6SM

Carbon and Other Biogeochemical Cycles
Supplementary Material

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6.SM.1 Supplementary Material to Section 6.4.6.1: Projections for Formation of Reactive Nitrogen by Human Activity

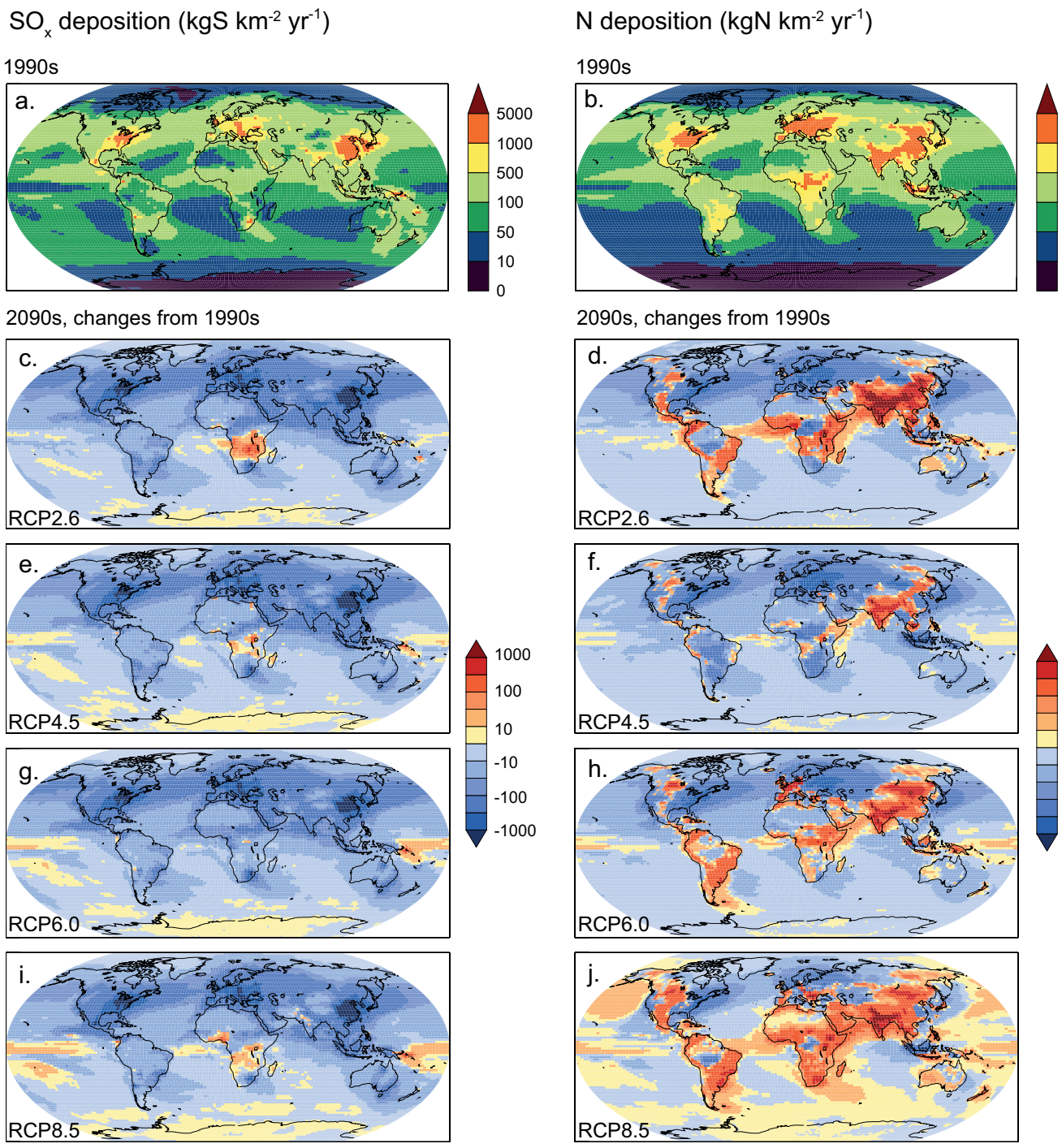

Figure 6.SM.1 | Spatial variability of nitrogen and SO_x deposition in 1990s with projections to the 2090s (shown as difference relative to the 1990s), using the 2.6, 4.5, 6.0 and 8.5 Representative Concentration Pathway (RCP) scenarios, kg N km^{-2} yr^{-1}, adapted from Lamarque et al. (2011). Note that no information on the statistical significance of the shown differences is available. This is of particular relevance for areas with small changes.

