SUMMARY
Joint Urban Stormwater Workgroup (USWG) and Land Use Workgroup (LUWG) Meeting
July 15th, 2014
9:30AM to 3:30PM
Annapolis, MD
http://www.chesapeakebay.net/calendar/event/21155/

SUMMARY OF DECISIONS & ACTION ITEMS

DECISION: The June USWG minutes were approved as submitted.
DECISION: The LUWG and USWG members decided that the Phase 6.0 developed land uses will be: developed impervious, transportation/roads, open space, stream corridor, developed pervious, and urban tree canopy.
ACTION: LUWG will finalize the remaining questions about the above land uses during their August conference call.
ACTION: The Phase 6.0 land uses will be presented to the Modeling Workgroup in September and the WQGIT in October.
ACTION: USWG members will send any other comments and suggestions on the proposed land uses to Jeremy Hanson, Norm Goulet & Jenny Tribo.

MINUTES

USWG session, 9:30AM – 11:00AM

Welcome and Review of June Minutes

- Norm Goulet (Northern Virginia Regional Commission; USWG Chair) convened the meeting, welcomed participants and reviewed the agenda.
- Goulet called for comments on the June workgroup minutes (Attachment A); none were raised.

DECISION: The June minutes were approved as submitted.

Announcements

- Katherine Antos (EPA, CBPO): Understand that Jeff Sweeney discussed the 2013 progress run with USWG in June. Since then EPA completed its evaluations of 2012-2013 milestones and 2014-2015 milestones. The evaluations are on the EPA Chesapeake Bay TMDL website: http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/RestorationUnderway.html
    - Norm encouraged participants to review the evaluations at their leisure, particularly if they are expecting new permits.
- Goulet discussed revisions to the BMP review protocol. One of the bigger points of discussion was whether the panel deliberations should be open or closed to the public. There was a compromise similar to the National Academy of Sciences process for holding an open meeting where the public or stakeholders can share their own viewpoints or information, followed by closed deliberations.

- Ray Bahr (MDE): We issued final determinations to Baltimore County, Baltimore City, Anne Arundel, and Prince George's. Tentative determinations for Howard, Frederick, Charles, Carroll, and Harford counties. Montgomery County's permit expires in February and MDE will be working to reissue that soon.
- Goulet noted that STAC approved the one-day workshop proposal for propriety stormwater technologies, which was discussed at the June USWG call.
- Schueler noted the revised Urban BMP Queue (Attachment B). The list will continue to expand and change going forward.
- Joan Salvati (VA DEQ): for CBTAP, who would be physically administering it?
    - That's at least a year down the road.

Virginia Tech Cooperative Agreement to Facilitate Expert Panels

- Brian Benham (Virginia Tech) noted the Virginia Tech cooperative agreement is not the only resource available to expert panels. TetraTech will continue to be available for panel support. He described Virginia Tech's six year cooperative agreement and the Chesapeake Bay Watershed Research and Outreach Collaborative (CBW-ROC).
    - View his slides for more details.
- Benham asked for questions
    - Goulet: in terms of managing expectations, 8-10 month timeframe is very ambitious. If a source sector workgroup wants to convene a panel on its own, can it do so or must they go through the VT process?
    - Benham: EPA would have to address that, but if they go through VT process, would need to go through the whole process starting with RFP.
    - Antos: As Brian said, there are other options such as Tetratech and Center for Watershed Protection, and Chesapeake Stormwater Network. CBPO will continue to work with workgroup chairs and coordinators to determine what the best route is for a specific panel.
    - Berger: Who determines which BMPs VT will handle?
        - Benham: The WQGIT would set the priorities. VT will take the lead from the Partnership.
    - Schueler wished Benham the best of luck and asked if there is the possibility of VT launching a stormwater panel over the next 8-10 months.
        - Benham: Have been focused on hiring the project Coordinator and will be working on getting the Manure Treatment Technologies RFP out. Expect that the focus will mostly be on agricultural BMPs, but not sure.
    - Goulet noted the cross-sector BMP prioritization should be placed on an upcoming WQGIT agenda.
    - Steve Stewart (Baltimore County): the new process seems a little more top-down, with the PC taking the lead on the literature review, whereas previous panels relied on the panelists for conducting the lit review.
        - Benham clarified that the PC would conduct a preliminary lit review to jump start the panel's review. The process does not limit the panel's ability to review the literature or other information.
    - Goulet thanked Benham and the participants for their discussion.

