

Industry Facing PV Degradation Prediction Tool and Database to Enable a 50 Year Life Module



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PVDegradationTool

Multi-Scale, Multi-Physics Model


**Awarded FY22
Core Modelling Call**

Contribution to DuraMAT Consortium Goals – Project Overview

The goal of this work is to create an online tool that can be used to search for degradation information and extrapolate PV module performance and durability to field exposure. A graphical user interface will aid in the understanding of the results. The prediction tool will be built modular and published open-source allowing users to expand on the existing framework.

**Period of Performance: FY23-26
Funding: \$750k**

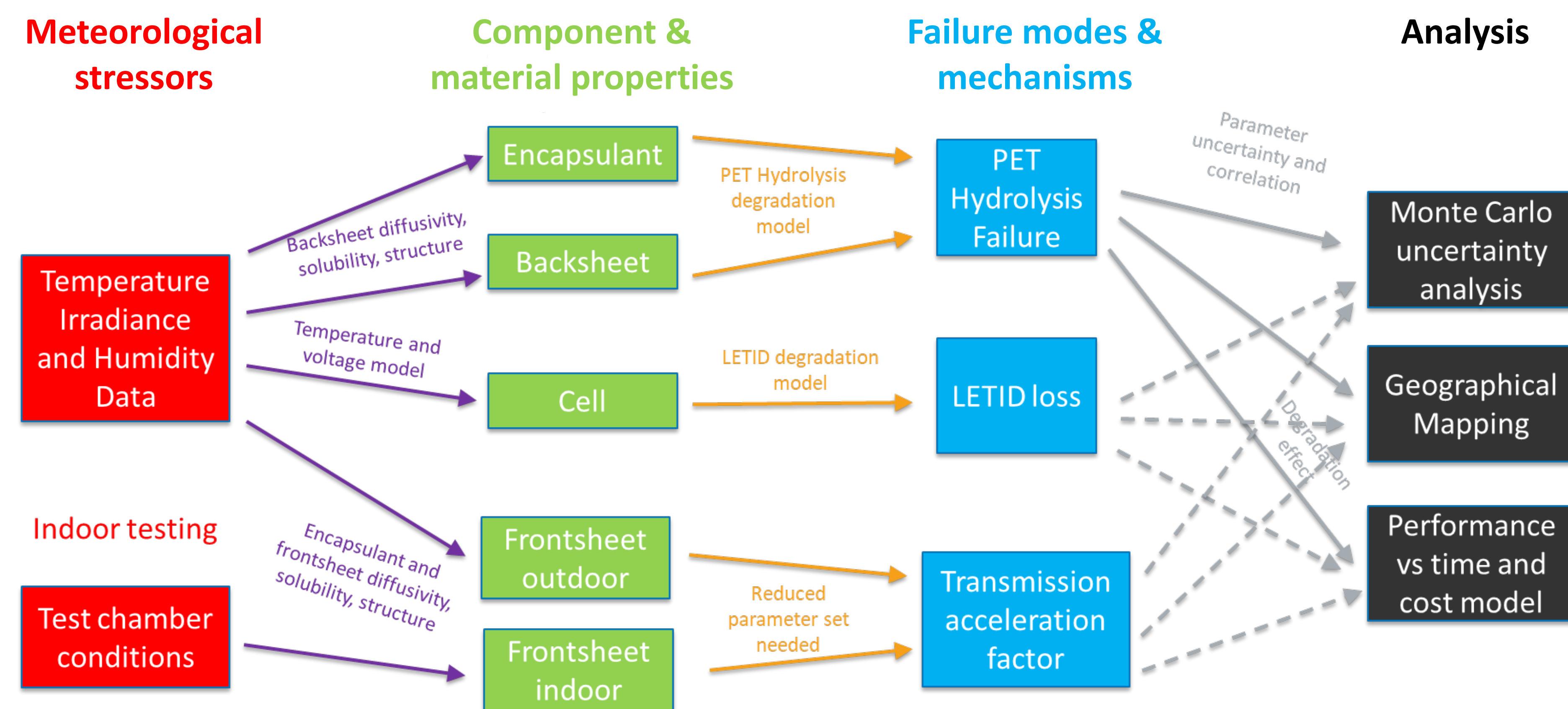
Project Highlights

- Searchable database of PV related degradation parameters.
- Open-source library for degradation analysis.
- Geospatial analysis via high-performance computing (HPC) on .
- User-friendly web application for single locations.

Impact

- Help the PV industry gain a better and more predictive understanding of degradation outdoors and in artificial stress suitable for the development of 50-year modules.
- Individual degradation mechanisms can be evaluated to determine the most critical failure pathways that need to be overcome for 50-year module lifetime.

