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## Impact of using various prior flux models on the posterior NEE derived from the Jena CarboScope regional inversion system

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Regional flux estimates over Europe have been calculated using the two-step inverse system of the Jena CarboScope Regional inversion (CSR) to estimate the annual CO<sub>2</sub> budgets for recent years, in cooperation with the research project VERIFY. The CSR system assimilates observational datasets of CO<sub>2</sub> mixing ratio provided by the Integrated Carbon Observation System (ICOS) across the European domain to optimize Net Ecosystem Exchange (NEE) fluxes computed from biosphere models at a spatial resolution of 0.25 degree. Ocean fluxes are assumed to be constant over time. Fossil fuel emissions are obtained from EDGAR\_v4.3 and updated based on British Petroleum (BP) statistics. Therefore, only biosphere-atmosphere exchange fluxes are considered to be optimized against the atmospheric data.

In this study we focus on the impact of using a-priori fluxes from different biosphere and ocean models on the annual CO<sub>2</sub> budget of posterior fluxes. Results calculated using the Vegetation and Photosynthesis Respiration Model (VPRM) and Simple Biosphere/Carnegie-Ames Stanford Approach (SiBCASA) models show a consistent posterior interannual variability, largely independent of which prior fluxes are used, even though those prior fluxes show considerable differences on annual scales.