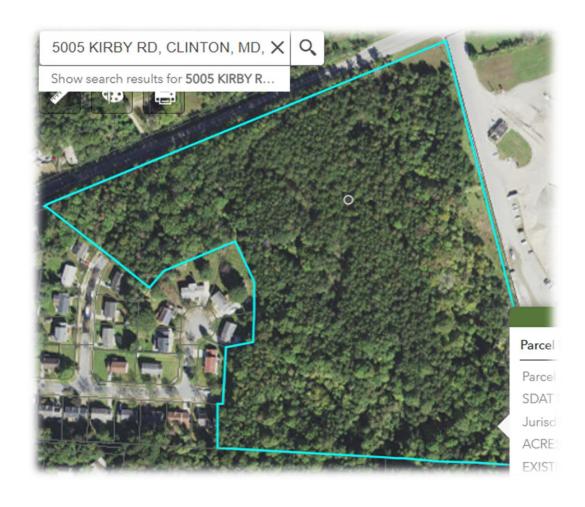
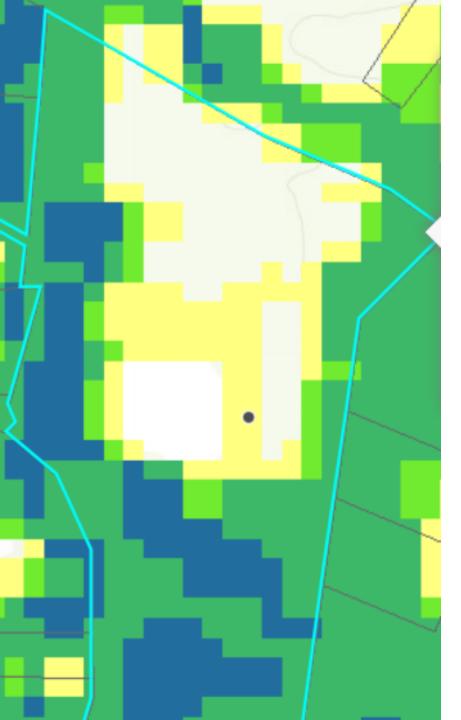
## Using Ecosystem Services Values (ESV) to Inform Solar Siting Practices





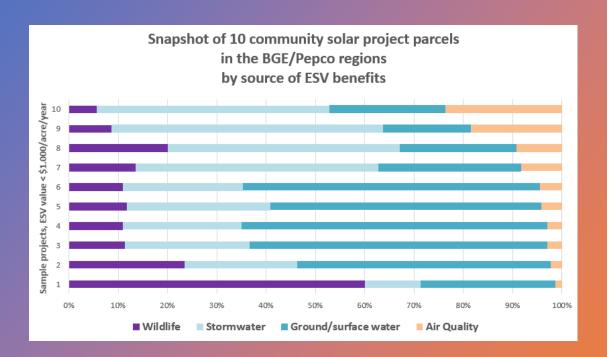




### ESV maps allow for rapid screening

- ESV enables solar developers and governments to quickly see:
  - parcels that should be avoided completely to protect ecologically valuable resources
  - areas within a parcel with low ESV value that may be suitable for solar arrays (e.g., area shown in white on map)
- ESV could be used to rank the priority of proposed projects, as was done by New Jersey for community solar generation





## ESV estimates explain why parcels have ecological value

A snapshot of 10 projects in the BGE/Pepco region found:

Water-related benefits accounted for > 70% of the ESV for those projects (blue in graph)

Water-related benefits include the value to surface and groundwater supplies as well as stormwater mitigation

Air quality benefits may be higher in urban settings; wildlife habitat higher in rural areas



