Solar Siting: Encouraging Thoughtfully Sited Renewable Energy Development

Agricultural Stakeholder Group
June 3, 2021

Maine Audubon

Sarah Haggerty

Maine Audubon and Renewable Energy Siting

Our mission: Maine Audubon works to conserve Maine's wildlife and wildlife habitat by engaging people in education, conservation, and action.

- Climate change is currently the most significant threat to Maine's wildlife and habitats, and 2/3 of all North American birds are at risk.
- Approximately one-third of the plant and animal species and their habitats found in Maine are affected by climate-change related threats.

Climate Change and Wildlife

Maine Audubon supports policies that transition Maine to a clean energy economy. Advancements in solar, wind, and other renewable energy technologies mean that achieving 100% renewable energy in Maine by 2050.

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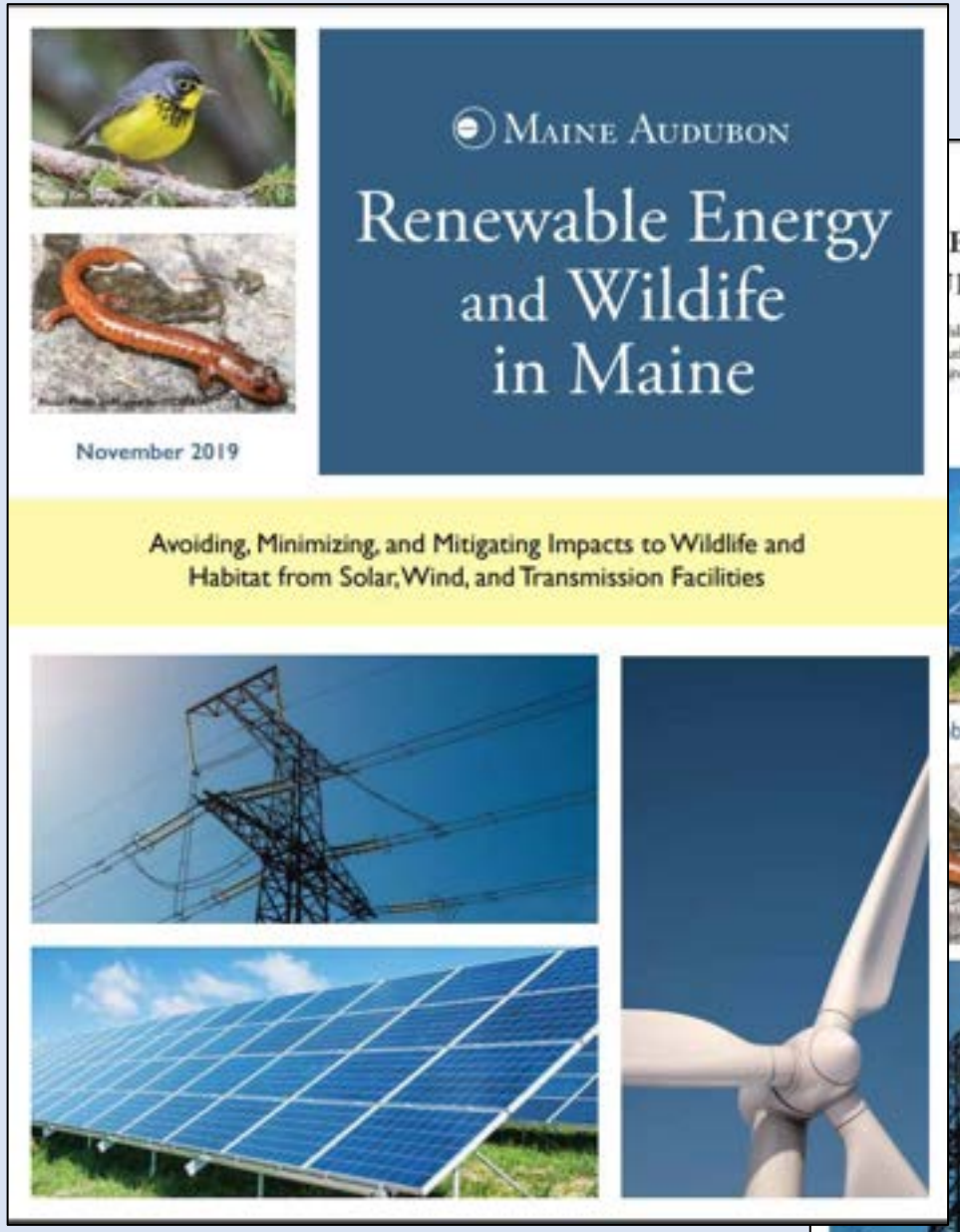
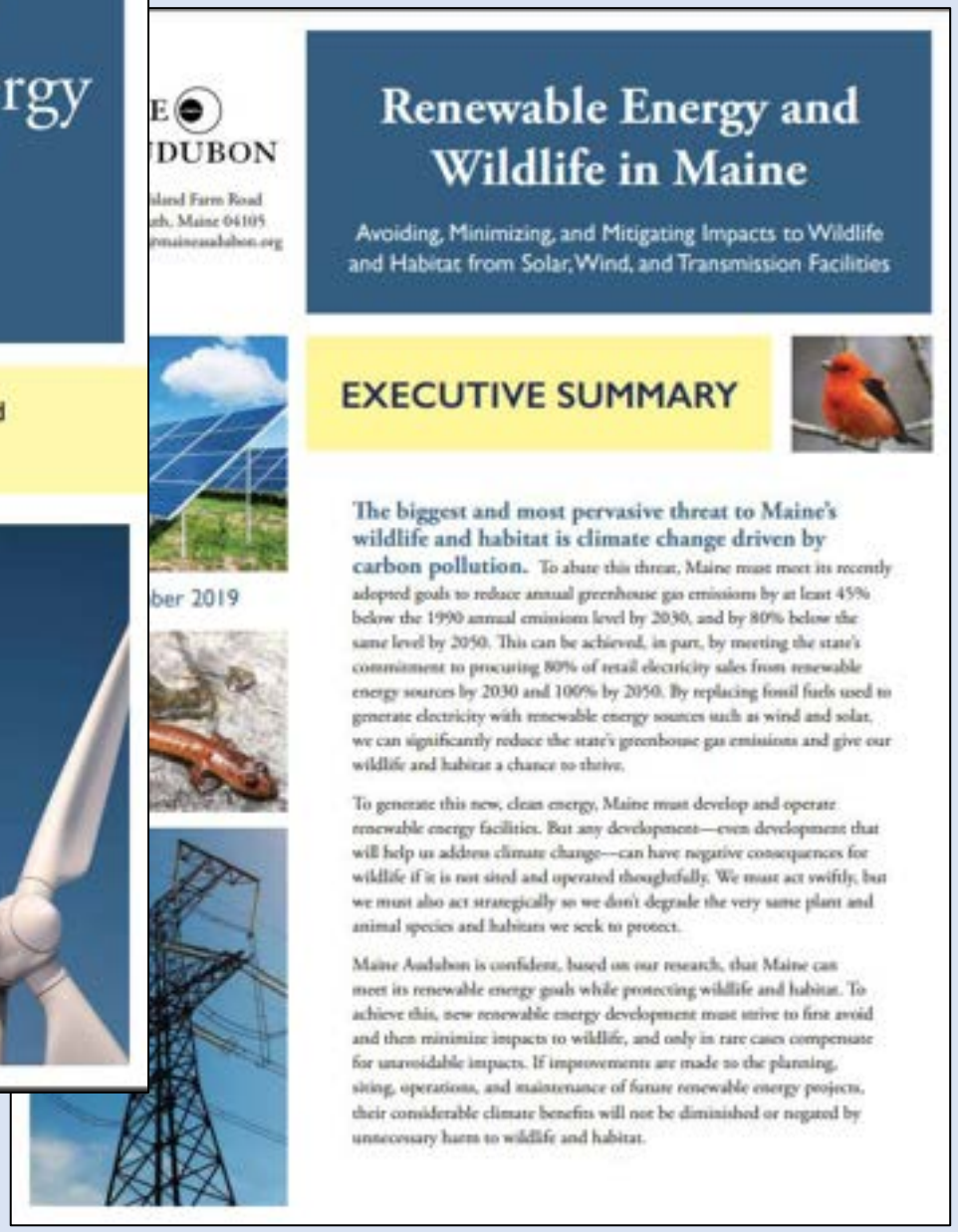
- In 2019 Maine Audubon published a report looking at the intersection of renewable energy and wildlife and habitats
- Scientific literature review
- Focused on solar, terrestrial and offshore wind, and transmission





https://maineaudubon.org/advocacy/climate-energy/

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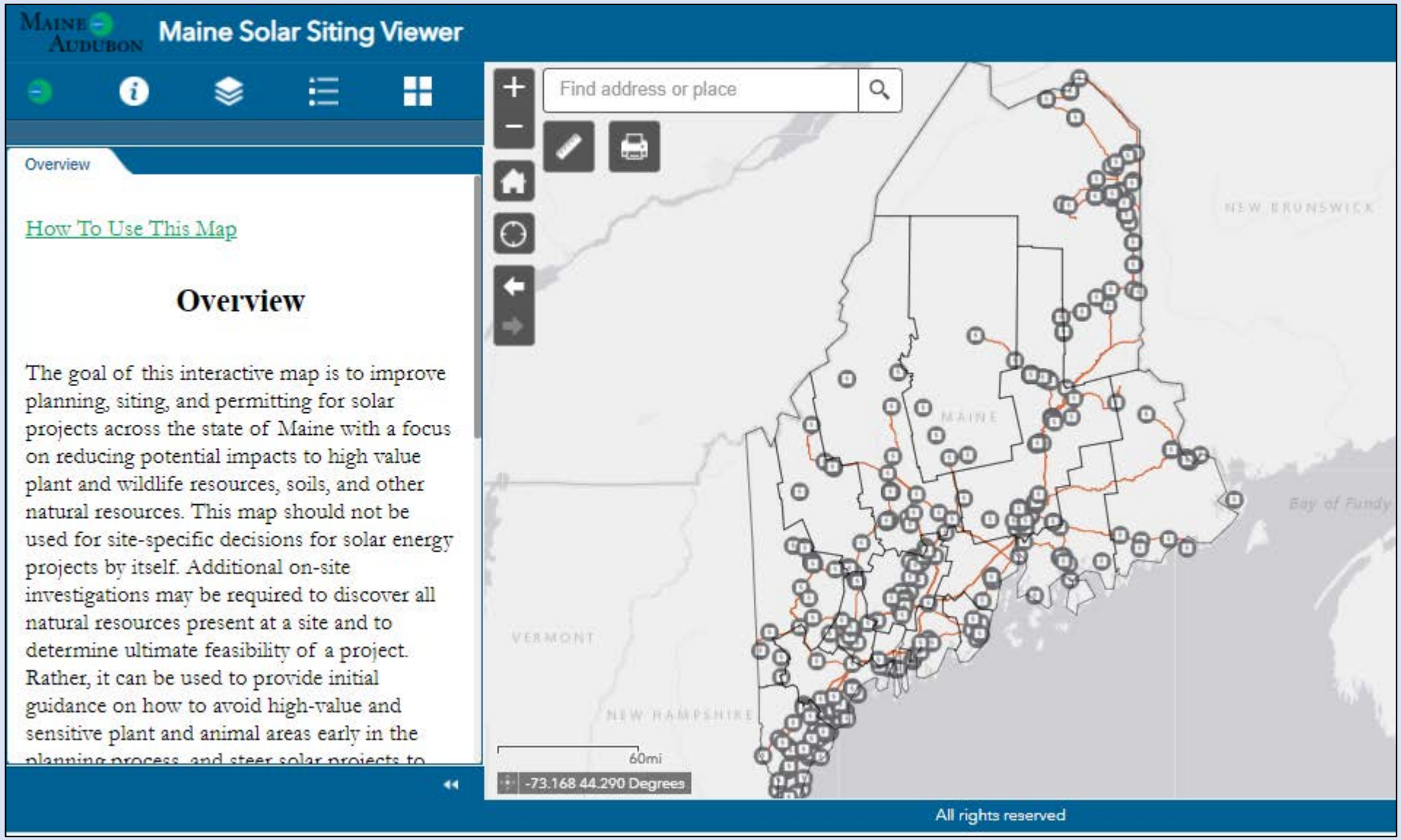
Solar Coalition

- Initially for solar legislation, shifted to getting solar projects on the ground
- Mix of Env NGOs, Solar Developers, Ag NGOs, natural resource agencies, etc.
- Siting was early topic of discussion
- Needed spatial tool to know where resources are
- SOLAR SITING TOOL

Solar Siting Map – 2020

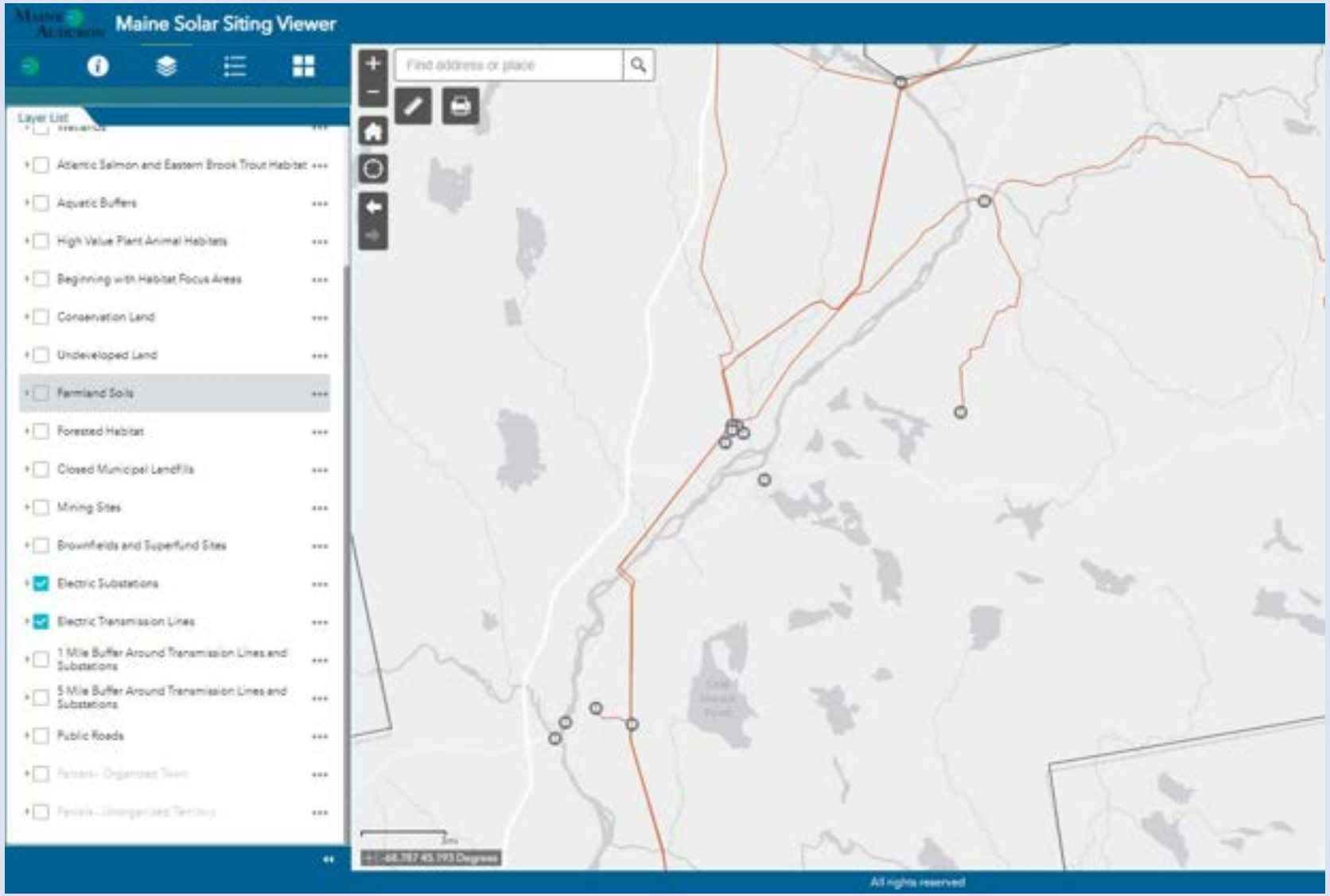
maineaudubon.org/solar



- Focus is on existing electric infrastructure
- Margins low for solar, so must be within short distance of infrastructure
- Shows High Value Habitats within 5 miles of electrical infrastructure

