grant universities, and it assumes nutrient management is in place. So that's the recommended application, and then that uses the recommended application rate which is the application goal. The third one there is using the same information, basically, but it's factoring 100% nutrient management, and that's calculated for each crop type. So, this is the adjusted terminology that we were hoping to use in Phase 7, in place of the crop need, and I think we call the third one down application goal at the moment.
Bill Keeling: Except for pasture isn't really at recommended rates for nutrient management. At least Virginia recommends up to 2 applications of 60 pounds each. So, we need to develop a yield expectation for all crops including hay and pasture, so that we can then figure the nutrient going down in need.

Tom Butler: I understand what you are saying, Bill, because there's a nutrient management panel that said pasture is going to get 15 pounds an acre as it's expected application, but this would not allow you to get the credit for nutrient management because its already implicitly involved in pasture and hay. So, what you're saying is that we should be looking at putting a yield on pasture and hay in the same way that we do for corn and soybeans. Is that right?
Bill Keeling: Yes, then you can account for what's directly deposited on the pasture versus applied in excess or, additional land applications of manure to pasture.
Tom Butler: I think we'll have to discuss that a little bit more. This here is the application process.
Bill Keeling: With all due respect, I brought this up months ago, that this is needed. Ag is interrelated. What happens in hay can impact crop and vice versa. If you don't have one right, it's a zero-sum game, and the other can't be right. So, we need to fix this.
Tom Butler: That is something that maybe we bring up and ask everyone else here from the other jurisdictions where they stand with it. I think, today, if we can make a decision about this, then we can put that on a future agenda.
Scott Heidel (in chat): I am in agreement with Bill.
Ken Staver: If you look at CAST 23 and the way fertilizer N is being handled, we are looking at being a wash in N on our grain acres. To the zero-sum game, if we're underestimating what goes on a significant land use, then it all ends up on corn acres. We can look at our CAST 23 output going forward right now, and we've got a real problem with N on corn in terms of base loads. Maybe part of the problem is we've got the fertilizer sales, but we're not distributing it on some of these other land uses. If it wasn't for being a wash in fertilizer N in the CAST 23 runs, you wouldn't worry about it so much but given that, these things maybe do need a harder look.
Tom Butler: That's fair, and I understand that in many places you are never going to get to 60% of your crop need met for grain and silage with just manure, so you wouldn't end up applying the manure to your pasture or your hay. That is an obvious issue for every county, so I recognize there's a difference there.
Bill Keeling: It's a particular issue in our Shenandoah Valley which happens to be, if you look at what impacts D.O., one of our biggest loading areas from Virginia and an area we need to characterize as best as we can. Otherwise, we have what we have, but it doesn't really describe what's going on.
Tom Butler: We will send this out after the meeting and talk to the whole voting membership here and see how they want to proceed with that. Tim, you are the rep from Virginia, so I'm going to ask you to take lead on this one, if that's alright.
Tim Larson: Yes, that's correct. We've been having discussions about the curves and the uptake rates of these as an internal group, so we'll be continuing to discuss.
Tom Butler: Ok, thanks. Bill, I hope that gets to where you want to go.
Bill Keeling: Maybe in Virginia it's more descriptive if, in that curve, the second step is to hay and pasture and not to the other grains. Again, I believe we have mischaracterized hay and pasture in Phase 6, and we're not fertilizing it or applying manure in a way that is actually occurring in the real world. We've created a disincentive for part of our nutrient management program where we have pastures that need nutrient management. There's an argument that, hay, you don't get credit in the model, so why should we do it? There are benefits to doing it in this situation, and it should be rectified and understood if we're trying to get credit for the management actions, which is one of the big goals of the whole model.
Tom Butler: I appreciate that perspective, Bill. The way it's set up now is there's a default where everyone has essentially nutrient management credited on pasture. I think the recognition across the board here from people should also be that the way it's set up now, if you remove

that, there's obviously the potential moving forward that any of these changes could have a difference. If you were to remove it, and not report nutrient management on that extent of acres, you could have a different result. That's my understanding of what happened historically. If I'm wrong and someone here can correct me, please do. I think the intent behind it was that it was very difficult to find the yields and the information on pasture. Maybe we have new data and it's worth putting that in, but the way it is set up with yields and everything that we have, it's become very tricky to determine those yields of pasture and hay. If you remove that nutrient management rate, that is essentially a credit across the board now. So, I think that was where a lot of people were concerned as to what they would have for nutrient management for pasture. Obviously, Virginia does a good job on that is what you are saying.
Scott Heidel (in chat): Please include PA in the future conversation on pasture management.
Bill Keeling: It' unrealistic to say all acres of pasture are treated the same so, therefore, if we don't have a nutrient management plan, every acre gets fertilized 120 pounds of fertilizer every year. That's not realistic either.
Ken Staver: In the old days, they used university recommendations for applying N before we went to fertilizer sales, and the University recommendation on pasture was a pretty big number. Then somebody did some survey work and said the vast majority of pastures aren't getting anywhere close to that amount of N now. That was 20 years ago. So, some fix was made to deal with the fact that university recommendations for pasture wildly overestimated the amount of N that was being applied to pasture. Of course it's oversimplified, so I don't know what the in-between thing is. I think that's going to require somebody to go out there and figure out what's going on, and that's a lot of work for somebody.
Mark Dubin (in chat): The pasture recommendation was based on NM data from MD.
Bill Keeling: We have artificially separated ten versions of cropland, so I don't understand why we can't have two versions of pasture, one where it's managed and one that's not. Then it's just determining roughly how many acres fall in each bend, and nutrient management would be eligible on one of those at any rate. The yields, as far as I'm concerned, have been readily available. At least in the Virginia system, when I was planning nutrient management, there was expected yield on pasture and hay across all sorts of the soil series in Virginia. So, somebody wasn't looking if they couldn't find that.
Tom Butler: Mark, I think you've worked across the watershed on a lot of these, so maybe your perspective can give more than mine.
Mark Dubin: Yeah, the pasture-based application recommendation was a recommendation actually through a subgroup of the six states we put together. It wasn't originated from the nutrient management expert panel, it was basically from the state reps on the AgWG, and we looked at available data at the time. The best data we could find for the various states was through MD Department of Agriculture, which had data looking at actual application rates from producers on pastures. That was the data that the group decided on was the best available data at the time, and that's what the recommendation was on. So that's where that originates from.
Bill Keeling: As I remember what came out of the Ag Modeling Group was one thing and then that kind of got overruled by this group from the Ag Workgroup. That's where we ended up. As I remember, initially coming out of the AMT back then, we were looking at 60 pounds per acre for pasture and the issue was, yes, that's not being applied everywhere. Currently the way the model does things, it kind of gets applied everywhere. It's sort of like that peanut butter thin layer of manure that gets spread in some counties where there's really relatively little manure. We treat all acres the same when they're not.