#### ESV estimates can inform the design of financial incentives for solar

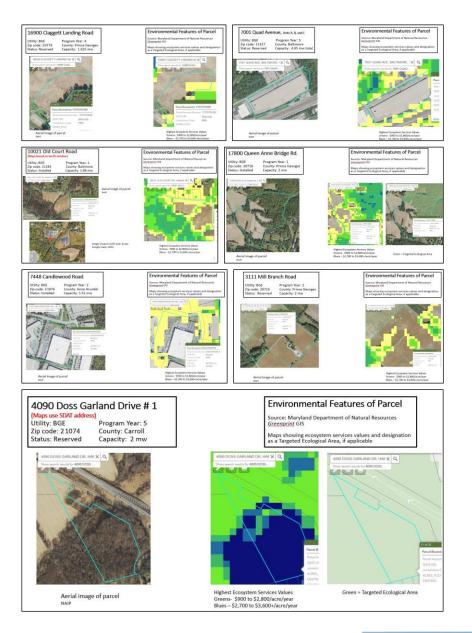
- Massachusetts' solar prices include:
  - "adders" for projects on rooftops, canopies, etc., and
  - "subtractors" for those on greenfield sites, such as forests or farmland
- Talbot County MD assesses an "impact fee" for projects on high priority farmland
- ESV estimates could give policymakers a quantitative basis for assessing ecological impact fees

	Annual Parcel-Level Values*		Annual Per-Acre Values**	
Ecosystem Service Name (and biophysical unit)(range)	Biophysical	Economic	Biophysical	Economic
Air Pollution Removal: Carbon Monoxide (CO) (kg per year)(0-1.35 kg per acre per year)	25.26	\$37.14	1.10	\$1.62
Air Pollution Removal: Nitrogen Dioxide(NO <sub>2</sub> ) (kg per year)(0- 9.01 kg per acre per year)	116.37	\$55.39	5.08	\$2.42
Air Pollution Removal: Sulfur Dioxide(SO <sub>2</sub> ) (kg per year)(0- 6.67 kg per acre per year)	52.83	\$5.36	2.31	\$0.23
Air Pollution Removal: Ozone (O <sub>3</sub> ) (kg per year)(0-34.35 kg per acre per year)	457.62	\$1,212.20	19.98	\$52.92
Air Pollution Removal: Particulate Matter(PM <sub>10</sub> ) (kg per year)(0-8.34 kg per acre per year)	122.97		5.37	
Air Pollution Removal: Particulate Matter(PM <sub>2.5</sub> ) (kg per year)(0-1.80 kg per acre per year)	32.28	\$3,718.31	1.41	\$162.32
Carbon Sequestration (mT per year)(0-4 mt per acre per year)	13.36	\$1,860.04	0.58	\$81.20
Groundwater Recharge (m3per year)(445 - 1236 m3 per acre per year)	1151.33	\$5,903.00	50.26	\$257.70
Nitrogen Uptake Potential Index (1 = low to 3 = high)*	1.00	\$763.00	No Data	\$33.31
Stormwater Mitigation Potential Index (1 = low to 5 = high)*	2.76	\$20,506.00	No Data	\$895.20
Wildlife Habitat and Biodiversity Potential Index (0 = low to 100 = high)*	12.28	\$3,245.00	No Data	\$141.66
Surface Water Protection	No Data	\$0.00	No Data	\$0.00
Show search results for 5005 KIRBY R				
				250



# ESV dashboard for solar siting:

In 2022, AHB gave the MD Public Service Commission profiles of the ESV of the 198 parcels being used for installed or planned community solar projects

