



Chesapeake Bay Program
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Agricultural Modeling Team Meeting Minutes

February 27, 2026
8:00-11:00AM

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Summary of Actions & Decisions

Decision: The AMT approved the [February 13th meeting minutes](#).

Decision: The AMT agreed to update the relevant broiler data in the Delmarva region of the Chesapeake Bay Watershed, with notification to the PSC from relevant parties regarding timeline adjustments. The data will be provided to the Chesapeake Bay Modeling team by March 31, 2026.

Action: The group will continue to meet throughout 2026, and a calendar invitation will be sent to the group once the final meeting schedule has been determined. Among other informational topics at future meetings in 2026, it was requested by an AMT member that we continue to explore nutrient application rates for inorganic fertilizer. At this time, it is anticipated that the group will reconvene in April.

Minutes

I. Introduction & Announcements

Lead: Tom Butler, EPA; Zach Easton, VT

Zach asked for approval of the February 13th meeting minutes.

Decisions:

1. The AMT approved the [February 13th meeting minutes](#).

II. Broiler Update

Lead: Mark Nardi, Chris Brosch

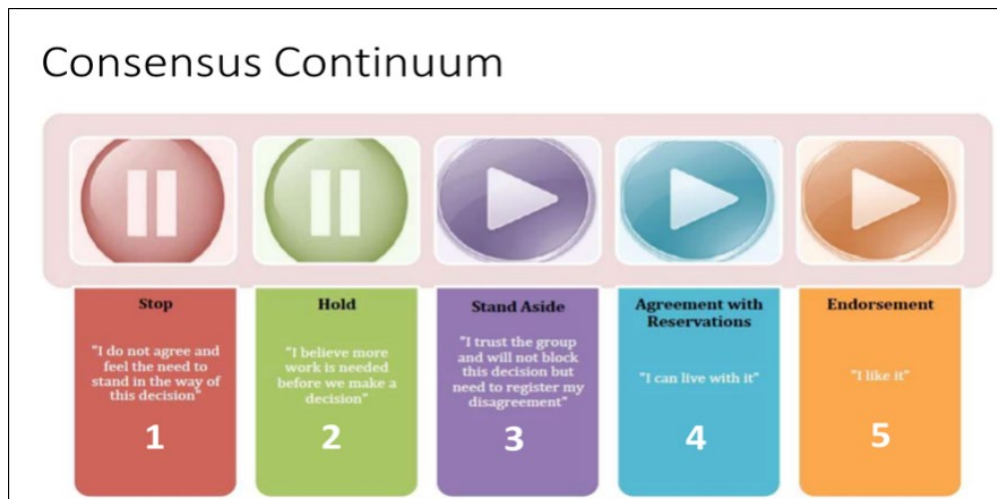
We heard a recap of the Broiler data investigation and ensured everyone has a clear understanding of what data is expected to be updated. After discussion, the group voted on how to proceed with the data from this effort.

Actions:

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1. The AMT agreed to update the relevant broiler data in the Delmarva region of the Chesapeake Bay Watershed, with notification to the PSC from relevant parties regarding timeline adjustments. The data will be provided to the Chesapeake Bay Modeling team by March 31, 2026.



Role	Name	Affiliation	Vote	Notes
Signatory	Clint Gill	DE	5	
	Alisha Mulkey	MD	5	
	Cassie Davis	NY	3	
	Scott Heidel	PA	3	
	Tim Larson	VA	4	
	Dave Montali	WV	3	
	Auston Smith	EPA	3	
At-Large	Ken Staver	UMD	3	
	Tamie Veith	USDA-ARS	5	
	Candiss Williams	USDA-NRCS	5	
	Alex Soroka	USGS	5	
	Zach Easton	VT	5	

Discussion Notes:

Laura Zielinski (in chat): About feed conversion efficiency and the Cornish hens not being able to digest the feed as well as the broilers. It was said that it is not genetic, but is this related to age at all? Are the birds' digestion systems mature?

Mark Nardi (in chat): Laura - yes it has to do with age and maturity of the birds' gut biome.

Laura Zielinski (in chat): Thank you!

Mark Nardi (in chat): The Cornish birds are the same birds that would grow into fryers and broilers but they are harvested at a younger age.

Hunter Landis: The data you've got so far potentially coming in from the integrators, was that representative across all of the Delmarva versus just Delaware data?

Chris Brosch: Yes, the first integrator in the door with the data operates across Delmarva. We have a second integrator now in the door that also operates across the entire Delmarva.

Hunter Landis: My question was about your proposal for getting more data on manure clean-out. Do the integrators have historical data, or would you be looking at more realistic clean out data?

Chris Brosch: The requests of integrators were based on historic crust out and clean out data from a manure hauler. The request that went to those integrators was to get relevant harvested flocks. So, it goes all the way back to 2014 in some cases, but most of the requests that we made of the integrators were from data from 2017-2024. When we got the lab data, 2025 was still not complete. So, we focused on the end of 2024.

Seth Mullins (in chat): I know you haven't gotten into it, but do you have a sense for how consistent clean/crust out practices are among individual growers?

Chris Brosch: The question about the consistency of clean-out and crust-out, we presented on that at our last talk, and I didn't want to spend too much time on it. Let me find the relevant information and pull that up for you folks and take another opportunity to exhibit that for you. The reality is that there's not a lot of consistency in the cleanouts. The interval from clean out to clean out is not very consistent but over the period of modeling years, there is consistent adoption of crusting out, windrowing, and longer intervals between full cleanouts. That is something that happened largely in the period for which we're capturing this data.

Mark Nardi: The mechanics of it are that the haulers gave us all their data as far back as they had it. We processed that into databases and then to try to understand cleanouts, versus crust outs, versus

anything else that might happen, we created cumulative frequency distributions for each of the farms. So, what we can do is go back and look at those. Where we have a bunch of small crust outs, then we have a big clean out.

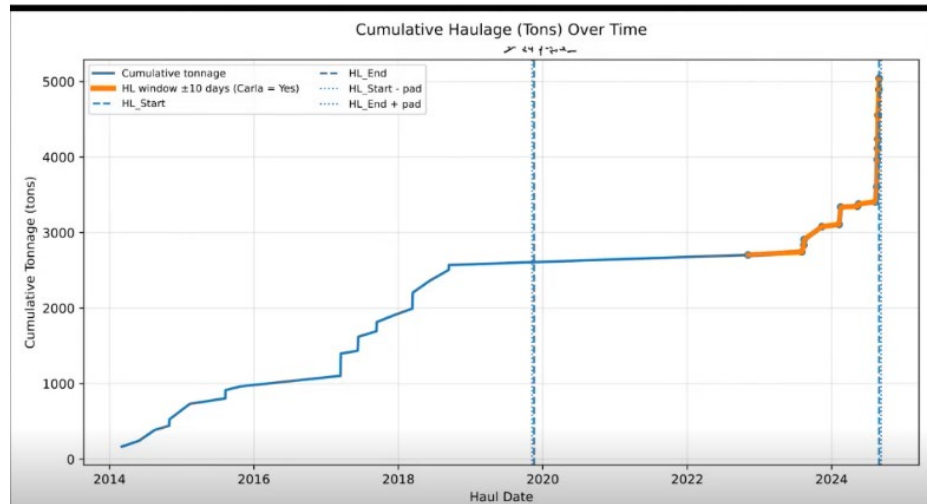
Chris Brosch: Here's an example farm, Seth, where we've got almost precisely a three-year interval between one cleanout with the most recent cleanout taking place in late August and early September 2023. I believe there are some STAC exhibits from other farms, too. A big jump in a graph is indicative in a cleanout. So, the signal from 2017 through 2018 is a little bit hard for us to decipher, but we can see incremental crust outs that line up very closely with the period for which a flock would be on a farm. In the end of 2024,

there's a huge jump in the tons coming off this farm and no jumps repeated in the entire period for this farm that matches that. So, we feel like we've captured lots of crust outs and a total cleanout on this one. Here's a third example. There are little steps upward and then a big clean out, and that's why we wanted to go looking at a subset of about 60 farms, sending that out to the integrators, and asking for that detailed flock inventory information.

