Barton & Loguidice

Cornell Waste Management Institute

Tompkins County Soil and Water Conservation District

Using Compost as a Roadway and Ditch Project Restoration, Stabilization and Stormwater Control Medium

September 18 , 2018

Speakers: Scott Nostrand, *Barton & Loguidice*
Jean Bonhotal, *Cornell Waste Management Institute*
Angel Hinickle, *Tompkins County Soil & Water District*

State of Organics

Organics in New York

- NYSDEC Priority – Reduction, Re-use and Recycling
- Greenhouse Gas Reduction
  - Aerobic Processes – Composting
  - Soil Amendments
- Anaerobic Processes
  - Methane Production
  - Energy Capture
  - CO2 production
  - e.g. Digesters, Landfill Gas

State of Organics

Diversion in New York State

- Beyond Waste – Sustainable Materials Management Strategy – 2010
- New York City
- County and Local Efforts
- Grants – 2017 8 Compost projects funded
- State Legislation
  - Mandated Organics Recycling
    - Close but not yet

Demand through Specification

NYSDOT

- Section 610 Ground Vegetation – Preparation, Establishment and Management
- Section 611 Planting, Transplanting and Post Planting Care
- Section 614 Pruning, Improving and Removing Existing Vegetation
- Section 713 Landscape Development Materials
  - 713-15 Compost

NYSDEC – 2015 Stormwater Mgmt. Design Manual

- Green Infrastructure Practices- Compost
  - Soil Restoration Amendment
  - Organic Filter

Compost in Practice

Socks and Blankets

Presented by Jean Bonhotal,
Cornell Waste Management Institute

Ditch Management and Stormwater Mapping

Presented by Angel Hinickle,
Tompkins County Soil & Water Conservation District

Organic Material in Socks & Blankets

Jean Bonhotal
Cornell Waste Management Inst.
cwmi.css.cornell.edu


Effects of erosion

Why Organic Material

- Moisture holding capacity
- Nutrients
- Long term effect
- Controls Erosion
- Covers bare soil
- Improves tilth

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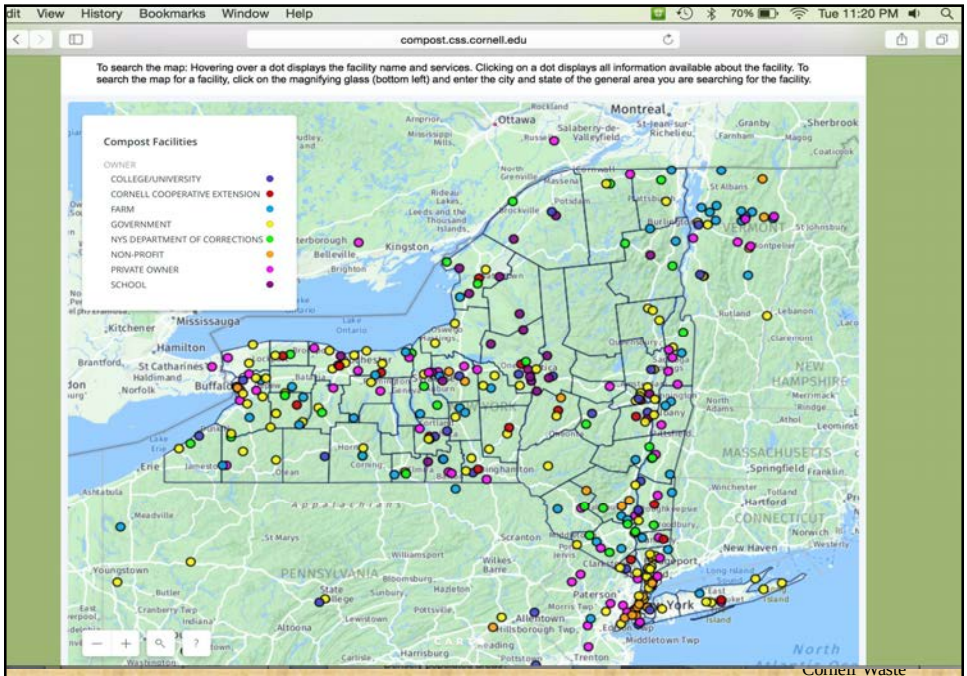