Dave Montali: I think we need a primer meeting for this that says here's how we deal with pasture now and, to the extent we can explain, why. I am re-confused. The point I wanted to make was West Virginia does a lot of nutrient management planning on pasture in counties where there is a fairly large supply of manure, so it would be helpful to me to understand what I might ask from these people to help the conversation. Is there something that can be gleaned from all the nutrient management planning that they do that would inform what we should do in the model?
Tom Butler: We'll have to try and get that as its own presentation, and this is all within our purview. Maybe this can be part of a different presentation we have, where we get those types of answers to you.
Cassie Davis (in chat): Here are the pasture (and all field crops) guidelines for NY from Cornell
TP:http://nmsp.cals.cornell.edu/publications/extension/Pdoc2022.pdf
TN:http://nmsp.cals.cornell.edu/publications/extension/Ndoc2022.pdf
Mark Dubin: I agree with Dave. I think it's probably more that we could get in today with the agenda. So, I think if we can work up something here in a future meeting, that would probably be a good idea.
James Martin: I want to make sure this group understands the importance of the work that's happening here in the context of everything else that's happening within the partnership. We know ag, according to our current model, is where the vast majority of remaining reductions are supposed to come from. At the same time, the partnership is establishing an Agricultural Advisory Committee that will serve alongside the Stakeholder Advisory Committee and the Local Government Advisory Committee and STAC. They're going to be looking closely at how ag works in our modeling system and these types of assumptions that we've put into it. If we can't make improvements to our Phase 7 Model that more realistically represent agriculture, I think the partnership is going to have a lot of struggles with that new advisory committee. I'm not sure how much everybody on this call is involved at the other levels of the partnership, but there are a lot of things happening around agriculture. They're going to put a spotlight on the decisions this group is making and how ag is modeled in Phase 7. I'll leave it at that. Thank you for taking the time to consider this important topic.
Tom Butler: James, I appreciate that. Cassie, you made a comment in the chat, and I did see your hand.
Cassie Davis: Thanks, Tom. I was just looking for clarification on what data are we asking for for this?
Tom Butler: We don't necessarily know. I think the point behind this is to bring it up to make sure it is addressed. It sounds like this is something the group wants to look at, so we're going to have to meet offline, get together to find out what needs to be presented here so that we can take that information, share it with everyone, and figure that out from each jurisdiction. That is where I think this is heading.
Cassie Davis: Thanks.
Tom Butler: Having said that, do we feel like we've gotten to a better place on this? I'll be reaching out to people offline, and I'll be including all the jurisdictions in this, and we'll see where this ends up. It seems like we have New York, PA, and Virginia who have a pretty good amount of interest. We are now going to talk about some decisions. We have two of them. The first part is should the acres of grains with manure be determined using plant available nitrogen, and the second one is should the manure spread algorithm be modified to create a fourth group as shown in this presentation? The first thing we are going to discuss and try to make a decision on is should the acres of grains with manure be determined using plant available nitrogen? If

you agree with this, you are going to be a 5 or a 4. If you don't feel too strongly, a 3. If you wanted to see more, a 2, or if you don't agree, that's a 1. If you're giving a 2 or a 1, please provide the reasoning. I'm going to go through the sheet we had last month, one by one, and we are going to try and get some type of answer. I will reach out to those who aren't available offline, get the results, and we will know what happened in our recap email. I'm going to start here with Clint. Last month you were a two.
Clint Gill: We're a four. Reservations are the ones we always have. When this thing actually shakes out, our manure heavy counties work weirdly. However, that is a problem we also currently have, so we are comfortable moving.
Tom Butler: Thank you. Elizabeth, are you online? Is Alisha online? I will reach out to them offline. Cassie?
Cassie Davis: Four, and same reasons as mentioned before.
Tom Butler: Scott in PA? Last month you were a five.
Scott Heidel: Staying the same, thank you.
Tom Butler: Tim Larson, Virginia?
Tim Larson: For the plant available nitrogen, I think we're a four. I don't feel anyone had any controversy about that in our discussion.
Tom Butler: Dave, you were a four. Where are you now?
Dave Montali: The same, thanks.
Tom Butler: Jeff, you were a four. Where are you now?
Jeff Sweeney: Remain the same at four.
Tom Butler: Ken, you were a five. You had wanted to see the algorithm for the curve.
Ken Staver: I'm still a five on it being based on plant available N versus animal units. How you use it to determine manure acres is the second part of that, so I am still interested in that, but certainly a 5 on shifting from animal units to plant available N.
Tom Butler: We had Curtis stand in. Tamie this is your vote if you are here, but also Curt, either one. You were a three last time.
Tamie Veith: Unfortunately, I couldn't get in right at the beginning of the discussion this morning. So, if it's ok, I'd like to just review and chat with Curt and get back to you in a few days. It's looking good, I just need to probably double check.
Tom Butler: I'll check back in with you Wednesday next week. Candiss, you were a four. Are you still?
Candiss Williams: I'm going to keep the vote four and remain the same.
Tom Butler: Thank you. Alex, USGS?
Alex Soroka: Stay the same.
Tom Butler: Zach?
Zach Easton: Stay the same.
Tom Butler: Ok. We're going to wait until Wednesday next week and hopefully we have a resolution on this one. The second part of this is should the manure spread algorithm be modified to create a fourth group that was shown in the presentation? Again, that is having Group 1 be grain with manure and silage with manure. Group 2 having small grains, double cropped, other crops, and specialty high and low. Group 3 being other hay and pasture, and Group 4 being soybeans and leguminous hay. We had a lot of holds and there was a lot of data distributed, so I want to go through this again. Clint?
Clint Gill: We are a four with the same reservations as last time.
Tom Butler: Elizabeth, have you jumped on? Cassie in NY?
Cassie Davis: Four.

