Street sweeping webinar, May 13, chat box questions, comments, and discussion. Replies are shown as sub-bullets. Comments were rearranged and lumped by topic, if appropriate.

Responder color code:

**Mike Trojan, Minnesota Pollution Control Agency**

**Sarah Hobbie, University of Minnesota**

**Aileen Molloy, Tetra Tech**

**Webinar participant**

* May 13, 2021 9:46 AM from John Gulliver to everyone: I have noticed a lot of tree and bush flowers in streets. Are these also important in adding to phosphorus contribution to receiving water bodies?
* May 13, 2021 9:54 AM from Randy Neprash to everyone: I am very interested in the strong peak of P in snowmelt. This is a topic worthy of additional research.
	+ **May 13, 2021 10:11 AM from Sarah Hobbie to everyone: Randy - the peak in snowmelt is super interesting and important and has been recognized for a long time - it is likely from runoff over frozen soil, from material in the street that overwintered, and from phosphorus deposition that accumulates in the snowpack over winter, but we don't know the relative importance. Definitely a topic for future study.**
* May 13, 2021 9:57 AM from Randy Neprash to everyone: The data showing that tree litterfall is 37% - 64% of the P in runoff seems extremely important.
	+ **This is one reason we are developing guidance on street sweeping concurrent with the calculator tool. Understanding when and where to sweep seems important.**
* May 13, 2021 9:59 AM from Ben Scharenbroich to everyone: Dr. Hobbie, do any of the communities in your sample area encourage residents to rake/blow leaves into the street during the fall? If so, was that additional leaf litter compared against cities who do not encourage that practice?
	+ **The focus of the study was on establishing relationships between leaf material and phosphorus removal, so this was not considered. I have not seen this practice encouraged by many communities, though if timed properly it might be a way of addressing leaves from yards. However, Sarah did point out the importance of not removing all organic material in a watershed, since recycling of nutrients is important.**
	+ **May 13, 2021 10:03 AM from City of Prior Lake to everyone: Ben Scharenbroich: Prior Lake does not encourage residents to rake/blow leaves into the street. We have looked into it, but that practice would require new equipment and a new approach to our program. It could happen in the future but for now we have not found it to be cost-effective.**
	+ **May 13, 2021 10:06 AM from Dan Lillis to everyone: to put leaves in the streets. Weather can change things and not allow for these leaves to get picked up in time before stormwater takes the leaves into the storm pipes.**
	+ **May 13, 2021 10:10 AM from Dan Lillis to everyone: Regardless of whether or not a street sweeping program picksup leaves, citizens should not be persuaded to put blow their leaves in the street.**
	+ **May 13, 2021 10:11 AM from Dan Lillis to everyone: There's too much of a threat to stormwater carrying them to a conveyance system.**
	+ **May 13, 2021 10:31 AM from Dan Lillis to everyone: We send out press releases and have news articles/radio PSA's that inform the citizens to NOT place leaves in the streets.**
	+ **May 13, 2021 10:51 AM from Dan Lillis to everyone: I have approached citizens about leaf dumping, but only when we get complaints from other citizens. It's impossible for us to actively look for each person who dumps leaves.**
	+ **May 13, 2021 10:54 AM from Nico Cantarero to everyone: @ Steve Gureney. In a previous life I would give the property owners a warning (NOV doorhangers) that gave them 24 hours to clean it up or get fine/assessed. Usually would lead to them givning the landscape company and angry call to come clean it up. Still requires some staff time but template doorhangers made things a littler quicker/easier for staff.**
	+ **May 13, 2021 10:54 AM from City of Prior Lake to everyone: Steve Gurney: We coordinate closely with our code enforcement official and anyone else out there driving around (public works, engineers, police). Contacting code enforcement about piles of anything in the street is specifically highlighed during our annual required MS4 training. We have already had a couple instances this year where a public works staff person stopped and talked to the company about a stockpile in the road, and it was cleaned up and swept later that day. Enforcement would step up from there. Key seems to be education for all field staff. Once key staff members know about the issue the program works well and follow-up is simple.**
	+ **May 13, 2021 10:56 AM from Sarah Hobbie to everyone: Not to mention that leaves that remain in the street or move into catch basins will start to decompose, which can release phosphorus that's not immediately "leachable".**
	+ **May 13, 2021 10:57 AM from Nico Cantarero to everyone: @ Sarah Hobbie. Yes, very interested to explore how sump structures and HD separators contribute to this.**
* May 13, 2021 10:00 AM from Lauren Letsche - City of Columbia Heights to everyone: Is there guidance for disposal of streetsweepings? While we have found that it is easy to sweep our streets we have found it is not cost effective to dispose of the sweepings.
