footprint. But because food is a much larger contributor than fossil fuel use to a personal nitrogen footprint, it provides more opportunity for reduction. Two effective strategies are consumption of no more than the recommended amount of protein and the reduction of food waste. For countries such as the United States, if consumers ate according to national and international protein recommendations and reduced food waste by 50%, their total nitrogen footprint would decrease by over 35% (ref. 3). Consumers can also replace animal protein with vegetable protein sources, which typically have a lower nitrogen footprint.

Nitrogen pollution is only one of many environmental impacts that our activities have around the world. Existing tools to determine various environmental impacts, for example on the nitrogen, water and carbon cycles as well as on land use, should be combined so that consumers have a more comprehensive view of the impacts of their decisions[7]. Second, a concerted effort is needed to reach out to inform consumers and encourage them to reduce their environmental impact.

The environmental footprint is a powerful approach that connects consumers with their environmental impacts and empowers them to make changes. Oita *et al.*[4] have used a global assessment of our nitrogen footprint to reveal the degree to which we may be, in effect, exporting our nitrogen pollution to other countries. Once consumers are made aware how large their footprint is on a global scale, they may be more motivated to downsize. With enough efforts, eventually even Fats Waller would conclude that our feet are no longer too big. ❐

James N. Galloway is in the Department of Environmental Sciences, University of Virginia, Charlottesville, Virginia 22904, USA. Allison M. Leach is in the Department of Natural Resources and the Environment, University of New Hampshire, Durham, New Hampshire 03824, USA.
e-mail: jng@eservices.virginia.edu; Allison.Leach@unh.edu

References
1. Wackernagel, M. *et al. Ecol. Econ.* **29,** 375–390 (1999).
2. Leach, A. M. *et al. Environ. Dev.* **1,** 40–66 (2012).
3. Stevens, C. J., Leach, A. M., Dalea, S. & Galloway, J. N. *Environ. Sci. Processes Impacts* **16,** 1563–1569 (2014).
4. Oita, A. *et al. Nature Geosci.* **9,** 111–115 (2016).
5. Galloway, J. N., Theis, T. L. & Doering, O. C. *EM Air Waste Manage. Assoc. Mag. Environ. Managers* **65,** 6–11 (2015).
6. Zhang, X. *et al. Nature* **528,** 51–59 (2015).
7. Galli, A. *et al. Ecol. Indic.* **16,** 100–112 (2012).

Published online: 25 January 2016

GROUNDWATER

India's drought below ground

The Indian subcontinent is in a water-stressed state due to the water-intensive demands of economic development and food supply for a population of over a billion people. Most of the utilizable water resources in India are devoted to agriculture and northern India in particular represents one of the most intensely irrigated and densely populated regions in the world. India's rainfall is largely delivered during the South Asian summer monsoon and even small declines in this monsoonal rainfall can lead to severe droughts, as in 2009.

Between 2002 and 2008, water in northern India was steadily depleted, warning of a nearing water crisis in the region, primarily as a result of unsustainable anthropogenic withdrawal of groundwater for irrigation purposes. Dileep Panda and John Wahr now extend these data to May 2014 and find that depletions in India's terrestrial water resources over the past decade have been most severe in the northern parts of the country and further exacerbated by drought (*Water Resour. Res.* http://doi.org/bbs7; 2016). They, too, suggest that groundwater abstraction is to blame. Assessing spatiotemporal variations in terrestrial water storage across India, they find that groundwater storage depletion rates amounted to about 1 to 2 cm yr^{-1} in the wheat- and rice-growing parts of northwestern India, including the Ganges Basin.

© BARTEK WRZESNIOWSKI / ALAMY STOCK PHOTO

The loss of terrestrial water storage was particularly severe during the drought years of 2004, 2009 and 2012 — with a particular peak in the Ganges Basin in 2009. Increased groundwater withdrawal in response to the soil moisture deficit and increased demand for drinking water are identified as the main contributing factors. Regional warming since 2008 could also be associated with rising demands on groundwater.

In conjunction with similar trends identified in other regions of the world, the findings highlight an alarming reduction in water storage when meteorological drought is compensated by a rise in groundwater withdrawal. This effect is exacerbating water scarcity issues in regions such as India where populations continue to grow.

TAMARA GOLDIN