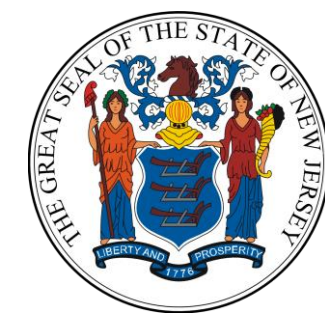


NJDEP Solar Siting Analysis Update (2017)



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<https://www.state.nj.us/dep/aqes/solar-siting.html>



Results

The 2017 Solar Siting Analysis Update utilized ArcMap to quantify the acreage and square mileage of the “Preferred”, “Not-Preferred”, and “Indeterminate” Lands in the state (see chart to the right).

Solar Siting Designation	Acreage	Sq. Mi	% Total
Preferred	1,355,375.11	2,117.77	29%
Not-Preferred	3,000,569.36	4,688.39	63%
Indeterminate	398,262.04	622.28	8%
TOTAL	4,754,206.51	7,428.44	100%

Introduction

In October 2012, shortly after the Solar Act was signed into legislation, the NJDEP’s Bureau of Energy and Sustainability—then under the name Sustainability and Green Energy (SAGE)—developed the Solar Siting Analysis (SSA). The SSA document and supporting mapping application was developed to aid the Department, local communities, and potential developers in planning for solar installations by distinguishing between sites where the Department encourages solar PV development from those where the Department discourages solar PV development. As a clean energy source, solar PV has many environmental benefits associated with it that can unfortunately be lost if solar PV projects are not properly sited. The SSA document and supplemental mapping product is intended to be used as a guidance tool to evaluate proposed projects based on the land use type in the proposed location, and should not be used to automatically disqualify projects from consideration.

In March 2017, the Bureau of Energy and Sustainability set out to update the 2012 Solar Siting Analysis to reflect the changes that have taken place in the state, as well as changes in solar energy technology and markets during this time.

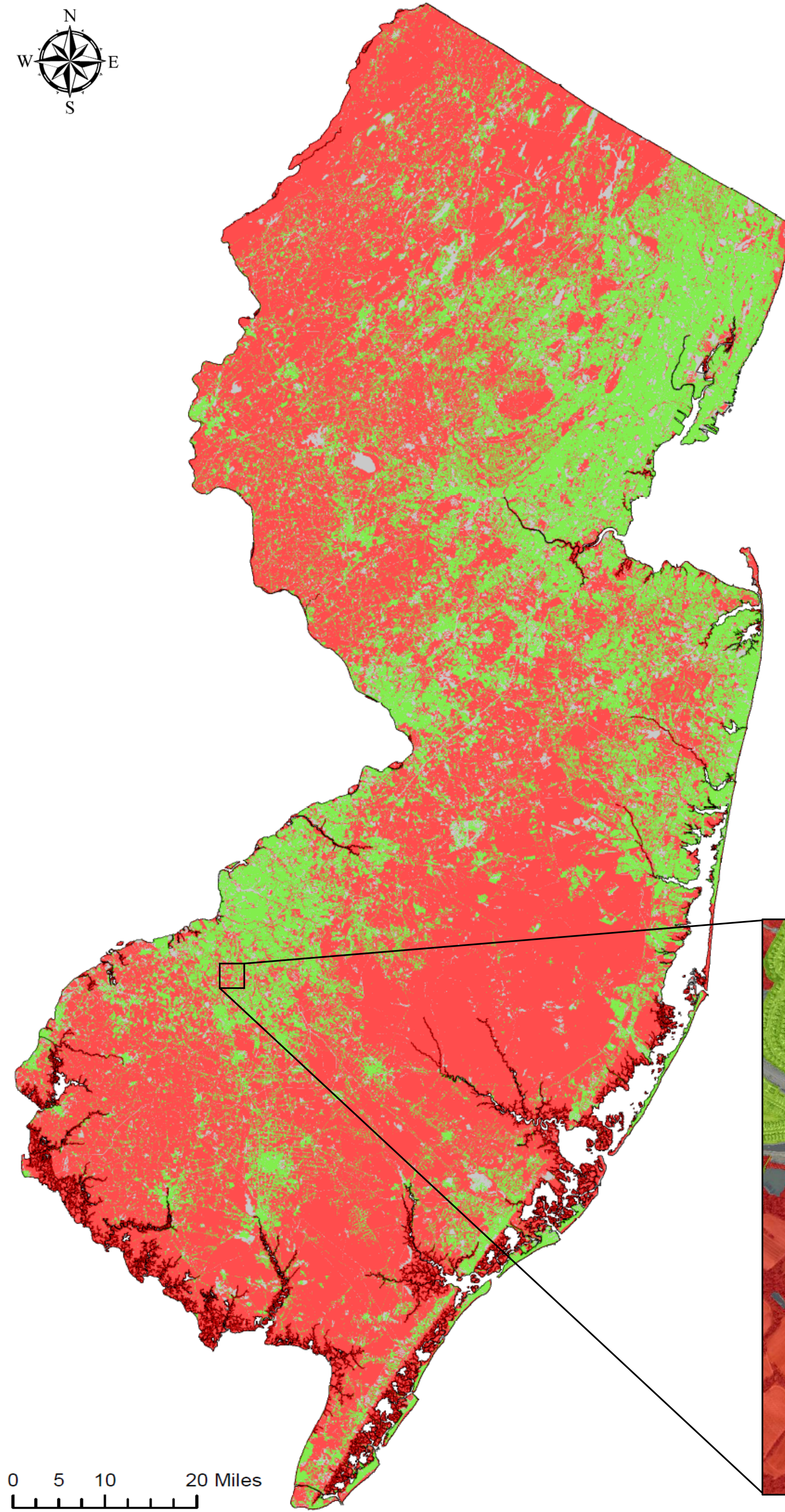
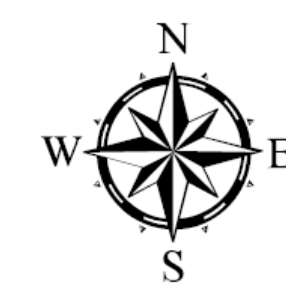
Data and Methodology

