

Introduction to Green Asset Management for Delaware Small Systems

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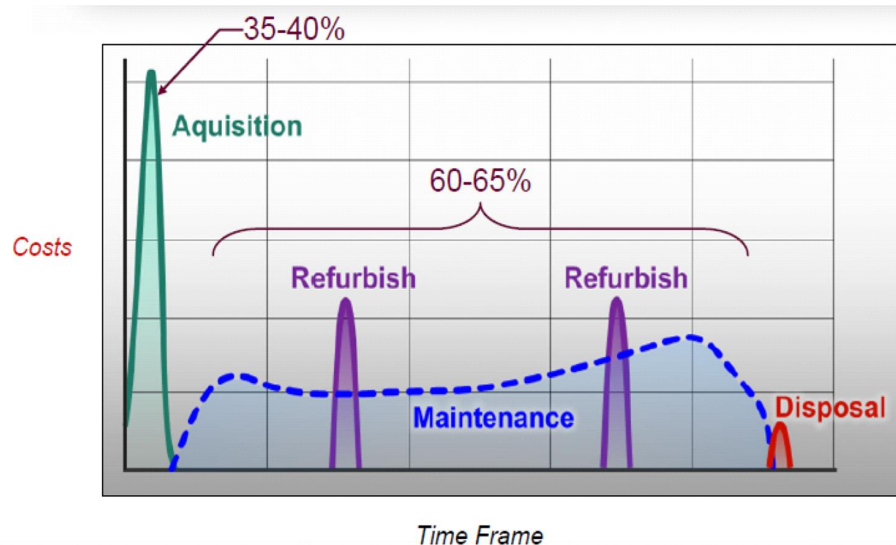
Agenda

- Welcome, Introduction, and Course Overview
- Q&A
- Overview of Asset Management for Natural Resources (Natural Capital)
- How Asset Management Can be Used for Source Water Protection (combining green and gray infrastructure)
- Q&A
- Source Water Protection as Green Asset Management for Drinking Water
- Q&A



Introductions

- Who is the Environmental Finance Center?
- What is water finance?
- What does a financing strategy look like?

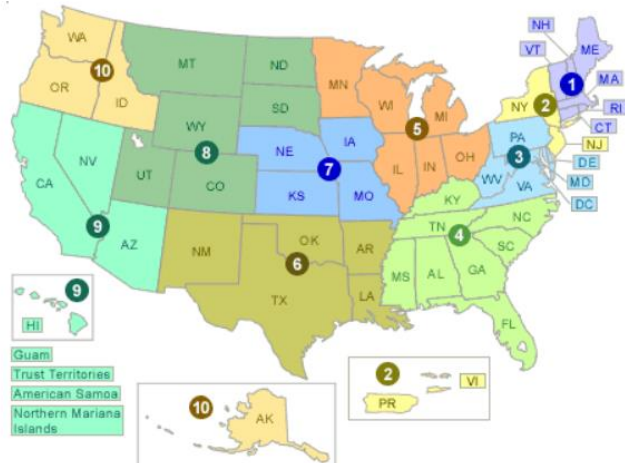


Who are the EFCs?

- UMD EFC is part of a network of 10 regional centers.
- UMD Serves Mid-Atlantic - PA, DE, MD, DC, VA, WV.

Environmental Finance Centers

Find the Environmental Finance Center (EFC) serving your area.



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What does UMD EFC do?



Capacity Building & Training

- Local Government Leadership Training
- On-line and Virtual Workshops
- www.mostcenter.umd.edu



Policy Analysis & Financial Assessment

- Policy Review
- Financing Strategies
- Budget Analysis
- Program Evaluation



Community Outreach & Facilitation

- Designing outreach campaigns
- Facilitating stakeholder engagement
- Conducting focus groups
- Managing community surveys and interviews



The MOST Center

- The Municipal Online Stormwater Training Center (MOST) center helps communities with stormwater programs.
- Online education and training resource center.
- Bridges the gap in technical and financial stormwater management resources.
- Focus on resilient, effective, and affordable methods.

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Questions

- What is your name and how do you work with water?
- What experience do you have with asset management?
- What experience do you have with source water protection?
- Are you working within a specific plan? (e.g., MS4, SWPP, WIP)
- What do you want to learn today?