Solar Siting Map – 2020

maineaudubon.org/solar



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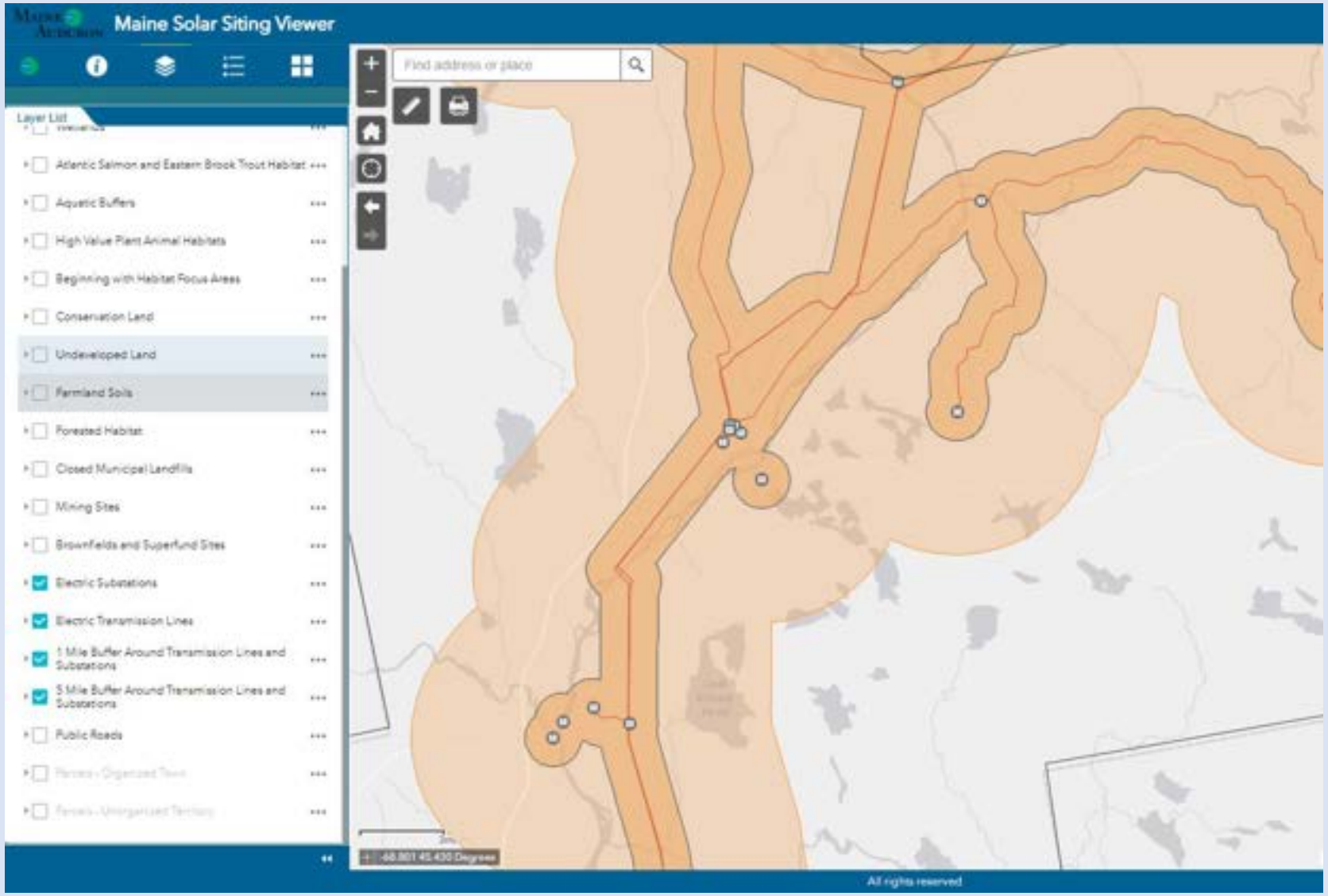

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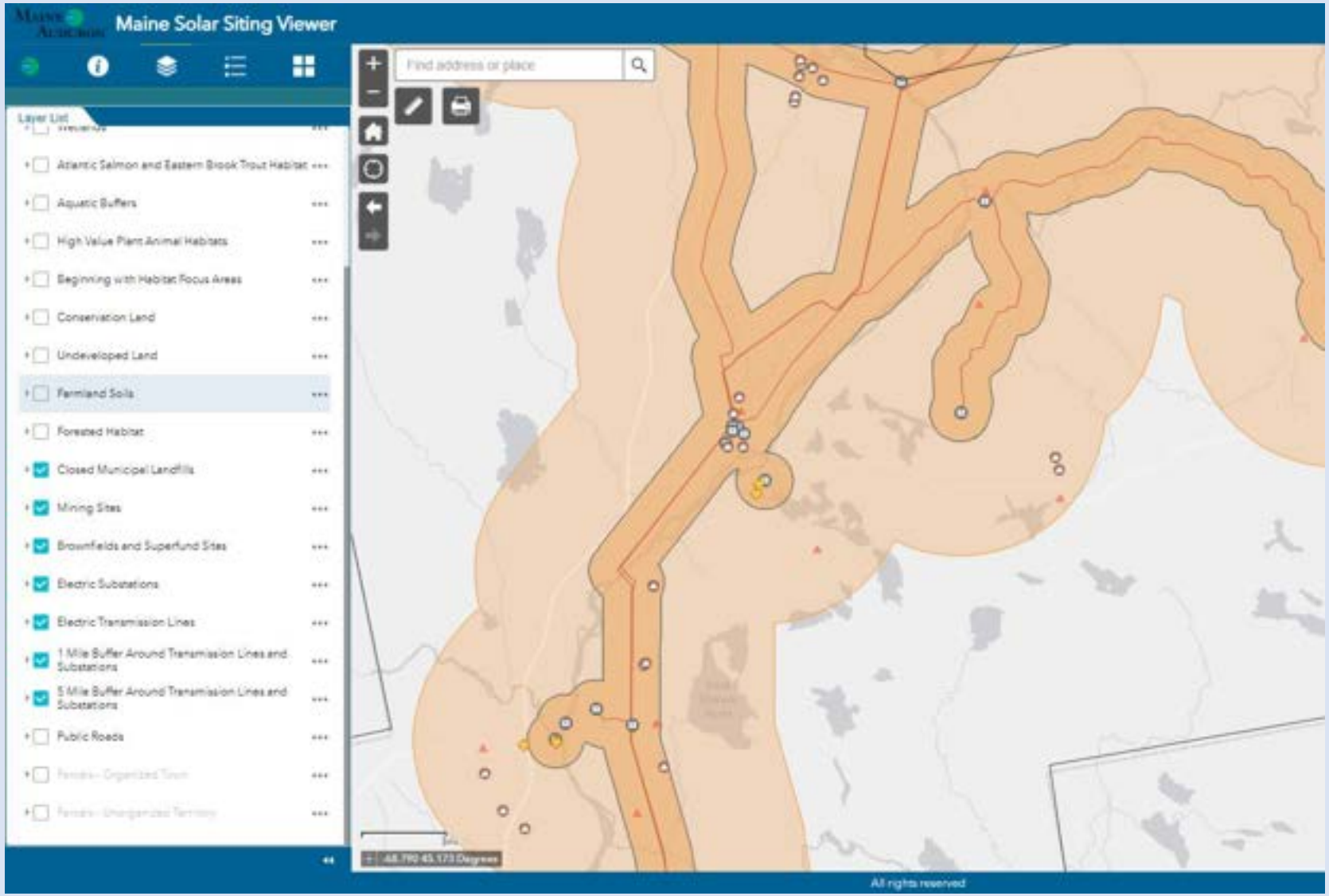

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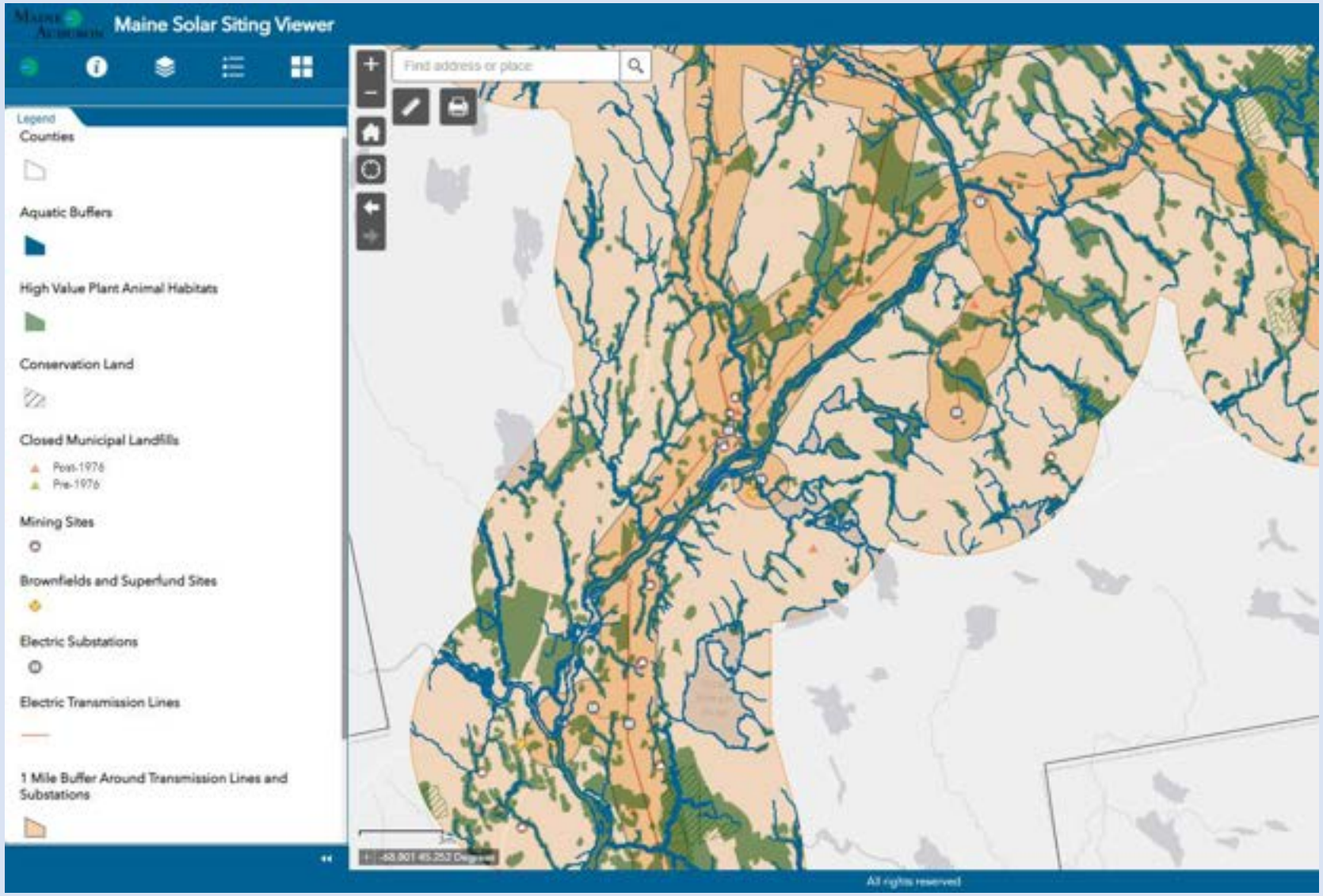

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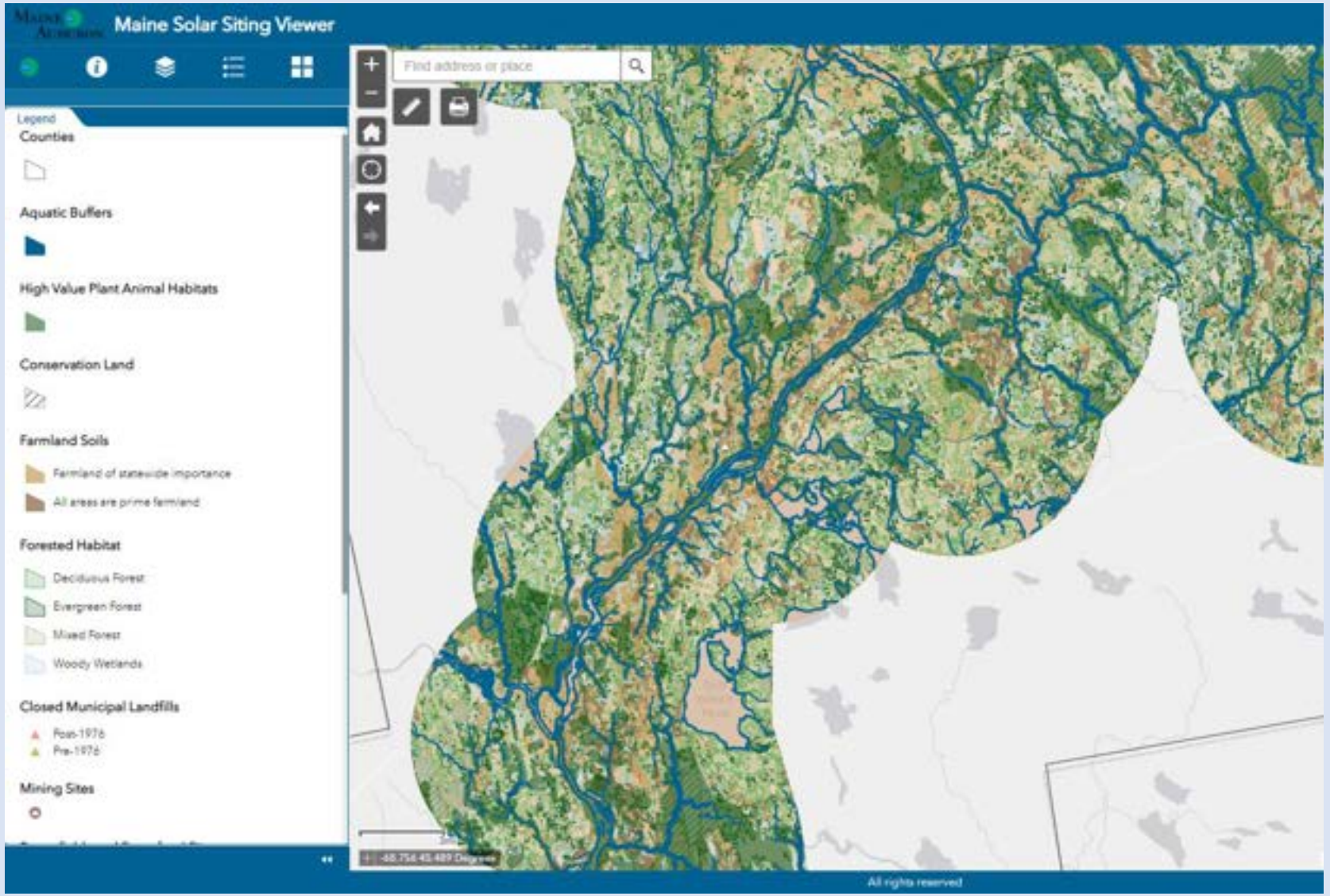

- Designed to be a tool to provide basic information
- Limited to areas within 1- and 5-miles from electric substations and transmission lines
- No guidance offered

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Solar Siting BMPs

- Developed with conservation and agricultural NGOs
- For siting solar in Natural Areas
- For siting solar in Agricultural Areas
- BMPs for all solar development

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BEST PRACTICES

for Low Impact Solar Siting, Design, and Maintenance

Avoiding and Minimizing Impacts to Natural and Agricultural Resources

Increasing renewable energy production in Maine is critical to mitigating the impacts of climate change on Maine's natural resources and agricultural and natural resource based economies. Solar projects that follow these low-impact best practices will help Maine people, businesses, and communities realize solar's climate and economic benefits, while avoiding or significantly reducing undue impacts to wildlife, farming, and critical natural resources such as clean water.

The purpose of this document, authored by Maine-based environmental and agricultural nonprofit organizations, is to advise solar developers, municipalities, and the public about ways to avoid or minimize development conflicts. It is not meant to supercede required federal, state and municipal permitting; likewise, we recommend using these best practices regardless of permit requirements. It is also important to note that solar development is subject to other considerations, including interconnection, project economics, and other siting constraints.

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- Prioritize disturbed or developed lands
- Avoid high value wildlife habitats
- Avoid high value agricultural soils
- Stay near existing infrastructure and population centers
- Engage with local communities

Natural Resource Siting Best Practices

(1) **Preferentially use disturbed, developed, or degraded lands.** This includes landfills, brownfields[1], roadway medians and edges, parking lots, rooftops, idle or underutilized industrial or commercial sites, and sand and gravel pits. Utilizing disturbed lands avoids new forest clearing, minimizes soil disturbance, and takes advantage of unutilized or underutilized space.

(2) **Avoid where practical, and minimize as much as possible, impacts to sensitive wildlife habitats and high-value natural resources.** This includes all habitats identified as "Significant Wildlife Habitats" under Maine's Natural Resources Protection Act, as well as additional areas and natural communities deemed to be rare or particularly sensitive to encroachment.[2] Other sensitive habitats include threatened and endangered species habitat, rare plant populations, cold-water fish habitat, wetlands, eelgrass beds, rare natural communities, Focus Areas of Statewide Ecological Significance, forested areas that have not previously been cleared for agriculture, and resilient and connected landscapes.[3]

There is no comprehensive statewide inventory that includes all Rare, Threatened, and Endangered species occurrences and habitats, Significant Wildlife Habitats, and important natural resources. Though many resources are included on data layers and resource maps, the completeness of such varies by habitat type, location, and previous survey efforts. Thus, such tools should be considered preliminary until otherwise noted by the appropriate resource agency.