Tom Butler: Scott, PA?
Scott Heidel: Four.
Tom Butler: Tim in Virginia?
Tim Larson: We're still at a two. We still have concerns about the characterization of the pasture. I think the concern is less about the distribution curves than it is about the rates that can be applied to hay and pasture and the way nutrient management is credited right now. You sent us some data last Friday, and we're still sort of trying to get through that.
Tom Butler: Is there a time I can check back with you? I gave everyone until Wednesday for the last one. If you're doing data analysis, could I have that by Friday of next week?
Tim Larson: I think Friday next week is plenty of time. Thank you.
Tom Butler: Ok. Dave, West Virginia?
Dave Montali: I'm a four after reviewing the two West Virginia counties.
Tom Butler: Jeff?
Jeff Sweeney: Four as well.
Tom Butler: Ken?
Ken Staver: This got more complicated for me because I've been digging a little bit and, I'm worried about leguminous hay and soybeans never getting manure. I like the new top category, but this is not a change. This is the same it's always been, but when you and see how low the crop needs are, we're essentially not putting any manure N on legume, hay, or soybeans. One thing that happens when you put manure on soybeans, you basically have manure N displacing fixed N, so it opens up space for fertilizer N on corn. I'm still trying to figure out where we're going to put all this fertilizer N on corn.
Olivia Devereux: Is that a separate decision, Ken? I'm confused about the decision. Could you read out the decision again, Tom?
Tom Butler: Should the manure spread algorithm be modified to create a fourth group as shown in the presentation?
Ken Staver: This is a separate discussion, but if this is locked in forever, this is how we are going to spread manure, then when do you talk about it? That's the problem, right, and this is not what we've been focused on.
Dave Montali: I don't think we're locked in forever. If the best information right now says this looks good and two months from now we find a glitch and we have to go back, we could do something else.
Ken Staver: I hear you, but we are desperate to move on and not look back.
Dave Montali: That's kind of what I am thinking, too. We're going to have separate discussions about other things, and if we solve those well and are able to retain this decision, great. But if the decision we made before doesn't work with what we think we should do now, then we can go back and redo this as well. We've got until about May or June of next year or something like that to make our final decisions, I think.
Ken Staver: We've had these discussions a couple times over the years about manure going in places, because the reality of manure spreading a lot of times is timing and what's open land. We know that leguminous hay and soybeans gets the manure. What makes it really important is it reduces our total N because it's a zero-sum game when you put manure on legumes. You just have less fixation. I'm looking at the CAST 23 stuff and we have all this fertilizer N. I think we've got to really think about how things are working in a different way. I like the new number one. I still have concerns about the legume category never getting manure, essentially, because the crop need for those is five pounds per acre. So even if you meet 100% of the crop need with manure, it's only five pounds. So, you look at a state like Delaware that are broiler loaded,

soybean acres get one pound of manure N. We aren't putting it on anywhere if we aren't putting it on Delaware. If a four get's this thing over the hump, I'll stick with a four, and I just want it to be on the record I'm still concerned about legumes and manure.
Mark Dubin (in chat): Question - what is the prevalence of specialty crops receiving manure applications?
Tom Butler: I've got that in the comment here. Thank you, Ken. Tamie?
Tamie Veith: Can I let you know Wednesday with the other? I'm sorry I've had to miss the last couple of little bits.
Tom Butler: I appreciate you working with us, so I'll reach back on Wednesday for that. Candiss, you were a two last time.
Candiss Williams: 4
Tom Butler: Thank you. Alex Soroka?
Alex Soroka: Stay the same.
Tom Butler: Zach?
Zach Easton: I'll stay a 4.
Tom Butler: Thank you. Ok, so we've got three responses we're going to be reaching out for for that one. We will know the answers in a week's time. That is it for manure application.

Action: Tom will reach out, offline, to members not present and get their votes on using Plant Available Nitrogen to determine the acres of grains with manure.
Action: Tom will reach out to non-present voting members and to those who requested additional information, to get their votes on modifying the manure spread algorithm to create a fourth group by Friday, 10/18.

A summary of votes and comments are provided below:

Decision 1: Should the acres of Grains with Manure should be determined using Plant Available Nitrogen?

Passed by consensus- The new method will be employed for Phase 7.

Role	Name	Affiliation	Vote	Notes
Signatory	Clint Gill	DE	4	not sure how the overall impact will work in manure heavy counties.
	Alisha Mulkey	MD	4	
	Cassie Davis	NY	4	not sure how the overall impact will work in manure heavy counties.
	Scott Heidel	PA	5	
	Tim Larson	VA	4	Nothing controversial
	Dave Montali	WV	4	
	Jeff Sweeney	EPA	4	
At-Large	Ken Staver	UMD	5	wants to see the algorithm of the curve for determining manure acres (sees as a part 2)
	Tamie Veith	USDA-ARS	4	
	Candiss Williams	USDA-NRCS	4	
	Alex Soroka	USGS	4	
	Zach Easton	VT	5	

Decision 2: Should the manure spread algorithm be modified to create a fourth group as shown in this presentation?

Not passed by consensus - No change will occur from Phase 6 regarding the application curves for manure.

Role	Name	Affiliation	Vote	Notes
Signatory	Clint Gill	DE	4	
	Alisha Mulkey	MD	4	
	Cassie Davis	NY	4	
	Scott Heidel	PA	4	
	Tim Larson	VA	2	concerns about pasture
	Dave Montali	WV	4	
	Jeff Sweeney	EPA	4	
At-Large	Ken Staver	UMD	4	step in the right direction, worried about legumes not getting manure
	Tamie Veith	USDA-ARS	4	
	Candiss Williams	USDA-NRCS	4	
	Alex Soroka	USGS	4	
	Zach Easton	VT	4	

Crop Yields 09:40-10:10 [30 min (10 min presentation 20 min discussion) (Joseph Delesantro, ORISE; Tom Butler, EPA)

We discussed the results of adding in updated crop yield trends progress being made to improve long term crop yields. This included a fix to the trends which had previously predicted a lower yield then would be expected. Decisional.

Decision:

- ***Should this new statistical framework be used to determine long term crop yield trends?***

Discussion

Tom Butler: Scott, I recall that you had a question in the office hours and that Joseph was better equipped to answer that. Did you want to follow up with that?

Scott Heidel: My concern was that the trend line continues to increase, yet it's going to need to plateau out at some point due to just the limitations of the resource. So, I just wanted to touch base on that, and what was conveyed is that you use the last year of data rather than projecting this infinitely growing trend line forward. I just wanted to verify if that's correct and if we could have that explicitly written out somewhere.

Tom Butler: Yeah, and I think Jess indicated that's what we did, so I will just call upon you again to say what you had said earlier.

Jessica Rigelman: Yes, that's correct. Yields at this point are of 2022 and 2022 yields would be carried forward unless this group were to change that decision. But that is the decision at this point, correct.

Joseph Delesantro: If we decide to move forward with this decision, we'll be basing these yields on a model, and that provides us with options if we would like to try to project yields forward. But, certainly, we do not need to do that. We could keep with the current method of using the year. It's just up to the group to decide how to move forward.

Scott Heidel: I'd prefer not to try to project this out based on continued growth. I truly do believe you are going to reach a point of maximum yield at some point. I think we're probably pretty darn close to that.

Joseph Delesantro: Yeah, I've played around with that projection and just because of the effects of climate change, we do see a tapering off of the yield in the projections. Certainly a lot of uncertainty in any projection.

Scott Heidel: Thank you very much for hearing that.

