



Modeling tools can inform planning and design decisions on a range of scales from sizing green infrastructure controls such as a cisterns for a single site to developing green infrastructure scenarios for an entire watershed.

Green Infrastructure Models and Calculators

[Links to Models and Calculators](#)

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This supplement supports Factsheet 2 in the Green Infrastructure Permitting and Enforcement Series: Combined Sewer Overflows

Integrating Green Infrastructure Concepts into Permitting, Enforcement, and Water Quality Standards Actions

This supplement is a companion to the U.S. EPA Green Infrastructure Permitting and Enforcement Series (http://water.epa.gov/infrastructure/greeninfrastructure/gi_regulatory.cfm#permittingseries).

This series describes how EPA and state permitting and enforcement professionals can incorporate green infrastructure practices and approaches into National Pollutant Discharge Elimination System (NPDES) wet weather programs, including stormwater permits, Total Maximum Daily Loads (TMDLs), combined sewer overflow (CSO) long-term control plans (LTCPs), and enforcement actions. This series builds upon EPA's continued investment in green infrastructure and low impact development. Existing EPA authority, guidance, and agreements enable EPA Regions and state agencies to work with permittees to include green infrastructure measures as part of control programs.

For additional resources on green infrastructure, go to the EPA Green Infrastructure Web page: <http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm>.

Key green infrastructure guidance issued to date can be found at: http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm.

Depending on their structure, modeling tools can be used to inform a variety of green infrastructure planning and design decisions: from setting a green infrastructure target for an entire watershed, to designing a green infrastructure practice for a particular site. Outputs that are particularly important in informing green infrastructure planning and design include runoff volume, runoff rate, pollutant loading, cost, and other environmental benefits. This supplement provides links to a series of models that can be used to predict the performance and/or cost of green infrastructure approaches. The table also identifies the model owner, model price, and model outputs.

Table 1: Models and Calculators that Can Incorporate Green Infrastructure Control Measures

Model/Calculator	Owner
Bioretention, Permeable Pavement, Green Roof, and Rainwater Harvesting Models	NC State Cooperative Extension
Delaware Urban Runoff Management Model (DURMM)	Delaware Department of Natural Resources & Environmental Control
Green LTCP-EZ	EPA
Green Save Calculator	Green Roofs for Healthy Cities
Green Values National Stormwater Management Calculator	Center for Neighborhood Technology
Hydrologic Modeling System (HEC-HMS)	US ACE
Hydrological Simulation Program – Fortran (HSPF)	USGS
i-Tree	USDA Forest Service
LID Quicksheet	Milwaukee Metropolitan Sewerage District
Long-Term Hydrologic Impact Assessment Model	Local Government Environmental Assistance Network
Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds (P8)	William Walker
RECARGA	University of Wisconsin – Madison, CEE Dept.
Site Evaluation Tool (SET)	Tetra Tech
Source Loading and Management Model (WinSLAMM)	PV & Associates
Stormulator	State Water Resources Control Board, UC Davis Extension, and the California Sea Grant Program
Stormwater Management Model (SWMM)	EPA
Watershed Treatment Model	Center for Watershed Protection
WinTR-55	Natural Resources Conservation Service

MORE INFORMATION ON GREEN INFRASTRUCTURE MODELING TOOLS CAN BE FOUND AT:

http://water.epa.gov/infrastructure/greeninfrastructure/gi_modelingtools.cfm

Freely Available?	Runoff Volume	Runoff Rate	Cost	Pollutant Loading	Environmental Benefits	More information
Yes, downloadable	•					http://www.bae.ncsu.edu/stormwater/downloads.htm
Yes, downloadable	•	•		•		http://www.dnrec.state.de.us/dnrec2000/Divisions/Soil/Stormwater/New/DURMM%20Release%201.0.xls (Spreadsheet) http://www.dnrec.state.de.us/dnrec2000/Divisions/Soil/Stormwater/New/DURMM_UsersManual_01-04.pdf (User's Manual)
Yes, downloadable	•	•	•			http://www.epa.gov/npdes/pubs/final_form_green_ltcpez.xls (Spreadsheet) http://www.epa.gov/npdes/pubs/final_green_ltcpez_instructionswithpoecacomment.pdf (Manual)
No, members only	•		•		•	http://lcc.greenroofs.org/index.php?option=com_content&task=view&id=626&Itemid=116
Yes, web enabled	•		•		•	http://greenvalues.cnt.org/national/calculator.php
Yes, downloadable	•					http://www.hec.usace.army.mil/software/hec-hms/
Yes, downloadable	•			•		http://water.usgs.gov/software/HSPF/
Yes, downloadable			•			http://www.itreetools.org/index.php
No, available on a CD for \$25 fee	•					http://v2.mmsd.com/AssetsClient/Documents/stormwaterweb/PDFs/Appendix_L.pdf
Yes, downloadable	•			•		http://www.ecn.purdue.edu/runoff/lthia/lthia_index.htm
Yes, downloadable	•			•	•	http://www.walker.net/p8/
Yes, downloadable	•					http://dnr.wi.gov/topic/stormwater/standards/
Yes, downloadable	•		•	•		http://www.unrba.org/set/index.shtml
No, available for \$320	•			•		http://www.winslamm.com/winslamm_overview.html
Yes, downloadable	•					http://www.stormulator.com/StormUlator/Welcome.html
Yes, downloadable	•	•				http://www.epa.gov/nrmrl/wswrd/wq/models/swmm/index.htm
Yes, downloadable	•			•		http://www.cwp.org/documents/cat_view/83-watershed-treatment-model.html
Yes, downloadable	•	•				http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/alphabetical/water/hydrology/?&cid=stelprdb1042901



Green infrastructure manages stormwater at its source to protect receiving waters and the life that depends on them from contamination and habitat degradation.

Green Infrastructure Permitting and Enforcement Series

This series on integrating green infrastructure concepts into permitting, enforcement, and water quality standards actions contains six factsheets plus four supplemental materials that can be found at http://water.epa.gov/infrastructure/greeninfrastructure/gi_regulatory.cfm#permittingseries.

Factsheets

1. Potential Challenges and Accountability Considerations
2. Combined Sewer Overflows
3. Sanitary Sewer Overflows
4. Stormwater
5. Total Maximum Daily Loads
6. Water Quality Standards

Supplemental Materials

1. Consent Decrees that Include Green Infrastructure Provisions
2. Consent Decree Language Addressing Green for Grey Substitutions
3. Green Infrastructure Models and Calculators
4. Green Infrastructure in Total Maximum Daily Loads (TMDLs)



For additional resources on green infrastructure, go to the EPA Green Infrastructure Web page: <http://www.epa.gov/greeninfrastructure/>.