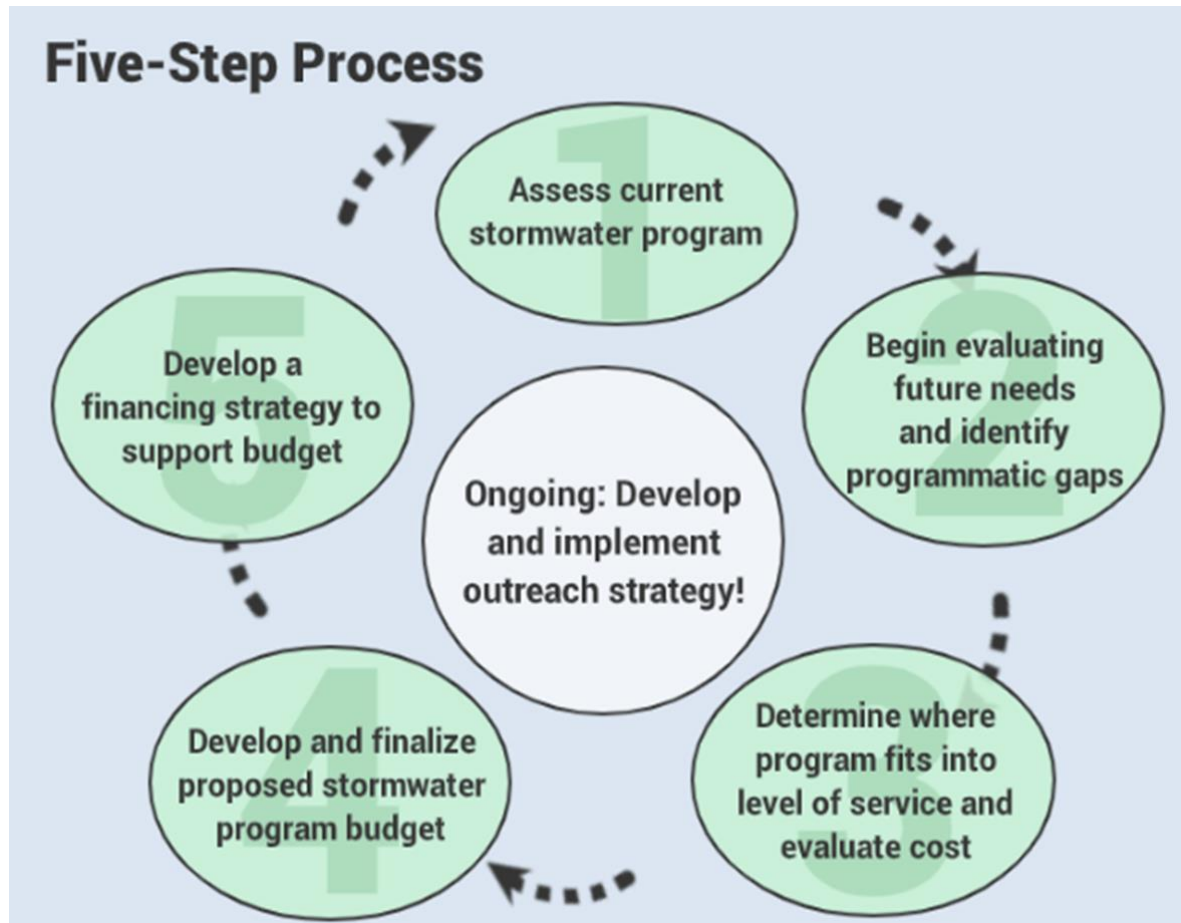


Water Quality Finance

1. Developing policies and programs to meet Chesapeake Bay Total Maximum Daily Load (TMDL) targets;
2. Outlining financing strategies for pollution reduction projects as part of Municipal Separate Storm Sewer System (MS4) permits;
3. Promoting regional approaches to sustainable water management and creating tools that help communities understand the costs and benefits of best management practices.



Stormwater Program Planning



Stormwater Financing Components

ACTIVITIES

- CAPITAL IMPROVEMENTS (BMPS)
- OPERATIONS AND MAINTENANCE
- PUBLIC EDUCATION AND INVOLVEMENT
- TECHNICAL SUPPORT
- ENGINEERING AND PLANNING
- REGULATORY COMPLIANCE AND ENFORCEMENT
- ADMINISTRATION
- BILLING AND FINANCE

