NREL's Tools for AgriPV Modeling

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National Renewable Energy Laboratory
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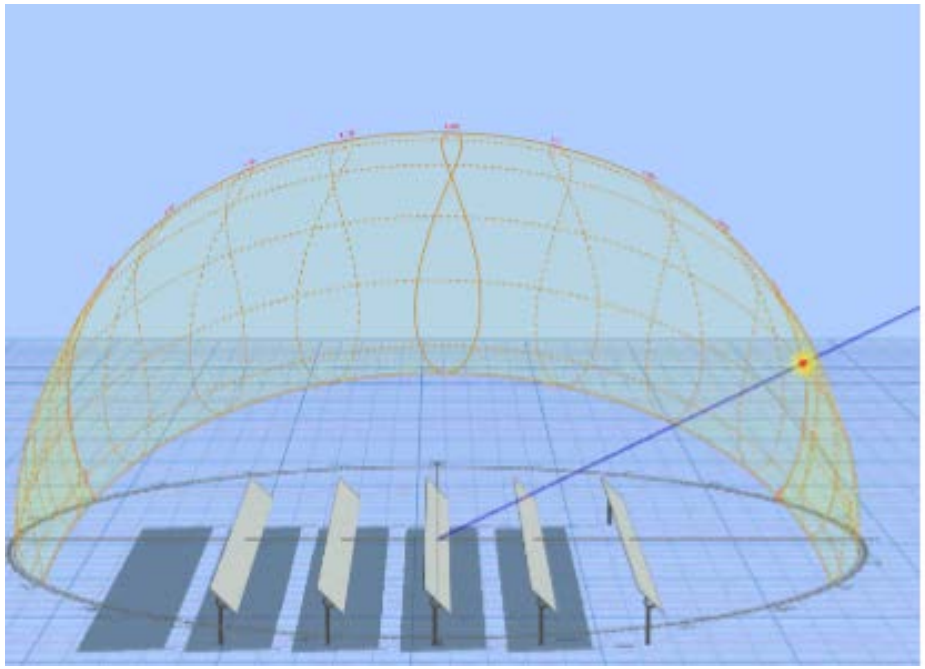
Modeling Pipeline

AgriPV modeling starts with light and ends in currency.



