The National Stormwater Calculator

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Outline

- Introduction to the National Stormwater Calculator

https://www.epa.gov/water-research/national-stormwater-calculator

- Demo→ Please navigate to the link in the chat!

- Discussion, Ideas, Future Collaborations

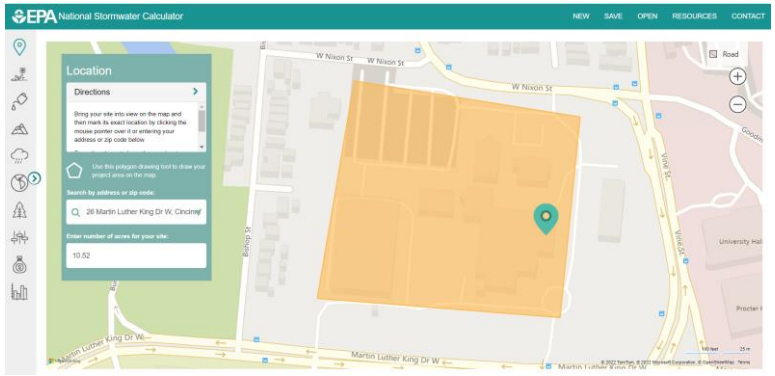
Introduction: EPA's National Stormwater Calculator (SWC)

What does it do?

- On-site estimation of runoff
- Provides access to national data sets
- Provides cost estimates for low-impact development (LID) controls
- Provides historical or future climate scenarios for runoff estimation

How does it work?

- Uses SWMM as its hydrologic/hydraulic model
- Considers soil properties, slope, land cover, and LID controls

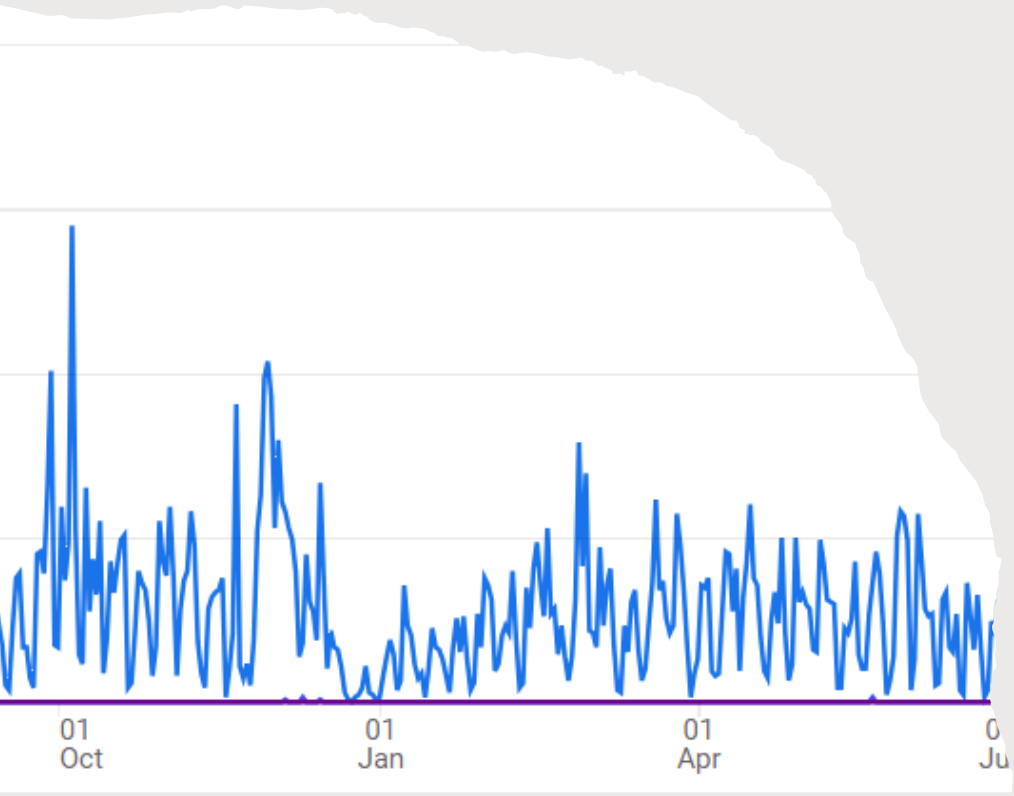


https://swcweb.epa.gov/stormwatercalculator/

Green Stormwater Infrastructure (GSI)-related tools in order of decreasing sophistication