PARTNERS

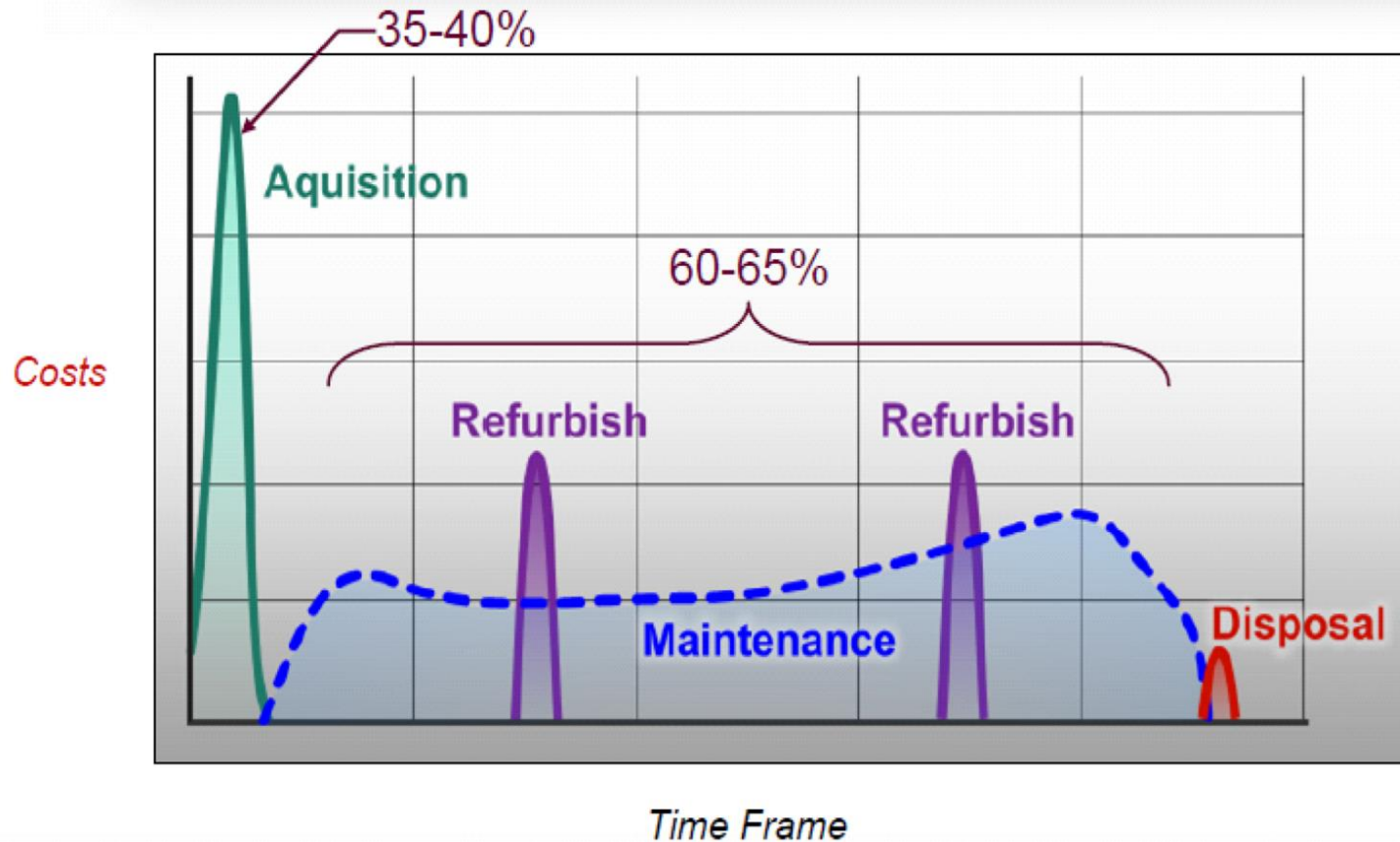
- Internal Municipal Partners (Parks & Rec, Roads, Admin)
- Municipal Committees (Open Space, Parks & Rec, Env'tl Advisory)
- Existing Municipal Authorities
- Other Municipalities
- Watershed Organizations
- Conservation District
- County Planning Department
- Private landowners

REVENUES

- General Funds
- CIP Funds
- Bonds
- Grants
- Fees
- Cost-share programs



Financing Lifecycle

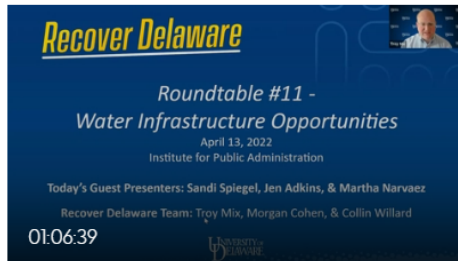


Water Finance Options

Source	Cost Coverage		Strengths	Weakness
	Capital	O&M		
General Fund	Yes	Yes	Can be used to support all program costs	Competes with other community priorities, changed from year to year, less equitably spreads costs across payers
Grants	Yes	No	Good source for “shovel ready/worthy” project implementation, demonstration projects, and initial program staff	Not guaranteed, highly competitive, suitable for demonstration projects, not sustainable in the long-term
SRF & Loan Programs	Yes	No	Can offer up-front capital for larger projects	Not guaranteed fund source, highly competitive, must repay – often with interest
Bond Financing	Yes	No	Can be used for large, long-term expenditures	Dependent on fiscal capacity, must repay with interest, cost of securing bond may be high
Permit, Development & Inspection Fees	Yes	No	Offers nexus to system and program expansion needs	May not sufficiently cover program costs, may deter development
Stormwater Utility Fee	Yes	Yes	Can generate sufficient revenue, sustainable, dependable, equitable depending on design, supports all program costs	Requires significant public dialogue, can create administrative challenges
Tax Districts	Yes	Yes	Can generate sufficient revenue, sustainable, dependable	Necessitates enabling statute, can have equity problems sue to property value basis



Infrastructure Investment and Jobs Act Clean Water SRF



[Recover Delaware Roundtable #11 - Water Infrastructure Opport...](#)

This session featured information sharing and discussion on opportunities for drinking water and clean water project funding from the Infrastructure Investment and Jobs...

From [Sarah Pragg](#) April 13, 2022

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- Water Infrastructure Webinar

