



Solar Energy



Outline



- Utility Scale vs. Used to offset ag. Energy costs vs. residential
- Constraints to industrial scale
- Using GIS mapping to grade suitability of sites- industrial level
- PV Mapper Tool
- PV Mapper Tool example
- Regional Analysis
- Localized Analysis- include local data and specific constraints
- Residential Analysis- include lidar
- Public Parcels Analysis-include lidar & power purchasing agreement
- Site Design- meet zoning ordinance

- Utility Scale
- Small Scale- 'offset energy costs purpose for Ag., Commercial or Industrial
- Residential
- Gov't solar

Constraints to industrial scale

- Suitable land
- Transmission Capacity
- Viewshed Impact

Suitable Land “must haves”

- Maximum slope requirement
- Proximity to roads
- Proximity to transmission infrastructure
- Proximity to water source
- Solar insolation/irradiance values high enough to accommodate solar

Map 1 showing Site Constraint

Map 1 showing Site
Constraint removed

Map 2 showing Site Constraint

Map 2 showing Site
Constraint removed

Suitable Land “It better not”

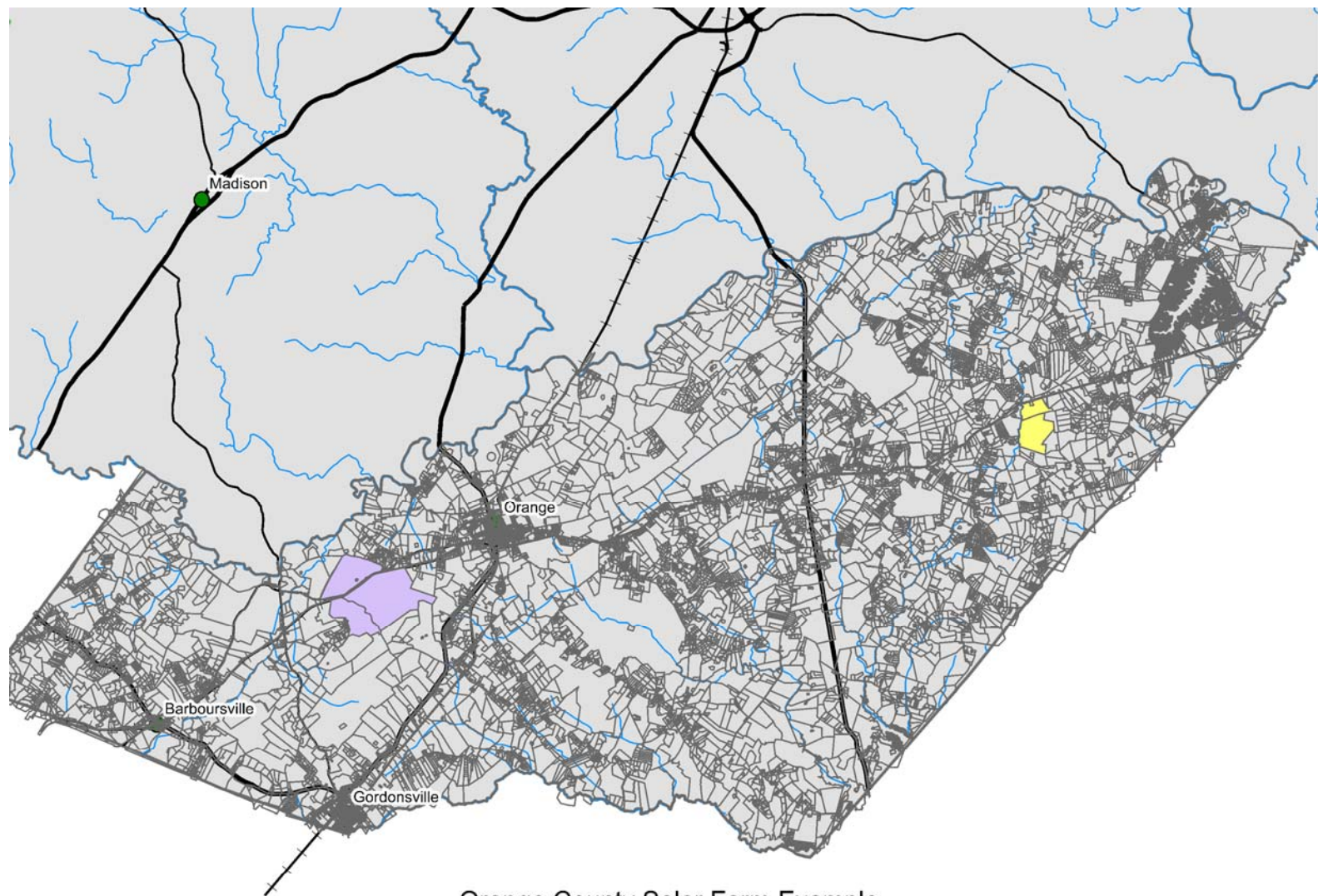
- Impact prime agricultural areas
- Impact historic viewsheds
- Impact battlefields
- Require large amount of land cleared
- Impact environment including
 - Sensitive wetland areas
 - Sensitive wildlife areas
- Impact agri-tourism related business (impact viewshed)

