

Energy Zones Mapping Tool for Eastern Interconnection

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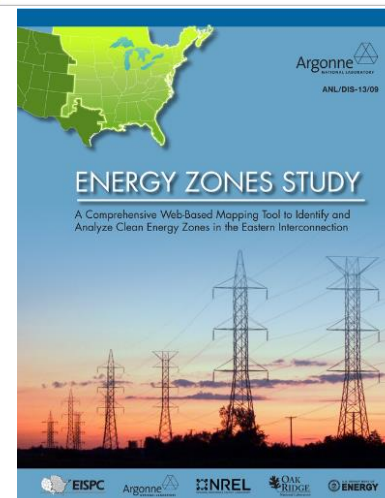
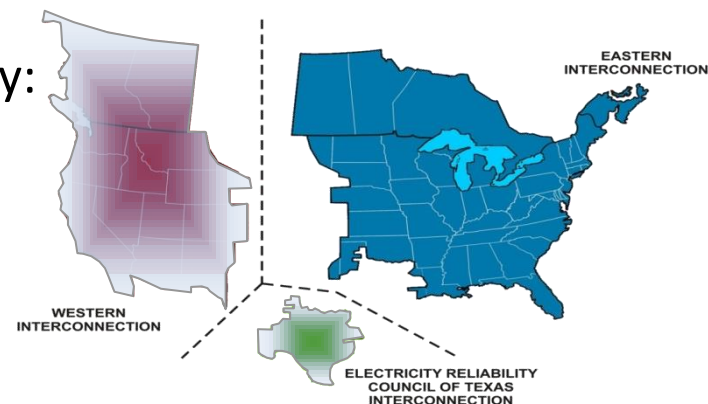
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EISPC Energy Zones Mapping Tool

- EZ Mapping Tool was developed for Eastern Interconnection States' Planning Council (EISPC) by:
 - Argonne National Laboratory (Project Lead)
 - Oak Ridge National Laboratory, and
 - National Renewable Energy Laboratory
- EISPC represents 39 states, District of Columbia, City of New Orleans and 6 Canadian Provinces located within the Eastern Interconnect (EI)
- EISPC is comprised of public utility commissions, Governor's offices, state energy offices, and other key government agencies and representatives
- Funding was provided by the U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability under the American Recovery and Reinvestment Act

North American Electric Reliability Corporation Interconnections



EISPC EZ Mapping Tool Is Publicly Available

- The EZ Mapping Tool provides data, models, reports, and policy information for nine clean (low/no carbon) energy resource categories in the Eastern Interconnection
- The tool is intended for:
 - EISPC members (state energy and environmental offices, public utility commissions, etc.)
 - Electric utilities and grid operators
 - NGOs
 - Energy industry
 - Regulators,
 - Energy researchers, etc.
- Over 1,000 registered users since April 2013

EISPC EZ Mapping Tool

Home | About the Study | Energy Resources | Data | Policies & Regs | Maps | Documents | Links | [Launch Tool](#)

EISPC EZ Mapping Tool
A map-based tool for identifying areas within the eastern United States that may be suitable for clean power generation.

[Launch Tool](#)

About the Tool
The EISPC EZ Mapping Tool is a free online mapping tool that enables users to identify potential clean energy resource areas within the Eastern Transmission Interconnection. This web site provides information [about the study](#), background on the [energy resources](#), and details on the [data layers used in the tool](#). There are also links to [policies and regulations](#), [printable maps](#), [documents](#), and related [links](#).

Features

- Eight energy resources: [Biomass](#), [Clean Coal](#), [Geothermal](#), [Nuclear](#), [Solar](#), [Storage](#), [Water](#), and [Wind](#)
- Flexible analysis of siting factors such as slope and land protections
- Analysis of potential collocation of energy technologies
- Informed analysis to reduce new transmission construction

Getting Started
The EZ Mapping Tool is an easy-to-use web-based mapping system. Click the launch button above to start. If you need help, use the Help menu at the top of the page. We are interested in your feedback. Please email your comments to eispctools@anl.gov. Your input will be used to evaluate the quality and value of this web site.

News

May 14, 2013
[Webcast Demonstration: Thursday, May 23, 11:00 Central](#)
A one-hour webinar demonstration of the EISPC Energy Zone Mapping Tool will be presented...