- Very sophisticated, requires lots of education
  - SWMM – dynamic hydrological/hydraulic model
  - VELMA – Water quality tool
  - GIFMod- evaluating performance of GSI with hydraulics, particle transport, and constituent fate and transport
- Medium sophistication, requires training
  - CLASIC – larger scale, provides life cycle cost frame work for green, hybrid green-gray, and gray infrastructure with decision analysis that uses SWMM
- Simple, accessible
  - EPA's National Stormwater Calculator

Introduction: EPA's National Stormwater Calculator (SWC)



Who is using the tool?

- Engineers screening a site for runoff estimates
- LEED for certification
- Individuals, cities, groups, and more for grant applications for green infrastructure
- Landscapers, urban planners, homeowners and more.

How many people are using the tool?

- 186k site visits from August 18, 2023, to August 18, 2024
- Of that only ~500 were people logged in with EPA account

Introduction: SWC Components

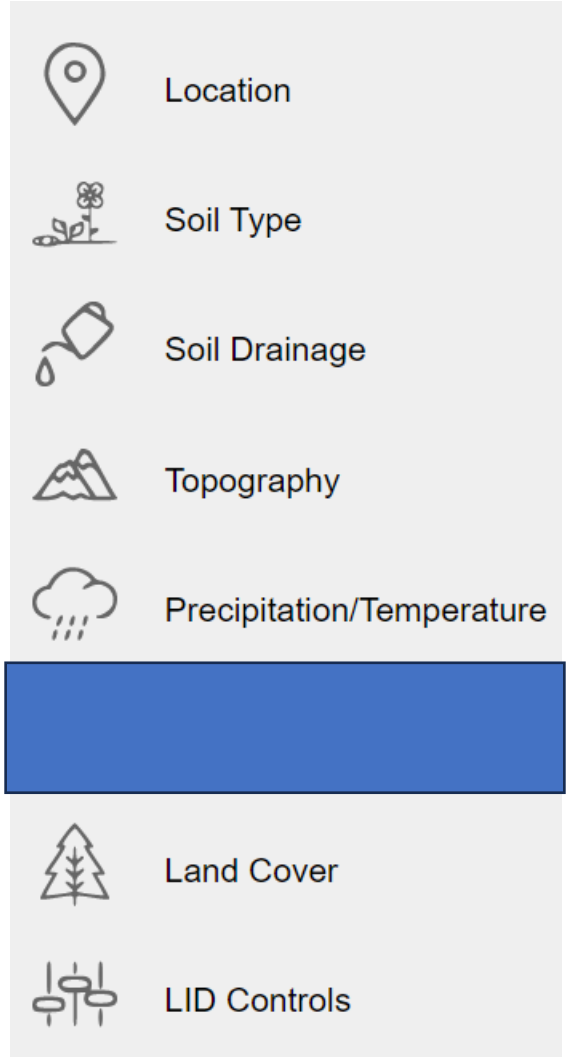
Soil (data layer available from SSURGO soil survey)
- Type
- Drainage

Topography

Precipitation and temperature (recently updated historical precipitation, temperature, and evaporation data)
- From NOAA, LDAS

