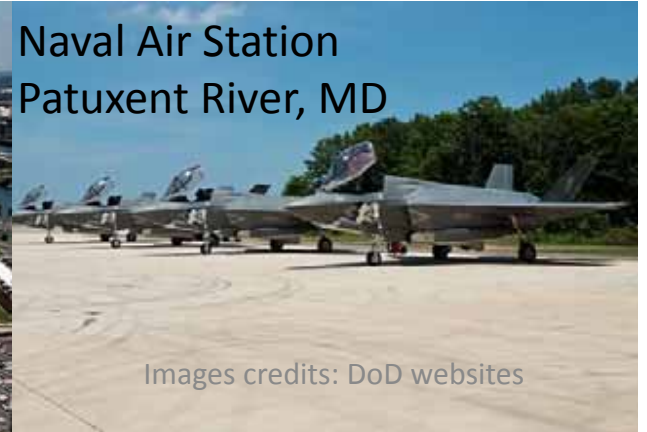




Pentagon



Naval Air Station  
Patuxent River, MD

Images credits: DoD websites



NSA



APG

# Chesapeake Bay TMDL Impacts on U.S. Department of Defense Installations

Presented to the  
Society of American Military Engineers – Baltimore Post

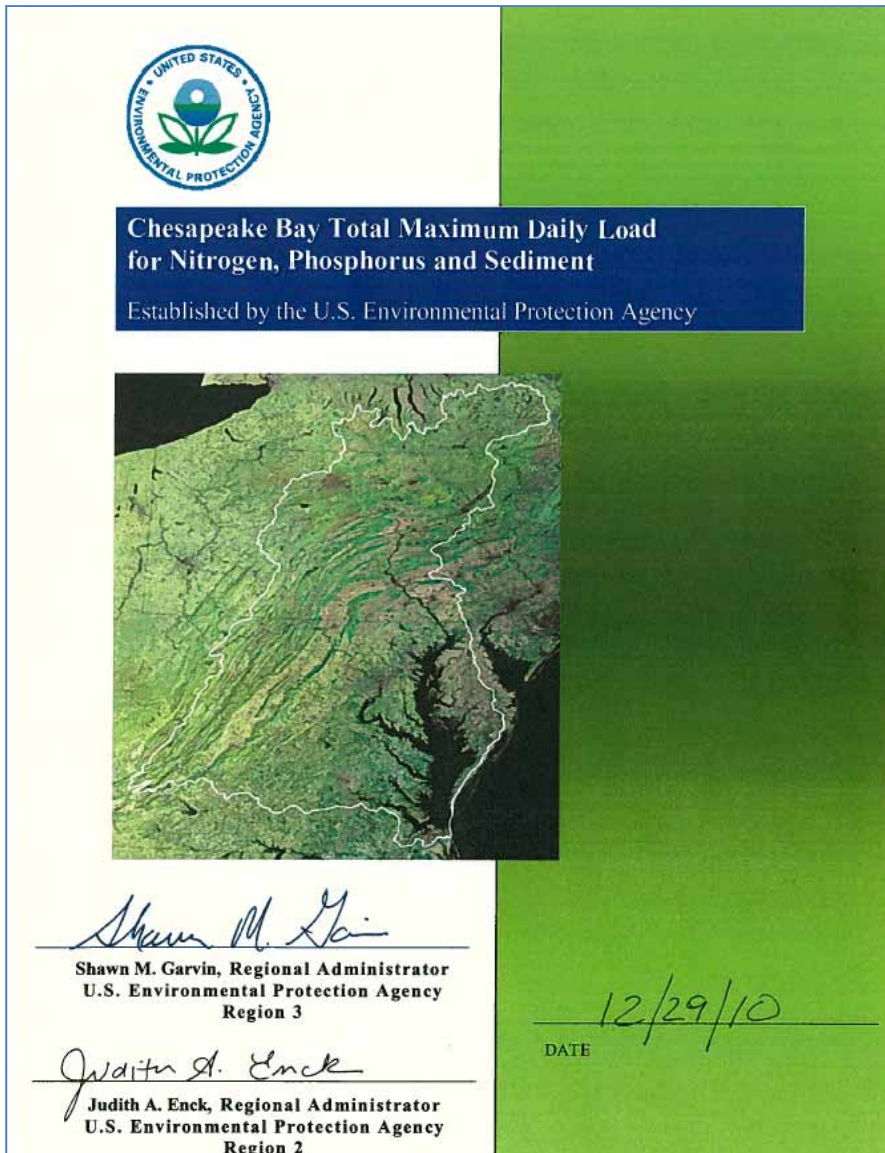
Dinorah K. Dalmasy


Jeff White

October 21, 2015





# Background

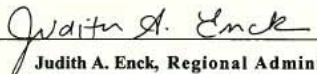




**Chesapeake Bay Total Maximum Daily Load  
for Nitrogen, Phosphorus and Sediment**  
Established by the U.S. Environmental Protection Agency



  
Shawn M. Garvin, Regional Administrator  
U.S. Environmental Protection Agency  
Region 3

  
Judith A. Enck, Regional Administrator  
U.S. Environmental Protection Agency  
Region 2

DATE 12/29/10

- Chesapeake Bay TMDL established in December 2010
- The TMDL\* sets a schedule to implement all nutrient and sediment reduction measures by 2025, with 60% by 2017
- Phase I WIPs established in December 2010. Set Statewide allocations
- Phase II WIPs developed in 2012 set allocations at a finer scale
- Phase III WIPs scheduled for development in 2017

\*CB TMDL = Sum (92 TMDLs)





