Since this was a vegetation-themed session, we asked the collected group to make comments regarding data gaps, field experiments, etc., with a particular focus on uncertainties in vegetation modeling and impacts. Specific comments:

-- More use should be made of satellite-derived interannual vegetation variability in the modeling and process study communities. This is largely an untapped resource, with modelers, for example, often prescribing climatological seasonal cycles of vegetation properties. The Noah model, for example, make use of the interannual information. -- However, some studies (e.g., at COLA and NASA) suggest a low impact of interannual vegetation variation on climate model simulations. Even so, we should remember that an AGCM is tuned, which may have an impact on the ability of land properties to affect it. So perhaps these vegetation studies are inconclusive...

-- We must keep in mind that the *prediction* of vegetation properties makes sense on the seasonal time scale and shorter. Predictions on the interannual scale may be largely out of reach.

-- One element of land surface models is the relationship between evaporation (including transpiration) and soil moisture content. The relationship has been measured only a handful of times at best, and thus, for most situations, modelers typically "invent" a reasonable relationship for their models. This is unfortunate because the relationship lies at the very core of land-atmosphere interactions -- the ability of land moisture anomalies to influence precipitation and temperature. An intensive study aimed at examining already measured (but never processed) soil moisture - evaporation relationships or at making new measurements to fill in this gap would be highly valuable. One possibility is to examine existing joint soil moisture - evaporation measurements at Ameriflux sites. This idea needs to be evaluated carefully, though, as some doubts were expressed about the value and completeness of these data.

-- More ambitious, but also tremendously useful, would be a field study aimed at measuring the separate components of evaporation -- namely, transpiration, bare soil evaporation, and interception loss -- and how they relate to time variations in the soil moisture profile. Again, this would give modelers a stronger basis for evaluating and improving their current parameterizations.

-- The recent surge in carbon flux modeling in conjunction with dynamic vegetation modeling should be extended to include studies of nitrogen, the variations of which also play a role in ecosystem dynamics.

Additional comments:

(1). As to the future field measurements, we have to include the measurement of the separate components of evaporation -- namely, transpiration, bare soil evaporation, and interception loss, as well as the carbon flux. Otherwise, it would not be very helpful for the further model development.

(2). There is a surge in carbon flux modeling in conjunction with dynamic vegetation modeling, and more and more these models introduce into the CPPA
program. However, validation of these models are extremely lacking. Without proper model validation and comparison, such as PILPS type effort, the application of these types models for SI studies are questionable.

In ecosystem studies, there were dynamic vegetation model comparison but yield no results. Eventually, they still go back to their old approaches: go for centuries and million years simulation without validation.

(3). As to nitrogen, there was one talk about this but did not show results. How importance its effect on Vmax then the transpiration is unclear.