

June 28, 2011

Stormwater and Transportation Webinar

Tuesday, June 28th, 2011 1:30-
3:30 PM Eastern Time

**Efficient and Innovative Strategies for Achieving Better
Environmental Performance**

Stormwater and Transportation Webinars

Introductory Remarks:

Kate Kurgan

Program Manager for Environment
Center for Environmental Excellence by
AASHTO

Stormwater and Transportation Webinars

Sponsored by:

- Center for Environmental Excellence by AASHTO

in Cooperation with :

- Federal Highway Administration and
- Federal Transit Administration

Stormwater and Transportation Webinars

- Construction Effluent Guidelines – Numerical Limits are Coming (April 28th, 2011)

Presentation and recorded webinar
available on the Center website

<http://environment.transportation.org/>

Stormwater Community of Practice

- Construction Stormwater Management
- Effluent Limitations Guidelines
- TMDLs
- EPA Post-Construction Stormwater Control Rulemaking
- Source Control

Stormwater Practitioner's Handbook

AASHTO PRACTITIONER'S HANDBOOK

13

June 2009

DEVELOPING AND IMPLEMENTING A STORMWATER MANAGEMENT PROGRAM IN A TRANSPORTATION AGENCY

State departments of transportation (DOTs) face increasing pressure to reduce pollution in their stormwater discharges. This handbook provides recommendations for developing and implementing an effective stormwater management program to help comply with National Pollutant Discharge Elimination System (NPDES) regulations.

Issues covered in this handbook include:

- Development and implementation of a stormwater management program;
- Clean Water Act (CWA) and the NPDES program;
- State and local stormwater regulations;
- Conducting a Program Effectiveness Assessment (PEA);
- Developing a stormwater management plan (SWMP);
- Public education and outreach;
- Construction site stormwater compliance;
- Integrating Best Management Practices (BMPs) into transportation project delivery;
- Roadway maintenance stormwater practices and NPDES compliance;
- Total Maximum Daily Loads (TMDLs) and other special requirements; and
- Important stormwater management terms.

The Center for Environmental Excellence by AASHTO produces the Practitioners' Handbooks. The handbooks provide practical advice on a range of environmental issues that arise during the planning, development, and operation of transportation projects.

Each handbook is developed by the Center in cooperation with an advisory group that includes representatives of the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), state DOTs, and other agencies as appropriate.

The handbooks are primarily intended for use by program and project managers and others who are responsible for coordinating compliance with a wide range of regulatory requirements. With their needs in mind, each handbook includes:

- A background briefing;
- Key issues to consider; and
- Practical tips for achieving compliance.

In addition, key regulations, guidance materials, and sample documents for each handbook are posted on the Center's web site at <http://environment.transportation.org>.



Center for Environmental Excellence by AASHTO



American Association of State Highway and Transportation Officials

<http://environment.transportation.org/pdf/programs/pg13-1%20lowres.pdf>



Today's Webinar

Moderated by:

Eric Strecker, P.E.
Geosyntec Consultants
Portland, Oregon

Seminar Development Support:

Marie Venner
Venner Consulting
Denver, Colorado

Today's Webinar

Efficient and Innovative Strategies for Achieving Better Environmental Performance

- DOTs are being challenged as never before – audits, consent decrees, budget shortfalls

We will explore:

- Ways DOTs are responding to new and old demands
- Different stormwater requirements around the country and innovative and efficient strategies for addressing those

Today's Webinar: Key Themes

Efficient and Innovative Strategies for Achieving Better Environmental Performance

- New Challenges and Innovative Tools & Methods
- TMDLs and ESA - maturing and beginning to impact the transportation world in new and greater ways
- Transparency and Accountability – doing what we said we were going to do, more efficiently and effectively

Today's Speakers/Topics

RIK GAY, Colorado Department of Transportation, Deputy Water Quality Program Manager

Making it Easy, Eliminating the Hurdles to Compliance

WILLIAM FLETCHER, Oregon Department of Transportation, Water Resources Program Coordinator

Efficient & Innovative Permitting Approaches in Oregon

KARUNA PUJARA, Maryland State Highway Administration, Chief, Highway Hydraulics Division

Planning for Efficient Treatment of Runoff from Many Untreated Miles of Highways – Maryland's Responses to TMDLs

Today's Webinar

- Each Speaker will have between 20 to 30 minutes for their presentations
- Followed by a question and answer period at the end
 - Questions can be submitted via the GoTo Webinar side bar (anytime during Webinar)
 - In addition, there will be polling questions for your response during the Webinar
- As of today, there are 161 sites registered for this Webinar

Making it Easy, Eliminating the Hurdles to Compliance

RIK GAY, Deputy Water Quality
Program Manager,
Colorado Department of
Transportation



Situation May 2007

CDOT MS4 Permit, Part I.B.1.a – Construction Sites Program

- **RECAT:** Site Inspection and Enforcement including **Regional Erosion Control Assessment Teams**. A minimum of **60 site inspections** will be performed per year, including follow-up inspections as necessary.
- **Reporting: Semiannual summary** of the RECAT site evaluations and outcomes as well as enforcement-related actions taken.

Construction Stormwater Discharge Permit (CSP), Part I.D.6 - Inspections

- **Minimum Inspection Schedule:** The permittee shall, at a minimum, make a thorough inspection, in accordance with the requirements in I.D.6.b (“Inspection Requirements”), at least once every 14 calendar days. Also, post-storm event inspections must be conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion.

Complication October 2008

Compliance Order on Consent

Division's Findings of Fact and Determination of Violations

- Failure to conduct inspections of Stormwater Management Systems on seven out of eleven projects
- Failure to Implement and/or Maintain Best Management Practices to Protect Stormwater Runoff on all eleven projects

Repercussion January 2009

CDOT Compliance Order on Consent Item #36

- At least once per month, each CDOT Water Pollution Control Manager shall perform an audit/inspection at each project in his/her region.
- Monthly inspections and the average number of CDOT projects with active Construction Stormwater Discharge Permits at any given time result in more than **2,000 inspections per year statewide.**

CDOT Compliance Order on Consent Item #38

- Submit a report on the findings of each monthly audit to the Director of Stormwater Compliance within 5 days of completing the inspection.
- The Director of Stormwater Compliance shall prepare a **semiannual report summarizing the findings of the inspections** as a whole.

CDOT Specification 208.09

- The Engineer will **immediately notify the Contractor in writing** of each incident of failure to perform erosion control in accordance with the CDPS-CSP.

Innovation April 2009

How to manage a workload increase from 60 inspections per year to 2,000
AND meet the reporting requirements *AND* our notification requirements
AND improve compliance?

Field Data Acquisition and Reporting Technology

The Challenges

- Support from Executive Management
- Acceptance from Field Staff
- **Timeframe**

The Benefits (sales pitch)

- Inspection efficiency
- Programmatic improvement through consistency
- \$\$\$\$ saved by eliminating contract Field Inspectors (big one)

Erosion and Sediment Control Assessment Notebook (ESCAN) Tool

The ESCAN Tool

- Significantly reduces the time and effort required to complete construction site inspection, paperwork, and recordkeeping
- Standardized the inspection process
- Creates a database to simplify required periodic reporting to regulatory agency



Erosion and Sediment Control Assessment Notebook (ESCAN) Tool

Key ESCAN Points

- Used existing inspection format for the development of a fillable form with multiple drop-down selections as well as “notes” sections that can be completed with handwriting recognition software by writing directly on the notebook screen
- Once a non-compliant item is identified and corrective action specified, the program automatically associates that item to the regulation or specification with which it is in non-compliance when the report is generated
- Has the capability to include location photos and plan drawings in the report automatically associating them with each non-compliant item in the report
- The generated reports are printed at the project site at the completion of the inspection



ESCAN - RECAT

315.001

Project name: ESCAN / CARL Demonstration Project

Location: at US 285 & C-470, Denver County, CO 80465, Latitude 39/38/30, Longitude...

Description: installing cable rail, Type 3 guardrail and 400 lf long paved median area...