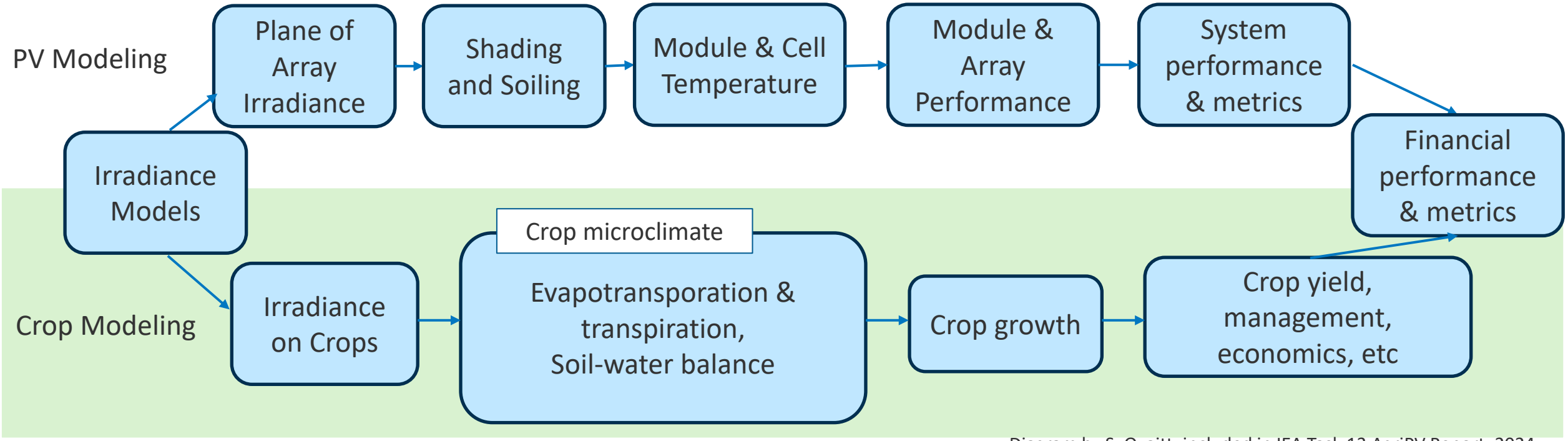
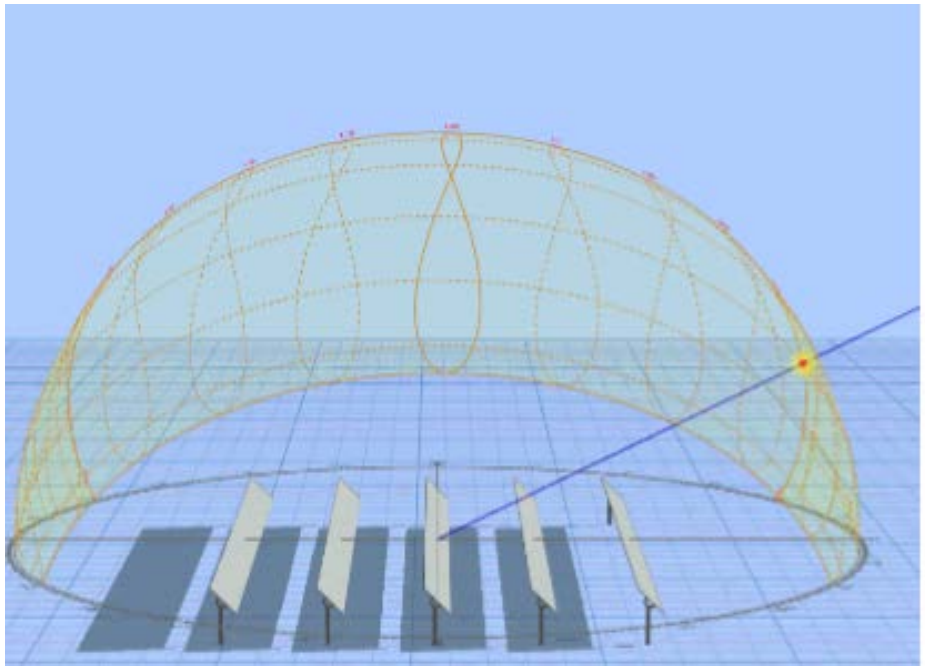
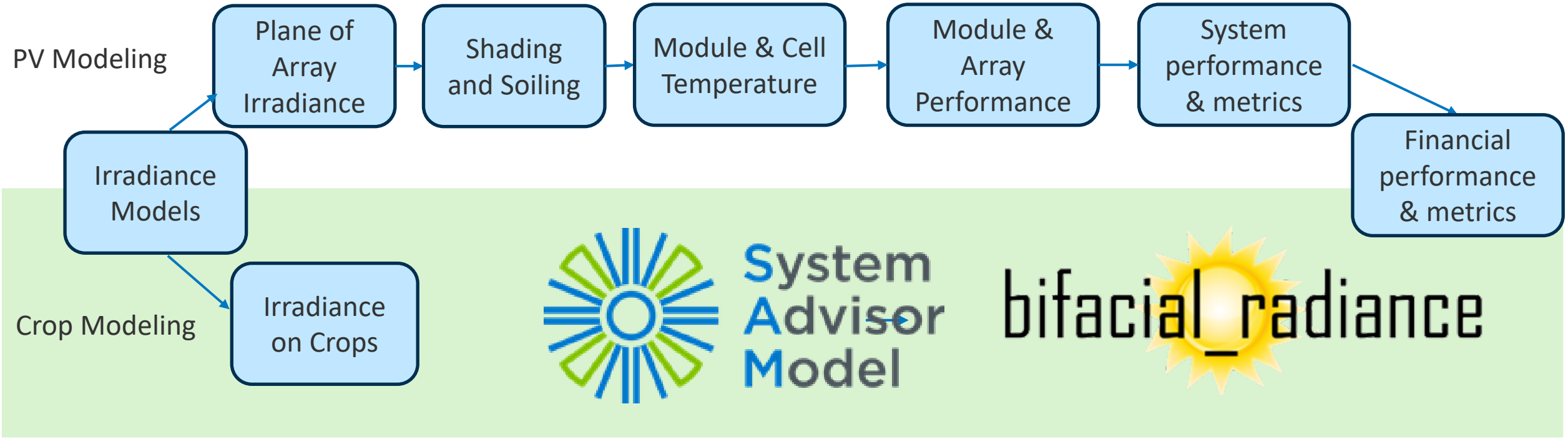


Diagram by S. Ovaitt, included in IEA Task 13 AgriPV Report, 2024

Modeling Pipeline

NREL tools include sophisticated PV modeling capabilities and can provide calculations of irradiance on crops.