	+ **May 13, 2021 10:07 AM from City of Prior Lake to everyone: Lauren Letsche: We follow this guidance for disposal: https://www.pca.state.mn.us/sites/default/files/w-sw4-54.pdf#:~:text=Street%20sweepings%20that%20are%20not,7035.2855). Agree that disposal by landfilling is not very cost-effective. We have been able to reuse some following the MPCA guidance.**
	+ **In addition to the above reference, there may be some information at this link -** [**https://stormwater.pca.state.mn.us/index.php?title=Guidance\_for\_managing\_sediment\_and\_wastes\_collected\_by\_pretreatment\_practices**](https://stormwater.pca.state.mn.us/index.php?title=Guidance_for_managing_sediment_and_wastes_collected_by_pretreatment_practices)
* May 13, 2021 10:01 AM from Josh to everyone: Is there a difference in P runnoff between communities that require residents to sweep leafs to street vs berm vs bag collection?
	+ **I am not aware of any studies of this nature. As discussed above, putting leaves in the street is generally not recommended. There are communities that have collection programs and it would be of interest to see if material collected is quantified in any fashion.**
* May 13, 2021 10:06 AM from Renee Bourdeau to everyone: For Sarah: Will the TN and TSS data that was collected be available?
	+ **May 13, 2021 10:08 AM from Sarah Hobbie to everyone: All of the data are publicly availably on the University of Minnesota's digital repository: https://conservancy.umn.edu/handle/11299/216252**
* May 13, 2021 10:06 AM from John Bilotta to everyone: Will there be guidance for local professionals on the selection of the crediting or sampling approach?
	+ **There will certainly be information about different crediting approaches. We could probably include some language about resource needs when determining which approach works best for a municipality.**
* May 13, 2021 10:07 AM from Nico Cantarero to everyone: Does the calculator account for Cities that restrict parking during street sweeping?
	+ **Options 1 and 2 are based on material collected, so they do not account for this. Option 3, which is based on miles swept, would be affected by parking restrictions since it is based on P8 modeling. Relative to the credits for options 1 and 2, however, this would be a minor factor.**
	+ **May 13, 2021 10:19 AM from Sarah Hobbie to everyone: Nico Cantarero and Chloe Hoke and Joe Mulcahy - the credit is based on the actual total amount of material removed in sweeping.**
* May 13, 2021 10:07 AM from Rich Profaizer to everyone: Does the level of P change over time as organics decay? Leaf that just fell retain the same P as it reaches its final decay point?
	+ **Yes. Research done by the U of MN, as well as others, shows that phosphorus is released from leaves as they break down. However, the process is somewhat complicated and varies with multiple factors, such as species, moisture content, rainfall characteristics, etc. Some information on this can be found at this link -** [**https://stormwater.pca.state.mn.us/index.php?title=Street\_sweeping\_for\_trees**](https://stormwater.pca.state.mn.us/index.php?title=Street_sweeping_for_trees)
* May 13, 2021 10:08 AM from Nico Cantarero to everyone: Does the calculator account for communities that target street sweeping specifically during leaf fall?
	+ **Yes, options 1 and 2 require the user to select whether the material is collected during leaf drop or non-leaf drop seasons.**
* May 13, 2021 10:09 AM from Pat Depkin to everyone: I'm jujst s simple technician concerned with the quality of what comes out the discharge of the pipe. My jurisdiction offers credits for urban tree planting. We also offer credits for street sweeping. Given the amount of P that organic material contributes, are we working at cross purposes by adding to the organic load in our urban scenarios? What about the emissions and environmental costs of operating and maintaining a sweeper fleet?
