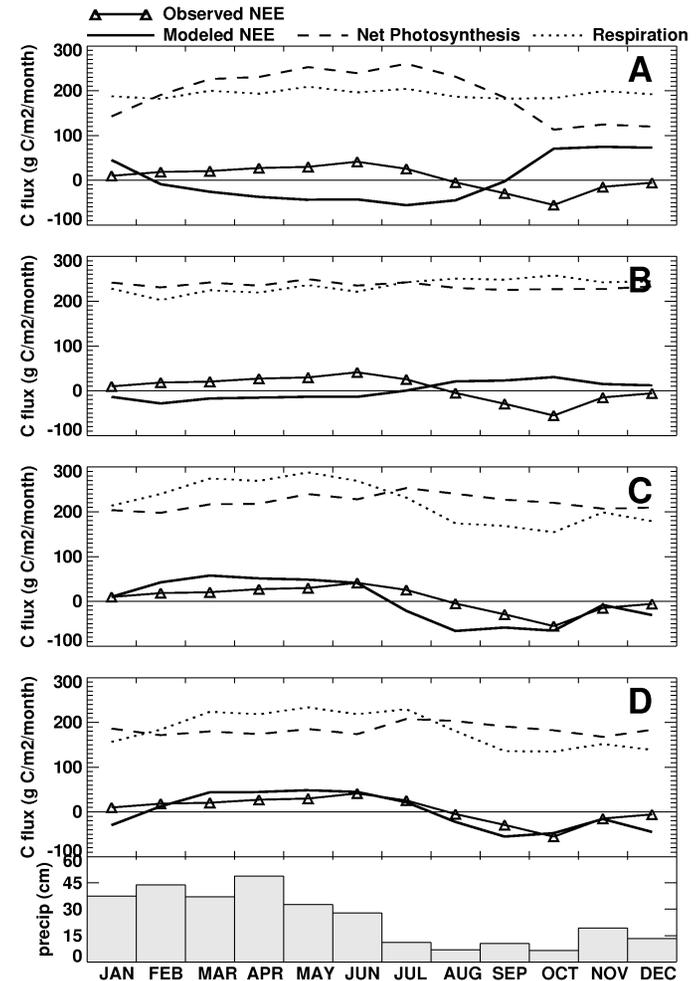


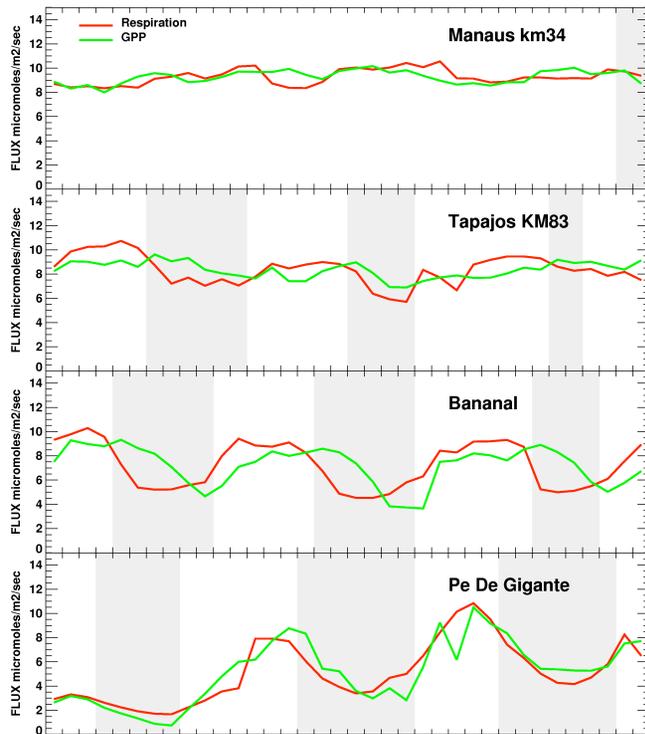
Base SiB code (above) was similar to other models in that it didn't capture the annual cycle: We modified the code (right) by including observed mechanisms for maintaining ecosystem function through seasonal drought, such as

- Deep soil
- Efficient roots
- Light response
- Hydraulic redistribution

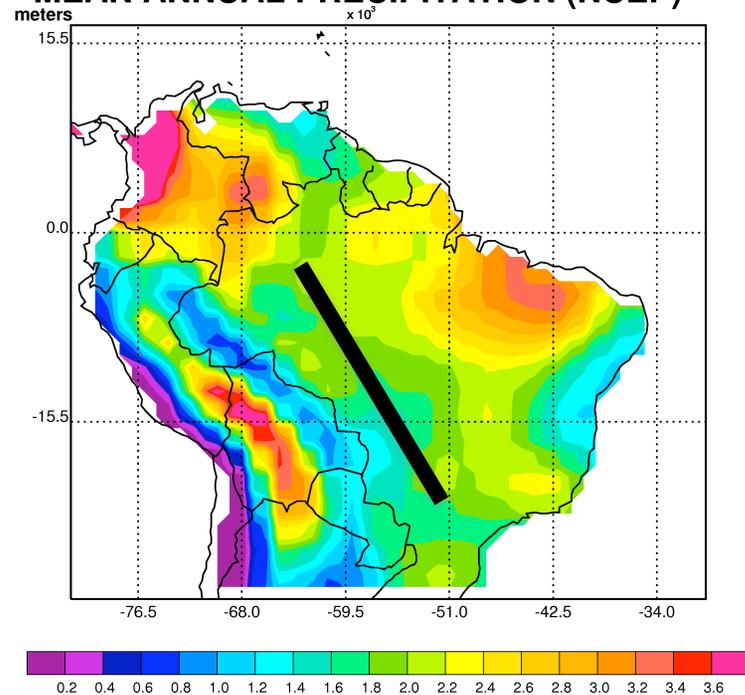
And found that, singly, no mechanism made the model reproduce the observed mean annual cycle. When we combined all mechanisms (right, bottom), the simulation reproduced observations.