System Advisor Model (SAM)
Free, Due diligence tool with AgriPV features

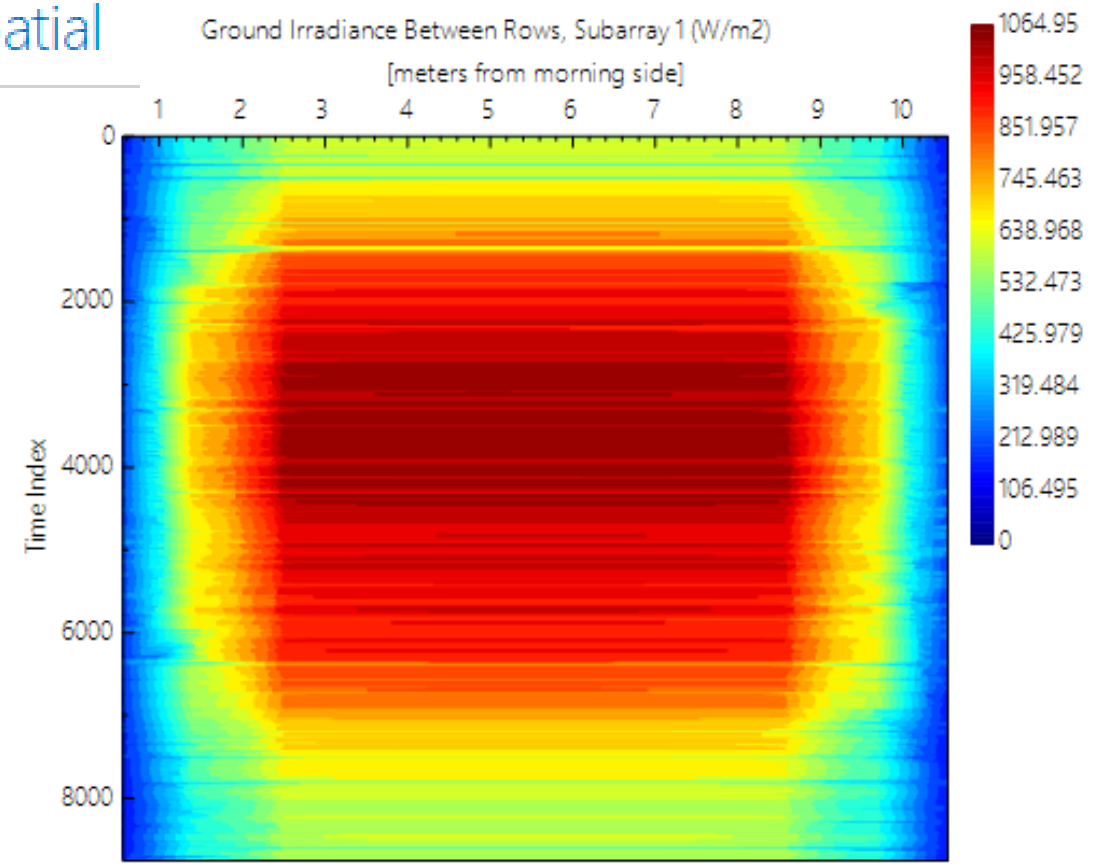
Tailor:

- Spatial albedo variations as input
- AgriPV-tailored modules can be captured with transparency factor (%) input
- Easy yearly spatial ground output