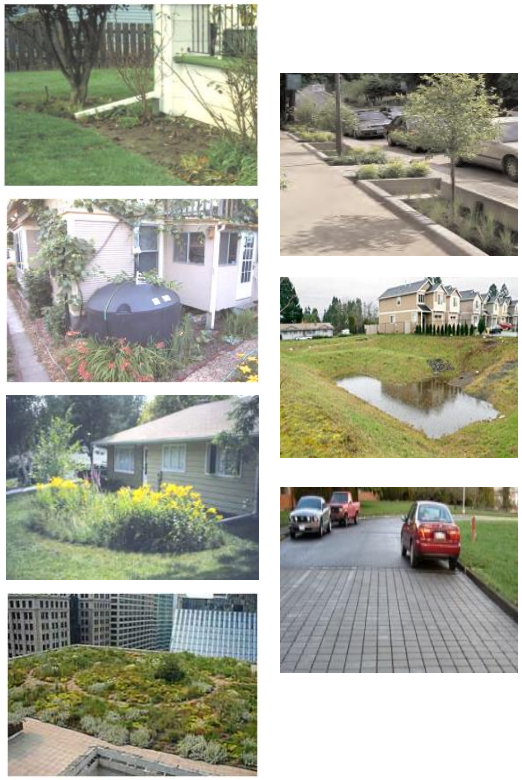
Land Cover
- Forest
- Meadow
- Lawn
- Desert
- Impervious

Low Impact Development Controls



Introduction: SWC Low Impact Development (LID) controls

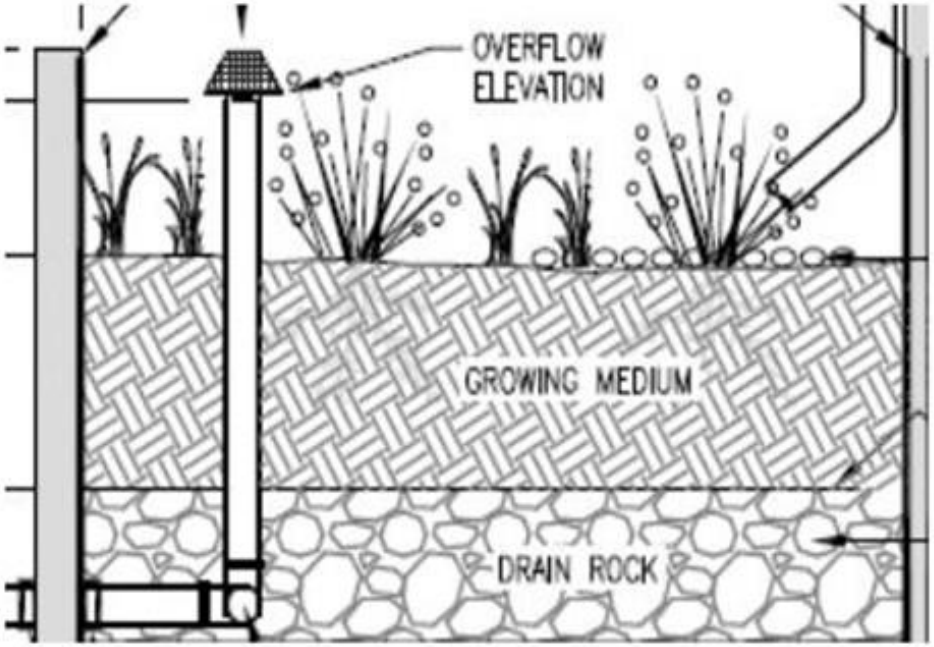
- Low impact development controls
  - Low Impact Development (LID) controls are green infrastructure and landscaping practices designed to collect runoff from impervious surfaces and retain it on site
  - Included in the SWC are
    - Disconnection
    - Rain Harvesting
    - Rain Gardens
    - Green Roofs
    - Street Planters
    - Infiltration Basins