Ken Staver: The projections are short term. They're like a five-year projection forward, right? It's not like we project 20 years out, do we? Somebody does, but that's not what we do.
Tom Butler: This isn't projecting, this is last year's carried over.
Ken Staver: Right, so this is just basically the last year we have data, how do we go from 2020 with data to 2025 with no data. Is that what we're talking about here? I think in the grand scheme of things it doesn't matter than much. If we're saying things are going up a little bit, then we have to plan for a few more BMPs than we would if we say things stay the same, just flatline, for five years. So, the worst-case scenario is we do too much. I don't think that's something we have to worry about.
Scott Heidel (in chat): My other question is are we shifting to county from regional?
Tom Butler: Ok. Thank you for the perspective there. Scott's other question is are we shifting from county to regional? Maybe you can elaborate?
Scott Heidel: Yeah, you had listed out Lancaster County. I fully agree Lancaster County is a bit of an anomaly, even within the region that it's listed at. So, are we shifting completely to county throughout the entire jurisdiction, or how's that getting factored in?
Joseph Delesantro: If you go forward a slide to that decision tree, these are the different options which include a county level model using only the yields from that county and predictors from that county. Then we have other potential options that basically use a regionally fit model where there's not enough data for those specific counties. In the growth region PA3, counties that have a lot of corn and have high rates of responses to the survey are going to be modelled at the county level. Chester and Lancaster at least for corn, and I don't know how exactly it shakes out for all the other counties in Pennsylvania, but those might end up being modelled regionally. There are two sets of criteria that decide how we move down this decision tree, one of which is the amount of data we have in the census for that county and then the other essentially is a goodness of fit metrics comparing across the different options of models for that county's yield. Does that answer your question, Scott? So, we're not going to the county level for all crops and all counties. It's dependent on the availability of data, the amount that that crop has grown in that county, and the goodness of fit.
Scott Heidel: I do appreciate your explanation. I do think it's going to enter a level of complexity to the modeling that has me slightly concerned.
Tom Butler: Thanks, Scott. That's important to note that, yeah, we do have certain complexities here and if we get past that, I want people to let us know. It sounds like we are close.
Tamie Veith: I was thinking, where you don't have county level data but you're nearby, you could use the county level data you do have for nearby counties or surrounding counties. That might be helpful in keeping there from being huge jumps in prediction data and discontinuities. But I agree with Scott that all of that could really add a lot of complexity. So, I guess I'm wondering have you thought about maybe some combination? Not during the modeling, but upfront, if there are enough county level data within a region to adjust the regional model based on that county level data and then just apply it across. I don't know if that would be helpful or not.
Scott Heidel (in chat): No offense but I disagree with using proximity data based on a higher loading county
Joseph Delesantro: I'm not 100% sure I am following with the details, but I can explain how the regional fit is based on the Chesapeake Bay Program growth regions. So those are very close to each other. Some of the growth regions have a lot more counties in them than others, but some of them only have a handful of counties. In that case, we can see the different colors here are showing different growth regions, and so first we're saying is there enough data in this county to do a county level model? If not, we'll do a model of yields within this growth region, but the

predictors are still at the county level. Does that work? If not, then we fit the model at the growth region, we apply the growth region level predictor. So, it's essentially the growth region average to yields.

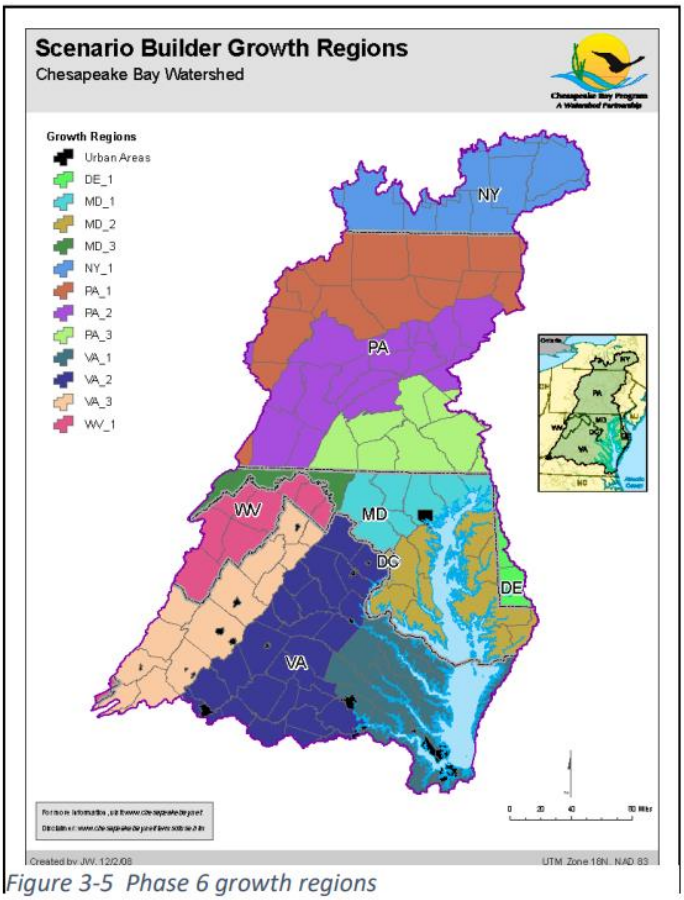

Figure 3-5 Phase 6 growth regions

Tammie Veith: Yeah, and it looks like Scott has a concern about using a proximity along with a higher loading county which, yeah, I could understand with these growth regions. Sounds like you got it thought out well.

Candiss Williams (in chat): What's the magic number for 'enough' data?

Joseph Delesantro: The magic numbers, I can pull them up, but essentially it was done by trial and error in order to get something that was producing good values across all these crops and counties. But essentially what we were looking for is the percentage of total crop land in that county that is being reported in the census. If corn is a lot of your cropland in the county, then we'll go ahead and look at the county level model, but then there's also the goodness of fit metric. That's the root mean square error that's compared to the regional model as well To Scott's point, there is a bit of complexity here which did require that trial and error to get criteria that created yields that were consistent with time and well fit to the census data.

Ken Staver: For the most part, for the major crops that cover most of the ag acreage, are going to be based on county level data. Is that a reasonable statement, or not? Is that what we are taking away? We have all these minor crops, and we have so few counties that don't report corn, soybeans, and wheat, things like that. Overall, isn't most of our production in the Bay watershed covered by annual county data?