Nutrient discharges from grey infrastructure expert panel report

- Schueler thanked the panelists for all their hard work. He noted the USWG would not seek a decision to accept the panel's recommendations, as stated in the agenda. He briefly recalled the panel's recommended creditable nutrient discharges.
    - View his presentation for more detail or the full panel report (Attachment C) for the full set of recommendations.
    - He explained the objections from EPA Region 3 and VA DEQ. Region 3 objects to credit N-9 (wet weather overflows). DEQ argues that an IDDE program should be detecting these discharges anyway, so credit should not be given. Based on the objections it was agreed to have a meeting among state and federal co-regulators sometime in the next few months. In the mean time the panel's work is on hold.
    - Schueler: these types of discharges are essentially lumped into the overall urban load through the calibration. They were never explicitly simulated.
        - Shenk: That's correct. The modeling workgroup has stated to the WQGIT that to protect the calibration we need to count actions that are actual changes on the ground. Counting these types of practices is consistent with that.
    - Bill Stack (CWP): As a former manager in Baltimore City, there are strong disincentives for identifying the specific source of a sewage overflow and to eliminate dry weather sources from the system. Had hoped that providing nutrient credit would help counter the disincentive.
    - Antos: Illicit discharges are illegal and thus are not explicitly simulated or modeled, so there were questions about how to credit these practices. Comes down to a baseline issue. Compliance is not the only goal for these IDDE programs. Need further fleshing out to ensure we are not violating the Modeling Workgroup's principle of protecting the calibration, and need to make sure we are only crediting additional actions that go above and beyond.
    - Goulet: We knew early on this would be an issue for the regulators. Agree with Bill that dry weather overflows are a gray area. This is a real issue and these practices have a benefit if we can incentivize them.
    - Stewart: If it is in our MS4 permit that we have to have an IDDE program, would we not receive credit?
        - Antos: EPA is not suggesting that we won't give credit for permit requirements. We do so for wastewater. We're trying to determine what the additional reduction is. If we are improving compliance with existing permit requirement, would be okay crediting them if they go above and beyond compliance.
        - Stewart: Given that logic we would only get credit for retrofits beyond the 20% retrofit requirement in our permit from MDE.
        - Schueler noted that the states and EPA will be working together to review each type of discharge. Any state with an interest in this discussion, contact Tom Schueler and Katherine Antos.
            - Salvati: VA DEQ will participate; still need to determine which DEQ representatives will be involved.
            - Schueler described the IDDE requirements for watershed states. The panel was pretty clear about what is expected for going beyond those basic program requirements.

- Goulet noted there is strong interest in the panel's recommendations and the discussion will continue.

Update: Status of current urban stormwater expert panels

- Schueler: The two CSN panels are street sweeping and floating treatment wetlands. Street sweeping may reach decisions in the fall. The panel elected to use WinSLAMM to assess street loads and reductions for street sweeping based on a large number of scenarios. TetraTech will be running those scenarios over the coming weeks. The other piece is that the panel needs to determine nutrient enrichment values of dirt collected by sweepers, and they have already compiled information on this. May not reach consensus on leaf detritus issue. Floating treatment wetlands is making progress, but slowly, given issues with other panels such as NDGI. Stream restoration test drive results will be going to the WQGIT in August. CSN will be taking a break from panels with the Virginia Tech process coming online.

JOINT USWG-LUWG SESSION 11:00-3:30

The Process for Deriving Urban Land Use Loading Rates for the Phase 6 Model

- Norm Goulet convened the joint session and summarized the goals for the two workgroups. He noted that Jenny Tribo would serve as the facilitator for the remainder of the day's discussion.
- Karl Berger described the proposed schedule for finalizing the phase 6 urban land uses, with a deadline for the WQGIT to approve the land use classification at its October meeting.