This analysis utilizes Anderson Codes for Land Use/Land Cover in order to determine which areas the Department would encourage and discourage solar PV installations. The 2012 Solar Siting Analysis utilized the Land Use/Land Cover data from 2007 to determine these areas. This update (2017) utilizes the most current Land Use/Land Cover data available for the State of New Jersey, which was completed in late 2012.

Each Anderson Code in the LU/LC data layer was assigned a category based on the Department’s goals and preference for installing solar:

- “Preferred” Areas—characterized by existing impervious surfaces traditionally associated with developed urban lands, since siting solar does not introduce additional land disturbance;
- “Not-Preferred” Areas—natural lands, dominated by forests, wetlands, agriculture, and open space that the Department sets out to protect and preserve;
- “Indeterminate” Areas—water bodies and other land use types that require additional research to assess the viability of siting solar.

Once each Anderson Code was assigned a category for preference, it became apparent that not all land use types were feasible locations for siting solar. As a result, in order to identify and calculate the viable land area for siting solar in the State, seven Anderson Codes (primarily associated with tidally influenced water bodies) were removed and excluded from the analysis. The data table was then joined to the 2012 LU/LC data layer based on the corresponding Anderson Codes (LU12 attribute). Next, the acreage for each resulting polygon was calculated in ArcMap and several new data tables were generated using the “Summarize” tool to calculate the total acreage and square mileage for each solar siting category.



Discussion and Conclusion

The State of New Jersey is currently ranked in the top 10 in the United States with regard to installed solar PV capacity. However, on a square mile basis, New Jersey is ranked 1st in installed solar PV capacity due to its limited geographic footprint. While this is encouraging, improper siting of future solar PV systems can jeopardize ecosystem services and the preservation of the valuable, yet limited open space resources remaining in the State.

When considering siting solar PV projects, existing impervious surfaces, such as residential and commercial rooftops and paved roadways and parking lots (for elevated solar carport systems), are most desirable since siting solar projects in these locations does not introduce any additional direct land disturbance that might affect ecosystem services. Siting solar PV in these locations is also in line with the Department’s mission to preserve natural lands and open space in the State.

Based on the 2017 SSA Update, roughly 29% of the State of New Jersey can be classified as “Preferred” for installing solar based on the LU/LC characteristics, largely a result of urbanized development. While this screening tool can be used to identify where the “Preferred” areas are in the State, there are many other considerations that should be taken into account when evaluating a proposed solar PV installation, including (but not limited to):

- Location and proximity to flood hazard areas;
- Location and proximity to known habitat of threatened and endangered species;
- Location and proximity to environmental hazards (i.e. landfills, brownfields, and other contaminated sites).

Future land use changes and changes in solar technology will also have to be taken into account in subsequent updates to this analysis. For example, the land use classification for Artificial Lakes (5300) is currently “Indeterminate” for the sake of this analysis. However, a new trend in solar technology is “floating solar”—or siting solar PV installations on floating pontoons on reservoirs and lakes. As this technology matures and installations become more popular and economically feasible, the classification of Artificial Lakes may have to be adjusted to “Preferred”. Similar changes will also have to be considered as they are discovered and become more prevalent throughout the country and State.