A desktop evaluation of these resources should not take the place of detailed, site-specific investigations of any proposed site to identify any unmapped habitats, species, or resources present at the site. Likewise, it should be recognized that GIS mapping may not be accurate and site specific investigations may supercede GIS mapping.

In all circumstances, preference should be given to avoidance, with minimization and compensation utilized only where avoidance is not possible.

(3) **Avoid where practical, and minimize as much as possible, impacts to intact forest landscapes.** Intact forest landscapes are areas with no significant human development or long-term habitat fragmentation and that provide relatively undisturbed habitat conditions. They are critical for increasing carbon storage, harboring biodiversity, regulating hydrological regimes, and providing other essential ecosystem functions.

(4) **Allow for habitat connectivity by avoiding or minimizing impacts to wildlife corridors; locate projects near existing transmission and distribu infrastructure, highways and population center co-locating new transmission infrastructure; an using wildlife-friendly fencing.** Wildlife corrido include migration corridors for terrestrial wildlife, corridors, and climate corridors utilized by wildli habitats and home ranges shift in the face of clim change. Likely upland and wetland habitat conne depicted on Beginning with Habitat maps, but n migration corridors aren't as thoroughly mapped. specific information, as well as conversations with resource agencies and local nonprofit organizatio be needed to properly avoid impacts.

Co-locate new transmission lines with existing ma linear features, wherever possible. If co-location i possible, utilize routes that have the least overlap high value natural resources and habitats. Minimi of fencing and where fencing is required, use desi allow for wildlife passage.

(5) **Protect water quality and avoid erosion.** Utiliz Smart road/stream crossings, proper erosion contr techniques, and minimize the number of stream a wetland crossings to the greatest degree possible. adequate buffers around wetlands, vernal pools, a other aquatic systems to allow for the natural fun of such systems, including retaining shade for str and providing travel corridors for multiple fish an wildlife species. Adopt stream protection standard buffers and cutting developed by the Maine Dep of Inland Fisheries and Wildlife.

(6) **If development is proposed in a greenfield site[4] away from existing infrastructure, evaluate pote cumulative impacts, including existing develop and potential future development for a site.** Th includes the amount of impervious surface and ar of vegetation clearing in the area.

(7) **Restore or maintain native vegetation in the pr area, including "pollinator friendly" species, an avoid where practical, and minimize as much a possible, the use of pesticides and/or herbicide**

1. Brownfields are properties, that, if redeveloped or reused, may be comp presence or potential presence of a hazardous substance, pollutant, or contaminant.
2. Maps for these areas can be found through the statewide Beginning with Habitat program.
3. The location of these habitats can be obtained through the Maine Department of Inland Fisheries and Wildlife, Maine Department of Marine Resources, Maine Natural Areas Program, federal agencies, and local non-profit organizations.
4. A greenfield site is a site that has not been previously developed or otherwise degraded.

Agricultural Siting Best Practices

If it is determined that agricultural land is a responsible site for solar power, the following should be considered to mitigate impacts to the future productivity of the land:

(1) **Where possible, avoid land identified by the Natural Resources Conservation Service as "Prime Farmland" or "Farmland of Statewide Importance," or otherwise cause productive farmland to be taken out of production, including land leased for agricultural uses.**

(2) **Preferentially use previously-developed, disturbed, degraded, or marginally productive portions of the farm property.** This includes rooftops, land within and around farmstead areas, sand and gravel pits, and other areas with low utility for agricultural production.

(3) **Encourage dual-use projects, where agricultural production and electricity production from solar installations occur together on the same piece of land.**

(4) **Build, operate, and decommission projects in ways that preserve the ability for the land to be farmed in the future and that do not inhibit access to or the productivity of farmland surrounding the solar installation.**

(5) **Minimize the impacts of grid connection on the agricultural resources of the property.**

(6) **Where applicable, projects should benefit the farm business directly by providing electricity to meet the energy needs (in whole or in part) of the farm.**

Best Practices for All Solar Development

(1) **Use a proactive approach to community engagement.** In general, Maine people overwhelmingly support solar power. As specific solar projects are proposed in greater number, at larger scale, and in and around communities, it is important to educate and listen to community members about individual projects as early in the development process as feasible. Informal presentations or open houses are often more effective for genuine engagement than the processes required for local permitting.

(2) **Provide municipalities and community members with information about the performance and beneficial outcomes of projects.** Project owners are encouraged to provide information about project performance or outcomes before, during, and after construction. Information can include: energy generation, financial savings, employment/spending, property tax payments, emission reductions or similar metrics. This information can be shared through signage at the project, newspaper articles, or updates to local government officials.

maineaudubon.org/solar

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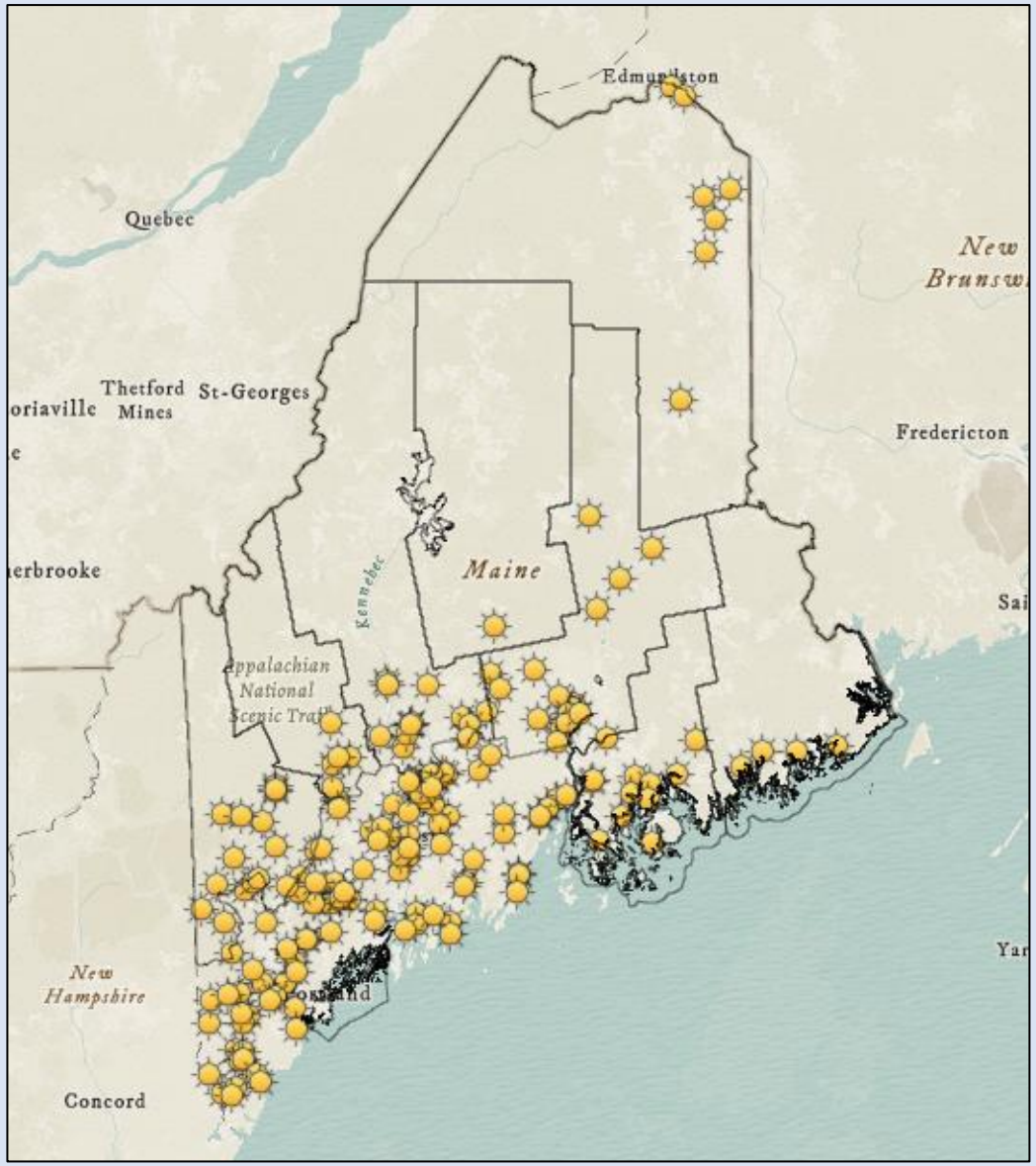
Solar Projects Proposed in Maine

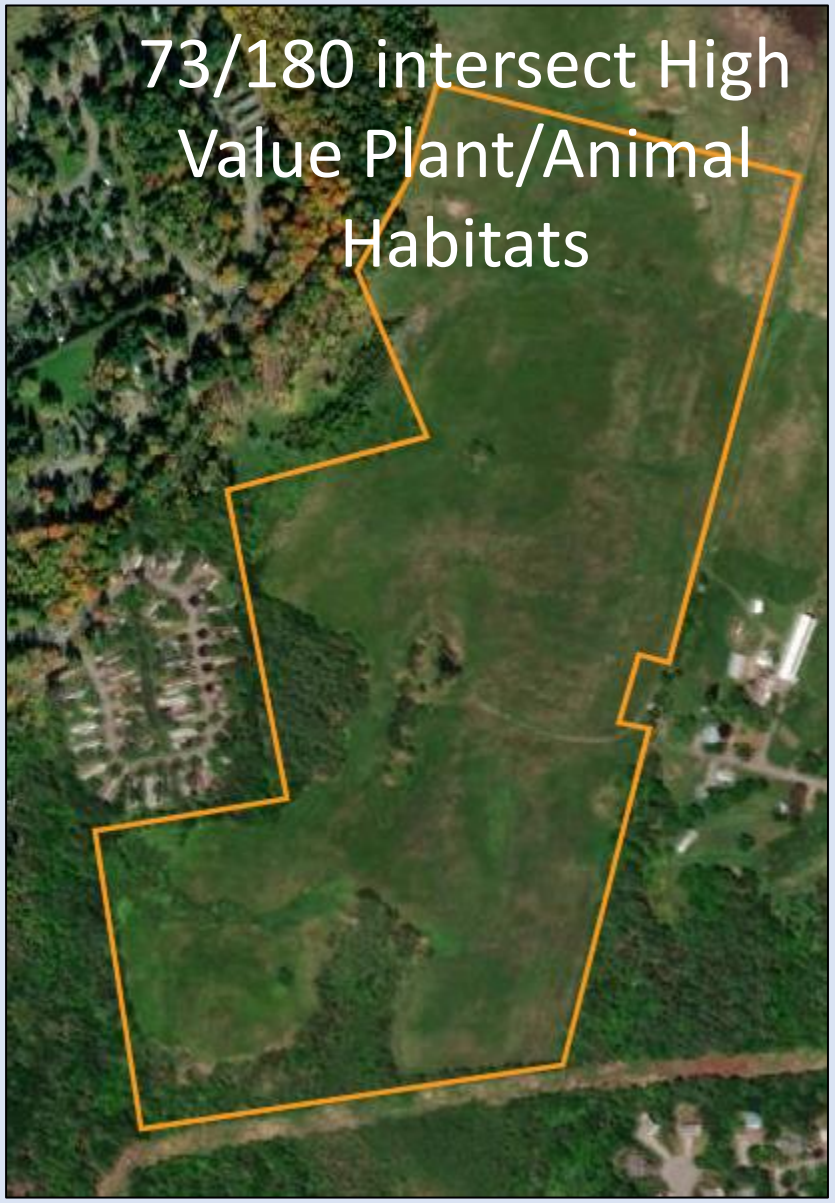
- In all counties
- Primarily southern ME and Central Coast
- ~180 projects submitted to DEP
- Near existing electric infrastructure



Caveats to Analysis

- Only projects in DEP
- Attrition will happen
- Mapping not exact for projects or resource areas

Where Solar Proposed in Maine



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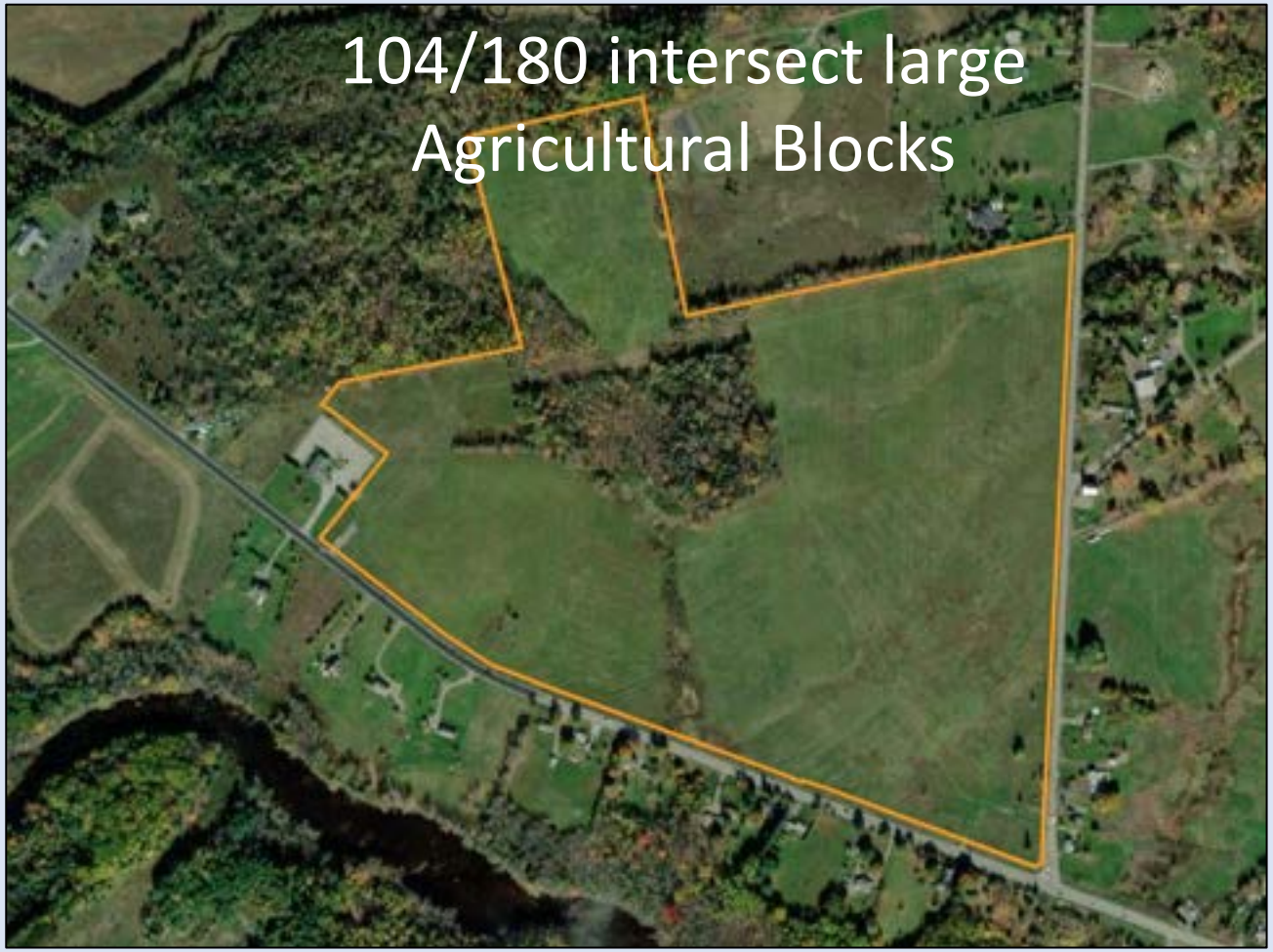

