Global Spectral Model for Vc,max and Jmax

We’re in the process of compiling a database of photosynthetic CO2 response curves measured in combination with leaf reflectance to enable us to produce a global model that will link leaf reflectance to maximum carboxylation capacity (Vc,max), maximum electron transport rate (Jmax) following (10.1093/jxb/erab295).

Our goal with this project is to cover as much of the global trait-space as possible and produce models that can be applied globally with confidence. We invite you to contribute your data to this effort, and in return share authorship of the paper that we anticipate will present global models that can be used to predict Vc,max and Jmax from leaf reflectance data, thereby enabling rapid collection of these plant traits using spectrometers and paving the way for the use of imaging spectroscopy to provide high resolution spatial and temporal maps of these key physiological traits. In addition to sharing your data we hope you will also be able to contribute intellectually to the manuscript.

Ideal data requirements

* Metadata describing your dataset including: latitude and longitude, elevation, Air temperature during the growing season, species, growth habitat (e.g. sun lit mature leaves), instrumentation and protocol used.
* Original, raw gas exchange data files from infrared gas analyzers associated with the measurement of the response of photosynthesis to CO2 concentration (commonly known as A-Cicurves).
* Full range (350 or 400 to 2400 or 2500 nm) leaf reflectance measured on the same or physiologically identical leaves
* Ideally, the Leaf mass per unit leaf area (LMA) and elemental nitrogen content measured in the same leaves.

Data use

Data will be used exclusively for this project. Fitted Vc,max and Jmax parameters, LMA and Na, and the associated leaf reflectance data will be made publicly available upon acceptance of our manuscript.

Data collection

Currently, we gathered data from the Arctic, the tropics, Mediterranean and several temperate sites with already 107 species and 785 observations. We are keen to fill the global trait-space by including data encompassing a wide range of leaf morphologies, growth forms, climates, growth habitats and locations, including data from managed and unmanaged ecosystems. Our intention is use data from natural systems, including crops, to build the model, but experimental manipulations may be useful for independent model validation and are also welcome.

How to participate

Revisit this site to learn more details and in the meantime, if you wish to participate, contact us (jlamour@bnl.gov,[sserbin@bnl.gov](mailto:sserbin@bnl.gov), [arogers@bnl.gov](mailto:arogers@bnl.gov)) to ensure you receive updates as we develop the project.