	+ **May 13, 2021 10:11 AM from Randy Neprash to everyone: To Pat Depkin: If your city is increasing the number of trees, you should look carefully at enhancing your street sweeping program. More trees = more leaves = more P in your stormwater discharge = greater responsibility for removing more P by implementing an enhanced street sweeping program.**
* May 13, 2021 10:14 AM from Justine Dauphinais to everyone: I noticed there is no input on the calculator for type of sweeper used(mechanical, vacuum assisted, regenerative). What is the current consensus on how these technologies differ in mass/nutrient removal?
	+ **May 13, 2021 10:16 AM from Sarah Hobbie to everyone: Justine Dauphinais: we were not able to detect differences among the sweeper types that we compared, so this credit does not distinguish among sweeper types.**
	+ **Other studies have suggested there are differences, including some of the work that Bill Selbig showed. In this study, there was insufficient data for different sweeper types to examine this effect.**
* May 13, 2021 10:15 AM from Karen Cappiella to everyone: How/does this information change the amount of credit that MN (or cities) give for urban tree planting?
	+ **Minnesota does not have a tree planting credit, unfortunately. It’s on our radar screen, and we are aware that others have explored this, including the folks in the Chesapeake Bay Area. One question it raises is whether aggressive tree planting should affect model inputs for entities calculating P loads in their watersheds (e.g. does an emc change as tree canopy increases).**
* May 13, 2021 10:15 AM from Chloe Hoke to everyone: How is the spatial extent contained? At what spatial scale are these reductions calculated and how can the reported values be tied to spatially explicit areas?
	+ **The reductions are tied to spatially explicit areas by the user. The spatial extent is defined by the user and how the sweeping activities are entered into the calculator. For example, if sweeping routes are entered individually, the reduction can be calculated and attributed to the known area covered by each sweeping route. If all sweeping for a jurisdiction is aggregated, the reductions can be attributed to the jurisdiction as a whole.**
* May 13, 2021 10:15 AM from Ben Scharenbroich to everyone: Is the collection of chlorides being considered for future street sweeping credit?
	+ **I’m not aware of discussion focused on chlorides. Winter and early spring sweeping may be a topic worth discussing in areas receiving heavy road salt application.**
* May 13, 2021 10:15 AM from Josh Accola to everyone: WI DNR and USGS have been doing similar work to quantify leaf management under different collection methods and frequencies of management. Has this research been considered as street sweeping isn't the only way to collect leaf litter?
	+ **This is something we would like to incorporate into crediting in the future. The crediting approach should be applicable to any type of collection process. If resources allow, we may be able to pursue this in a future work order.**
* May 13, 2021 10:17 AM from Chloe Hoke to everyone: SImilar to Nico Cantarero's question about parking controls, are there considerations for curb accessibility for these sweeping events? Assuming low accessibility will not be representative of the full amount of sweeping material/litterfall that will actually make its way into the stormdrain system
	+ **May 13, 2021 10:19 AM from Sarah Hobbie to everyone: Nico Cantarero and Chloe Hoke and Joe Mulcahy - the credit is based on the actual total amount of material removed in sweeping.**
* May 13, 2021 10:19 AM from Joe Mulcahy to everyone: Does the credit include P removal from fine sediments or just organic matter?
	+ **May 13, 2021 10:19 AM from Sarah Hobbie to everyone: Nico Cantarero and Chloe Hoke and Joe Mulcahy - the credit is based on the actual total amount of material removed in sweeping.**
* May 13, 2021 10:19 AM from Randy Neprash to everyone: Everyone interested in street sweeping should check out this Web site - http://www.worldsweeper.com
* May 13, 2021 10:20 AM from Jim Kosluchar to everyone: Sarah Hobbie: Can you elaborate more on your response regarding sweeper type? Were the collection of differing types of sweepers compared and differences in P collected per mile insignificant, or were they not compared?
	+ **May 13, 2021 10:22 AM from Sarah Hobbie to everyone: Jim Kosluchar - we compared different sweeper types and were not able to detect differences in P collected per mile. However, I will say that we had limited ability to make these comparisons, because cities use different sweeper types at different times of the year.**
* May 13, 2021 10:26 AM from Jill Murray to everyone: Have you measured removal of pesticides and/or have you noticed, if not quantified, removal of microplastics?
