# Article information:

ESSD - Upscaled diurnal cycles of land–atmosphere fluxes: a new global half-hourly data product  
<https://essd.copernicus.org/articles/10/1327/2018/>

# Article summary:

1. A global half-hourly data product has been created to analyze diurnal cycles of land-atmosphere fluxes, including gross primary production, net ecosystem exchange, latent heat, and sensible heat.

2. Two prediction approaches for the diurnal cycles were proposed based on large-scale regression models and compared in extensive cross-validation experiments using different sets of predictor variables.

3. The monthly average diurnal cycles are recommended for use as they are less affected by day-to-day variation, observation noise, and short-term fluctuations on subdaily timescales compared to the full half-hourly flux products.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article presents a new global half-hourly data product for analyzing diurnal cycles of land-atmosphere fluxes, including gross primary production, net ecosystem exchange, latent heat, and sensible heat. The authors propose two prediction approaches based on large-scale regression models and compare them in extensive cross-validation experiments using different sets of predictor variables. They analyze the results for a set of FLUXNET tower sites showing the suitability of their approaches for this upscaling task.

The article provides valuable insights into the interactions between the biosphere and the atmosphere and how they can be well characterized by fluxes between the two. However, there are some potential biases and missing points of consideration that need to be addressed.

Firstly, the article focuses solely on upscaling carbon and energy fluxes between land and atmosphere to subdaily timescales. While this is an important aspect to consider, it neglects other factors that may affect biogeochemical processes on an ecosystem level or global scale.

Secondly, the article does not provide enough evidence to support its claims about the suitability of their approaches for upscaling diurnal cycles globally. While they analyze the results for a set of FLUXNET tower sites, it is unclear whether these findings can be generalized to other regions or ecosystems.

Thirdly, the article does not explore counterarguments or potential risks associated with upscaling diurnal cycles globally. For example, there may be limitations in using remote sensing and meteorology data at daily resolution as well as half-hourly potential radiation to calculate global half-hourly data products.

Finally, there is some promotional content in the article that may bias readers towards accepting their findings without questioning them critically. For example, they recommend primarily using monthly average diurnal cycles without providing enough evidence to support this claim.

In conclusion, while the article provides valuable insights into upscaling diurnal cycles of land-atmosphere fluxes globally, there are some potential biases and missing points of consideration that need to be addressed. Further research is needed to validate their findings and explore potential risks associated with upscaling diurnal cycles globally.

# Topics for further research:

* Limitations of using remote sensing and meteorology data for upscaling diurnal cycles globally
* Factors affecting biogeochemical processes on an ecosystem level or global scale
* Risks associated with upscaling diurnal cycles globally
* Generalizability of findings to other regions or ecosystems
* Alternative approaches for upscaling diurnal cycles of land-atmosphere fluxes
* Critiques of using monthly average diurnal cycles for upscaling purposes

# Report location:

<https://www.fullpicture.app/item/956dd10b0022996577685f7738d20533>