Schematic structure of the online tool for degradation calculations

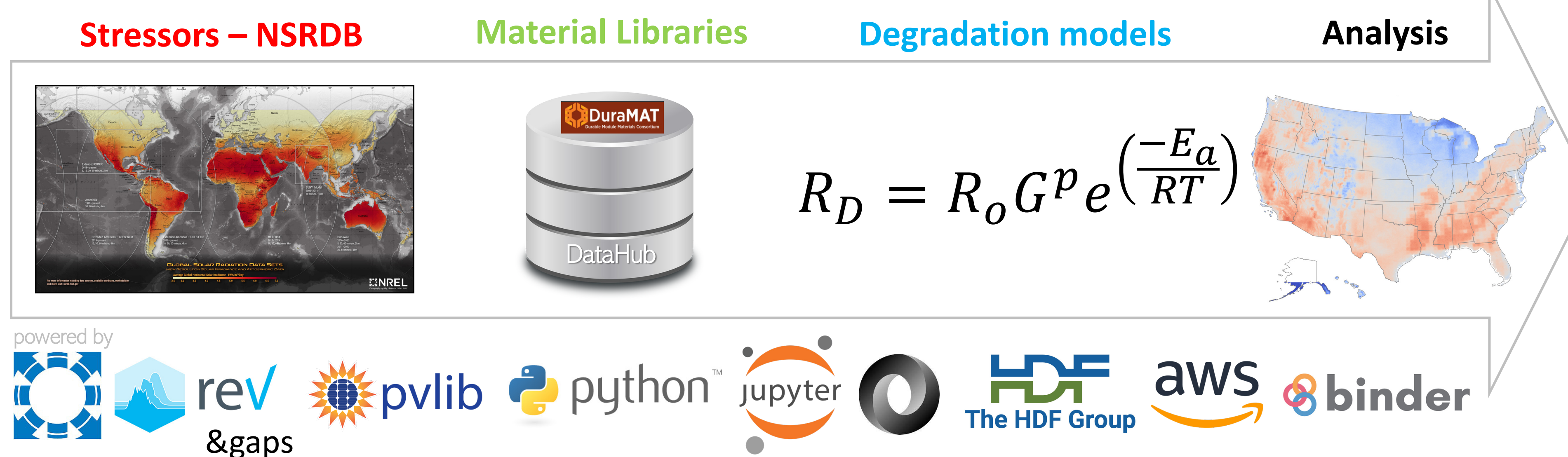


How YOU can help

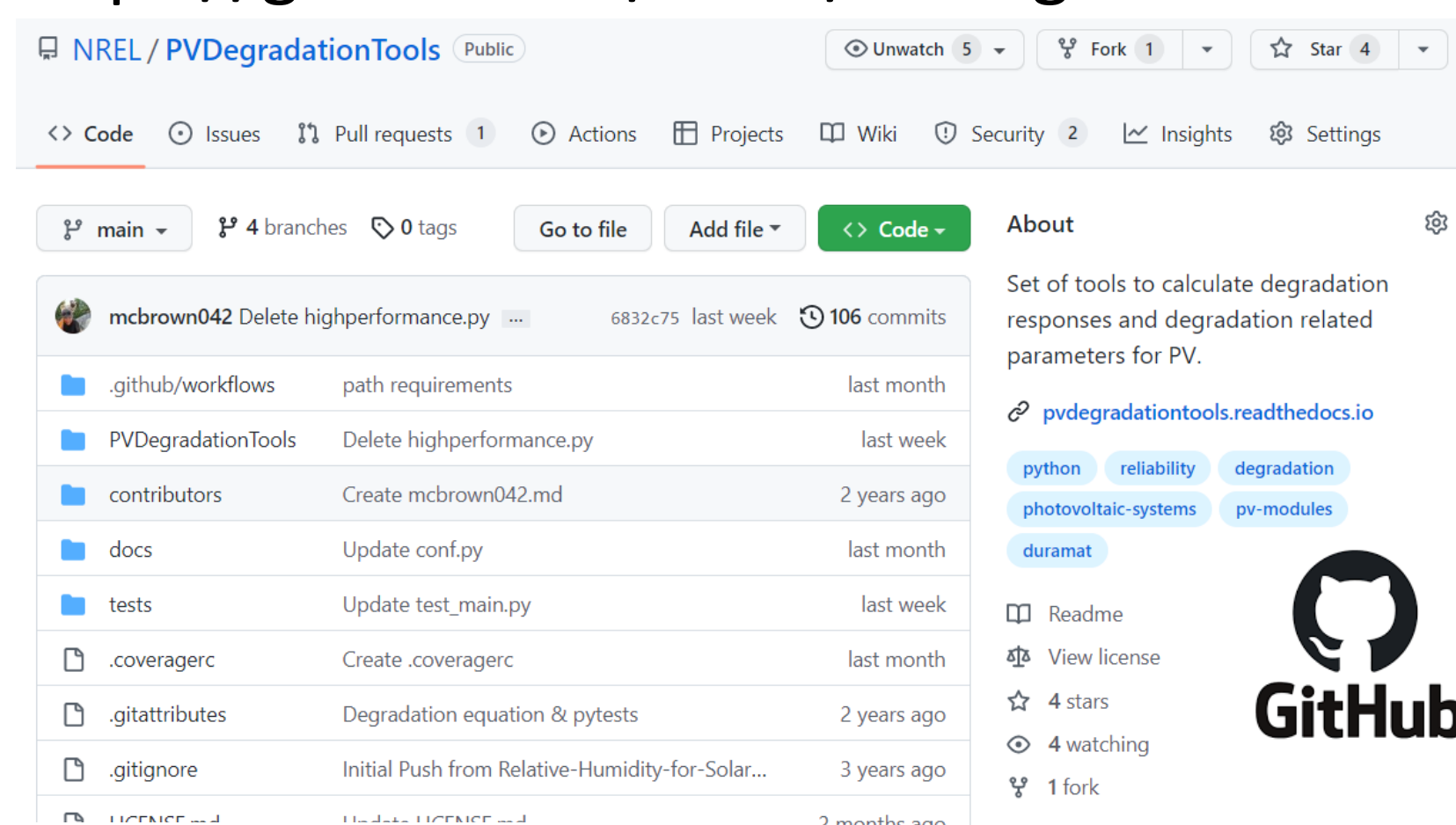
We are hoping to become a repository for a wide range of models and material parameters focused on PV degradation and failure analysis. If you have any code, Excel functions, formulas or data to contribute, please contact us!

