

## Reviewer's Final Report

**Author(s):** Yu et al.

**Title:** Soil carbon release responses to long-term versus short-term climatic warming in an arid ecosystem

### General Comments:

The authors worked hard to address the concerns in the first round of critiques, and it shows here. My only commentary is for clarifying the language of the authors' sections of new text. Please see below for specific examples and suggestions for edits.

### Specific Technical Comments:

Line 12-13: Edit out "such as the changes in" and replace with 'by altering rates of' for a stronger opening sentence

Line 16: Remove "about" for  $\sim 3^{\circ}\text{C}$

Line 17: Remove "about" for  $\sim 4^{\circ}\text{C}$

Line 30: precipitation pulses during the growing season

Line 37: of the earth's

Line 62: during the growing season

Lines 94-101: A previously published warming experiment is referenced but no explicit mention of those results are given. The new, long-term warming experiment is then stated to possibly have an opposite result, but again, no explicit statement of what that might be. Could the authors clarify this paragraph?

Line 104: Remove "about" for  $\sim 3$  and  $\sim 4^{\circ}\text{C}$ , or since this is clarified in the Abstract and then outlined in the Methods a few paragraphs later, this detail could be omitted here.

Line 132: remove long-term as this sentence (line 131 above) started by defining this as the longer warmed plots

Line 137: space needed between regimes (one-year)

Line 148: Can remove the sentence defining the control plots as they were already defined in lines 138-139

Line 150: were installed with a “dummy” heater...

Line 274: Respiration significantly increased with...

Line 290: end sentence with: from each other (P= 0.45)

Line 340-342: Awkwardly worded sentence. Rework to state that the positive feedback loop could be weakened with length or intensity of warming

Line 343: Edit out Actually, and start sentence with Total respiration (Rs)

Line 350: add in “and” before consequently the total Rs

Line 378: may rapidly increase

Line 382-384: Edit out “at a higher level” as substrate limitation is just another limitation, not necessarily higher (or more important) than moisture, or soil type for instance. Unless you mean higher level as in greater respiration....Please clarify

Line 385: high meaning increased respiration?

Line 414: thus affecting its temperature sensitivity; SWC becomes the main factor...

Line 419: warming; and – split into 2 full sentences

Line 421: implicate that multiple factors together...