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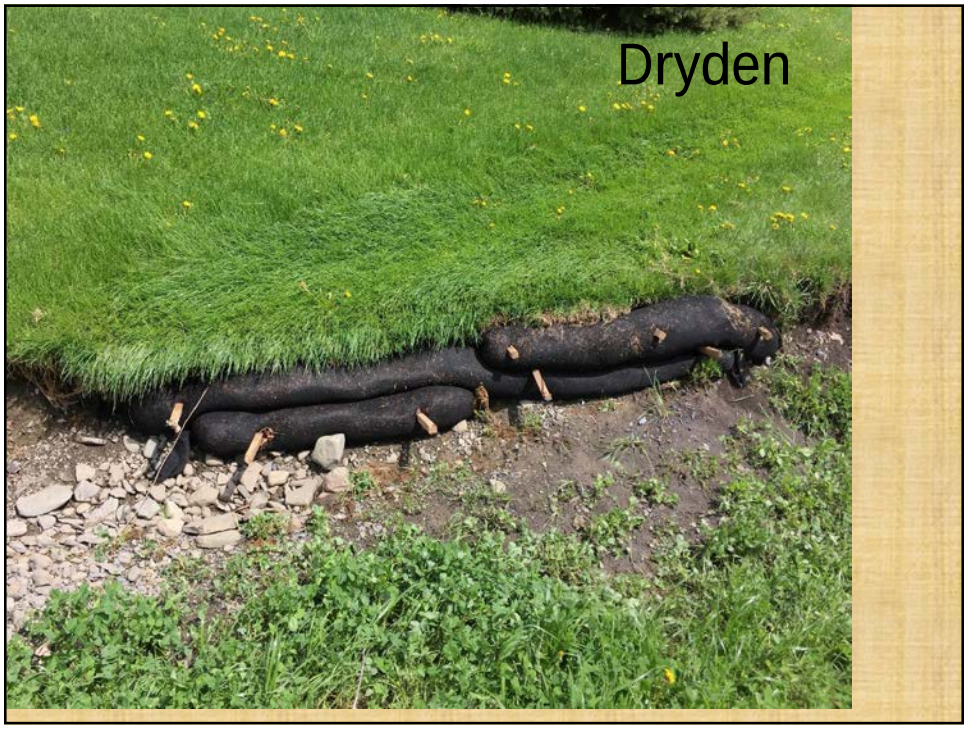
Improves Highly Compacted Soils

