Agriculture Workgroup (AgWG)
DRAFT Meeting Minutes
April 18th, 2024
10:00 AM – 12:00 PM
Meeting Materials

Summary of Actions and Decisions

Decision: The AgWG approved the minutes from the March 2024 call.

Action: If your organization would like to contact NASS about the decision to not produce annual, county level estimates of cropland and livestock, contact Bryan Combs (bryan.combs@udsa.gov) and USDA-NASS Chief of Staff, LaKeya Jones Smith (lakeya.jones@usda.gov).

Action: Eric Hughes will send a call for information on agroforestry and the names of agroforestry experts to AgWG members.

Action: Eric Hughes and Tom Butler will present on the potential of an Expert Panel Establishment Group (EPEG) at the May 16th AgWG Meeting. This will likely be brought up as a decision item after it has been discussed at the AgWG.

Introduction

10:00 **Welcome, rollcall, review meeting minutes – 5 minutes**
Kathy Brasier, AgWG Chair

- Roll-call of the governance body.
- Roll-call of the meeting participants - *Please enter name and affiliation under "Participants" or in "Chat" box.*
- **Decision:** The AgWG approved the minutes from the March 2024 AgWG call.

10:05 **Introduction of Presentation Topics – 5 minutes**
Eric Hughes, AgWG Coordinator

Innovation/Data & Modeling

10:10 **Evaluating Water-Quality Trends in Agricultural Watersheds Prioritized for Management – 45 minutes (presentation and Q&A)**
Jimmy Webber, USGS

Jimmy presented on a recent study he led about water-quality patterns in three agricultural Chesapeake Bay showcase watersheds.

Discussion
Ruth Cassilly: For slide 14, the corresponding nitrogen (N) trend with manure application, did you map synthetic fertilizer application as well for that area?

Jimmy Webber: Yes, we took all nutrient input data that CAST estimates for this watershed and then used a statistical approach to see what combination of factors best explained the response observed. Fertilizer was not identified from that approach as an important factor for explaining the response, but that does not mean synthetic fertilizer does not have an impact on nutrient load. These results highlight how manure applications have an outsized influence on water quality response here.
Dave Graybill (in chat): Can you give an example of increase in crop yields over the years 1985-2020?
Jimmy Webber: When we looked at data in the watershed model, we saw an increase in yield and production of corn and soybeans over time. This could potentially speak to more removal of nutrients.
Dave Graybill: Thanks, I was just curious how much an increase in crop yields would have driven the amount of fertilizer applied.
Kathy Boomer: Another lesson from the Comprehensive Evaluation of System Response (CESR) report is the importance of carefully locating BMPs across the landscape to achieve our strategic goals of intercepting the sources of nutrients on the landscape more effectively. I think we have to improve our spatial targeting of restoration practices.
Jimmy Webber: I did not present it today, but we also employed synoptic water quality monitoring in each of these watersheds to spatially identify hotspots that can then be targeted by management for conservation practices. A second point is that this study was a great partnership with some local conservation group who we had great data sharing agreements with. This enabled the utilization of multiple types of data sources which can better inform management actions. This information exchange will be critical moving forward.
Matt Royer: Having spent the better part of my career working in the Conewago, I was happy to see those decreasing trends in the watershed. I was curious if you were able to identify causes for the increasing N trends in the upper portion of the Conewago?
Jimmy Webber: In general, in all of these watersheds, we did see increasing intensification of agricultural activities and increasing input. The upper portion does include some forested land, there is a dichotomy between the upper and lower stations. We could look into influences of intensification on the inputs.
Matt Royer: There are some fairly new animal concentration areas, such as a few poultry barns and swine in that area.
Ken Staver: You mentioned high flow is where trends seem to be changing the most. How was stormflow done in these projects?
Jimmy Webber: We have stream gauges that characterize hydrologic conditions and our staff go out during high flow storm events. This monitoring regime is designed to capture a range of conditions, from baseflow to stormflow. We then use WRTDS (weighted regressions on time, discharge, and seasons) to estimate the changing nutrient loads over time, which indicates how loads change during high flow and low flow conditions. We need to have someone out there conducting monitoring during stormflow conditions.
Ken Staver: What was your target sampling number for storm flows?
Jimmy Webber: The Nontidal Network monitoring regime includes one sampling event a month and 8 stormflow samples a year. This meets WRTDS's statistical requirements. We also have high frequency instrumentation for nitrate in these streams as well, which allows us to rely on observations.
Clint Gill (in chat): In terms of phosphorus (P), some of the increase might be related to stronger storm events mobilizing legacy in stream sediment.

