Biogeosciences Discuss., 5, S2293–S2295, 2008
www.biogeosciences-discuss.net/5/S2293/2008/

Biogeosciences Discussions

Interactive comment on "Carbon and oxygen isotope analysis of leaf biomass reveals contrasting photosynthetic responses to elevated CO_2 near geologic vents in Yellowstone National Park" *by* S. Sharma and D. G. Williams

S. Sharma and D. G. Williams

Received and published: 23 November 2008

The authors would like to thank the editor and an anonymous reviewer for their insightful comments and suggestions. A revised version of the paper addressing the comments will be submitted to Biogeosciences. Here are our answers to their specific comments:

Referee 2

Comment 1: The isotopic data provide indirect measurements of gas exchange responses. Because they are indirect measurements, there is additional uncertainty associated with them that would not be associated with direct measurements. For

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

example, the interpretation of the d18O responses relies on the assumption that d18O of leaf dry matter will decrease with increasing stomatal conductance. However, data sets have now been published that showed the opposite pattern, so the assumption should be treated with caution.
Author reply: The referee brings up a very good point and work done by Sheshshayee et al., 2005 shows that δ^{18}O of leaf matter can increase with increasing stomatal conductance. Keeping this in mind, in the follow-up project we are proposing to measure leaf gas exchange rates, stomatal conductance and the response of photosynthesis to leaf internal CO_2 concentration (A-ci curves) three times during the growing season. These A-ci curves would then be used in conjunction with isotopic data to determine patterns of stomatal and non-stomatal limitations to photosynthesis across CO_2 exposure gradients.

Comment 2: I suggest that the authors conclude their discussion section with a call for direct measurements of leaf gas exchange in these plants to confirm the patterns suggested by the isotopic data.
Author reply: In the revised version of the paper a short discussion specifying importance of direct measurement will be included.

Comment 3: Figure 3: I can′t think of any reason why the y-axes should be reversed here. I suggest that the figure be revised with values on the y-axes increasing from origin upward.
Author reply: We will modify the figure accordingly in the final version.

Editor
Comment 1: Can air temperatures also influence photosynthesis and water relations?
Author reply: Yes they can, but we do not anticipate any major variation in air temperatures at our study sites.

BGD
5, S2293–S2295, 2008

Interactive Comment

Comment 2: At what time of year were the samples taken and, presumably, the soil temperatures were measured?
Author reply: The samples were taken in July and soil temperatures varied from 20-25^{0}C

Comment 3: The Figure 4 makes no mention of only the lodgepole pine data being used to generate the regression line, r2 and probability, while the text makes it clear that the regression etc. only applies to lodgepole pine.
Author reply: Yes only lodgepole pine data was used to generate the regression line and we will add this statement to figure text.

Interactive comment on Biogeosciences Discuss., 5, 3825, 2008.