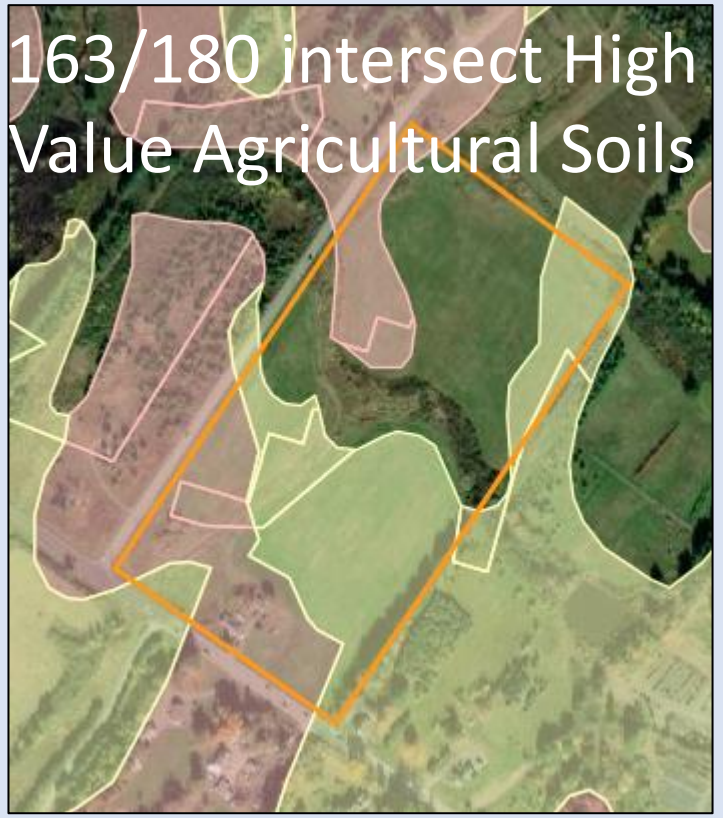

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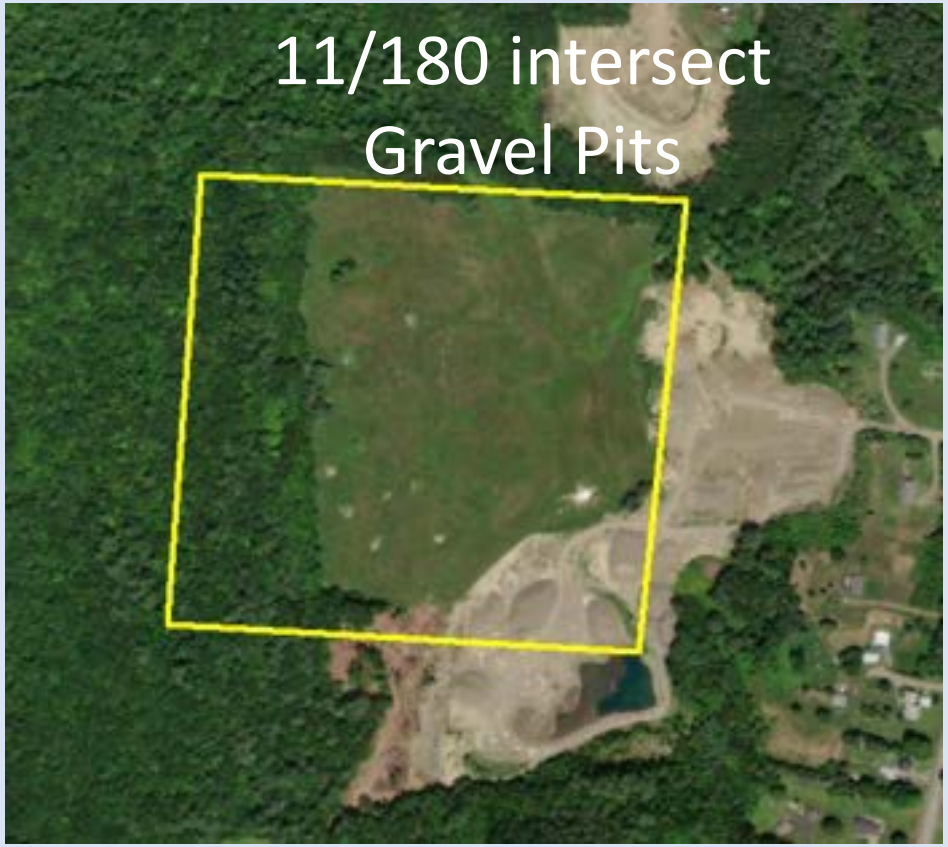

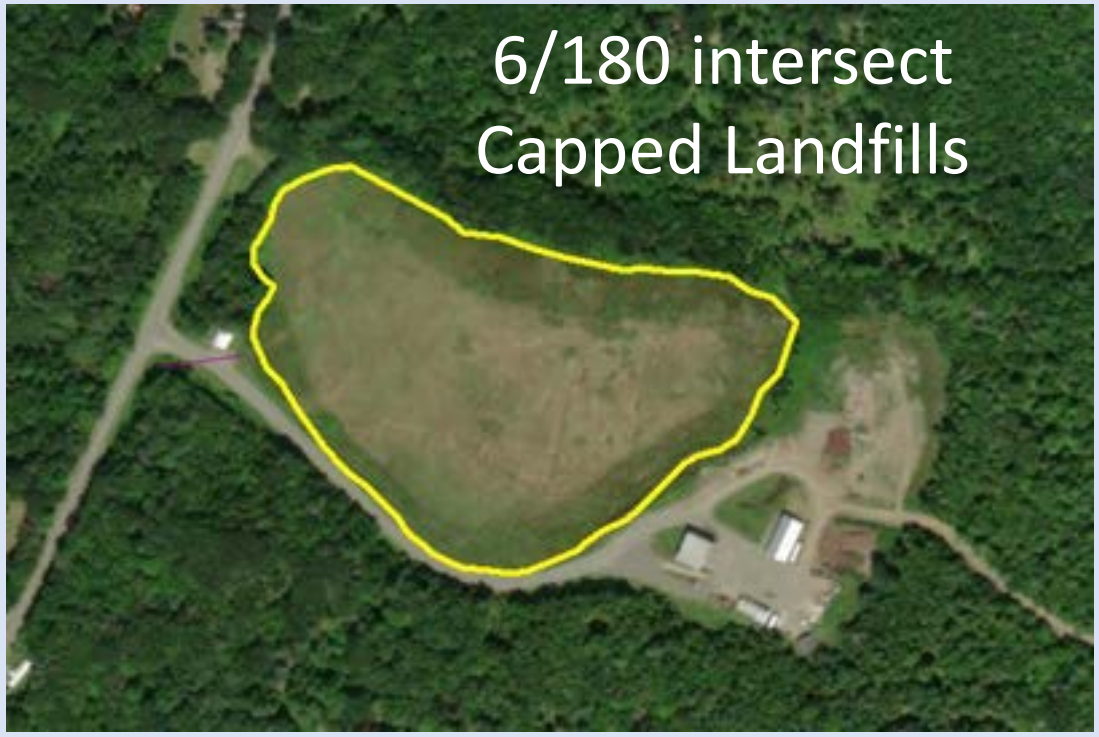

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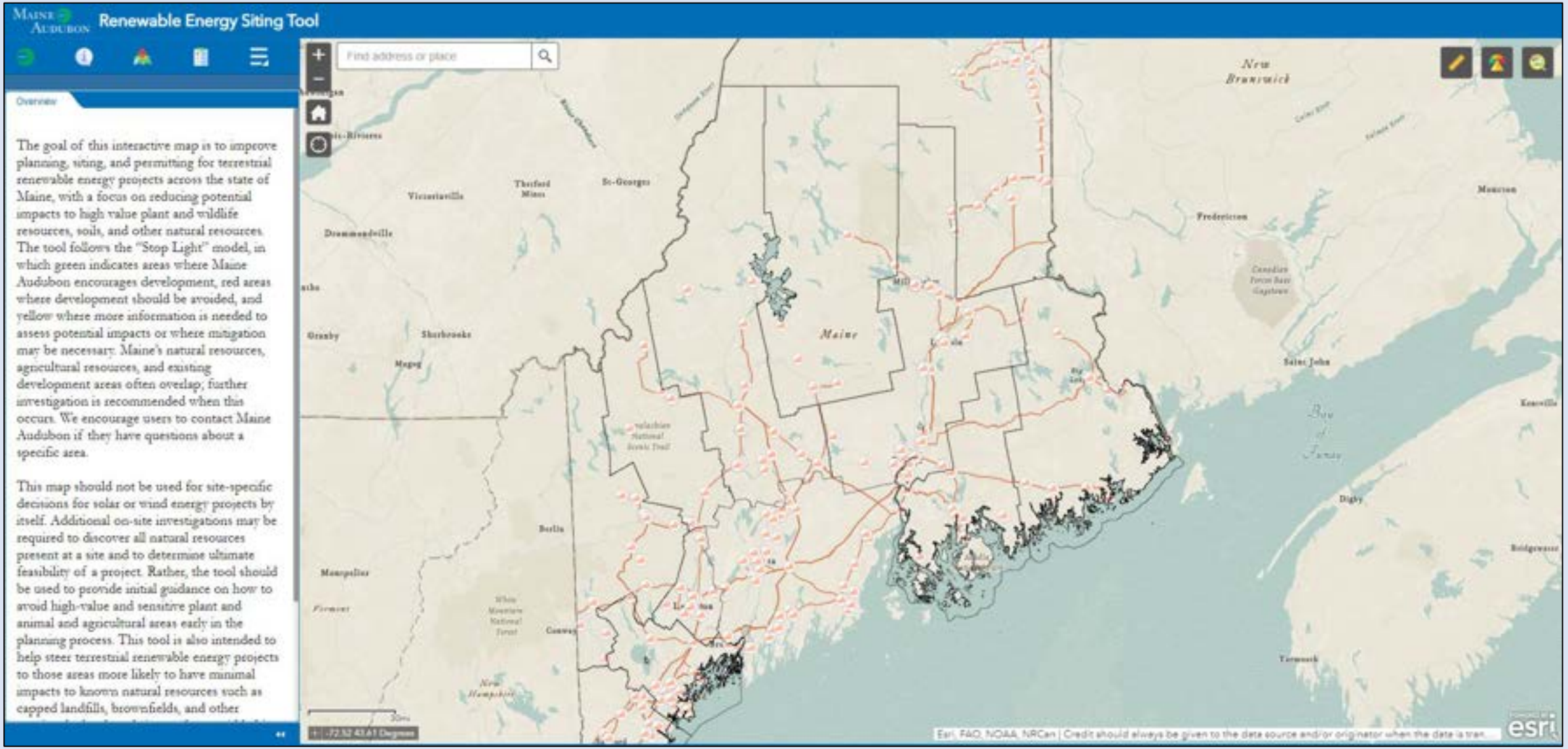
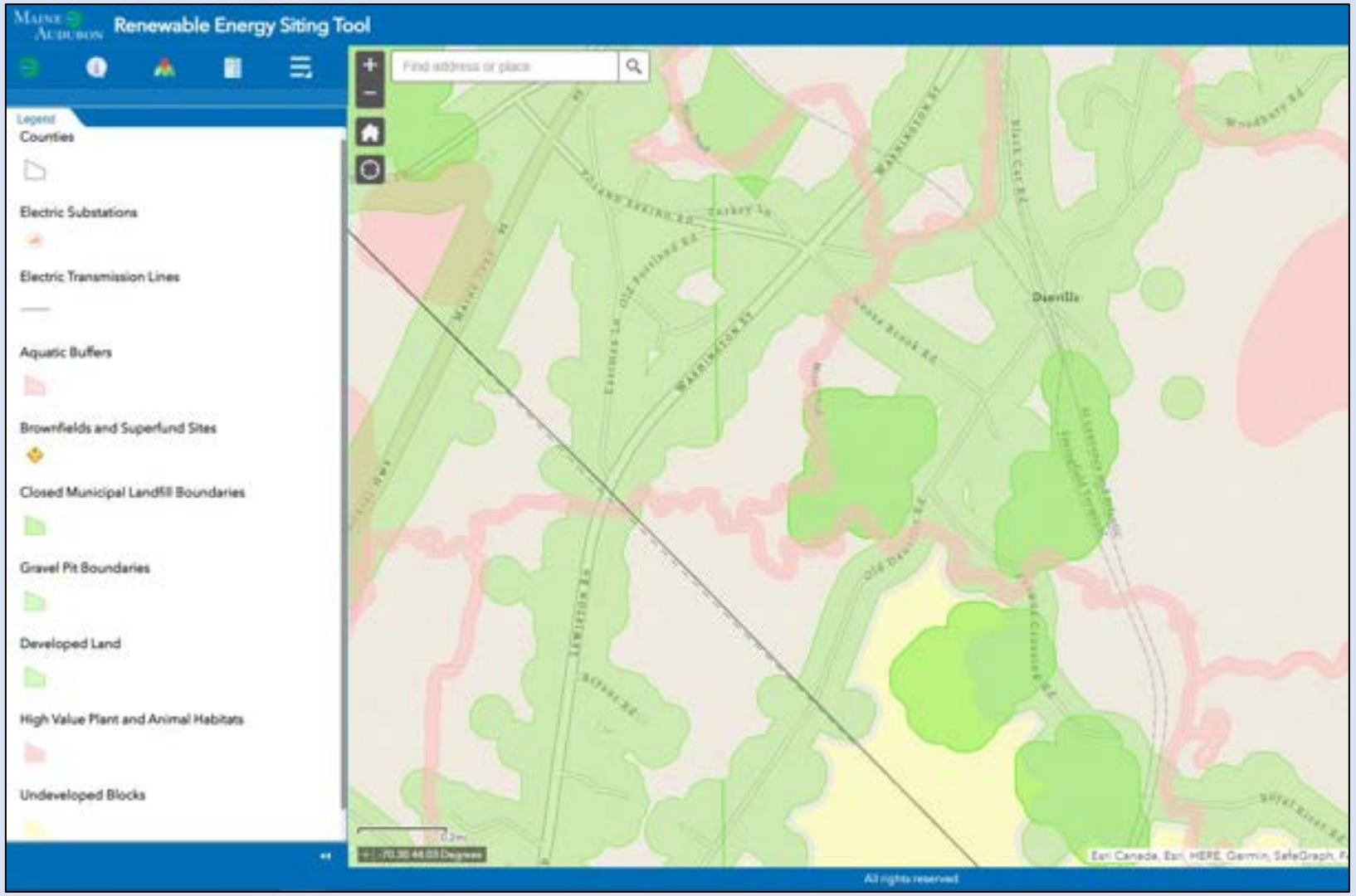
Maine Renewable Energy Siting Tool

Coming Soon!



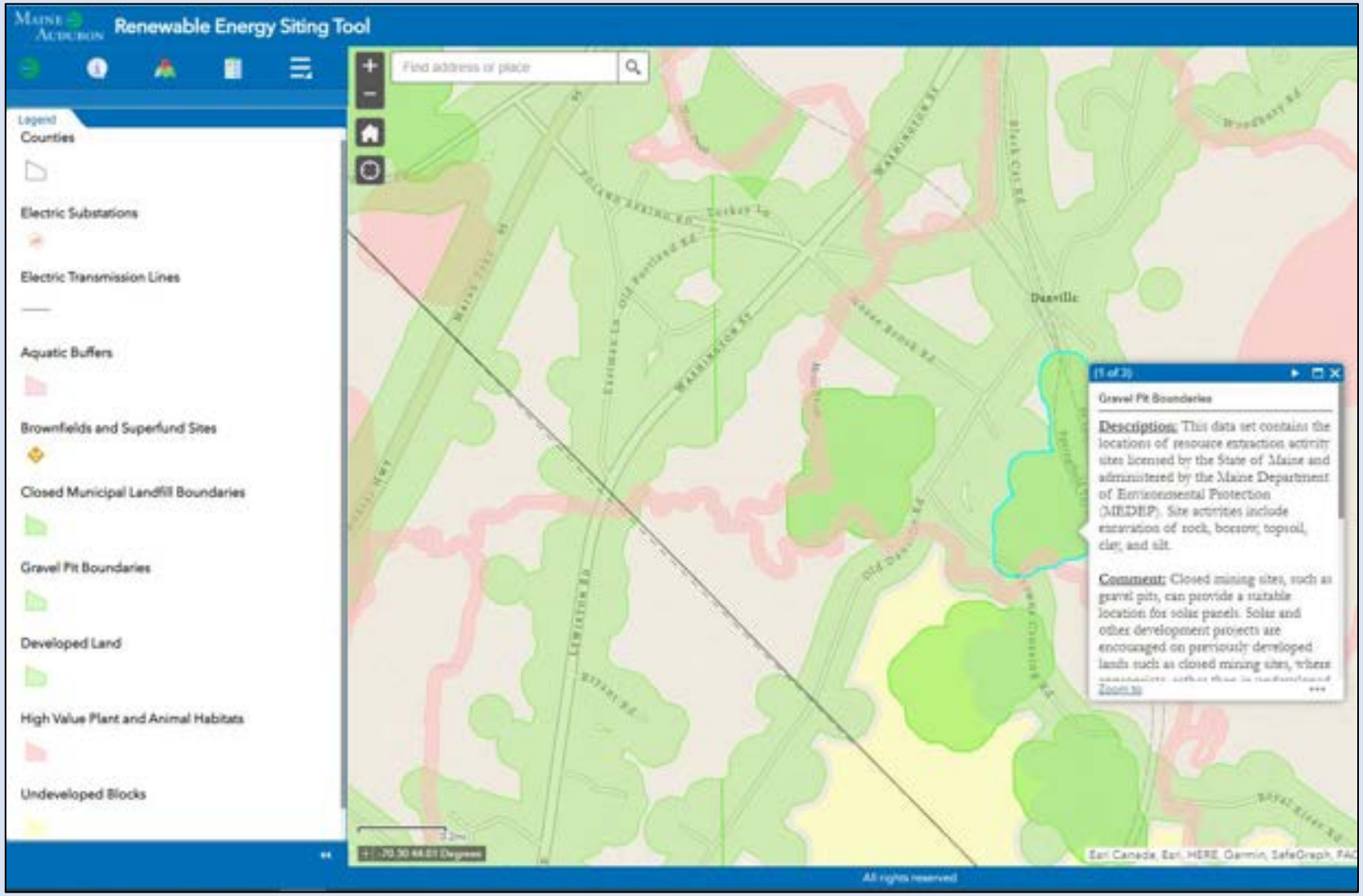
Maine Renewable Energy Siting Tool



Uses "Stop light" approach – red, yellow, green guidance

- "Green" areas – primarily developed areas (gravel pits, landfills, etc.) – solar development is okay
- "Yellow" areas – sites where more information may be needed
- "Red" areas – sites to be avoided
- **There may be overlap**