Jimmy Webber: Yes, storm intensity is a great metric. Our model tries to remove the variability of streamflow, but we still see the artifact of these storms in the data.
Mark Dubin (in chat): Can you speak towards the potential influence of geology within these three watersheds, and sub-watersheds, which might influence the comparable H20 results between them, e.g. Karst, slopes, etc.
Jimmy Webber: Smith creek has carbonate headwaters and shale siltstone downstream area, Upper Chester is in the coastal plain, and Conewago Creek has a mix of siliciclastic conditions. Smith creek has the highest proportion of karst and carbonate geology and can be quickly discharged, as identified in synoptic monitoring. This can demonstrate the importance of protecting karst and carbonate areas.
Kristen Saacke Blunk (in chat): How has the monitoring data been informed by the karst topography - especially within the Smith Creek WS? Is there a way to "normalize" what it would look like if karst wasn't a part of the picture here?
Jimmy Webber: I think we could maybe do that by extrapolating the monitoring data from downstream areas, but I would have to think more about that because karst would already have an influence.
Mark Dubin (in chat): In describing the change of inputs in the Upper Chester, you mentioned the increase in manure inputs which might have influenced the increase load for N. Would this input influence the measured P load in addition to the decrease of inorganic P?
Jimmy Webber: I would agree with you that an increase in manure input would influence the measured P load, but I'm not sure if the increase in manure would lead to increases in inorganic P. I would think that is more related to increasing suspended sediment loading since the material likes to bind to the sediment. I'm happy to discuss that more later with you if you are interested.
Ken Staver (in chat): Is the paper from this study available?
Caitlin Grady (in chat): Yes - https://onlinelibrary.wiley.com/doi/10.1111/1752-1688.13197
Amanda Barber (in chat): Could changes in manure management (daily spread and solid manure vs. storage and liquid manure) be impacting nutrient load?
Jimmy Webber: Yeah, that's something we're really interested as kind of a follow up and continuation of this study. We had a coarse understanding of manure applications in the watershed as those data were from county level estimates, what's applied and reported and produced by cast. But there's really a lot more to this question than just the total amount applied, like if this is broadcast spray. I know in Smith Creek they're starting to do a lot of injection manure applications. Also, the time of the year that the manure is applied certainly has an influence. The increase in a lot of those animal waste storage facilities is potentially allowing for more flexible manure disposal options. That level of detail is absolutely what we want to move towards with for this work and that's where the partnership idea really resonates with me because not one of us can understand all these concepts individually. In Smith Creek, we were really working closely with local stakeholders and partners and farmers to learn about these kinds of processes.
Marel King (in chat): Observation - Trends seem to be influenced by manure, but only Upper Chester included "nutrient management" in their priority suite of practices, and that is the watershed that seems to be holding its own even though N inputs have doubled. Perhaps NM planning as a foundation can lead to more effective BMPs?
Jimmy Webber: I believe in Maryland nutrient management on farms and fields may be required compared to other states, but certainly most of the farms in the Upper Chester had nutrient management plans. Other watersheds have nutrient management plans, but I think your point still stands.
Kristen Saacke-Blunk (in chat): If you were standing in a room full of farmers - what would you tell them about their efforts to get conservation on the ground - with the goal of WQ improvements?

