CE 3372 WATER SYSTEMS DESIGN

LESSON 24 GREEN INFRASTRUCTURE FALL 2020

GREEN INFRASTRUCTURE (GI)

- Definition: Section 502 of the Clean Water Act defines green infrastructure as "...the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters."
- Purpose: Conventional stormwater infrastructure, piped drainage and water treatment systems, is designed to move urban stormwater away from the built environment in contrast to green infrastructure (GI) that reduces and treats stormwater at its source while delivering environmental, social, and economic benefits.

COMPONENTS

- Downspout Disconnection
- Rainwater Harvesting
- Rain Gardens
- Planter Boxes
- Bioswales
- Permeable Pavements
- Green Streets and Alleys
- Green Parking
- Green Roofs
- Urban Tree Canopy
- Land Conservation

GREEN INFRASTRUCTURE AND URBAN STORMWATER IMPACTS

- Large areas of connected impervious cover and changes in land use dramatically increase the volume and rate of stormwater discharge
  - increased pollutant delivery
  - Increased flooding, and erosion
  - Decreased groundwater recharge.

HOW IMPLEMENTED?

- Design of various GI components reasonably straightforward
- Prediction of performance ?
  - Guess based on reports/databases
  - Screening tools (large scale estimates)
  - Modeling (SWMM and related tools)

GREEN INFRASTRUCTURE AND URBAN STORMWATER IMPACTS - REPORTS

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GREEN INFRASTRUCTURE AND URBAN STORMWATER IMPACTS - DATABASES

- https://www.bmpdatabase.org/performance-summaries.html
- http://www.stormwaterok.net/CWP%20Documents/CWP-07%20Natl%20Pollutant%20Removal%20Perform%20Database.pdf

GREEN INFRASTRUCTURE AND URBAN STORMWATER IMPACTS - SCREENING TOOLS

- http://greenvalues.cnt.org/national/calculator.php
- https://www.epa.gov/water-research/national-stormwater-calculator

AVAILABLE (SWMM) MODELING COMPONENTS

- Rain Gardens
- Bioretention Cells (or Bioswales)
- Vegetative Swales
- Infiltration Trenches
- Green Roofs
- Rooftop (Downspout) Disconnection
- Rain Barrels or Cisterns (Rainwater Harvesting)
- Continuous Permeable Pavement Systems

EXAMPLES (FROM NCIMM)

- Go to share swmm
  - Go to ncimm database