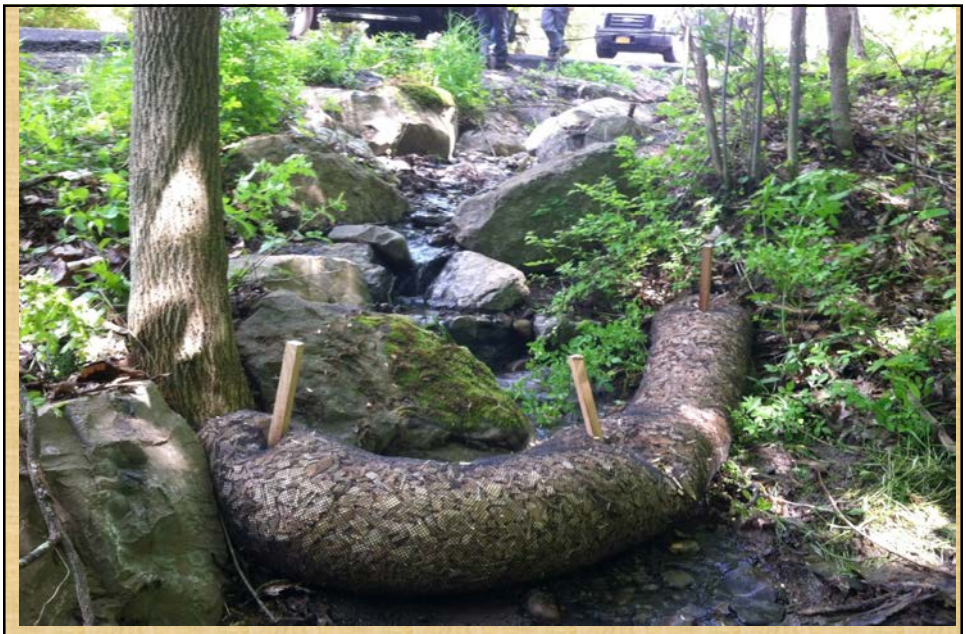
Compost Socks

Filter Tubes Installed for Storm Water Protection


Dryden


Undercut bank

Socks in road ditches



Soil placed on top of Compost??

Slope failure -blanket was improperly built

Hydro-seed with Compost/Soil Mix

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2017/03/09


Brooktondale

Eroding Stream Bank

Swale at Upper Buttermilk

Application to 1:1 ROCK SLOPE
2” compost mulch w/native seed mix
Barton Creek Development – Austin, TX
AUGUST 17, 2002


8 MONTHS LATER
IRRIGATION INSTALLED, NEVER USED
APR 17 2003

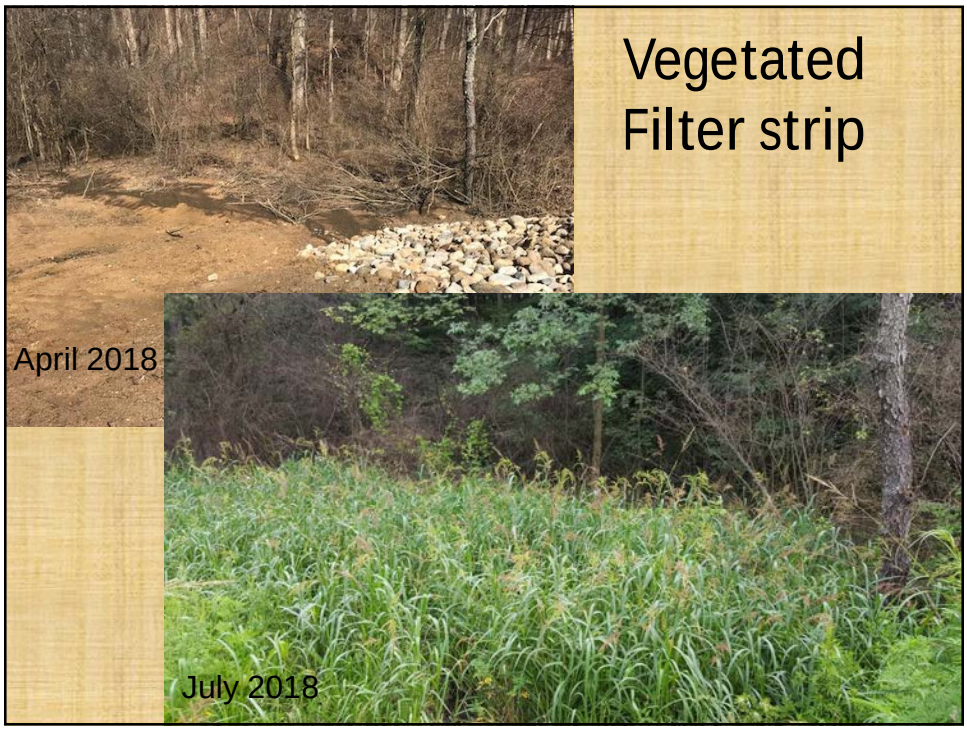

DEC 2 2004


West Cypress Hills on October 05, 2004. Before Compost Application


JAN 11 2005


Wetland
Mitigation in
Adirondack Park
2016.05.25
2016.09.28


Establishing Vegetation
2016.10.21


Vegetated
Filter strip
April 2018
July 2018

Tree Establishment


3 years

Landscaping Project

http://cwmi.css.cornell.edu

Homer


MINISINK SITE


COMPOST
SOIL NEEDS IT
FEED THE SOIL
SPREAD IT AROUND
Cornell Waste Management Institute
Landscaping
Backfilling
Land Spreading
Gardening
Top dressing


Sept 2017


October 2017

Recycling Organics Makes Good Sense!