	+ **May 13, 2021 10:27 AM from Sarah Hobbie to everyone: Jilll Murray: We have not measured pesticides or microplastics in our samples, which would be really interesting to do.**
* May 13, 2021 10:27 AM from Rich Profaizer to everyone: In the early stages of using sweeping as part of storm water quality there was a push to use vacuum sweepers so the small fine particles in the crevices of pavements were picked up. At that time it seems the fine particles had the most P bonded to them. Am I following correctly that leaves should be our target and using a mechanical sweeper to pick up twigs/ leaves could be equally as effective?
	+ **May 13, 2021 10:29 AM from Sarah Hobbie to everyone: Rich Profaizer: a lot of the earliest studies did not measure the leaves - either because they discarded the coarse material (leaves!) or because they did not measure sweepings in the fall when leaves are dropping - so yes, we can conclude that leaves are the most important contribution of P.**
* May 13, 2021 10:27 AM from Chloe Hoke to everyone: Were there considerations for pavement condition in the calculator or in the effectiveness variables? Given that sweepers will be less able to pick up all material if the roads are cracked, but stormwater will still convey the material (and nutrients) trapped in the cracks of the roads
	+ **May 13, 2021 10:30 AM from Sarah Hobbie to everyone: Chloe Hoke - this credit averages over road conditions, since the routes measured had a variety of road conditions, etc.**
* May 13, 2021 10:27 AM from Greg Wilson Barr Engineering to everyone: Do your costs include the cost of disposing all of the swept materials?
	+ **The values shown are rough estimates taken from the literature and likely do not include disposal costs.**
* May 13, 2021 10:29 AM from Randy Neprash to everyone: The focus here was on P. The potential for removing other stuff is probably significant and a reason for further research. I am really interested in the concept of thinking about streets as useful collectors where we can pick up and remove many really nasty things at reasonable cost and effectiveness.
	+ **This point was made near the end of the webinar. Studies show that bacteria can grow in streets having concentrations of organic material, so sweeping should be useful for reducing bacteria. Similarly, any practice that reduces solids will also reduce organic pollutants and metals in runoff. The issue here is quantifying the effects of sweeping on these pollutants.**
	+ **May 13, 2021 11:09 AM from Paula Kalinosky to everyone: Yes - street sweeping is important for collection of solids, not just phosphorus!**
* May 13, 2021 10:29 AM from Paul Gardner to everyone: Does anyone track % of cities that employ best practices in MN? Is there certification like with the SmartSalting program?
	+ **We conducted a survey of street sweeping practices -** [**https://stormwater.pca.state.mn.us/index.php?title=File:Street\_sweeping\_lit\_review.docx**](https://stormwater.pca.state.mn.us/index.php?title=File:Street_sweeping_lit_review.docx)**. There is no certification program for sweeping that we are aware of.**
	+ **May 13, 2021 10:31 AM from John Bilotta to everyone: Maybe we should design and offer a 'street sweeping training program/certificate/certification program' like our winter salt, OSTP, and SW BMP inspection trainings...**
* May 13, 2021 10:29 AM from Nico Cantarero to everyone: I agree timing is very important, but from the demo it seems like the curb line calculator method doesn't account for timing of street sweeping, just curb line miles. Is there an opportunity to add timing factors and parking restrictions to the curb line calculation that increase removal levels? I agree that monitoring street sweeping piles is ideal but I think that will be costly for municipalities to implement.
	+ **The curb line calculator method is an annual average, using default values in P8 and is intentionally conservative to encourage data collection at the local level. P8 prioritizes the fine sediment reductions from street sweeping and is not explicitly addressing contributions from leaf litter.  There are no plans to adjust the modeling parameters for the tool to account for other factors; however jurisdictions are free to run their own models to calculate load reductions using modeling parameters appropriate to local conditions. MPCA will provide additional guidance creditable modeling in the future.**
	+ **Monitoring street sweeping piles is not necessary to use the tool. The mass of the freshly swept material is the only information from sweeping that is required to use the higher crediting option in the tool. This can be obtained using an on-board scale or weighing the truck. The forthcoming SOPs will provide more information on determining the mass of sweeper materials.**
* May 13, 2021 10:30 AM from Pat Depkin to everyone: Remember, diesel fuel turns into atmospheric emissions- the air quality folks down the hall from me may have a differing opinion on the net, global benefit of increasing sweeping efforts. Remember- air, water, it's all part of a single environmental system, are we sure benefits to the water side are not offsetting gains on the air quality side?
