3. Atmospheric Supply of Nitrogen to the Baltic Sea in 2004

Nitrogen emission data, as well as the model results presented here have been approved by the 30th Session of the Steering Body of EMEP in Geneva in September 2006. The EMEP Unified Eulerian model system has been used for all nitrogen computations presented in this Chapter. Annual deposition of total nitrogen to the Baltic Sea basin in 2004 was 214 ktonnes N, the same amount as in 2003.

3.1 Nitrogen emissions

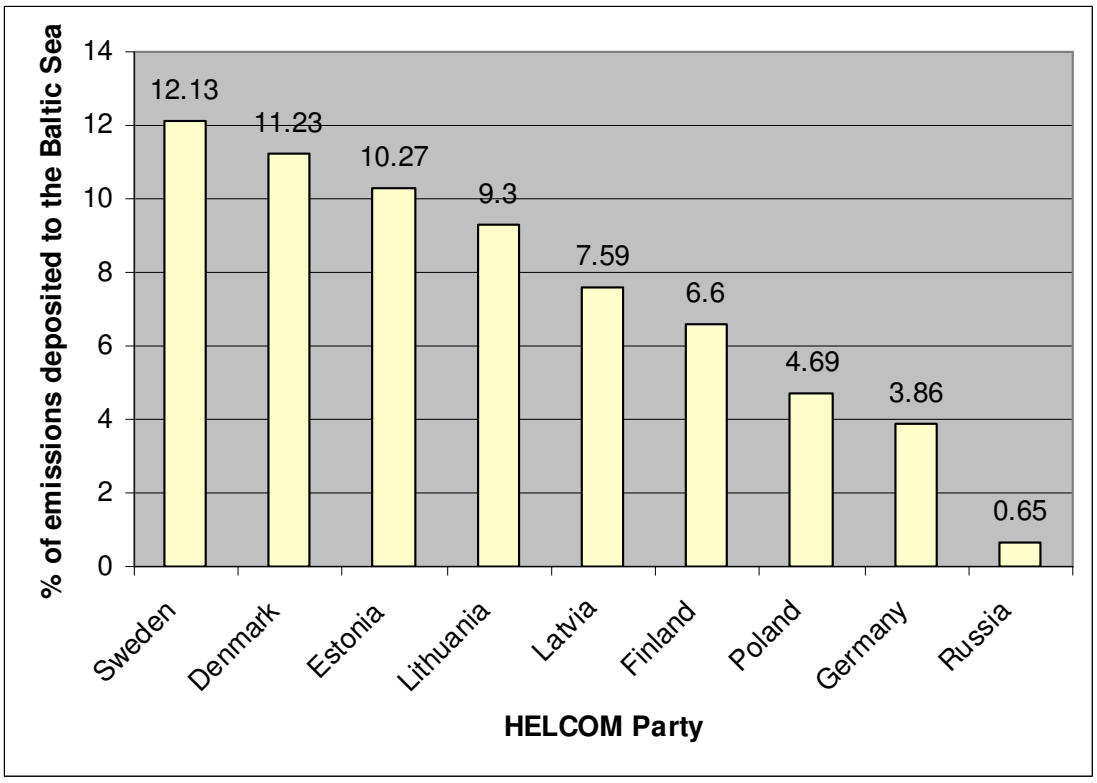

Figure 3.1. Percent of annual emissions of total (oxidized + reduced) nitrogen from the HELCOM Parties deposited to the Baltic Sea basin in 2003 (data for 2004 are not available yet).

