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Subject: Watershed Staff Interview Summary

Staff from MPCA and BWSR used written surveys as well as live interviews to gain feedback from watershed staff on various nutrient initiatives. This memo provides combined responses from 17 one-on-one and small group interviews conducted after 66 state and local staff responded to the BWSR User Tool Assessment Survey. Overall, the watershed staff seemed appreciative the State was taking the time to ask listen to their opinions. MPCA and BWSR were interested in staff perspectives on models and tools available to state employees, what tools and data helped most when interacting with the public (specifically farmers), downstream nutrient reduction, potential staff shortages, issues for the Nutrient Reduction Strategy (NRS), and metropolitan concerns such as stormwater issues, monitoring, and technical capacity. An addendum provides information from seven additional interviews of state technical staff. General responses can be found in Figure 1 below.

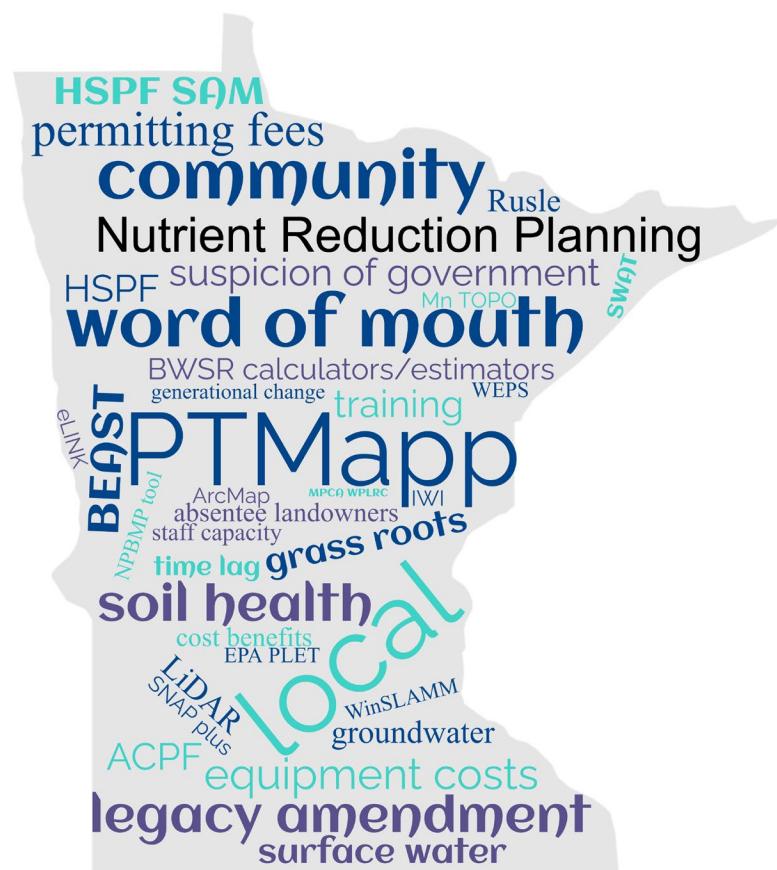


Figure 1. Word cloud of most common interview responses.

Data and Support

In terms of technology needs, most staff requested some type of additional training on any of the tools or models used by the State. This training could come in a variety of formats, including step-by-step user guides, training for new versus more experienced users, as well as online trainings that staff could access on an as-needed basis.

Many watershed staff also mentioned a need for some type of repository or “one-stop-shop” to house all tools and related trainings in the same location to make them easier (and less time consuming) to find. Some staff suggested creating a “Wiki” for tools, similar to something MPCA already uses for stormwater¹.

Another suggestion was for a statewide TMDL tracking database, using what the 1W1P has previously created as an example. MPCA does publish a list approved TMDLs (including a downloadable PDF) on its TMDL website² and refers to the *Impaired Waters* viewer. MPCA may want to consider developing a more user-friendly viewer and searchable list of approved TMDLs, potentially using Tableau.

“Bit of “analysis paralysis” at times. It’s helpful to compare different methodologies as a truth check sometimes.”

“There are so many good tools and many of them are good references even if we don’t use them directly. At the local level we need to decide what works best for us. Every tool is different, and every region has different needs, here we have agriculture and lakes there is no one tool that works for all of the different needs. It is hard to know what all is out there and where they are housed. A one stop shop for tools would be useful.”