Dave Montali: I've got some concerns about moisture. So, you showed your spreadsheet where you were filling in the years after '14 relative to moisture. That graph suggests that litter is getting drier even from 2002-2024. In your spreadsheet, I saw numbers that kind of looked like it was still 71% in 2024. We've got a constant .7135 up through '13. That's what we did in Phase 6, and then the next 4-5 years look drier, but then the last five years kind of look like we had before. Is there any explanation for that?

Chris Brosch: You've clued in on the fact that Dr. Glancey used a constant. Mark and I didn't feel like we got consensus to overrun the old data. It would be our recommendation to do that because, as you noticed in this slide, the horizontal/red line is that constant in percent moisture. I don't think about percent dry matter, and I imagine most of you don't either. The percent dry matter is the inverse of the percent moisture. That horizontal line is 71.35. So, you can see that at the end of Jim's work, we were right there with the data and then it shot up and dropped back down and below in the years since. That's why I would like to get rid of the constant all together, but to do that retroactively in the Delmarva based on this Delmarva data would be a much stronger change or deviation from what was performed in the other states. We're not proposing to change retroactively any of Appendix B from Glancey's work, having a very short timeline to change, discuss, and implement this.

Clean out detection



Dave Montali: What slope would you intend to use? That from 2002 until now, or that from 2014 until now?

Chris Brosch: Our recommendation is to capture the average moisture in each year from real data because moisture impacts the dry concentrations of nutrients and the dry concentrations of nutrients are the injection point for the three year moving average. The moisture isn't used for anything else. So, we are saying keep the raw average in the new data instead of the constant. You can see each of those bullets to the right of the vertical dotted line. That's what's in the spreadsheet- the inverse of those numbers.

Ken Staver: What percentage of litter is captured in these points? Is it the same every year, is it the same integrators, the same type of bird? Trying to chase this around every year is a little worrisome to me. It's always a little risky when you look at a graph like this and you have a trend and take out those two high years at the beginning, then the trend doesn't look nearly as strong. You've got two high years. Why do you have two numbers over 34%? What's the reason? Is that a different subsample of farms? That's not the whole population you have here, right? Trying to chase this every year based on a different data set every year seems a little bit risky to me.

Chris Brosch: I think there's 22 mitigating factors in that risk. I would tell you with a lot of confidence that the end value for these averages is unparalleled in any other region because the lab data is done for free for these farms and it's required for their CAFO. So, other states require manure testing, but they don't require reporting of that testing. So, there's a lot of information behind this. I don't have those end values at my fingertips, but they were discussed in the original subcommittee report and are available there. So, that's not a change in method. The change in method is using the actual number, and I think we can all see that there is a trend which would lead to the conclusion that a constant is probably not appropriate. As I talked to Bud Malone yesterday, he emphasized that his data for manure generation that he captured was in a time when new technologies were coming on and all of those things began to reduce moisture in the litter. Modern husbandry practices like windrowing between flocks, conservation of the litter, are further driving the moisture end.

Clint Gill (in chat): Required every year by our regs

Ken Staver: I'm ok with the trend line. I was responding to the last question where somebody said what is the trend line you are going to use? I wouldn't necessarily argue with a trend line but rather trying to bounce it around every year based on a different data set. Every one of these points is not the same. You aren't measuring the same thing every year.

Chris Brosch: Capturing this average annual figure knowing that it's bouncing around, our proposed method was to capture it because it's only used to remove the moisture in the wet nutrient concentrations, which are then smoothed using that three year moving average technique. So, smoothing takes place at a different step from the same source of data (the lab's concentration data). The slides I showed for the lab data on nitrogen and phosphorous are on a weight basis. To smooth the moisture data and then smooth the concentration having removed the moisture would be double smoothing the data that's used by the model. I don't think that's something you would agree with.

Ken Staver: I wouldn't agree with it. Having been through the whole Glancey period of waiting for a report and waiting for a report, I have to say I am a little exhausted. At the end of the day, what matters is how much is applied to the fields and how we put this in. The way the model works is it's applied on cropland. I guess that's the bottom line in all of this. How much litter do we have? How much N and P do we have? I don't even care about moisture.

Chris Brosch: You made that same point last time, and it was well taken. The bottom line for this is that the volume of manure combined with the concentrations of nutrients are how we more accurately reflect what's available for spread. If we don't update this for the Delmarva, the trends that were captured in the last report are very unlikely to capture reality because they are a minimum of 14 years old. Explicitly, most of these factors are not captured. We can capture them implicitly by updating concentrations, updating moisture, and trying to capture a new method for the volume of the litter produced.

Ken Staver: Better information is always a good thing. I am just a little concerned about chasing proxy data that still, in the end, isn't what we really need to know. It's what ends up being applied to the field and what's plant available and how it figures into nutrient management plans.

Chris Brosch: What are you referring to when you say proxy data?

Ken Staver: It doesn't matter how many chickens there are in the watershed. What matters is how much is land applied to cropland. So, we don't really need to count chickens. We don't need to know moisture content in the litter. We don't need to know pounds of litter. We don't need to know how big birds are. We don't need to know any of that. We need to know what is applied to the fields and then what doesn't volatilize in the field. What is in the soil available for the crop? The whole thing is built off what the crop takes out of the soil relative to what's applied to the soil. So, all those things are truly not the information we need. But, if we need them to get to the information we need, then we need it. The frustration for me is that with all the nutrient management planning that supposedly is done, farmers are making decisions based on manure tests, and they apply it to their fields and they know how much they apply to their fields. So, we are trying to get to that.

Chris Brosch: I give you a lot of credit for making that point again, because it didn't quite land on me the same way last meeting. We don't have a great mechanism to capture what's actually land applied. We just don't. We don't have a great mechanism to capture what fertilizer is actually land applied. So, if we were to replace it with actual application, we would not need any of these methods. But I can tell you that the methods to capture the manure that are maintained in this proposal existed in Phase 3. So, I take your point well, and I don't think I took it well last time, so I appreciate you making the point again. Our proposal is to respect the framework of how to approximate manure and nutrients where there doesn't exist a better mechanism to do so with more modern, up to date, reliable data.

Alisha Mulkey (in chat): This data directly informs volume and nutrient concentration which would be included into NMP.

Ken Staver: I'm frustrated we put so much time into chasing this. We literally have been doing this for 30 years working on the old ASABE numbers, etc. I just want to make sure we don't lose sight of what we are really after and put all this effort into something that is not directly what we are after. But I guess if it is the best we can do, it's the best we can do.

Hunter Landis: I don't disagree with you, Chris, but I just want to see what your perspective is on the idea that we don't have the tool to determine the litter going on the field being land applied. Is that a thought that that's a "we" meaning Delaware, or "we" the model, or "we" all jurisdictions?

Chris Brosch: Of those three choices, I would apply the "we" to the jurisdictions. My experience in Maryland, Virginia, and Delaware is that the capture of actual applications of litter by farmers is exclusively through regulatory tools, if it exists at all, which is of questionable reliability and of questionable scope. It's not part of what I am presenting today, but I agree with Ken that it's a useful

conversation for some day. We're doing it this way because of the issues in capturing the data another way.

Clint Gill (in chat): Short of auditing every farm every year, I don't know how we get the numbers for manure going down on fields, and I want to be respectful of the privacy and time of farmers.

Dave Montali: I think I recall a slide of yours last time, Chris, that showed that the industry data suggests a certain percent increase in bird counts and a certain increase in weight. Then I heard this morning that we are not proposing to replace the bird counts that we get from NASS with this work. I am just trying to understand, and maybe you haven't analyzed the data enough, but if you had a source of bird counts and weights from the industry versus what NASS said, how different are those two data sources? You can be anecdotal if you want.

