



Noacco, V., Wagener, T., Worrall, F., Burt, T. P., & Howden, N. J. K. (2017). Human impact on long-term organic carbon export to rivers. *Journal of Geophysical Research: Biogeosciences*, 122(4), 947-965. <https://doi.org/10.1002/2016JG003614>

Publisher's PDF, also known as Version of record

License (if available):  
CC BY

Link to published version (if available):  
[10.1002/2016JG003614](https://doi.org/10.1002/2016JG003614)

[Link to publication record in Explore Bristol Research](#)  
PDF-document

This is the final published version of the article (version of record). It first appeared online via Wiley at <http://onlinelibrary.wiley.com/doi/10.1002/2016JG003614/abstract>. Please refer to any applicable terms of use of the publisher.

## University of Bristol - Explore Bristol Research

### General rights

This document is made available in accordance with publisher policies. Please cite only the published version using the reference above. Full terms of use are available: <http://www.bristol.ac.uk/red/research-policy/pure/user-guides/ebr-terms/>

**Human impact on long-term organic carbon export to rivers**

**Valentina Noacco<sup>1\*</sup>, Thorsten Wagener<sup>1,2</sup>, Fred Worrall<sup>3</sup>, Timothy P. Burt<sup>4</sup>, and  
Nicholas J. K. Howden<sup>1</sup>**

<sup>1</sup> Department of Civil Engineering, University of Bristol, Bristol, BS8 1TR, UK,

<sup>2</sup> Cabot Institute, University of Bristol, Bristol, BS8 1UJ, UK,

<sup>3</sup> Department of Earth Sciences, Durham University, Durham, DH1 3LE, UK,

<sup>4</sup> Department of Geography, Durham University, Durham, DH1 3LE, UK.

**Contents of this file**

Tables S1 to S4

**Introduction**

The supplementary tables contain information behind Soil Organic Carbon (SOC) and Soil Bulk Density data statistics for the different land uses used in this study (Table S1), the variables tested in the UK DOC export model but not statistically significant (Table S2), SOC first-order constants for each land use transition (Table S3), and the preferential direction of land use change (Table S4).

**Table S1.** SOC and soil bulk density summary statistics under different land uses.

	N	Mean	Min	Max	Range	Lower Q	Median	Upper Q	SD	CV	Skewness	Kurtosis
<i>SOC (%)</i>												
Arable	592	3.17	0.68	30.8	30.12	1.77	2.3	3.2	3.14	0.99	4.28	26.35
Temporary grass	205	2.86	0.8	20.1	19.3	1.89	2.4	3.31	2.05	0.72	4.89	35.28
Permanent grass	367	4.14	0.68	19.8	19.12	2.63	3.76	5.12	2.28	0.55	2.78	17.08
Woodland	82	5.84	1.3	25.6	24.3	3.22	4.65	6.7	4.51	0.77	2.73	11.33
Urban <sup>1</sup>	808	3.5	0.9	18.6	17.7	2.42	3.3	4.58	1.6	0.46	-	-
<i>Bulk Density (g/cm<sup>3</sup>)</i>												
Arable	242	1.2	0.44	1.47	1.03	1.15	1.18	1.28	0.13	0.11	-2.43	14.99
Temporary grass	65	1.25	1.06	1.37	0.31	1.18	1.26	1.3	0.08	0.06	-0.48	2.58
Permanent grass	111	1.04	0.26	1.24	0.98	0.97	1.07	1.12	0.15	0.15	-2.88	14.89
Woodland	65	0.97	0.58	1.19	0.61	0.93	1	1.07	0.15	0.16	-1.18	3.96

<sup>1</sup>Urban from *Rawlins et al.* [2008]

**Table S2.** Variable tested in *Worrall et al.* [2012]

---

Variables tested but not statistically significant
Arable
N. cattle
N. sheep
BFI
Actual annual evaporation
Standard average annual rainfall

---

**Table S3.** SOC first-order rate constants for land use changes from A to B (yr<sup>-1</sup>)

Land use A	Land use B				
	Arable	Temporary grassland	Permanent grassland	Urban	Woodland
Arable	0	0.04	0.04	0.69	0.02
Temporary grassland	0.28	0	0.03	0.69	0.02
Permanent grassland	0.28	0.33	0	0.69	0.02
Urban	0.03	0.04	0.04	0	0.02
Woodland	0.06	0.06	0.06	0.69	0

**Table S4.** Land use transition matrix showing preferential direction of land use change (after *Adger et al. [1992]; Adger and Subak [1996]*).

From	To			
	1	2	3	4
Arable	Temporary grassland	Urban	Permanent grassland	Woodland
Temporary grassland	Arable	Urban	Permanent grassland	Woodland
Permanent grassland	Woodland	Temporary grassland	Arable	Urban