

Stormwater Management

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What is stormwater?



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Why care about stormwater?

- Excess stormwater and flooding
- Poor water quality
- Regulations
- Benefits and costs

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Stormwater management issues for sports turf managers

- Regulations for new facilities
- Regulations for expansion or renovation of facilities
- Management of existing facilities
- How turfgrass is viewed by stormwater managers
- Stormwater utilities
- Use of stormwater

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Management of stormwater quantity

Primary purpose: prevent flooding

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Flooding from excess stormwater...



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Impervious and pervious surfaces



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Stormwater quality



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Nonpoint source pollution



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Management of stormwater quality

Driven by:

- Concern for the environment and
- Regulatory requirements (Clean Water Act)

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Historical approaches to stormwater management

- Conveyance – Get the water away!
- Detention – Don't cause flooding
- Water quality – clean up polluted runoff
- Infiltration – groundwater recharge, maintain the natural water budget

Adapted from "Stormwater Paradigms," Andy Reese, *Stormwater Magazine*, July/August 2001

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Conveyance



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“Dry” detention ponds for flood prevention



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“Wet” detention ponds



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Stormwater management and traditional drainage concepts



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Infiltration of stormwater

Infiltration basins, rain gardens, swales, etc.

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Porous pavement



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Bioretention / biofiltration



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Other current / new approaches in stormwater management

- Underground treatment units
- Rain barrels and cisterns
- Street sweeping
- Nutrient management
- Source control
- Public education
- IPM

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Regulatory requirements

- Most stormwater management is driven by regulatory requirements, not by voluntary measures
- Often a size threshold
- Regulations may be triggered by addition of impervious area

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Quantity and quality requirements

- Manage stormwater quantity and/or quality; usually both
- Stormwater quantity / flood prevention – manage the very heavy, infrequent events – the “10-year flood,” “100-year flood”
- Stormwater quality / pollution – manage the much more common small and medium rain events

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“New” development

- Brand-new facilities
- Expansion
- Redevelopment / renovation



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Key question: Is turf treated as a high-runoff or low-runoff surface by regulators?

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Will a new field or park require stormwater management?

- If all or most of project will be natural turf, sports turf managers may be able to make the case that turf will cause little to no additional runoff vs. existing conditions, or may even reduce runoff vs. prior land surface
- Still consider post-construction management of runoff quality (nutrient management, etc.)

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Stormwater management for existing facilities

- Probably not causing any new problems, but changes may be driven by regulation, public/political pressure, or voluntary interest
- Retrofits – physical changes to site/infrastructure
- Operations / maintenance
- Nutrient management
- Pest management

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Multi-use concepts

- Use of athletic fields and park areas for stormwater detention



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What do stormwater managers think of turfgrass?

- There is perhaps a recent trend in stormwater management to view turfgrass as a problem or a negative
- “Natural” or “native” vegetation, such as prairie in the Midwest, is perceived as much better
- But is this supported by science and empirical data?

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Infiltration / runoff characteristics of turfgrass

- Runoff from turf areas is highly variable, depending on many factors such as rainfall patterns, turf condition, surface slope, soil texture, soil moisture, soil compaction, presence of subsurface drainage, etc.

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Most common runoff model is Soil Conservation Service (SCS) “curve number” model

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Curve numbers for open space: “lawns, parks, golf courses, cemeteries, etc.”

The fine print says: “Curve numbers shown are equivalent to those of pasture.”

(Table 2-2a, Runoff curve numbers for urban areas, *Urban Hydrology for Small Watersheds: TR-55*, Natural Resources Conservation Service, 1986/1999)

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Stormwater utilities

- User fee, utility charge or tax paid for stormwater management
- Fee should be based on amount of stormwater runoff the property generates
- Often rate is based on impervious area

Looking to reduce your stormwater utility charge? Look into the utility’s credit policy

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Beneficial use of stormwater

- Use of stormwater for irrigation
- Consider pond water quality – stormwater ponds are designed to trap pollutants
- Water budgeting
- Water rights issues



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Thank you

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