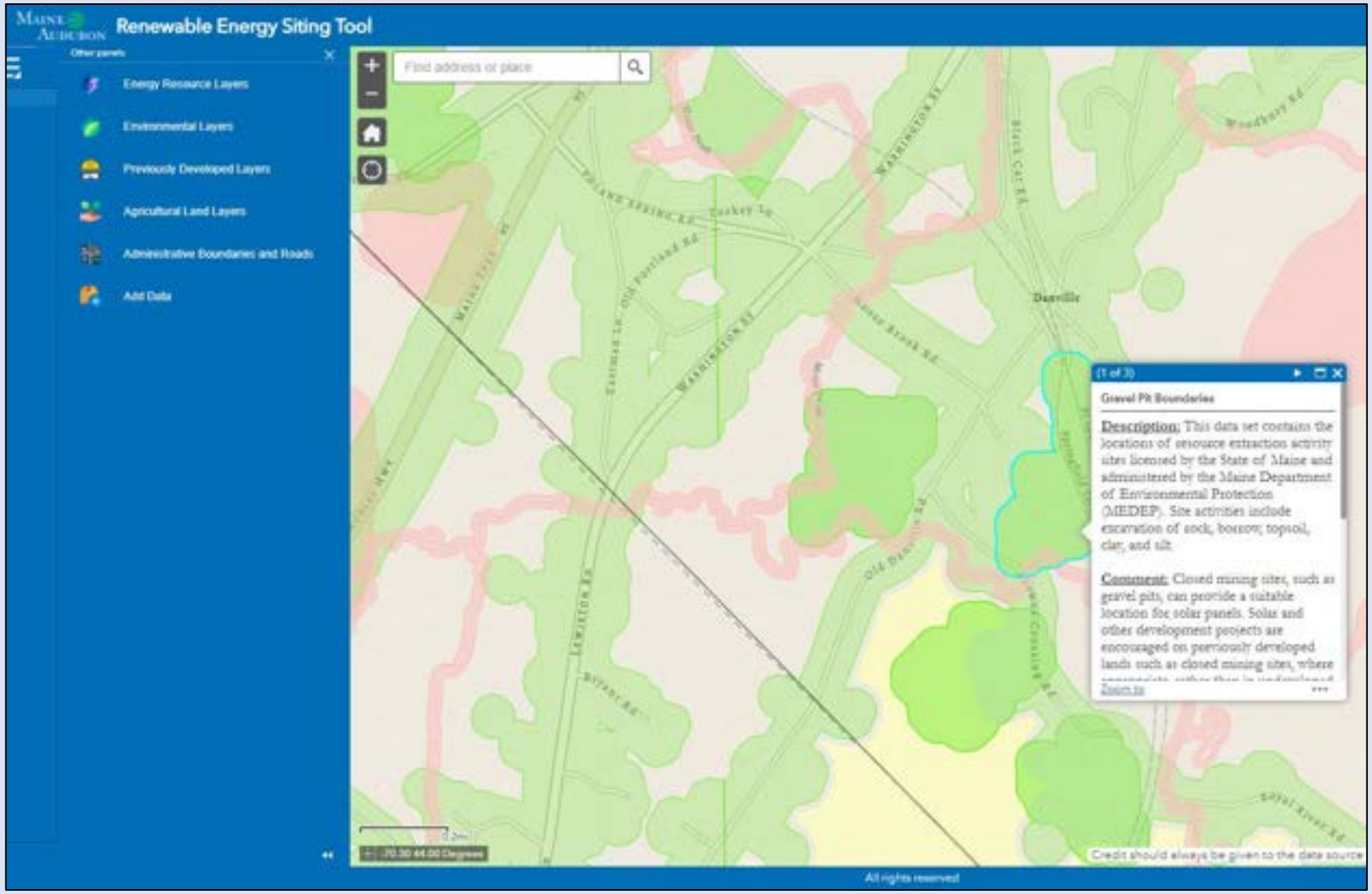
Maine Renewable Energy Siting Tool



Pop-ups provide additional information

- Description – describes what data are included
- Comment – provides guidance on use or avoidance and why
- Contact – provides additional information on regulatory requirements
- Data Source – provides a link to the data source where available

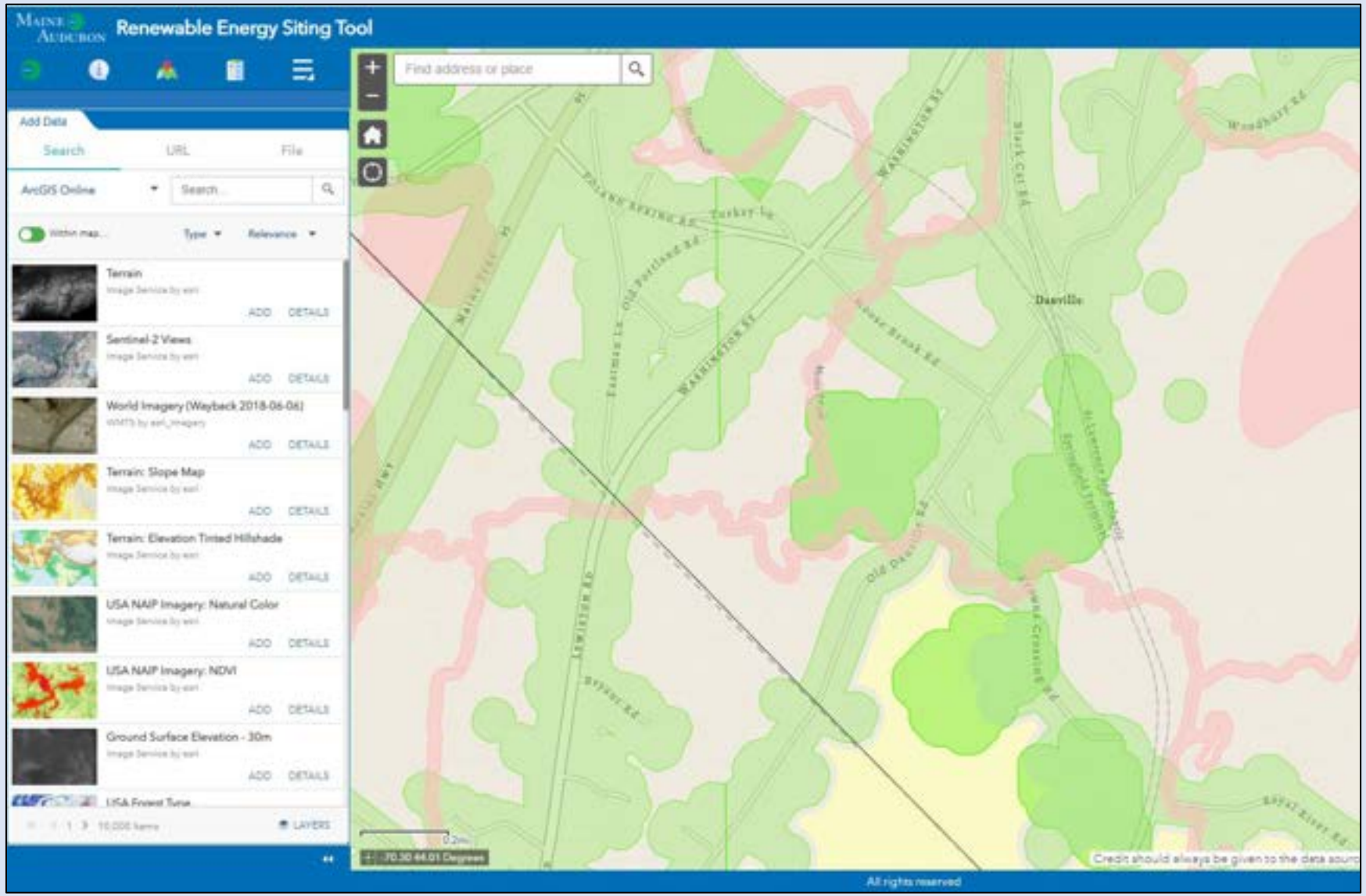
Maine Renewable Energy Siting Tool



Datasets grouped by type

- *Energy Resource Layers*
- *Environmental Layers*
- *Previously Developed Layers*
- *Agricultural Land Layers*
- *Administrative Boundaries and Roads*

Maine Renewable Energy Siting Tool



Add additional data

- From ArcGIS online

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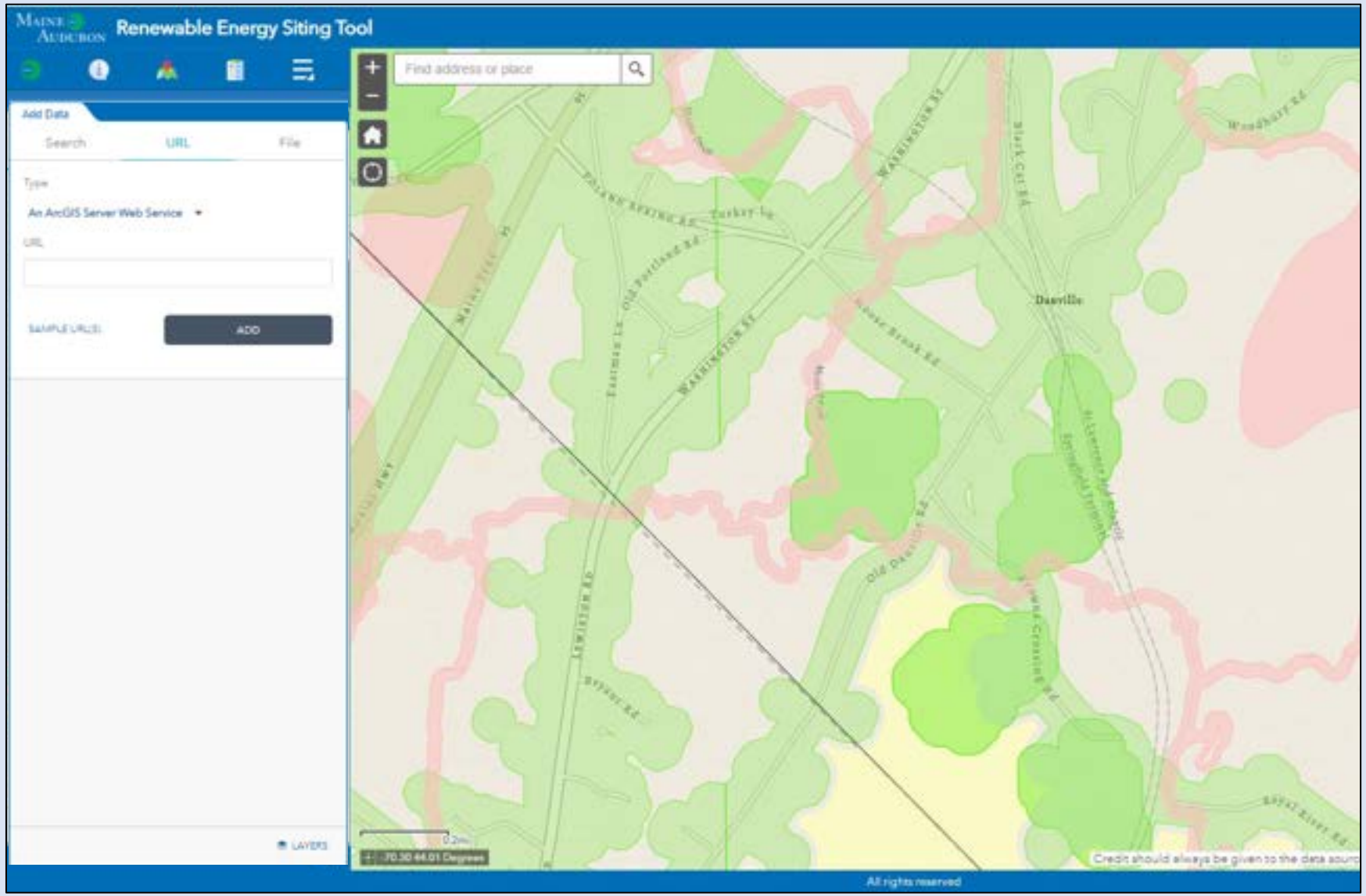

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- From a web service

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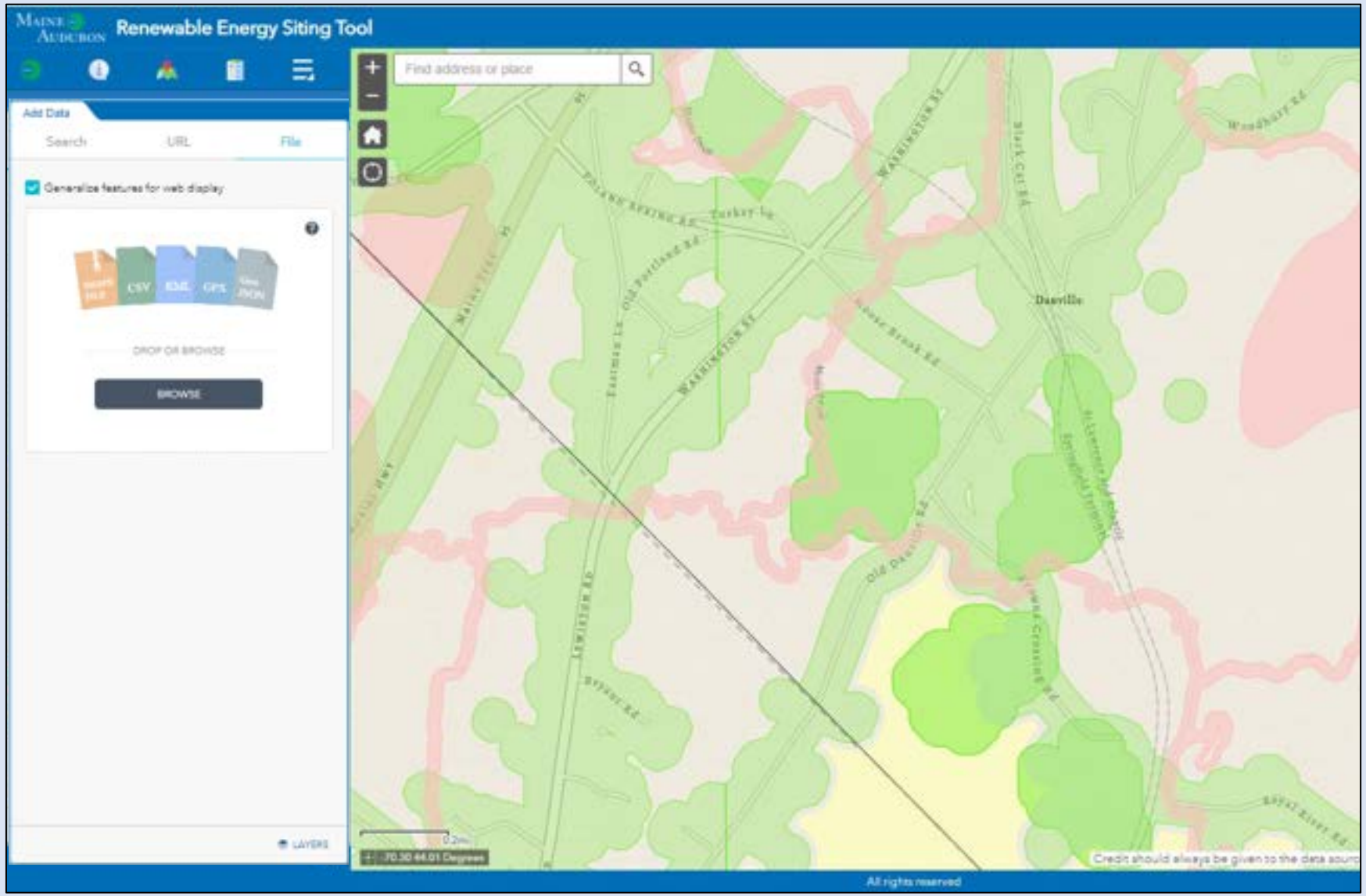