# Chesapeake Bay Executive Order

Protecting and Restoring a National Treasure



Executive Order 13508

## Strategy for Protecting and Restoring the Chesapeake Bay Watershed

May 12, 2010



Developed by the Federal Leadership Committee for the Chesapeake Bay



- “Federal agencies with property in the watershed will provide leadership and will work with the Bay jurisdictions in the development of their Watershed Implementation Plans”
- “states would establish explicit load reduction expectations for individual federal facilities as part of the WIP process.”

\*Executive Order 13508 of May 12, 2009  
(Federal Register Vol. 74, No. 93)





# Setting Nutrient and Sediment Loading Reductions Targets for Federal Facilities



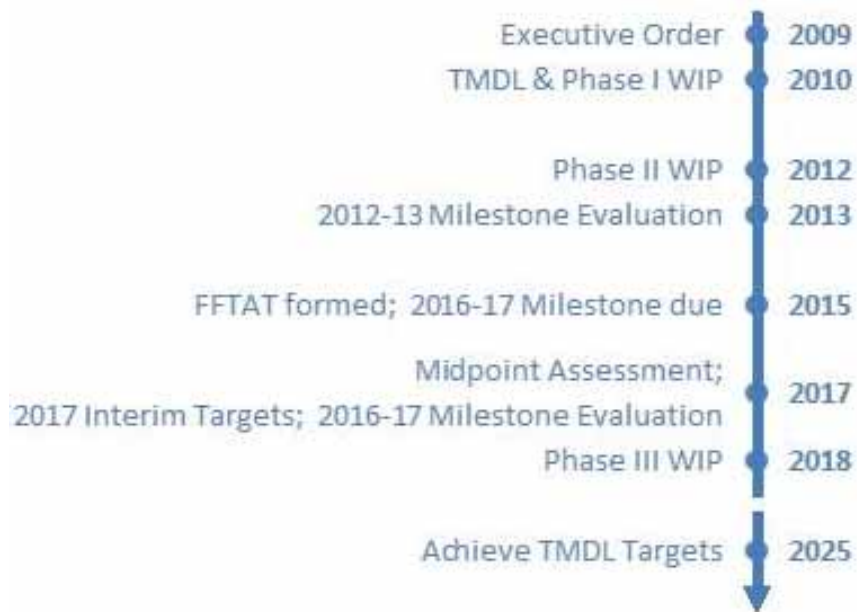
- FFTAT formed by PSC and charged with developing Federal Targets Protocol
- VA, MD, DC and PA (No FF in DE)
- Federal Agencies: DOD, ACOE, DHS, GSA, NPS, USDA, EPA
- Protocol completed and reviewed and approved in June 2015 by FFTAT and WQGIT and the MB (*Protocol for Setting Targets, Planning BMPs and Reporting Progress for Federal Facilities*)
- CBP MB also requested a permanent FF Workgroup under the CBP WQGIT.