Map 1 showing Site Constraint

Map 1 showing Site
Constraint removed

Map 2 showing Site Constraint

Map 2 showing Site
Constraint removed



Legend

 parcels  Orange Solar farm parcels  Montpelier

Orange County Solar Farm Example

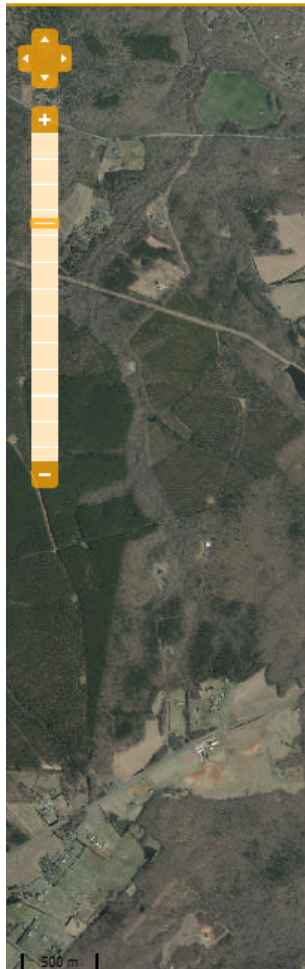


0 5 10 Miles



Main Scoreboard

Add Site Sites Measure Distance



Tool Name

Geography (4)

Gross Area

Nearest River

Slope

Soil

Geography (average)

Land Use (2 Tools)

Land Administration

Land Cover

Land Use (average)

Meteorology (3 Tools)

Direct-Normal Irradiance

Global-Horizontal Irradiance

Tilted flat-plate irradiance

Meteorology (average)

Power Infrastructure

Nearest Substation

Nearest Transmission Line

Power Infrastructure (average)

Social Acceptability

Agriculture Proximity

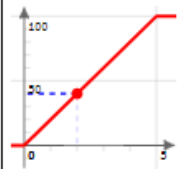
Existing Solar Potential

Historic Proximity

Recreational Proximity

Wetland Proximity

Soil



Value: Appling sandy loam, 7 to 15 percent slopes, eroded, Well drained [2 stars], Breomo silt loam, 4 to 15 percent slopes, Somewhat excessively drained [2 stars], Cecil clay loam, 4 to 15 percent slopes, severely eroded, Well drained [2 stars], Cecil loam, 7 to 15 percent slopes, eroded, Well drained [2 stars], Colfax loam, 2 to 7 percent slopes, Somewhat poorly drained [2 stars], Elsinboro loam, 2 to 7 percent slopes, eroded, Well drained [2 stars], Louisburg sandy loam, 15 to 25 percent slopes, Well drained [2 stars], Manteo silt loam, 15 to 25 percent slopes, Somewhat excessively drained [2 stars], Nason loam, 7 to 15 percent slopes, eroded, Well drained [2 stars], Rock land, acidic, moderately steep [2 stars], Rock land, acidic, sloping [2 stars], Tatum loam, 7 to 15 percent slopes, eroded, Well drained [2 stars], Tatum silty clay loam, 7 to 15 percent slopes, severely eroded, Well drained [2 stars], Appling sandy loam, 2 to 7 percent slopes, eroded, Well drained [3 stars], Cecil loam, 2 to 7 percent slopes, eroded, Well drained [3 stars], Lignum silt loam, 2 to 7 percent slopes, Moderately well drained [3 stars], Seneca fine sandy loam, 2 to 7 percent slopes, Moderately well drained [3 stars], Tatum loam, 2 to 7 percent slopes, eroded, Well drained [3 stars], Turbeville loam, 2 to 7 percent slopes, eroded, Well drained [3 stars], Vance fine sandy loam, 2 to 7 percent slopes, Well drained [3 stars], Chewacla silt loam, Somewhat poorly drained [4 stars], Starr silt loam, 2 to 10 percent slopes, Well drained [4 stars], Water [4 stars], Worsham silt loam, 2 to 7 percent slopes, Poorly drained [4 stars]

Score: 40
Weight: 10
Comments on Score: Prefer sites with less erodible, higher-rated soil

This star rating tool finds the various types of soil present at a proposed site. These areas are defined in the Soil Survey Geographic (SSURGO) dataset from the National Cooperative Soil Survey. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships, and county natural resource planning and management. Note that the extent of SSURGO data is limited to soil survey areas; many counties and parts counties are not included. For more information, see the USDA Natural Resource Conservation Service (soils.usda.gov/survey/geography/ssurgo).