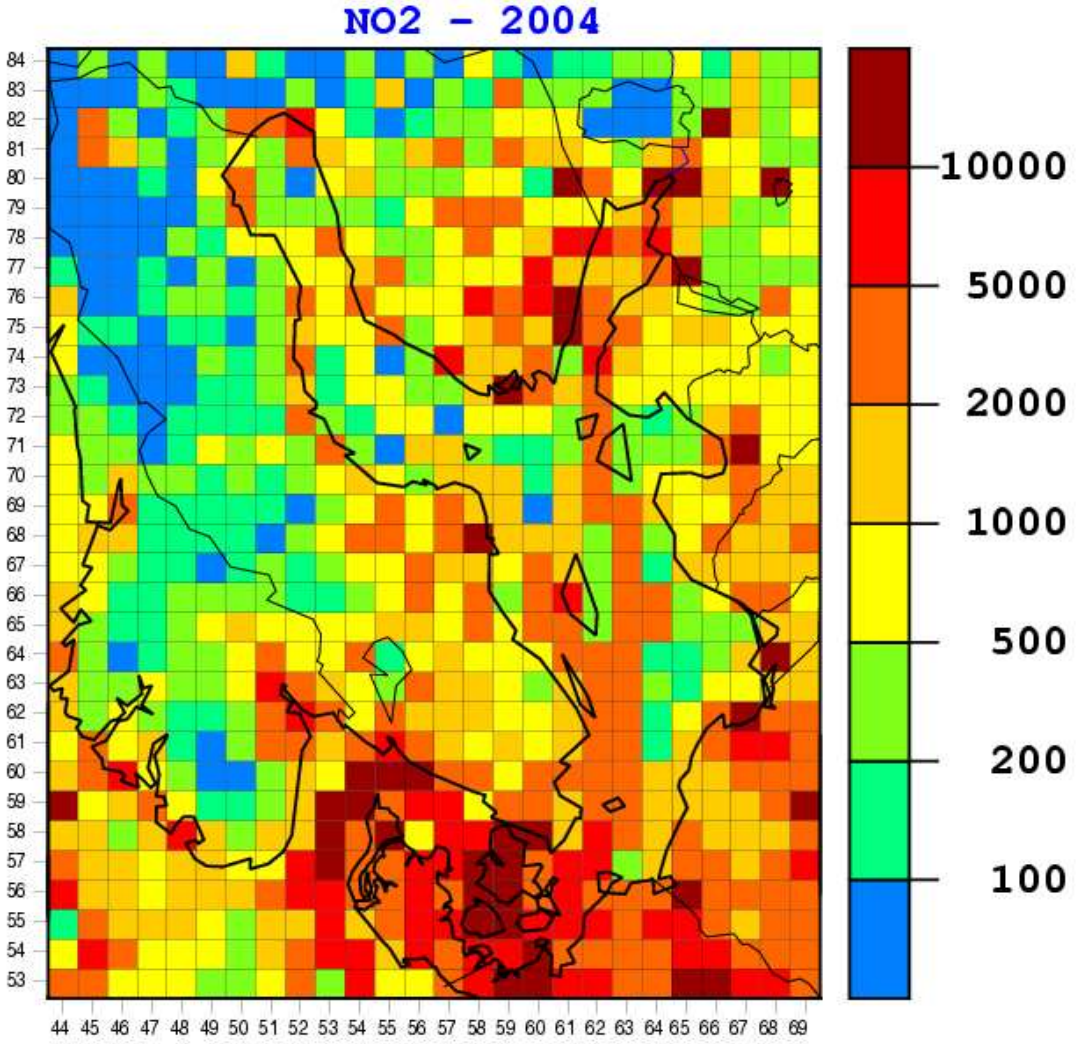

Figure 3.2. Map of annual emission of oxidized nitrogen in the Baltic Sea region in 2004. Units: Mg of NO_2 per year and per 50×50 km grid cell.

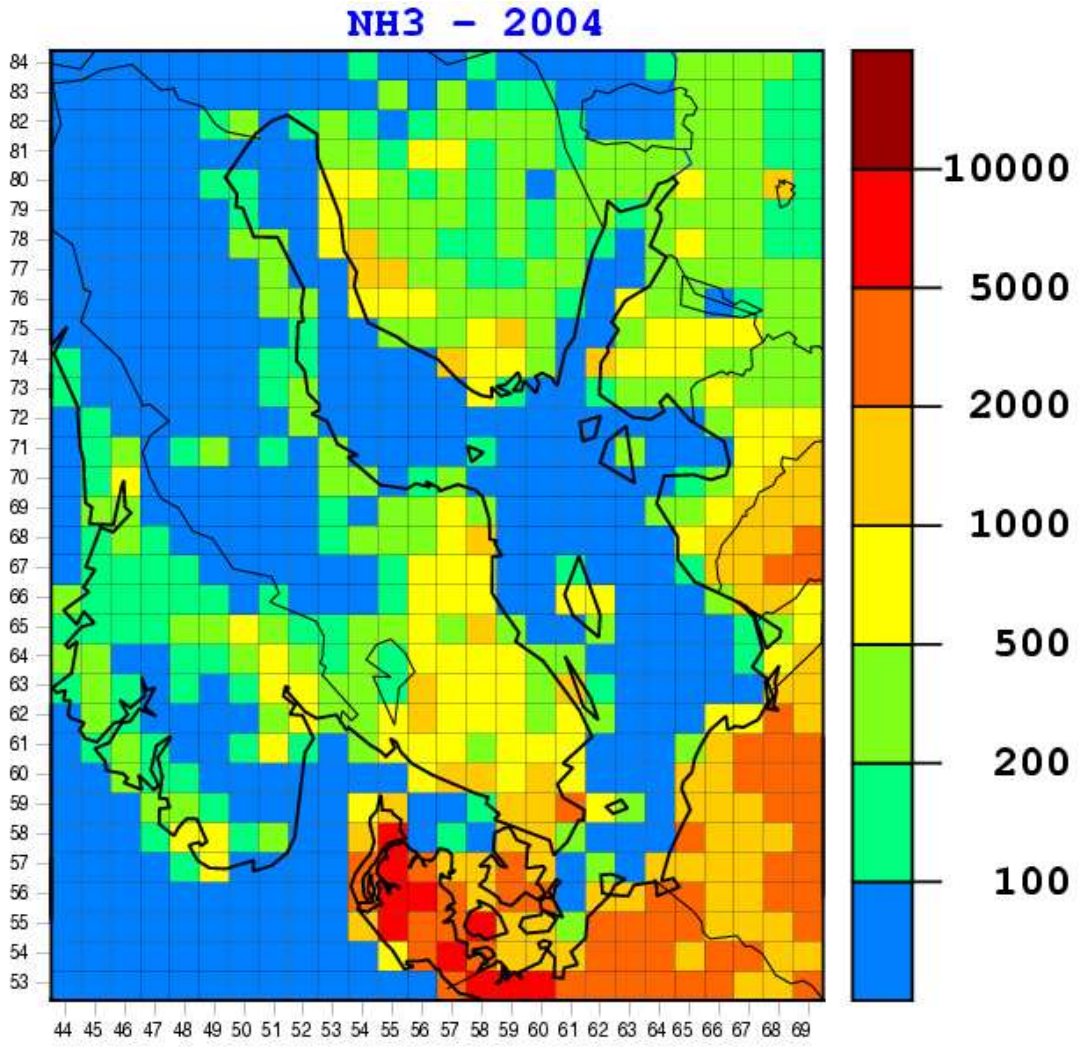

Figure 3.3. Map of annual emission of ammonia in the Baltic Sea region in 2004. Units: Mg of NH_3 per year and per 50×50 km grid cell.

Table 3.1. The list of 11 SNAP emissions sectors as specified in the EMEP-CORINAIR Emission Inventory Guidebook.