Chris Brosch: I was under the false impression that when Glancey finished his report, the Bay Program was capturing industry production data. That was true until two days ago. Thanks to Tom, his team, and Alisha, my false impression was corrected. The population of birds is not in Appendix B that we are proposing to update. So, I am pleased to report to you that my answer two weeks ago and today would be the same. We're not proposing a change in the method of capturing the number of birds. I am disappointed it's not the industry data because I think that's more reliable. But that's got nothing to do with the methods and the decision today. I would prefer to use the industry data because it goes back to the 60's, and NASS can't do that, but I am not suggesting that today.

Denise Uzupis (in chat): This seems similar to the issue with fertilizer data. We use sales and not actual application. We can only use the best information available to us.

Ken Staver: How does this affect our animal units? Are we adjusting our animal units? It's not bird count, right, it's pounds of birds? What's the situation there?

Chris Brosch: That is squarely outside the scope of this work, Ken, and I would direct that question to somebody from the Modeling Team. I think that's why they gave us the deadline they gave us so that those questions between the Modeling Team, Mark, and I can be answered. Unfortunately for everybody, Dr. Glancey is not around to provide those insights nor are the vast majority of the Modeling Team that implemented that report. So, we need a considerable amount of time to make sure that we can investigate the historical use of the data and implement it as close to the same way as possible.

Ken Staver: So, are animal units based on bird counts? Tom, do we have a simple answer to that?

Joseph Delesantro: Looking through this, it seems like it should be a matter of unit conversion because the data exists. Chris is collecting the pounds of the animal, the animal numbers, and then the litter, so we should have all the data that we would need to convert to whatever units are necessary. But, just as Chris said, there will be time needed once the data is in, the analyses are completed, to make sure we get everything CAST-ready.

Jess Rigelman: The first step is to convert everything to animal units, so we would have to use that data to update the animal unit data on a yearly basis.

Tom Butler: This is our last official meeting where we make decisions, so we need to effectively decide how to proceed with this today. Chris has outlined in this slide the areas that would be updated with the focus on Delmarva. So, the question we have is, is this group willing to accept the processes that are laid forth here as updates in Phase 7? I will pause to see if people have questions about that before we move to a formal vote.

Alisha Mulkey: I think there is a lot of good work that will continue past today. Ken's not wrong. We've been talking about the industry being a partner for years. But I think this is a first real step in that direction. I know it's been a priority of the partnership. It's a priority of the new Ag Advisory Committee to really make sure that industry and better, newer farm level data is brought into this space. For the purposes of today, given the tight timeline, I want to make sure we're all crystal clear of what's being asked before we get to voting to make sure some of these lingering questions and next steps are to be continued. For the purposes of today, what I am hearing and hoping that folks will agree on is that what we have data to complete and move forward on with the limited time would be that spreadsheet Chris shared where he started to populate 2013/2014-forward, and we would limit that to Delmarva Counties. I don't think that there's time or data availability to expand that into the Shenandoah or other parts of West Virginia. So, how do we as a group hopefully get to consensus on accepting the next few weeks to get the rest of that data populated under the methodology that Chris and Mark have laid out so well over this past month and move forward with that as the bounds by which we are thinking about a motion today?

Clint Gill (in chat): DE supports moving forward with the work, we can't develop proper nutrient loss mitigation strategies without having more accurate numbers about how much nutrient we have

Tom Butler: Thank you, Alisha. I appreciate that additional context there. I want to see if other people have questions about that. We will make sure that that's clear. I think I saw a thumbs up. Looking through the chat, we've got some feedback from Clint already. So, just to reiterate that today is our last decision-making meeting. We are essentially done after this. The decision today would be on that process that's outlined here and specifically for these counties. So, the question that comes to mind is does anyone have heartburn with that?

Seth Mullins: We have data for Virginia farms. We don't have production bird numbers/bird weight in the same data set that we have percent moisture. To put that into the same data set will take longer than April 1, but we have it. For me, and others from Virginia, a question is if we support this, would our data be usable later?

Tom Butler: That's a great question. I think what's coming from these discussions is that we have a timeline that the PSC have agreed to. So, a lot of this work has to basically revolve around how that timeline touches this. So, we'd initially had the data for the AMT coming in today and, obviously there were extenuating circumstances. So, I think that becomes the issue. So, if it is a partnership choice to move beyond the deadline and accept what we have here, then that is something we definitely need to discuss.

Chris Brosch: Mark and I are hoping to get you data this month, finalize what we've got, understanding that you need more than that to clean up the information for the other Virginia counties. We're not going anywhere. We want to keep working on this, understand it better, and set ourselves up for the next opportunity in these modeling tools to better reflect the modern poultry data. So, I'd encourage you to keep working on it separate from the decision today. Mark and I are focused on this one-month deadline extension that we're asking for, but we're not going to put our pencils down forever.

Hunter Landis (in chat): Note the data Seth is referencing was submitted in September, 2025 but did not have moisture data in that set.

Seth Mullins: The production data are in our planning software. But, because the planner enters nutrient concentrations as sampled on an as sampled basis, they don't enter moisture content. We

have moisture content from our database from Clemson, which more than 99% of our growers use. So, we've got these two data sets, and we just have to put them together. It's just a lot of individual samples to do that, and I don't know that we have a common link between the two sets. So, it's going to take somebody sitting down and saying this is this sample and adding moisture to it. It will just take longer.

Mark Nardi: I know you've got PII problems, but if there is any way I can help with that, I am happy to.

Seth Mullins: Tim Larson is on here. He's good at this stuff, but that is good to know. Thank you.

Scott Heidel: Thank you very much. Excellent job, Chris. I really appreciate the analysis that you put forth in this study. I definitely want to advance the science, and I want to say thank you to you and your team. It seems like you're on your way to doing that. I do agree that the data set could be a little bit more complete before we really lean into this. I don't want to slow it down. But I think that if you're right on the bring of collecting the remainder of the data, it's probably a good idea to wait and do that. I also think that since it has such potential to change the nutrient loads throughout multiple jurisdictions, we should revisit the spreadsheet that Tom developed showing the crop need throughout all the different jurisdictions. Another thing to add to that is that each jurisdiction should be at least brought up to 90% of crop need. So, again, since we're going to be revisiting the nutrient concentrations across jurisdictions, I think that a couple of things need to happen before I can really fully get behind this.

Ken Staver: That's how we deal with it is the bottom-line numbers of total manure production in jurisdictions. At the end of the day, is this a two percent difference? A 20 percent difference? What do you think this is? One thing about the graphs you showed is that a lot of them don't start at zero. Like your moisture graph, it looks like it's a huge change, but if you had your axis starting at zero, it wouldn't look quite as dramatic as it looks the way you presented it. So, I am just wondering, how big of a difference are we making with all this effort?

Chris Brosch: I can't answer that because it's not done. The answer to your question relies on the remaining cells being filled in. But the Ag Modeling Team is built up from a lot of expertise in science, and the scientific method is about chasing down hypotheses. What I've asked everyone here today is to basically approve the hypothesis that this data is going to result in a new manure volume estimate for these birds, and that's going to take the next four weeks to sort out for the Delmarva. If it's 2%, great. If it's 20%, that's great. If it's 0%, we did the job and when we get to Phase 7.1, we will be able to do it even better having learned from this method if it gets approved.

Alisha Mulkey: Speaking for Maryland, I don't want to know that answer. That's part of the reason why I want to approve where we are today because I don't want any assumptions of bias, particularly for Maryland's portion of the Delmarva, that I am looking for a better answer. It's going to be what it's going to be. I am trusting the methods and the analysis that Mark and Chris are undertaking without having seen the data myself. We need to approve that to move forward so that we can represent that to your point of what producers are sampling for, what's coming out of that house and the manure shed, and how am I going to put that into a nutrient management plan that I'm then going to track for field application in the BMPs. So, we need this to get to those incremental steps that you're talking about when we start talking about loads.