While most staff did mention using PTMApp, others did say that they found the models hard to use (Figure 2). MPCA and BWSR may want to develop educational/outreach material for watershed staff considering using these tools and models that indicate what levels of effort and experience are necessary to use each model and tool. They also noted frustration when entering the same data into two (or more) different models and receiving different results. A similar concern has been observed with watershed staff

during TMDL development, when different models yield different results. MPCA and BWSR may want to develop educational/outreach material for watershed staff that discusses how different models and tools operate using different methods, different sets of assumptions, and different input datasets. MPCA and BWSR may want to consider emphasizing a weight-of-evidence approach, where each model or tool is a different line of evidence.

Recommendations

1. Create additional training and educational/outreach material for models and tools. These materials must be kept up to date and consistent with State needs. Potentially a pilot study (or multiple studies) of certain types of training could be conducted throughout the State. Another recommendation is to use

¹ Minnesota Stormwater Manual. https://stormwater.pca.state.mn.us/index.php?title=Main_Page

² Total Maximum Daily Loads Projects. <https://www.pca.state.mn.us/business-with-us/total-maximum-daily-load-tmdl-projects>

the results of the BWSR survey or a more focused survey to get at exactly the type of tool(s) training most needed/requested by watershed staff. Training on the “newer” tools was specifically requested, potentially over the summer instead of only at BWSR Academy (in October). Some users suggested creating 5-minute videos and record screens with step-by-step instructions or explaining how models differ from each other and when each should be used.

2. Create “one-stop-shop” for easy location of models and tools. This will let multiple users from all over the State to access the correct tools and models for their needs quickly, without having to search various databases throughout the State. It will also allow for more efficient updates as tools become outmoded and new data is available to revise models.

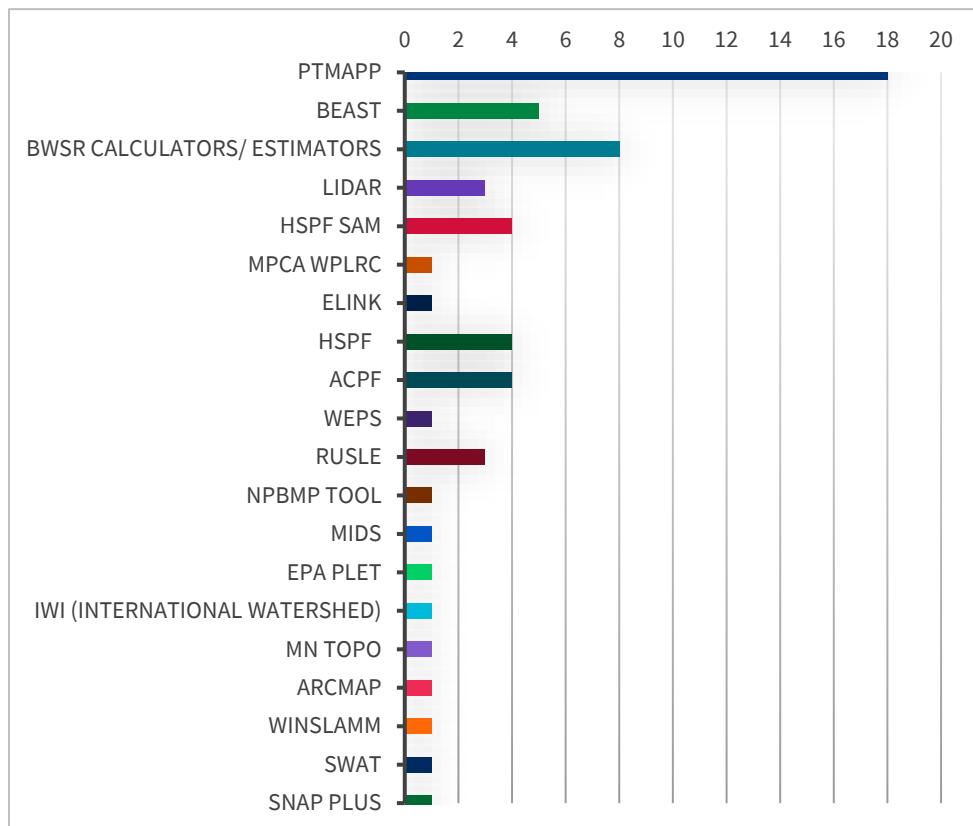


Figure 2. Models/tools most used by watershed staff.