Sector 1	Combustion in energy and transformation industry
Sector 2	Non-industrial combustion plants
Sector 3	Combustion in manufacturing industry
Sector 4	Production processes
Sector 5	Extraction and distribution of fossil fuels and geothermal energy
Sector 6	Solvent and other product use
Sector 7	Road transport
Sector 8	Other mobile sources and machinery (including ship traffic)
Sector 9	Waste treatment and disposal
Sector 10	Agriculture
Sector 11	Other sources and sinks

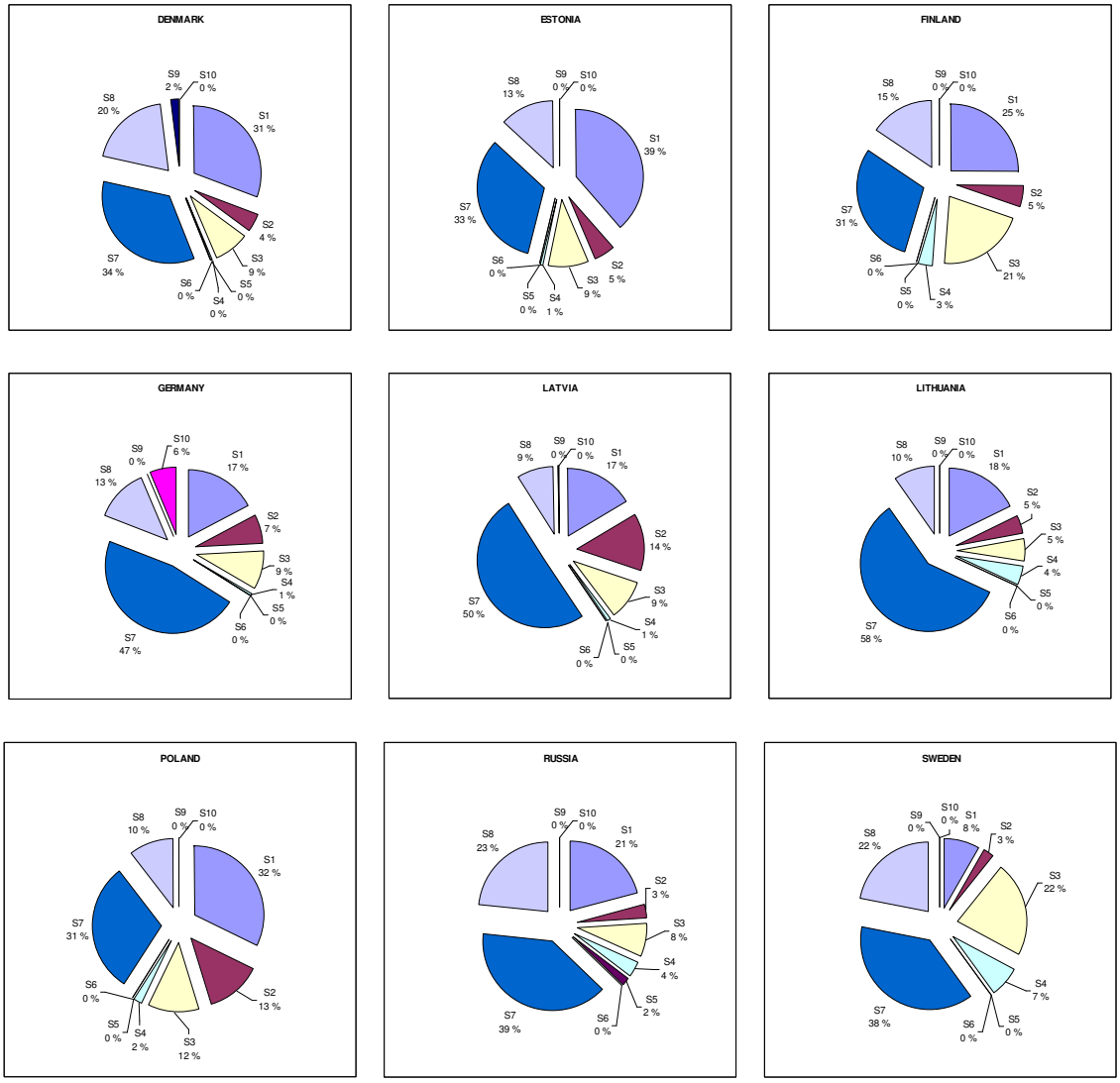

Figure 3.4. Annual 2004 nitrogen oxides emissions from the HELCOM Parties split into the SNAP sectors.