	+ **It’s an interesting point. I’m not sure we are encouraging more street sweeping though, versus more focused sweeping, if one of the goals of sweeping is water quality. Also, if leaves can be recycled as compost, there may be carbon benefits**
* May 13, 2021 10:30 AM from Leslie Yetka to everyone: Does the impact of P loading from trees and litterfall in streets outweigh the benefits that trees provide in mitigating urban heat, stormwater interception, cleaner air etc. Not sure that data exists, but my hope is that a takeaway is not that we AVOID planting trees near pavement.
	+ **May 13, 2021 10:32 AM from Sarah Hobbie to everyone: Leslie Yetka: I completely agree. Trees provide all sorts of benefits - cooling, wildlife, mental health, etc. So, I think we can think of enhanced street sweeping as an opportunity for managing potential water quality effects of trees.**
* May 13, 2021 10:31 AM from Michael Capistrant to everyone: Allied Blacktop has 14 Pelican Class Elgins, and a Vac Truck sweeper.
* May 13, 2021 10:31 AM from Josh Accola to everyone: It seems like this research and credit program may encourage municipalities to plant less trees to perform source reduction or plant more trees to allow increased mass removal. This could have other unintended consequences. Has MPCA considered this potential issue? Are there concerns?
	+ **May 13, 2021 10:32 AM from Sarah Hobbie to everyone: Leslie Yetka: I completely agree. Trees provide all sorts of benefits - cooling, wildlife, mental health, etc. So, I think we can think of enhanced street sweeping as an opportunity for managing potential water quality effects of trees.**
	+ **I don’t think that is the message we are delivering. The focus is on better timing and focus for street sweeping. I agree we need to do a better job of communicating the benefits of trees when we discuss managing tree debris.**
* May 13, 2021 10:33 AM from Paul Gardner to everyone: Pat Depkin--did a quick google search on electric street sweepers. They all seem new but they are making their way into the markeplace. <https://www.bortekpwx.com/fully-electric-street-sweepers/>
	+ **May 13, 2021 10:34 AM from Pat Depkin to everyone: Electric sweepers still need to get their charging power from somewhere, might be nuclear, might be coal ...**
* May 13, 2021 10:33 AM from Randy Neprash to everyone: Info wanted - Detailed info, including SOPs and costs, on how cities can best measure their sweepings, to maximize their P reduction credits.
	+ **This is information being developed as part of the sweeping guidance.**
* May 13, 2021 10:34 AM from Stuart Schwartz (privately): 't need to clean out catch basins and drop inlet structures. Have the calculated P load reductions ever been verified in receiving water quality changes - not withstanding Bill's research?
	+ **There is published research on this, and there is also information from programs such as Washington’s TAPE and New Jersey’s NJCAT. In Minnesota, many of these devices are used as pretreatment, which is required in the Minnesota Construction permit. They are therefore not credited in Minnesota. If used as stand-alone practices though, they should get credited. The Minnesota Stormwater Manual provides some discussion of this - https://stormwater.pca.state.mn.us/index.php?title=Pretreatment**
* May 13, 2021 10:35 AM from John Paulson to everyone: Calculator for leaf vacuum collection
	+ **Hopefully as more research is conducted we’ll be able to determine if crediting should be a function of sweeper type.**
* May 13, 2021 10:37 AM from Paula Kalinosky to everyone: Re: Sweeper Waste Management: The City of St. Could has a long standing sweeping program. Each year they rent a screener to separate trash from clean fill. This significantly reduces the landfilling cost associated with sweeping. Fall sweepings are composted. They have no problem with demand for clean fill.
	+ **May 13, 2021 10:38 AM from Ben Scharenbroich to everyone: I 2nd what Paula said. Plymouth also rents a screener**
	+ **May 13, 2021 10:34 AM from Lauren Letsche - City of Columbia Heights to everyone: How are other cities disposing of screened street sweepings if they have no other use for the material, since it seems to be mostly organic matter? Are there options other than a landfill that may be more cost effective?**
* May 13, 2021 10:38 AM from Josh Accola to everyone: If you want to do your individual part of cleaning the street to reduce stormwater pollution, may I suggest https://www.adopt-a-drain.org/.