April 30, 2013
[Webcast Demonstration: Wednesday, May 15, 2:00 Central](#)
A one-hour webinar

Partners and Sponsors
The study is led by the Eastern Interconnection States' Planning Council (EISPC). The research support and technical assistance to EISPC is provided by Argonne National Laboratory, National Renewable Energy Laboratory, and Oak Ridge National Laboratory. Funding is provided by the U.S. Department of Energy. [More >](#)

<http://eispctools.anl.gov>

EZ Mapping Tool Includes Searchable Policy Database

- Laws, regulations, incentives, and other policies in the EI states (including Canadian provinces) related to clean energy generation
- Over 2,300 policies (compiled by Clean Energy States Alliance – CESA)

EISPC EZ Mapping Tool

Help My Account

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Search for Policies & Regulations Provide policy updates or edits to eispc tools@anl.gov.

Country/State/Province	Policy Type	Implementation Sector	Affected Technologies
District of Columbia Florida Georgia Illinois Indiana Iowa Kansas Kentucky Louisiana	Bond Program Climate Policies Corporate Tax Incentive Enterprise Zone Environmental Regulations Equipment Certification Equity Investment Fees Generating Facility Rate-Making	Federal Local Non-Profit State/Province Utility	Biomass/Biogas Coal with CCS Concentrating Solar Power Energy Storage Fuel Cells Geothermal Electric Hydroelectric Natural Gas Nuclear

Search

Found 13 results

[Administrative Code Title 83, Public Utilities \(Illinois\)](#)

↓ [Show the Summary](#)

Policy Type	Environmental Regulations, Generating Facility Rate-Making, Renewables Portfolio Standards and Goals, Safety and Operational Guidelines, Training/Technical Assistance
Affected Technologies	Biomass/Biogas, Coal with CCS, Concentrating solar power, Energy Storage, Fuel Cells, Geothermal Electric, Hydroelectric energy, Small Hydroelectric, Natural Gas, Nuclear, Photovoltaics, Wave Energy, Wind energy
Implementation Sector	State/Province

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IEEE PES
Energy Society®

EZ Mapping Tool Supports Suitability Modeling of Nine Clean Energy Resource Categories



Wind



Biomass



Clean Coal (with carbon capture and storage)



Water

Clean Energy Resource Categories



Geothermal



Storage



Solar



Nuclear



Natural Gas

Suitability Models and/or Reports are Available for 29 Clean Energy Technologies

Biomass

- New biomass-fired plant with traditional combustion
- Biomass co-fired with existing coal plant
- Landfill gas extraction and plant inventory
- Methane extraction from wastewater treatment
- Methane extraction from animal manure processing

Clean Coal

- New clean pulverized coal technology
- New integrated gasification combined cycle
- New coal fluidized bed
- Retrofitted pulverized coal

Geothermal

- Enhanced geothermal system
- Geopressured geothermal

Natural Gas

- Combined cycle
- Underground natural gas storage
- Above-ground natural gas storage

Nuclear

- Large light-water reactor
- Small modular reactor, integral pressurized-water reactor
- High-temperature gas cooled reactor/
Very high temperature gas-cooled reactor

Solar

- Concentrating solar power
- Utility-scale photovoltaic
- Rooftop photovoltaic solar

Storage

- Hydroelectric pumped storage
- Compressed air energy storage

Water

- Added output from existing hydropower dam
- New output from existing non-powered dam
- In-stream hydrokinetic energy
- Tidal hydrokinetic energy
- Wave energy

