

Interactive comment on “Regional and large-scale patterns in Amazon forest structure and function are mediated by variations in soil physical and chemical properties” by C. A. Quesada et al.

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This is a major paper, confirming and greatly extending an earlier finding on the relationships between the vitality of rain forest and the biogeochemical features of the soil across the Amazon basin. The authors demonstrate a gradient in biomass, productivity and turnover from very high values in the base rich soils of the western Amazon, to substantially lower values in the (generally) poor soils of the east. There are strong positive correlations with Cation Exchange Capacity, phosphorus, calcium, magnesium and potassium, but not with nitrogen. Whilst this is of no great surprise to many, the effort of assembling and analysing so many measurements over such a wide geograph-

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ical area is gargantuan, and to be admired.

It is a pity that most of the flux stations within the Large Scale Biosphere Atmosphere Programme have so far been situated in the east, on the ‘poor’ soils predominantly. However, plans are in place to establish a flux tower in one of the more fertile sites in Peru. Such a station and associated measurements will help us to understand the eco-physiological processes involved. For example, what rates of canopy photosynthesis are seen here, and how important is the difference in rainfall between wet and dry seasons? Of special importance is the magnitude of the carbon sink of forests in the eastern Amazon; additional flux stations will do much to clarify this issue, and may make the task of predictive modelling much more realistic. We expect that additional data streams will be important too, for example: data on soil respiration and carbon stocks, atmospheric measurements and not forgetting new satellite data on CO₂ concentrations to come from the recent successfully launched Japanese satellite, GOSAT.

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