* May 13, 2021 10:39 AM from Kim Ashmore to everyone: i believe it was said earlier, this presentation will be avaialble on line ?
	+ **Yes - https://stormwater.pca.state.mn.us/index.php?title=Stormwater\_Manual\_webinars**
* May 13, 2021 10:39 AM from Nico Cantarero to everyone: What are the considerations for municipalities that have already developed their own methods/models for quantifying street sweeping load reductions?
	+ **Municipalities are free to use existing methods. We’ve found that these methods, which typically employ modeling, provide far less credit than crediting using the relationships developed with this research**
	+ **May 13, 2021 10:45 AM from Paula Kalinosky to everyone: Response to Nick Cantarero - depending on what data you have collected, you may find that the calculator credit is greater than what you've estimated. I found this to be the case for the Forest Lake data set compared to initial predictions.**
* May 13, 2021 10:40 AM from Stuart Schwartz (privately): The labile forms of nutrients and carbon tend to leach into runoff very quickly ~24-72 hours after leaf fall, leaving recalcitrant forms in the leaf "skeletons". Is there evidence of a water qualiity benfit in receivng waters from collecdting recalcitrant nutrients in leaf skeletons?
	+ **This is an important point and should be discussed in the guidance being developed to accompany this work. There is some benefit to removing this “aged” material, but much less than collecting fresh material. More research is needed on this and it is one reason for providing a lower quartile value rather a median value for the credit. See this link for more information - https://stormwater.pca.state.mn.us/index.php?title=Street\_sweeping\_for\_trees**
* May 13, 2021 10:43 AM from Steve Gurney to everyone: lawn care companies are notorious for leaving piles in the street for 2-3 days before coming back to vac them up. even worse, now we're seeing them collect and then dump their loads in the street; when they come bakc and vacuum they don't get all the ground up little particles. anyone have good ideas on how to stop this? regulation and enforcement would be difficult...
	+ **May 13, 2021 10:49 AM from Alan Rupnow to everyone: Steve Gurney - I think you could enforce that leaf dumping as an illicit discharge**
	+ **May 13, 2021 10:51 AM from Steve Gurney to everyone: Alan Rupnow - we have; very cumbursome. looking for the easy fix! :)**
	+ **May 13, 2021 10:52 AM from Alan Rupnow to everyone: Steve - Got it. Maybe require them to take out a ROW Permit to stockpile leaves? Make cleanup required within a set amount of time with performance conditions?**
* May 13, 2021 10:44 AM from Randy Neprash to everyone: Paired watershed studies are the best!
* May 13, 2021 10:45 AM from Nico Cantarero to everyone: Something for future consideration by the researchers and the MPCA. In the Minnehaha Creek Bacteria Study we found high levels of E. Coli associated with run off from “dirty” curb lines (sediment and tree litter) as compared to “clean” curb lines. It would be interesting to explore potential bacteria reductions associated with street sweeping.
	+ **Agreed**
	+ **May 13, 2021 11:10 AM from suthe to everyone: Very little research has been done on bacteria as it relates to street sweeping. Dr. Robert Pitt studied it in Tornoto Canada in 1986. I have that document if anyone is interested. You can reach me at** **Sutherland.roger1@gmail.com**
	+ **May 13, 2021 11:01 AM from Jill Murray to everyone: Nico, I agree. We have some pilot data that suggests curb inlet screens prevent leaves from entering catch basins, with some bacteria reduction downstream (pilot data because it was confounded by drought, we did not have paired watersheds, and our baseline was one year long).**
* May 13, 2021 10:47 AM from Jeff Rice (privately): Sorry, entered late. But I'm getting no video. Will this webcast be available for re-viewing later?
	+ **May 13, 2021 10:48 AM to Jeff Rice (privately): Yes. This is being recorded and will be posted on the Minnesota Stormwater Manual. https://stormwater.pca.state.mn.us/index.php?title=Stormwater\_Manual\_webinars**
* May 13, 2021 10:53 AM from Ross Bintner to everyone: Bill, can you address spring seed/organic debris data or findings?
	+ **May 13, 2021 10:09 AM from Sarah Hobbie to everyone: John Gulliver - flowers likely contribute, along with seeds, to the the peak that occurs in late spring/early summer in stormwater P, but we haven't separated out those different contributions.**
* May 13, 2021 10:53 AM from Steve Gurney to everyone: interesting that leaching plateaus within 6 hours or so...