# Protocol Summary

## Chesapeake Bay TMDL/WIP Timeline

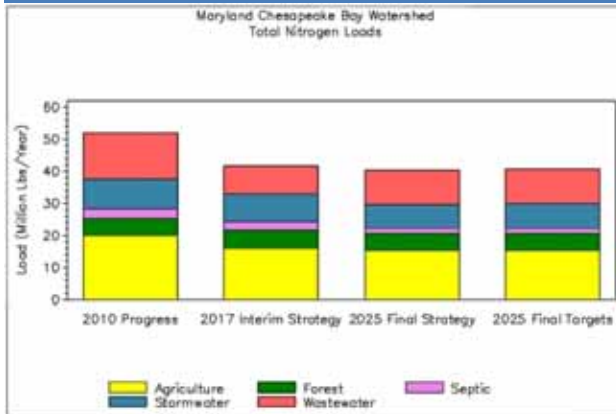


- Describes the process for setting nitrogen, phosphorus and sediment pollutant reduction targets for federal facilities consistent with:
  - *the 2010 Chesapeake Bay TMDL Bay TMDL, and*
  - *the EO 13508 Strategy*
- Describes the data needed by the jurisdictions to set those targets
- Also developed to assist FF with using Bay FAST to develop implementation Plans
- Federal facilities are expected to achieve at least the same level of effort as nonfederal entities

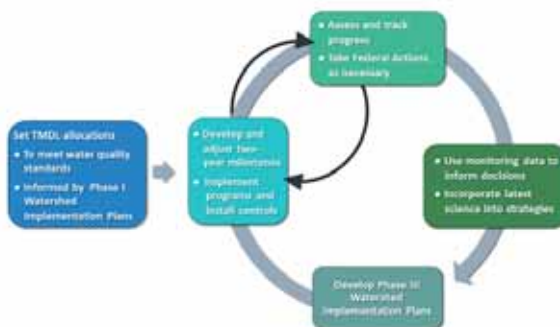




# Jurisdictions Responsibilities



- Set numeric targets following the protocol for the 2025 Bay TMDL goal and 2017 interim goal (Done)
- Targets are calculated for a combination both NPDES Regulated facilities and areas not subject to NPDES permits (Done)
- Communicate these targets in writing to federal agencies (Done)
- Provide a reporting format to federal facilities (Done)
- Report BMPs implemented by federal facilities using the NEIEN (by December 1, 2015)
- Develop 2016-2017 Milestones that include the federal plans and submit to EPA (by December 1, 2015)



Images credits: Chesapeake SW.net; daa.com; NCSU.edu



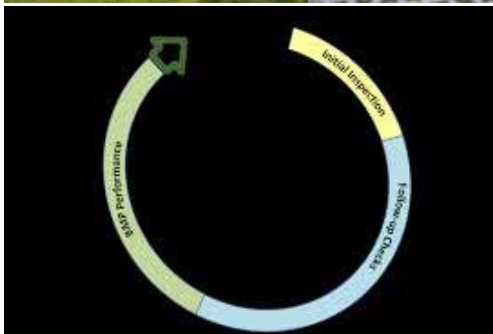
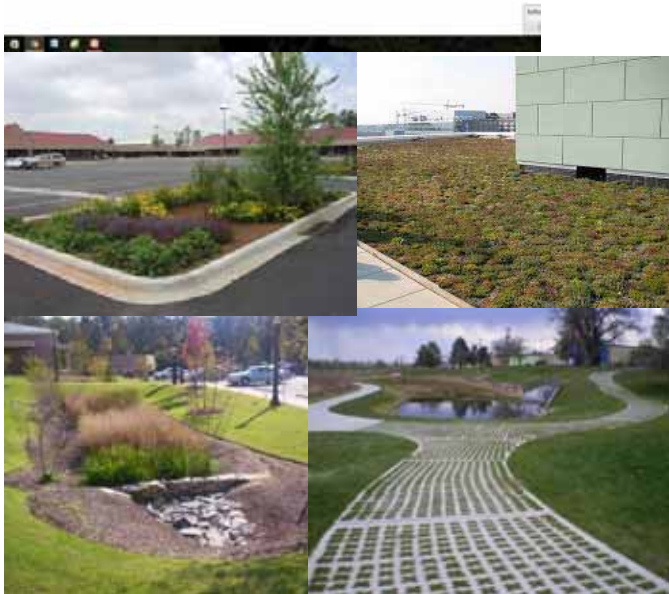