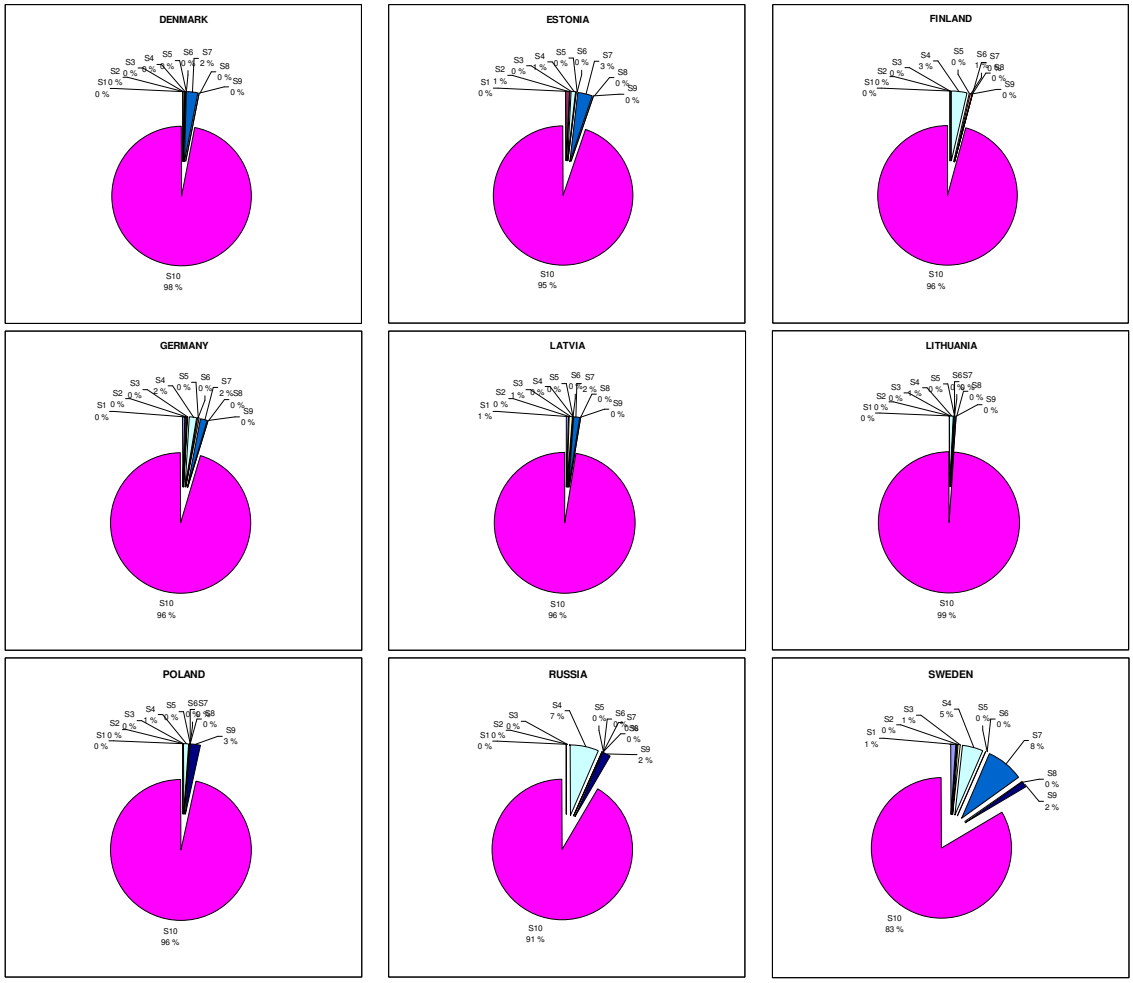

Figure 3.5. Annual 2004 ammonia emissions from the HELCOM Parties split into the SNAP sectors.

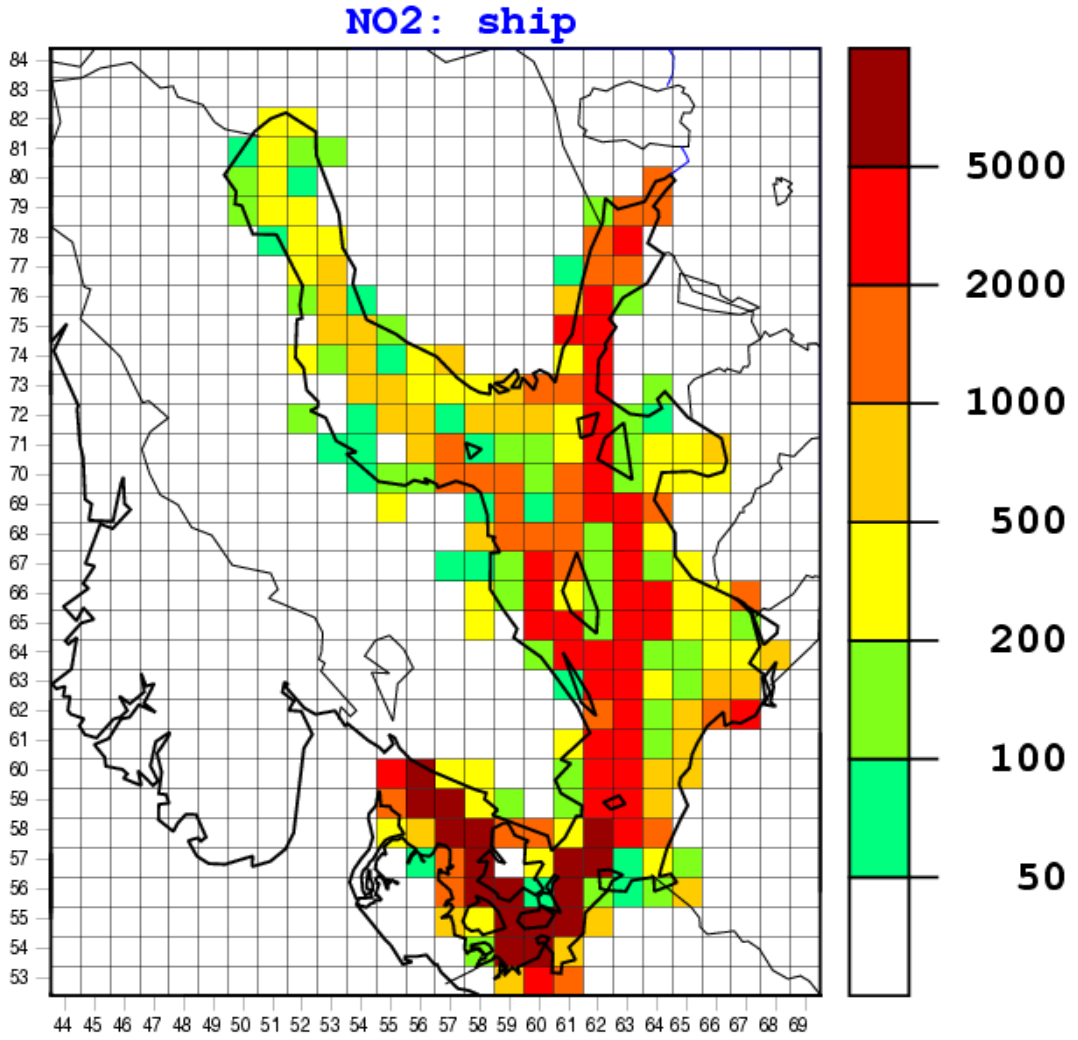

Figure 3.6 Map of annual emissions of nitrogen oxides from the international ship traffic on the Baltic Sea in 2004 used in the EMEP model calculations. Units: tonnes of NO_2 per year and per 50×50 km grid cell.