<https://capture.udel.edu/channel/Institute+for+Public+Administration/>

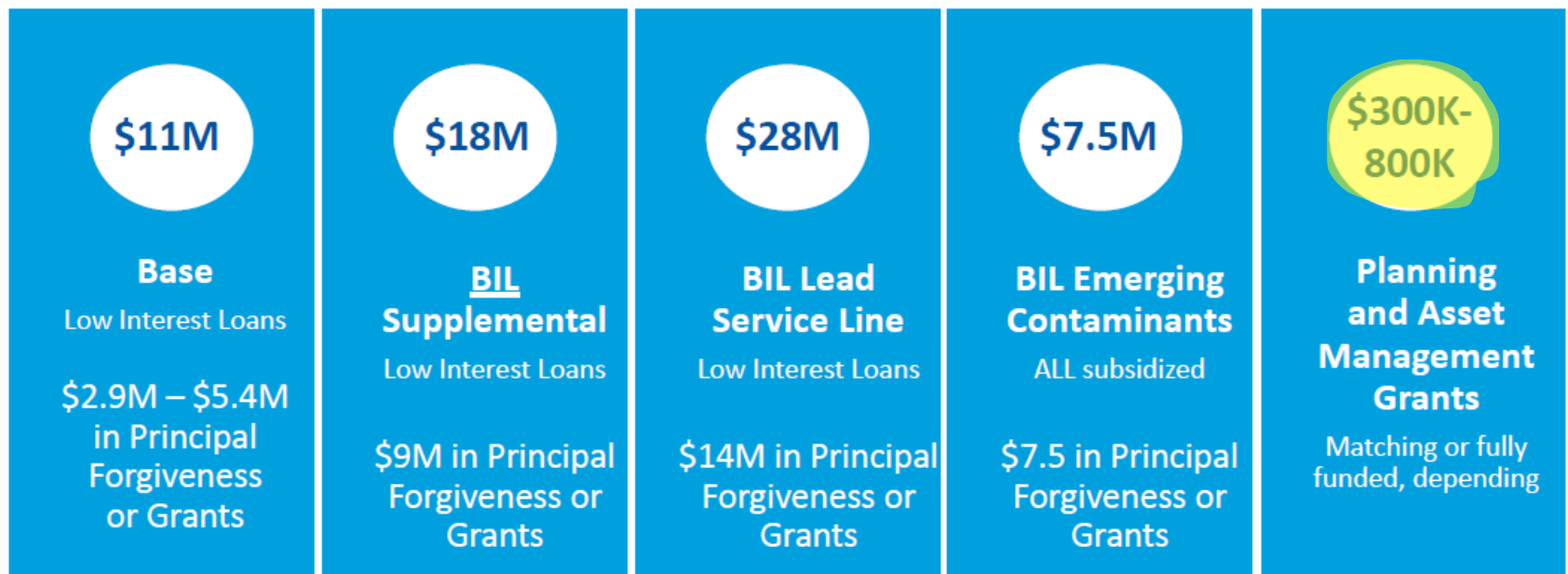


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Infrastructure Investment and Jobs Act Clean Water SRF

DWSRF 2022 Opportunities

What's Available (this year and the next 4)?



Infrastructure Investment and Jobs Act Clean Water SRF

Who's eligible to apply?

- Existing private and public community water systems and non-profit non-community water systems
 - A community water system serves 15 service connections or 25 year-round residents
 - A non-profit non-community water system is a public water system that is not a community water system and is a non-profit, such as a school
- New community water systems that provide solutions to existing Public health problems

Infrastructure Investment and Jobs Act Clean Water SRF

What's eligible?

Emerging Contaminant/
Treatment
Projects



Lead Service Line
Inventory
and Replacement



Planning
and Asset
Management



Distribution Projects



Storage
Projects



Infrastructure Investment and Jobs Act Clean Water SRF

How to get started?

Engage

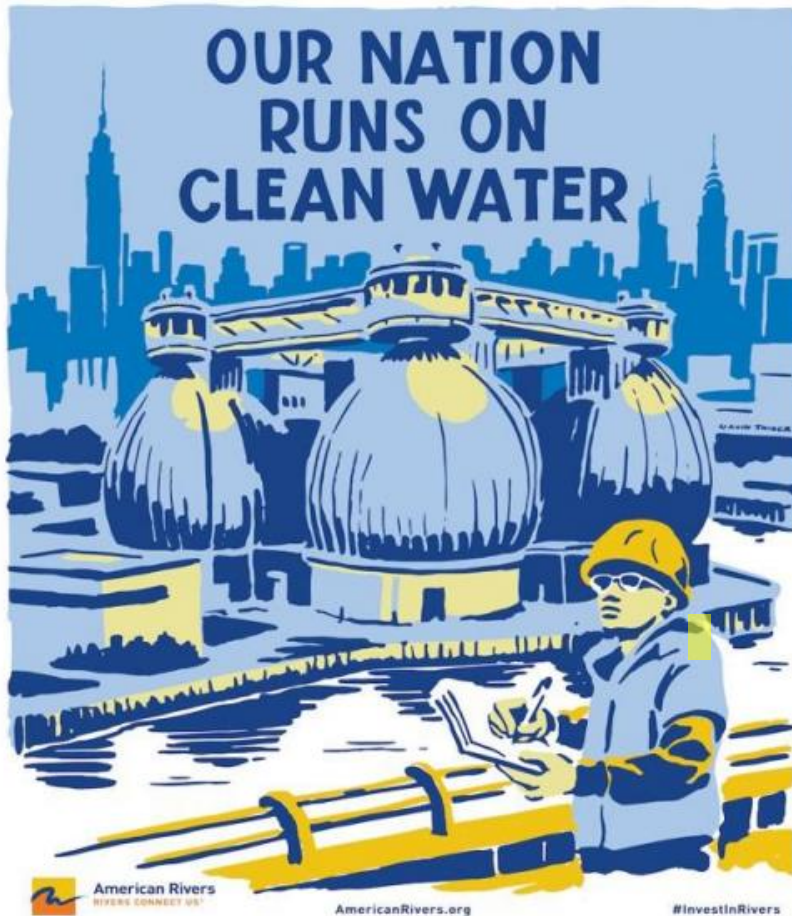
- Delaware's Office of Drinking Water for new drinking water regulations
- Me (DWSRF) program administrator for process
- Engineer for community water system for assistance in application process
- Drinking Water Operators for further understanding of plans

Prepare

- Drinking Water Capital Improvement Plans
- Drinking Water Asset Management Plans
- To understand new Lead and Copper Rule Revisions
- To understand new emerging contaminants – PFAs, etc.

