

Proposal for Fluxnet–La Thuile–dataset publication

Title:

Generation Global LAnd Surface Satellite (GLASS) surface daytime Net Radiation products based on multi-source datasets

Initial coordinator and proposal groups

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Short outline

Net all-wave surface net radiation (R_n) is greatly needed in various scientific research, ecosystem management and modeling applications. However, it is difficult to collect tempo-spatially continuous R_n measurements globally. Besides, the R_n products available today cannot satisfy the practical application requirements because of their coarse spatial resolution and low accuracy. Thus, a long-term high tempo-spatially continuous and accurate R_n dataset is urgently needed. A practical solution is to estimate R_n empirically based on multi-source datasets including remote sensed products, model reanalysis products, and radiation in-situ observations and so on. In the previous study (the corresponding proposal titled “comparison of empirical models for surface daytime net radiation estimation”), we have compared and developed several empirical linearly-based models, and several limits have found based on the results. Therefore, in this study, several empirical models, which

including non-linear machine learning models and linearly-based models, will be tested, compared and developed using the comprehensive radiation measurements globally. Based on extensive results, the most appropriate empirical model will be selected and developed as the algorithm to generate the long-term high tempo-spatial (daily, 0.05deg, 1983-2013) Global LAnd Surface Satellite (GLASS) surface daytime R_n product. The new R_n product will be validated against in-situ observations and other products. Finally, some conclusions regarding the accuracy of the new product will be made based on all results

Research questions

1. Which models are more adaptive under different conditions (e.g., different land covers)?
2. Is there any possibility to develop a conventional empirical model for the generation of R_n products?
3. How to extract useful information from multi-source datasets to estimate R_n ?

Sites

The proposal focuses on Global radiation measurement. All sites will be considered.

Rules applied for co-authorship

Persons that have contributed data and/or have given intellectual input to the paper will be contacted to invite for co-authorship. All data contributors will be invited to give intellectual input.