Ken Staver: As a farmer, if I use litter, the litter I'm going to use gets tested, and it's tested on an as is basis, and I spread it on an as is basis, and that's how my nutrient management plan is done. So, at

the field level, I don't think this makes a difference to farmers. This doesn't make any difference in how we're doing it actually at the field level. That's my perspective based on how I do it now. I don't care about moisture in another house. I don't care about how big the chickens were. I don't care about any of that. I just get a pile of litter, I send a sample in, and I get a result. It's based on the moisture as-is. So, I spread it based on as is, and that's how it's done in the field. So, it won't change anything at that level. I think I am doing it the way I am supposed to be doing it.

Joseph Delesantro: I wanted to throw in one last point as someone who crunches a lot of numbers. There are quite a few details in the methods, analysis, what not, that Chris has proposed that are yet to be figured out, and it totally makes sense that those have yet to be figured out because they don't have the data at hand. Some of the decisions and analyses could have fairly large impacts. So, I just wanted to make sure that was clear. So, to make sure I am understanding, it would be a vote today and the decisions on those methods would not be up for revision? Is that sort of the idea?

Tom Butler: Yeah, Joseph, I will let Chris speak to what his interpretation is, but that is my understanding.

Chris Brosch (in chat): Ken, still appreciate your perspective about your farm. I think it is ok to work at this macro level AND believe that estimating at the scale of the watershed has benefit on the micro (farm) level. Bad macro estimates could have regulatory impacts on a micro level.

Chris Brosch: [Can you repeat the question?] I was writing to Ken, sorry.

Joseph Delesantro: There are some of these details in the methods that are sort of yet to be determined. Things like figuring out the clean out interval or the necessity for some sort of time averaging of the mass and the weights of the birds. Looking for those covariables, deciding on the data sources for those covariables, any sort of comparison from P6 to P7, or comparing the Delmarva to elsewhere in the watershed. So, all of those sorts of details, none of that is really possible now without the data. I think for some of those things like the clean out intervals, time averaging covariates, some of those decisions could have fairly large impacts. So, is the idea that the vote today would be to follow the science in making those decisions and then they don't go up for revision?

Chris Brosch: The decision today is to allow Mark and I to continue to come up with a replacement method for the blue bubble (manure/bird lbs production annualized). The current method is that Malone relationship based on the 1990 data. Which, we believe because of the covariables, is not appropriate, and the data we are collecting from the industry will support or refute the use of that. What Mark and I come up with will be very simple in terms of a method that would potentially replace what Glancey did, which was to just adopt the Malone relationship. The covariance of windrowing and feed conversion are going to contribute to the new method which should be simple. We want a simple method because we don't have the time to come up with something more complex. I hope that answers your question.

Dave Montali: So, we're voting today to give 30 more days, assuming that all the data comes in and you go through this, make a new equation for the blue box, and you're also going to analyze the moisture. Is that going to be numbers that change every year up and down or is it going to be smoothed? I kind of missed that, but it's probably a detail we need to talk about. But they've got 30 days. So, basically, if we say yes, go ahead, you would be able to provide new numbers to the Program by the April 1 deadline. This group is not going to review or question it. Whatever you

guys come up with, it's going in, and that's the way it's going to be until the year of review. What's our word today if you aren't able to accomplish that? Please tell me if I've got the "big plan" wrong. **Question was repeated by Dave given lost internet connection from Chris**

Chris Brosch: You have that right. I would add that the moisture element is done. The only thing left to do is analyze the data to come up with an alternative for manure production. We have one month to work with the modeling team to work with a new method and turn in a new Appendix B that applies to the Delmarva counties.

Dave Montali: Ok. Then help me one more time with moisture. You are going to change it every year. You are going to do some rolling average of the annual moisture stuff?

Chris Brosch: The proposal today was to change it every year to use actual annual numbers from 2013-present. If the modelers need us to do a little something different, then Mark and I have the data to make a method that makes sense. But our proposal is to use the animal numbers. It's easy to update. It's easy to get from the DDA lab and just plug it in ever year.

Alex Soroka: Selfishly, from our perspective, it would be fantastic to make better progress on the manure nutrient numbers. Any progress that we can make here might help us with our national modeling efforts. Quite frankly, all the numbers we have are quite outdated to understand these processes. So, if we do make progress on the Delmarva, we could use that to better understand what's happening across the country or at least talk with other industry leaders elsewhere. So, I am in favor.

Tom Butler: I don't see anything here in the chat, and I see a pause in hands, so I will approach this from the perspective of the timeline we have laid out. As I've said, there is this group, the PSC, and they are responsible for [guiding what we do], and they have indicated deadlines. One of those deadlines was for us to be done by the 27th with the ag input side. So, proceeding with this, we do need to have PSC approval for a timeline extension. This impacts the modeling side as well because their workload is now a little bit condensed. It's the same amount of time with an additional level of effort for this. So, we do need to have some level of approval from them, and that would require people from this group reaching out. So, it isn't necessarily as simple as 30 days and then we get it. We've also heard the question if we don't have it at 30 days, how does that impact the decision today? So, I'd like to open that up for discussion amongst the group here before we get into the voting side of it.

Dave Montali: What you are saying is the PSC said all this work needs to be done by Feb 27, and now we are kind of hem-hawing on that and saying the end of March is ok as long as we get the stuff to the modelers prior to April 1. Are you saying this group doesn't have the authority to do that or that we need to make a decision to get some kind of blessing of that through the PSC?

Tom Butler: Yeah. I've heard as well that we have other things people have shown an interest in talking about and that we need to talk about more than just this. So, we need to address that. I don't want to push this to the side, but we've heard that there is a broiler effort, we've already got an extension to be where we are today with it in addition to Hillandale and nutrients. We have heard today from at least one partner that in addition to this broiler effort, there's a concern with nutrients. Today is the end of decision making. To investigate any of these things further today, we need to run by the PSC what we would want to do. If we have multiple topics we are going to talk about as a group. I think we need to have some agreement on how we address that with the PSC because,

otherwise, we run into a situation where we're just out of time and no one's things are getting addressed, and that's not really optimal.

Chris Brosch: That's a fair question. I don't think it's appropriate to ask that question before Mark and I get some type of conclusion from the group to proceed. There's zero chance of us turning nothing in if we get another month. We have two thirds of the farms that we reached out to the integrators for which we've got data back. We are going to come up with another method for the blue bubble in the next 30 days. So, I'm not sure why you're asking that question in a different order than the question of can we do this with 30 more days?

Alisha Mulkey: I am also thinking of the timeline differently. The ask today is to agree to the hypothesis without all the final numbers in place. That gets us as close to the PSC deadlines versus having to come back for additional meetings. I would say, again, that the conversation around nutrient applications is not insignificant but should be separate from the question of the broiler methods.

Tom Butler: Understood, and I certainly appreciate that. If I take and separate those, I think we can do that. In terms of the broiler effort, I do still think that timeline requires that elevation based on what our timeline is and the constraints we have. So, I wanted to make that transparent as people move in for this decision, because we have to have time for the modelers to do their thing. Unfortunately, this does encroach on their time when they would be working on this particular thing. Obviously, they are getting data from a number of other places, but there is still that need there.

Alisha Mulkey: I agree and hear you. I think my point is that agreeing today versus having to assume additional meetings of the AMT, both of them need to be a vote of the PSC, but I am certain Lee is going to be asked how many more weeks. So, if we can agree today, that's less time we need to ask the PSC to push the schedule. That's what I am trying to differentiate.

Tom Butler: That's fair. We still have to ask the PSC, but if we can nail this down, it would be a reduced amount of time to have a meeting to figure out the time.

Dave Montali: You guys got me confused. You guys are thinking the same way and I am not. With regard the broiler issue, can we simply say, yes, go ahead, VA, MD, and DE will accept the results going into the model by April 1. Do we still need to get some PSC blessing for that?

Tom Butler: Yes.

Dave Montali: I don't really understand that. I certainly understand that if we are going to dive into other issues that would result in changed model inputs past April 1, we would need to get some blessing of that. We also talked about what the AMT will do after February and talked about meetings where we explored the decisions we've made and re-reviewed some of that stuff. So, if the model is closed out after April 1 and we have a need to meet every couple of months to go over different issues/what we did just for understanding, do we need PSC blessing of that?