3.2 Annual deposition of nitrogen

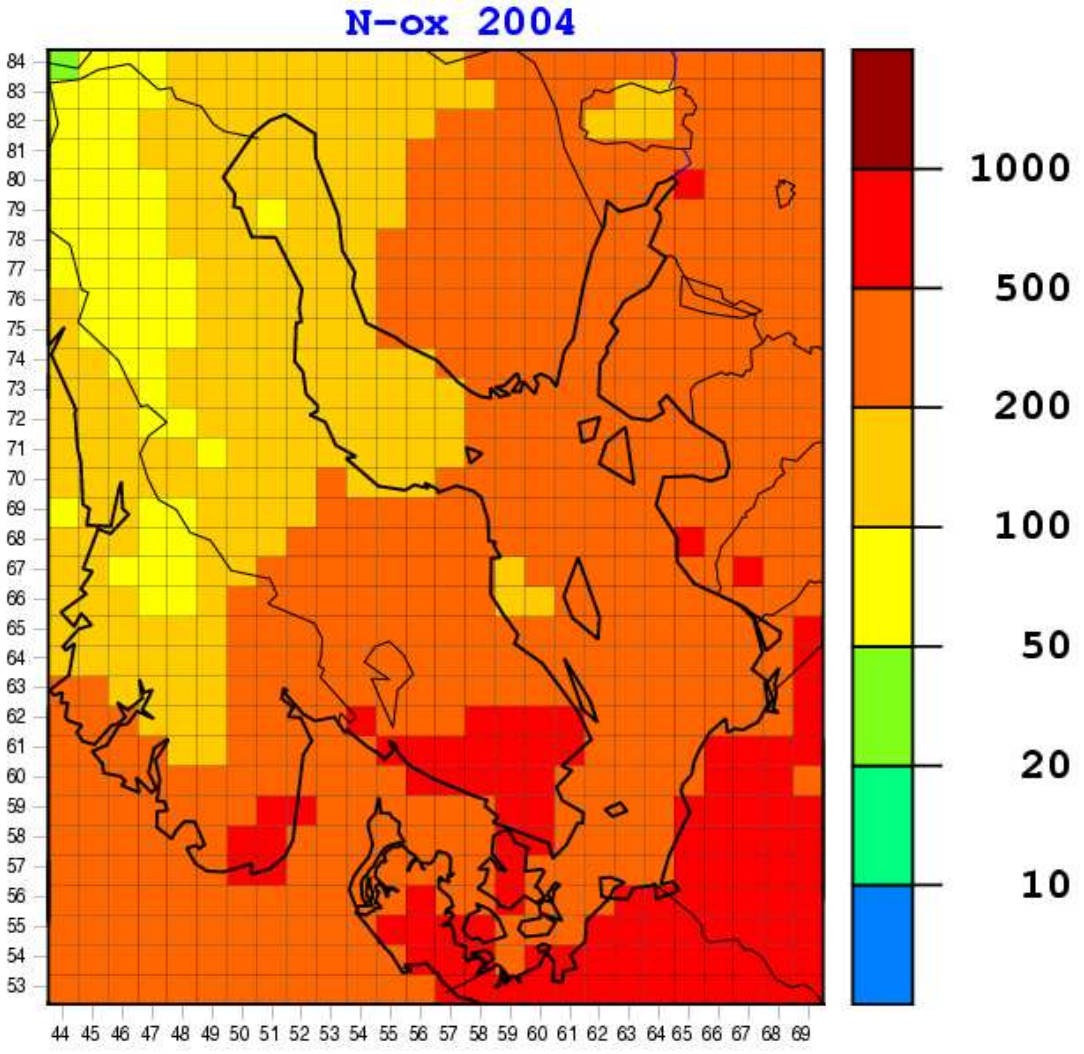

Figure 3.7. Map of annual deposition flux of oxidized nitrogen (dry + wet) in 2004. Units: mg N m^{-2} yr^{-1}.