Healthy Soils =
Healthy Food!

http://cwmi.css.cornell.edu

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Compost Based Stormwater Best Management Practices

Angel Hinickle

Resource Conservation Specialist

Tompkins County Soil and Water Conservation District

Cayuga Compost
a division of P&S EXCAVATING, LLC

Applications

- NYS Stormwater Management Design Manual
  - Soil Restoration
  - Rain Garden Soil Media
  - Bioretention Soil Media
- BMPs
  - Soil Amendment
  - Filter Sock
  - Compost Blanket
  - Filter Berm
- Road Ditch BMPs

Soil Restoration Requirements

**Compost shall be aged, from plant derived materials, free of viable weed seeds, have no visible free water or dust produced when handling, pass through a half inch screen and have a pH suitable to grow desired plants.

Table 5.3 Soil Restoration Requirements

Type of Soil Disturbance	Soil Restoration Requirement		Comments/Examples
No soil disturbance	Restoration not permitted		Preservation of Natural Features
Minimal soil disturbance	Restoration not required		Clearing and grubbing
Areas where topsoil is stripped only - no change in grade	HSG A &B	HSG C&D	Protect area from any ongoing construction activities.
	apply 6 inches of topsoil	Aerate* and apply 6 inches of topsoil	
Areas of cut or fill	HSG A &B	HSG C & D	
	Aerate and apply 6 inches of topsoil	Apply full Soil Restoration **	
Heavy traffic areas on site (especially in a zone 5-25 feet around buildings but not within a 5 foot perimeter around foundation walls)	Apply full Soil Restoration (de-compaction and compost enhancement)		
Areas where Runoff Reduction and/or Infiltration practices are applied	Restoration not required, but may be applied to enhance the reduction specified for appropriate practices.		Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area
Redevelopment projects	Soil Restoration is required on redevelopment projects in areas where existing impervious area will be converted to pervious area.		

*Aeration includes the use of machines such as tractor-drawn implements with coulters making a narrow slit in the soil, a roller with many spikes making indentations in the soil, or prongs which function like a mini-subsoiler.

** Per "Deep Ripping and De-compaction, DEC 2008".

Planting Soil Characteristics

- The recommended bioretention soil mixture is generally classified as a loamy sand on the USDA Texture Triangle, with the following composition:
  - 85% to 88% sand;
  - 8% to 12% soil fines; and
  - 3% to 5% organic matter

Table H.2 Planting Soil Characteristics

Parameter	Value
PH range	5.2 to 7.00
Organic matter	1.5 to 4.0%
Magnesium	35 lbs. per acre, minimum
Phosphorus (P_2O_5)	75 lbs. per acre, minimum
Potassium (K_2O)	85 lbs. per acre, minimum
Soluble salts	• •500 ppm
Clay	10 to 25%
Silt	30 to 55%
Sand	35 to 60%

Compost BMPs in Use


STANDARD AND SPECIFICATIONS FOR COMPOST FILTER SOCK


STANDARD AND SPECIFICATIONS FOR LOOSE STABILIZATION BLANKETS

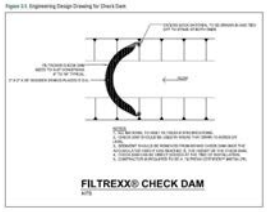
Bluebook Specifications

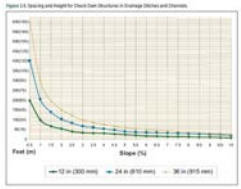


Ditch Applications

- Wood chip/composted wood chip socks
- Slope stabilization
- Following Ditch Maintenance