Tom Butler: The way that this has been explained is that the deadline to get things to the modelers is April 1. The deadline for the AMT to have provided things was the 27th, so we would be done. At this point, the modelers would have the month of March to start doing some of the things Joseph articulated needed to be done, and that time is now gone with the 30 days. So, we are essentially taking 30 days out of their schedule to work on those processes and giving them two weeks to do six weeks of work. That's the real crux of it. So, the AMT would certainly meet, but that's why that needs to occur. They can't meet their deadlines with the shortening of that time.

Dave Montali: Ok. I guess I was under the impression that somebody at the program office said as long as you get it to us by April 1st, we can go on without a big timeline revision, and I may be wrong on that. I look at the PSC as having said get the model done by December 31st, 2026, and then we have a year of review. Is what we are talking about now changing that big picture schedule or is it more like we had to wiggle around on the broiler issue for an extra month, but we can accommodate it? Do we still need the PSC blessing of that? I am missing something obviously.

Auston Smith: April 1 is the deadline we have for a lot of the inputs to be submitted. But, as Tom mentioned, the end of February was kind of giving extra time before the deadline for the modelers to take these decisions and begin to integrate them into the processes they have to have honed before that model data deadline of April 1. As Tom mentioned, with this extra 30 days, there may be additional delays as well. So, nailing down that exact amount of time and informing the PSC of that extension is the main ask here. Just ensuring that the AMT is all on the same page with the additional review that is needed to ensure that this is properly put into the model. Let me know if I didn't answer your question and, Tom, feel free to add on.

Tom Butler: The decision would be to accept the principle of this effort because Chris and Mark have done a tremendous amount of really good work to collect information, to involve a new source, the industry. People are interested in it, and they want to get it done. Obviously, things happen. They need time because there's an avian flu outbreak happening, poultry houses are on the verge from collapsing from the crazy snow, and stuff is happening. So, they couldn't make the deadline that had initially been set. To protect the ability of our team internally to be able to meet those deadlines, there has to be some give with that PSC timeline. But, today we can still decide on the acceptance of this. We just have to then alert the PSC that there will be extenuating circumstances surrounding this. So, again, it is to try and accept this in principle and then allow more time for people to do the work on it.

Auston Smith: I do appreciate Alisha's point that if we want to have another meeting in two or four weeks, that is valuable time that is lost if we need to take time to make this decision. I do understand the trepidation of stepping somewhere where you can't fully see the ground. But the background that's been given on some of this work seems rather robust.

Scott Heidel: Thank you very much, and I agree this work is incredibly robust. My point was just to ensure it continues down that path. That also being said, we haven't really updated this type of information for a very long time. So, I don't believe we should limit it just to Delmarva. I think changing this up to be watershed wide might be an interesting this to discuss as well. I agree also that it is an independent issue of the overall crop need analysis that's being done. So, if there's anything that I can do to help with the PSC information, or anything like that, let me know.

Alisha Mulkey (in chat): Could we take a pulse check of states on this vote, so we can move to remaining topic?

Tom Butler: So, the vote today would be to update the relevant broiler data in the Delmarva region, and that's the principle that we're looking at with this. So, I understand there's support. I just want to run through this [vote tracker] really quick since, Scott, you were maybe a little divergent on that one. So, I see that Delaware endorses this one. Maryland, I think, endorses this one. Scott, you had said maybe not doing just Delmarva but doing the whole thing?

Scott Heidel: I think with this study being the first of its kind in a long time, it would take the science to a better place and make the model more accurate. So, I wouldn't want to just limit it to Delmarva.

Alisha Mulkey (in chat): Scott, I agree to leveraging this effort for other parts of the watershed. But on a different timetable given data in hand.

Alisha Mulkey: Scott, I don't disagree with what you're saying but I think from the way it has been communicated to me, that's going to blow up the entire PSC timeline. So, I think we need to be thoughtful of sticking to what we have now in the timeframe we are up against for the partnership and then use that to then leverage additional studies, additional integrators, whatever that would look like that would be more representative of other regions of the watershed that could be added into the model at a future timetable. I'll let Dave Montali speak to those opportunities. I think your comment is good, but I think [that might be] taking it a step too far for the time constraints we're under today.

Tom Butler: So, I will maybe open that back up to Scott to see how he is feeling with that. Maybe Dave has comments as well.

Scott Heidel: I agree. Thanks for that clarification.

Dave Montali: You are asking what I think about this today?

Tom Butler: It was initially to help with what Alisha had said to Scott, but if you just want to vote that's also fine.

Dave Montali: I am a three, provided that the work that's done is limited to the Delmarva. If the will of this group goes to applying it to other states, I've got a big problem with that. So, I don't think we're going there yet.

Tom Butler: Ok, so then I think we maybe need to have the wording in there that it's Delmarva specific with notification to the PSC from relevant parties.

Scott Heidel (in chat): PA 3

Tim Larson (in chat): 4

Auston Smith (in chat): EPA is a 3, understand folks various feelings here

Tamie Veith (in chat): 5

Candiss Williams (in chat): NRCS 5

Alex Soroka (in chat): USGS-5

Zach Easton (in chat): 5

Dave Montali: Is what we are voting on today a part of the deal that says we're going to extend the schedule for all the models to be complete by December 31st? Or is it simply a notification that we've lost a little bit of time for actually reviewing this input, but it's still going to be incorporated into the first version of the Watershed Model because it's to be done by April 1?

Chris Brosch: For the purpose of the project and what I presented today, I think we should change the phrasing in Tom's spreadsheet here to the AMT will turn in the broiler data with a deadline of March 31, instead of today, and no other suggestions on timeline adjustments for the AMT's work. The questions you are raising about model timelines, I think, are outside of the scope of this group, presented as a friendly clarification.

Dave Montali: With my Modeling workgroup hat on, I kind of have to say if this affects our 2026 model timeline, then I am kind of against it. If the three states involved are happy with it and we can proceed with our plans for 2026 without modification of the timeline, at least now, then I am ok with

it. So, I am kind of caught in the middle a little bit here. Your amendment, if everyone else likes the wording revision, is fine with me too.

Tom Butler: [On that point], it certainly has the potential because Jess and Joseph can't meet their deadlines getting the data 30 days after they were supposed to. So, there has to be some elevation to the PSC in some capacity. I think that we've acknowledged.

Joseph Delesantro: If that is acknowledged, then I don't really need to say anything else. Chris is updating these metrics with the data that is available to him, and, in theory, it might be possible that he could create some coefficients that Jess and I wouldn't need to look at at all and just drop right in the model. But I think we all need to acknowledge that the reality is we will probably likely spend some time with Chris, making sure that we get those coefficients ready to drop into the model, that all the units are right, that we have all the pieces of information that are required. We will likely have to spend some time doing the testing, when you think about all the testing we've done when we make changes to other things to make sure they blow up the model. So, we would probably want to run a test specific to just changing this coefficient to make sure that with this isolated change, we don't see anything too crazy. So, those are the things that come to mind of the reason why Jess and I would need a little bit more time on this. What I've said there is also more of a best-case reasonable scenario. There is also a case where there are still lingering issues with the data on March 31 that would take work from Jess and I with Mark and Chris to iron that out before we can generate the coefficients for the model. Before I give up the floor, Dave, does that sort of answer your questions about where I am coming from in terms of the time?

Dave Montali: I thought maybe at the Program Office you guys talked that if we get this and everything goes well, it doesn't really change our big picture schedule for 2026. If the feeling is that to get this, incorporate it, and go through all the checks and that stuff that we are talking about adding time to the overall 2026 timeline, if that's what is behind this, I hope somebody would tell me that. If you do tell me that, I would say why can't you take the additional time provided in 2026 to do the work and potentially consider a revision in the year of review. I know I got pushback on that when I said that earlier at the GIT. To me, we have messed with a whole bunch of inputs on a whole bunch of things, and we recognize that we are piecemealing this and we aren't going to get to see how it all fits together and whether it works as intended. I've always kind of thought, and maybe I am wrong, that if something isn't working as intended then during the year of review, we can say right up front we don't like it and want to change it. So, there's going to be an opportunity, I think, in 2027 to do beta versions of what we are going to have this year with recalibration. So, I just blurted out all the things that are in my head. I still don't know that if we do this and everything goes well by April 1, we are still on a path to meet our overall December 2026 deadline or if we think that if we do this, we are certainly going to bounce back at least another month or two months to get that work done.