Joseph Delesantro: We're definitely using the annual county data. Sometimes it's just aggregated at the growth region. This is survey data, and we get unreasonable values, so aggregating at the growth region provides what I think is better data, more reasonable reporting. Once we run through this decision tree, how often do we go down each of these different paths? If that's something people want to see, I can go ahead and put percentages on each of these arrows as well, but I think that it's probably not that most of the data is using the county level model fit to all the county level predictors. I think that a lot of it is still using this growth region fit yields to deal with that noisiness in the county level reporting of the census.
Ken Staver: I thought it was more of the smoothing part was where you dealt with that, not so much going to the regional data, but I guess I'm good for now.
Scott Heidel (in chat): This seems like a great opportunity to develop a satellite imagery remote sensing/machine learning model to determine crop type and double cropping
Gary Shenk (in chat): I think you'd find a lot of people would support that, but it will take a few years. Phase 8!
Alex Soroka (in chat): How far along is cropscape to being useful here? We found it accurate with some of the major crops in the last ~5/8 years or so (In MD and DE)
Ken Staver: Just to be clear, this yield is the yield the farmer expects?
Tom Butler: Expects, yeah.
Dave Montali: That was my question, too, this looks like actual yield.
Tom Butler: This is what they're expecting.
Dave Montali: This is expected, ok. What's that blue line going up and down?
Joseph Delesantro: The blue line is sorghum, and it's a pain. The sorghum is difficult because there's a lot of year-to-year variation because it might be harvested for grain, or it might be harvested for silage and there's just not a lot of it grown, especially in places like Pennsylvania. There's a lot more year to year variation in sorghum than I would like to see in the way that the model predicts that yield expecting application, and if we wanted to do something sorghum specific and say, well, let's just put a straight line through, that would be something I could easily do for sorghum. If you look at where the dotted blue line is for the old method, that is an absurdly low yield. I couldn't reproduce that value. The mean census yield for Lancaster sorghum is about 75 over this period, so this blue line, despite its year-to-year variation which is not great, does represent a much better yield and much better average yield or attracting application than the old method, I believe.
Dave Montali: Ok, thanks. My eyes went to that, but that's the unique issue with sorghum and then the other lines do look like they're relatively smooth, so ok.
Joseph Delesantro: I didn't want to apply a rule only for sorghum on my own. If that's something that you all want to drive then by all means, but as this method stands right here, we're using the same block of code for all crops and counties. We could add some rules on the end if needed, but I wanted to use that standardized approach to whatever extent possible.
Dave Montali: One real quick question, is the sorghum issue watershed-wide or is this unique to Lancaster?
Joseph Delesantro: It's less of an issue where sorghum is grown more heavily, but it's pretty much a watershed-wide issue.
Dave Montali: Ok, thanks.
Joseph Delesantro: When you think about corn, there's a small percentage of corn acres that might be harvested for grain or might be harvested as silage, but for sorghum, the percentage that might go to grain or might go to silage seems to be much higher.

Tom Butler: Were there any other questions, comments, concerns? If not, we are going to be doing the same thing we did before. The question will be, should this new statistical framework be used to determine long term crop yield trends? I'm going to start with Clint.
Clint Gill: I'd say we are a four.
Tom Butler: Cassie in NY?
Cassie Davis: Four.
Tom Butler: Scott, PA?
Scott Heidel: I'm sorry, Tom, I just want to see this played out. I'm going to have to go with a two. If you could link up with me and provide me some model runs, I just want to see how modeling specific counties compared to regional runs is going to affect the outcome of the model.
Tom Butler: Ok, I'll reach out to you offline.
Scott Heidel: It really just looks like putting Lancaster in outside of whatever region it currently is loading at, is going to potentially blow up the numbers. I just want to get a visualization of what that's going to look like.
Cassie Davis (in chat): I would be interested in those results too.
Alex Soroka (in chat): Same
Tom Butler: Alright. Cassie, I'll include you on that and Alex as well. Tim, Virginia?
Tim Larson: I think we're at a two, but that's only to look at the outputs you sent us last week. So, we'll look at that as well and get back to you. I don't have any specific concerns except that we just will review them and make sure everything's looking good.
Tom Butler: Ok. I will check back with you again Friday if that's ok.
Tim Larson: Yes sir, thank you.
Dave Montali: I'm a five. I think this is a perfect solution and also recognizing that we could add rules at the end like Joseph said for sorghum or anything else that kind of jumps out and needs an alternative approach. For the biggies, I think this is a perfect solution.
Tom Butler: Thank you. Jeff?
Jeff Sweeney: Four
Tom Butler: Ken?
Ken Staver: I guess I'm a four.
Tom Butler: Tamie?
Tamie Veith: Four. I'm interested also to see how the runs go with the regional, but it looks good.
Tom Butler: Candiss?
Candiss Williams: Four as well. I, too, would like to see the runs.
Tom Butler: Scott, I am going to have to get some specifics on these runs for everyone. Alex?
Alex Soroka: I'm a five. Really excited to see the progress in the yield model.
Clint Gill (in chat): I would also like to see Sussex county specific data if available, but I'm going to remain a 4
Alex Soroka (in chat): Yes, I think that the model runs should show at least a county from each jurisdiction, ideally a representative or a higher yield county
Tom Butler: Zach?
Zach Easton: Five as well. I think this is great.
Tom Butler: Alright. So, Scott, I'm going to include a bunch of people in that email and we're going to ask you exactly what you want and hopefully get some answers there.
Scott Heidel: Alright. Thanks, Tom. Trust me, I want the model to be as accurate as possible. I just want to see what level of complexity that this leads to and whether or nor we can replicate it here in house.

Action: Tom will reach out to members not present to get their votes on using the proposed statistical framework to determine long term crop yield trends.

A summary of votes and comments are provided below:

Decision 3: Should this new statistical framework be used to determine long term crop yield trends?

No decision reached – Data reviews under way meaning the topic will be revisited in November.

Role	Name	Affiliation	Vote	Notes
Signatory	Clint Gill	DE	4	I would also like to see Sussex county specific data if available, but I'm going to remain a 4
	Alisha Mulkey	MD	2	provide model runs to see how specific counties vs regional runs effects model
	Cassie Davis	NY	4	provide model runs to see how specific counties vs regional runs effects model
	Scott Heidel	PA	2	provide model runs to see how specific counties vs regional runs effects model
	Tim Larson	VA	2	look at outputs again
	Dave Montali	WV	5	good solution and can add rules if needed at the end for specific cases that need altenate approaches
	Jeff Sweeney	EPA	4	
	Ken Staver	UMD	4	
	Tamie Veith	USDA-ARS	4	provide model runs to see how specific counties vs regional runs effects model
	Candiss Williams	USDA-NRCS	4	provide model runs to see how specific counties vs regional runs effects model
t-Large	Alex Soroka	USGS	5	provide model runs to see how specific counties vs regional runs effects model
	Zach Easton	VT	5	

Industry Data 10:10- 10:55 [45 min (10 min presentation 35 min discussion) (Paul Bredwell, US Egg, and Poultry)]

Paul requested that the group decide on the potential to collect relevant production information directly from the poultry industry to update, replace, and/or supplement existing model data sources. Decisional.

Decision:

- ***Should new data sources from the poultry industry be incorporated into nutrients calculations in CAST?***

Discussion

Dave Montali: Back with Poultry Litter Subcommittee and your characterizations of broiler, litter, generated pound of bird weight, can you say anything about the percentage of respondents that were operating farms with clean out methods per flock, versus more modern methods of allowing it to build up? The work that was done and used for phase six is our gold standard. What was the house management characterization of that litter?

