Biogeosciences
Discussions

Open Access

Interactive comment on "**Altered phenology and temperature sensitivity of invasive annual grasses and forbs changes autotrophic and heterotrophic respiration rates in a semi-arid shrub community**" *by* **M. Mauritz and D. L. Lipson**

Anonymous Referee #2

Received and published: 8 May 2013

General comments:

This study compared soil respiration (and it's autotrophic and heterotrophic components) and in an invaded and non-invaded coastal shrub ecosystem. The authors measured soil respiration with automated chambers over two growing season, and partitioned soil respiration with 30 cm deep soil collars to remove the autotrophic contribution. Temperature and moisture relationships as well as total C fluxes were quantified. The study is interesting in that invasive plants (and particular annual grasses) have affected large areas, yet their influence on the carbon budget is not well quanti-

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

fied. Additionally, this is interesting because the influence of altered-phenology has not been extensively quantified with respect to soil respiration.

In general, the writing in this manuscript is acceptable, however not as concise as it could be for the amount information provided. I recommend a broader literature review and a double check that references are being cited appropriately. The manuscript would benefit from focusing the take home points and improving the data display. I agree with reviewer 1's assessment that the author's are inferring causality throughout the manuscript, without sufficient data (such as a gradient or manipulation). I also agree that the analyses of temperature and moisture relationships are quite basic and could be improved.

P6336 L10 – add time units - g C m-2 per year? L14 – "invasion increase temperature sensitivity in Rt and Rh when wet and decreased when dry" What timeframe are you referring too, daily, seasonal temperature sensitivity? L15 – How can the altered temperature sensitivity be due to phenology of invasives if Ra temperature sensitivity is not altered as well?

P6337 L3 – on an annual basis L15 – Ra is often younger C than Rh, but not always. This statement should be reworded.

P6338 L10 – Rh and Ra partitioning when dry is system dependent, check your references are incorrect. In annual plant ecosystem, this is true because all annuals are dead. But in a perennial plant ecosystem, often the Rh is more sensitive to moisture than Ra... thus Rt is usually dominated by Ra when dry because plants have roots that can get water from depth, where as the majority of microbes are in the upper soil layers, and cannot access water at depth.

L13 – This study was done on perennial grasses, not annual – it is in the title of the paper. Increase Ra with respect to what?

P6340

Equation 1 should be: Ra = Rt-Rh

P6341

Unnecessary text on data quality control.

P6344

L8 – "invaded areas became hotter than shrubs" this is a problem throughout the manuscript, shrub areas, plots, or chambers should be used.

Subsection headers, for example "3.2 Invasion increased respiration rates" should be less causal for example "Greater respiration rates in invaded areas"

Figures – One multipanel figure with Rt,Rh,Ra – soil temp – and soil moisture would be informative instead of two separate figures and no time series of temperature. Fig 1,3 – what do the grey and white areas represent? Fig 5 – why not do the temperature and moisture analyses with Ra and Rh, instead of Rt and Rh. Fig 7 – connect symbols with lines

———————————————————

Interactive comment on Biogeosciences Discuss., 10, 6335, 2013.