

UNIVERSITY OF BIRMINGHAM

University of Birmingham
Research at Birmingham

Addendum

Comer-Warner, Sophie A.; Romeijn, Paul; Goody, Daren C.; Ullah, Sami; Kettridge, Nicholas; Marchant, Benjamin; Hannah, David M.; Krause, Stefan

DOI:

[10.1038/s41467-019-11185-x](https://doi.org/10.1038/s41467-019-11185-x)

License:

Creative Commons: Attribution (CC BY)

Document Version

Publisher's PDF, also known as Version of record

Citation for published version (Harvard):

Comer-Warner, SA, Romeijn, P, Goody, DC, Ullah, S, Kettridge, N, Marchant, B, Hannah, DM & Krause, S, 2019, 'Addendum: Thermal sensitivity of CO₂ and CH₄ emissions varies with streambed sediment properties', *Nature Communications*, vol. 10, no. 1, 3093. <https://doi.org/10.1038/s41467-019-11185-x>

[Link to publication on Research at Birmingham portal](#)

Publisher Rights Statement:

Checked for eligibility: 15/10/2019

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.

<https://doi.org/10.1038/s41467-019-11185-x>

OPEN

Addendum: Thermal sensitivity of CO₂ and CH₄ emissions varies with streambed sediment properties

Sophie A. Comer-Warner ^{1,3}, Paul Romeijn^{1,3}, Daren C. Goody ², Sami Ullah¹, Nicholas Kettridge¹, Benjamin Marchant², David M. Hannah ¹ & Stefan Krause¹

Addendum to: *Nature Communications* <https://doi.org/10.1038/s41467-018-04756-x>; published online 18 July 2018.

We would like to clarify the discussion in this Article of the previously published relationships between temperature and greenhouse gas (GHG) emissions. Previous studies identified complex relationships between temperature and GHG emissions or microbial metabolic activity, some of them pointing towards exponential behaviour following Arrhenius law^{1–3}. The results of the study presented in this Article specifically highlight non-linearity in the temperature dependency of GHG emissions, which was not exponential. This includes threshold responses of streambed GHG production as a function of streambed warming, with temperature sensitivity varying greatly with substrate, organic matter content, and geological origin. Our results, therefore, demonstrate the relevance of global warming impacts on streambed GHG production; especially due to observed non-linearity in streambed GHG production with increased temperature.

Published online: 09 July 2019

References

1. Shelley, F., Abdullahi, F., Grey, J. & Trimmer, M. Microbial methane cycling in the bed of a chalk river: oxidation has the potential to match methanogenesis enhanced by warming. *Freshw. Biol.* **60**, 150–160 (2015).
2. Yvon-Durocher, G. et al. Methane fluxes show consistent temperature dependence across microbial to ecosystem scales. *Nature* **507**, 488–491 (2014).
3. Yvon-Durocher, G. et al. Reconciling the temperature dependence of respiration across timescales and ecosystem types. *Nature* **487**, 472–476 (2012).



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

© The Author(s) 2019

¹School of Geography, Earth and Environmental Sciences, University of Birmingham, Edgbaston, Birmingham B15 2TT, UK. ²British Geological Survey, Maclean Building, Wallingford, Oxfordshire OX10 8BB, UK. ³These authors contributed equally: Sophie A. Comer-Warner, Paul Romeijn. Correspondence and requests for materials should be addressed to S.A.C.-W. (email: scx469@bham.ac.uk)