Wind

- Land-based wind turbine
- Offshore wind turbine



Suitability model

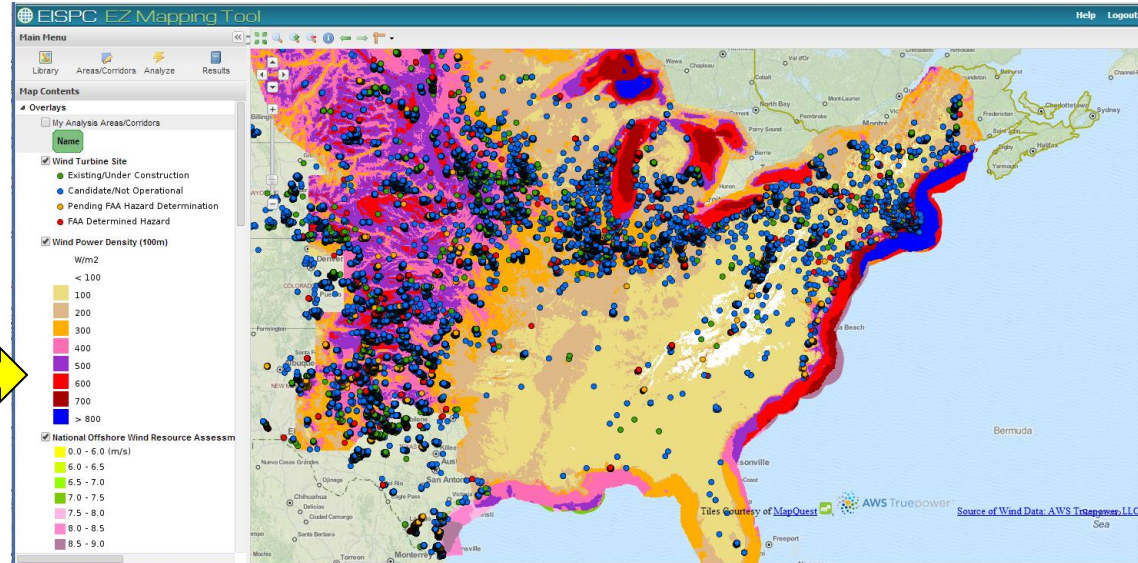
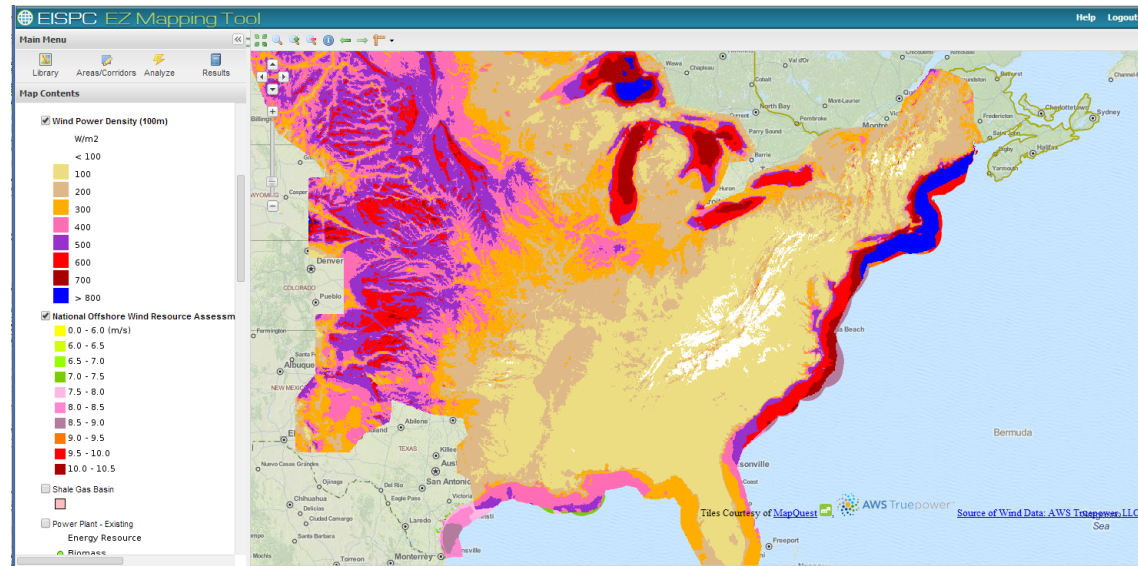
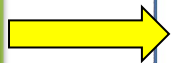