Nutrient Reduction

Local concerns were overwhelmingly more important to farmers and landowners according to interview respondents (Figure 3) than any other issue concerning nutrient reduction. Although in certain situations, local priorities still impact larger waterbodies that are relatively close by (e.g., Lake Superior versus Gulf of Mexico). Other priorities included dealing with absentee landowners, prohibitive equipment costs, and problems such as suspicion of government that occur with generational land ownership. Many staff cited grass-roots efforts or word of mouth as being the best ways to get landowners on board to making changes regarding nutrient

reduction efforts. They also preferred using easy to understand graphics (e.g., maps, cartoons) that focus on a particular landowner's location using straightforward language, and cost-benefit estimates when available.

"The pollution reduction estimates are useful and eye opening for many producers...They don't seem to care about impairments unless it directly affects them."

Figure 4 is a graphical representation of how staff prefer to communicate with landowners. Using an environmental justice perspective for certain nutrients (e.g., nitrogen, chloride) and their impacts is another way to communicate to people in more urban or municipal locations. Data, reports, and results should not just be published on a website that the public may rarely see, but actually disseminated in communities that are affected. Creating specific templates of the types of information that need to be communicated so staff can just plug data into a form that will generate a user-friendly fact sheet, map, or cost estimate would be a good starting point.

Recommendations

1. Create a connection between local landowners, watersheds, and larger water quality issues. If the ultimate goal is to keep the Gulf of Mexico free of nutrients and lower eutrophication levels, potentially start by working backwards from that point. Look to what the State of Mississippi is doing with their water quality standards and follow those up the river. The practices may not be exactly the same, but most people are highly influenced by their bottom line. Work to find the right incentives to get and keep people motivated for the long term.
2. Continue to learn from and lean into positive word-of-mouth experiences to get more land owners interested in conservation plans. Nutrient reduction programs need predictable, sustained funding to maintain a path forward that will not only incentivize land owners to participate monetarily but also gives added faith to the landowners that projects will continue well into the future. Potentially create some kind of partnership between State agronomy services divisions, private sector, and crop advisors to increase the visibility of practices, provide technical assistance as needed, as well as create a sense of community.

"Success breeds success and good conservation experiences can speak for themselves and have the potential to snowball into more projects."

