CBLCM Run #2

Modeling the Effects of Population, Employment, and Renewable Energy on Land Use Change

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Land Use Workgroup Office Hours
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U.S. Department of the Interior
U.S. Geological Survey

Review Schedule

~~August 6th Post run #2 results~~ August 11th Post Run #2 results

August 12th Office Hours – discuss Run #2, share draft solar results for Virginia

August 27th LUWG review of Run #2 and proposed changes for Run #3

September 9th Post Run #3 results (aka “Final version” including solar)

September 16th Office Hours – discuss Run #3 (fatal flaw check)

September 23rd Joint LUWG/USWG review

- recommend BAU scenario specifications and results for approval

September 28th Clean Water Goal Team review and approval

Run #1 to Run #2: What's changed?

1. **Refined lands suitable for development**
    - Small gaps created by rasterizing vector parcels and resampling high-resolution land use/land cover from 1m to 30m cells were filled through filtering.
    - Excluded "no growth" areas identified by Metropolitan Planning Organizations.
        - Traffic Analysis Zones with independent forecasts of no growth were excluded.

2. **Aligned urban vs rural growth patterns to observed changes in impervious cover**
    - Proportions of residential and commercial growth in urban areas were recalculated based on observed proportions of residential and commercial impervious change rather than observed proportions of housing and employment change.

3. **Refined infill/redevelopment rates to better match observed development**
    - Increased the number of Census Blocks eligible for infill/redevelopment by eliminating a % impervious criteria, decreased the rates of infill by increasing the expected densities from the 75^{th} to 90^{th} percentile, and considered total change in impervious cover in Census Blocks with increases in housing and/or jobs and no corresponding increases in residential and commercial impervious surfaces.

Outstanding CBLCM Updates for Run #3

1. **Refine model inputs**
   - Develop separate residential, commercial, and solar suitability layers
   - Update MDP population projections from March to November 2025 version
   - Exclude updated BMC Traffic Analysis Zone housing and employment “no growth” areas from residential and commercial suitability respectively
   - Update solar probability layer with data from 2023-2026 and simulate utility-scale solar field growth for all states
   - Incorporate planned/proposed data centers
   - Further investigate and adjust commercial densities

2. **Verify and validate model outputs**
   - Compare infill/redevelopment estimates derived from MD and DE parcel data with CBLCM estimates.
   - Compare observed and simulated growth relative to distance to roads and urban areas.
   - Compare observed vs simulated patterns of growth at different spatial scales: 0.1 km2, 1 km2, 10 km2.

Simulating Utility-Scale Solar Fields

Jurisdiction	Panel_acres_2021	Panel_acres_2025	MW(USS)_2025	MW(TOT)_2025	% USS	MW_2030	MW_2035	MW_2040	SOL_30	SOL_35	SOL_40	Total
DE	142	437	95	352	27%	648	449	651	1,228	851	1,233	3,312
DC	0.2	31	28	350	8%	298	291	422	167	164	237	568
MD	1,557.1	2,265	699	3,200	22%	2,600	2,604	3,774	3,974	3,981	5,769	13,724
NY	1,307.3	12,705	2,750	8,200	34%	12,400	9,250	13,404	29,107	21,713	31,463	82,282
PA	618.6	3,827	1,017	3,200	32%	5,100	3,727	5,401	11,350	8,295	12,019	31,664
VA	4,993.2	21,868	4,710	7,800	60%	9,100	7,589	10,996	38,461	32,073	46,475	117,010
WV	-	1,901	140	383	37%	1,517	853	1,236	3,893	2,189	3,172	9,254