Report based on inventory or energy resource availability

EZ Mapping Tool Has an Extensive GIS Data Library

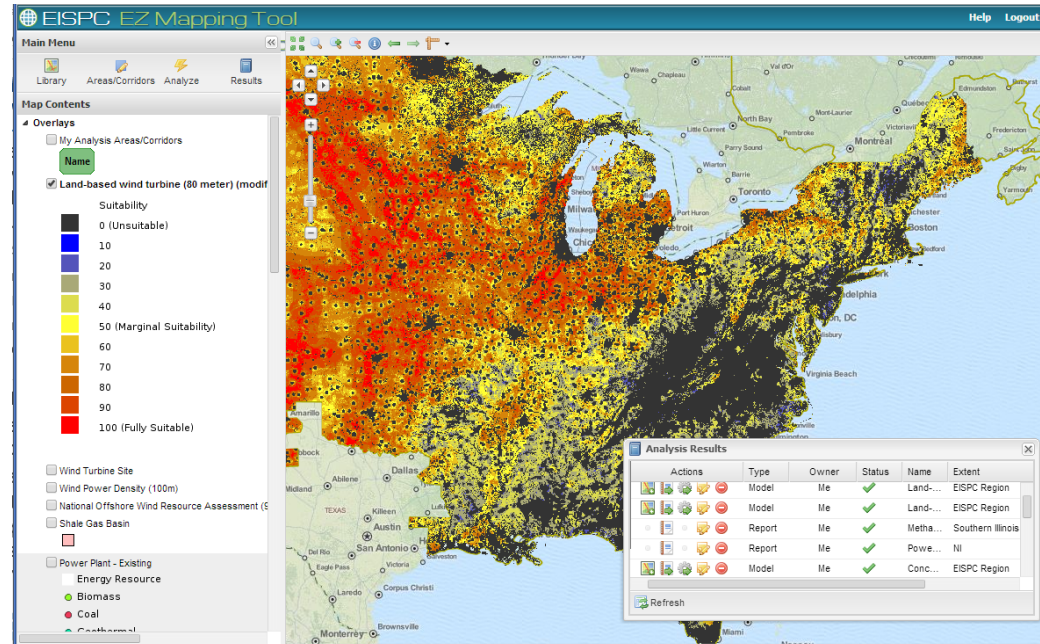
- About 250 GIS mapping layers:
 - Energy resources (wind, solar, biomass, etc.)
 - Energy infrastructure
 - Siting factors
 - Reference layers
 - Environmental
- Detailed metadata for all layers
- Downloadable GIS data for most layers
- Searchable energy policy database (2,360 policies)
- Actively maintained and updated

Existing/planned wind turbine sites shown over wind energy potential data



EZ Mapping Tool Allows Users to Perform Customized Suitability Modeling of Energy Resources

- Models generate “heat maps” showing suitability of areas for developing any clean energy resources
- Inputs include:
 - Energy resource data
 - Land cover/landforms
 - Environmental factors
 - Population density
 - Existing infrastructure
 - Other suitability factors
- Models are user-configurable and fully customizable
- Users can design new models using any of 60 input model layers
- Composite “synergy” models map areas suitable for multiple technologies