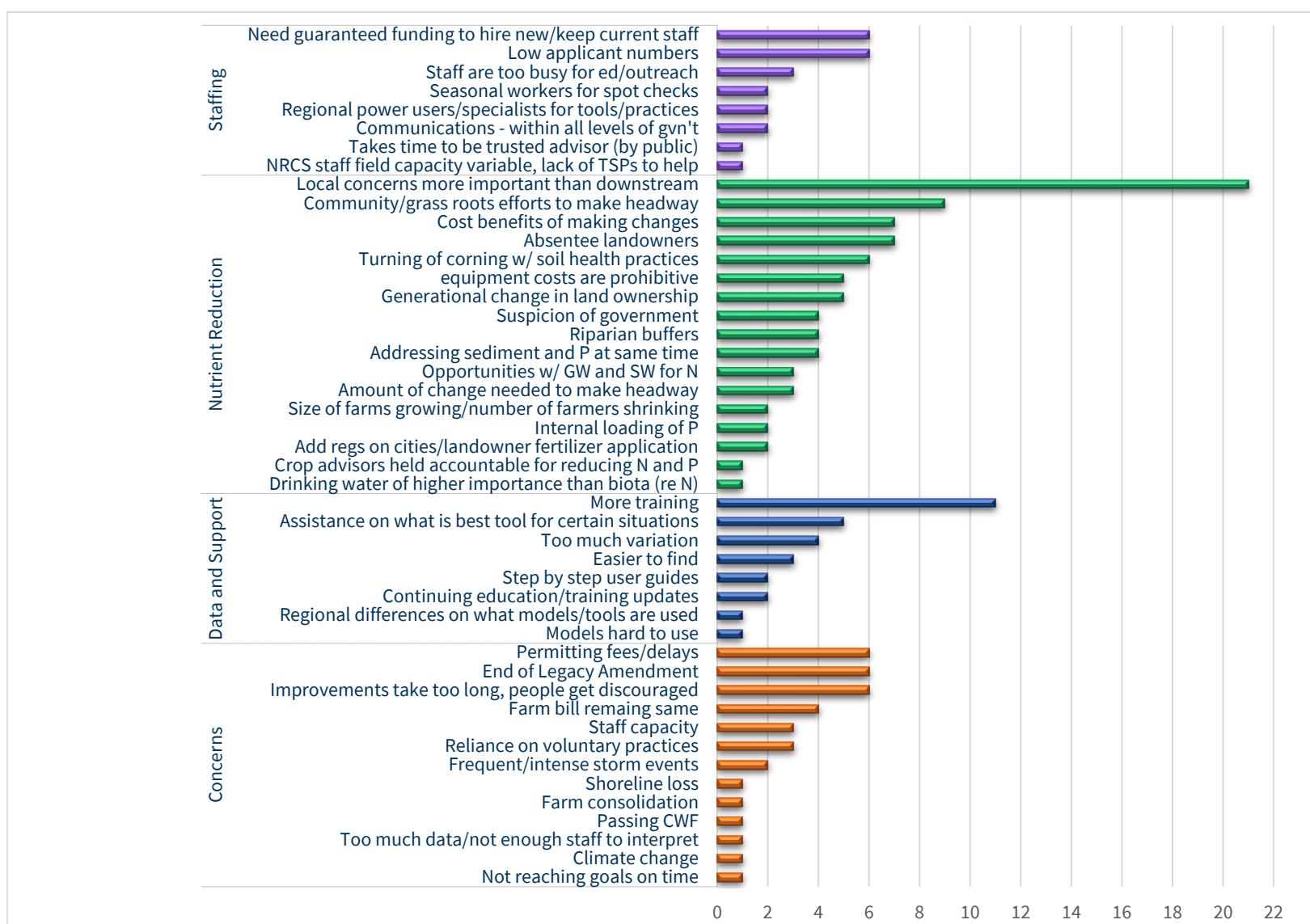


Figure 3. Pivot table comparing Minnesota state staff interview responses.

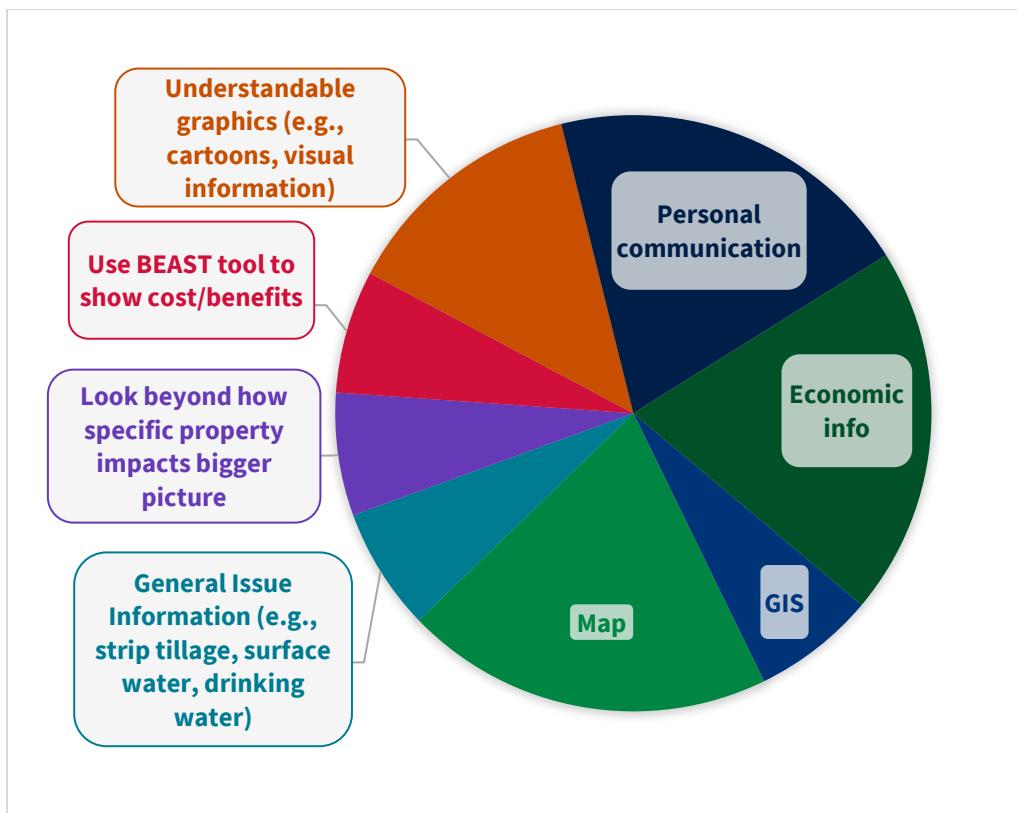


Figure 4. Types of data/information for landowner outreach.