Checklist ☐

Summary ☐

BMP Categories

BMPs in the Category

Erosion Control

Sediment Control

Materials Handling

Waste Management

Spill Prevention

Special Requirements

Erosion Bales

Temporary Slope Drains

Temporary Diversions

Outlet Protection

Erosion Logs

Temporary Stabilization

Soil Binder

Mulching

Embankment Protection

Grading Techniques

Ditch Protection

Run-on

Please choose a BMP category and a BMP from above to get started.

Complication August 2010

CDPHE Additional Information Request

- Regarding CDOT's implementation of the Colorado Contractor Erosion Control Compliance Program and CDOT's oversight of that escalated enforcement program
 - Requested documentation (including date) of each response to each finding for a six month period
 - Not including staff time, \$12,000 in consultant hours were required to assemble and prepare a report
- Concluded that dates of findings reported compared with the resolution dates of the findings were **not in compliance** (48 hours) with CDOT Specification 208.09 and the Permit
- Additionally - Inadequate follow-up to findings and response tracking system.

Innovation February 2010

CDOT Responded by Developing an Extension to ESCAN

Corrective Action Response Log (CARL)

- A web based interface which allows the Project Engineer to follow up on responses and report results immediately
- Tracks each finding to resolution and if findings remained unresolved, provides automated prompts at predetermined time intervals
- CARL also provides a legally defensible mechanism to escalate enforcement if required
- Supports the Chief Engineers performance objective of all findings will be resolved within 48 hours of inspection

CDOT Environmental Water Quality RECAT Headquarters Module - Corrective Action Response Log



logged in as: Rik Gay **LOG OUT**

[Corrective Action List](#) | [Form 105](#)

Corrective action List

A list of outstanding findings is show below. By default only those findings that require action by you are shown. To see findings that have already have approved actions submitted, select a different option below.

Enter your corrective action by clicking on the Action details icon in the first column.
To view the entire inspection report that includes a particular finding, click on the Report icon in the 6th column.

Show: ☐ Completed actions ☐ Actions not yet completed ☒ Either

[Refresh this list](#)

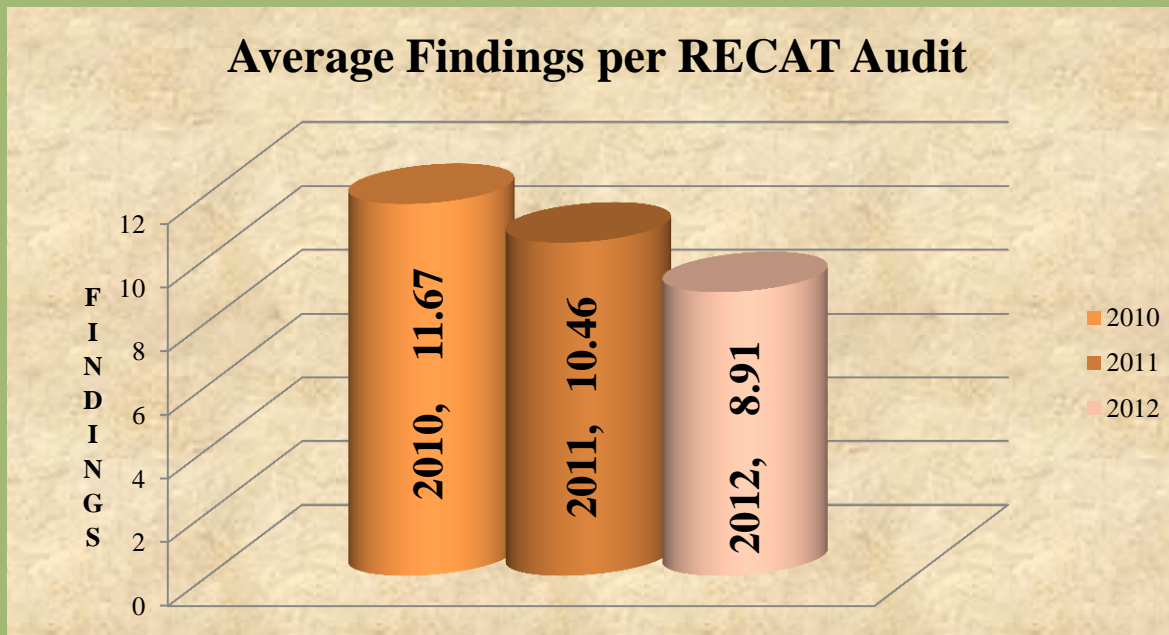
Action details	Project name	District	Date of finding	Report	BMPTType	BMP Problem	BMP non-compliance	Location	Date action taken	Completed	By	Approval status
	Site #3 - CDOT Project FBR 096A-039 SH#96 (Ex Str K-23-B)	Region 2	2/11/2011		Stabilized Construction Entrance	BMP not implemented	Failure to utilize Stabilized Construction Entrance(s) per SWMP.	Both sides SH 96	2/25/2011	Yes	Tom Bronniman	Approved
	University Concrete Pavement and Slab Repair	Region 6	2/14/2011		Stabilized Construction Entrance	Failure to maintain BMP per specification	Stabilized Construction Entrance(s) require maintenance.	East bound C-470 on ramp	2/16/2011	Yes	George Wanda	Approved
	University Concrete Pavement and Slab Repair	Region 6	2/14/2011		Roadway Cleaning	BMP not implemented	Failure to utilize Roadway Cleaning as a BMP per SWMP.	Project Wide	2/16/2011	Yes	George Wanda	Approved
	University Concrete Pavement and Slab Repair	Region 6	2/14/2011		Perimeter Control	BMP not implemented	BMP missing	Median (2 locations where slab replacement is occurring)	2/16/2011	Yes	George Wanda	Approved
	University Concrete Pavement and Slab Repair	Region 6	2/14/2011		Inlet Protection	BMP not installed per specification	Installation of Inlet Protection not per specification.	University south of County Line Road, 2 lcoations on west and east of road.	2/16/2011	Yes	George Wanda	Approved

Benefits

Not only has the original objective of managing the workload been met, but a number of unintended benefits have been realized.

Improved Compliance

- Reduced average number of findings per project



Benefits

Not only has the original objective of managing the workload been met, but a number of unintended benefits have been realized.

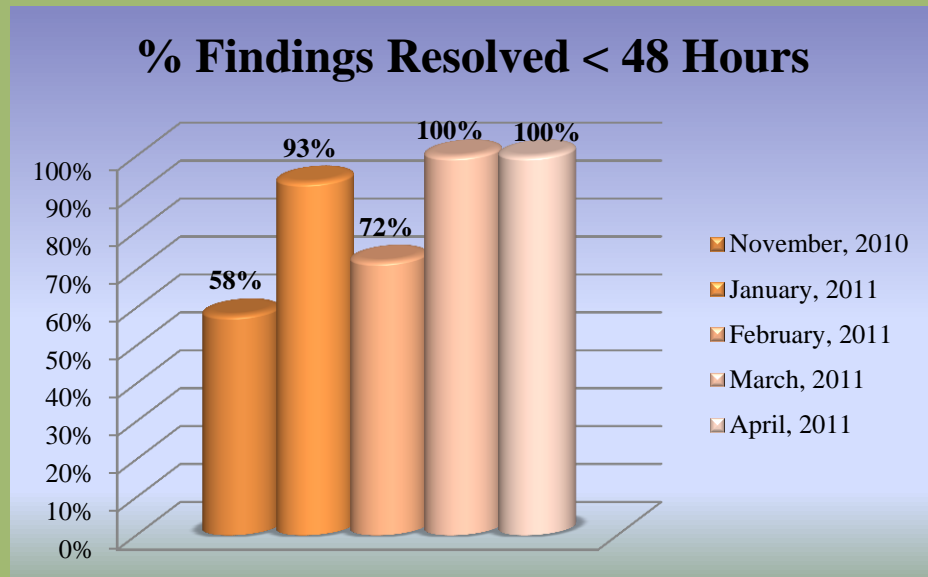
Improved Compliance

- Reduced average time required to respond to findings

**6B Annual Area of Emphasis
Water Quality**

2011 Chief Engineer Objective:

100% of RECAT findings will be resolved or addressed within 48 hours of the inspection.



