

Interactive  
Comment

***Interactive comment on “CO<sub>2</sub> enrichment increases nutrient leaching from model forest ecosystems in subtropical China” by J. X. Liu et al.***

**Anonymous Referee #1**

Received and published: 5 August 2008

General comments

Subtropical forests cover large areas in China. Together with high atmospheric deposition of N, other nutrients, and pollutants, these forests are also subjected to increasing CO<sub>2</sub>, as the most prominent effect of global change. Liu et al., studied the effect of effects of a CO<sub>2</sub> enrichment on the leaching of plant nutrients using an open top chamber technique.

The manuscript is well written, easy to understand, presents interesting data and matches the scopes of BG. Their approach to study both the effect of high CO<sub>2</sub> and high N loads on nutrient leaching is original and well adapted to the local environmental

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



conditions. The last point makes it possible to provide information to decision makers about risks and future environmental changes in the studied area. The data obtained had been analysed using adapted statistical tools, the resulting tables and figures supported the main points of this manuscript.

Nevertheless, it would be of interest to see of the observed evolution of the nutrient concentrations will vary in the same way over a longer time period.

#### Specific comments

Abstract: more precise "weathering of minerals" instead of soil weathering.

Line 9–10: should be changed, especially the end of this sentence.

#### Introduction

Line 23–25: delete dangerous or the whole sentence, because it is quite trivial.

Line 27–30: sinks for CO<sub>2</sub> are: SOM, tree biomass, but sinks can turn into sources, depends on forest management, environmental conditions...

Page 2681, line 26: Soil moisture controls microbial activity but in subtropical climate, higher moisture should be interpreted in terms of a reservoir for the dry season.

#### Materials and Methods

##### Comment

Mixing of soils by sieving destroys aggregates and may increase mineral surface which could be weathered by the soil solution. As done by the authors they waited 9 month before the measurements started, a time span which seems long enough that the soil recovers from this treatment (see for instance the FACE experimental set up of Hagedorn et al., 2000).

#### Results

##### Comment

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

Figure 2: How do you explain the increase in the soil pH (from 4.2 to 7.7)? Suggestion: compile Figures 3 and 5, and Figure 4 and 6, this will reduce the number of the figures without reduction of the information. Table 1: add the C (%), verify the N (%) which is quite high (3–2 %), and add the total amounts of each nutrient as kg/ha. This makes it possible to see how much of the total is lost per year (losses presented Table 2)

Discussion

Comment

Could you provide more information about the increase in pH? This is a dramatic increase within one year, an effect rarely observed in other forest ecosystems.

Moisture effect on litter decomposition is rather speculative; it would be highly improved if litter decomposition had been measured. Even direct measurement of litter decomposition is critical because this should be done for pure and mixed litters from the 8 tree species.

4.3

Aber et al is studied N saturation in northern temperate forests in the U.S and in Europe

4.4

Another point is the high N loads into this ecosystem, which will increase growth, if N was limiting or Liebig's law should be kept in mind.

---

Interactive comment on Biogeosciences Discuss., 5, 2679, 2008.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

