



PV-SMaRT Solar Farm Runoff Calculator

Version 3.1

An innovative spreadsheet-based runoff calculator to estimate stormwater runoff from ground-mounted solar photovoltaic sites for pre-construction as well as post-construction site-specific conditions.

Technology ID

2023-053

Category

Express License

Engineering & Physical

Sciences/Design Specifications

Software & IT/Simulation &

Modeling

Soil Texture		Clay Loam	***BLUE CELLS REQUIRE USER INPUT***	
Soil Depth (inches)		36	***MAROON CELLS REPRESENT TOOL OUTPUTS***	
Bulk Density (g/cm³)		1.4		
Vegetation Present		Newly Established Pollinator	Runoff Curve Number	66.0
Are Solar Panels Present?		YES	24-Hr Precip Event (inches)	10.00
Panel Width (feet)		10	Expected Runoff (inches)	5.70
Panel Spacing (feet)		25		
Array Orientation		Follows slope contours		
Percent Slope		5		
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This tool has been updated to Version 3.1!

There is a demo of the tool freely available to download on the bottom of the page.

IP Status: Copyrighted

Applications

- Estimation of stormwater runoff CN and runoff for the purposes of obtaining general construction or operating and management permits for solar PV development.

Technology Overview

A runoff curve number (CN) and runoff calculator has been developed to estimate stormwater CN and runoff at ground solar photovoltaic (PV) sites by accounting for: 1) Soil and topographic characteristics (soil texture, soil depth, soil bulk density, slope); 2) Surface cover (row crop, turf, pollinator habitat, etc); 3) Disconnected impervious surfaces associated with solar panel design (panel spacing and orientation); and 4) Climatic factors (precipitation).

Phase of Development

TRL: 8-9

Software has been developed and is ready to be used.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more. For technical inquiries, please reach out to David Mulla (mulla003@umn.edu).

Researchers

- **David Mulla** Professor, Department of Soil, Water, and Climate