Benefits


Not only has the original objective of managing the workload been met, but a number of unintended benefits have been realized.

Improved Compliance

- Improved consistency
- Less subjective

AVERAGE NUMBER OF FINDINGS PER INSPECTION

<u>Yr</u>	<u>RECAT</u>	<u>MAR</u>	<u>Deviation</u>
2009	11.67	3.92	7.75
2010	10.46	4.96	5.50
2011	8.91	3.78	5.13


ESCAN - Enhanced Monthly Audit Report 2011
575.0

Project name: ESCAN / CARL Demonstration Project
 Location: at US 285 & C-470, Denver County, CO 80465, Latitude 39/38/30, Longitude...
 Description: installing cable rail, Type 3 guardrail and 400 lf long paved median area...

[< Back To Inspection List](#)
[Summary](#)

Admin Findings Erosion Control Sediment Control Construction Materials Handling and Waste Management Site Management	SWMP Plan Sheets SWMP Site Map / Project Plan Title Sheet Standard Specs / M-208-1 / BMP Narratives / Calendar	Environmental Permits / Potential Pollutants / SPCC Inspections Other Documentation
---	--	--

Admin Findings - SWMP Plan Sheets

- ☐ A copy of the SWMP was not located on site.
- ☐ The SWMP was not prepared prior to applying for coverage under the general permit.
- ☐ The initial phase of the SWMP was not implemented prior to commencement of construction activities.
- ☐ SITE DESCRIPTION - The Project Site Description does not clearly describe the nature of the construction activity at the site.
- ☐ The Project Site Description does not summarize the grading activities.
- ☐ The Project Site Description does not clearly describe the proposed installation of utilities.
- ☐ The Project Site Description does not clearly describe the proposed paving.
- ☐ The Project Site Description does not clearly describe the nature of any proposed excavation.
- ☐ The Project Site Description does not provide the location and description of all ground surface disturbing activities.
- ☐ The Project Site Description does not clearly describe the proposed sequence for major activities.
- ☐ The Project Site Description does not provide the estimated acreage of the area expected to be disturbed by clearing activities.
- ☐ The Project Site Description does not provide the estimated acreage of the area expected to be disturbed by excavation activities.
- ☐ The Project Site Description does not provide the estimated acreage of the area expected to be disturbed by other construction related activities.
- ☐ The Project Site Description does not provide the estimated acreage of the total area of the site.
- ☐ The Project Site Description does not provide the estimated acreage of the areas to be seeded.
- ☐ The Project Site Description does not provide a summary that describes the soil(s).

Benefits

Not only has the original objective of managing the workload been met, but a number of unintended benefits have been realized.

Improved Compliance

- **No further compliance advisories...knock on wood**

Benefits

Not only has the original objective of managing the workload been met, but a number of unintended benefits have been realized.

Data Management Utility

- Database used by Design Engineers to evaluate BMP effectiveness
- Regulatory reporting much less burdensome

Not to Mention

- **Minimum of \$187,000 per year savings just in personal services alone!!!**

Conclusion

Timing (and Circumstances) was Everything!

A decade-old idea and then a “perfect storm”

- In-situ field data acquisition with automated reporting capability
- Imposition of a significant regulatory action
- Substantial reductions in budget

= Accelerated Research, Development, Funding, & Implementation

Your Challenge? Don't wait until you are already on fire before you try to put it out!!!

- More info: Rik.Gay@dot.state.co.us

Multi-Agency Collaboration in Addressing Stormwater ESA and 401 Requirements Process, Results and Consequences

William Fletcher

Water Resources Program Coordinator

Geo/Environmental Section

Oregon Department of Transportation

Incentives for Collaboration

- ODOT dissatisfaction with and confusion about the stormwater regulatory environment: ESA, CWA, NMFS, DEQ, all at once...
- Regulatory Agency dissatisfaction with ODOT's stormwater management process and products
- Fear that without improvement, regulatory gridlock was imminent

Working Together

- ODOT initiated a collaborative working group with the stormwater stakeholders:
 - NMFS
 - Oregon DEQ
 - USFWS
 - FHWA
 - EPA
 - ODFW



Challenges to effective collaboration

- Lack of trust
- Lack of a common language
- Difficulty in translating laws into implementation leads to unclear goals
- Fear of lawsuits inhibiting regulatory agencies from making definitive agreements

Strategy

Twin tracks:



- **Technical:** Develop the process and tools for effective stormwater management
- **Regulatory:** Streamline the ESA and 401 processes

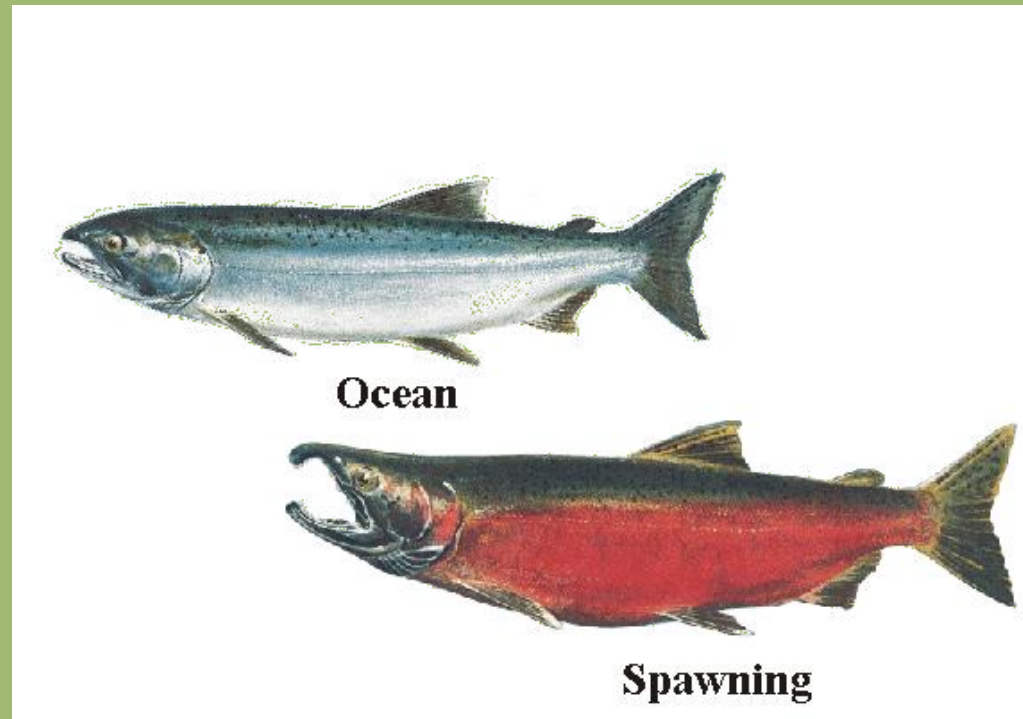
Strategy

- Define the problems
- Define each agency's goals
- Break down the task into constituent parts
- Agree on a course of action: what to tackle when

Regulatory Agency Goals

Protection and recovery of Oregon's waters and aquatic species

Bottom Line:
Maintaining the Status
Quo is not Sufficient!



ODOT Goals

Certainty in scope, schedule and budget, while meeting environmental requirements

-permittable, constructable and maintainable

- ODOT is responsible for its own stormwater, not everyone else's



The Big Goal

Clear, Consistent, and Mutually Agreed on
Stormwater Management Criteria



Competing Approaches

Numeric Standards

- Difficult to verify
- Require ongoing monitoring
- Different goals lead to different numbers for various pollutants
- Environmental outcome determinable (in theory)

Management Criteria

- Verification at design
- Easy confirmation of implementation
- Clear, but flexible
- Environmental outcome somewhat fuzzy

Stormwater Management Criteria

- Treat all of the runoff generated by the **water quality design storm** from the **contributing impervious area** using **preferred BMPs**
- Maintain pre-project hydrology to protect channel form and processes

Technical Issues

- What are the preferred treatment techniques?
- What is the water quality design storm?
- What stormwater is ODOT responsible for?
- What is the range of storms for flow control?