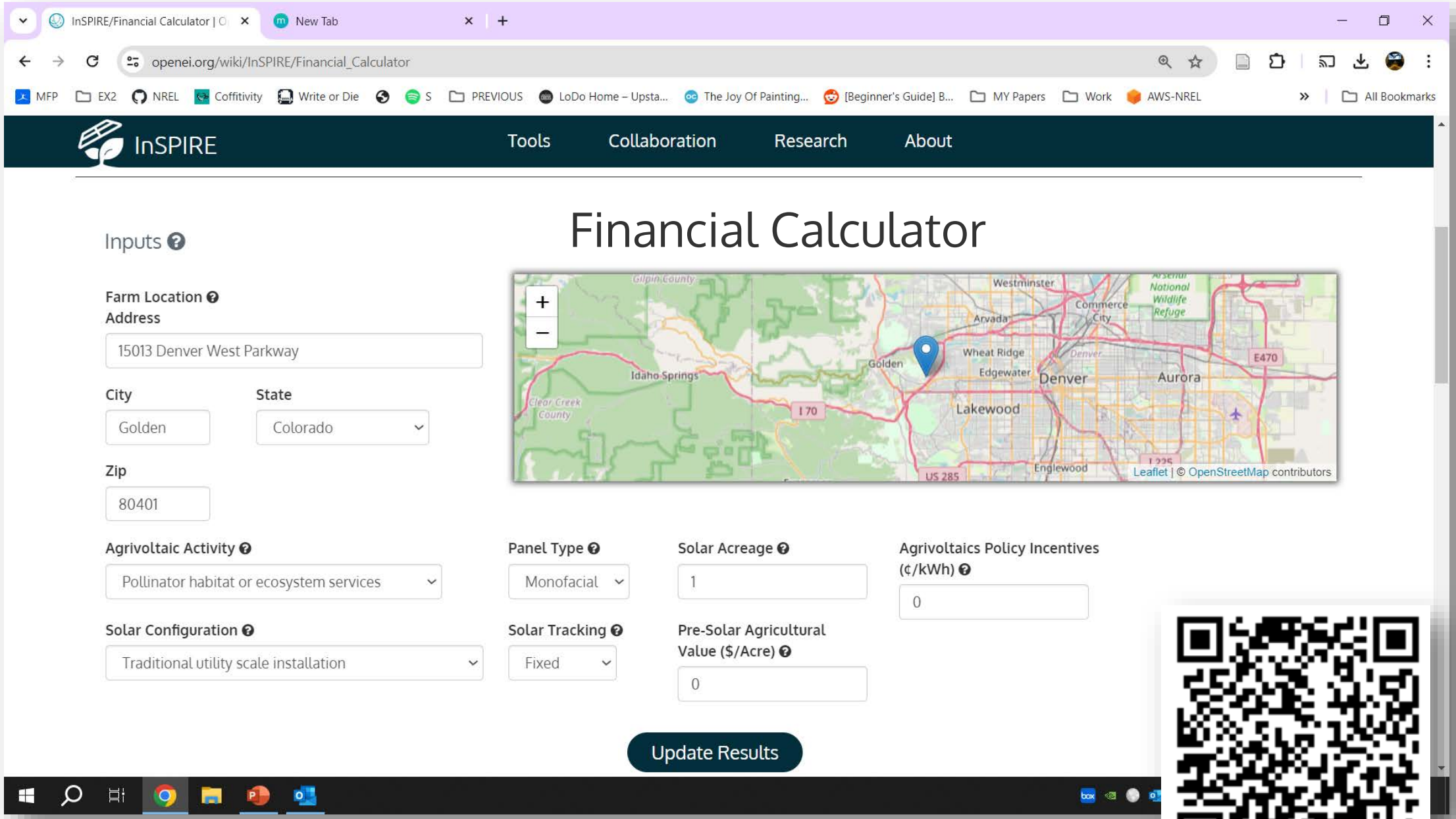
Free due diligence program interface, also accessible through pySAM

The detailed economics inputs can capture impact of configuration changes on PV revenue and incentives.

