

TITLE: Nitrogen fluxes from the landscape are controlled by net anthropogenic nitrogen inputs and by climate

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ABSTRACT:

Frontiers in Ecology and the Environment Volume 10, Issue 1 p. 37-43 Concepts and Question Nitrogen fluxes from the landscape are controlled by net anthropogenic nitrogen inputs and by climate Robert Howarth, Corresponding Author Robert Howarth Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY(howarth@cornell.edu) Search for more papers by this author Dennis Swaney, Dennis Swaney Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY Search for more papers by this author Gilles Billen, Gilles Billen UMPC Université Paris 6 and CNRS, UMR Sisyphe, Paris, France Search for more papers by this author Josette Garnier, Josette Garnier UMPC Université Paris 6 and CNRS, UMR Sisyphe, Paris, France Search for more papers by this author Bongghi Hong, Bongghi Hong Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY Search for more papers by this author Christoph Humborg, Christoph Humborg Baltic NEST Institute, Stockholm Resilience Centre, Stockholm, Sweden Search for more papers by this author Penny Johnes, Penny Johnes Aquatic Environments Research Centre, School of Human and Environmental Sciences, University of Reading, Whiteknights, Reading, UK Search for more papers by this author Carl-Magnus Mörtz, Carl-Magnus Mörtz Baltic NEST Institute, Stockholm Resilience Centre, Stockholm, Sweden Search for more papers by this author Roxanne Marino, Roxanne Marino Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY Search for more papers by this author Robert Howarth, Corresponding Author Robert Howarth Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY(howarth@cornell.edu) Search for more papers by this author Dennis Swaney, Dennis Swaney Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY Search for more papers by this author Gilles Billen, Gilles Billen UMPC Université Paris 6 and CNRS, UMR Sisyphe, Paris, France Search for more papers by this author Josette Garnier, Josette Garnier UMPC Université Paris 6 and CNRS, UMR Sisyphe, Paris, France Search for more papers by this author Bongghi Hong, Bongghi Hong Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY Search for more papers by this author Christoph Humborg, Christoph Humborg Baltic NEST Institute, Stockholm Resilience Centre, Stockholm, Sweden Search for more papers by this author Penny Johnes, Penny Johnes Aquatic Environments Research Centre, School of Human and Environmental Sciences, University of Reading, Whiteknights, Reading, UK Search for more papers by this author Carl-Magnus Mörtz, Carl-Magnus Mörtz Baltic NEST Institute, Stockholm Resilience Centre, Stockholm, Sweden Search for more papers by this author Roxanne Marino, Roxanne Marino Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY Search for more papers by this author First published: 15 July 2011 <https://doi.org/10.1890/100178> Citations: 239 Read the full text About PDF Tools Request permission Export citation Add to favorites Track citation Share Share Give access Share full text access Share full-text access Please review our Terms and Conditions of Use and check box below to share full-text version of article. I have read and accept the Wiley Online Library Terms and Conditions of Use Shareable Link Use the link below to share a full-text version of this article with your friends and colleagues. Learn more. Copy URL Share a link Share on Facebook Twitter LinkedIn Reddit Wechat Abstract The flux of nitrogen (N) to coastal marine ecosystems is strongly correlated with the "net anthropogenic nitrogen inputs" (NANI) to the landscape across 154 watersheds, ranging in size from 16 km² to 279 000 km², in the US and Europe. When NANI values are greater than 1070 kg N km⁻² yr⁻¹, an average of 25% of the NANI is exported from those watersheds in rivers. Our analysis suggests a possible threshold at lower NANI levels, with a smaller fraction exported when NANI values are below 1070 kg N km⁻² yr⁻¹. Synthetic fertilizer is the largest component of NANI in many watersheds, but other inputs also contribute substantially to the N fluxes; in some regions, atmospheric deposition of N is the major component. The flux of N to coastal areas is controlled in part by climate, and a higher percentage of NANI is exported in rivers, from watersheds that have higher freshwater discharge. Citing Literature Supporting Information Filename Description i1540-9295-10-1-37-s1.pdf PDF document, 500 KB Supplementary Data Please note: The publisher is not responsible for the content or functionality of any supporting information supplied by the authors. Any queries (other than missing content) should be directed to the corresponding author for the article. Volume 10, Issue 1 February 2012 Pages 37-43 Related Information

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