Nutrient Scientific Advisory Board Meeting #5 Minutes -

Friday, February 4, 2011
TJCOG - 4307 Emperor Blvd, Durham NC, 27703
9:30 am -12:00 pm

Attendees

Members: Matt Flynn, Michael Layne, Bill Hunt, Kathy DeBusk (BH alt), Matt Lauffer, Andy McDaniel (ML alt), John Cox, Sandi Wilbur (JC alt) Fred Royal, Larry Band, David Phlegar, Trish D'Arconte (Grady McCallie absent)

Non-Members: Andy Sachs (facilitator), Jason Robinson (DWQ), Rich Gannon (DWQ), Kathy Stecker (DWQ), Heather Saunders (TJCOG), Sarah Bruce (TJCOG), Michael Schlegel (TJCOG), Britt Stoddard (Wake), Sally Hoyt (UNC), Michael Sloop (CDM), John Huisman (DWQ), Michelle Mayfield, Trevor Clements(TT), Jon Butcher (TT)

Convene

The NSAB facilitator convened the meeting and outlined the agenda and desired outcome of the meeting: *Shared understanding of the benefits and limitations of site-scale tools that are available for potential consideration for calculating baseline loading, reduction adjustments, and nutrient reduction credits*.

The Board agreed on the proposed agenda and approved the minutes from the last meeting with no revisions. . The remainder of the meeting was dedicated to presentations, followed by discussion by the Board.

Presentations

The next hour and a half of the meeting was dedicated to presentations. Links to all of these presentations can be found on the NSAB website at: http://portal.ncdenr.org/web/wq/nutrient-scientific-advisory-board

1. Bill Hunt of NCSU BAE Stormwater Team (and Board member) did a presentation on the Tar-Pam Nutrient Accounting Tool that is used for new development, and the improvements that were considered when developing the Jordan/Falls Nutrient Accounting Tool. The following were the main points of the presentation:
   - Both tools use Schuler's Simple Method.
   - Tar-Pam Tool uses flat nutrient removal efficiencies for BMPs.
   - Study with 3 wetlands in series showed that vast majority of pollutant removal was done in first cell, and little pollutant removal done in the following two cells. This was the case in other studies of BMPs in series as well.
   - Jordan/Falls Tool doesn't use flat removal efficiencies, and instead assigns effluent concentrations for BMPs.
   - Jordan/Falls Tool accounts for infiltration of stormwater in BMPs in series
   - Land type event mean concentrations of N and P were obtained from peer reviewed data out of NC and eastern U.S.

2. Sally Hoyt, UNC Stormwater Engineer did a brief presentation comparing the application of the Tar-Pam and Jordan/Falls Accounting Tool to development at the University. The following were main points of the presentation:
   - The Jordan/Falls Tool's loading was lower than the Tar-Pam.
   - Estimated loading was not compared to actual monitoring.
   - UNC liked the Jordan/Falls Tool because it offers more land types, it accounts for infiltration, and it allows for undersizing of BMPs (Note: undersizing is not allowed for new development)
   - UNC would prefer that buffer and stream restoration be included in the tool as BMPs.

   Discussion followed, including these points:
   - John Cox expressed concern that in overestimating untreated loads, the Tar method also overestimates BMP load reductions relative to actual stream effect.
   - Dr. Band shared that in the Baltimore ecosystem study they found a positive relationship between concentration and flow indicative of nonpoint source dominance. He raised the idea of a potential refinement to the site accounting tool of incorporating this relationship.
3. Trevor Clements and Dr. Jon Butcher of Tetra Tech did a brief presentation about other nutrient export models. Some of the main points:
   - What constitutes a model? Input -> Model -> Output
   - Types of Models: Landscape Models, Receiving water Models, Watershed Modes, and Site-Scale Models
   - Empirical formulations use mathematical relations based on observed data rather than theoretical relationships (Tar-Pam, Jordan/Falls, PLoad, Set tools).
     i. Pros: Simple and provides a consistent framework. Easier to sell to the public.
     ii. Cons: Don't enable analysis of changes in assumptions and don't enable detailed source tracking.
   - Deterministic model are designed to produce system responses or outputs to temporal and spatial inputs (process-based). Full process-based models represent physical, chemical processes, interactions among plants, soil, surface and groundwater; largely academic use. More effort is required to implement. When is this worthwhile?
   - Examples of Dynamic, Semi-Empirical Tools: SLAMM, SWMM, HSPF
   - Examples of Full Process-Based Simulation: SWAT, GSSHA, SUSTAIN
   - Recent development, EPA's SUSTAIN – really a decision support systems allowing choices of model for different components. A "flexible optimization framework".

Discussion

The remaining fifty minutes of the meeting were dedicated to discussion of the preceding presentations.

- There are gaps between site level and watershed level tools that need to be integrated. E.g., western Washington has developed a "community of practice" using HSPF.
- Hydrology must be correct before anything else can be correct. The site-scale model doesn't recognize impervious disconnections, so the hydrology is wrong from the start (TT did a version of the Site Evaluation Tool for Orange County that accounts for IC disconnection). Agreed, Simple Method is ok for annual loading of more highly developed sites, but data basis at lower end of impervious is pretty thin. Option - could develop an empirical tool that captures estimates made by more sophisticated watershed models.
- Being able to use the same input data (land use) in subsequent models could be beneficial.
- Not really any models that estimate loads to stream but no further for both surface and groundwater; one reason, surface and sub-surface operate at such different temporal scales.

- SWMM accounts for street-sweeping and other non-structural BMPs. There are also examples of this in the Chesapeake Bay. Could incorporate use of factors for these into an empirical model.
- Board members asked DWQ how changes in Jordan Lake will be evaluated, and how DWQ will account for those changes as it regulates the runoff from each jurisdiction's existing development over time. How will DWQ evaluate local governments' work? What happens if the lake is no better in 10 years? What modeling will DWQ be doing along the way? What else will DWQ require of local governments that won't be required of other sources?
- DWQ explained that Jordan was monitored and modeled, and rules were made based on this. DWQ has initiated a lake monitoring regimen under the strategy and will continue it indefinitely. They also have ongoing ambient monitoring around the watershed which will continue indefinitely. Otherwise there are currently no plans for additional monitoring, but DWQ is open to future modeling.
- The question was raised that if all that is important is relative change (reductions), then why calculate baseline loading at all?
- There was discussion about land use datasets, including whether everyone should use the one universally available 2001 MRLC.

Meeting Follow-up

- Dave Phlegar and Trish D'Arconte to talk to TT prior to next meeting to be sure their questions are answered in TT's presentation at the March meeting

Discussion items for upcoming March meeting

Methods to account for nutrient loading/reductions at a watershed level for each jurisdiction.

- DWQ presentation on how other sources are addressed, and implementation of the Tar-Pam and Neuse nutrient strategies.
- DWQ presentation on ongoing monitoring and how the data was used to model the lake and watershed.
- TetraTech to present large-scale watershed models

Future meetings: Always the first Friday of each month, 9:30 – 12:00 at TJCOG