(Scientists communicating their findings really matters.... Am truly curious about how you would communicate on this front).
Jimmy Webber: I've presented similar information to partners in Smith Creek and found them to be receptive to the monitoring data. I've never heard them dispute the information. They appreciate the local knowledge of what is happening in their streams.
Zack Evans (in chat): Following up to Kristen's comment, I think it's important to acknowledge increased food production and sustaining the food supply for a growing population when presenting the information to farmers, and all audiences. In a vacuum it could present that monitoring data shows an increase in nutrient loads despite BMPs, but that may not take into consideration how much more food farmers are generating while still managing to mitigate additional nutrient runoff into the watershed.
Jimmy Webber: Yes, I think that is fair to recognize the pressures on agriculture in the Chesapeake Bay Watershed, whether they are from climate change or development pressures. Also, a lot of agricultural intensification reflects societal demand and consumer preferences. I don't want this work to be mis-interpreted to say that conservation is not effective, because that is not what our data is saying here. These practices may be effective, but we need to place them within the context of a lot of other influences.
Zack Evans: I think providing this context of the entire picture and acknowledging that conservation efforts have been helping, but we need to continue to do more and want to see progress.
Jimmy Webber: Thanks for the feedback. The research community is always looking for ways to improve our communication with the community.
Ken Staver: Does the modeling show something similar to the monitoring data?
Jimmy Webber: We compared what CAST and the monitoring data show, which did not always align. CAST indicated loads should be steady or decreasing slightly, but the monitoring showed increases in some areas. The watershed model team said this discrepancy may be explained by the fact that the watershed model does not incorporate groundwater lag time into those estimates. The watershed model is meant to represent long-term eventual changes in the water quality conditions that should result from the use of conservation practices, whereas our monitoring data are showing just what's in the stream at that point in time. There is good reason why this information differs, but there is a lot of research that can be done here to inform how to improve monitoring and modeling.
Kathy Boomer: I am concerned about the assumptions made in the black box like model. The model focuses extensively on mass balance, and I wonder if we're not thinking enough about the processes within that black box, if you will, and how have we changed conditions in a way that might result in a greater release or conversion of biologically unavailable phosphorus to orthophosphate. For processes, is this because of sulfate conditions, contaminant transport, or flow?
Jimmy Webber: For those of us who work with the monitoring data, we would love to hear about these comments. We want our research to answer these questions about the model results.
Mark Dubin (in chat): Did the studies identify a potential change in nutrient loads during the year?
Jimmy Webber: We looked at this using the high frequency continuous monitoring and the discrete grab samples. In the paper we briefly discuss changing seasonal conditions, and this can inform BMPs. It is a great idea to look at seasonal patterns.
Dave Graybill (in chat): Dry years, wet years show any significant differences in nutrient flow.
Kathryn Braiser: What are the next steps for this work and how can we contact you with questions or ideas?

Jimmy Webber: There are five additional small watersheds being planned right now. This work is being done in coordination with EPA and NRCS and one thing we learned from this study was some of these watersheds were still a little large to really closely identify these cause-and-effect relationships. To know what happening on the in the landscape and in the streams we identified this need to work at an even smaller watershed scale. These five watersheds have been picked for an additional round of water quality monitoring, so there's going to be this intensive amount of water quality monitoring and these areas and these are no bigger than 12 or 13 square miles. The smallest watershed is 5 miles and the largest ones are about 15 square miles or so.
We want to keep asking these same questions and learn what's happening in the landscape and what's driving responses in these areas. Feel free to contact me with further questions - jwebber@usgs.gov. I am also happy to participate in future AgWG meetings, although I may often just be listening in.
Eric Hughes: We would welcome you to participate in the AgWG meeting going forward.

Innovation/Accounting & Reporting

10:55 **Update: Remote Sensing Verification of Conservation Tillage BMPs in Pennsylvania – 10 minutes (presentation and Q&A)**
Scott Heidel, PA DEP; Tom Howard, Resolve Hydro

Scott Heidel, PA DEP, and Tom Howard, Resolve Hydro, provided an update on Pennsylvania's project focused on remote sensing verification of conservation tillage BMPs.

Discussion
Dean Wells Hively: Is the intention that this dataset would provide training for satellite analysis using Normalized Difference Thermal Index (NDTI)?
Thomas Howard: This dataset will be used as a training dataset. NDTI will be used as one of the inputs for this model, which will take a few different approaches for the classification. I showed an example of NDTI derived from Landsat and it correlated well with observed conservation tillage measurements in 2023. Generally, we take all of these transect survey data points, assign them to fields, and do some data filtering to make sure that we don't have any structures or other non-agricultural elements in the pixel area, and then we'll pair that with coincidence satellite measurements over the fields.
Ken Staver: A comment was made earlier about conservation tillage being the best practice for dissolved P. I think dissolved P is problematic. Are you looking at any interactions of applications of manure on the soil surface with dissolved P.
Thomas Howard: These questions of P loading are outside the scope of this project, but PA DEP may be working on it.
Scott Heidel: This is currently outside the scope of this project, but it is of high relevance.