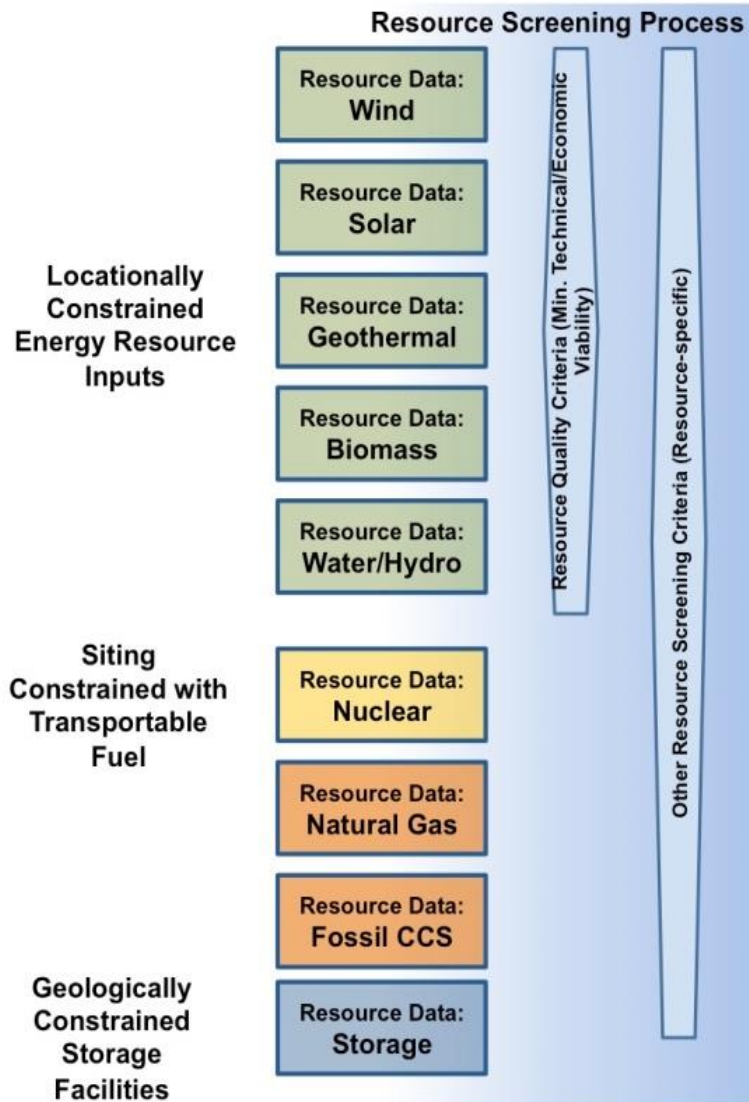


Models			
Actions	Resource	Name	
[Icon]	Geothermal	Geopressedured	
[Icon]	Water	Marine Tidal Hydrokinetic	
[Icon]	Wind	Land-based wind turbine (100 meter)	
[Icon]	Geothermal	Enhanced Geothermal Systems (EGS)	
[Icon]	Nuclear	High-Temperature Gas-cooled Reactor (HTGR)	

Reports			
Actions	Resource	Name	
[Icon]		Corridor	
[Icon]		Demand-Side Resource	
[Icon]		Electrical Transmission	
[Icon]	Water	Existing Hydropower Dams	
[Icon]		Habitat	

EZ Mapping Tool Suitability Modeling Approach

I. Single Resource Analysis



II. Synergy Analysis

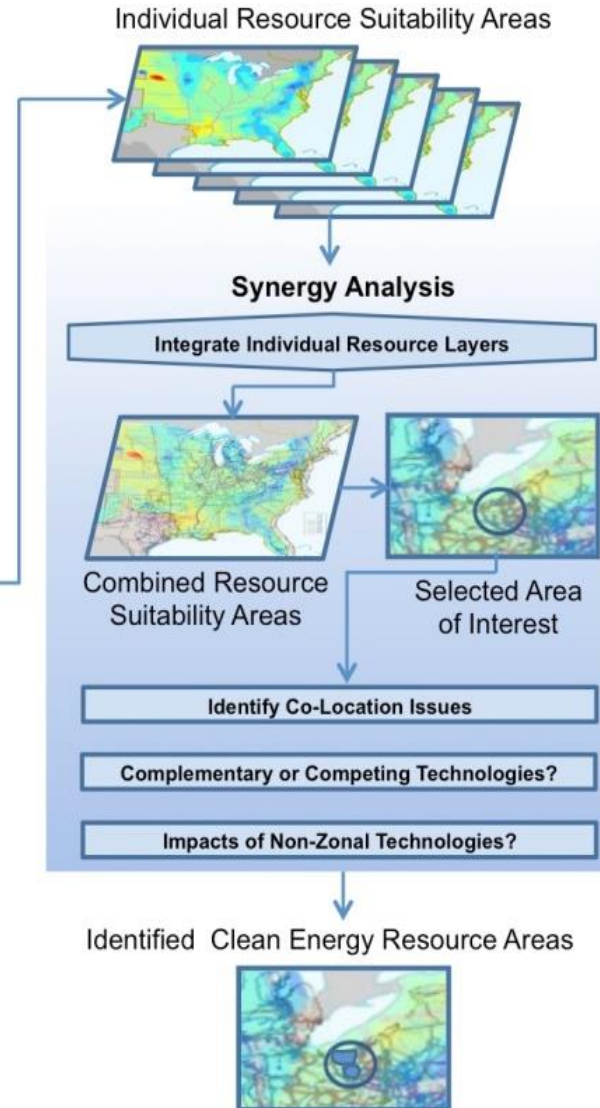
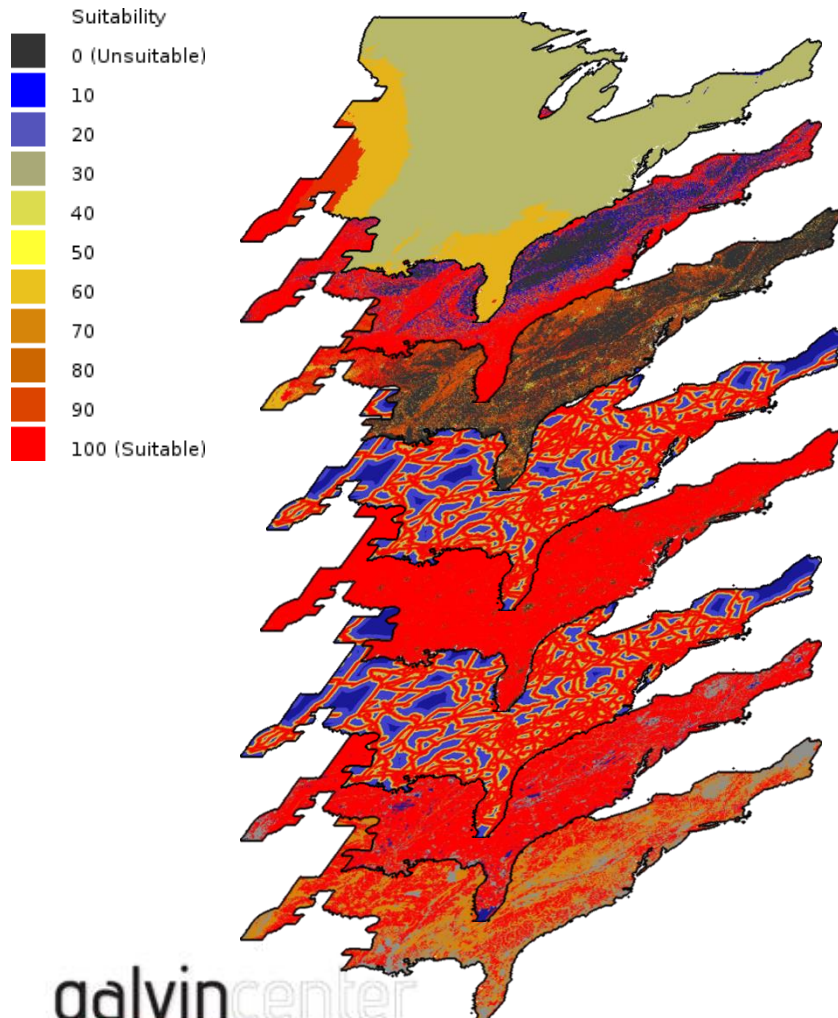