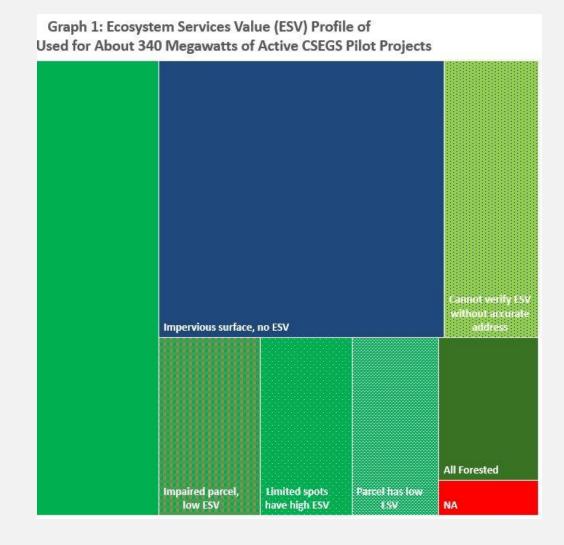




# ESV dashboards identify opportunities for adding solar capacity while protecting ecological resources

#### Takeaways of AHB's 2022 dashboard:

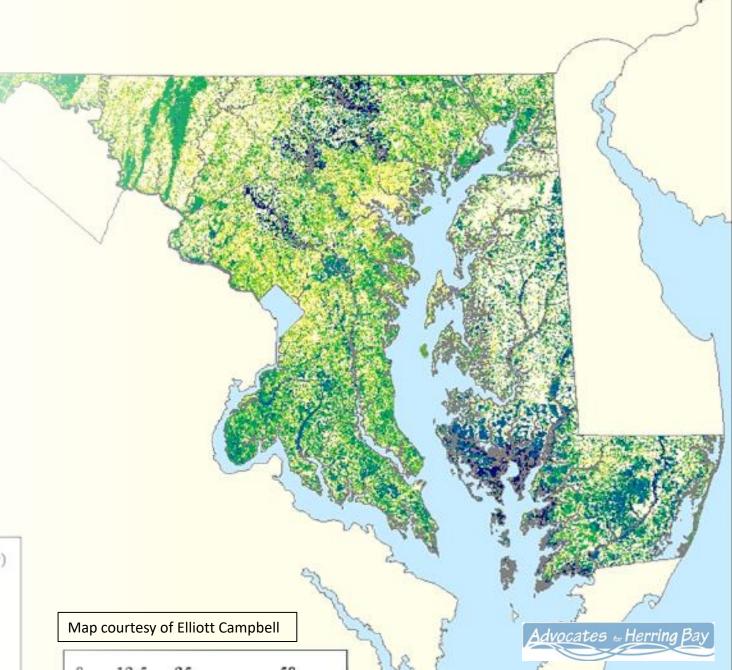
- 26 percent of the capacity was on "hard" surfaces, such as building rooftops and parking canopies
- 74 percent of the capacity was on greenfield sites, some of which were completely forested
- Most of the greenfield parcels could accommodate 2-megawatt projects without impacting high ESV acreage
- Unlike New Jersey and Massachusetts, Maryland currently lacks incentives or rules to encourage developers to put arrays on areas with low ESV value





# Future uses of Maryland's ESV analysis

- Values are not indexed for inflation, so current estimates may be too low
- Since maps are pixelated, use for individual parcels may require groundtruthing
- ESV programs need funding to maintain their analytical value
  - Models need to be updated regularly to reflect changes in land use
  - MD's "parcel evaluation" tool needs to be expanded to provide estimates for all parcels statewide





AHB's 2022 dashboard and related comments on Maryland's community solar projects are available at <a href="https://www.herringbay.org">www.herringbay.org</a>, Policy Positions, "Optimizing the Benefits of Solar," <a href="https://cseas.org/cseas.org/cseas.org/">CSEGS Report, August 2022</a>, and <a href="https://cseas.org/cseas.org/">Comments on PSC CSEGS Report, August 2022</a>

Maryland's Ecosystem Services Value estimates are available at <u>GreenPrint (md.gov)</u>

For information on New Jersey's 2021 ranking of community solar projects, see <u>NJ year-2 scoring criteria for community solar</u>, and on the state's permanent programs that prohibit siting on certain forests, see <u>NJ BPU</u>, <u>Community Solar Program 2023</u>, and <u>NJ, BPU Competitive Solar Incentive Program</u>, <u>Dec. 2022</u>

For information on Massachusetts' land-use pricing policies for solar projects, see <u>2023 Guidelines for Renewable</u> Target Program

For questions or comments about this presentation, contact Kathy Gramp at <a href="https://example.com">herringbay@gmail.com</a>