Paul Bredwell: If the question is is there a common practice, I would say no. I think the trend now is to operate on more built-up litter rather than clean out after every flock, but those decisions are made by the producer. They deal with the live operations people, the field techs that go out there and support them, but I don't know that I could say they're cleaning this out on a yearly basis or three months for every flock. For the turkey industry, typically what will

happen is when they bring poults into a farm, let's say it's a two-stage farm, they'll raise those poults to a certain age on new litter. They pretty much typically harvest that litter and move it to a second barn while they continue to use it. That's really not going to be the same for the broiler industry because we don't raise broilers in a two-stage fashion. That's what I can share with you, but we could go back and get that data from the researcher who's over at Virginia Tech.
Bill Keeling (in chat): For years I have seen various turkey types listed in permitting data and NM plan data but CBP only had a single type. It is good to see some real data on the various turkey operation types. See that as a real improvement.
Dave Montali: So, we have a characterization that we're using in our model for both the amount of litter that we get and the nitrogen or the nutrient content. My big picture question is, that work that was done and is existing in the model, is there conservation of mass? Is it good enough to use in the future? Is there any way to refine that data? Because what I'm hearing is that, because of the move towards more management by built up litter, there's less litter in the watershed to deal with. I don't know if there's less litter at the same mass of nutrients. I just don't know anything about the mass. That's where I am struggling.
Paul Bredwell: I think the trend is, yes, to go to built up litter so intuitively that would say there's less mass out there. But intuitively, that would also say that potentially there's more N and P concentration within the built-up litter. All these variables are really not known well, and my hope is that we can get a better understanding of what those variables are and how they vary from one farm to the next. If we were to move forward with something like this and we found out there was more nitrogen and phosphorous coming from the poultry industry due to the current litter management technologies, the industry would be responsible for that. One of the main concerns of the industry now is do we have the most accurate set of data, and do we feel comfortable with the responsibilities and the burdens that will fall on the poultry company with a data set that's lacking accuracy for what we know we could get. The industry's not going to shy away from responsibility, we just want to make sure that if we have an opportunity to get the best data set in there, we do.
Clint Gill (in chat): Our litter nutrient concentrations are going up in DE, but we don't have a great understanding of clean out schedules and tonnage actually moved out of the house. We're working on solutions to try and characterize this.
Tim Larson: Will the Bay Program then have access to or be able to see the individual sample test results for litter nutrient content? You said you have a Virginia Tech researcher. Would they collect all the samples, aggregate, and then send forward aggregated results to the Bay Program? What is the kind of mode here?
Paul Bredwell: I don't necessarily see an issue with providing the nutrient content data. Our only concern is that we protect the privacy of the farms. If we can develop a better overall nutrient content for the litter that's being generated, I think that's the goal here. So, I don't see that there would be an issue with providing the raw data, but I think it obviously is going to have to be washed of any private information.
Tim Larson: Sure, and in Virginia we also collect a lot of individual samples. We have a litter transfer program. They're required to send us lab result, so we have additional samples. I just think it would be interesting to have access to that. I wonder if our samples and your industry samples could be aggregated together. At least in Virginia's case, that data exists, and it would be worthwhile to have more samples. Thank you for that answer, and I look forward to going forward with this.

Paul Bredwell: Thanks, Tim, and I agree with you. If the states have data that we can use, we obviously need to compare it, and if we don't have to collect data we don't need, that's going to cut down on the burden and the cost as well. So, I agree with you.
Mark Dubin (in chat): The VA litter analysis data was shared with VADCR.
Clint Gill: In Delaware, we also have free litter testing for all of our poultry growers. Over the years, we've been seeing our concentrations go up as a result of the management of litter. With the wind blowing, you blow off some nitrogen, but the phosphorous isn't going anywhere. We've been seeing our concentrations steadily move up. We had a dip when one of our integrators moved to miscanthus, so full cleanouts, and then replaced with miscanthus. You've got fresh bedding there, so concentrations are going to be lower, but we also don't have a really good characterization of what's coming out of the house as opposed to what used to come out of the house. We can get the concentrations, that's no problem, but we only have half of the puzzle, and that other half of the puzzle is just as important.
Paul Bredwell: Great comment, Clint, and I agree with you. I think it's intuitive that these concentrations are going to go up if we're extending the clean out cycles. The feed conversion ratios for the poultry industry now are much than they were back in 2010/2015. There will come a day that our feed conversion ratios will be below one. So that factors into this, too. If we're feeding these birds less nitrogen and less phosphorous, that's going to be a factor in the concentration we're seeing and if we can compare samples that we take under this potential project with the states, that makes all the sense in the world.
Mark Dubin (in chat): We used Clemson University Lab and followed a similar analysis process so it was compatible with the VADCR NM program database.
Clint Gill: That's a great point, Paul. We need nutrient use efficiencies across the board.
Tom Butler: If Paul were to go out and do this effort, I think there would be some desire to have the backing of the partnership. Our last voting item here is should new data sources from the poultry industry be incorporated into nutrients calculations in CAST? I'm going to put this up here for a vote now. Clint?
Clint Gill: I would hesitate with the wording of the question. I think we definitely should seek these nutrient numbers, but if we can't get both halves of the equation, I don't know if it should automatically be incorporated into CAST. I feel like I need to see what we're actually getting. I support the effort, and I assume I will probably be involved in some of that effort, but I don't know that I would agree with the blanket should be incorporated.
Tom Butler: Ok, so that might put you at a two on this?
Clint Gill: If the question was worded differently, I would be there. But this seems to indicate that it's going to be included regardless of whether or not we can get satisfactory data.
Tom Butler: Ok, that's fine. Let's run down the list and see where everyone else is and if we want to change the wording, we can talk through that. Cassie?
Cassie Davis: Clint brought up a great point, and I would agree with changing the wording.
Tom Butler: Is this where everyone on this list is kind of trending? We shouldn't necessarily just incorporate it?
Dave Montali: I think that Clint says it very well. On both sides of the equation, we need to recognize that what we did in Phase 6 is our default and we also need to recognize that we've got a very short time. I'm all for using industry data, but can we get the data in the time we need? If we can't, then we're kind of stuck with Phase 6 on both sides of the equation. It's a mass balance.
Tom Butler: So, it looks like we're getting a lot of twos. I'm just going to run down the list. Cassie, you were a two, Scott a two as well. Tim I assume you are a two?