Illustration of Suitability Modeling Approach

Example for Concentrating Solar Power



Input Modeling Layers

Energy Potential: Solar CSP

Slope

Land Cover Area

Distance to Rivers $\geq 64,500$ gpm

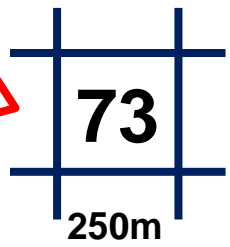
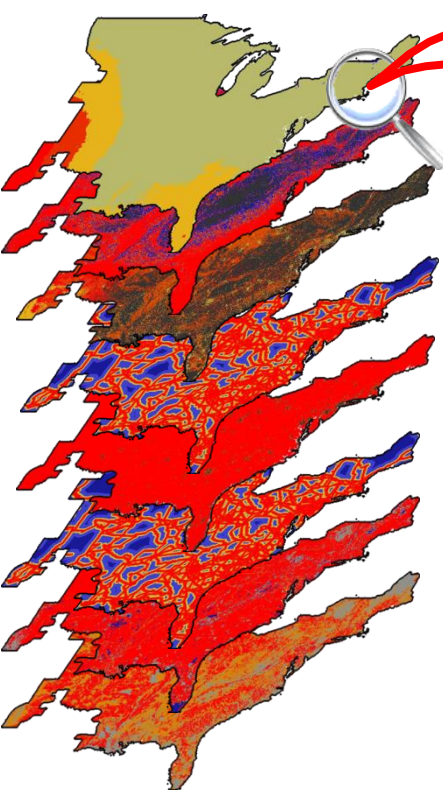
Population Density

Distance to Transmission ≥ 345 kV

Protected Lands (Composite of many sources)

Habitat (Composite of many sources)

Calculating Composite Suitability Score for Each Cell



Each 250m x 250m cell, in each layer, is coded with a suitability value from 0 (unsuitable) to 100 (highest suitability)

Input data

- 73
- 12
- 27
- 46
- 31
- 80
- 50

Model Parameters

Actions	Weight	Name
	4	Concentrating Solar Direct Normal Potential
	2	Slope
	1	Land Cover Area
	2	Distance to Rivers (>64,500 gpm)
	3	Landscan Population Density
	1	Distance to Transmission (>345 kV)
	2	Protected Lands
	2	Habitat

Name: Concentrating Solar Power (CSP) (modified)

Composite Score



Geometric Mean Computation

Potential Studies and Applications

- Mapping and characterizing offshore wind resources in Great Lakes region
- Identifying areas in Great Plains with highest wind energy potential and least environmental impact
- Identifying biomass areas in the Southeast and New England
- Measuring and mapping reduction in wind potential when assuming stringent rather than moderate habitat avoidance criteria
- Mapping location of flexible resources (e.g., energy storage) relative to variable renewable resources, etc.