Advocates for Herring Bay

Testimony of the Advocates for Herring Bay[1]
Regarding SB 931/HB 1036—Public Utilities – Generation and Siting
Submitted by Kathleen Gramp, February 26, 2025

Informational

The Advocates for Herring Bay (AHB) have an active interest in solar policy because of our dual focus on clean energy and promoting the health and sustainability of Maryland's ecological resources. We are submitting information for the record on two environmental concerns—forest and stormwater management—that are not addressed effectively by SB931/HB1036 or in current law.

Minimizing impacts on forests: Maryland lags behind states like New Jersey in mitigating the impacts of multi-acre solar arrays on forested land. For example, New Jersey's Solar Act of 2021 expressly precludes siting projects larger than 5 megawatts on designated forested lands without a waiver. Similarly, the list of surfaces eligible for New Jersey's community solar program excludes forested land. SB931/HB1036 does not address the potential impacts of solar projects on forested land.

The potential for impacts on Maryland's forests is real. A 2017 solar application would have cleared 240 acres but was disapproved based on wetlands issues. Attachment 1 shows three recent projects being built on parcels that are completely forested, including a 22-acre area that is part of Maryland's Habitat Connectivity Network. Those and other forest-related projects are in areas that experienced the greatest forest loss over the 2013-2018 period, according to a 2022 study by the Hughes Center on Agro-Ecology.[2]

Legislative options for minimizing the loss of ecologically valuable forests could include enacting provisions similar to those in SB983/HB827 regarding forest clearance,[3] adopting New Jersey's waiver approach, or directing the state to screen projects using Maryland's maps of Ecosystem Services Values.[4]

Ensuring best practices for stormwater and erosion control. Maryland's solar-specific stormwater law and guidelines were written more than a decade ago, before the state began experiencing more intense rain events stemming from climate change. They also predate research on best practices by the National Renewable Energy Laboratory (NREL), Penn State, and Virginia Tech.

Recent studies show that well-drained soils and deep-rooted vegetation under and between the panels can reduce runoff.[5] For that "green infrastructure" to be effective, stormwater estimates and strategies must account for the effects on runoff from the solar panels (which may vary in their impacts), the absorptive capacity of soils before and after construction, and the permanent groundcover at each site.[6] Attachment 2 highlights ways that soil characteristics and the absorptive capacity of ground covers could affect runoff.

Legislative options for ensuring best practices could include enacting provisions similar to those in SB983/HB827 (as amended)[7] or directing the state to update its solar-specific stormwater guidelines to incorporate best practices for estimating and managing runoff at each site, including methods that account for the effects of solar panels, soil characteristics, and ground covers on runoff. While SB931/HB1036 includes discrete directives regarding grading, mowing, herbicide applications, and bonding to ensure vegetation is maintained for the first 3 years of the project, it does not require doing the holistic analyses or using the resources shown to be effective in minimizing runoff from solar projects.

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[1] The Advocates for Herring Bay, Inc. is a community-based environmental group in Anne Arundel County.
[2] See Technical Study of Changes in Forest Cover and Tree Canopy in Maryland, November 2022.
[3] See SB 983/HB 827 as introduced, Section 7-207.4 on page 5, lines 18-24.
[4] See MD Department of Natural Resources background on Ecosystem Services Value.
[5] See Penn State University, Solar Farms with Stormwater Controls Mitigate Runoff, Erosion, July 18, 2024.
[6] See NREL's overview of the PV-SMaRT program.
[7] See bills as introduced, Section 7-207.4 on page 5, lines 25-31. It is our understanding that those provisions will be amended to clarify that the standards shall the consider effects of soil characteristics and ground covers on runoff.

Attachment 1: Examples of Solar Projects Sited on Forested Parcels

Maps of ecosystems services values are from MD DNR's Greenprint GIS

7704 Croom Rd, Upper Marlboro MD (pending PSC review)

5 megawatts

Aerial image of parcel
Pre-construction

Highest Ecosystem Services Values
Greens- $900 to $2,800/acre/year
Blues – $2,700 to $3,600+/acre/year

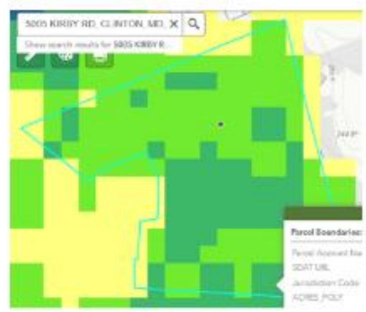
MD Habitat Connectivity Network
Shaded in green