Challenges and Opportunities

Not surprisingly, funding is the top concern of most SWCDs (Figure 3). The current, overriding economic system rewards farmers that grow annual crops even though they have high nutrient requirements. Regardless of the number of BMPs in place, the nutrients still have an outsized impact in these systems. Moreover, in the occasion that a landowner would like to institute new BMPs, they often do not understand why there are permit fees associated with projects that the State has suggested they make. This ends up adding time to an already long process in which people often become discouraged at seeing how little change is made in water quality, even after a new project is put online. MPCA and BWSR may want to consider developing educational/outreach material for permit programs that explains why permit programs are needed and how permit fees fund the permit programs. The agencies could also develop educational/outreach material to explain that (1) improvements in water quality following BMP implementation can take several years, especially when legacy nutrients have built up in the system and (2) biological response to improved water quality can also take several years as fish and benthic macroinvertebrates recolonize or repopulate formerly degraded streams.

“There are opportunities to work adjacently to riparian corridors [to reduce sediment/P inputs] rather than larger priority watershed areas.”

Aging infrastructure to handle changes in sediment loads as well as stormwater pond maintenance is a potential problem that may be covered with federal funding. However, those dollars are not necessarily promised whereas the State is always expected to be able to help citizens when natural disasters (e.g., flooding) occur. There is also a perceived lack of responsibility on behalf of the fertilizer companies (not all the farmer's/public's fault). Those companies make a lot of money selling products that ultimately are washed into the waterways yet they do not seem to ever pay any penalties.

"Soil health is super exciting and starting to take off. Hope more folks get into cattle and start to put in more living cover."

Although not always secure, staff is hopeful with the Comprehensive Watershed Management Plans (CWMP) and Watershed Based Implementation Funding through the Federal Inflation Reduction Act that funding will remain predictable and consistent. Additional resources allow for use of more precise and fuel-efficient equipment, crop genetics, and more research into the value of soil health practices. As new, younger generations of farmers continue to try new things and make adjustments to make things work.

Recommendations

1. Investigate reducing permitting fees and wait times on State recommended projects. Potentially reducing either of these even by a fraction could entice additional landowners to participate in conservation programs.
2. Continue to work at the grassroots level with landowners and develop trusted networks. This goes back to word-of-mouth being the best "selling" device available to local staff. Focusing on what works as far as landowner buy-in is a strength that should be capitalized. Furthermore, word-of-mouth is basically free press. The State does not have to do any additional marketing beyond its own quality work to sell the idea of conservation to the landowners when they can see the benefits to their bottom lines and talk amongst themselves about the benefits to their land and crops.
3. Initiate strategies that identify benchmarks that are easily quantified and updated. This will allow the State to timely track progress and adapt as needed to get the best results. This could help people understand the lag times between BMP installation and response in water and how it may vary from area to area. Develop educational/outreach material that summarizes success stories for BMP implementation and improved water quality and focus on the time needed for ecological recovery.

Staffing

Recruitment and retention along with low applicant numbers are the highest among the staffing concerns of the SWCCs (Figure 3). On the surface, it looks like the State and local governments receive a lot of money. But there is also a lot of competition between various organizations for a limited number of qualified individuals. On top of that, there are consultants and universities, ag extensions, and other private firms that are willing to pay similar or greater compensation for staff.

"Need to get more people out there that can sell conservation or sell the concepts...how do you teach that to students in college?"

Staff also need to be able to communicate and “sell” science conservation to farmers, especially the older generation. This is not always taught at a university and takes time to learn on the job. People become trusted allies and then are difficult to replace that skill set when someone leaves for another position.

Recommendations

1. Create mentorship program (like Peace Corps, AmeriCorps, MT Conservation Corps). This could admittedly take time but using federal and other State examples could speed up the process. A pilot program funded through LCCMR to aid SWCDs through the Conservation Corp of Minnesota and Iowa could be used as model to scale up this type of effort in the future. If infrastructure funds are available to subsidize the program and it is marketed to graduating college seniors as an alternative to graduate studies or a gateway into the workforce, this type of program could be extremely successful and continuously generating applicants. The State could set the program up so an attendee would have to spend enough time in the program to not only learn the background of a particular area but also train a replacement for long enough so the locals are comfortable with the transition.
2. With planned retirements, the replacement staff could shadow the planned retiree for the last year preceding retirement. This would allow the planned retiree to pass on more of his or her institutional knowledge to the replacement staff and allow the planned retiree to introduce the replacement staff to his or her network of colleagues (across organizations) and active stakeholders.