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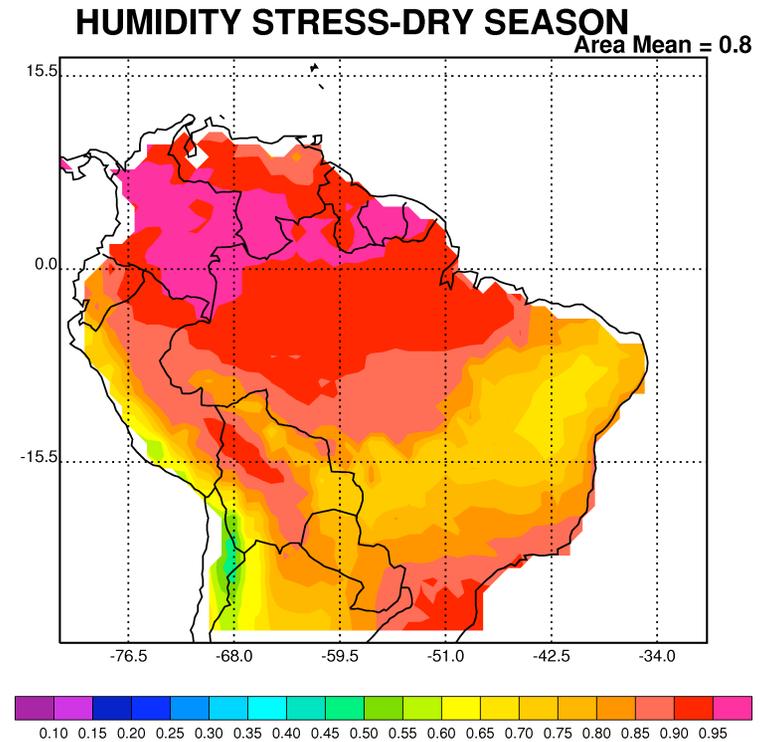
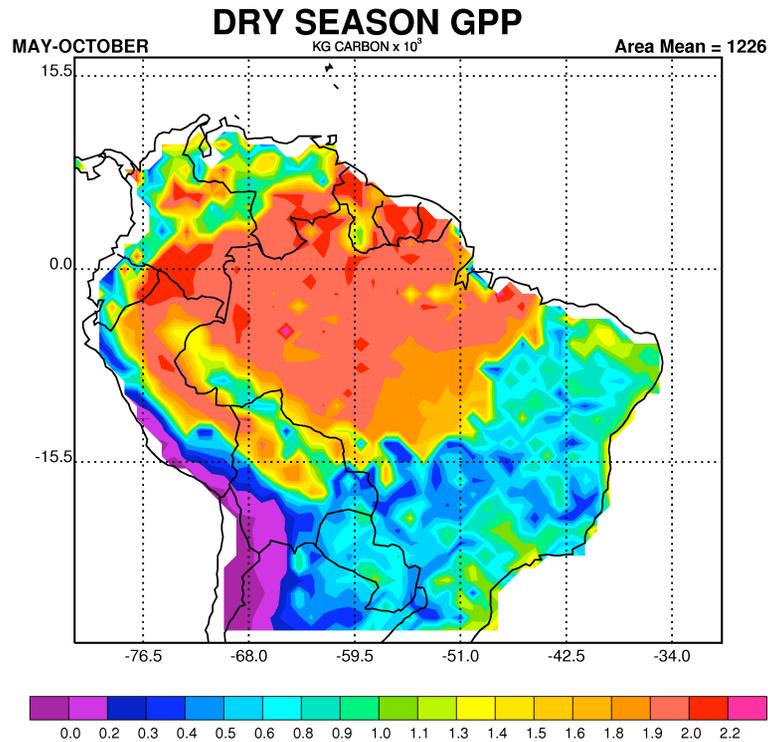
MEAN ANNUAL PRECIPITATION (NCEP)



With this new understanding of regional biophysics, we can create a conceptual model of regional behavior. In the wettest part of Amazonia (left, top), both GPP and Respiration (which, combined, determine NEE) are large and respond to high-frequency meteorological forcing. Towards drier sites (left, downwards), seasonality increases. There is a change in phase as well; in wetter sites (Tapajos), annual cycles of GPP and Respiration are out-of-phase. With decreasing precipitation (and longer seasonal drought), GPP and Respiration are in-phase. The locations of the sites of the panel on the left lie approximately along the line superimposed on the annual precipitation in the right panel.

Jul 23, 2008

Jul 25, 2008



We can also now investigate the ‘transitional forest’, or the region on the edge of the tropical forest (roughly, the red/orange region of the left panel), which forms the interface between the savanna and the main body of the tropical forest. This region is important to the initiation of the wet season, and surface fluxes in this region are important to the overall ecophysiology in Amazonia. The transitional forest has not been completely described, either in behavior or extent. We can see an indication of it’s extent above: it lies along the SE edge of the tropical forest, in the region of strong gradients in GPP and Humidity Stress. (large values => no stress)