

AUTHORS' RESPONSE: COSMOGENIC NOBLE GAS DEPLETION IN SOILS BY WILDFIRE HEATING

We listed several proposed changes to the paper in our responses to RC1 and RC2. We have made these changes in the revised text and here we identify their locations. Note that the line numbers for the main text refer to the revised version, *not* the latexdiff comparison of original and revised versions.

As instructed by the associate editor, we have not adopted the suggestion in RC1 to move material from the supplementary methods into the main text. The overall length of the main text is unchanged from the submitted version. Finally, we also corrected several typographical errors that we discovered in both the main text and the supplementary methods.

RC1:

1. Add parameter values and other technical details for computing diffusion kinetics to the supplement.
 - Parameter values added and discussion expanded in section 4 of the supplement.
 - In addition, note that all equations and parameter values also appear in the MATLAB script implementing the model, which is included in the supplement.
2. Clarify the 'most likely explanation' section of the main text (p. 4).
 - Clarified this text to better communicate that wildfire heating is the only plausible explanation for the observations (p. 4, lines 10-15).
3. Correct technical errors with the mathematical notation in the supplement.
 - Corrected in section 4 of the supplement. We also corrected several additional errors that were not identified by the reviewer.

RC2:

1. Add information about density measurements and topographic shielding to the supplement.
 - Density measurements are now described in section 1 of the supplement. A note about snow cover and topographic shielding has been added to section 4 of the supplement.
2. Clarify dimensionality of model in main text
 - Clarified this section: p. 5, line 14 through p. 6, line 5.
3. Clarify vague or confusing sections of the text highlighted by the reviewer
 - We made minor changes in: Figure 1 and its caption; p. 4, around lines 10-15; p. 5, near line 14; p. 6 near line 5.
4. Correct minor errors and omissions
 - These have been corrected.