Tom Butler: This will bump that. If we give Joseph and Jess more work with the same amount of time, that's going to crunch what they do and then crunch what Gopal does, and that's going to have ripple effects.

Dave Montali: I was mistaken under the idea that we could accommodate it if it is done by April 1. We can't accommodate it.

Tom Butler: No. They can't get this done in that time. We have really great people and they are really capable, but we can't give them more work with less time.

Dave Montali: Ok.

Tom Butler: With that perspective, I think it certainly sounds like people are interested in doing it. We just have to get that weigh-in from the PSC. I think, Scott, you have been receptive to helping with that. I think we've heard feedback from several other people, so I think that is the direction this is going. People absolutely want this in and there are multiple jurisdictions who will talk to their PSC reps to make an amendment for this. If I am wrong on that, please raise your hands.

Scott Heidel: I've already discussed with my chain of command, but that's about the extent that I can do. So, it is in their hands at this point.

Ken Staver: I am pretty uncomfortable on a last second vote on something we haven't seen the bottom line on, but I don't want to get in the way of the group. So, just put me in as a three.

Tom Butler: Ok. So, then what I have for today is that the group has created a consensus decision to update the relevant broiler data that Chris presented today for just Delmarva region of the watershed, with notification to the relevant members of PSC regarding timeline adjustments. We are all on board for that, so people from this group are going to have to talk to their PSC reps so that in April, that comes out, and it's a foregone conclusion that they get the time on that. Any other additional comments, questions, concerns?

Chris Brosch (in chat): Thank you Mark. Thank you partners. We will get this done!

Nutrient Concentrations

Tom Butler: The next part of this that has come up in conversations, which is distinctly different is that, are questions surrounding nutrient applications. Scott, can you elucidate that for me so we can discuss that separately and determine if that needs its own attention? Today is the last meeting to make decisions, so if that needs to change, that is a conversation [we need to have].

Scott Heidel: Thank you very much, I appreciate that. It comes down to that attachment that was shared. I understand how you came up with the numbers. If we are going to be making some really large assumptions in this model on a number of different areas I think defying the logic that crops need a certain amount of nutrients in order to grow simply because whatever algorithm was used indicates that they don't is, in my opinion, not a really solid thing to stand on, especially if we are going to be trying to explain the credibility of this model to our implementation partners throughout the watershed. So, I would think that if whatever calculation is done and it comes up with less than even 90% of crop need, it needs to get bumped up to somewhere around that so that it can build a little bit more confidence in the model and how we are going to be splitting this out.

Hunter Landis (in chat): Is there a visual for this topic?

Caroline Kleis (in chat): Last meeting's materials (including slides and spreadsheet):

<https://www.chesapeakebay.net/what/event/agricultural-modeling-team-meeting-february-2026>

Joseph Delesantro: If I am understanding your point correctly, Scott, it seems like you are interpreting the crop need as some sort of critical threshold for productivity. You all here are the experts, but that is not how I've interpreted crop need. I've sort of interpreted crop need as, in ideal scenarios, this is the application that will deliver maximum yield. So, being below that maximum yield application doesn't seem unreasonable at all to me. I guess I'd like to leave it to the farmers and the experts to correct me if I am wrong on that.

Tom Butler: Thank you, Joseph, for that description. This is the chart I made from that spreadsheet, and you all have access to that from last month's materials. What Scott is referencing is the average percentage across the state for nitrogen applied relative to a crop's application goal or nitrogen need. What I think Scott is referencing is that being below 90% doesn't look like it's possible.

Jurisdiction	Percent of N applied relative to crop need	Percent of N applied relative to crop need (application goal)	Number of counties that have at least one crop over 100%	Number of counties that have at least one crop over 120%
DE	1.37	+37%	3	3
MD	0.72	-28%	2	1
NY	0.55	-45%	0	0
PA	1.04	+4%	42	0
VA	1.08	+8%	61	2
WV	0.21	-79%	0	0

This is essentially the relative amount of nitrogen relative to the crop need you are applying. I think your argument is that below .9 doesn't make sense, and you are saying that this whole thing needs to be reevaluated. Is that correct?

Scott Heidel: I'm trying to say that if you have less than a certain threshold, how are the crops going to grow? Granted, this is taking into account organic, inorganic, things like that, but it's still kind of shocking that a state like West Virginia can apply 21% of the crop need in nitrogen and still have crops growing.

Tom Butler: I think that is valid to ask. I think the real key is to look at the applications. If you look at grain with and without manure, think about it for corn, are the applications in pounds per acre reasonable within your jurisdiction as per nutrient management plans? Are people actually doing that? West Virginia is applying somewhere close to 90 or 100 pounds per acre on their corn with manure. That was the lens I suggested people look at this from. I think the first step is to verify how crazy some of these numbers look. The spreadsheet has this by county, by state, and it's got a lot of detail. I obviously boiled things down and aggregated them, which probably creates some of this situation. When you look at a state like Pennsylvania, are you guys actually applying almost 200 pounds of nitrogen per acre? In New York, 110-120? Are those reasonable? That's accounting for that crop need. Joseph has articulated that that's kind of the expected yield we are looking at for drawing these applications and asking if that number makes sense. That's obviously organic and inorganic sources together. In talking about putting a cap on that, I would ask how do people want to address that? This is based on the data from the animals that we have in the county. The nutrient concentrations update for broilers, that has implications for the organic material that we have to put down. So, it will have to go through a number of processes once the data comes in. It will get put in in the relevant areas and, at the end, it will affect the recapture/stored and usable organic pool and have an implication for the organic amount that goes down. That then has an implication for the fertilizer sales. So, we are working off of NASS populations with updated information from the broilers, that type of data that will impact your nitrogen, and then we have the state scale that says this is the amount of fertilizer you have. We look at a state like West Virginia where they have 5 million pounds versus some of the other states where it is very different. How might we jump the gap from going from those sources of data to looking at that kind of a cap?

Dave Montali: I think this is a perfect example of what we should be looking into during 2026 to prepare for the year of review. WV has total of 40,000 acres of crop. We know that the model can sometimes give some crazy results when there's not much of things around. I would first say that WV isn't a big crop state. Second, the way this has all come out is dependent on a whole host of individual decisions we make. We said a) we are going to limit the fertilizer bucket to the state scale.

We've got protocols in place for how we are going to distribute state sales numbers to counties within the Bay. We have manure transport. Anecdotally, crops grown in the eastern panhandle of WV, there are not a lot of animals there. There is land application of manure that is coming from other states. That might influence this. Maybe our assumptions relevant to how much to load things when there is not nutrient management is too high. So, you are saying we are only applying 25% of the goal. There are so many different factors that could come back to why this is coming out. I would say, no, the time isn't to rethink all those decisions now and delay model development. Let's use all the time that we have to prepare ourselves to answer the question "are all our individual decisions working out as intended"? If they are not, maybe then we can say here's why this is doing this and we want to change something during the year of review.

Scott Heidel: I appreciate that. I agree that a lot of decisions were made that impact this. There are a lot of variables that impact this. Certainly, I agree also that WV has a small amount of cropland and could be skewing the information a little bit. Again, with a small amount of croplands, if it gets changed to a default of 90% of crop need, then it will have very little impact in WV. So, I think that while we do need to look into this and adjust it where it makes sense to adjust it, there still does need to be some kind of a back stop. You can't have 20% application of crop need. That just doesn't really pass the laugh test at that point.