“Internships for college students can be helpful and raise interest in environmental science and getting experience and skills to do that work later when they enter the work force.”

Addendum

The following section is a compilation of interview responses from State technical staff. The overall substance of the interview questions was the same as what was asked of watershed staff, although in a somewhat less formal approach.

Data Analysis and Modeling

Many of the technical staff had similar ideas to those from the watershed staff, such as standardizing data inputs, knowing the local demands of the regions, and needing easy-to-follow guidance on when to use which tool (or model). Additional ideas include information on more “real-life” data to collaborate models, such as multiple lines of evidence (e.g., BMP efficiencies, water quality data, hydrographs, flow duration curves) for ground-truthing purposes.

Modelling capabilities between technical and watershed staff are similar (HSPF, HSPF SAM, PTMApp, simple estimator, SWAT, etc.), with the exception of the use of LiDAR among the technical staff. Some of the technical staff mentioned HEC-RAS, a python version of HSPF, APEX models to improve modelling of state agriculture practices, and BMP efficiencies as some models that they would like to learn more about. Particularly using HSPF and PTMApp or HSPF SAM to find sources of pollutants, perhaps by using PTMApp on smaller lakesheds or watersheds (e.g., HUC 12 size). As far as training is concerned, the group requested easy to follow guidance on which tools to use and/or one on one or small group trainings for new models as opposed to large group presentations which give a general overview of HSPF overall.

Technicians suggested the State provide training on user access to models and public interface interaction, such as HSPF Git Hub. Right now, gaps exist between users and those who have knowledge of specific models to run scenarios. There also seems to be a cutoff on which models watershed managers want to use. Not too many local partners seem interested in HSPF SAM but prefer “lighter” tools like WPLRCT or simple estimators. Ideas to close that gap included using focus groups to see which model to focus training, creating a “power user” concept where certain people are trained in multitude of models, or instituting a requirement of contractors that specific models or tools need to be used as part of a bid/contract win.

Nutrient Reduction Goals

A desire to model the effectiveness of BMPs (specifically what local BMP adoption was actually reducing) was an issue that was often raised in terms of modelling effectiveness, as well as meeting nutrient reduction goals. One way state technicians suggest is a type of progress tracking. For example, compiling evidence of how land and field management influence BMP adoption and water quality improvements. Also using the models to forecast where the largest loading rates may occur and therefore where the BMPs might provide the most usefulness. Determining real-world BMP nutrient capture/reduction effectiveness and targeting BMPs to the highest nutrient loading areas are issues being dealt with by state environmental agencies across the Midwest.

Some of the challenges facing the technical staff in relation to meeting nutrient reduction goals include interactions (e.g., decay factors, cycles) that make it difficult to calibrate the models because data are sparse in some cases. Some of the models (e.g., HSPF) are more challenging than others to use. Since no specific standard has been selected or required by the state, local watershed managers also may use different models or even revert to the simple estimator rather than use the potentially more complex model or tool that was used to develop their TMDL/WRAPS/1W1P.

Staff Technical/Modeling Capacity

There is a desire among many of the technical staff to increase consistency when knowing what tools to use in certain situations, for example which models fit with local needs, or the most efficient way to input and extract data. Multiple people referenced GIS in various capacities, either moving from Arc Map to Pro, the ESRI portal, GIS interface, LiDAR data. It would be helpful to have at least one (if not more) person dedicated to modelling and improving consistency across the state. Instituting a technical unit meeting once every six months or annually could also keep everyone up to date on emerging technologies.

Staff Training

Overall, there is an interest among state staff for additional training in various tools and models (e.g., HEC-RAS, WASP, QUAL2K). Although, some training could be project-dependent, so what is learned in training can be immediately used and not forgotten. Specific to increased GIS work and analysis, Python, and HSPF training have been requested to increase efficiency and broaden services provided to internal partners. As well as potential training on how to use LiDAR data to allow staff to “embrace its voluminous nature” and “appreciate the details of the landscape it maps”. Finally, understanding what other states are doing, specifically on the modelling front, as well as those close by with similar issues and geography could help guide training ideas and goals for state staff.