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PV Degradation Tools – The integration pipeline for PV degradation analysis!

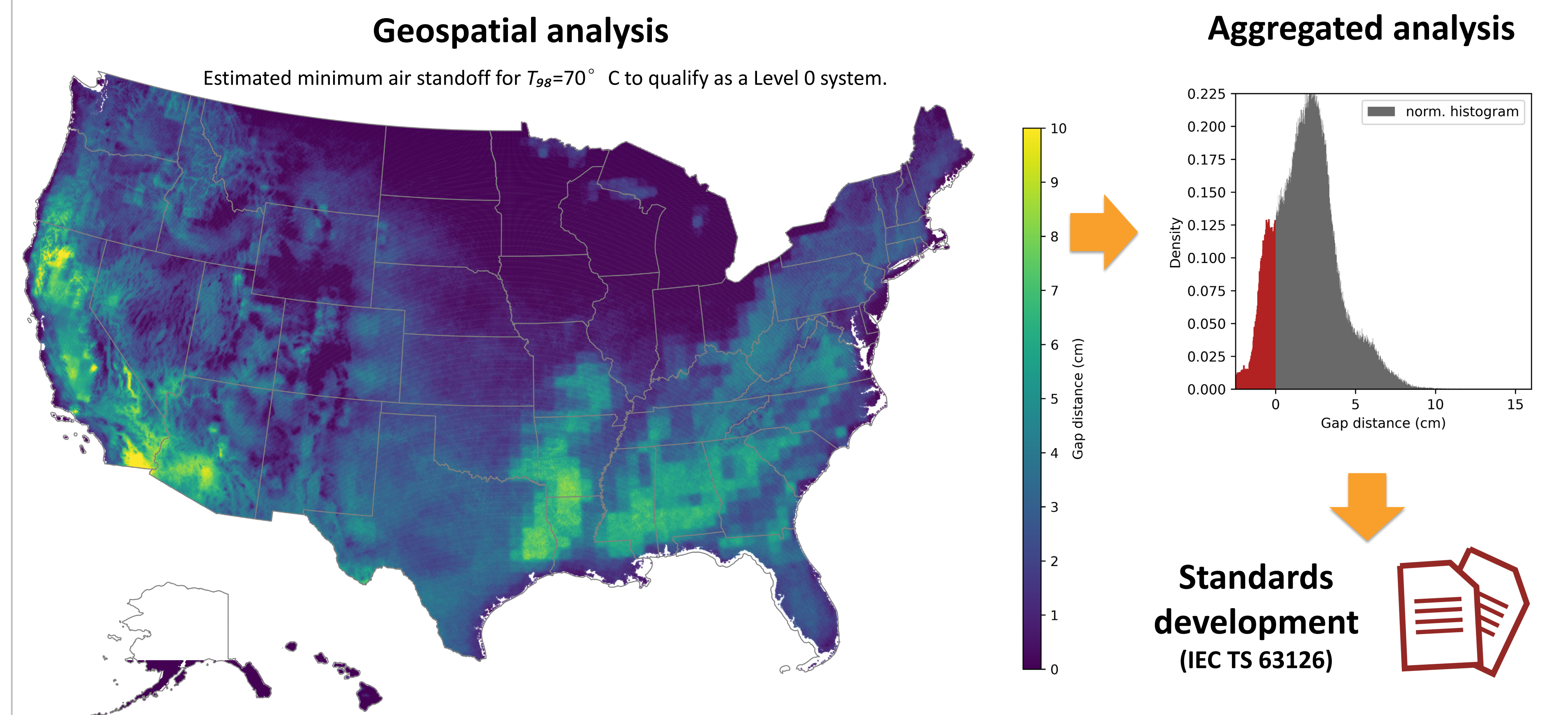


Check out our GitHub repository!

<https://github.com/NREL/PVDegradationTools>


...and our example Jupyter notebook in the demo folder!

Application – Calculation of the ideal standoff distance for roof-mounted PV



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