Scott Heidel (in chat): Any potential new data sources need to be reviewed before inclusion but yes, they should be investigated.
Olivia Devereux: Is there a way to rephrase the decision following what Clint said? Is there a way to rephrase it so that we can know what direction we're moving in, since it is pretty clear that, as written, it is not going to be approved?
Tom Butler: Yes.
Alex Soroka: Tom, if you take "be" and say "be considered for", that would probably move it to approval.
Tom Butler: This is a lot of work, talking to people, and if the information were to for some reason not be used, I think that would not be the intent of what Paul coming here is to get. I think Paul is coming here to get approval that it would be used, so he can take that to collect the data. Paul is that along the lines?
Paul Bredwell: I understand the reservations. I hope you all understand how much effort would go into this. There's a large effort just collecting the population. They have to go back and set up spreadsheets, harvest all that data, not only for this year, but years past. So that's a lot of information. But then the ask would be that they have to get their live operations people on board. To give just a quick sense of the protocol, the protocol is that 30 operations need to be visited, these questions asked, the data collected per bird type. So, while we can stretch that out over the integrators, it's still a big ask. I'm willing to ask the questions. I'm willing to make the appeal to them. I'd just like to have a little better sense that there is a real chance of this being used if we can collect this information, but I get the concern.
Clint Gill: I think we're probably not going to come to a conclusion this month, and I think we're going to work on this offline. But, Paul, I would say not used and not useful are important distinctions. Getting that information, regardless of whether we use it or not, would be really helpful to us as states, and maybe to the industry as a whole.
Paul Bredwell: If we collect the information and it's verified statistically, it would be used even if it doesn't paint a good picture. I'm committing for the industry that we would stand behind this if it looked poorly on the industry, and I would ask for a commitment from you all that the same commitment would be that if loads are higher and you as individuals have to on a state level deal with higher loads, you will accept that.
Clint Gill: I would say that, as a state, we are willing to accept that as long as we are confident that the data is correct. I know that you are making a good faith effort here, and I want to assure you that we are, too, but these are big questions. This is a lot of nutrients we are looking at, so I don't want to take it lightly.
Paul Bredwell: I agree. I am being 100% transparent here.
Tammie Veith: I think that, to some extent, maybe it's just how we read the question. It seems like having the new data to be considered to be used in CAST and how to incorporate it at all, would be helpful. We're just not going to blindly put it straight in and say this is the new answer. The pure data, straight through, we're going to use it. I'm thinking back to the previous discussion. Maybe it gives us some county level information, in some cases we still need regional assessments because we don't have enough. Maybe it's that kind of a qualification.
Alex Soroka: I think it's really great that the industry wants to take part in this. I think that's fantastic, and it's one of the only ways we could really move forward. I would be interested to know what the timeline is because it sounds like Paul needs a definite yes. Then from that point, how long would the data take to gather? Then what would it look like for inclusion in terms of could we actually incorporate it for the next phase?
Tom Butler: Paul, I think you need a yes now. Is that correct?

Alex Soroka: Today or next month?
Paul Bredwell: I think part of the question needs to be for the modelers, but we need it quickly. The one good thing I will point out is if we're going to ask industry representatives to collect the information, it connects the process because we don't have a team of say five having to go out to 30, or whatever the number may be. We can spread that out over live operations people with each company, so I think that will expedite the data collection process. It was my understanding from earlier conversations that we needed this information by sometime next summer. Tom, I don't know if my recollection is correct or not.
Tom Butler: You are right. We have to have all of our data in by November. That means everything. So, this data would have to be collected between January and July of next year, which I think is still possible. But the timeframe for us being able to do that is shrinking. So, from the logistics of our group's timeline, we need it now. Unfortunately, we've made no decisions and we're two years in. Although, we are close on a lot of things. So, I do appreciate that, and I know everyone is putting in effort. We would need this more or less along the lines that we're working for these other decisions- next Wednesday, next Friday. Ideally today is the day that we would be having this done.
Dave Montali: That goes back to my question. If you got the go ahead today, when could we expect some results? We've got this real timeline. I think Tom was giving you that, saying we need to have it all by November, but that might even be a little bit too long. If we're going to get new information to use, we need it in the summertime.
Paul Bredwell: I want to clarify- you are talking about November of 2025, right?
Tom Butler: Yes.
Paul Bredwell: If I have some assurance from you all that you're truly going to consider this data, I think we could start to see data come in maybe February.
Tom Butler: The phrasing of the question seems kind of more in line with what we need for the answer for Paul here, and that's that there is at least a very reasonable and almost completely concrete assurance the data would be used. Given that that is the wording of it, and given that we've heard the timeframe, how are people on the vote?
Dave Montali: The question from Paul is really simple. If we get quality data, will we use it? In my mind, absolutely. We're trying to figure out how much manure we have in the watershed. So, it's an easy answer for me if that's the question.
Tom Butler: I'll put you at a 4 or a 5. What do you want, Dave?
Dave Montali: If we get new better data in the time we have, we are absolutely going to use it. How would we not?
Tom Butler: Ok, then I'll put you at a four. Jeff?
Jeff Sweeney (in chat): EPA would like to vote "4". I was personally involved with the original change in how we use poultry information. It was valuable for the model and I strongly expect the quality of the data will be the same.
Tom Butler: Jeff's a four. Ken, you've had some comments, I think.
Ken Staver: I didn't really get a strong sense of what our big miss is and what we're currently doing with poultry nutrients. What I heard a bunch of people say is we do all our nutrient management plans, and we get litter samples, so we have quantitative analysis of nutrient availability per ton in litter that's field applied. We have a lot of data sets on what's going to the field. So, it seems like the thing that's missing is the tons. If we're not happy about something, it must be about the tons part of it, not the quality part of it, because we've had hundreds of samples per year around the watershed on litter quality. You don't want to do all this for a 5% change in our estimate. What is it that we really don't know? I guess I have to sit at a three from

a standpoint of feeling like we're asking for something, and we haven't really decided what we need. The one thing I thought the industry could be helpful on is they could do the P mass balance from a nutritional standpoint of birds produced and feed fed phosphorous. We could nail down the phosphorous really well and, long term, a lot of our manure problems have to do with excess phosphorous. We could tell how much phosphorous is in the waste. So that component of this I would say, absolutely, yes.
Tamie Veith: Four.
Tom Butler: Alex?
Alex Soroka: Put me at a three.
Tom Butler: Zach?
Zach Easton (in chat): I am supportive of inclusion of new data sources, but we have not approved any AMT items without running through CAST first.
Zach Easton: I am supportive of the effort, so if it helps get it off the ground, I'll be a four. But, I don't think we should approve blanket incorporation without seeing the data first.
Tom Butler: Ok and Tim, you were similar to Scott or to Zach?
Tim Larson: I echo them. Whatever data set we get will be informative at a minimum and, perhaps, the first year when we review the outputs from CAST, we may or may not incorporate it, but we give them feedback for why we don't incorporate it and they could give some requirements or ability to improve the data set for the next year. So, I think the effort is worthwhile.
Hunter Landis: Tom, can I ask you a question about Ken's comments? Looking at the presentation from Paul, I thought maybe some of the questions we were unsure about are your realistic bird numbers and, therefore, volume of potential litter. Not necessarily the nutrient concentration, but volume. I thought maybe the proposal is that this industry data could help give us more accurate bird numbers and, therefore, volume of litter. Ken, are you suggesting that you think what we have is the best?
Ken Staver: I guess the question is are we talking about fixing the Hillandale deal with industry data? If that's the case, then absolutely, I'm for the industry data. Three feels too low. Maybe you should change me to a four to be supportive, but I guess if it fixes Hillandale situations then absolutely, yes. Seems like fixing Hillandale is pretty simple, right? Do we have to go through all this to fix Hillandale?
Tom Butler: Well, it would be another source of information, I think.
Scott Heidel (in chat): Please change PA to a 3
Tim Larson (in chat): I'm a 4. I didn't actually answer before. But need to have a data review before final inclusion.
Alex Soroka (in chat): Tom, move me to a 4, there will still be a review step.
Clint Gill: Cassie is off the call now, so we are going to be stuck here no matter what. I propose follow-up over email and try to get Paul an approval to move forward by Wednesday next week. Paul, is the agreeable to you?
Paul Bredwell: That's fair. I am good with that, Clint. If it's the numbers, the animal numbers, that's the data point that I'm the least concerned about. It's the farm numbers that are going to be the bigger hurdle.
Ken Staver: In terms of your work, what is the overall level of effort to get it?
Paul Bredwell: The ask and the work effort will be high, yes. I'm not nearly as concerned about engaging upper-level management as I am getting them to make the commitment to get field techs out to collect other data points.