* May 13, 2021 11:00 AM from Jeff Rice to everyone: Performance in series: Hence the problem with using % removal as a performance metric.
	+ **This is a concern with street sweeping, as we may overcredit downstream bmps when there is aggressive sweeping up in the watershed. It’s something we’ll look into in our guidance. There are other benefits though, as pointed out in the following comment about the effect of sweeping on longevity of downstream practices.**
* May 13, 2021 11:00 AM from Randy Neprash to everyone: To what extent does removing dirt and solids by street sweeping extend the functional life of downstream stormwater ponds? Less solids to the pond means longer time intervals between dredgings.
	+ **Pretreatment, which would include street sweeping, does improve downstream bmp performance and life expectancy while reducing maintenance needs for the downstream bmp(s). For example, see recent work by Bill Hunt on forebays.**
* May 13, 2021 11:02 AM from Randy Neprash to everyone: We recommend the MN Stormwater Manual highly!!
* May 13, 2021 11:04 AM from Mary Welch to everyone: The street sweeping tool seems very useful. Great job explaining it Aileen!
	+ May 13, 2021 11:04 AM from Sarah Hobbie to everyone: Agreed!
	+ May 13, 2021 11:05 AM from Aileen Molloy to everyone: Thanks, we worked really hard to try to make it accessible and easy to use
* May 13, 2021 11:05 AM from Randy Neprash to everyone: Bill Selbig's work on the stormwater volume benefits from trees are fascinating. Look at his presentation at the St. Anthony Falls Lab Stormwater Seminar series.
	+ **https://www.wrc.umn.edu/news-events/mnswseries-0**
* May 13, 2021 11:05 AM from Greg Wilson Barr Engineering to everyone: apples-to apples comparison with how other tools are crediting structural BMPs. The elephant that still remains in the room is how much of the swept material removed would have actually been delivered downstream to the nearest receiving water without street sweeping? Also, Bill's paired watershed loading estimates with enhanced leaf management appear to show that it only makes sense to do street sweeping in the fall--can we actually quantify the benefits during other times of the year?
	+ **The point is well taken. In the case of phosphorus, it seems reasonable that much of the phosphorus released from organic material would eventually reach a receiving water as it is in dissolved form. More work is needed on this. Also, fall does appear to be the time when street sweeping provides the greatest benefits.**
	+ **May 13, 2021 11:07 AM from City of Prior Lake to everyone: Greg Wilson: We have done some work on that. As an example, we assign our lowest sweeping priority to landlocked areas. Agree that there can be more targeted work completed to help address the issue you raised.**
* May 13, 2021 11:05 AM from Dan Lillis to everyone: How many people were present for this weibinar?
	+ **307**
* May 13, 2021 11:05 AM from victoria swanson to everyone: thanks much My question is "where do they bring all the collections that the street sweepers collect? Since there could be other items collected with the leaves, who separates this collected street waste? are the individual municipalities responsible for segregating what is collected. i.e. rubbish, plastics, etc. , where do the leaves go?
	+ **May 13, 2021 10:07 AM from City of Prior Lake to everyone: Lauren Letsche: We follow this guidance for disposal: https://www.pca.state.mn.us/sites/default/files/w-sw4-54.pdf#:~:text=Street%20sweepings%20that%20are%20not,7035.2855). Agree that disposal by landfilling is not very cost-effective. We have been able to reuse some following the MPCA guidance.**
	+ **In addition to the above reference, there may be some information at this link -** [**https://stormwater.pca.state.mn.us/index.php?title=Guidance\_for\_managing\_sediment\_and\_wastes\_collected\_by\_pretreatment\_practices**](https://stormwater.pca.state.mn.us/index.php?title=Guidance_for_managing_sediment_and_wastes_collected_by_pretreatment_practices)
* May 13, 2021 11:08 AM from Joe Mulcahy to everyone: Any comparisons between residential streets and those in commercial, industrial areas?
	+ **May 13, 2021 11:10 AM from Sarah Hobbie to everyone: Joe Mulcahy: much higher phosphorus in residential areas, but I believe that heavy metals may be higher in commercial/industrial areas.**