5505 Kirby Road, Clinton, MD (in service)

1.32 megawatts

Aerial image of parcel
Pre-construction

Aerial image of parcel
Post-construction



Highest Ecosystem Services Values
Greens- $900 to $2,800/acre/year
Blues – $2,700 to $3,600+/acre/year

10711 Cross Trail Road, Brandywine, MD (in service)

0.875 megawatts

Aerial image of parcel
Pre-construction

Aerial image of parcel
Post-construction

Highest Ecosystem Services Values
Greens- $900 to $2,800/acre/year
Blues – $2,700 to $3,600+/acre/year

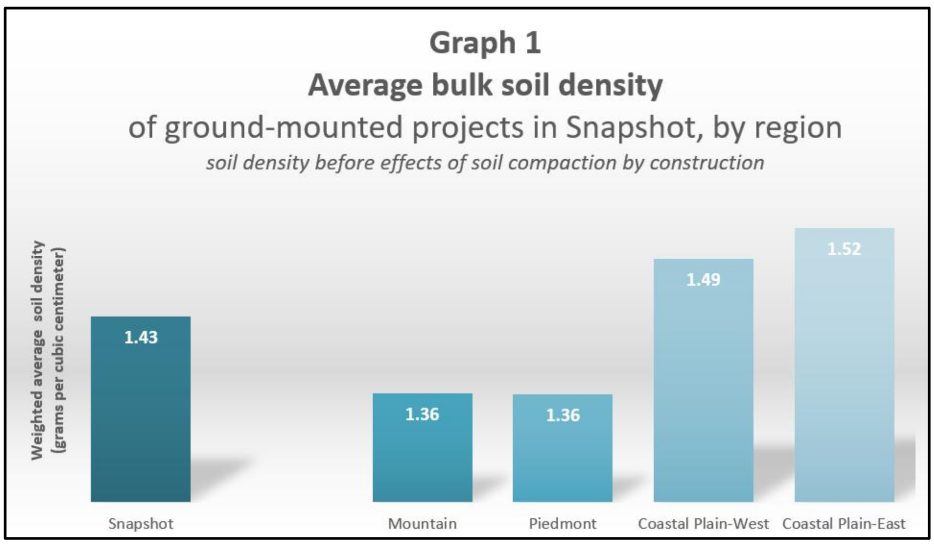
Attachment 2: Overview of Solar Stormwater Runoff Estimates and Issues

Presentations at an April 2023 conference convened by the Chesapeake Bay Program addressed some of the challenges and opportunities for managing stormwater runoff from solar arrays.[8] The conference included a review of a federally funded modelling effort known as "PV-SMaRT," which is being developed by the National Renewable Energy Lab (NREL) and the Great Plains Institute (GPI) to estimate the key drivers of runoff from solar projects.[9]

Policymakers can use the PV-SMaRT calculator to gauge how estimated runoff may differ under varied environmental conditions.[10] Key inputs to the model include the density and depth of the soil, the type of ground cover under the arrays, and rainfall in a 24-hour period. All of the data presented in this Attachment assume that solar panels have an average width of 10 feet and are installed in rows 25 feet apart.

To apply the model to conditions in Maryland, AHB developed a "snapshot" of the types of soils under existing ground-mounted solar arrays using the U.S. Department of Agriculture's (USDA's) Web Soil Survey.[11] Because of data limitations, it was not possible to account for every ground-mounted solar project in the state. However, AHB's Snapshot covers over 1,700 acres of solar arrays spread across 20 counties and may provide reasonable parameters for estimating stormwater runoff using the PV-SMaRT calculator.[12]

Graph 1 summarizes USDA's data on the weighted-average bulk density of the soils at the sites shown in the Snapshot. Because of the data limitations, this analysis aggregates the county-level results into broad geographic regions.[13] Several sites had slopes higher than 10 percent, notably those on brownfields, but all of the runoff estimates presented here assume lower slopes. USDA's data also suggest that soil depths will exceed the 60-inch metric used in the PV-SMaRT calculator.