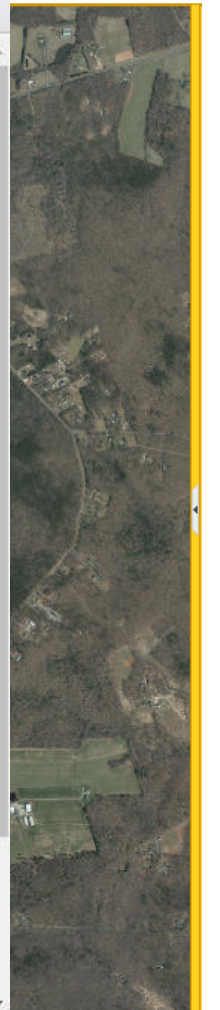
This tool depends on a user-defined star rating for each soil type found at a site, on a scale of 0-5 stars. The default rating for soil types is based on their erodability. "Highly erodible land" gets two stars by default; "potentially highly erodible land" is given three stars; "Not highly erodible land" has four stars. These ratings may be further adjusted by the user. Note that the user should be knowledgeable of soils data and their characteristics.

When a site has just one soil type, its score is based on the star rating of that soil (so overlapping a five-star soil type might give a score of 100, while overlapping a one-star soil may give a score of 20). If a site includes more than one soil type, the lowest star rating is used to calculate its score (so a site with both a one-star and a five-star soil might have a score of 20). Like every other score tool, these scores ultimately depend on the user-defined utility function.

Hello, JCostello
[Log out](#)
[Home](#)
[Contact](#)

Related Links

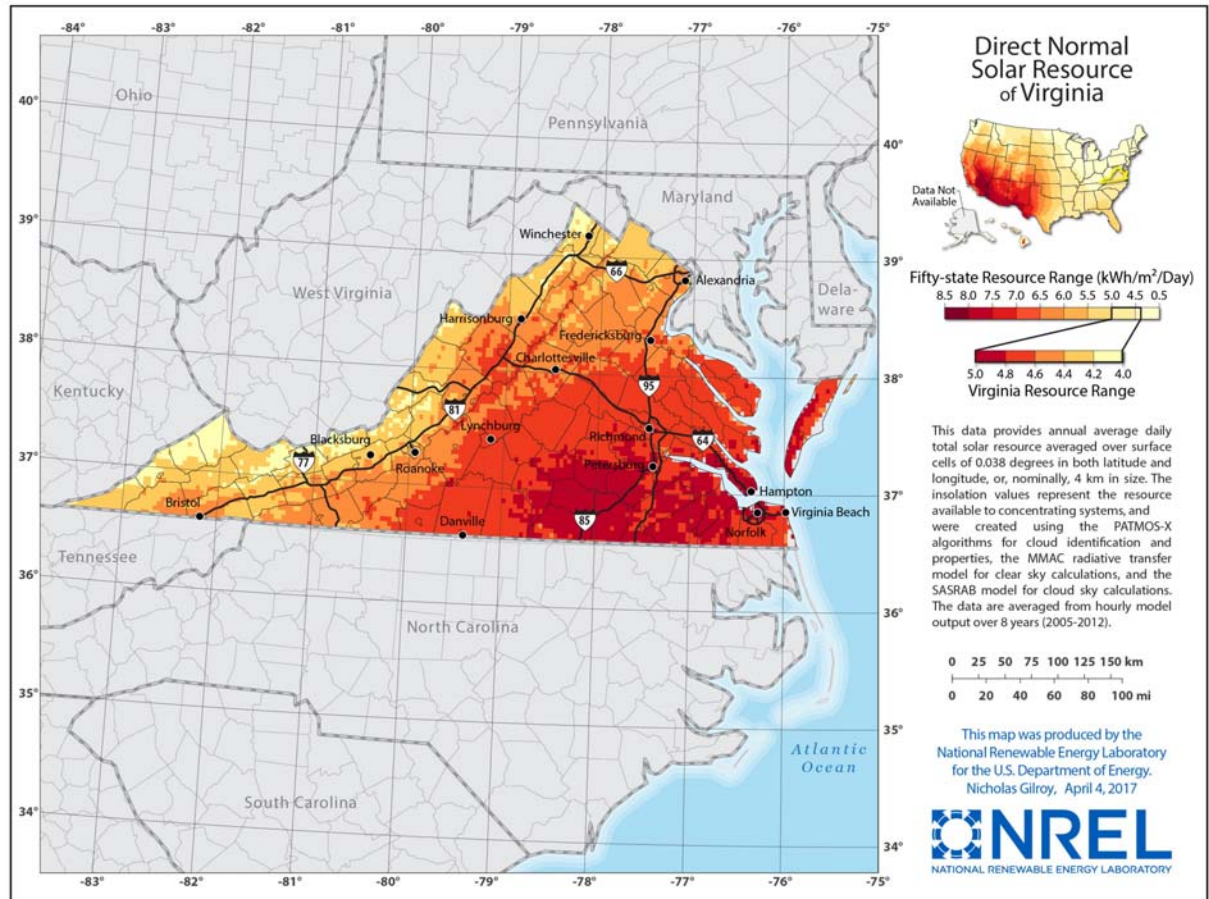
TAX_LINK	
Link	Score
25 sq mi (463,8 ...	100
or 500: Service L...	...
or 500: Service S...	...
iling sandy loam,...	40
	40
or 500 Internal S...	...
or 500: Service L...	...
or 503 Service U...	...
or 503 Service U...	...
or 503 Service U...	...
3 mi to Locust Gr...	99
5 mi to 500kV tr...	92
	95
re was no agricu...	100
re was no existi...	100
re was no histori...	100
re was no recre...	100
or 500 Internal S...	...