Discussion of the Six Key Issues

- Tribo noted the six issues and the available time for discussion.
    - View Jenny Tribo and Karl Berger's introductory slides for more information.

Issue 1: Do different types of Impervious Cover have different loading rates?

- Schueler and Mark Sievers (Tetratech) described the issue for participants and summarized findings from Tetratech's literature review and the STAC workshop.
    - View their presentation on issue 1 for details.
- The workshop consensus is that no further subdivision of impervious cover is warranted on the basis of land use, given that they do not load differently.
- In counties or areas without local data, it is harder to fill in the gaps.
- Greer: To clarify, Tt did not find the loading rates were any different from what is currently in the Model?
    - Correct, even with over 4000 new data points. The measurements are almost all edge of stream or edge of the impervious surface being drained.
    - Neely: Pitt has done some analysis regarding different storm size. That may be too fine of a point to make.
- Goulet: There is a strong argument to include open space as a separate land use. There is a different loading rate.

    - Schueler: Keep it on the table for now. Would it be possible to go back and define what they are describing as open space in the National Stormwater Quality Database?
        - Sievers: There were no firm descriptions of open space. Would have to go back to the literature.
    - Greg: If open space is so small and difficult to quantify, would it be possible to include it within another similar class like forest?
    - Schueler: We can evaluate the EMCs from NSQD. Less confidence in the hydrology of the open space without more specific local data.
        - Claggett: Worth investigating the open space option.
        - Shenk: Support having open space and the Forestry Workgroup has stated they do not want everything lumped into forest.
    - Peter will look into local data and Mark will revisit literature.
- Including transportation/streets as a separate category
    - P. Claggett: In urban areas the transportation makes up about a third of the IC, about 70% in rural areas.
    - Mary Gattis: Recommend keeping streets as a separate category for a number of reasons.
    - Schueler: Not a lot of difference in TP and TSS, TN a bit higher. The average daily traffic volume is a major factor for TN load from roads.
    - Goulet: This is important from a local government standpoint. Some DOTs would be responsible for these loads rather than the local governments, so having that differentiation would be useful.
    - Goulet noted there will be a STAC workshop in the next year that will be focused on dirt roads.
    - For a separate road layer, does it need to be divided or broken out by density?
        - Consensus support for road layer outright.
            - Keeling: This will be problematic for historical BMP cleanup.
            - Shenk: Many BMPs can be reported on a group of land uses.
            - Schueler: Note that street sweeping is the only BMP specific to streets.
            - Claggett: Recommend looking at roads and trees interaction.
- Tribo: Consensus on including open space land use category. Details TBD. Consensus on a separate transportation land use for roads/highways, but details TBD.
    - All other impervious cover into one category?
        - No objection, but would need a lot of communication about the reasons why.
        - Joan: no objection
        - Erik: that would gloss over density and development type.
            - We still need to discuss disconnected and connected, but it would remain as it is now with industrial, commercial, etc lumped together.
        - Goulet: this will have to be explained in detail, since it gets back to a lot of the issues from previous land use classifications.

Break for lunch

Issue 2: Should we recommend a lower target load for disconnected impervious cover?