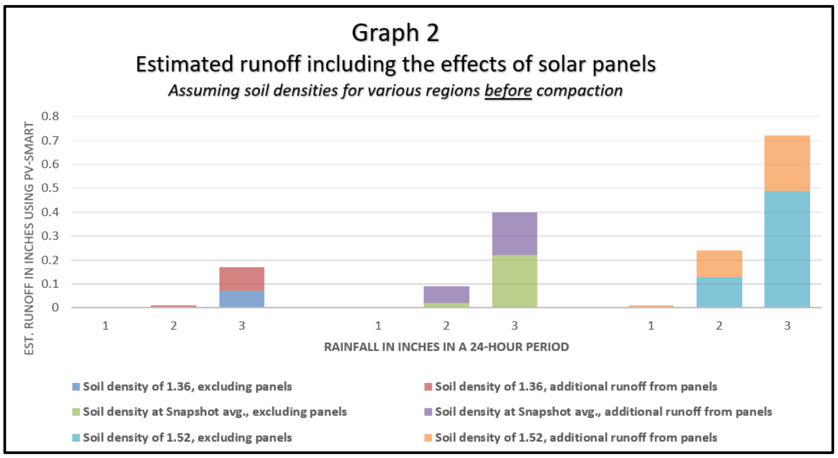


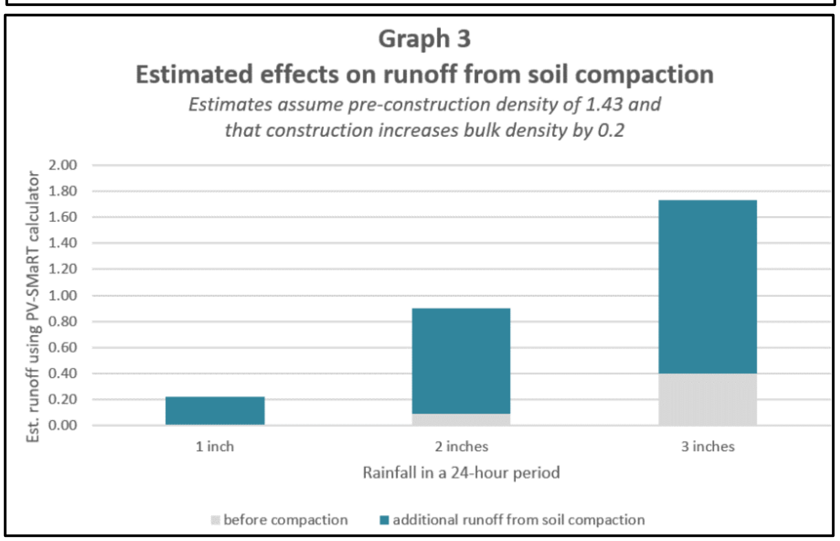
[8] See the proceedings of the April 2023 Scientific and Technical Advisory Committee's conference on Best Management Practices to Minimize Impacts of Solar Farms on Landscape Hydrology and Water Quality
[9] See Great Plains Institute, Best Practices: Photovoltaic Stormwater Management Research and Testing (PV-SMaRT), January 2023.
[10] NREL's overview of the PV-SMaRT program includes a link to the PV-SMaRT calculator.
[11] See USDA Web Soil Survey.
[12] See Advocates for Herring Bay, Solar Soil Snapshot, 2024.
[13] For this analysis, the "Mountain" region includes Allegany, Garrett, and Washington Counties; "Piedmont" includes Baltimore, Carroll, Frederick, Harford, Howard, and Montgomery Counties; "Coastal Plain-West" includes Anne Arundel, Charles, and Prince George's Counties; and "Coastal Plain-East" includes Caroline, Cecil, Dorchester, Kent, Queen Anne's, Talbot, Wicomico, and Worcester Counties.

The following graphs summarize estimates of potential stormwater runoff trends in Maryland using the PV-SMaRT calculator and data from AHB's Snapshot. Unless otherwise noted, the estimates assume that the ground cover under the solar panels is turf grass. In addition, the estimates of runoff account for mitigation benefits of the "disconnection" distances between rows of panels. That is, the amounts shown are the incremental amounts of runoff not addressed by the vegetation between rows.

