Anne Arundel County
WATERSHED
Protection & Restoration
PROGRAM

MY HOPE FOR THE FUTURE OF STORMWATER DESIGN

Fixing *Our Watersheds*

Anne Arundel County
Department of Public Works

Presentation Overview

COMPLEX PARAMETERS IMPACTING PROGRAM EFFECTIVENESS

My Wish List:

- CIP Work Group for Local Agencies
- Better Overarching Support for Stormwater Utility Fees
- Improved Modeling Software
- Increased Focus on Flow Mitigation
- Discharge Threshold for TSS During Construction
- A Tape Program for BMPs
- Tighter Controls, Certification and Standardization for Engineered Soil

LOCAL AGENCY CIP WORK GROUP

COMMON PROBLEMS

- Meeting Permit Requirements
- Interim Permit Goals
- Regulatory Consistency
- Needed Staff Increases
- Constituent Complaints
- Funding Shortfalls
- Internal Expectations

COMMON GOALS

- Funding Increases Needed
  - Phased Fee Options
  - How to Present to Stakeholders
- Staffing & Training
- Reporting & Tracking
- Regulatory Agencies
- Cost Control

Stormwater Utility Fees

- Key to a sustainable program
- Information for typical fees in comparable communities
- How to phase the fee to make it more palatable to Council and Public
- Budgetary support – how to front load correctly to meet goals
- Better ongoing PR to counter the mislabeled "Rain Tax"
- Support for implementation – help on expanding a program
- Selling your program – target market and branding
- Gap Analysis – from what you have to what you need for full funding
- Maximizing partnerships for cost savings

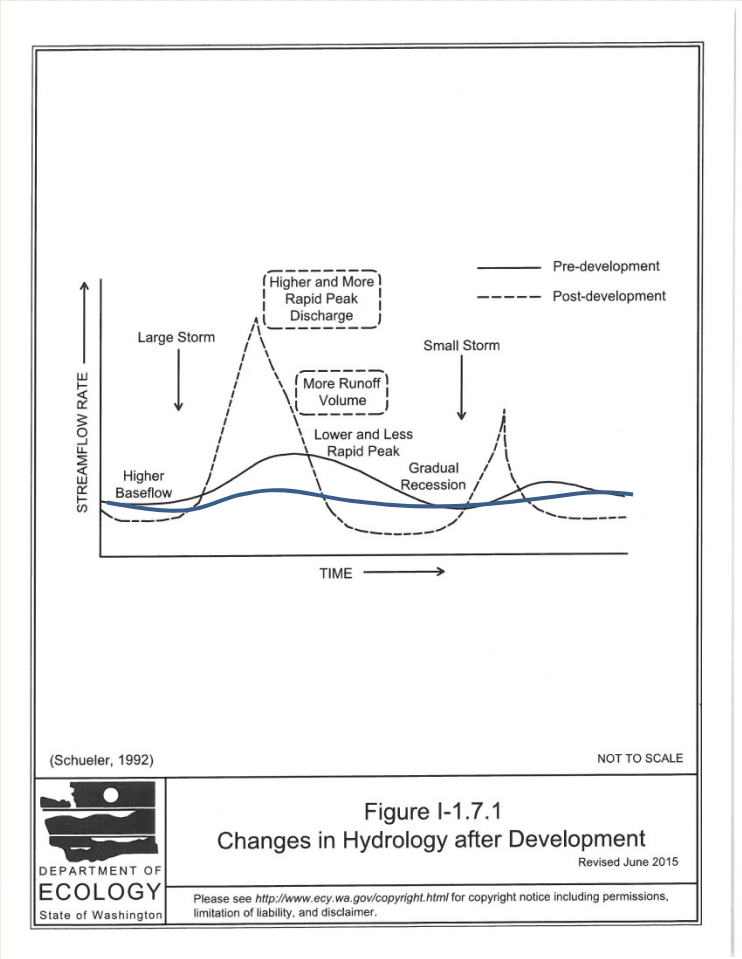



Why We Should Change How We Model

Event vs. Continuous Modeling

- Complex problems need complex analysis and simple solutions
- Current modeling challenges:
  - TR20 & TR55 – does this method do what we need it to do?
  - Need additional BMP mitigation accuracy in modeling
  - Protection against scour – not currently quantified pre vs. post
- Both use the same spatial and temporal data
- Change has to happen at a State-wide level
- Some stream experts think we are doing more harm with the 48-hour draw down allowance of peak flows