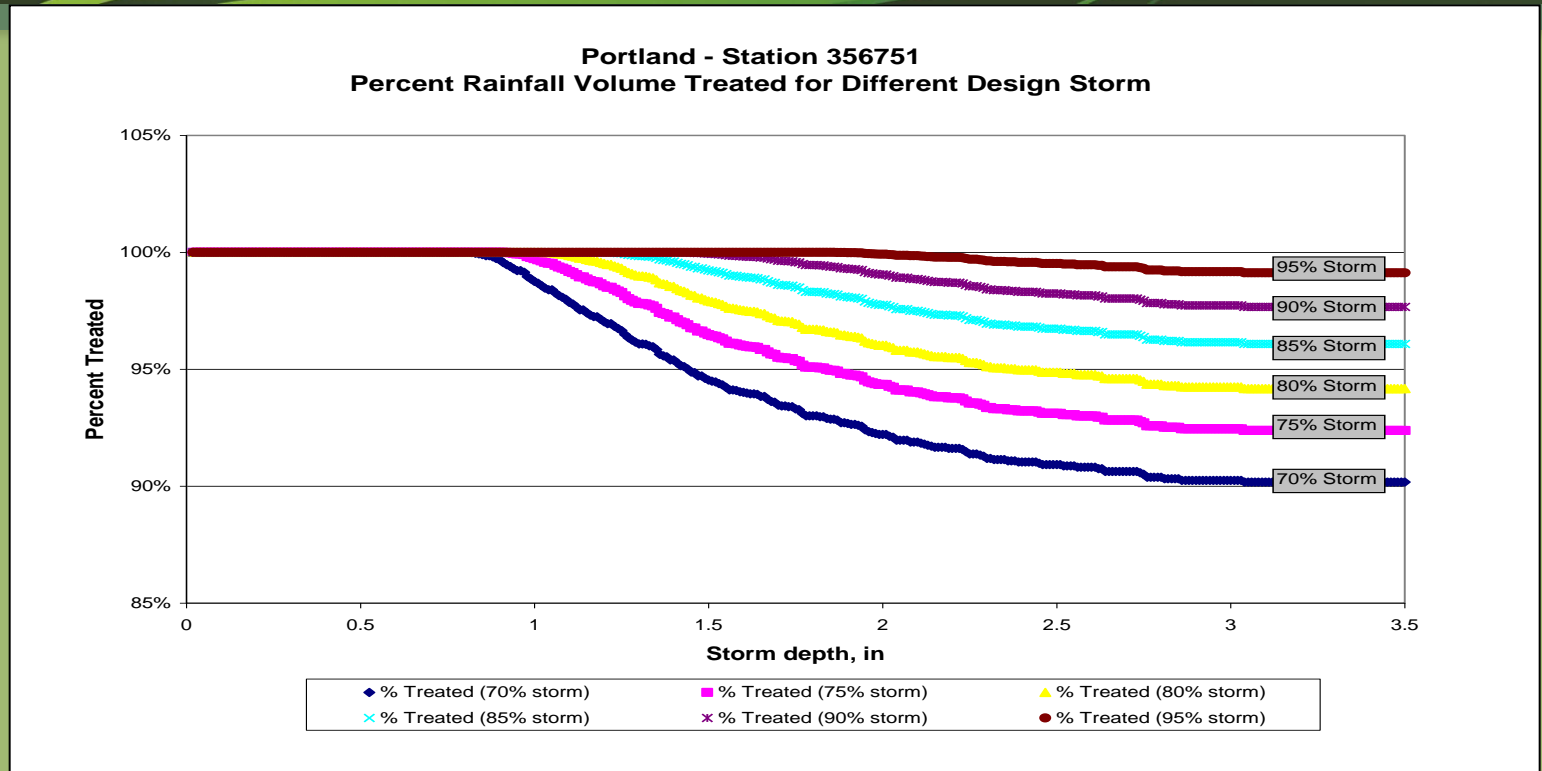


BMPs

- Ranked qualitatively, based on the results of a literature review of effectiveness and unit processes
- “Preferred BMPs” address a wide range of pollutants, including dissolved metals



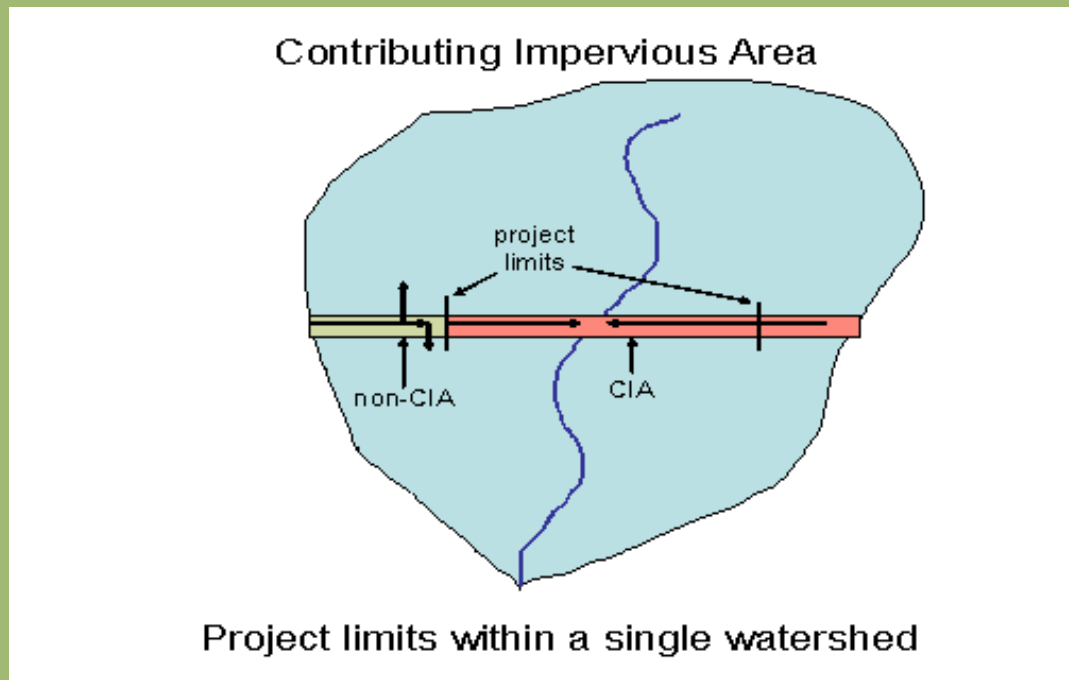
Water Quality Design Storm



- The design storm was selected based on climate data analysis to determine the point where increasing storm size produced relatively little benefit.