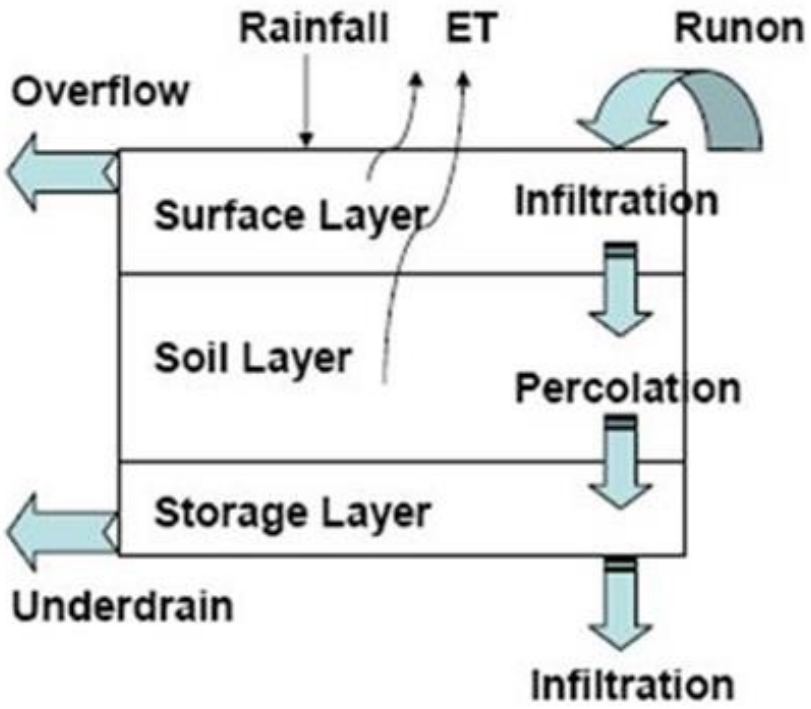


Introduction: Understanding how the SWC works

- Uses SWMM 5 (EPA, 2010) as its computational engine
- SWMM 5 Addresses
  - Surface runoff
  - Infiltration
  - Groundwater
  - Snowmelt
  - Stormwater detention
  - Full dynamic wave flow routing with any configuration of open and closed channels
- SWC only carries out its hydrology calculations from runoff, infiltration, and LID sub-models for on-site scenarios
  - Other parameter values: site area, width of the outflow face, slope, percent impervious, depression storage depth (varies by land cover), roughness coefficient (varies by land cover), percent of impervious area without depression storage

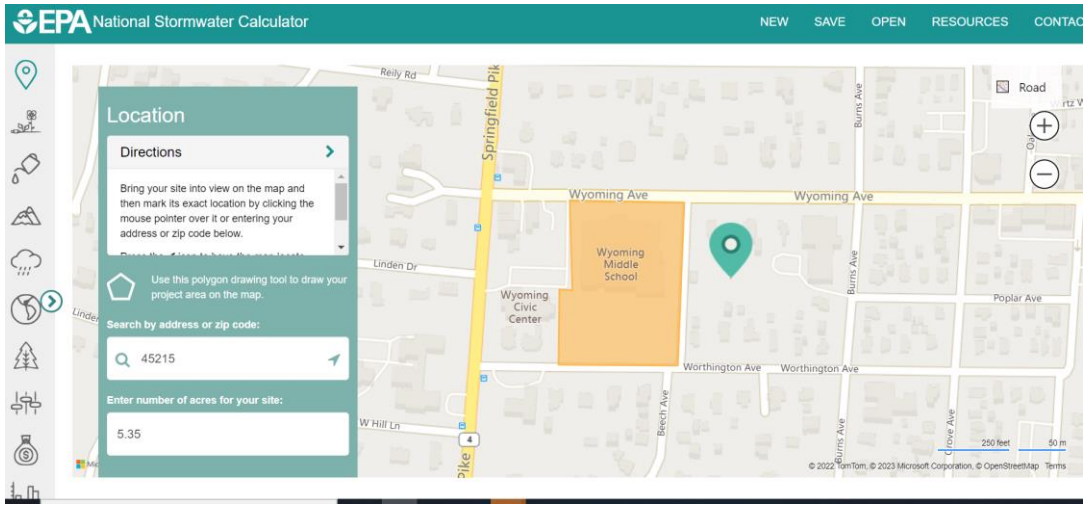
Consider a street planter (i.e., a kind of bio-retention cell)





Demonstration

1. Navigate to https://swcweb.epa.gov/stormwatercalculator/
2. Name your site
3. Enter in an address or zip code and press enter
4. Locate your site on the map and use the polygon drawing tool to draw your project area



Thank you!

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