- Peter Claggett presented on the issue of whether to count disconnected impervious as a separate land use. View Peter's slides here.
- STAC PoP workshop finding: impervious surf connectivity is spatially and temporally variable and therefore difficult to generalize. However, the amount of impervious in a watershed does affect peak flows and high flows (increasing sediment erosion and transport capacity in streams).
- One option is to include all stream corridors in the Phase 6 model and parameterize nutrient and sediment loading characteristics using impervious cover, riparian forest cover, slope, etc.
- Finer scale hydro models could be used for determining a disconnection credit as a BMP
- Schueler: What stream order would be modeled in the stream corridor?
    - Claggett: Phase 6.0 model will operate on modeling segment scale. Use 1:24,000 scale streams and aggregate the results up.
- Berger: The parameters would make a difference in loading rates.
    - Claggett: Largest impact would be on sediment and phosphorus.
- Salvati: Would detention ponds be included in stormwater infrastructure?
    - Claggett: Yes.
- Salvati: If localities already report stormwater BMPs would there be overlap with reporting the disconnection BMP?
    - Schueler: If disconnection were a BMP, it would represent a continuum of conditions.
- Keeling: Not enough time for an expert panel to recommend how a disconnected BMP would work.
    - Schueler: Rather than compiling all available information, recommend mapping just the storm drains.
- Claggett: looking at connectivity from a presence or absence if infrastructure not worth it, need to look more at total impervious.
- Randy Greer: would the connectivity calculation take place within the hydrologic model?
- Salvati: Localities asked for better and more clear land use information during the Phase II WIPs. Recommend against additional confusing parameters.
- Mary Gattis: Agree with these concerns. An issue with a lower target load for disconnected impervious cover is the negative side effects of sprawl. Would not want to encourage sprawl.
- Tribo: Issue 2 is still open. The stream corridor issues will be addressed in the next presentation.

Issue 3: Should there be a new land use representing the urban stream corridor?

- Bill Stack presented options for including urban stream corridor as a land use.
- Account for the instream sediment and nutrient loads plus watershed loads. National Stormwater Quality Database can represent the loadings from the landscape. Calibration stations can also provide data.
- Use a county with extensive data – determine correlation of reduction to potential factors (floodplain width, etc.)

- Neely Law: Stream corridor would include floodplain and riparian areas, which BMPs could be applied to if it were a land use.
- What about stream corridor in agriculture & forest?
    - Looking at urbanized watersheds first. Same concept should be applicable to rural areas, providing that the datasets are there.
- Salvati: Recommend data representing various physiographic areas.
- Randy Greer: Support looking into this issue. With only 10% urban in DE Chesapeake Bay watershed, DE's sediment loads were higher than expected. This may help resolve those issues.
- Schueler: There are 20 BMPs associated with stream corridor. Load reductions are computed for them, without being able to assign them to stream loads. These BMPs are not physically associated with the land use that is generating them.
- Stack: Moving forward with these calculations based on data from the National Stormwater Quality Database. CWP will work with the team in Fairfax county (possibly in Baltimore too). This project will be undertaken in the next few months.
    - Berger: Better accounting for stream corridor would improve the real world reflection of the model.
    - Schueler: Stream corridor matched the criteria for a separate land use. Profitable to pilot some options for mapping stream corridor. Many STAC presentations supported accounting for it separately.
- Tribo: Some questions from Peter's presentation would begin to be addressed by this land use. Bill's group will analyze which factors influence the loading rates, and will bring it to us in the future.
- Tesler: Request that other stream corridors be included as well as urban.
    - Justin Shafer (Norfolk): Could tidal shorelines be included as well?
        - Shenk: Tidal shorelines seem very different than other land uses, while still important.
        - Stewart: Tidal erosion aspect accounted for in the estuarine model.
    - Shenk: The agricultural sector would like to see stream corridors included.
        - Stack: There is not a comparable dataset to the National Stormwater Quality Database in agriculture. However this study will help determine which factors are responsible for stream processes.
        - Law: The characteristics may be applicable across multiple sectors.
    - Claggett: Undergoing a six month study with WVU on GIS techniques to derive these metrics.
    - Keeling: What about the disconnect between 1st and 3rd order streams.
        - This is a proxy for being able to model the finer scale streams.
- Tribo: More information needed, however the group recommends including an urban stream corridor land use. Bill Stack will report back in September ahead of making the final recommendations in October.

Issue 4: What changes in nutrient inputs to urban land can be expected in the future—atmospheric deposition, fertilization, discovered nutrient discharges, etc.?

- Norm Goulet presented the expected future changes in nutrient inputs.
    - View Norm's slides here.

- Goulet: Long term decline in air deposition loads expected due to more stringent air pollution controls. Reinforced by NADP monitoring at 24 bay stations.
- Decline in lawn fertilization rates due to state-wide lawn fertilizer laws are expected.
- Construction site fertilization will be included in the next model.
- Organic matter loads from pervious areas are a new source.
- Gray infrastructure discharge is a new nutrient source that was implicitly modeled in the past model.

