

Stormwater Paradigm Shifts

An Overview of Shifting Policy and Technology

Presented at:

***Delaware Nonpoint Source Program
Annual Committee Meeting***

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Q. How Do We Impact Water Quality?

It's a matter of perspective...







Susquehanna

Baltimore

New Castle County

C&D Canal

Delaware

Dupont
Chambers Works



Two Minute History

Federal Stormwater Regulations

Phase I

Finalized in 1990

Regulates medium and large MS4s (defined as areas that serve 100,000 or more people)

- 10 categories of industrial operations
- Active construction sites of 5 acres or more

Requires:

MS4s to develop and implement a stormwater management plan (SWMP) to

- find and eliminate illicit discharges
- control discharges from its system by addressing runoff from active construction sites, new development and redevelopment, industrial program

Construction and Industrial stormwater dischargers to develop and implement Stormwater Pollution Prevention Plan (SWPPP)

Phase II

Finalized in 1999

Regulates small MS4s located in an "urbanized area" (UA) as defined by the Bureau of Census

Additional MS4s outside of UAs designated by the NPDES permitting authority

- Active construction activities disturbing between one and five acres

MS4 SWMP must include 6 minimum control measures:

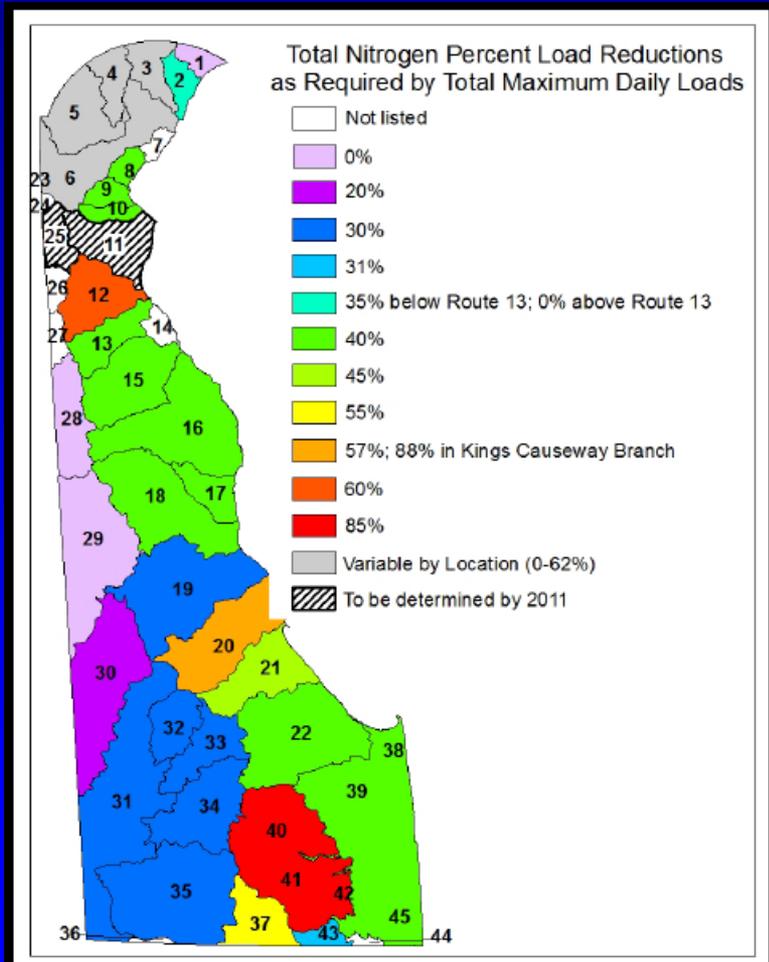
- Public Education & Outreach
- Public Participation/Involvement
- Illicit Discharge Detection & Elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/Good Housekeeping

1991 Delaware Sediment and Stormwater Regulations

- Erosion and sediment control during construction on all projects statewide.
- First state regulations to require water quality and quantity management for post-construction on all land development projects.



