

WRF-Solar Use Case

Compiled Mar. 2022 by Model Data RCN team

Summary

Weighted rubric score - 60

Category - Preserve selected simulation workflow outputs

- Use Case Description
 - High-level overview of the use case
 - The objective of the project was to create a probabilistic NWP model tailored for solar energy applications, the WRF-Solar EPS model.
 - Science goals and basic workflow
 - Contribute to the WRF configuration for more accurate modeling of solar based experiments
 - Provide (for first time) probabilistic forecast specifically tailored for solar energy applications in the WRF model
 - Run different model members with stochastic perturbations in selected variables
 - Identify which parameterizations were most important, and which variables are most relevant for cloud and radiation simulations
 - Evaluate WRF-Solar over the whole US using satellite-based irradiance data as the comparison
 - Provide users with a reference configuration for WRF-Solar
 - Published journal link:
 - <https://doi.org/10.1175/JAMC-D-21-0090.1>
 - Data repository link
 - <https://doi.org/10.5065/yvdr-pa90>
- What use-case specific additional materials were preserved and shared?
 - Data
 - Inputs to model
 - This is a WRF-Solar regional model, so some other model is needed to generate boundary conditions. For this project, forecasts from the Global Forecast System (GFS) run by the National Centers for Environmental Prediction (NCEP) were used to generate the initial and boundary conditions necessary to run WRF-Solar
 - Standard WRF initialization datasets were used as inputs.
 - Not included in published journal articles due inadequate space, and lack of interest in these details by the journal. The data can be downloaded from the WRF website
 - [Reference Configuration](#) is described on the WRF-Solar web site

- Visualizations or images
 - N/A
- Why were these things preserved and shared?
 - General
 - To support the journal article
 - To provide a reference configuration of WRF-Solar for reproducibility and others to use
 - To provide solar irradiance observational data in a gridded format
 - Reasons why the things listed above are important
 - Expected/intended audience and what they expect/need
 - Are there specific people who will be using the data downstream?
 - Not discussed
 - Possible/aspirational users?
 - Not discussed
 - Note any temporal considerations, such as particular products that become more/less useful over time
 - If they improve the model in the future, they may release a new version of this reference configuration. Older versions would be less useful in this case.
 - On the flip side, if new releases are made researchers may need updated configuration data, and this release of WRF could be used to help compare with the updated configurations.
- Broader Impacts:
 - How will output from this project be used by stakeholders?
 - Not discussed
 - How were stakeholders involved in the data curation decision-making?
 - Not discussed
 - How will stakeholders be compensated for their participation in the data curation decision-making process?
 - Not discussed
- Do you have any concerns about misuse of your data or software? If so, what concerns do you have, and what are the reasons for those concerns?
 - Nothing specific.
 - Could be concerns about use of older versions down the road if new versions are produced. People may not know that there is a better version available. He would want to work with the repository to make it clear what versions are available, and which is newest/best.