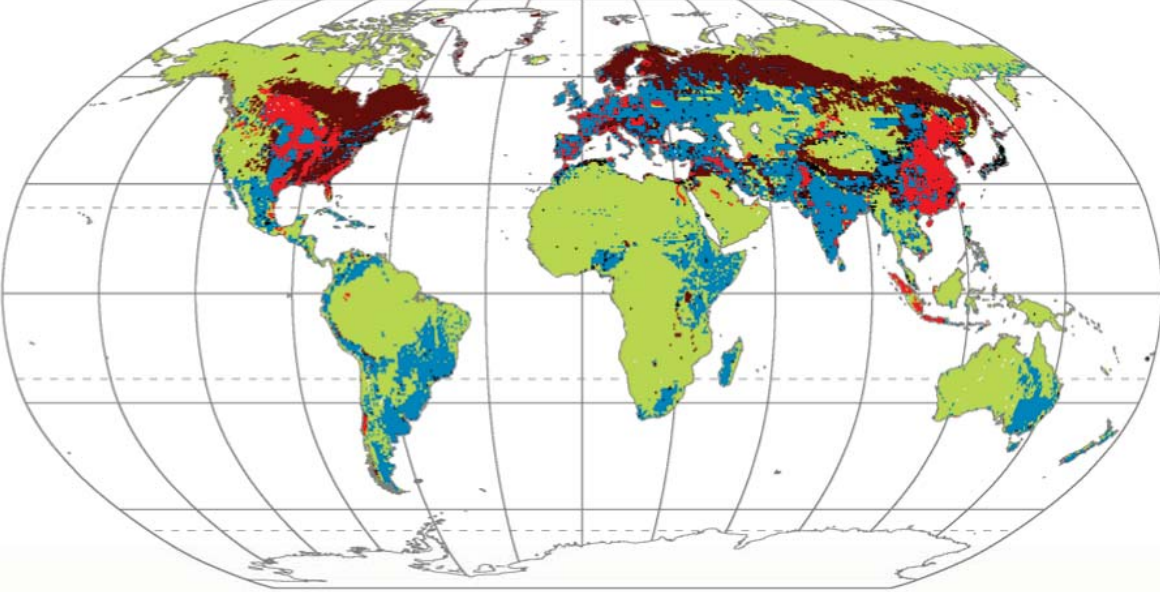


Indicator name	Sources of contemporary nitrogen loading
 <p data-bbox="397 924 1339 966"> Sewage Fixation Livestock Deposition Fertilizer </p>	
Prepared by	Water Systems Analysis Group, University of New Hampshire (UNH)
Example	WWDR2, Section 2, Global Map 4
Rationale	Nitrogen loading onto the land mass and aquatic systems as a source for delivery to the coastal zone; a measure of potential water pollution.
Position in DPSIR chain	State, Pressure
Definition of indicator	Total and inorganic nitrogen loads as deposition, fixation, fertilizer, livestock loads, human loads and total distributed nitrogen to the land and aquatic system.
Underlying definitions and concepts	<p>The indicator is based on the following definitions:</p> <ul style="list-style-type: none"> • Nitrogen (N) loading in the form of deposition, fixation, fertilizer application, livestock and human waste. • Residence time in soils, rivers, lakes and reservoirs • Ratio of runoff to precipitation • Average temperature
Specification of determinants needed	Atmospheric Nitrogen Deposition Nitrogen Fixation Nitrogenous Fertilizer Loads Livestock Nitrogen Loading Human Nitrogen Loading Gridded precipitation fields (annual precipitation per grid cell) Gridded temperature fields (annual temperature per grid cell) Gridded runoff fields (annual runoff per grid cell)
Computation	See Green et. al. Biogeochemistry 2004, reference listed in the “Sources of Further Information” section below for full explanation of computations.
Units of measurements	Nitrogen loading in units of kg N/km ² /yr.
Data sources, availability and quality	All data for this indicator is available from the Water Systems Analysis Group at University of New Hampshire: http://wwdrii.sr.unh.edu/download.html (Accessed 3 March 2009)
Scale of application	Local for basins exceeding 25, 000 km ² (within a city or community); regional (within a sub-national region); national (for a country); international (across

	several countries or globally).
Geographical coverage	Global, gridded dataset at 30-minute grid cell resolution Africa, gridded dataset at 6-minute grid cell resolution
Interpretation	This indicator provides a measure of potential water pollution by explicitly mapping out the extent of both natural and anthropogenic nitrogen loading to the land and aquatic systems. Global, continental, regional, and coastline-specific estimates of nitrogen loadings onto the continental land mass are derived by applying a mass balance assessment of nitrogen loads to the landscape providing an accounting of nitrogen sources, uptake, transport and leakages to terrestrial and riverine systems. Nitrogen loads to the land mass include sewered and non-sewered human wastes, atmospheric deposition, fixation from natural vegetation and cropland, industrial fertilizers, and livestock emissions. Redistribution of N results from the interception of atmospheric N inputs by (a) the growth, harvesting and transport of crops, (b) the growth, harvesting and transport of feed and forage for livestock, (c) the production and transport of animal products, (d) and the loss of N through sewered and non-sewered.
Linkage with other indicators	Not reported
Alternative methods and definitions	Not reported
Related indicator sets	Total Nitrogen flux (kg N/km ² /yr); Dissolved inorganic nitrogen flux (kg N/km ² /yr)
Sources of further information	Pamela A. Green, Charles J. Vörösmarty, Michel Meybeck, James N. Galloway, Bruce J. Peterson And Elizabeth W. Boyer. Pre-industrial and contemporary fluxes of nitrogen through rivers: a global assessment based on typology. <i>Biogeochemistry</i> : 68 71–105, 2004.
Involved agencies	Water Systems Analysis Group, University of New Hampshire http://www.wsag.unh.edu/ (Accessed 3 March 2009)