Sources and sinks of reactive nitrogen in the Canadian landscape

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Canada is a large country with a small population density. Much of its population, agriculture and industry is concentrated near its southern border with the United States, with which there is a significant exchange of atmospheric N. The country is a large exporter of fertilizer, food, hydrocarbons and wood. Using a combination of measured and modeled values, we produced a reactive N budget for Canada, which estimated not only trans-boundary exchanges, but also within-country fluxes. We stratified the Canadian landscape into natural forest, agricultural, urban/industrial, water and atmosphere and estimated fluxes into and out of each of these units. Our results show that natural forest N fluxes in Canada are in balance, that agricultural systems are gaining N in soils, and that there are flows in urban/industrial sectors which we need to identify in order to better understand the fate of reactive N in the country.

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