Bioswale

Overview

- Bioswales are vegetated, landscaped depressions created to collect, treat, and infiltrate stormwater runoff.
- Bioswales are usually designed to be large enough to handle the first flush, or the initial surge of water during a storm event. Since the first flush generally contains the most pollutants, the bioswales are designed to remove these pollutants before they can enter water bodies downstream.
- Bioswales decrease the amount of peak stormwater runoff and decrease flood levels.
- Bioswales can be constructed within medians, cul-de-sacs, bulb outs, and other public spaces.
- Bioswales are aesthetically pleasing and can provide habitat for pollinators.
- They can be used instead of conventional stormwater management practices such as underground piping and storm gutters.
- Small property bioswales are 5% cheaper over the total lifecycle of the infrastructure than conventional stormwater management techniques, such as underground piping systems. Additionally, they can save over $8,000 in construction costs when installed with a new structure.

Design Considerations:

- Costs will vary depending on the size, plant species, and site conditions.
- Always plant deep-rooted native plants.
- A green infrastructure contractor and design engineer are essential to ensure that the bioswale can handle at least a 10-year storm.

Key Takeaways

During storm events, water may pool in yards, flood roads, or flood structures.

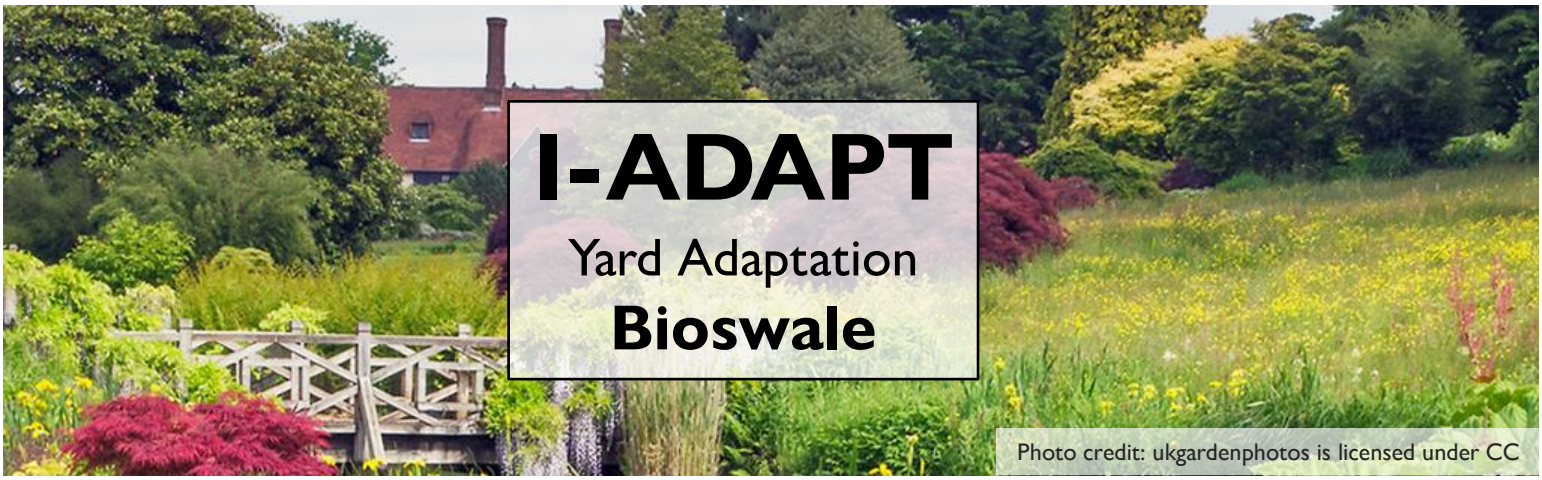
Flooding can cause extensive damage to the interior and exterior of structures. Pools of water can ruin landscaping and provide breeding grounds for mosquitos.

To help avoid flood damage costs, install a bioswale to filter and absorb stormwater.

Estimated Costs/Benefits

*U.S. dollars (2022), estimates are subject to change

Potential Costs		**Potential Benefits**		
Item	*Estimate*	*Post-Flood Recovery Actions*	*Estimate*	
Bioswale	$58 per linear foot	Flood damage recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 inch water ↓ 1 foot water	$10,800-$53,500+ ↓ $29,400-$143,500+
		Mosquito control	$400-$600 per treatment	
		Remove standing water	$1,300-$5,000	
ESTIMATED TOTAL COST **9-16 feet wide, 26 feet long**	**$1,500+**	**ESTIMATED TOTAL SAVINGS**	**$12,500-$149,100+**	



I-ADAPT

Yard Adaptation

Bioswale

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Potential Funding Sources

- Delaware Water Pollution Control Revolving Fund

Expected Maintenance

- Periodic inspection of the bioswale for damage and disease.
- Re-seeding and weeding as necessary.
- Periodic cutting or mowing of vegetation.
- Remove debris as needed.
- Do not fertilize the bioswale.

Additional Resources

- Clemson Cooperative Extension: An Introduction to Bioswales
- Economic Value of Stormwater in Delaware
- National Association of City Transportation Officials: Bioswales
- Rutgers: Planning, Design, and Construction of Green Infrastructure

Resources can also be found at https://de.gov/iadapt

Additional Actions

- When installing a bioswale, plant native deep-rooted species.
- Ensure that the bioswale will direct the flow of excess stormwater away from the structure so that it does not cause flooding.
- Ensure that the lawn is graded so that excess stormwater flows away from the structure.

Permitting Agencies

Contacts for permitting requirements include but are not limited to the following:

- Your city and/or county government for local flood ordinances or regulations
- Your city and/or county government for building permits

Who to Contact

- Geotechnical engineer
- Green infrastructure contractor
- 811 Call Before You Dig

Technical definitions and more information are located on the I-ADAPT website: https://de.gov/iadapt.

For more information, contact DNREC's Division of Climate, Coastal and Energy at DNREC_IADAPT@Delaware.gov