Ongoing Modeling Concerns



- Event Modeling Limits:
  - Peaks not mitigated just reduced and extended
  - Assumes facility is dry
  - Bathtub fill modeling
  - CPv volumes are a design component where not necessary
  - Infiltration, groundwater and evapotranspiration impacts not calculated
- Continuous Modeling would solve these issues

Benefits of Continuous Modeling

- Values can be region specific or modified for local conditions
- Runs on Windows with graphical interface
- Uses actual data:
  - Long-term precipitation data (50+ years) that can be updated
  - Measured local pan evaporation
  - EPA based regional HSPF model
  - 15-minute time step (was 1 hour)
  - WQ design flow calcs
  - Soils, vegetation and land slope
- Reports compare pre and post flows and volumes
- Custom and/or multiple points of compliance (up to 50)
- Accounts for surface, interflow and groundwater flows pre and post
- All standard BMPs in menu choices
  - Source control BMPs
  - Bioretention with or without underdrains
  - Green Roofs with evaporation loss
  - Automated sizing for infiltration facilities using insitu soil types
  - Flow duration analysis for LID/ESD – quantity and quality
  - Wetland hydro-period calculations
  - Permeable pavement treatment
  - CAVFS to calculate representative bioretention WQ and infiltration loss
  - Optimized pond sizing
- Shows stream protection flows modeled for pre and post development using accurate modeling of all BMPs on site with an integrated site approach

Comments on Current BMP Design

- No one right answer – site constraints dictate design options
- We NEED every tool in the tool box all of the time
- Good ESD/LID needs integrated site design to work properly
- Ongoing BMP development should be encouraged through a transparent and predictable approval process (Like Washington's Tape Program)
  - Encourages ongoing innovation
  - Presumptive vs. demonstrative treatment
- Not all structural BMPs are bad as they allow:
  - Flexibility of design for retrofits
  - Allow for non-standard design options where constrained
  - ESDs can't fix everything with replacing end-of-pipe solutions
  - We can't afford ESD everywhere we need restoration
- Do we really need settling basins in highly urban settings?

Bioengineered Soil Mix (BSM)

- Well designed BSM mix is critical to BMP functionality
- Geotech testing should be required if BSM is custom mixed on site
- Certified suppliers – we need them in Anne Arundel County and State-wide
  - Helps ensure long-term functionality
  - Can be used in place of geotech testing
  - Supports local suppliers
- Organics need to be properly aged to prevent nutrient contribution
- Current allowable level of aggregate fines is too high at 10%
  - 2-4% max passing the 200 sieve
  - Any higher level of fines was found to cap off native infiltration over time
- Compost standards (partial)
  - 75% passing the ¼" Screen
  - pH between 6-8
- Compost to aggregate ratio is 40 to 60 percent by volume and 6-8 percent by weight, respectively

Use Discharge Threshold for TESC

- Quantitative verification
- Incentivizes doing it right:
  - Contractors see good practices as revenue source
  - Performance based
  - Creates good practice
- Creates new industry
- Can easily be modified for specific water bodies

Questions and Discussion

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Social Media Information:
WWW.AARIVERS.ORG
https://www.facebook.com/aawprp
https://twitter.com/AAWPRP

Reference Materials:
Washington Stormwater Center
http://www.wastormwatercenter.org/
Stormwater Management Manual for Western Washington
http://www.ecy.wa.gov/programs/wq/stormwater/manual/2014SWMMWWinteractive/2014%20SWMMWW.htm
City of Bellevue Surface Water Engineering Standards
https://utilities.bellevuewa.gov/utilities-projects-plans-standards/utilities-codes-and-standards/surface-water-engineering-standards/

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