Data & Modeling

11:05 **2022 Census of Ag: An Overview – 45 minutes (presentation and Q&A)**
Bryan Combs, USDA - NASS

Conducted every five years, the Census of Agriculture offers America's producers the opportunity to take part in the nation's most comprehensive and impartial data collection for agriculture.

Since 1840, the ag census has played a significant role in showing the value of agriculture, and these important statistics are used at the local, state, and national levels to plan for the future. During the presentation, Bryan Combs, Chief, Environmental, Economic, & Demographic Branch at USDA's National Agricultural Statistics Service shared data from the recently released 2022 ag census and highlight the latest trends, including the number of farms, economics, land use practices, and highlight additional ag census products which will be released over the next several months.

Discussion

Eric Hughes: Can you speak in more detail about the watershed specific data?

Bryan Combs: We will retabulate these data at the Hydrologic Unit Code (HUC) 6 scale, which will be released on July 24th, 2024.

Tom Butler: NASS products are very useful for the Chesapeake Bay Program Partnership, especially USGS and jurisdictional agencies. We like to use the five-year census and county level annual estimates for decision making and academic research, which lends credibility to our work. We have recently learned that NASS will be discontinuing these annual, county level estimates of crops and livestock. Would you please explain why this happening and if there are ways to adjust to this change.

Bryan Combs: I'm not involved in the annual county level estimates, but I can talk generally about this change. Unfortunately, we received a reduction in appropriations from Congress for 2024 and the budget came out later in the year, so we ran out of available projects to make funding reductions in because of when we learned this information. This was a very difficult decision because we know every data product we produce is important to someone and has a critical use. We are hoping that our budget will increase to allow us to fund this project starting in 2025 but will need to see what happens in terms of congressional appropriation. There is potential that external funding from a state, other agency, or industry group could allow us to keep producing these annual, county level datasets.

Lisa Duriancik: This change that Tom asks about will also impact USDA's Conservation Effects Assessment Project (CEAP) in several components, particularly our Watershed Assessment Studies and our National Cultivated Cropland Assessment, both the APEX and SWAT modeling. We have also determined that the ARS Manureshed Project and the US Greenhouse Gas Inventory uses the county level estimates and will be impacted by this decision. We hope to gather the list of products impacted by this decision and share them with NASS so we can find a way to mitigate this disruption.

Kathy Braiser: How can we engage in these conversations with NASS?

Bryan Combs: Many of us involved with federal agencies are unable to lobby congress. I would recommend state and local officials, plus other stakeholders, advocate to their members of congress the importance of NASS's mission and our data products. Highlight how these annual, county level estimates are used in your work and why they matter.

Tom Butler: Bryan who might you suggest federal agencies and states reach out to exactly? Is there a single person who would be the best to reach out to?

Bryan Combs: You're welcome to reach out to me (bryan.combs@udsa.gov), but probably our best contact would be our NASS Chief of Staff, Lakeya Jones Smith (lakeya.jones@usda.gov) and she can get you into the right folks to talk about possible external agreements and external project funding.

Kathy Boomer: You mentioned irrigation, but will later reports include estimates or statistics on conservation drainage?

Bryan Combs: Right now, we don't have plans that have a specific topic on conservation drainage. We potentially have some other products, particularly the agricultural resource management survey, that touch on that slightly that may be able to provide some information, but probably not at the level of detail down to the county level that the census has.
Kathy Boomer: That is unfortunate.
Bryan Combs: NASS keeps an eye out for information that is relevant to our data users, so we will keep in mind if there is data on a topic that we can incorporate in future Ag Censuses. The census functions as a screening tool that allows us to understand what stakeholders are interested in and if they should be a focus of future, finer scale efforts. We also want to be cautious as the value of the census is stability, so once something is added to the census, we are hesitant to remove it.
Kathy Boomer: Just to add, I've heard estimates of tiling going in it rates of 300,000 acres a year. This is something that definitely needs to stay on our radar screen if we're concerned about managing for water scarcity and water quality concerns. Soil health, as well as the whole cascade of ecosystem services tied to that concept, are intertwined with water availability.
Hunter Landis: Can you please elaborate on the response rate and how that impacts the overall quality of the data?
Bryan Combs: We did receive a response rate that was down about 10.8% from 2017, which is never ideal as a statistical agency. As part of the federal statistical community, this is a common trend across all surveys in the federal government, so we do make adjustments for non-response. However, we still did receive over 1 million census of agriculture forms from producers across the country and we continue to apply rigorous statistical methodologies to adjust and account for that. The non-response part of the way we do that is in addition to the actual surveys that were sent out to producers, we actually use an area frame. We know a definite amount of land and that typically doesn't change, so we will go out and sample segments of land and enumerate everything in that area to help account for some of the incompleteness of our list, which we know is never 100% accurate. This helps adjust for some of the non-response that for surveys that we don't get back in the mail. If you're interested in more on the methodology for non-response, Appendix A of the census has all the full methodology that you can look into.