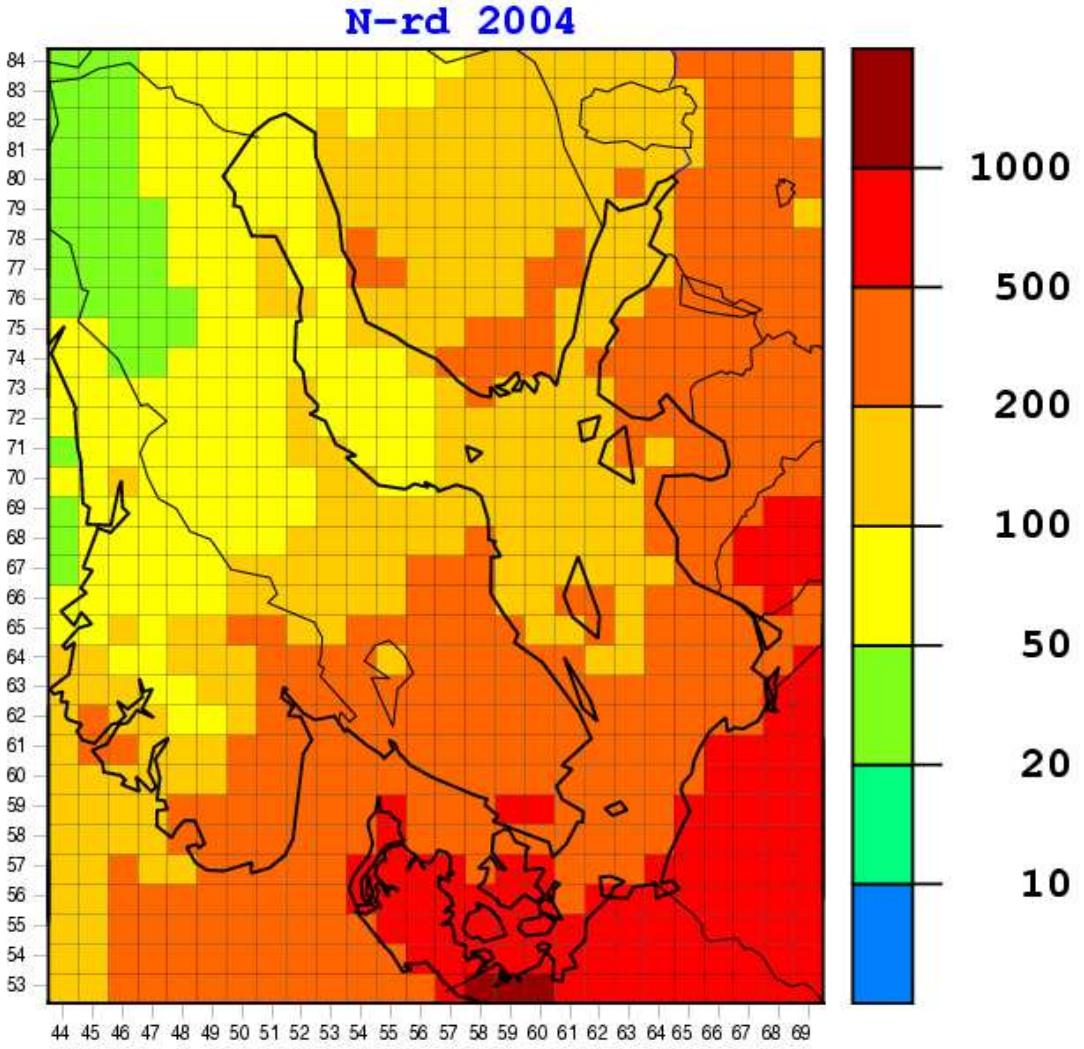

Figure 3.8. Map of annual deposition flux of reduced nitrogen (dry + wet) in 2004. Units: mg N m^{-2} yr^{-1}.

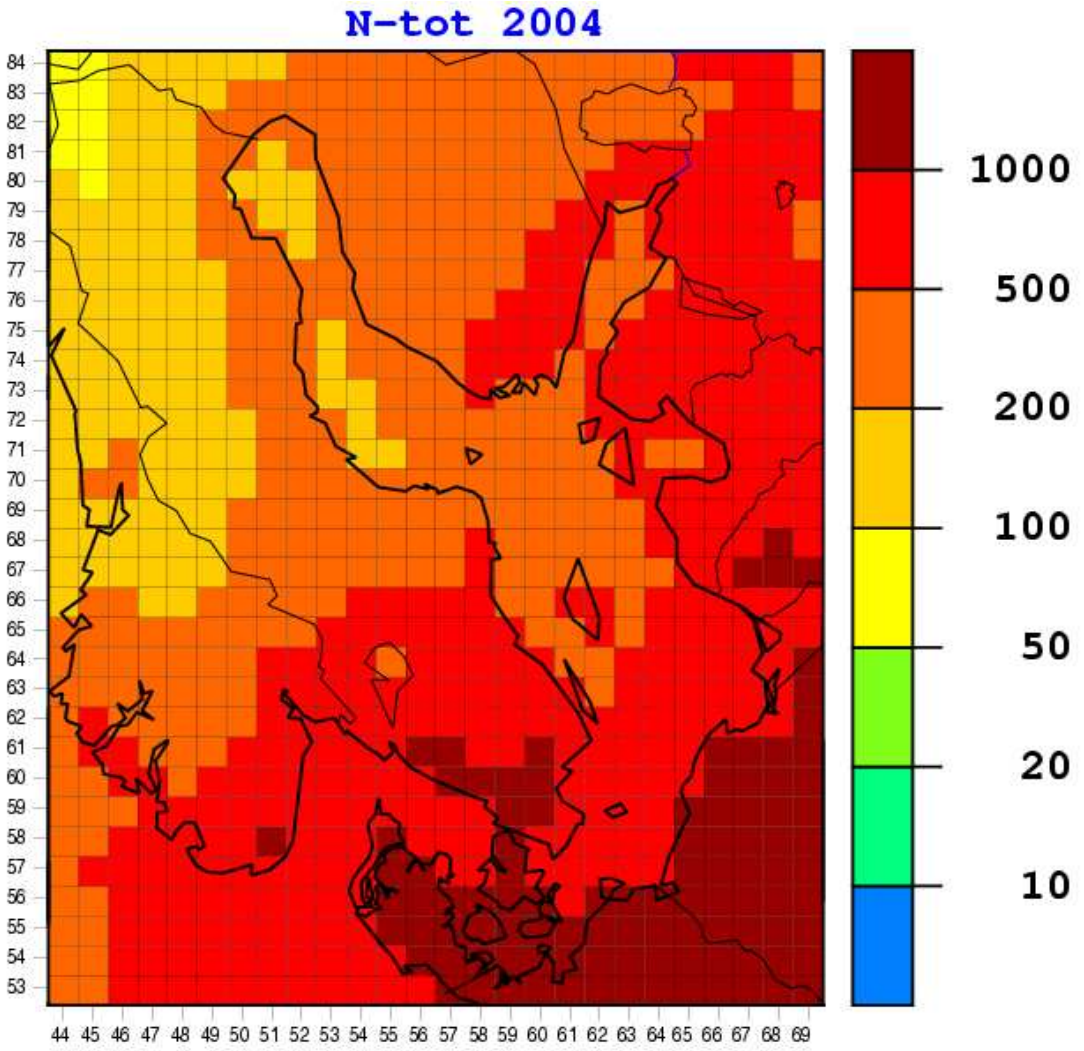

Figure 3.9. Map of annual deposition flux of total (oxidized + reduced) nitrogen in 2004. Units: mg N m^{-2} yr^{-1}.