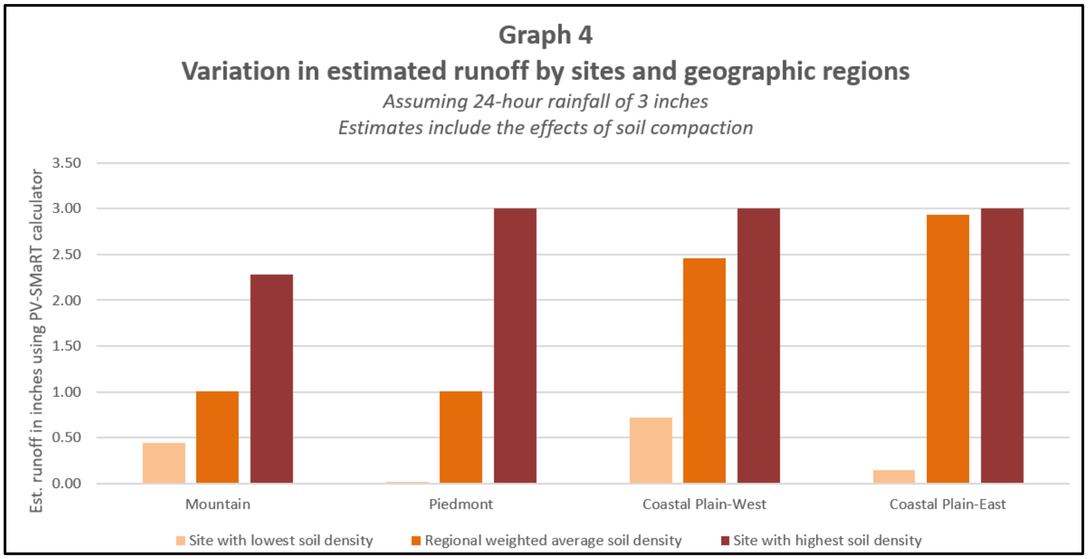
- Graph 2 shows the importance of including the solar panels in the calculation of impervious surfaces, especially as Maryland experiences more intense rain events;
- Graph 3 attests to the importance of accounting for the effects of bulk soil density on stormwater runoff, especially after any soil compaction resulting from construction[14];
- Graph 4 illustrates the importance of accounting for the geographic diversity of soil densities among projects and regions of the state; and
- Graph 5 shows variations in the amounts of runoff that can be absorbed by different types of ground covers under the solar panels.

Finally, sustaining the infiltrative capacity of vegetation over the multi-decade life of solar projects will require continuous monitoring and maintenance. Patchy growth—which increases stormwater runoff—is already an issue for some existing Maryland solar projects (see Figure 1).





[14] This analysis assumes that compaction will increase soil density by 0.2, the amount estimated by the Center for Watershed Protection for "construction, no grading." See Stormwater Center, Compaction of Urban Soils.



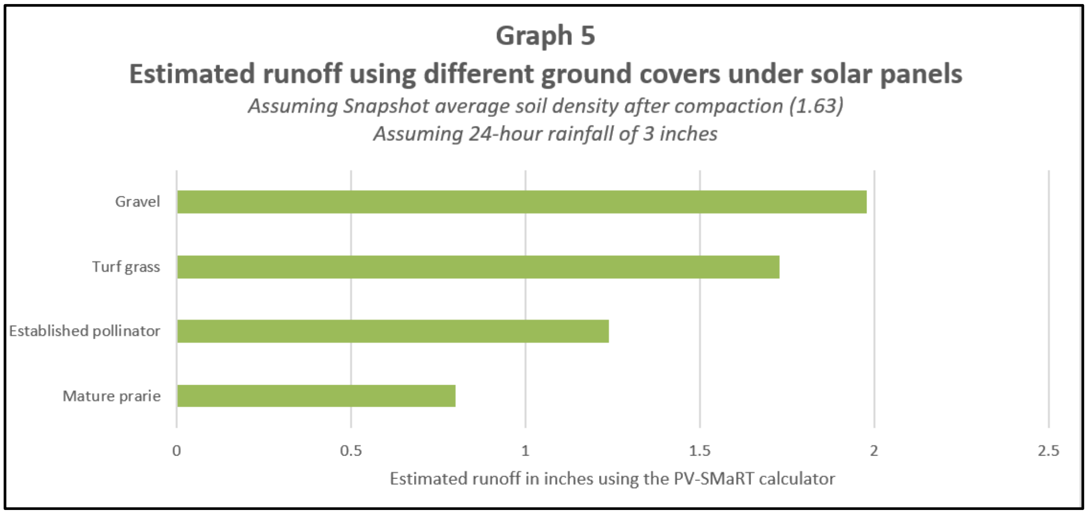


Figure 1
Patches in Vegetation Increase Runoff
Current Examples in Maryland

Source: U.S. Department of Agriculture, Web Soil Survey

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