Contributing Impervious Area

ODOT is responsible for treating all of its runoff that is managed by the project, even if it comes from outside the project area, but not runoff from land owned by others



Flow Control Design Storms

- Selection of the design storm range based upon fluvial geomorphologic considerations
- Manage the change from pre-project conditions



Regulatory Effects

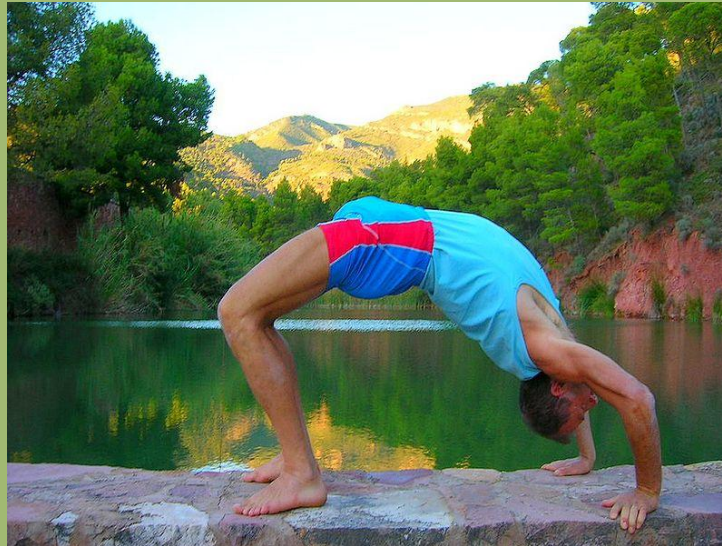
- Stop obsessing on the Effect Determination: NMFS incorporated the SW management criteria into SLOPES IV, a programmatic BO for projects with 404 permits
- Tacit agreement from DEQ that the SW management criteria meet 401 requirements

Implementation

- Joint ODOT and DEQ training on stormwater management plans for 401 certs
- Incorporation into ODOT' s Water Resources Specialist Manual
- Incorporation into ODOT' s SLOPES IV Handbook
- BMP selection guidance in ODOT' s Hydraulic Manual

Outcomes

Well defined criteria can provide a good basis
for flexibility project by project,



or

It can lead to rigidity

Outcome

Stormwater management criteria formed the basis of a major change in water quality permitting of ODOT projects:

- ODOT assumed the right to self-evaluate 401 SWMPs for Nationwide 404 Permits
- DEQ/ODOT Liaison responsibility shifting from project evaluation to program level permitting

Ongoing Efforts

- Using the SW Management Criteria as the basis for ODOT's Environmental Performance Standards
- Developing clarification and interpretation guidance
- Working with NMFS and FHWA on a broader programmatic BO

Contact:
William Fletcher
Oregon Dept. of Transportation
Email: William.B.FLETCHER@ODOT.state.or.us

More and Detailed Information:

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/storm_management_program.shtml

Planning for Efficient Treatment of Runoff from Many Untreated Miles of Highways – Responses to TMDLs

KARUNA PUJARA, Chief, Highway Hydraulics,
Maryland State Highway Administration



Past Efforts To Do The Right Thing -

Maintain Existing Stormwater Infrastructure - An Asset Management Program



Past Efforts To Do The Right Thing -

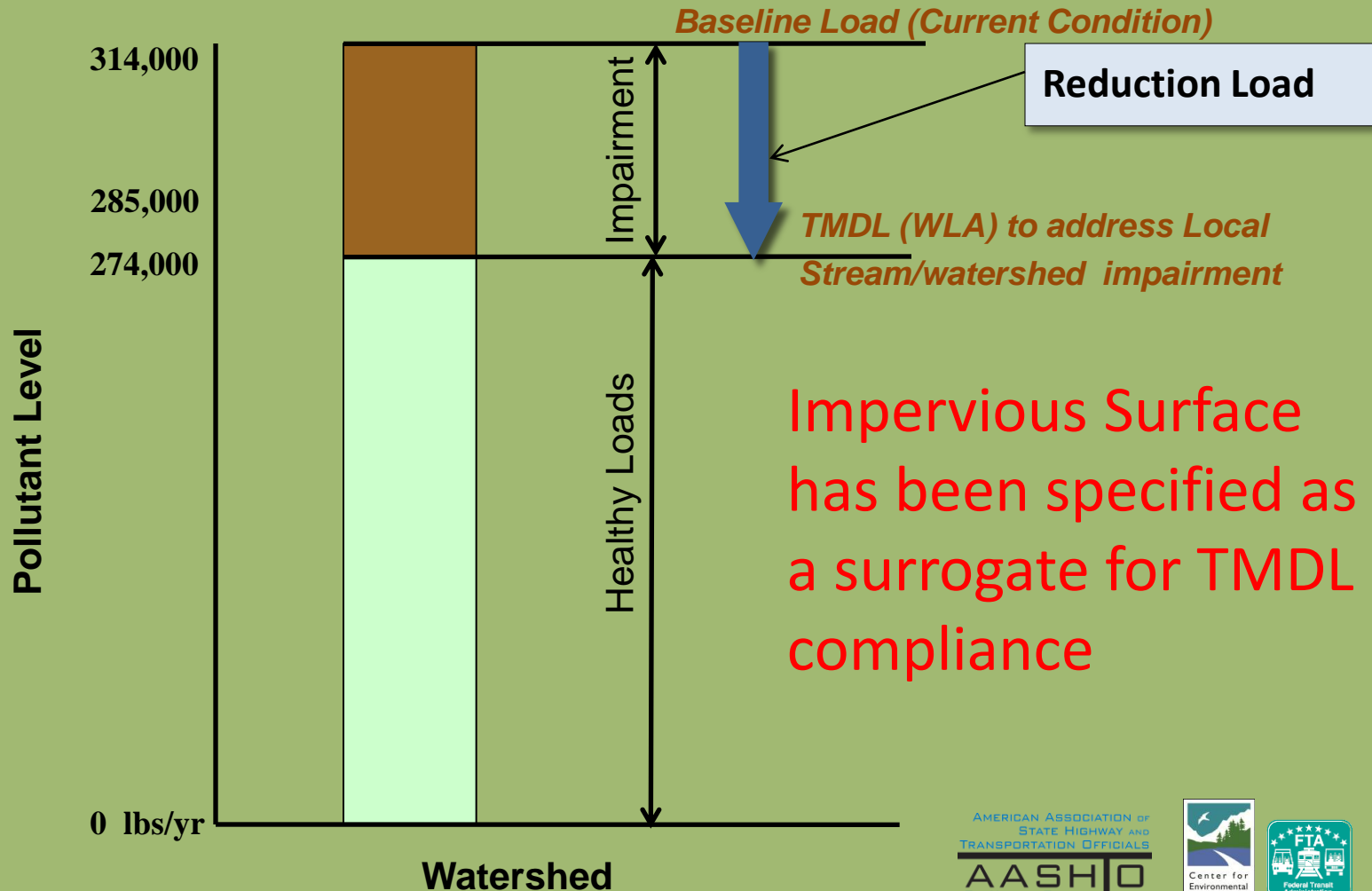
Upgrade Existing Infrastructure To Perform at a Higher Standard



upgrade from ½ inch to 1 inch of runoff,
provide volume control for channel
protection



The Fundamental Need – TMDL



New Focus

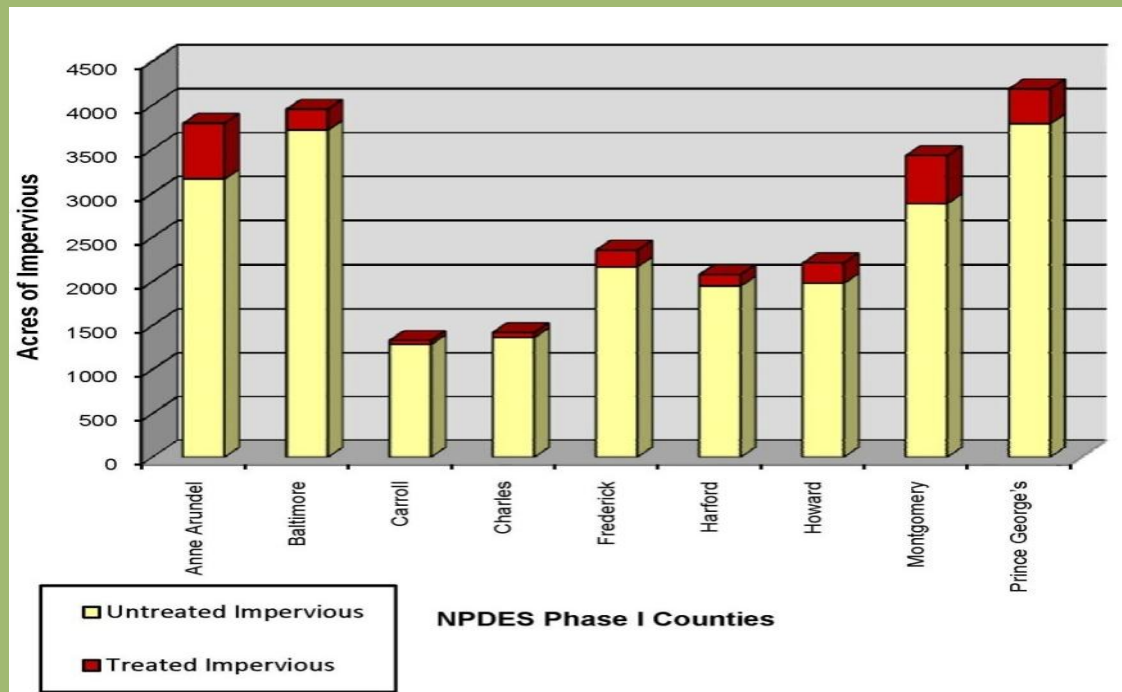
Focus on meeting numerical limits and compliance with NPDES MS4 Permit and State regulatory requirements

