

Sobota, Daniel J., Jana E. Compton and John A. Harrison. Reactive nitrogen in the United States: How certain are we about current input and sources? To be submitted to *Frontiers in Ecology and the Environment*.

## **Abstract**

Reactive nitrogen (N) input to air, land, and water in the United States (US) has been increasing for a century, with important consequences for ecosystems and human health. Comparisons of national N input estimates can aid in prioritization of future N research in the US, yet remain missing from current peer-reviewed literature. Here, we provide an inventory of available data on N input to the US and examine ranges of current (1990s – 2000s) estimates. We suggest 25.7 Tg N yr<sup>-1</sup> is the best estimate of current, new N input associated with human activities, with nearly half originating from synthetic N fertilizer. However, anthropogenic N input may range from 14.1 to 30.4 Tg N yr<sup>-1</sup> due to poorly constrained estimates of other N sources. In particular, our analysis suggests N inputs associated with agricultural N fixation, livestock manure, and wastewater urgently require additional research to better inform N management.