Add additional data

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- From a web service
- From your own files

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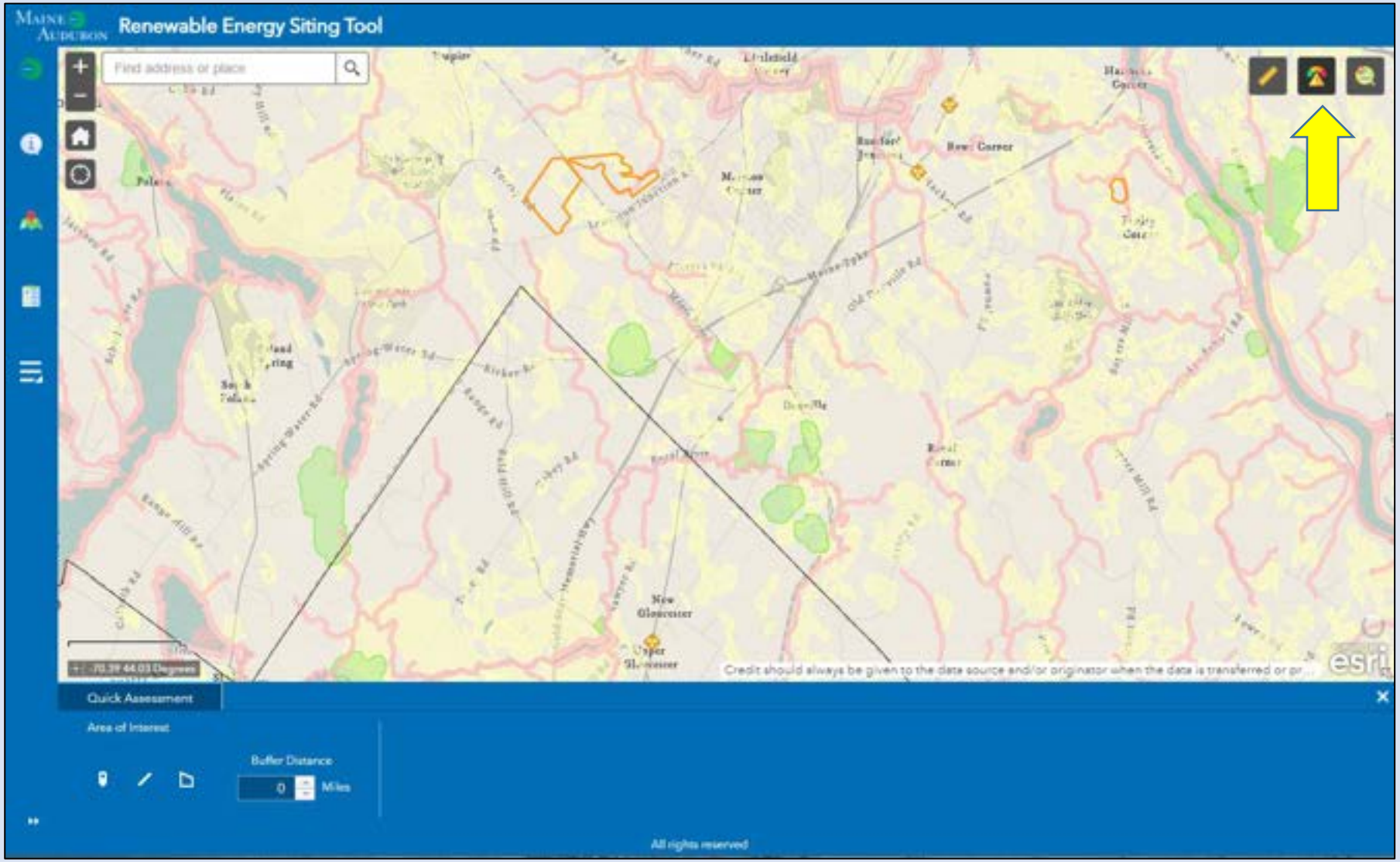
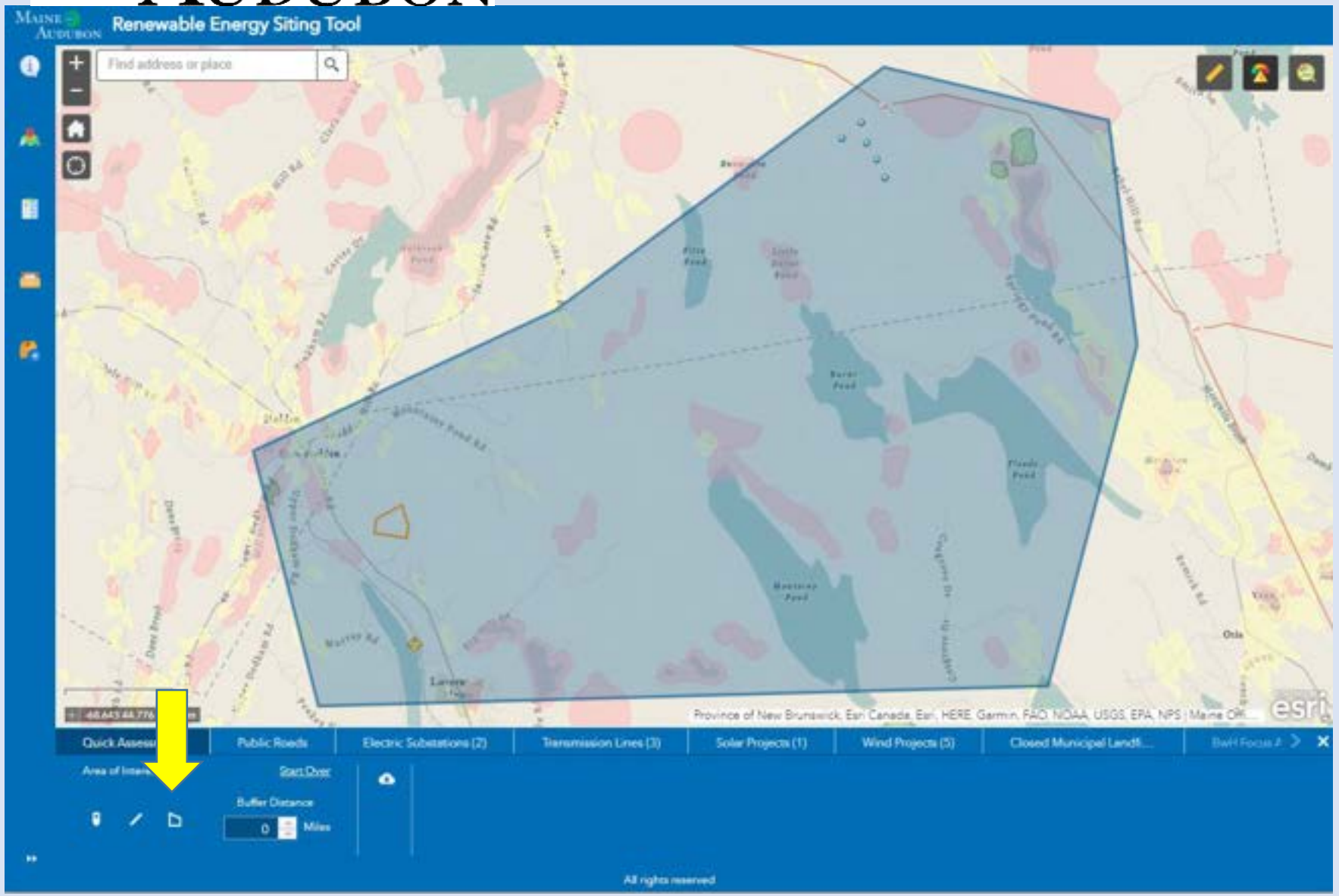


Quick Assessment Screening Tool

Allows user to evaluate pre-defined resources in a particular area

Maine Renewable Energy Siting Tool



Quick Assessment Screening Tool

- Allows user to evaluate pre-set resources in a user-defined area (drawn polygon, downloaded shape, or buffered point)
- Useful for assessing existing renewable energy capacity of an area

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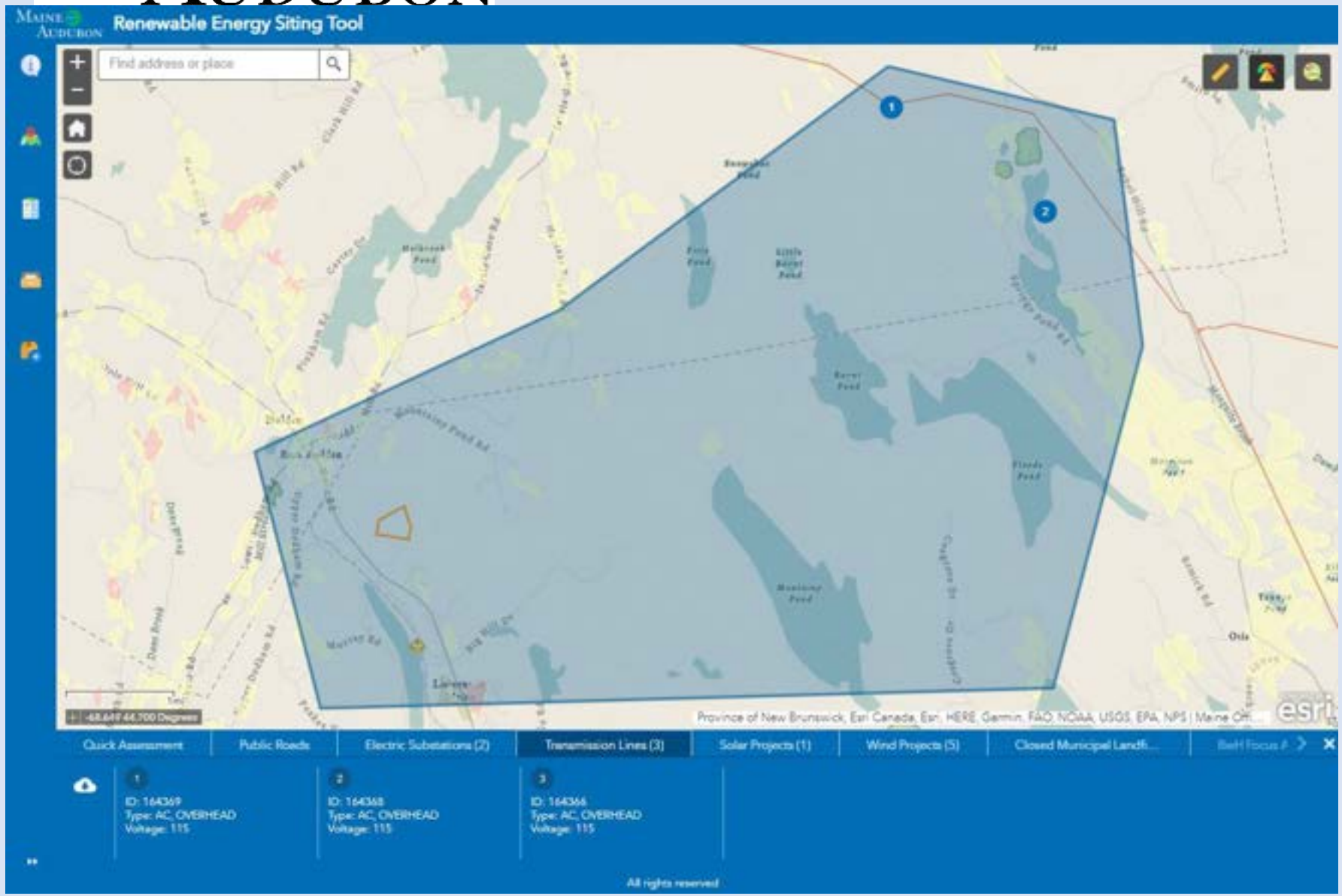

Quick Assessment Screening Tool

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- Highlights datalayer in question as you click each results tab
- Results include tallies or sums of data intersected (not clipped) by the shape being analyzed

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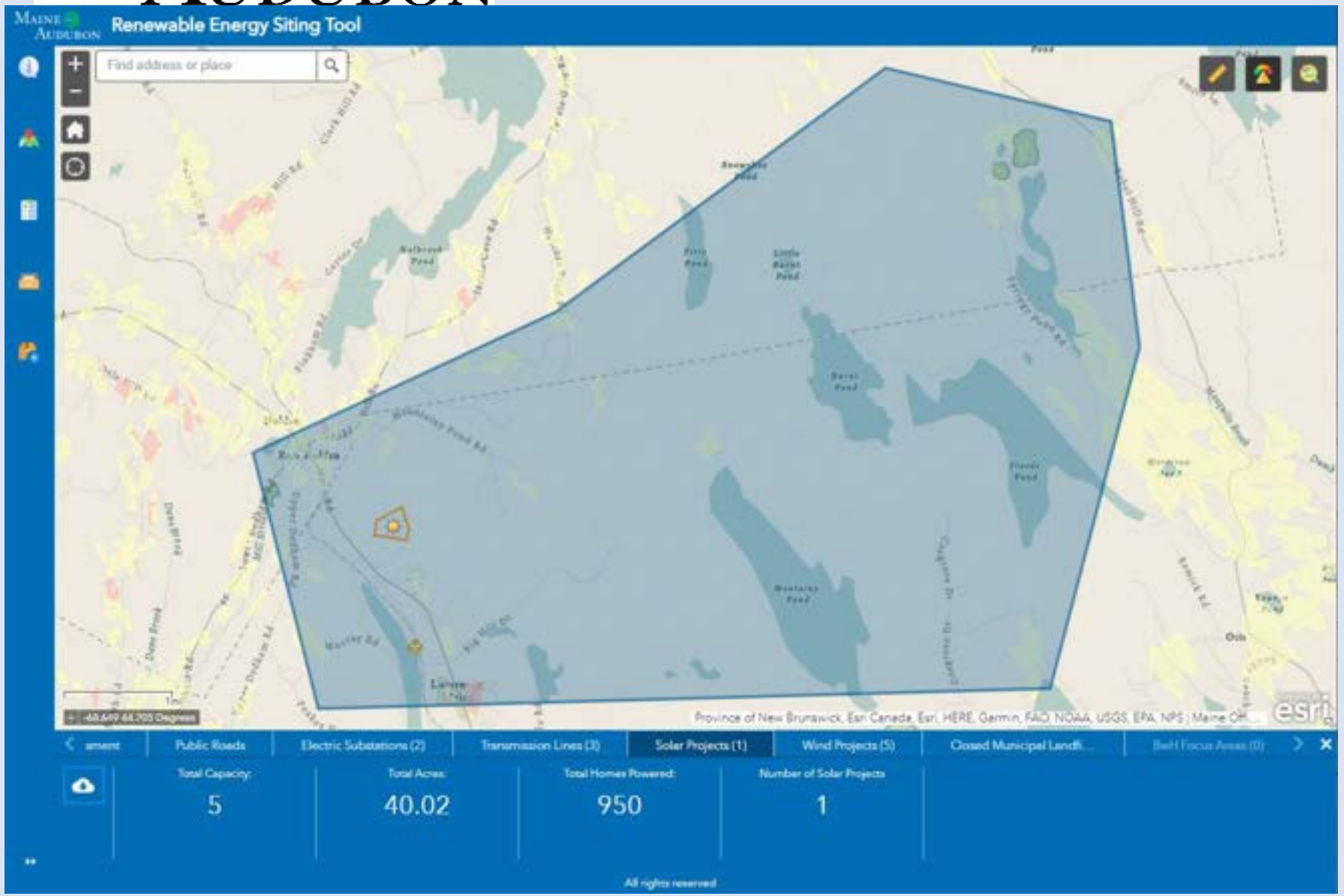