Wrap-up

11:50 **New Business, Announcements & Updates – 5 minutes**

- **Agricultural Modeling Team**
  - Tom Butler, Coordinator of the AMT, provided a brief update on the group's latest activities.
- **Crediting Agroforestry Practices**
  - Eric spoke about next steps for following up on the presentation at the March AgWG meeting.
- **Other Announcements?**
  - Send to Eric Hughes (Hughes.Eric@epa.gov) for inclusion in "Recap" email.

11:55 **Review of Action and Decision Items; Adjourn - 5 minutes**
See top of document.

Next Meeting: **Thursday, May 16th, 2024: 10AM-12PM, Call-in Zoom**

Participants

Alex Gunnerson, CRC
Eric Hughes, EPA
Kathy Braiser, PSU
Caitlin Brady, GWU
Greg Albrecht, NY
Elizabeth Hoffman, MDA
Kate Bresaw, PA DEP
Cindy Shreve, WV
Emily Dekar, USC
Alex Echols, Campbell Foundation
Nick Hepfl, HRG
Clint Gill, DE
Matthew Royer, PSU
Jeff Hill, YCCD
Zach Evans, Mountaire Farms, Inc.
Jenna Schueler, CBF
Brady Seeley, PA SCC
Dean Wells Hively, USGS
Nicole Christ, MDE
Tom Howard, Resolve Hydro LLC
Natahnee Miller, PA DEP
Dave Graybill, PFB
Ken Staver, UMD Wye
Caitlin Bolton, COG
Bryan Combs, USDA-NASS
Fred Irani, USGS
Grant Gulibon, PFB
Michele Drostin, Green Fin Studio
Carlington Wallace, ICPRB
Jimmy Webber, USGS
Kristen Wolf, PA DEP
Dylan Burgevin, MDE
Hannah Sanders, EPA
Suzanna Trevena, EPA
Peter Hughes, Red Barn Consulting
Hunter Landis, VA DCR
Seth Mullins, VA DCR
Nancy Nunn, UMD
Olivia Devereux, Devereux Consulting
Amanda Barber, NY
Kathy Boomer, STAC/FFAR
Kristen Saacke Blunk, Headwaters LLC
Seth Mullins, VA DCR
Marel King, CBC
Kate Patton, Stakeholders Advisory Committee
Tom Butler, EPA
Kendrick Flowers, NRCS
Ruth Cassilly, UMD CBP
Mark Dubin, UME/CBPO
Cassie Davis, NYS DEC
Karl Blankenship, Bay Journal
Caroline Harper, Campbell Foundation
Pat Thompson, EnergyWorks Group
Helen Golimowski, Devereux Consulting
Tyler Trostle, PA DEP
Scott Heidel, PA DEP
Tyler Groh, PSU
Lisa Duriancik, NRCS

****Common Acronyms**

AgWG- Agriculture Workgroup
AMT- Agricultural Modeling Team (Phase 7)
CAST- Chesapeake Assessment Scenario Tool (user interface for the CBP Watershed Model)
CBP- Chesapeake Bay Program
CBPO- Chesapeake Bay Program Office
CBW-Chesapeake Bay Watershed
CTIC – Conservation Technology Information Center
CVN – Conservation Validation Network
EPA- [United States] Environmental Protection Agency
FSA – Farm Service Agency
NRCS – Natural Resources Conservation Service
NFWF – National Fish and Wildlife Foundation
OpTIS – Operational Tillage Information System
PSC – Principals' Advisory Committee (CBP)
PSU- Penn State University
SWCD – Soil and Water Conservation Districts
SWG – Small Watershed Grant Program
WQGIT- Water Quality Goal Implementation Team
WILD – Watershed Investments for Landscape Defense

UMD- University of Maryland
USDA – United States Department of Agriculture
USGS – United States Geological Survey