Previous:

- Water Quality Volume
- Recharge Volume
- Channel Protection Volume
- Flood flow Peak Discharge

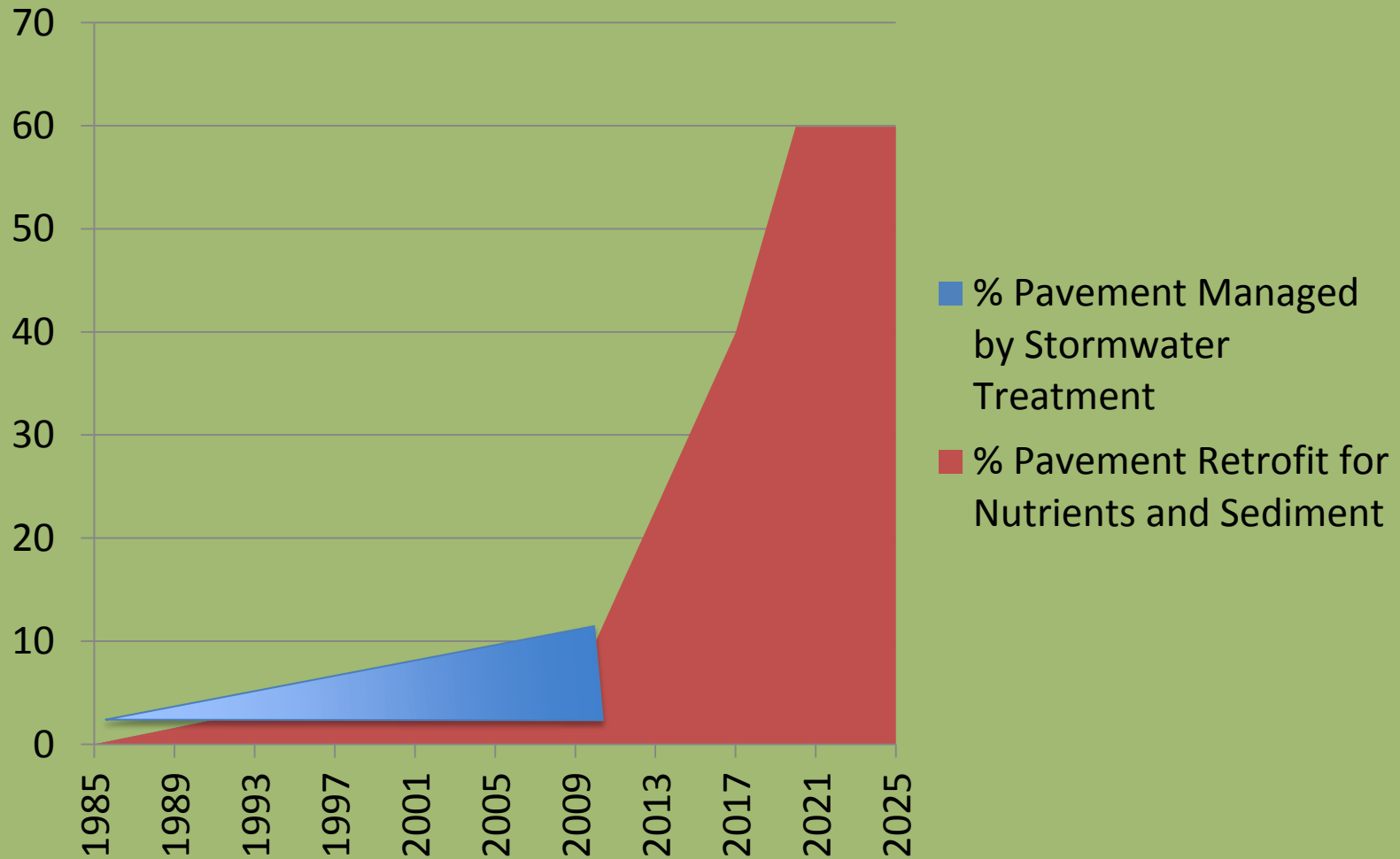
A Quick Glance of Achievement

- ❖ Practicing SWM Since 1985 – 25 Years Under State Regulations
- ❖ Latest Count of Pavement Managed by Stormwater Control – 9.9% of Pavement Owned



- ❖ New NPDES TMDL Goal for Additional Management of 30% by 2017 – Next 6 years

A Quick Glance at Achievement and Target



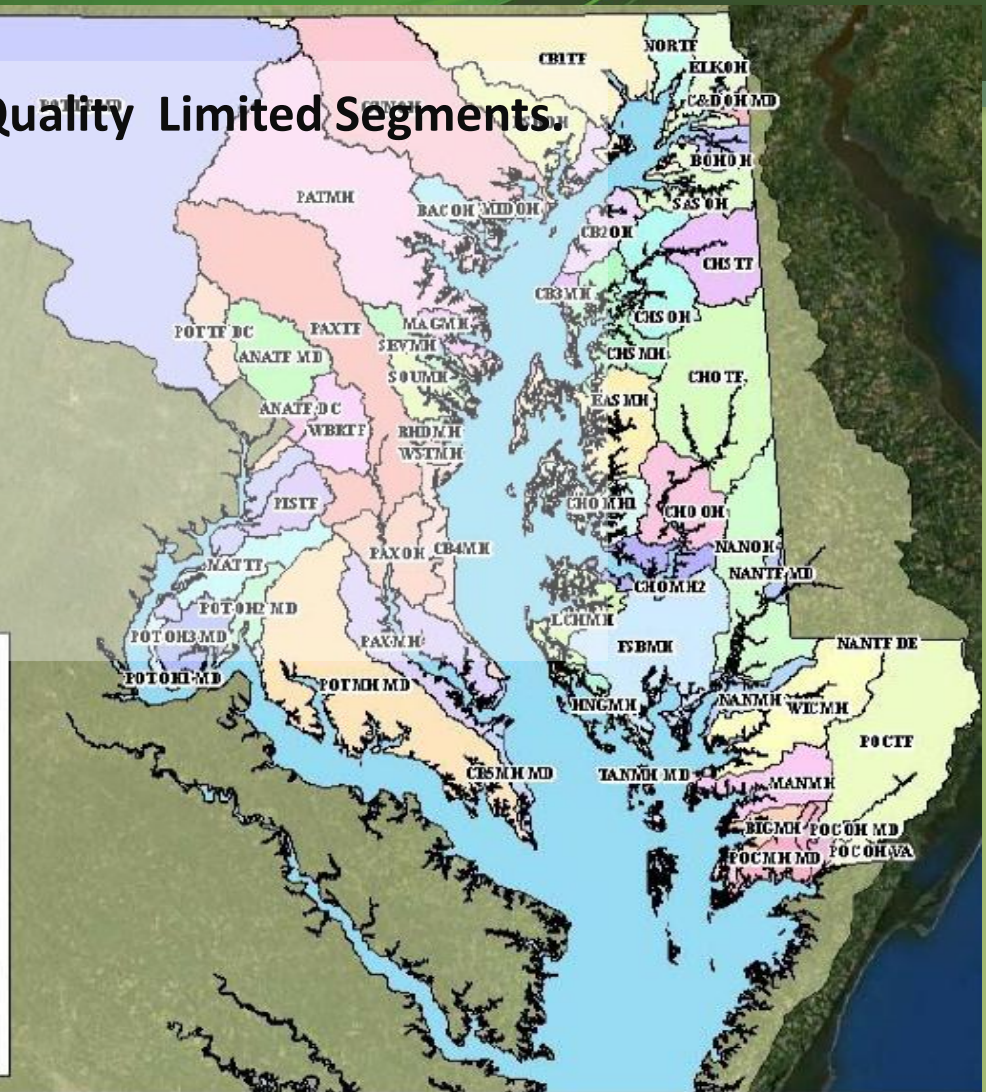
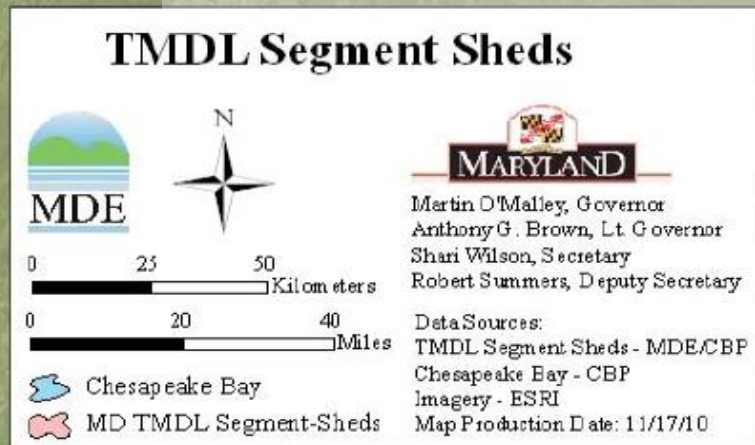
Sub-Allocations