Dave Montali: I don't care how it comes out. I am saying it's not appropriate to delay model development because there are so many contingencies downstream. We do have time to evaluate this and potentially change during the year of review. I think we ought to try and stick to putting something out this year so that we have the year of review and then we meet the future deadlines relative to new planning targets, new WIPs, and start using Phase 7 in 2030. If we just keep stepping back and saying we need another six months, we need another year, we are never going to get there. If we are looking at this to understand how our individual decisions have turned out right now, we do that with available AMT stuff in '26 and get prepared to go into '27 with an idea we really need this or that changed and here's how to do it. Right now, you say it's no good unless everyone has got at least 90%. Trying to get nutrient efficiency, all that stuff, maybe MD's 72 is exactly where everyone should try and be at. We can say this is no good, but we have to figure out where the decisions we made are wrong to make it not good and then say this is the change that we want. My big point is we shouldn't be doing that now. We should be doing it in prep for the year of review.

Tom Butler: Thanks, Dave. Scott, are you ok with what Dave is saying- we should be looking at the inputs and doing that? Or [do you think] we need to stop things and do this?

Scott Heidel: I fully agree with Dave that we do need to look into this. But, I think there needs to be a backstop added. If you still go through the analysis and people are coming up with 21% still, that just can't possibly be accurate with what's actually taking place. Setting aside a backstop to say, with everything we just looked at, we can fix it, and we know that it can't possibly be 21%. There needs to be some kind of backstop in there.

Alisha Mulkey (in chat): We should also consider impacts to NM BMP role if we impose set % of crop N

Tom Butler: If we can't decide on a backstop in 49 minutes today, are you of the mindset that we need to pause the model's timeline for development to address that, or are you ok with going forward with what we have and then evaluating things later?

Scott Heidel: I think we should discuss a backstop.

Tom Butler: Ok. If we do that, we will have to go probably ask for more time from the PSC.

Dave Montali: Let me rephrase what I think [Scott] is saying, and maybe I read it wrong. He is saying do the review while the first model is being developed, but when we do our review, we should make an issue about changing something if some metric is below some number. He is saying put a backstop on it and if we don't have violation of that backstop, then we are ok. He is saying don't put a stop on our '26 plans, but as we evaluate this going forward, define what is "ok", "good enough", for us not to change it.

Tom Butler: Ok, so then it doesn't need a reevaluation. Scott, go ahead.

Scott Heidel: I was just agreeing with Dave.

Tom Butler: So, then we don't need to re re-adjust the timeline. We need to just go forward with looking at what some of these concerns are and then during our review periods, we need to look at how that might happen, if it should happen, etc. We are not asking for more time now. We are putting things out the way they are. Obviously, we have the extension with the broiler data, but this is not a part of that. We are effectively done until we get past the first model version being out.

Robert Sabo: Scott, thanks for sending that email yesterday. Tom, can you go back to the previous slide with the state percents? At first it might seem like it doesn't pass the laugh test, but one thing to bear in mind is when you look at the Fertilizer Institute's NUGIS data platform and the national nutrient inventory in some of these West Virginia counties (particularly ones situated in the Shenandoah Valley), they do have negative surpluses. They have nutrient use efficiency values greater than 100%. It is not this extreme. One thing that is different between what you all have in CAST and what the NNI has or NUGIS has is pasture. Cow/calf operations are a big thing in those areas, and the pasture removal term is quite large. So, at first it doesn't seem like it passes the laugh test, but I think there is just a large flux or uptake from pasture that is kind of in play in the valley. But, based on national nutrient inventory and NUGIS, we do see these negative surpluses for cropland balances and higher than 100% nutrient use efficiency values. At first WV might seem kind of odd, but I think part of that is, in aggregate, that there is a lot of pasture removal going on that fertilizer is not accounting for.

Ken Staver: It's corn that they are putting on 30 pounds of N. I don't know, somebody from West Virginia knows, but I would guess that most farmers in West Virginia are not putting on 30 pounds of N on their grain corn. I am not from West Virginia, so I don't know what a nutrient management plan looks like there. You said look at these numbers and see if they pass the test. To me, from somebody far away looking at that, I would say it doesn't pass the test. If you look all around the country, most of the data we have is on N applied to corn. Nitrate losses are from corn, so that's our poster child for N use efficiency is grain. Corn with manure is a very low application rate.

Robert Sabo: My broader point is at the aggregate level for the agricultural system in West Virginia, I can't necessarily speak to all the particular applications for all the crop systems that are listed here, but when you go back to that table, WV being in a negative surplus, over 100% nutrient use efficiency, is not out of the question. That broader point is that, overall, the state bucket fertilizer assumptions are still largely holding, it's just how it is getting allocated across all the different crop types.

Dave Montali: I am from West Virginia, but I am not an ag expert. I do know that we made a change, and we said based on information we have, we have this many acres of managed hay and managed pasture. If you think big picture, there's a lot more pasture and hay acres than there are crop acres. If

you look at those boxes about how much nutrients are now going on the managed hay and managed pasture, maybe that was the thing that we screwed up in one of our inputs. We said we are going to have these two new land uses and try and figure that out. Maybe we erred in saying we have too much of that and it's not drawing nutrients that are available too much away from the small acres of crops that we have. My point is that there are a lot of moving pieces, we've made some changes, and this is a result. We need to figure out where we went wrong.

Jess Rigelman: I am not disagreeing with anything Dave is saying. I just wanted to be clear that the reported acres of managed hay and managed pasture aren't incorporated into this. When these were run, I didn't have data from all the states. I still don't. So, this is under the earlier assumption way back when we said 25, or maybe it was 10%, of acres were in managed hay and/or managed pasture. So, don't think that this uses your reported acres. There are some defaults in there.

Dave Montali: Oh, well that is interesting. So, you are not saying that there is none of it, you are saying that it was put in when we made the default decision early on. This is pretty good because we've probably prescribed lower percentages, particularly in the eastern panhandle counties where this problem is probably magnified. We did look at Hardy county, and numbers seemed very reasonable there. But there are a lot of animals and a lot of manure. Big picture, there are a lot of moving things that are going on. We might come up with some reasons why these things look wonky and latch on to an appropriate fix.

Robert Sabo (in chat): Accounting for manure deposited and fixation inputs for the aggregate mass balance puts WV in positive ag surplus territory and 80% NUE. Using the provided spreadsheet.

Ken Staver: The whole grass thing, we knew that when we started pulling N that it was going to make N applications on crops maybe look a little more accurate. Maybe it actually overshot. It seems reasonable that what [Dave] said might be the case.

Tom Butler: Hopefully this type of discussion can carry on at our non-decisional meetings through the rest of the year. This is really good insight, and I think that this is a direction we want to plan on going. I don't think this inhibits anything else we've done, but I definitely appreciate, Scott, you bringing this up in that light and then being willing to work on this as we move forward.

Scott Heidel: I appreciate that, too. This is all complicated stuff and everybody is trying very hard to make the model more accurate. When this came up with these numbers looking all over the place, I just wanted to ensure that there was some kind of backstop put in place if whatever analysis was performed still came up with really oddball results. Is that possible to get that to happen, or are we just going to look into this and then hope for the best?

Tom Butler: That would depend on what everybody says when we dig into this. If Dave reports his acre split of the hay and pasture land uses and that changes it/reduces the fertilizer pool, then potentially their applications change kind of drastically for a lot of their acres for other things. That might have an implication overall. So, it's up to the partnership to decide that, and I can't speak to where everyone is. I would assume people would want to dig a lot more into it and that there is no guarantee it would or would not happen.

Joseph Delesantro: I am not 100% following your use, Scott, of the language "backstop" here. In some cases, it seems like you are referring to a numeric value of a coefficient or a default. Also, it seems like the backstop could be the process. It could be the year of review, and the backstop could be raising your hand in 2027 and saying this doesn't look right, we need to address this in revisions.

Scott Heidel: Thank you for that. I do think that there needs to be some kind of numeric backstop.

Tom Butler: That's helpful, then. If you wanted a numerical back stop, that would require going through meetings and then making that decision. Or, as we have kind of couched it, during the review we would see what the results are. This is application, and the application does not equal the load. There are so many other factors that go into this. So, if during that time people looked at the results and wanted to go that route and investigate what that might be, might not be, and how that would affect other things, that could certainly be a discussion. I don't know that people are going to today say there needs to be a backstop and it needs to be X percent. If that's what you are asking, I don't think there's a guarantee it will or will not happen. That has to be a pretty extensive discussion.