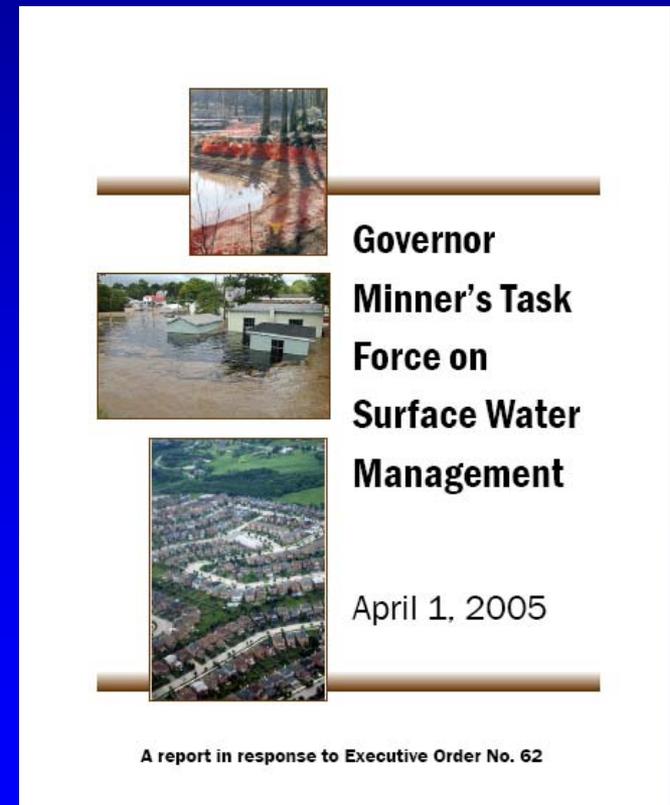
Development of Water Quality Strategies



- Identification of impaired waters
- Development of TMDL's
- Development of PCS's
- Need to examine stormwater programs and policies on all levels

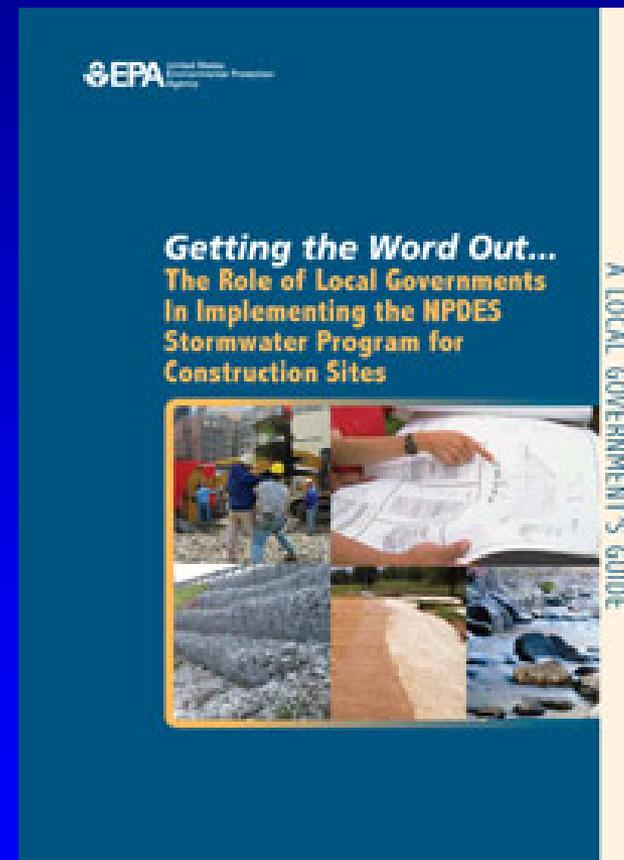
National and State Stormwater Program Evaluation

- Watershed approaches
- New state regulations
- Runoff reduction and volume management approaches
- Improve construction site runoff



National and State Stormwater Program Evaluation

- Modify the Construction General Permit
- Increase compliance with MS4 Permitting
- Draft new Effluent Guideline Limitations for Construction Site Stormwater Runoff



Chesapeake Bay Stormwater Strategy

- Better stormwater management at Federal facilities and lands
 - Minimize impacts
 - Innovative urban retrofits
 - Implement non-structural stormwater practices
 - Expand forest land conservation



Chesapeake Bay State Stormwater Strategy

- Develop Delaware's bay wide draft strategies for load reductions
 - Determine target load allocations and waste load allocations for Delaware
 - Determine load reduction strategies for stormwater relative to urban and developing lands

Sectors and

Segments and

Targets



Oh my!

