

Species performance

- I. Principles of resource availability and plant resource acquisition
 - a. Water input and use
 - b. Nutrient cycles (see worksheet)
 - c. Disturbance impacts on nutrient cycles

- II. Principles of ecophysiology
 - a. Basic processes
 - i. Germination
 - ii. Absolute growth rate and relative growth rate
 - iii. Allocation and root structure
 - iv. Carbon balance and water use
 - v. Nutrient requirements
 - b. Building a whole-plant growth model (exercise, see worksheet)
 - c. Predicting plant effects on and response to the immediate environment
 - i. Species diversity, functional group diversity and functional trait diversity
 - ii. Role of species abundance
 - iii. Designing an invasion resistant plant community (exercise)
 - d. A universal trade-off in plant functioning

- III. Managing species performance: Matching plant traits to the environment or managing the environment to match desired plant traits
 - a. Role of resource availability
 - b. Resource capture vs. resource conservation
 - c. Growth rate and priority effects
 - d. Putting it all together (see handout)

Readings

Grime, J. P. 1998. Benefits of plant diversity to ecosystems: Immediate, filter and founder effects. *Journal of Ecology* 86:902-910.

Grotkopp, E., M. Rejmanek, and T. L. Rost. 2002. Toward a causal explanation of plant invasiveness: Seedling growth and life-history strategies of 29 pine (*Pinus*) species. *American Naturalist* 159:396-419.

Whole plant growth model