STANDARD AND SPECIFICATIONS FOR CHECK DAM

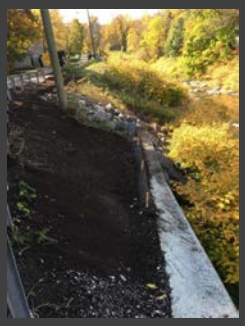




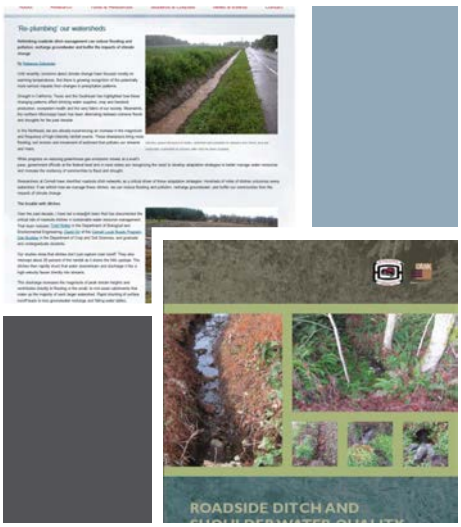
For filter sock or fiber roll check dams: The check dams
will be anchored by staking the dam to the earth contact surface. The dam will extend to the top of the bank. The check dam will have a splash apron of NYS DOT #2 crushed stone extending a minimum 3 feet downstream from the dam and 1 foot up the sides of the channel..

Filter Sock Check Dam

Use of compost socks, compost blanket on stream bank



Compost Blanket Application



Road Ditch BMPs

- Roadside Ditch and Shoulder Water Quality Enhancement Plan – Kitsap County, Washington
  - Soil Amendments: Optimally, provide 18 inches of soil amendment, with coarse organic compost as the chief element in the amendment.
- "Replumbing" Our Watersheds
  - http://climatechange.cornell.edu/re-plumbing-our-watersheds/

Stormwater Mapping Efforts

Angel Hinickle

Resource Conservation Specialist

Tompkins County Soil and Water Conservation District

Stormwater Conveyance System Mapping

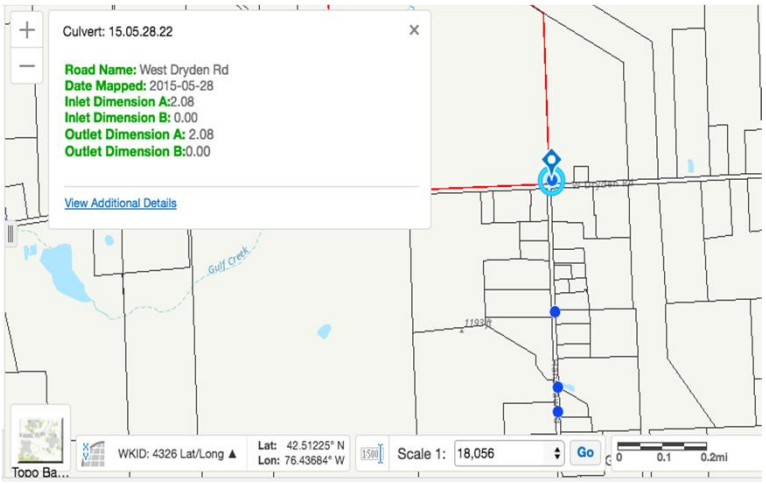
WHY?

- Requirement NYSDEC SPDES Permit for Stormwater Discharges from Municipal Separate Storm Sewer System (MS4) to map outfalls and "storm sewershed"

Combined Permit Requirement with other efforts

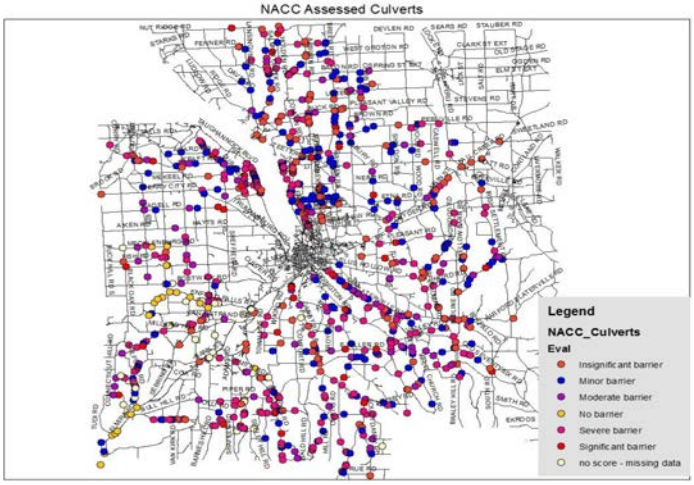
- Cornell Water Resources Institute started mapping culverts in 2015 and 2016 to run through culvert capacity model to identify undersized culverts
- North American Aquatic Connectivity Collaborative
  - Aquatic organism passage through culverts, bridges

