

Summary Report
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Photosynthesis is limited by a number of factors. Of principle interest in this model is access to soil water. As a plant opens its stomata to pull CO₂ for photosynthesis, it also loses water via transpiration. It can control these two coupled processes through the stomatal conductance, which we assume is a function of soil water content.

Based on the evolutionary stable strategy (ESS) theory, we try to identify the best stomatal control strategy in plant water competition. When two plant species share water in the soil, the one with the best strategy will never have less long-term average photosynthesis rate than the other with any different strategy.

During my visit, I collaborated with NIMBioS Postdoctoral Fellow Caroline Farrior to make large progress in developing this modelling method and identifying the relevant physiological constraints. We have a plan to publish this model.

In other activities, Farrior, Louis Gross and his lab members showed me the variety of studies in mathematical ecology, which may be even more important for my future career development. They also showed me the social life of scientists. I really appreciate them.