This effort is a marathon, not a sprint.

Infrastructure Investment and Jobs Act Clean Water SRF



Investing in Natural Infrastructure

- 10% Green Project Reserve
- Principal forgiveness and sponsorship
- Community and planning grants and technical assistance



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Asset Management Steps



Asset Management: A Handbook for Small Water Systems

One of the Simple Tools for Effective
Performance (STEP) Guide Series



Asset Management: A Handbook for Small Water Systems

*Worksheets provided *

https://www.vdh.virginia.gov/content/uploads/sites/14/2016/04/AM_STEP.pdf

Integrated Asset Management Framework: Combining Green and Gray Assets

- Introduction
- Level of Service
- Current State of the Assets
- Criticality
- Life Cycle Costing
- Long-Term Funding
- Energy Management

Green Asset Resource DB
Acknowledgements

Search

Integrated Asset Management Framework:
Combining Green and Gray Assets

SOUTHWEST ENVIRONMENTAL FINANCE CENTER

spring point

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Integrated Asset Management

<https://swefc.unm.edu/iamf/>



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Asset Management Steps

- Define asset unit and “count” the assets (inventory)
- Systems or categorization of assets
- State or condition of the assets
- Level of Service
- Criticality
- Life Cycle Costing
- Long-Term Funding



<https://www.wsp.com/en-CA/services/asset-management-for-water>



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Why Use Asset Management?

EXTERNAL FORCES

- Regulatory compliance
- Growth and demand
- Public and elected officials

ASSET AGE AND CONDITION

- Aging and deteriorating infrastructure
- Justification for capital and O&M needs

SERVICE LEVELS

- Demand for improved reliability
- Prevention of catastrophic asset failures
- Response to resiliency and climate change

COST EFFICIENCY

- Do “more with less” through optimized decisions
- Move towards a “businesslike” culture

<https://www.wsp.com/en-CA/services/asset-management-for-water>



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Why Use Asset Management?

- Current state and future needs
- Proactive rehabilitation and replacement
- Probability and consequence of failure
- Manage high-risk assets
- Minimize the life-cycle cost
- Develop a systematic methodology for prioritizing work and budget
- Be transparent by involving the City Council and the Public in the development of the asset management program and the associated decisions

<https://www.chulavistaca.gov/home/showdocument?id=12382>



Are Assets only Built or Engineered Systems?

Why or Why not?



What are the Steps?

- Inventory and categorization - wells to meters...Green infrastructure?
- Condition –status, maintenance, records, useful life, staff input
- Level of Service – meet regulations, provide PSI through distribution, complaint monitoring, quality monitoring



GSI Asset management toolkit

<https://giexchange.org/wp-content/uploads/2021/12/GSI-AM-Resources-Toolkit-Final-Dec-17.pdf#page=43>



Image from <https://www.vdh.virginia.gov/>



What are the Steps?

- Criticality – measure of risk associated with asset, probability of failure and the consequence of failure
- Life Cycle Costing - total capital, operating, and maintenance costs of an asset over its operating life
- Long-Term Funding – sources exist to handle the capital, operations and maintenance



<https://swefc.unm.edu/iamf/life-cycle-costing/>



GSI Asset Inventory Example

Field	Description
Asset ID	Unique identifier for the assets
Location	The physical location of the asset. (e.g., coordinates, intersection, or street address)
Quantity	The amount of the asset (e.g., length, volume, size, area)
Year Installed	The year the asset was installed or acquired
Ownership	Who owns the asset
Management Responsibility	Who is responsible for the asset
Age	The current age of the asset
Unit Replacement Cost	Cost per unit of the asset
Replacement Value	The current replacement value of the asset
Expected Useful Life	Theoretical useful life of the asset
Remaining Useful Life	Estimated remaining useful life of the asset
Condition Rating	A rating of the asset's condition