<https://pvmapper.apphb.com/App#>

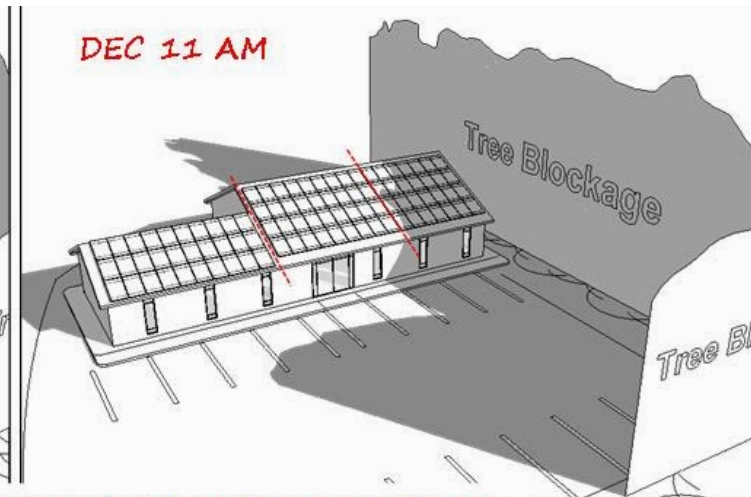
Main Scoreboard

NREL Maps

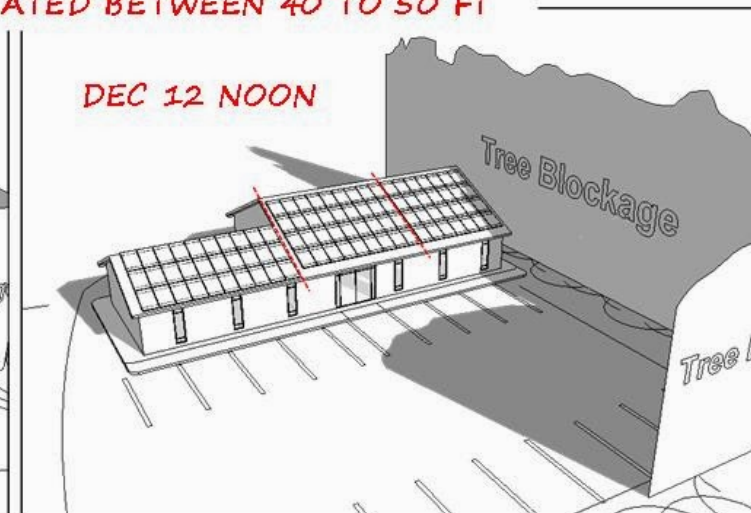


Regional Study?

- Use tool to screen all parcels in the region weights
 - Upload local data to tool
 - Include desirable weights
- Exclude any parcel violating a “must have”
- Establish weights for all the “it Better not(s)”
- Export csv. of parcels meeting all requirements
- Incorporate more specific local data
 - Zoning ordinances
 - Viewshed analysis
 - Local interconnection application info (County by County transmission capacity if available)



NOTE: TREE HEIGHT ESTIMATED BETWEEN 40 TO 50 FT



MILESTONE SOLAR CONSULTANTS LLC	MILESTONE SOLAR CONSULTANTS LLC BILL ANDERSON PO BOX 507 FALLING WATERS WV 25419	COMMERCIAL ESTIMATE	4244 VIRGINIA AVE COLLINSVILLE VA 24078	SHADING REVIEW	DATE	PAGE	REV
					01/07/2014	3	
CONSULTANTS LLC	PO BOX 507 FALLING WATERS WV 25419	ESTIMATE	COLLINSVILLE VA 24078		01/07/2014	2	