Issue 5: Does it make sense to split pervious land based on fertilizer washoff risk or fertilization status?

- Karl Berger presented options for splitting land uses based of fertilization or fertilizer washoff risk.
    - View Karl's slides here.
- Based on the STAC workshop presentation the fertilized rate did not consistently show higher concentrations on fertilized lawns.
- One option is to compare responsible fertilization vs. irresponsible, however this is not mappable.
- A second option is to compare risk factors, which can't be mapped at bay wide scale, maybe locally.
    - A county with detailed GIS could begin tracking this information. However, not likely to be widespread enough to include in the Bay model at this time..
- The Urban Nutrient Management BMP panel report can give credit to unfertilized as a BMP; it does not need to be a separate land use.
- Stewart: What about using a greenness index?
    - Claggett: Too easy to mis-attribute the cause.
- Keeling: What is the difference between open space and urban pervious?
    - Tribo: Open space does have data to suggest a different loading rate than turf.
    - Unmanaged areas.
    - Claggett: We have defined open space as unfertilized land. So fertilizer inputs to the model would go on developed pervious land. Mixed open would be landfills, abandoned agricultural land, and all areas not actively fertilized.
- Tribo: How will open space be mapped?
    - Claggett: Currently we estimate lot size for rural, suburban and urban areas. Sample impervious area from aerial photography to estimate how much of a lot is impervious. In areas where there is not local land use data, we'll use the proportions of forest to open space along the roads to estimate the lot composition. Those areas are then accounted for, along with forest and farmland, and the leftover acreage is open space.
    - Claggett: Open space will hopefully be small acreage in most areas, except for possibly in abandoned areas.
- Antos: Did the Urban Nutrient Management panel estimate what proportion of land receives fertilizer?
    - Berger: The panel estimated 50% of land received fertilizer based on survey data.
    - Goulet: Fertilizer sales statistics are not available to inform this decision, however may be available in the future.

- Shenk: Fertilization data not dense enough to tease out its individual impact on calibration.
- Shenk: Note that even a small load difference over a large area could have a large impact.
  - Berger: However, some research data shows no difference in runoff concentrations of nutrients between fertilized and unfertilized lawns.
- Tribo: Group will discuss the last question in the recap.

Issue 6: How should we handle urban tree canopy and forest fragments on pervious land?

- David Sample: Based on the STAC workshop, not currently enough knowledge to break this out as a separate land use.
- Sally Claggett: Consensus at the workshop to break out the tree canopy land use, however not enough data at this time to quantify the load. The Urban Tree Canopy expert panel's literature review would help determine the loads.
- Goulet: What is the timing for the expert panel?
  - Sally Claggett: There may need to be a larger audience involved to make this happen by this October.
- Shenk: loading rates not needed by this October.
- Peter Claggett: Recommend pilot project with Dave Nowak and I-Tree Hydro to be complete by this fall.
- Goulet: Recommend the pilot approach; look at a few physiographic areas. Need to see pilot project before undertaking next steps.
- Tribo: Recommendation is that there is a loading difference in urban tree canopy vs. urban impervious, turf and forest. There is some information out there. Undertake pilot project to understand how to establish as a separate land use.
- Antos: Is it possible to map urban tree canopy?
  - Peter Claggett: There are datasets to map urban tree canopy.
- Keeling: Is the land use a BMP? If that's the case, do we have the datasets through the calibration period?
  - Peter Claggett: Very little land use data through the calibration period. Bay wide tree canopy data in 2001 and 201? Hi res data from 2007-2014 that varies by county.
- Tribo: How would the lack of historical data be accounted for?
  - Peter Claggett: Urban census data, land cover data through 1984 (urban areas considered not treed in the land cover record) are available. Make inferences with the information that we have, or keep it constant through time.
- Keeling: What if there is a reduction in tree canopy? Recommend against this being a land use. Recommend counting it as a BMP.
  - Peter Claggett: There is a possibility to do both. With locality data, there is excellent tree canopy data.
- Salvati: Localities want this as a BMP or a land use. The question is how to verify and track it; however it is an important activity that should be reported.