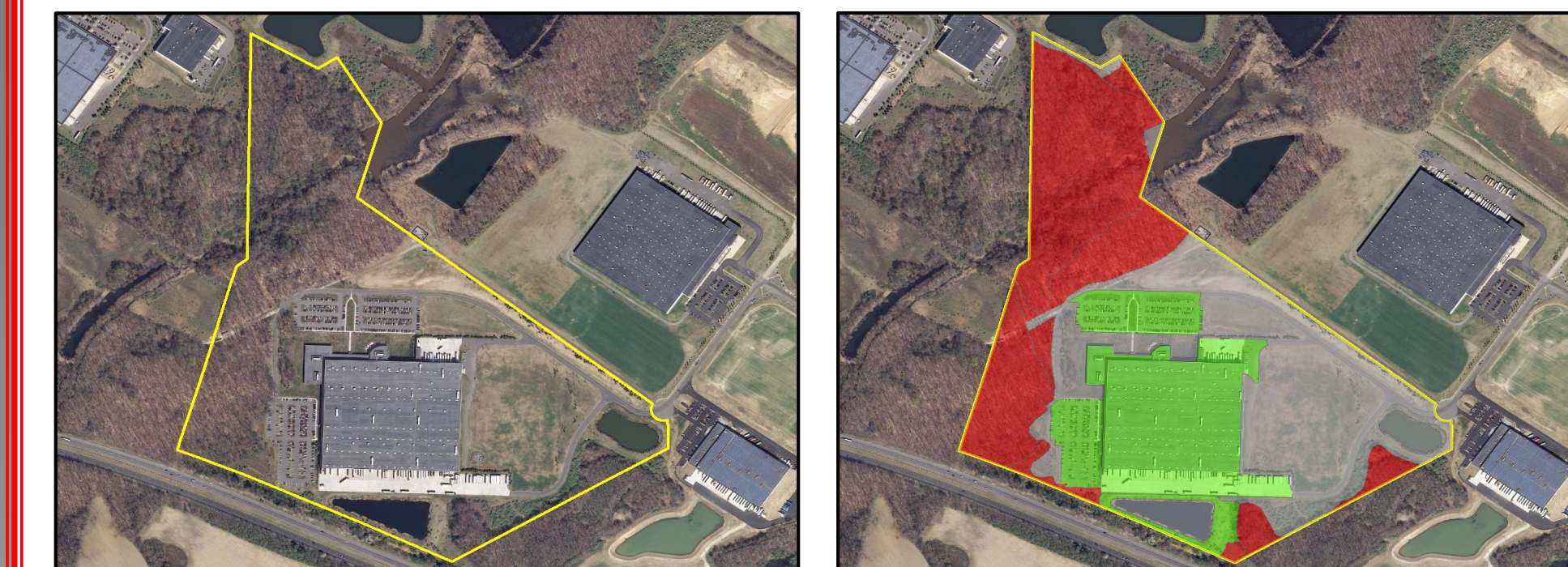
Legend

Solar Siting Designation

- Preferred Area
- Not-Preferred Area
- Indeterminate Area
- State Boundary

Applying the Solar Siting Analysis

The Solar Siting Analysis can be used to evaluate a site, prior to solar PV installation, in order to identify which sections of the property would be best for siting the solar project. In the hypothetical example below, the SSA was applied to the “proposed site” and indicates which areas would be most “Preferred” for solar—roughly 28% of the property, characterized by industrial rooftop and impervious parking lot locations. The remainder of the property is deemed to be “Not-Preferred” (34%) or “Indeterminate” (38%), characterized by mixed forest and wetlands, in addition to artificial lakes and other urban lands.



LU12	LABEL12	TYPE12	ACREAGE	Solar Siting Category
1300	INDUSTRIAL	URBAN	4.26	Preferred Area
1300	INDUSTRIAL	URBAN	3.33	Preferred Area
1300	INDUSTRIAL	URBAN	18.42	Preferred Area
1499	STORMWATER BASIN	URBAN	2.03	Preferred Area
1700	OTHER URBAN OR BUILT-UP LAND	URBAN	33.65	Indeterminate Area
1700	OTHER URBAN OR BUILT-UP LAND	URBAN	0.52	Indeterminate Area
2140	AGRICULTURAL WETLANDS (MODIFIED)	WETLAND	0.15	Not-Preferred Area
4120	DECIDUOUS FOREST (>50% CROWN CLOSURE)	FOREST	0.87	Not-Preferred Area
4120	DECIDUOUS FOREST (>50% CROWN CLOSURE)	FOREST	5.31	Not-Preferred Area
4410	OLD FIELD (~25% BRUSH COVERED)	FOREST	0.31	Not-Preferred Area
4410	OLD FIELD (~25% BRUSH COVERED)	FOREST	0.01	Not-Preferred Area
4440	MIXED DECIDUOUS/CONIFEROUS BRUSH/SHRUBLAND	FOREST	0.9	Not-Preferred Area
4440	MIXED DECIDUOUS/CONIFEROUS BRUSH/SHRUBLAND	FOREST	0.58	Not-Preferred Area
5200	NATURAL LAKES	WATER	0.32	Indeterminate Area
5300	ARTIFICIAL LAKES	WATER	1.46	Indeterminate Area
5300	ARTIFICIAL LAKES	WATER	2.17	Indeterminate Area
6210	DECIDUOUS WOODED WETLANDS	WETLAND	1.22	Not-Preferred Area
6210	DECIDUOUS WOODED WETLANDS	WETLAND	6.91	Not-Preferred Area
6210	DECIDUOUS WOODED WETLANDS	WETLAND	17.43	Not-Preferred Area
6210	DECIDUOUS WOODED WETLANDS	WETLAND	1.13	Not-Preferred Area
6231	DECIDUOUS SCRUB/SHRUB WETLANDS	WETLAND	0.02	Not-Preferred Area