Scott Heidel: Understood, thank you.

Ken Staver: Tom, on the backstop thing, this has plagued us for decades. We could kind of come up with a backstop for the main agronomic crops like corn. We could say, well, we know farmers aren't doing this. When it comes to pasture and hayland, we've always struggled with data on what was happening. In areas that have a lot of grass, pasture, and hay, the backstop would be hard to come up with. I think that's going to be one of the challenges. If you are going to have a backstop, you can't have a backstop for corn and then not have a backstop for other things. Nitrogen is going to move. It has to go somewhere. If we are going to stay with the state bucket, it has to end up in that state. Some backstops are easier than others. I think we are going to end up in the same place as we've always been wondering what is going on in all these big acres of pasture and hayland. So, I think that's what that discussion is going to turn into. I think the answer to that will kind of be the same as they always were of, well, we are not really sure.

Zach Easton (in chat): Where do we draw the nutrients for the backstop?

Scott Heidel (in chat): By correcting for incomplete fertilizer data.

Zach Easton (in chat): Which we don't have.

Tom Butler: This will be good in advance. People have a year to start reviewing it to see if there are any master's students or undergraduate students who need a summer project, and we can get some data. That is my optimism. I do appreciate that though, Ken. That historical perspective is good and important for people here to have. I myself am kind of going through this for the first time. So, if that discussion has been had many times, it is important for many of us to know that. Zach has dropped a comment in here about drawing nutrients for the backstop. So, just highlighting that there are many questions around how that would work, where it might work and not work, and how to get data.

Robert Sabo: This is a fascinating discussion. I look forward to delving into this deeper. Pasture is a problem for National Nutrient Inventory as well. Maybe we can find some solutions. One thing I just wanted to point out is that, for West Virginia, that .2 figure in the state aggregate slide, when you have a pasture removal term, you need to calculate the net pasture removal. In CAST, it is my understanding that it is what the plant is taking up. Of course, the cows are eating it and a proportion of that is being re-deposited. This calculation, as I am seeing it described currently in that spreadsheet, doesn't account for manure deposit. So, that West Virginia value skyrockets when you actually account for the net crop removal as well. So, I just want to emphasize that at the state level, we are going to generally be in ok shape. I can't necessarily speak for the next slide. I am sure there is going to be some nuances there. But, I just want to cultivate a little bit more faith in the West Virginia number. As you said, Scott, at first it doesn't pass the laugh test. When you account for the manure deposited onto pasture, that number gets close to 1.

Tom Butler: I think Scott has made a comment about incomplete fertilizer data. Scott, I wonder if you could highlight what you mean by “incomplete fertilizer data”?

Scott Heidel: By admission, multiple jurisdictions have not reported fertilizer sales data. So, how can we do a really accurate analysis if you have partial data for something that is a huge portion of the load?

Tom Butler: I understand we went through a process whereby we went through a projection method with certain smoothing algorithms put in place, and that’s accounting for two of the jurisdictions in the watershed. I think that just needs more discussion in terms of fleshing out what we would really mean by that. We made that decision, and if we are talking about revisiting that as a part of the review, that’s totally fine. I think the primary example you brought up doesn’t actually do that, but that is certainly a conversation that we can have.

Scott Heidel: Agreed. Those two jurisdictions are the ones that are on this chart loading at the lowest rates, so maybe it does need to be revisited.

Dave Montali: No, that’s not correct. West Virginia has provided sales data up through the last year it was requested. There was a time a few years ago where we hadn’t, but now we have. So, we have sales data. That was my first question- is our process for distributing state fertilizer data to the counties right? Maybe there is something wonky going on there. We just don’t have very much. The main point is, no, West Virginia is not in the bucket of not providing sales data. We have it, and we’ve provided it.

Jess Rigelman: This is 2020 data and all states in this chart, except New York, have reported fertilizer data for this year. So, it is only incomplete for New York, and New York has agreed to the smoothing method that the AMT has provided.

Zach Easton (in chat): How would you correct data that don’t exist?

Tom Butler: Understanding that the nuances to this certainly merit more discussion. I see the conversation is continuing in the chat. I don’t know, Zach, if you wanted to ask a question there or if you are just good with the chat.

Zach Easton: I am fine with just doing the chat. The data don’t exist. I don’t know how we would correct them would be my point.

Tom Butler: I don’t see any other hands or chat comments. I definitely appreciate the desire and the enthusiasm that people here have to look at some of this stuff as we review the data, understanding that we made our last decision today. Obviously, this is going to involve people talking to some other higher ups, but definitely appreciate the group effort on that. We have to coalesce around the time that it will be required for the broiler update. But, in terms of this, we are all on the same page that we will be revisiting these as we look at the inputs, the source data, some of the outputs, and then through the actual review period that we have. I think that that puts us in an ok spot, as long as we are all feeling relatively good about where that has landed. Does anyone have further comments, or are we all kind of in agreement? We can certainly take 30 more minutes here to discuss the direction we want to go. We will have to schedule our next meeting. So, I want to reiterate that we will be meeting every other month for these informational presentations. So, we will kind of have a little bit of time off here. We can certainly meet to hear if there is an update on data for March, or we can kick it off back in April. I can also run that by people offline. I am thinking tentatively that April is the start of those every other month meetings. Is this registering ok with the group? Do people have comments, questions, concerns, desires, or anything else?

Ken Staver: I was just taking a quick look at the spreadsheet for West Virginia acreages to try and better inform myself, and it looks like pasture and hay are at least 10x of what row crops are. So, it wouldn't take much of a per acre adjustment in pasture N to put some more N on the row crops. So, there is potential there for really big effects with small changes per acre on the hay and pasture. Even if it is 25%, which Jess said is the default mode, that is still way more acres than what they have in row crops if I read the spreadsheet correctly. So, Dave might have figured that one out. We just have to figure out how to do it, that's all.

Alisha Mulkey (in chat): April sounds good. Thanks all.

Tom Butler: Thanks for doing that on the fly here, Ken. Definitely some interesting stuff to look into. I think that we will probably try to meet again in April here. We will probably bring this up, since it sounds like it is a relevant thing. We will probably have a little update on the broilers, since we will have that information. Obviously, this is informational at this point to get us spinning up. Other than that, I think we are good for today and we don't need to drag this one out. Unless anyone has any comments, I will pass this off to Zach.

Robert Sabo (in chat): It will be fun to figure out together, thanks for bringing it up Scott.

Tamie Veith (in chat): April is ok with me. Thanks Tom.

III. **Wrap-Up**

Lead: Zach Easton, VT

II. **Adjourn**

Next Meeting: TBD.

Attendees:

Zach Easton, VT

Tom Butler, EPA

Caroline Kleis, CRC

Auston Smith, EPA

Mark Dubin, VT Cooperative Extension

Arianna Johns, VA DEQ

Seth Mullins, VA DCR

Chris Brosch

Alisha Mulkey, MDA

A.K. Leight, MDA

Dave Montali, Tetra Tech

Tyler Trostle, PA DEP

Kaylyn Gootman, EPA

Jess Rigelman, J7 Consulting/CBPO

Scott Heidel, PA DEP

Tim Larson, VA DCR

John Lancaster, PA DEP

Mark Nardi

Joseph Delesantro, Koniag

Clint Gill, DDA

Curtis Dell, USDA ARS

Hunter Landis, VA DCR

Denise Uzupis, PDA

Eric Hughes, EPA

Alex Soroka, USGS

Lisa Duriancik, USDA NRCS

Jeremy Hanson, CRC

Ken Staver, UMD/Wye

Laura Zielinski

Krista Crone, PA DEP

Tamie Veith, USDA ARS

Anne Coates, TJSWCD

Candiss Williams, USDA NRCS

Robert Sabo, EPA

Tad Williams, VA DCR