The change in dissolved inorganic nitrogen (DIN) discharge under the Global Orchestration (GO) scenario of the Millennium Ecosystem Assessment (MEA) (the scenario with the most extreme pressures) was assessed by taking the change between the base year 2000, and the projection year, in this case 2050 (Figure 6.34b). Manure is the most important contributor as a result of assumed high per capita meat consumption, although there are considerable regional variations (Seitzinger et al., 2010). At the other extreme is the projected change in the riverine flux between 2000 and 2050 for the Adapting Mosaic scenario, the most ambitious in terms of nutrient managements of the MEA scenarios. These two scenarios provide a range of projections for future DIN riverine fluxes by the year 2050.

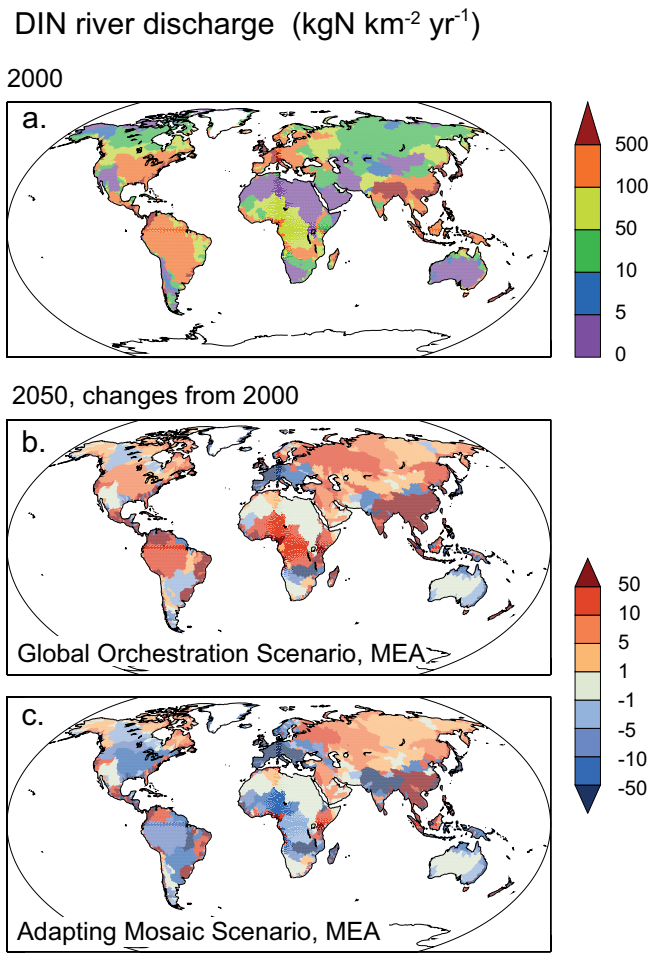

Figure 6.SM.2 | (a) Dissolved inorganic nitrogen (DIN) river discharge to coastal zone (mouth of rivers) in 2000, based on Global Nutrient Export from WaterSheds (NEWS) 2 model; change in DIN discharge from 2000 to 2050, based on the (b) Global Orchestration and (c) Adapting Mosaic scenarios from the Millennium Ecosystem Assessment (MEA) (Mayorga et al., 2010; Seitzinger et al., 2010). Units are kg N km^{-2} yr^{-1} of watershed area, as an average for each watershed. Global DIN export to the coastal zone in 2050 under the Global Orchestration and Adapting Mosaic scenarios changes by +5.5 and –0.4 TgN yr^{-1}, respectively, relative to the export of 18.9 TgN yr^{-1} in 2000 (Seitzinger et al., 2010).

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Seitzinger, S. P., et al., 2010: Global river nutrient export: A scenario analysis of past and future trends. *Global Biogeochem. Cycles*, **24**, GB0A08.