53 Maryland Bay Water Quality Limited Segments

24 Jurisdictions

Source Sectors

- Point Sources - WWTPs
- Agriculture
- Stormwater (Urban)
- Septic Systems



Preliminary Budget Estimate for Stormwater Controls

- Approx 150 to 200 K/acre of pavement managed through traditional stormwater control (cost of LID higher) for construction.
- 2017 Goal – 6690 acres
- Next 5 Year budget need > \$1 B
- Negotiations for allowable alternative strategies for pollution control (focus on nitrogen, phosphorous, sediment)

MSHA Approach to TMDL Implementation

- Broader set of pollution control strategies to be deployed
 - Identification of Existing Non-Structural Water Quality Features, Retrofit and Accounting
 - Upgrade Existing Structural Stormwater Facilities
 - Stabilize Eroding Outfalls and Channels
 - Reforestation and Tree Planting
 - Stream Buffer Planting
 - Stream Restoration/Stabilization
 - Wetland Creation
 - Street Sweeping/Inlet Cleaning
 - Pavement Removal
 - Shoreline Stabilization
 - Other

MSHA's Approach to TMDL Implementation

- Broader set of pollution control strategies to be deployed beyond stormwater controls
- Cost and pollutant removal efficiencies - main factors in selection of strategy
- Commitment of some level of pollution reduction with stormwater controls based on current capacity of \$ and resources
- Address infrastructure needs while achieving pollution reduction
- Demonstrate good faith effort as a State agency

MSHA's Draft Implementation Approach for 2017 Target

Treatment/Source Control Strategy	Units	Total 10 yr Cost (Millions) *
Structural BMP & ESD Facilities	1,115 Acres	161.6
Stream Restoration	16,063 LF	15.1
Tree Plantings	22,210 Acres	255.4
Wetland Restoration	335 Acres	70.4
Pavement Removal	216 Acres	64.8
Inlet Cleaning	40,000 Each	35.0
Street Sweeping	1,417 Miles	20.1

*Not including ROW costs

Current Methodology

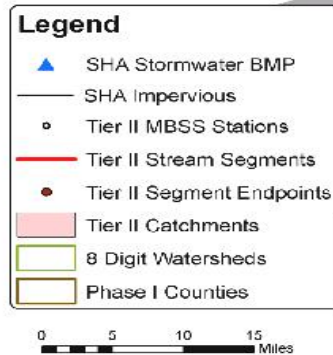
- MSHA has inventory of
 - the impervious surface MSHA owns in permitted areas,
 - inventory of all stormwater facilities owned and the drainage areas serving that facility, and
 - developing ROW GIS layers
- Obtain federal buy-in/clarification on federal aid support
- Utilize existing infrastructure and examine least cost opportunities for expansion of management controls within available r/w

Current Methodology

- Identifying areas that do not have already planted trees or wildflowers
 - mass afforestation to reduce runoff (stand alone efforts and partnership efforts e.g., DOT provides funding to buy the trees, DNR provides the land, Corrections provided the labor)
- Working with Agriculture Department to provide buffer planting where that hasn't been possible to date
- Address needs/opportunities where MSHA could get credit but locals aren't able to address

APPROACHES TO STORMWATER MANAGEMENT FOR BAY TMDL

– MSHA INFRASTRUCTURE IN WATERSHED CONTEXT



- Rights of Way Accounting
- Impervious Area Accounting
- IDDE
- Stormwater Management Facilities Program
- Own and Maintain more than 2000 Facilities Statewide
- An asset management program
- A system of Inspection and Rating
- Response based on Functional and Structural Rating (Routine maintenance to Retrofits)

MSHA's Approach to Stormwater for paved surfaces built prior to 1985



MSHA's Approach to Stormwater – A watershed approach - for paved surfaces built prior to 1985



Removal of Concrete Channel at I 68
Partnership project with Watershed Group
Planting by others
USE III Stream



MSHA's Approach to Stormwater – A watershed approach - for paved surfaces built prior to 1985