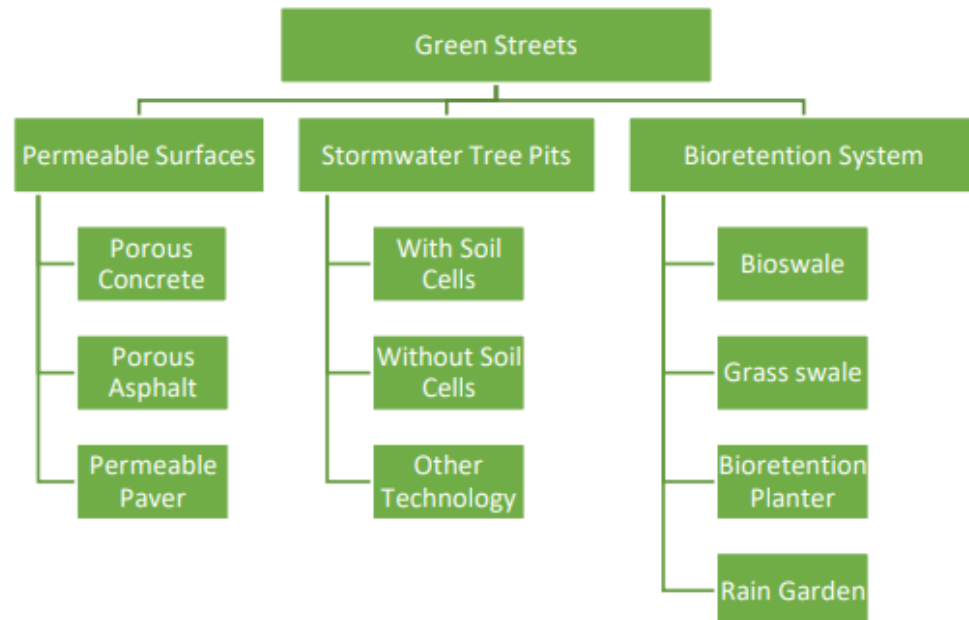


Figure 3 City of Toronto Green Streets GSI Asset Hierarchy (Source: City of Toronto)

Natural Assets



PROJECT NO.
4727

Asset Management Framework for Forested and Natural Assets



Natural Assets

Because managing natural assets may be an entirely new endeavor for water utilities, it will be beneficial to start with a simplified implementation of AM methods called a reconnaissance-level implementation. For traditional AM with built assets, this is sometimes referred to as desk-top assessment. In other contexts, it may be described as a screening-level approach. The key is that it is a simplified version of the AM methods that sets a foundation for full implementation later.

“There is widespread recognition that natural assets provide highly valuable services to water sector utilities and the communities they serve. There also is broad appreciation that active engagement by utilities is needed to ensure the services provided by those natural assets upon which utilities rely are preserved or enhanced.” (p.34)

Raleigh, NC Example

- City of Raleigh Public Utilities Department (CORPUD), North Carolina, draws and treats water from Falls Lake to provide potable water to its 600,000 customers.
- Development pressures – how to protect water quality of the lake?
- Nutrient Reduction Fee, then replaced with volumetric fee for new development.
- Revenue dedicated to land trust partnership and other nonprofits to invest in natural assets that protect water quality.

City of Newark, De Example

“The Brandywine-Christina Revolving Water Fund aims to drive regulatory-driven municipal stormwater and drinking water utility investments toward agricultural restoration projects and to ...create a self-sustaining, revolving fund structure.”



Water Funds Toolbox <https://waterfundstoolbox.org/regions/north-america/brandywine-christina-healthy-water-fund>



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Why take this approach?



“By helping GASB clarify the use of one of its standards – a clarification that was recently published in GASB’s 2018 Implementation Guide – we opened a way for state and local agencies to count natural capital as assets. This change will allow agencies to unlock the financing needed to scale up installations of green infrastructure as well as conservation and restoration projects that can save utilities money while also improving community health and resilience.”

<https://www.eartheconomics.org/gasb62>



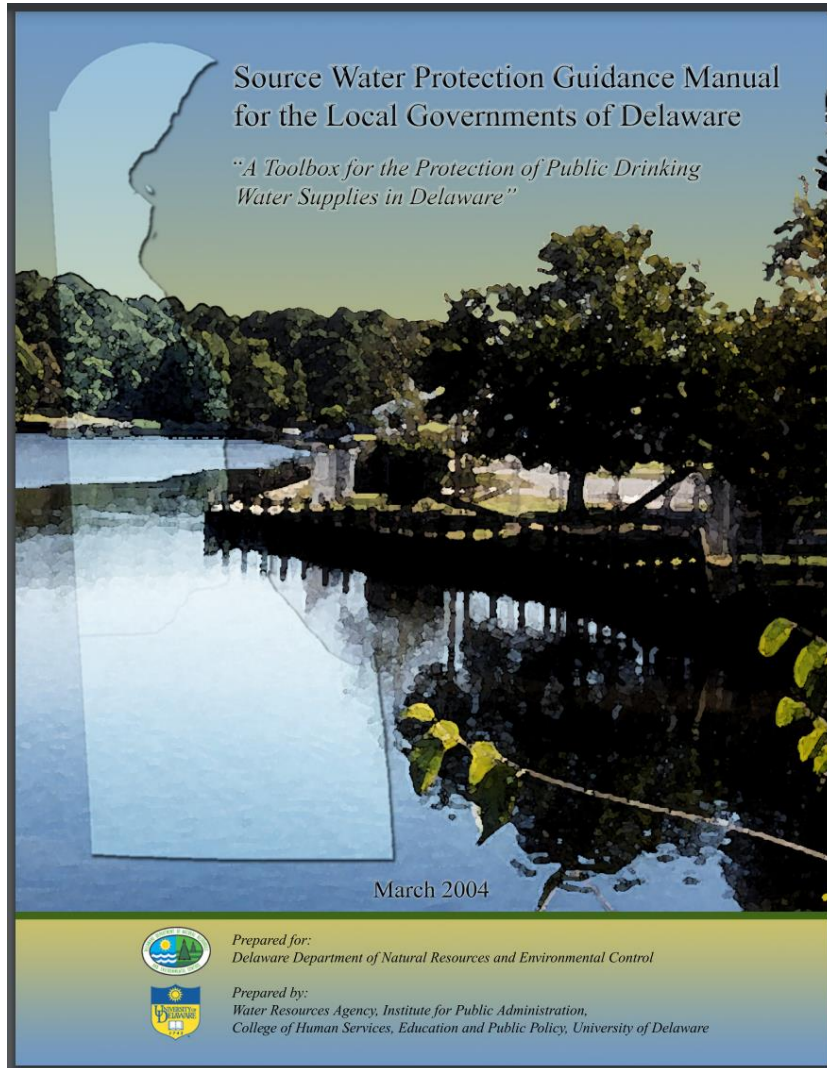
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Questions