Spatial



https://sam.nrel.gov/



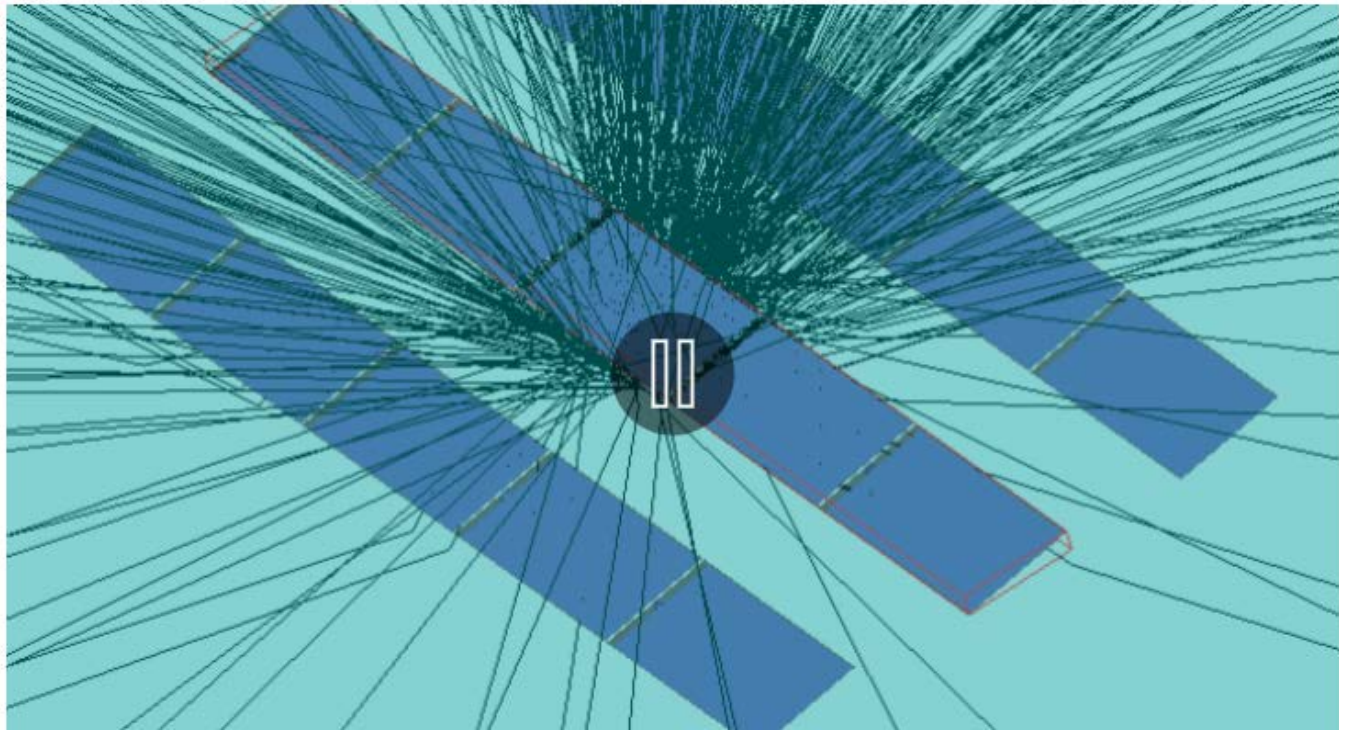
Simplified Financial Model using PVWatts

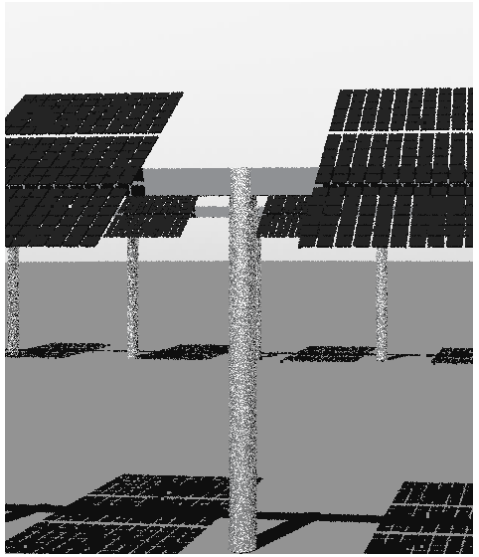
https://openei.org/wiki/InSPIRE/Financial_Calculator

bifacial_radiance

Validated NREL's Open Source Bifacial (and AgriPV) raytracer

https://github.com/NREL/bifacial_radiance





AgriPV Examples:

- Uses backward ray-trace to evaluate the irradiance (W/m^2) at any location in the scene. Much customization!
- Weather → Irradiance → Module Performance calculations with PVLib

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nrel.gov/pv/pv-ice-tool.html

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