Ken Staver: Paul, if you look at our effort here, what's your sense of what we're getting the most wrong? Does the industry sit back and say they really have this wrong, or they don't have that?
Paul Bredwell: If I said wrong, I didn't mean to. More accurate is all I am saying. The only thing I can do is look at the Turkey project and it was pretty striking to find that manure generation rates were that far off. I'm not saying the generation rates that are now being assigned to the broiler industry are that far off, but if we have an opportunity to validate them, why wouldn't we do that?
Bill Keeling (in chat): From my experience the 5 year Ag Census animal data should not be considered accurate. We have counties where permit and NM plan data conflicts with NASS. The industry data can only improve the data being used.
Olivia Devereux: I just would like to get some clarification. I believe we are only talking about poultry, broiler, pullet, turkey, and layer animals. Not all animals. Can I just get confirmation that that's true?
Tom Butler: Yeah, so this request is poultry only.
Olivia Devereux: So we're not talking about the other animal types that are going to have to get addressed at some point?
Tom Butler: This one is specific for this poultry effort.
Ken Staver: The big ask sounds maybe not even doable from a timeline standpoint. If I heard Paul right, he said the production numbers would not be as difficult just to get that. Maybe a subset, rather than the whole shebang?
Tom Butler: It's up to anyone here to propose whatever way they want this to go. I think the thing that I've heard is that there's a desire to try and get the whole picture and that maybe grabbing parts here and there was not what people wanted to do.
Dave Montali: If we just keep running on NASS annual production, that's the least of our concerns. My concerns are the quality and quantity, that's the big thing.
Tom Butler: I'm going to take this to an email chain offline and if we can't reach anything by Wednesday of next week, I think we know where this is. Paul, I really appreciate the time.

Action: Tom will follow up with members over email and work to reach a consensus on the incorporation of poultry industry data sources into CAST nutrient calculations by Wednesday, 10/16.

A summary of votes and comments are provided below:

Decision 4: Should new data sources from the poultry industry be incorporated into nutrients calculations in CAST?

> **No consensus was reached – There will not be an implementation of the proposed item. Data from Phase 6 will still be used.**

Role	Name	Affiliation	Vote	Notes
Signatory	Clint Gill	DE	2	support effort; not direct blanket incorporation, wording indicates inclusion, we need all sides of the equation and a short time to get the data.
	Alisha Mulkey	MD	2	support effort; not direct blanket incorporation, wording indicates inclusion, we need all sides of the equation and there is a short time to get the data.
	Cassie Davis	NY	4	Would like to have a thorough review before incorporation.
	Scott Heidel	PA	3	would be a 5 if everything could be updated at the same time, without this there are concerns with issues of updating just parts such as only litter generation.
	Tim Larson	VA	4	wants data review before final inclusion, data would be informative and we might provide feedback on further data.
	Dave Montali	WV	4	
	Jeff Sweeney	EPA	4	
At-Large	Ken Staver	UMD	4	mass balance from the industry. If it fixed populations then yes.
	Tamie Veith	USDA-ARS	4	
	Candiss Williams	USDA-NRCS	4	I think it is a good idea to collect data from the poultry industry BUT there needs to be some type of check and balances in its use. I think it is important to set criteria because industry also has a 'leg' in this issue which means that the data could also be shared in a way that supports them. So my vote is yes but with caveats (4).
	Alex Soroka	USGS	4	wants to see review
	Zach Easton	VT	4	supports effort , supports seeing data first

Recap/Closing 10:55-11:00 [5 min (Zach Easton, VT)]

Action Items:

- Decide: Phase 7 crop yield trends, manure application and acre calculations, and if there is support for using industry data.
- Prep comments for Fertilizer in November.

Adjourn – 11:00

Up Next:

Office Hours: Friday, November 8th, 2024, from 8:00 - 9:00 am.

AMT Meeting: Friday, November 8th, 2024, from 09:00 - 11:00 am.

Participants

Zach Easton, VT
Tom Butler, EPA
Caroline Kleis, CRC
Olivia Devereux, Devereux Consulting
Mark Dubin, UME/CBPO
Tim Larson, VA DCR
Jeff Sweeney, EPA
Candiss Williams, NRCS
Cassie Davis, NYS DEC
Eric Hughes, EPA
Curt Dell, USDA-ARS
Helen Golimowski, Devereux Consulting
Gary Shenk, USGS/CBPO
Scott Heidel, PA DEP
Paul Bredwell, US Poultry and Egg Association
Ken Staver, UMD Wye
Kate Bresaw, PA DEP
Clint Gill, DDA
Alex Soroka, USGS
Ruth Cassilly, UMD CBPO
Jessica Rigelman, CBPO Contractor
Bill Keeling, VA DEQ
Tamie Veith, USDA-ARS
Dave Montali, Tetratech
James Martin, VA DCR
Joseph Delesantro, ORISE Fellow/EPA-CBPO

**Common Acronyms

AgWG- Agriculture Workgroup

AMT- Agricultural Modeling Team (Phase 7)
BMP- Best Management Practice
CAST- Chesapeake Assessment Scenario Tool (user interface for the CBP Watershed Model)
CBP- Chesapeake Bay Program
CBPO- Chesapeake Bay Program Office (houses EPA, federal partners, and various contractors and grantees working towards CBP goals)
CBW-Chesapeake Bay Watershed
CRC- Chesapeake Research Consortium
EPA- [United States] Environmental Protection Agency PSC
– Principals' Advisory Committee (CBP)
STAC- Scientific & Technical Advisory Committee
TMDL- Total Maximum Daily Load
WQGIT- Water Quality Goal Implementation Team