# Federal Agencies Responsibilities



- Create a plan in BayFAST to meet the 2017 interim target
- The Bay jurisdictions and the federal partners are also setting two-year milestones.
- Report implemented BMPs to Bay jurisdictions and CBP annually
- Follow the Basinwide BMP Verification framework and verification protocols



Images credits: chesapeakebay.net; Katie McKain





# Maryland's Approach



## MD's approach to set Interim Nitrogen Targets:

- Based on Phase II WIP Strategy for Phase II MS4s
  - 20% retrofit of untreated impervious surface
    - Impervious surface with no SWM







# Interim Targets - Overview

- To estimate accurate targets, need data from federal facilities
- Land-use
  - How many urban impervious and pervious acres on site?
- BMPs
  - How many of those acres have adequate SWM?
- Reporting format
  - Reporting spreadsheets sent to facility managers through FFAT

Phase 5.3.2 Urban Land- Use	Phase 6 Urban Land- Use	Total (Acres)	BMPs (Acres Drained)			
			<i>Wetponds and Wetlands</i>	<i>Infiltration Practices</i>	<i>Filtering Practices</i>	<i>SW to the MEP**</i>
Impervious	Impervious	25	5	3	0	0
Pervious	Turf Grass	75	15	9	0	0
	Urban Tree Canopy*	25	5	3	0	0
	Total	100	20	12	0	0



# Interim Targets - Overview



1. Define facility boundary
2. Delineate impervious surface
3. Delineate urban pervious area
4. Delineate areas with and without SWM



# Interim Targets - Calculations

- Calculate baseline loads
  - Use CBP P532 Model No Action Rates
    - MD Average
  - Use average reductions efficiencies for areas with adequate SWM
    - 2002-2010 SWM by Era
      - Average of reductions for all practices that meet SWM requirements

Scenario	TN (lbs/acre/yr)		TP (lbs/acre/yr)		TSS (lbs/acre/yr)	
	<i>Impervious</i>	<i>Pervious</i>	<i>Impervious</i>	<i>Pervious</i>	<i>Impervious</i>	<i>Pervious</i>
Untreated	15.3	10.8	1.7	0.4	1,117.7	175.6
Treated*	10.7	7.6	1.0	0.2	223.5	34.8

\*SWM by Era (2002-2010) efficiencies: TN = 30%; TP = 40%; TSS = 80%. If facilities provide detailed BMP data, these rates will correspond to the efficiencies for the specific BMPs provided.







# Interim Targets - Calculations

---

$$\text{TN Baseline Load} = (\text{Imp SWM}) + (\text{Imp No SWM}) \\ + (\text{Perv SWM}) + (\text{Perv No SWM})$$

Where,

- Imp No SWM = Acres\*15.3 lbs/acre/yr
- Imp SWM = Acres\*10.7 lbs/acre/yr
- Perv No SWM = Acres\*10.8 lbs/acre/yr
- Perv SWM = Acres\*7.6 lbs/acre/yr



# Interim Targets - Calculations



## Calculate Targets

Apply reduction equivalent to 20% retrofit of untreated pervious urban

Apply reduction equivalent to 20% retrofit of untreated impervious

No reductions applied: treated impervious and pervious urban



# Interim Targets - Calculations

- Target Load = Retrofit Load + Non-retrofit Load
  - Retrofit Load = 20% of untreated urban area \* No Action Loading Rate \* (1-Reduction Efficiency)
  - Non-retrofit Load = Remaining Load from untreated urban area + Load from treated urban area
    - Remaining Load from untreated urban area = 80% of untreated urban area \* No Action Loading Rate
    - Load from treated urban area = Treated urban area \* Treated Urban Loading Rate
- To calculate retrofit load, use average reduction efficiency for all SW BMPs that could be used to achieve reductions