EPA's National Research Council Report on Stormwater

- 2006 study of EPA's stormwater program
- Released in 2008
- Current approaches are not sufficient to reduce stormwater's contribution to waterbody impairment



Federal Stormwater Rulemaking

A straightforward way to regulate stormwater contributions to waterbody impairment would be to use flow or a surrogate, like impervious cover, as a measure of stormwater loading

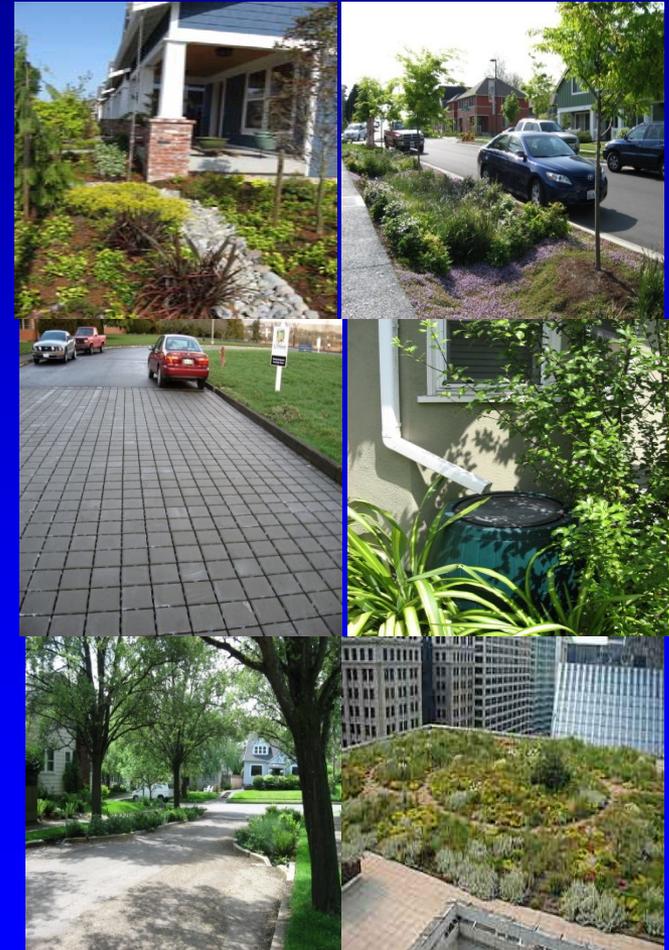
Efforts to reduce stormwater flow will automatically achieve reductions in pollutant loading.

Moreover, flow is itself responsible for additional erosion and sedimentation that adversely impacts surface water quality.

Stormwater control measures that harvest, infiltrate, and evapotranspire stormwater are critical to reducing the volume and pollutant loading of small storms."

EPA Supports “Green Technology”

- Permeable Pavement
- Green Roofs
- Impervious Disconnection
- Vegetated Swales
- Green Parking
- Bioretention
- Infiltration



States' Support Runoff Reduction Technology

- Permeable Pavement
- Green Roofs
- Impervious Disconnection
- Vegetated Swales
- Green Parking
- Bioretention
- Infiltration



Implementation In The Coastal Plain is Difficult



- High groundwater
- Poor soils
- Poor outlet conditions



DNREC's Answer?

DURMM and DURMMER

| PROJECT: | | DURMM v2 | | | | | |
|--|-------------------------------------|-----------------|----------------------------|-------|----------|-------|--------------|
| DRAINAGE SUBAREA ID: | | BMP 1 | | BMP 2 | | BMP 3 | |
| | | Type: | Downspout Disconnection | Type: | Bioswale | Type: | Bioretention |
| Step 1 - Calculate Initial R_{Pv} | | Data | | Data | | Data | |
| 1.1 | Contributing area (ac) | | | | | | |
| 1.2 | RCN from TR-55 | | | | | | |
| 1.3 | Runoff volume (in.) | | | | | | |
| 1.4 | Max. allowable discharge (cfs) | | | | | | |
| Step 2 - Adjust for Storage | | | | | | | |
| 2.1 | Storage volume (cu. ft.) | | | | | | |
| 2.2 | Storage volume (in.) | | | | | | |
| 2.3 | Runoff volume after reduction (in.) | | | | | | |
| 2.3 | CN* | | | | | | |
| Step 3 - Adjust for Runoff Reduction | | | | | | | |
| 3.1 | Annual CN (ACN) | | | | | | |
| 3.2 | Annual runoff (in.) | | | | | | |
| 3.3 | Runoff reduction allowance (%) | | | | | | |
| 3.4 | Annual runoff after reduction (in.) | | | | | | |
| 3.5 | Adjusted ACN | | | | | | |
| Step 4 - Calculate Total BMP Reduction | | | | | | | |
| 4.1 | Total runoff reduction (in.) | | | | | | |
| 4.2 | Total runoff reduction (%) | | | | | | |
| 4.3 | Adjusted RCN | | | | | | |



EPA's Policy Options

- Baywide Stormwater Requirements
- Expansion of the MS4 Requirements
- Use of the Residual Designation Authority (RDA's)
- Strengthen or introduce retrofitting requirements