3.2 Monthly depositions of nitrogen

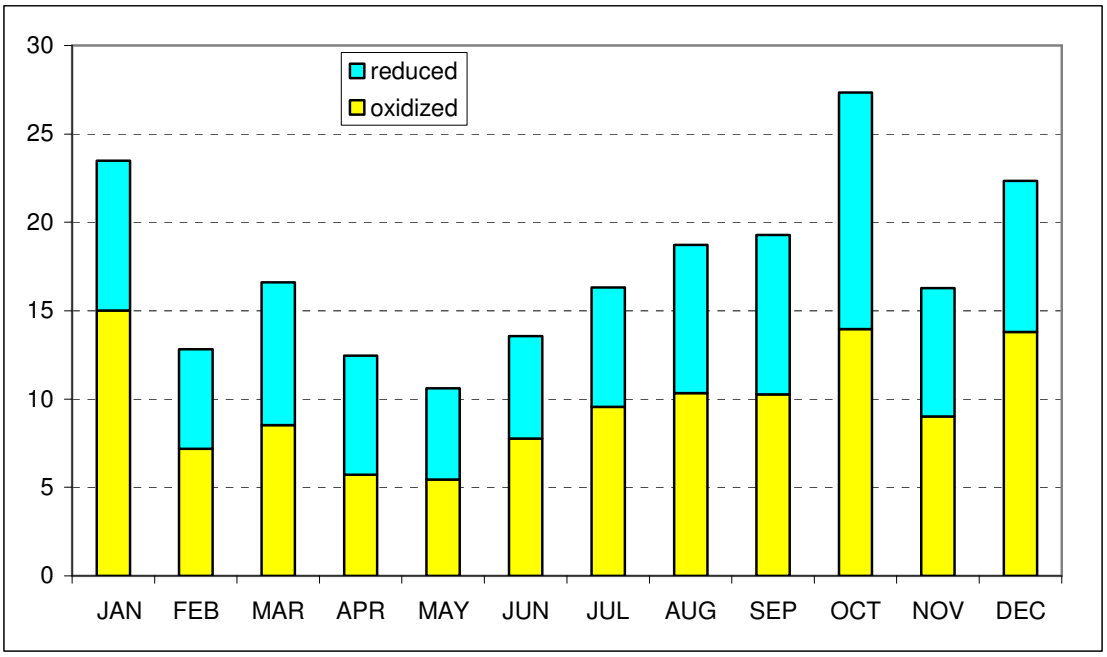

Figure 3.10. Monthly depositions of oxidized, reduced and total (oxidized +reduced) nitrogen to the entire Baltic Sea basin in 2004. Units: ktonnes N month^{-1}.

Table 3.2. Values of monthly depositions of oxidized, reduced and total (oxidized +reduced) nitrogen to the entire Baltic Sea basin in 2004. Units: ktonnes N month^{-1}.

Month	Oxidized	Reduced	Total
January	15,0	8,5	23,5
February	7,2	5,6	12,8
March	8,5	8,1	16,6
April	5,7	6,7	12,5
May	5,5	5,2	10,6
June	7,8	5,8	13,5
July	9,6	6,8	16,3
August	10,3	8,4	18,7
September	10,3	9,0	19,3
October	14,0	13,4	27,3
November	9,0	7,2	16,3
December	13,8	8,6	22,4

3.4 Source allocation of nitrogen deposition

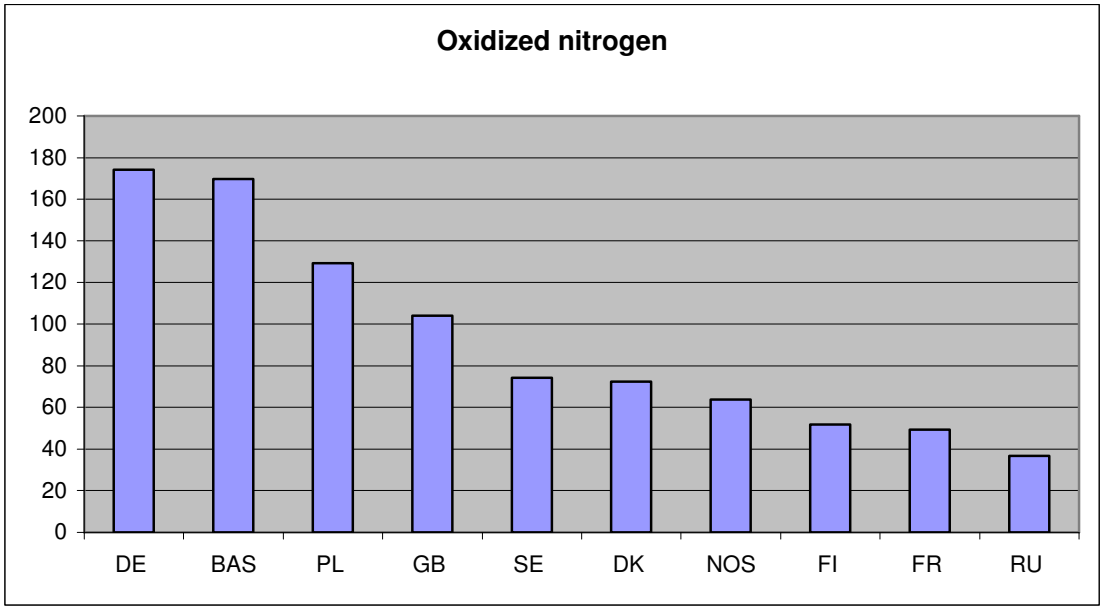

Figure 3.11. Top ten countries with highest contributions of nitrogen emissions to annual deposition of oxidized nitrogen into the Baltic Sea basin in the year 2003. Units: 100 tonnes N year^{-1} (2004 data not available yet). BAS and NOS denote ship emissions form the Baltic Sea and from the North Sea, respectively.

