



## **Towards consolidating the plant trait data domain**

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In response to the basic concept of this session - 'the optimality principle proposes that organisms adjust to environmental variations so as to maximize measures that impinge on fitness, and are thereby subject to natural selection' - we propose that observable characteristics of individual plant organisms – plant traits – are the product of optimality principles and thus provide a first level to validate implementations of optimality principles in vegetation models. On the long term, the application of optimality principles may thus lead to a shift of paradigm in vegetation modeling, where plant traits were traditionally used for model parameterization, but in the future may provide the first step in a hierarchical cascade of model validation at multiple scales. However, so far the value of plant traits is obscured by two roadblocks: ecological research produces a tremendous amount of trait data, but the diversity in topics covered and the ways in which studies are carried out result in large numbers of small, idiosyncratic data sets using heterogeneous terminologies. Such heterogeneity can be attributed, in part, to a lack of standards for acquiring, organizing and describing data. We here present recent progress in consolidating the plant trait data domain by standardized terminology (TOP thesaurus of plant characteristics: [top-thesaurus.org](http://top-thesaurus.org)) and data integration (TRY database: [try-db.org](http://try-db.org)) - and we report current limits. Nevertheless, we suggest that consolidated trait data are a valuable tool for optimality driven vegetation model development and validation.