Stormwater Conveyance Mapping App


Culvert: 15.05.28.22
Road Name: West Dryden Rd
Date Mapped: 2015-05-28
Inlet Dimension A:2.08
Inlet Dimension B: 0.00
Outlet Dimension A: 2.08
Outlet Dimension B:0.00
View Additional Details
Gulf Creek
WKID: 4326 Lat/Long
Lat: 42.51225° N
Lon: 76.43684° W
Scale 1: 18,056
Go
0 0.1 0.2mi
Topo Ba...


Catch Basin ID: 16.07.27.1
Road Name: Warren
Date Mapped: 2016-07-27
Grate Type: 10
Grate Shape: rectangle
Grate Size: 3.5 * 3.2
View Additional Details
Gulf Creek
Springbrook
Village Circle Apts
WKID: 4326 Lat/Long
Lat: 42.51294° N
Lon: 76.45795° W
Scale 1: 18,056
Go
0 0.1 0.2mi
Topo Ba...


Stormwater Mapping
Legend
CB_merged
Culverts_12_28_17Prj


NACC Assessed Culverts
Legend
NACC_Culverts
Eval
Insignificant barrier
Minor barrier
Moderate barrier
No barrier
Severe barrier
Significant barrier
no score - missing data

Ditch Mapping

Ditch Mapping

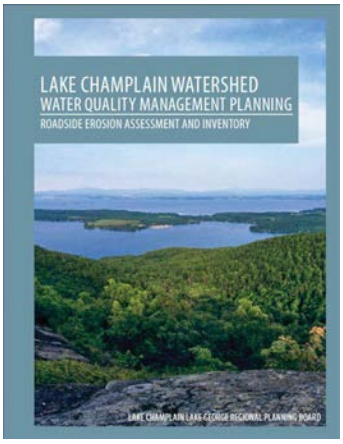
Table

Ditch_flow final

FID	Shape *	Percent_Ve	Erosion	Flow_Direc	Tributary	StreamFlow	Width_Ft	Depth_Inch
0	Polyline ZM	76-100	Low	east		No	1	6
1	Polyline ZM	76-100	Low	east		No	0.5	4
2	Polyline ZM	76-100	Low	east		No	2.5	1
3	Polyline ZM	76-100	Low	east	ends at driveway culvert	No	2	1
4	Polyline ZM	76-100	Low	east		No	3.4	2
5	Polyline ZM	51-75	Low	east		No	3	2
6	Polyline ZM	76-100	Low	east		No	4	1
7	Polyline ZM	76-100	Low	east	starts at dw culvert	No	4	2
8	Polyline ZM	0-30	High	east		No	2.5	1
9	Polyline ZM	76-100	Low	e		No	3	2
10	Polyline ZM	76-100	Low	east		No	3	1
11	Polyline ZM	76-100	Low	e	starts at dwc ends at rd culv	No	7	1
12	Polyline ZM	76-100	Low	e	ends at rdculvert in	No	6	2

(0 out of 267 Selected)

Ditch_flow final



The successful future of Lake Champlain's water quality is dependent on several factors, including the proper maintenance and control of the highly erodible soils that make up so much of the watershed.

The goal of this project was to identify critically eroding roadside banks that contribute significant sediment loads to the high quality streams throughout the Champlain Watershed.

PDH Quiz

Why is compost availability increasing?

PDH Quiz

Why is compost availability increasing?

What makes compost a good erosion control medium?

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Name 3 BMPs for compost use.

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In New York State, compost is specified by what agencies?

PDH Quiz

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What makes compost a good erosion control medium?

Name 3 BMPs for compost use.

In New York State, compost is specified by what agencies?

What application tool can be used to monitor road ditch BMP's effectiveness?

Questions?

Barton&Loguidice

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Water Conservation District

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