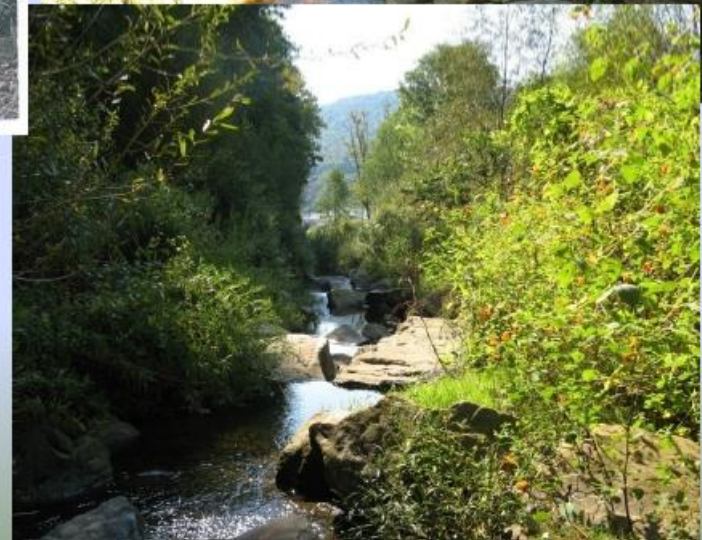
Built on Fill with step/pool

MPHI (Pre restoration) = 6.6

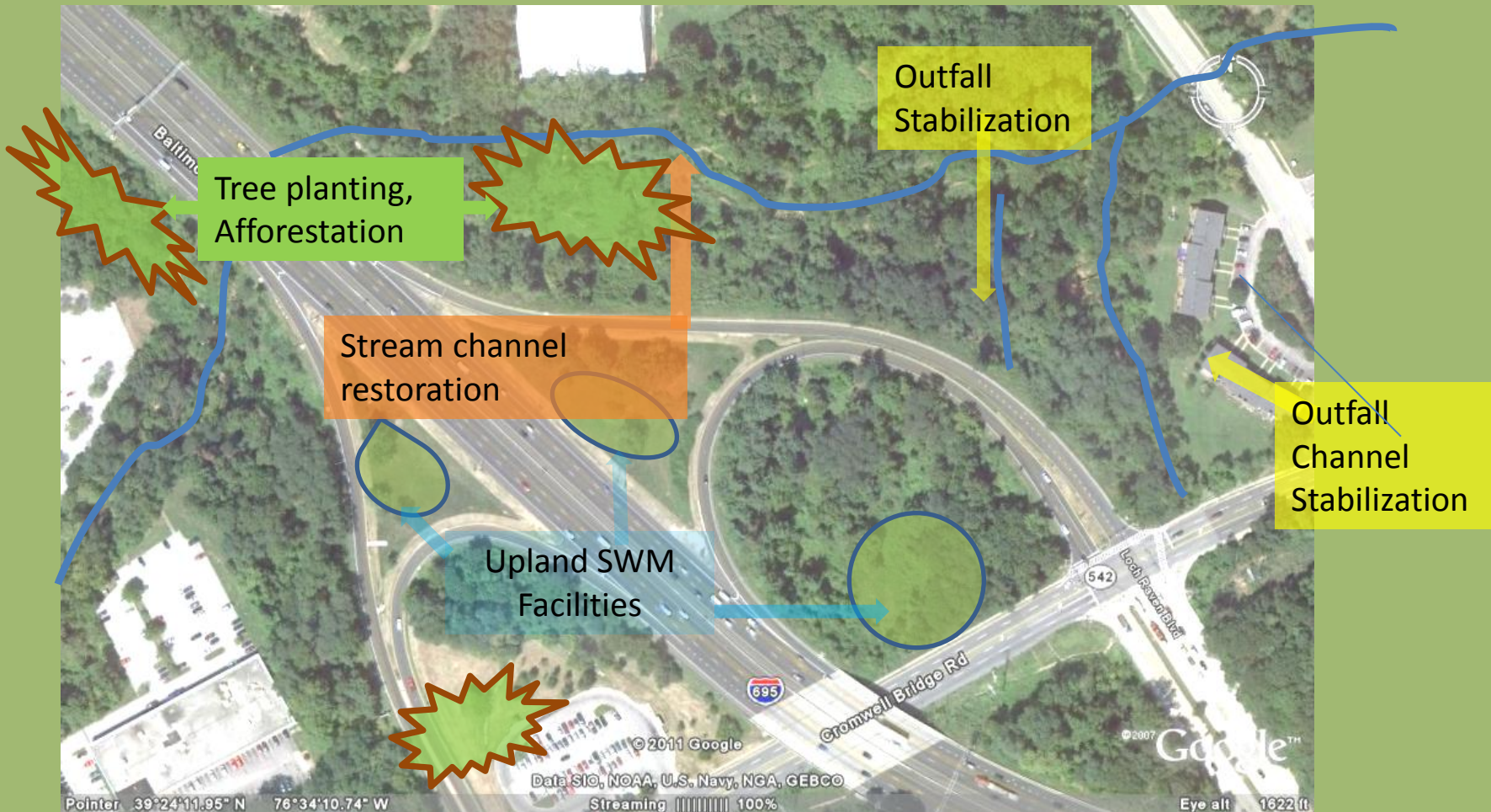
MPHI (2005) = 56.5

Avg. MBSS 1st Order Stream MPHI (2005) = 35.8

Trout found in 2005 in Restored reach



TMDL Projects – Maximizing Mobilization



Tree Plantings

- Compile tree plantings sites that have occurred since 2006
 - 1 Million Tree Initiative
 - ARRA Projects
 - Partnership Plantings
- Next Steps:
 - Identify addition ROW Opportunities
 - Consider other public or private property if necessary



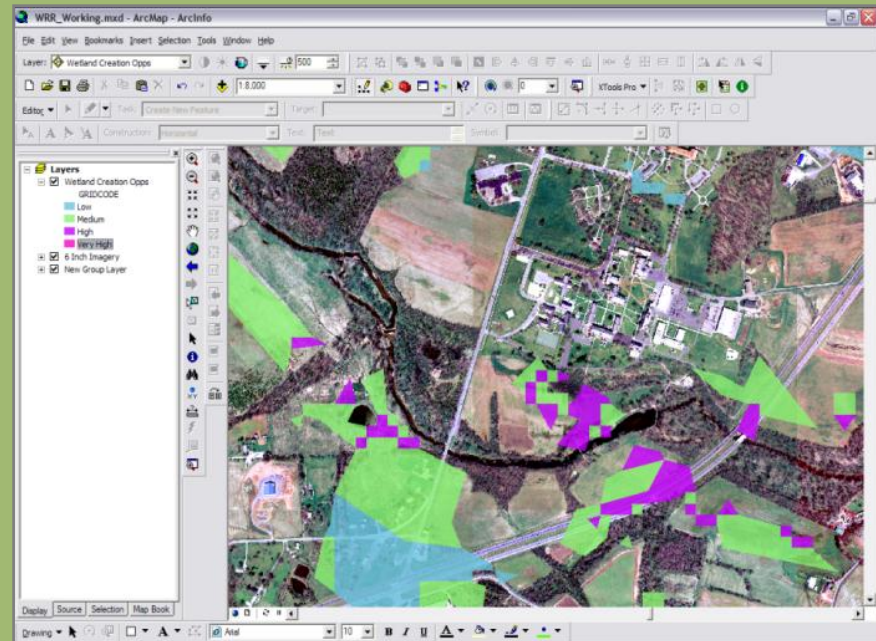
Tree planting site identified within MSHA ROW at I-695 and US 40, Baltimore County

Wetland Creation

- Currently compiling all MSHA wetland creation sites that have occurred since 2006:
 - Transportation Enhancement Program Projects
 - Stewardship Projects

Next Steps

- Utilize the Watershed Resource Registry (WRR) data to identify potential wetland creation sites and potential ranks



Preliminary results of WRR data identifying potential wetland creation sites.

Administrative and Organizational Response

- Formed a TMDL steering committee (includes administrator and directors from various offices)
- Formed multi-office, multi-disciplinary subject area expertise teams such as
 - Watershed Coordination Team
 - Planning Team
 - Research Team
 - Implementation Team
- Work area focus and lead with hydraulics and water quality expertise
- Established TMDL fund similar to drainage and bridge funds

Implementation Comparison

ICC- Inter County Connector

- Planning to Construction
Time Line
2003 to 2010
- Annual Spending \$300M to \$565M including Highways and Bridges
- Average review time 550 hours per month

TMDL

- Time line
2010- 2020
- Projected Annual Spending \$50 to \$350M only in water quality improvement projects and activities
- Working towards developing MOUs with regulatory agencies

Lessons Learned

- Federal aid support
- Attention to local TMDL as well as bay TMDL (watershed scale)– maximize output for multiple needs
- Attention to anti-degradation policies
- Attention to TMDL documents
- Efficiencies
- Partnerships with regulators, local governments, and watershed groups
- Regulatory flexibility and cohesion
- Management of excess land
- Future maintenance
- Understanding of drainage assets that need improvement
- Right of way and utilities
- Understanding of organizational capacity
- Knowledge of existing stormwater controls, its functional condition, drainage areas and impervious surfaces

– *All important in building a good plan of action*

Additional Information

Chesapeake Bay TMDL

<http://www.epa.gov/chesapeakebaytmdl/>

Bay TMDL Watershed Implementation Plans - Ensuring Results

<http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/EnsuringResults.html?tab2=1>

Maryland's Watershed Improvement Plan for the Bay and other TMDL information

http://www.mde.state.md.us/programs/Water/TMDL/ChesapeakeBayTMDL/Pages/programs/waterprograms/tmdl/cb_tmdl/index.aspx

Questions and Answers

- Please submit questions via the GoTo Webinar Bar

Concluding Remarks

- Please fill in and submit the simple on-line questionnaire (e-mail will provide directions)
- The webinar will be available for on-demand viewing and pdf of the presentation for download at the Center website:
 - <http://environment.transportation.org/>
- Thank you for your attention and participation