The ODIAC - The Second Fossil Fuel CO_2 Emission Dataset for CarbonTracker

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Fossil fuel CO_2 emission (FFCO2) is a critical component in conventional inverse estimations of surface CO_2 sources and sinks. Unlike biospheric fluxes and oceanic exchanges, FFCO2 is often assumed to be a perfect quantity and is then never optimized. Thus, FFCO2 needs to be prescribed accurately in atmospheric CO_2 simulations. Here, we present version 3.0 of the global gridded FFCO2 dataset ODIAC (Open-source Data Inventory for Anthropogenic CO_2, hereafter ODIAC ver. 3.0). ODIAC ver. 3.0 dataset (currently available for 2000-2010) differs from the previous products in several points: 1) national emission estimates, 2) spatial proxy data, and 3) inclusion of montly variations. National emission estimates used for ODIAC ver. 3.0 are based on data published by Carbon Dioxide Information Analysis Center (CDIAC). Emission estimates for 2000-2007 are based on CDIAC data. Those over the last three years (2008-2010) were projected using BP's fuel consumption statistics. Spatial distributions of emissions in earlier versions of ODIAC were determined/estimated using power plant emissions and geographic locations in addition to satellite-observed nightlights. In ODIAC ver. 3.0, we also employed other available proxy data according to emission type, such as a nightlight data for gas flaring, and aircraft and ship tracks adopted from EDGAR and AERO2k emission inventories. Temporal variations of emissions are modeled on monthly basis using CDIAC's monthly global FFCO2 dataset for land and AERO2k for aviation. The ODIAC ver.3.0 is being used for prepartion of the next release of CarbonTracker as the second fossil fuel FFCO2 dataset.

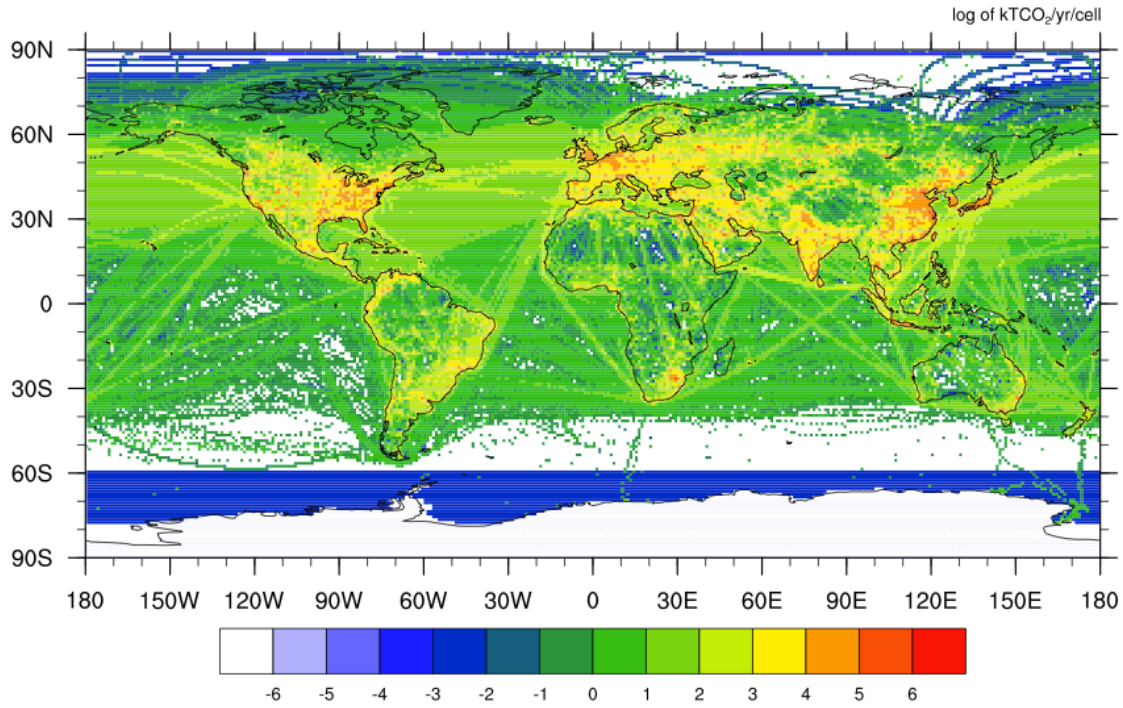

Figure 1. The spatial distribution of fossil fuel CO_2 emissions for year 2010 (1° × 1° resolution). The values are given in the units of the log (base 10) of kiloton CO_2 $year^{-1}$ $cell^{-1}$ to show details in emission spatial distribution.