Consensus Recap and Next Steps

- Jenny Tribo reviewed the group's decisions on each of the six issues.

    - **1 impervious cover:** Consensus on including open space land use category. Methodology and loading rates TBD. Consensus on a separate transportation land use for roads/highways, but the methodology and loading rates will still need to be determined.
    - **2 disconnected:** Could be addressed as a BMP, no resolution today. USWG/LUWG to follow up.
    - **3 stream corridor:** Consensus to add stream corridor as land use. Peter and CWP are piloting analyses on what the loading rates would be, and the factors that would influence the rate. Expect a loading rate Sept/Oct.
    - **4 nutrient inputs:** Much of this is being addressed in the modeling workgroup's determination of loading rates.
    - **5 fertilization status:** There was not a strong recommendation to support fertilization status as a separate land use. There remains some concern with the model's assumption that all pervious land is fertilized f, even though we know that it isn't. However, until better scientific data is available on the impact of fertilization on loads, this cannot be addressed. It was suggested that the mixed open land use not receive fertilizer, but this was not resolved.
    - **6 Urban tree canopy:** Methodology and loading rates need to be worked out; there will be an urban tree canopy land use.
- Proposed Developed Phase 6.0 land uses: Developed impervious, transportation/roads, open space, stream corridor, developed pervious, urban tree canopy.
- Goulet: Modeling workgroup will be responsible for loading rates. LUWG/USWG will finalize decisions in August.
- Claggett: Present land uses to the Modeling workgroup by September.
- Goulet: Recommendations will be made to the WQGIT in October.
- Goulet: USWG members send any other comments/concerns/suggestions on the proposed land uses to Jeremy Hanson, Norm Goulet & Jenny Tribo.
- Antos: Note that October 2014 deadline also affects historic data cleanup done by states. Keep Watershed Technical Workgroup in loop.

DECISION: The LUWG and USWG members decided that the Phase 6.0 developed land uses will be: developed impervious, transportation/roads, open space, stream corridor, developed pervious, and urban tree canopy.
ACTION: LUWG will finalize the remaining questions about the above land uses during their August conference call.
ACTION: The Phase 6.0 land uses will be presented to the Modeling Workgroup in September and the WQGIT in October.
ACTION: USWG members will send any other comments and suggestions on the proposed land uses to Jeremy Hanson, Norm Goulet & Jenny Tribo.

Adjourned

Meeting and Teleconference Participants

Name	**Affiliation**
Norm Goulet, USWG Chair	Northern Virginia Regional Commission

Tom Schueler, USWG Coordinator	CSN
Karl Berger, LUWG Co-Chair	MWCOG
Jenny Tribo, LUWG Co-Chair	HRPDC
Peter Claggett, LUWG Coordinator	USGS, CBPO
Jeremy Hanson, USWG Staff	CRC, CBPO
Emma Giese, LUWG Staff	CRC, CBPO
Katherine Antos	EPA, CBPO
Melissa Appler	MDP
Darold Burdick	Fairfax County
Greg Busch	MDE
Reid Christenson	CWP
Erik Fisher	CBF
Jack Frye	CBC
Cecilia Lane	CSN
Neely Law	CWP
Stephanie Martins	MDP
Gary Shenk	EPA, CBPO
Mark Sievers	Tetratech
Ginny Snead	Louis Berger Group
Bill Stack	CWP
Steve Stewart	Baltimore County
Quentin Stubbs	USGS, CBPO
Ted Tesler	PA DEP
Jeff White	MDE
Julie Winters	EPA, CBPO
Kristen Wolf	PA DEP
Via Teleconference	
Ray Bahr	MDE
Kaitlyn Bendick	EPA Region III
Brian Benham	Va Tech
Ted Brown	Biohabitats
John Cox	
Sebastian Donner	WV DEP
Ginger Ellis	
Nathan Forand	
Mary Gattis	Local Government Advisory Committee
Randy Greer	DE DNREC
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