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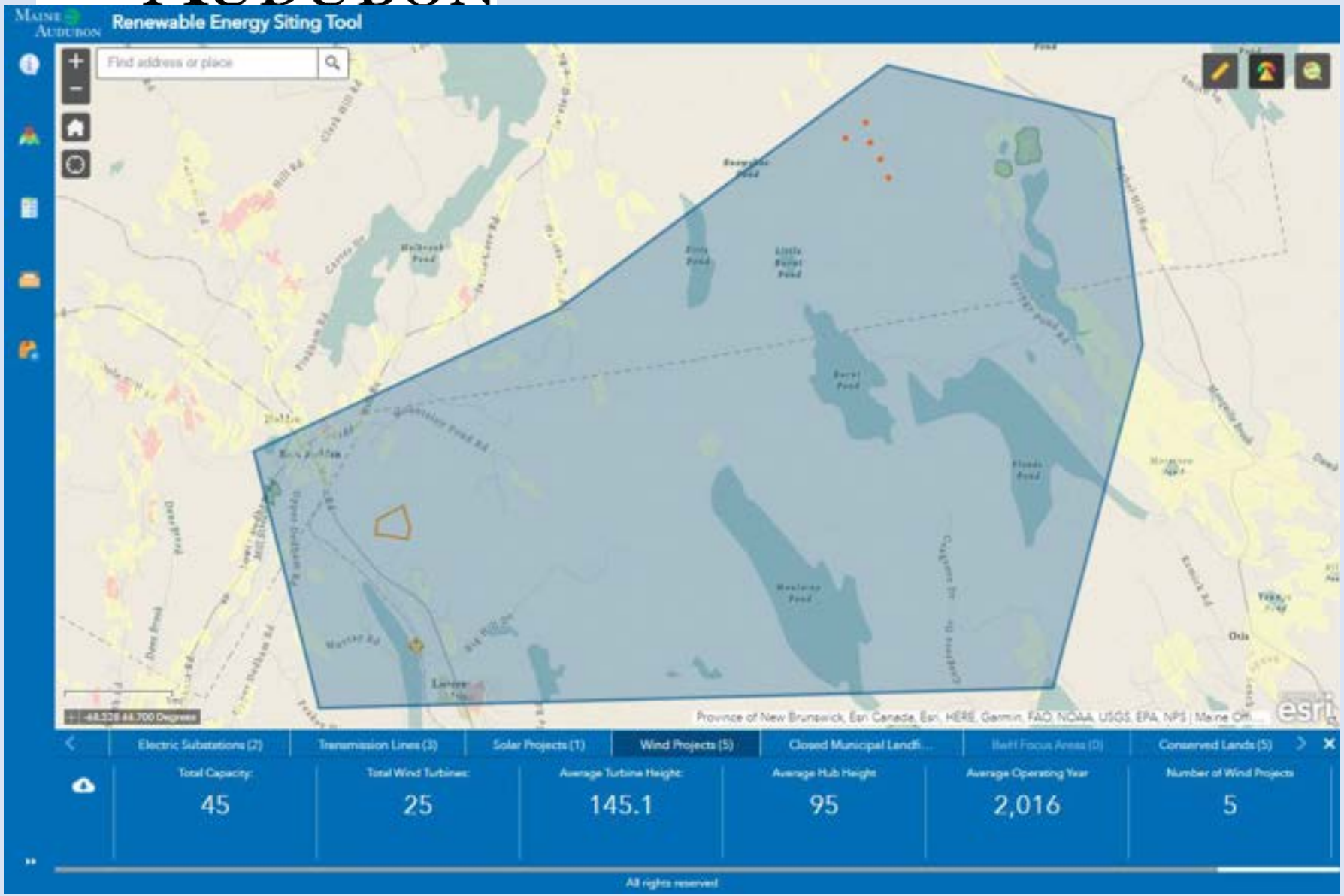

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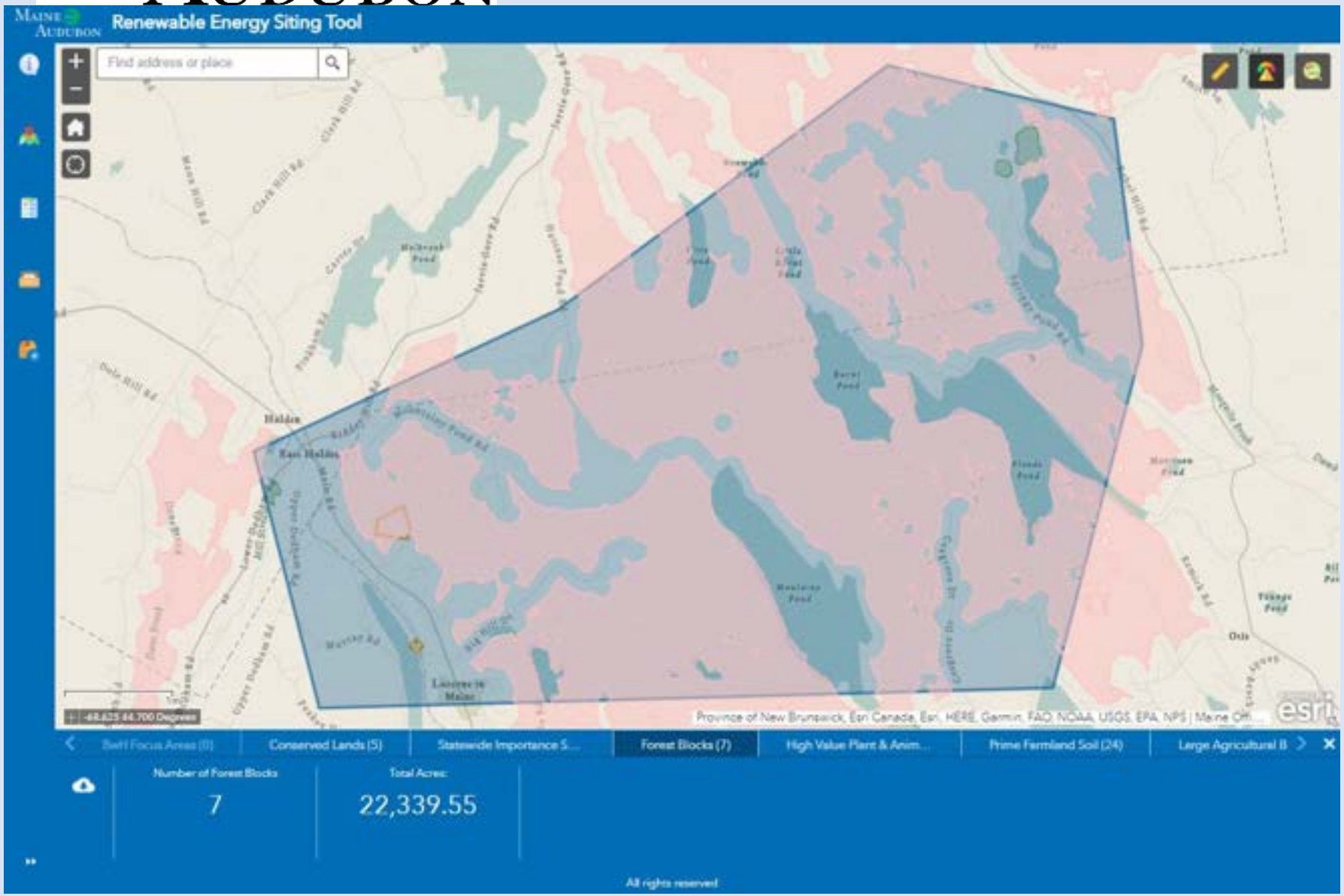

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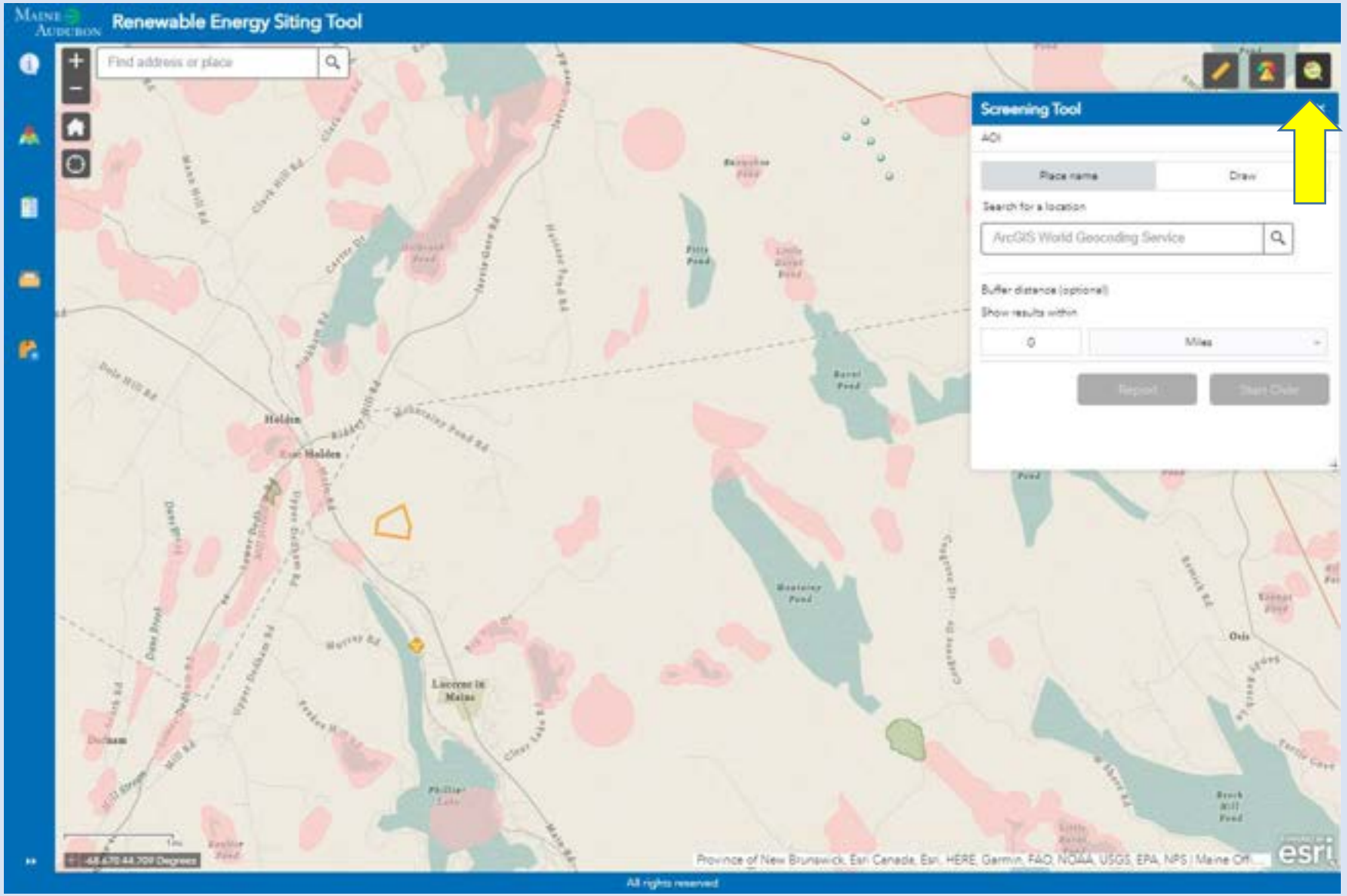

Report Screening Tool

Allows user to evaluate all “on” resources in a particular area

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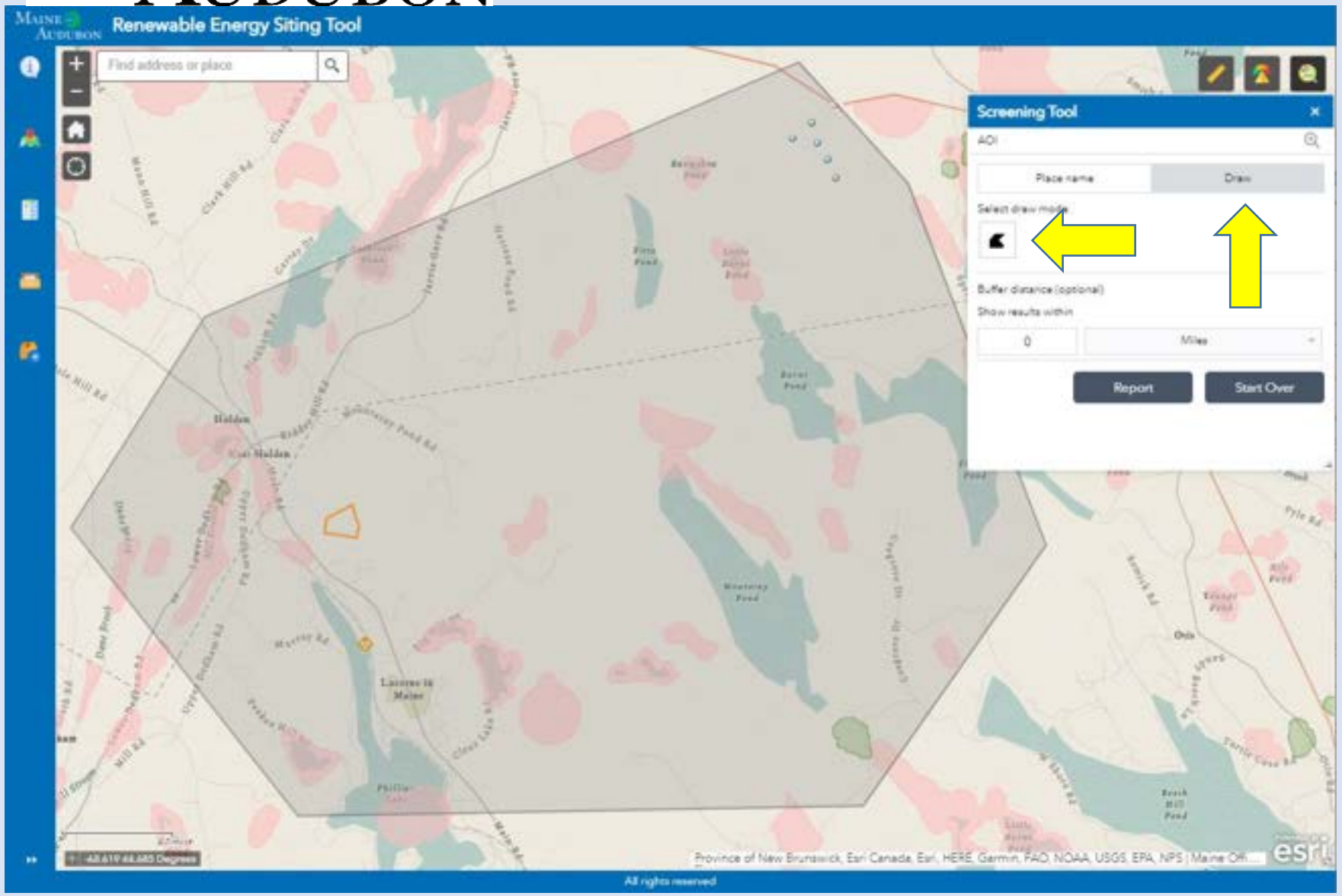

Report Screening Tool

- Allows user to evaluate resources that are “turned on” and that fall within a user-defined area
- Provides report that can be printed out

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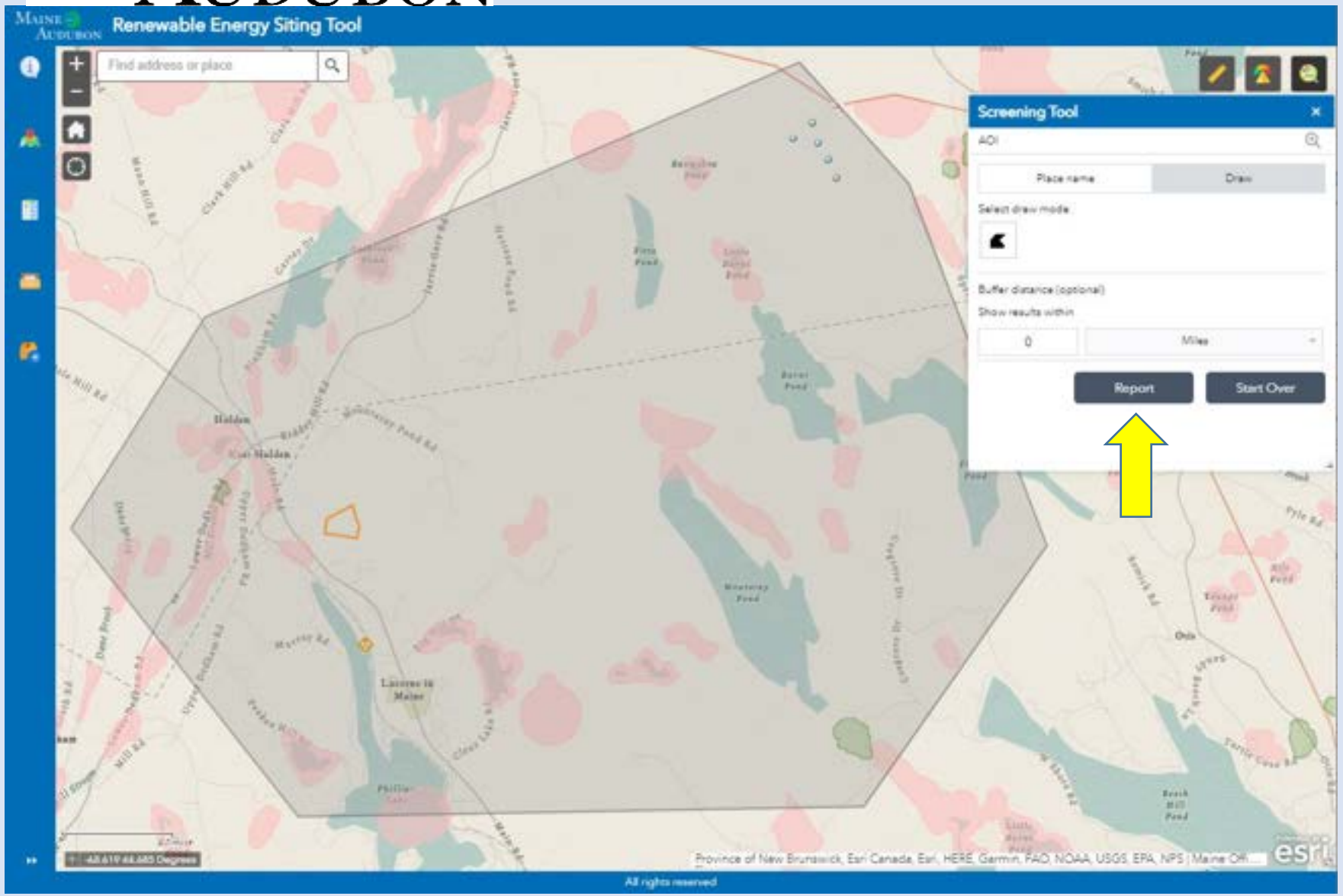