- Do you see how this approach could be used for your organization/municipality?
- Who else should be at the table to build green or natural assets into your program?
- Do you have something like this already – but do not formally call it “natural asset management”?



What is Source Water Protection?



- The “Wise use of land around public drinking wells. The goal of SWP is to protect ground water used for drinking water from contamination.”
- *Source Water Protection Guidance Manual for the Local Governments of Delaware, March 2004*



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The Delaware SWP Program

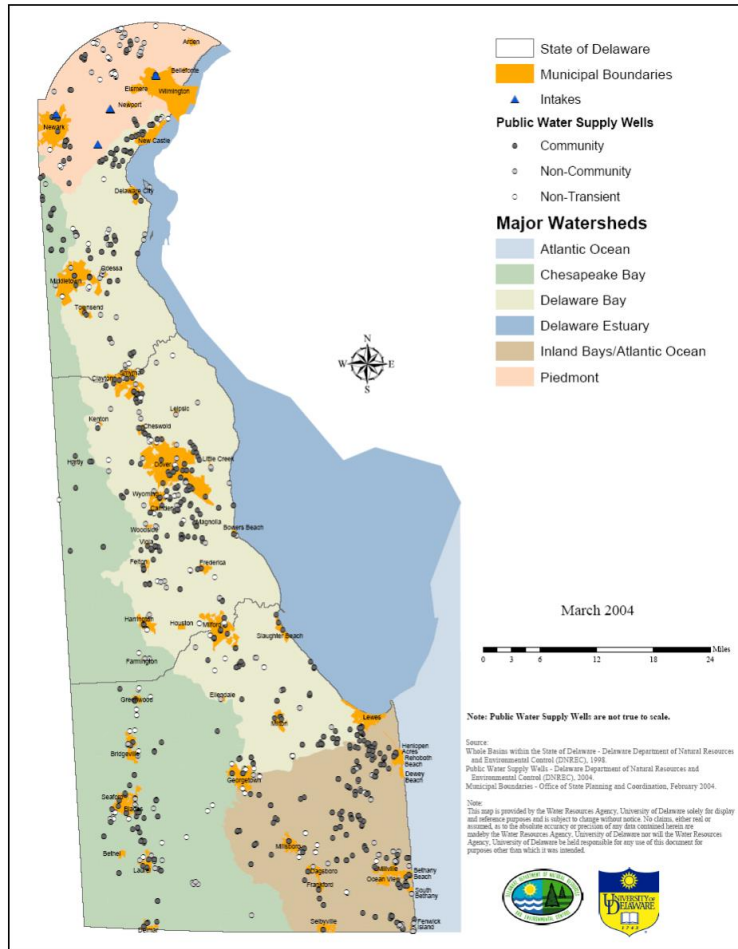
- Federal Safe Drinking Water Act (SDWA)
 - Amended in 1996 to include source water protection
 - All states must develop plans for the evaluation of drinking water supply sources
- Delaware Source Water Protection Law (2001)
 - Senate Bill 119
 - Areas with year-round populations of 2,000+ must develop maps delineating source water assessment, wellhead protection, and excellent ground-water recharge areas
 - Regulates land use within these areas
- Water Resource Protection Area (WRPA) zoning ordinances
 - Limit amounts of impervious cover

<https://delawaresourcewater.org/>



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Drinking Water in DE



- 67% of Delawareans get their drinking water from groundwater
- 100% of residents in Kent and Sussex County rely on groundwater as their sole source
- Contaminated ground water is difficult and expensive to clean up



Best Management Practices (BMPs)

- The *Source Water Protection Guidance Manual* provides draft ordinances, statewide mapping, and recommended Best Management Practices (BMPs) for common land uses:

Residential	Combined Urban	Commercial
Recreation	Cropland	Extraction
Highways / Parking Lots	Industrial	Forest Land
Transportation	Confined Animal Feeding Operations (CAFOs)	Water / Wetlands

- Practices are broken into 5 categories:
 - Land Use Tools, Sediment & Stormwater Control BMPs, Urban/Suburban BMPs, Agricultural BMPs, and Non-regulatory tools



Land Use Tools

- Zoning Ordinance Examples
 - *Buffer and setback zoning** – designate areas of land along the edges of streams, rivers, or reservoirs upstream of community water supply intakes that must remain vegetated.
 - *Critical area zoning* – used to protect highly vulnerable portions of the SWPA by imposing restrictions and limiting the types of activities allowed.
 - *Overlay districts* – used to identify and set additional protective measures for sensitive/priority areas by establishing additional zoning restrictions in addition to the underlying zoning.