2021/22 High-res Land Use Data

USGS-LBL

USGS-LBL

SEIA Factsheets

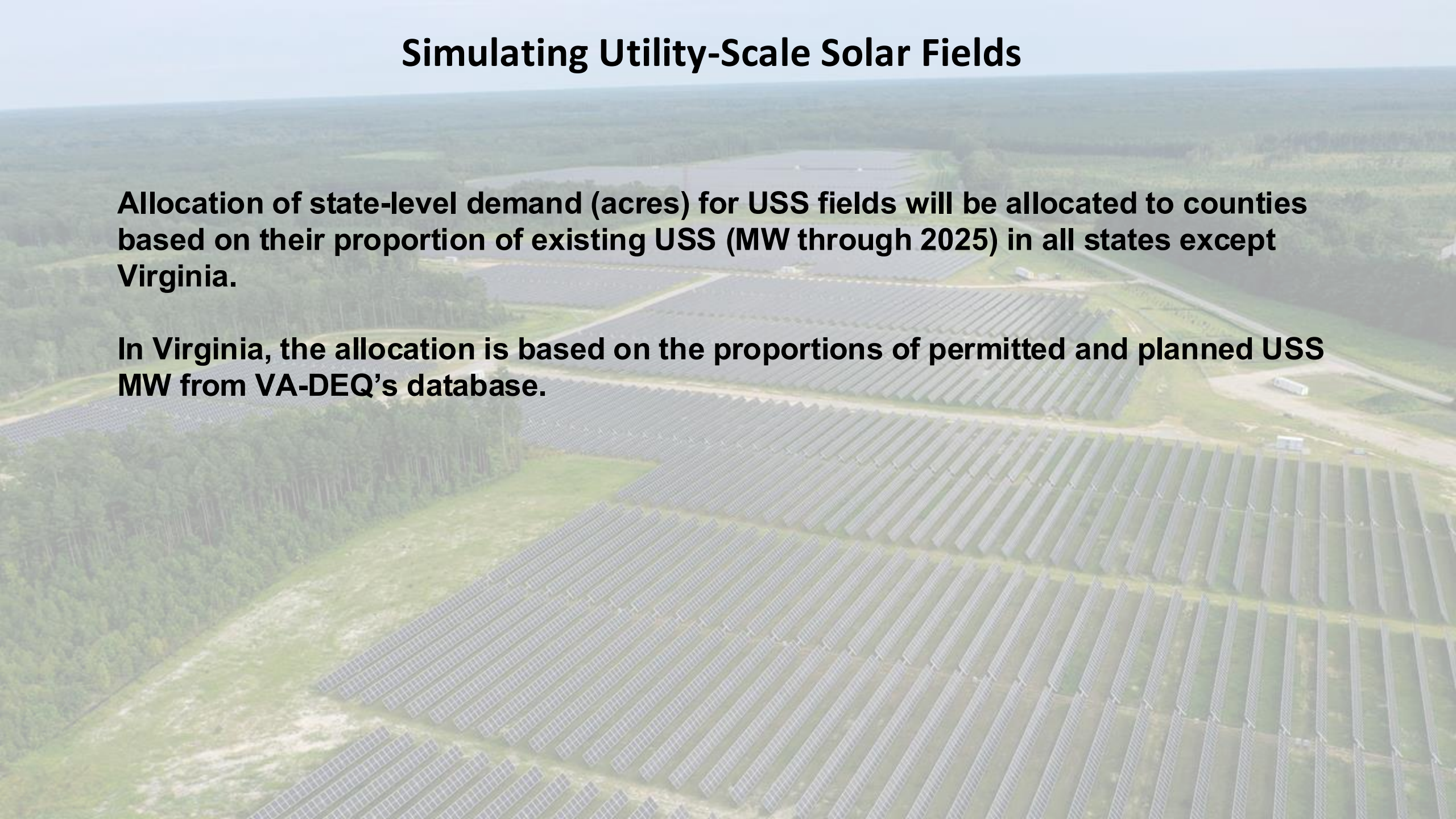
Proportion of total MW from USS

SEIA Factsheets

Extrapolated 7.7% growth rate PJM

USS acres needed to meet forecasted energy demand (MW * 7 * %USS)

Simulating Utility-Scale Solar Fields



Allocation of state-level demand (acres) for USS fields will be allocated to counties based on their proportion of existing USS (MW through 2025) in all states except Virginia.