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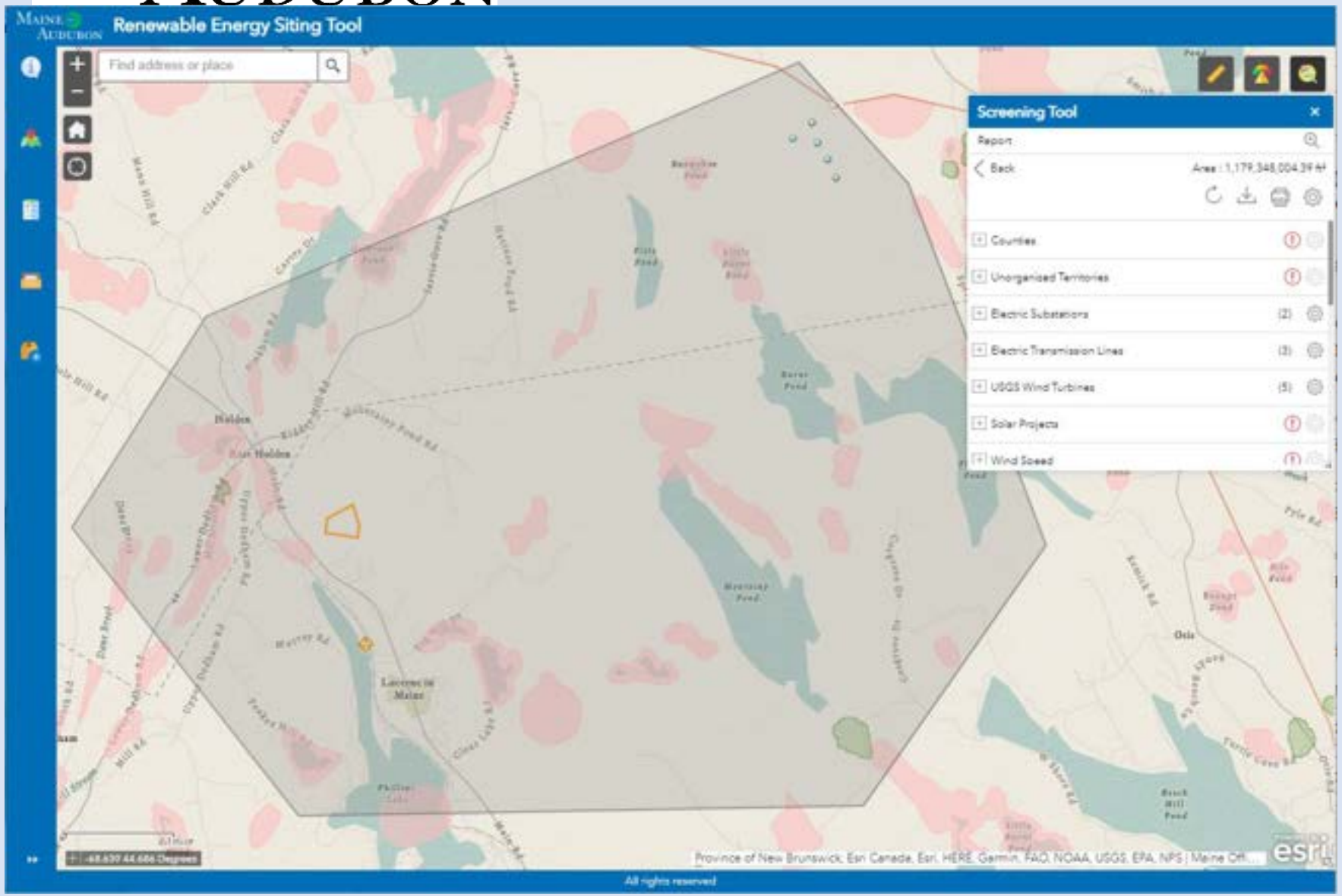

Report Screening Tool

- Screen shows which layers have results and which don't (!). Only layers "turned on" will have results.
- Similar to Assessment Tool, it tallies layers with results which can be expanded to review

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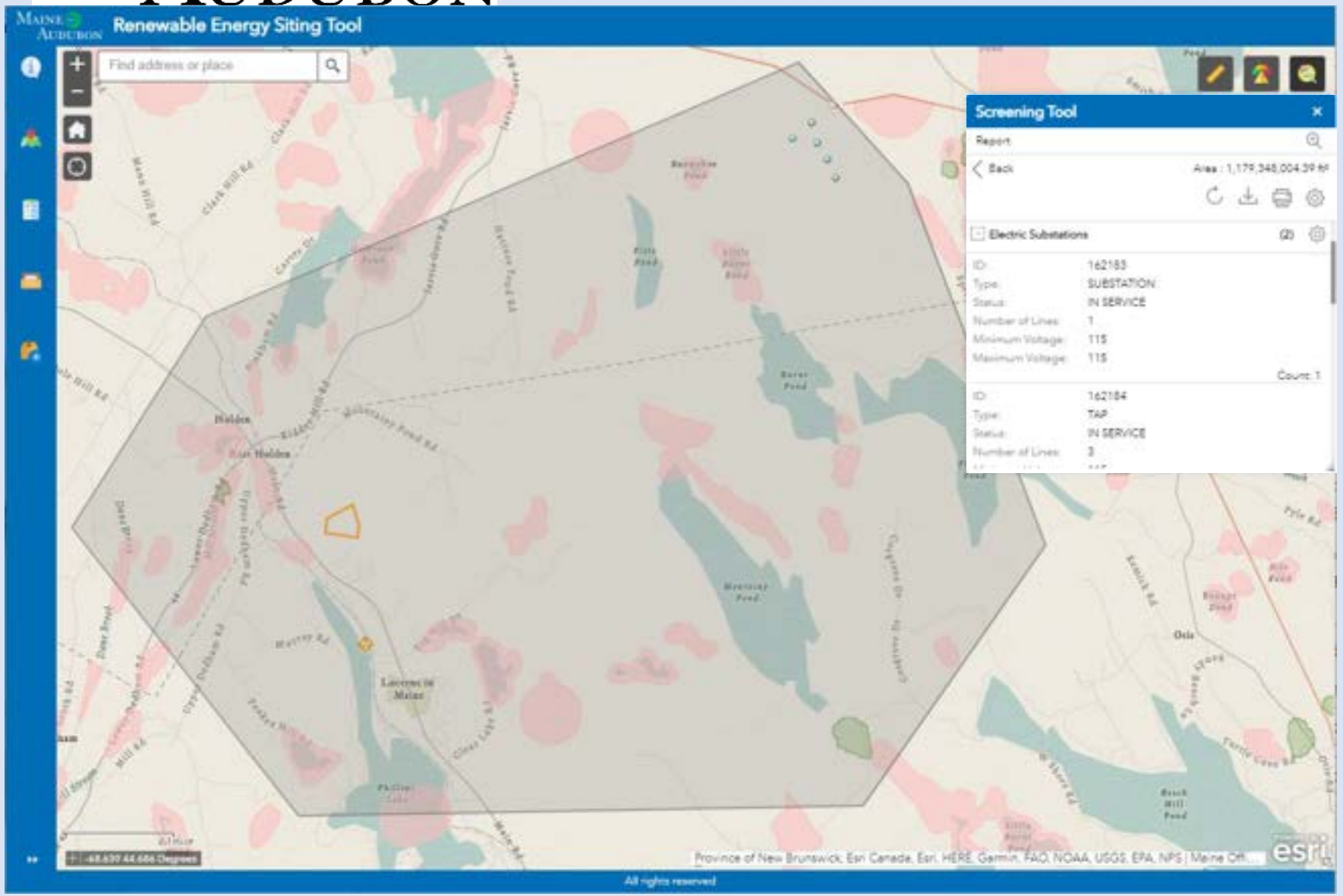

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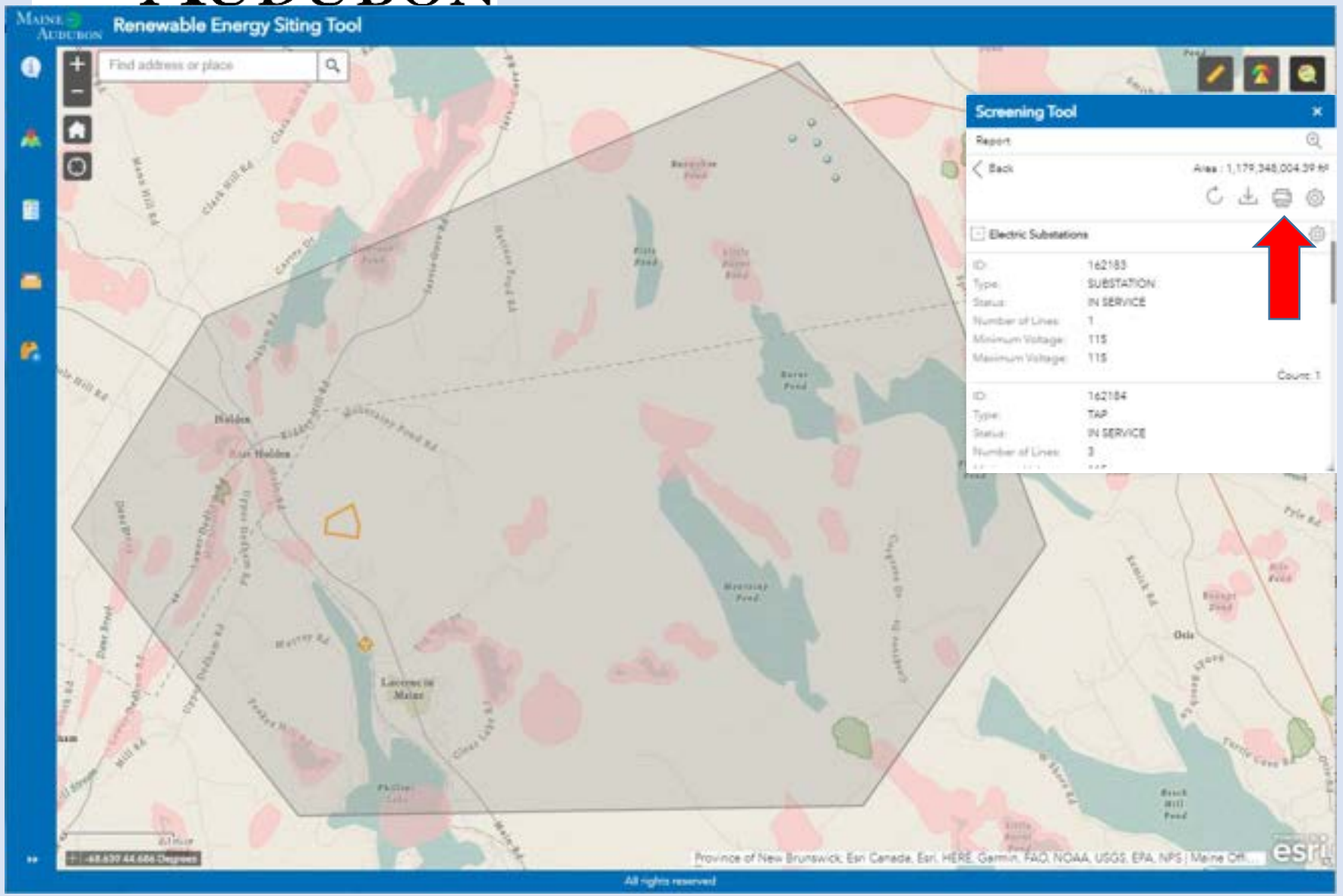

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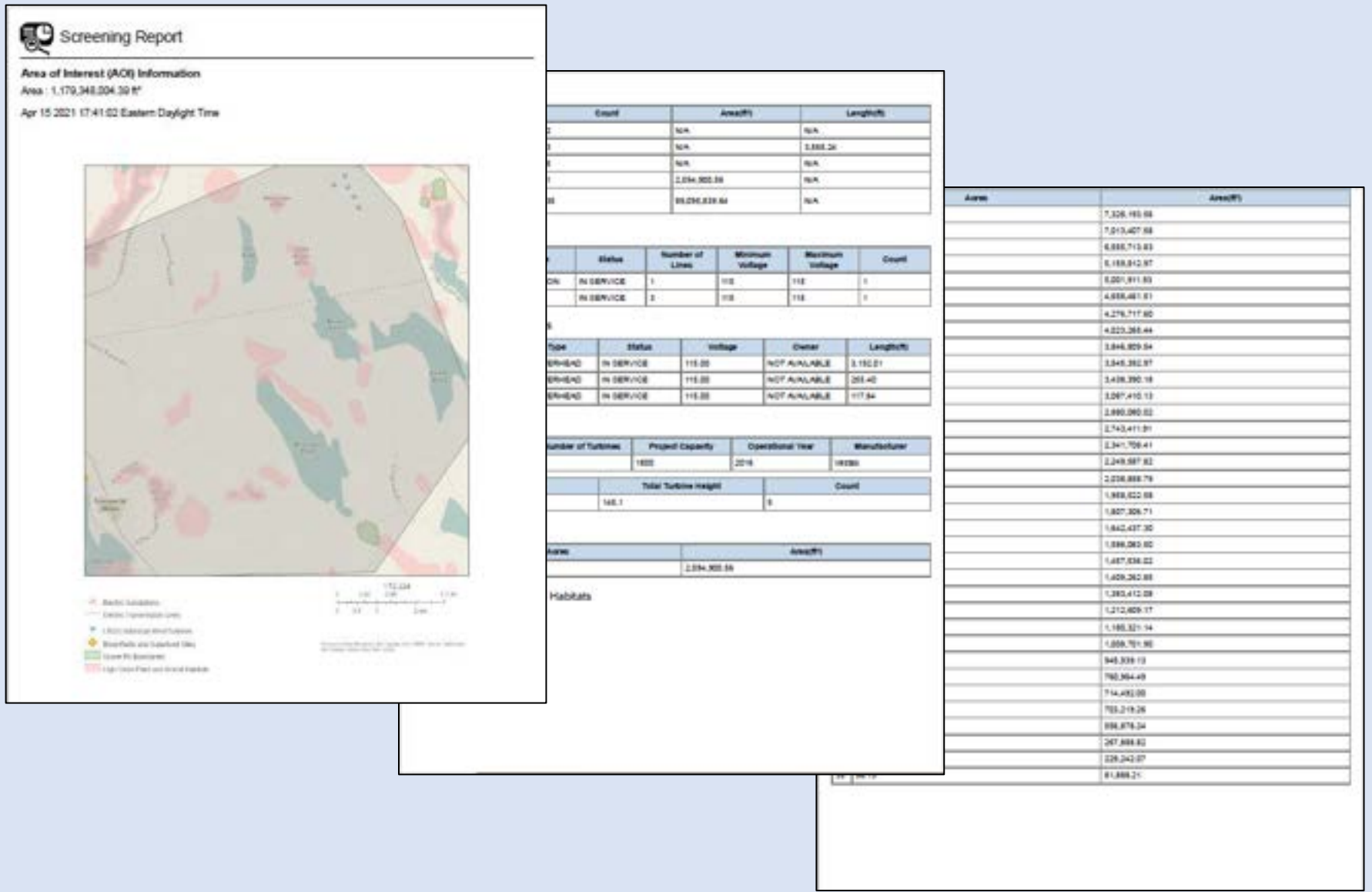

Report Screening Tool

Printout of report includes inset map and tables of attributes and calculations where applicable

Remember! This tool only analyzes the layers you have “turned on”!

Maine Renewable Energy Siting Tool

Things to Remember:

- This is for planning purposes only! This is not a regulatory map and it does not include all resources that exist.
- These data are from a variety of sources that are being updated all the time.
- We have utilized datasets that are the most applicable in the real world and that are consistent with other tools.
- Some datalayers will not draw until you are zoomed in to a preset extent. This is to maintain site stability.

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QUESTIONS?

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All this information can be accessed through https://maineaudubon.org/advocacy/climate-energy/