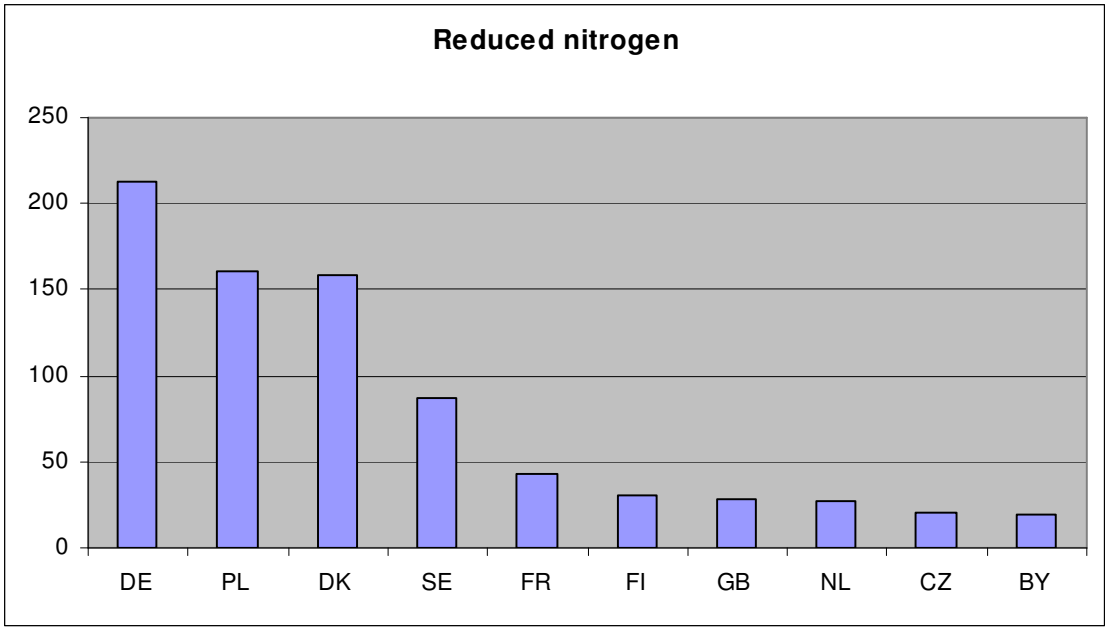

Figure 3.12. Top ten countries with highest contributions of nitrogen emissions to annual deposition of reduced nitrogen into the Baltic Sea basin in the year 2003. Units: 100 tonnes N year^{-1} (2004 data not available yet).

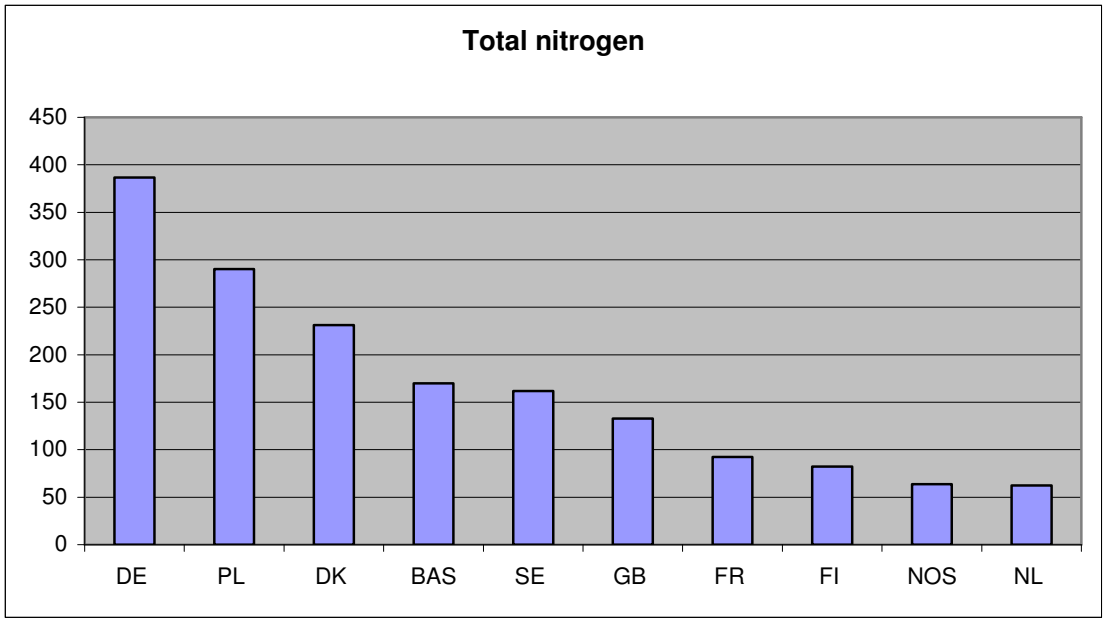

Figure 3.13. Top ten countries with highest contributions of nitrogen emissions to annual deposition of total(oxidized + reduced) nitrogen into the Baltic Sea basin in the year 2003. Units: 100 tonnes N $year^{-1}$ (2004 data not available yet). BAS and NOS denote ship emissions form the Baltic Sea and from the North Sea, respectively.