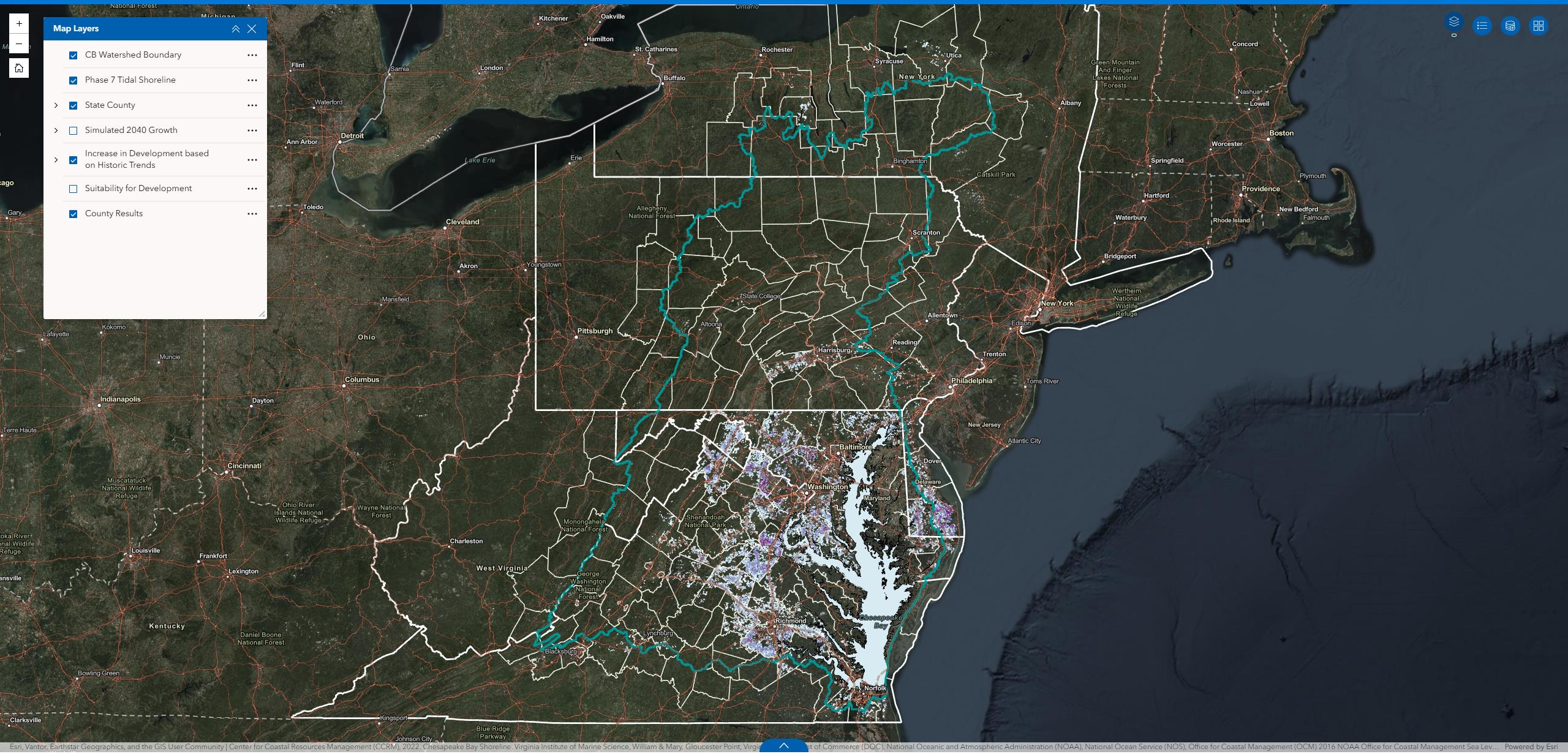
In Virginia, the allocation is based on the proportions of permitted and planned USS MW from VA-DEQ's database.

Chesapeake Bay Land Change Model

Documentation

Map Layers

- [x] CB Watershed Boundary
- [x] Phase 7 Tidal Shoreline
- [x] State County
- [ ] Simulated 2040 Growth
- [x] Increase in Development based on Historic Trends
- [ ] Suitability for Development
- [x] County Results



CBLCM Review Resources

CBLCM Frequently Asked Questions (a must read): available on CWGT 7/27 meeting page

CBLCM Output Viewer: https://gis.chesapeakebay.net/cblcm/

Peer-reviewed Journal Article:
https://onlinelibrary.wiley.com/doi/10.1111/1752-1688.13131
available for free on CWGT 7/27 meeting page

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