Land Use Tools Continued

- Building Code Examples
 - *Excavation, grading, and seeding codes* – regulate the amount and quality of surface runoff that leaves a site during and after construction
 - *Impervious surface codes* – control the proportion of a building site that can be covered by impervious surface without capturing/treating runoff
 - *Porous pavement codes* – require the use of specific permeable materials for streets, driveways, sidewalks, etc. in order to increase infiltration and treatment of runoff



Source Water Protection BMPs

- Sediment & Stormwater Control BMPs
 - New development in all SWRPAs must comply with the Delaware Standards for Erosion and Sediment Control
- *Urban/Suburban BMPs
 - Green technology BMPs
 - Stormwater wetland areas
 - Wet ponds
- *Agricultural BMPs



Urban/Suburban BMPs

- Can remove up to 99% of the pollutants entering water bodies.
- Green Technology BMPs
 - *Bioretention
 - Infiltration basins
 - Infiltration trenches & dry wells
 - *Porous pavement
- Stormwater Wetlands
- Wet Ponds
- All must be designed, constructed, and maintained according to specific criteria



Operation & Maintenance

- Must be inspected regularly to ensure infiltration is occurring
- Periodic mowing
- Removal of sediment deposits
- Routine mulching
- Plant replacement



Advantages of Infiltration BMPs

- Are often the most cost-effective approach
- Can often be installed under impervious surfaces or fit into small spaces such as parking lot islands, around buildings and parking lots, or on residential properties
- Increase infiltration, mimic natural hydrology, and decrease flooding
- Can be used to address issues in highly developed areas
- Planted practices can improve aesthetics, increase habitat, and provide shade
- Relatively simple maintenance



Disadvantages of Infiltration BMPs

- Can only be used where soils are permeable (must drain within 48 hours)
- Can be clogged by sediment buildup
- Require regular maintenance



Bioretention

- Use plants and soils to remove pollutants
- Reduce quantity of and slow down runoff
- Allow water to infiltrate into the ground to facilitate recharge
- Installed on top of specialized soils and rock
- Can be designed to look like any typical garden





Porous Pavement

- Allow water to infiltrate and pass through a rock underlay before infiltrating into the ground
- Many types of systems including pavers and concrete
- Can be used for sidewalks, driveways, roads, etc.





Photo Courtesy of District Department of Energy & Environment

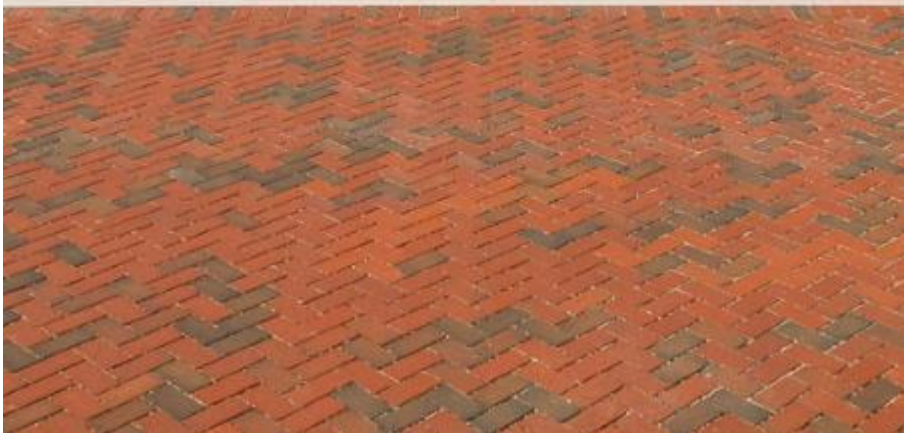


Photo Courtesy of Chesapeake Bay Program

Photo Courtesy of Chesapeake Bay Program

Agricultural BMPs

- 53 agricultural BMPs, 7 categories
 - *Feed/litter
 - Manure Storage
 - Animal Mortality Handling
 - Soil Analysis & Testing
 - Nutrient Application Equipment Calibration
 - *Residue Management
 - *Buffer Strips
- <https://agriculture.delaware.gov/nutrient-management/publications-resources/>





Photo Courtesy of Chesapeake Bay Program



Photos Courtesy of James River Association



Non-regulatory Water Resource Protection

- Conservation and Reuse
- Emergency Response Planning
- Land Acquisition
- Pollution Prevention
- Public Education & Awareness
- Site Restoration (stream restoration)



Funding for SWP Projects

- EPA Source Water Protection Program
 - <https://www.epa.gov/sourcewaterprotection>
- Two funds
 - Loans for voluntary, incentive-based measures including ag resource management planning and industrial source water management plans/ordinances
 - Loans for acquiring land and conservation easements for source water protection
 - <https://delawaresourcewater.org/swloanfund/>



Potential Project Partners

- Conservation Districts
- The Nature Conservancy
- Partnership for Delaware Estuary
- Delaware Center for the Inland Bays
- American Rivers
- Small Watershed and Restoration groups
 - Brandywine Red Clay Alliance
 - White Clay Watershed Association



Questions?

Contact Us

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