Urban Land-Use	Average Retrofit BMP TN Efficiency (%)
Impervious	45%
Pervious	45%







# Interim Targets - Calculations

---

- TN Target = *TN Retrofit Load* + *TN Non-retrofit Load*
  - Where,
    - *TN Retrofit Load* =  $[0.2 * \text{Untreated Impervious Acres} * 15.3 \text{ lbs/acre/yr} * (1 - 0.45)] + [0.2 * \text{Untreated Urban Pervious Acres} * 10.8 \text{ lbs/acre/yr} * (1 - 0.45)]$
    - *TN Non-retrofit Load* =  $[0.8 * \text{Untreated Impervious Acres} * 15.3 \text{ lbs/acre/yr}] + [\text{Treated Impervious Acres} * 10.7 \text{ lbs/acre/yr}] + [0.8 * \text{Untreated Urban Pervious Acres} * 10.8 \text{ lbs/acre/yr}] + [\text{Treated Urban Pervious Acres} * 7.6 \text{ lbs/acre/yr}]$





# Interim Targets - Expectations

- Timeframe
  - Targets represent reductions to be achieved over 5 year timeframe (Approx. 2020)
- Milestone Submissions
  - November 2<sup>nd</sup>, 2015
  - Programmatic vs. acres/units of implementation
- Develop plan to meet interim targets
  - Use BayFAST to develop plans
  - MD Guidance for creating nutrient/sediment SW-WLA Plans
  - <http://www.mde.state.md.us/programs/Water/TMDL/DataCenter/Pages/TMDLStormwaterImplementation.aspx>

**BAYFAST**

Facilities | Scenarios | Costs | Scenario Worksheets | Scenario Results | Log Out

**Test Baseline Scenario Summary Results**

Description: Testing baseline scenario for guidance writeup  
 Facility: Test  
 Date Created: 8/14/2014 4:30:01 PM

Download Results | Compare Scenarios

**Total Loads**

Load Type	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
Landuse	3,234,941.5	1,586,708.5	182,380.2	85,320.6	141,908,512.1	91,764,487.4
Septic	136,152.8	66,632.1	0.0	0.0	0.0	0.0
<b>Total:</b>	<b>3,371,094.3</b>	<b>1,653,340.6</b>	<b>182,380.2</b>	<b>85,320.6</b>	<b>141,908,512.1</b>	<b>91,764,487.4</b>

**Total Annualized Costs**

Sector	Total Annualized Cost
Urban Land	\$16,496
Septic	
Forest Land	
Agricultural Land	
Animal Manure	
<b>Total:</b>	<b>\$16,496</b>

**Land Use Loads**

Land Use	Pre-BMP Acres	Post-BMP Acres	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
<b>Sector: Agriculture</b>								
	59,302.7	59,302.7	2,242,970.0	1,099,787.0	128,031.1	59,878.9	110,506,400.0	71,491,960.0
<b>Sector: Forest</b>								
	40,440.7	40,440.7	279,017.7	137,020.9	6,883.5	3,223.1	3,517,430.0	2,267,180.0
<b>Sector: Urban</b>								
	29,335.3	29,335.3	704,657.7	345,844.0	46,958.7	21,981.8	27,884,670.0	18,005,350.0
<b>Sector: Water</b>								
	835.1	835.1	8,296.2	4,057.0	506.9	236.8	0.0	0.0
<b>Total:</b>	<b>129,913.8</b>	<b>129,913.8</b>	<b>3,234,942.0</b>	<b>1,586,709.0</b>	<b>182,380.2</b>	<b>85,320.6</b>	<b>141,908,500.0</b>	<b>91,764,490.0</b>

**Septic Loads**

Septic Zone	Pre-BMP Systems	Post-BMP Systems	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered
Critical Area	0.0	0.0	0.0	0.0
Within 1000 ft of a perennial stream	6,945.5	6,945.5	78,799.2	38,563.7
Outside of the Critical Area, not within 1000 ft of a perennial stream	8,425.4	8,425.4	57,353.6	28,068.4
<b>Total:</b>	<b>15,370.9</b>	<b>15,370.9</b>	<b>136,152.8</b>	<b>66,632.1</b>

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# Questions?

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