

## **The Community Earth System Model: Evaluation and CMIP5 simulations. Activities of the Chemistry-Climate Working Group**

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The Chemistry-Climate Working Group (CCWG) is part of the Community Earth System Model (CESM) effort at NCAR, Boulder. The goal of the Chemistry-Climate WG is to continue the development of the representation of chemistry in the CESM and to further investigate our understanding of the interactions between chemistry and climate. Scientific motivations include advancing knowledge on past, present and future atmospheric composition, interactions between atmospheric composition and the Earth System, stratosphere-troposphere coupling, and impacts of global composition and climate on air quality. The chemistry is now fully incorporated into the CESM, e.g. a super-fast chemistry version and a full troposphere and troposphere/stratosphere chemistry version. CAM-chem was used extensively to perform 1850-2100 (CMIP5) simulations to define atmospheric composition (and deposition fields) for use in CCSM4. CAM-Chem can also be run as an offline version using GEOS5 and MERRA data to support aircraft campaigns and other observations. The model is further part of various model intercomparison projects (CCMVal2 , GEO-MIP, POLMIP, CMIP5, ACC-MIP) and recently evaluated for present day conditions. We present a general description of the performance of CESM-CAM4Chem for present day conditions and highlight results from CMIP5 simulations as well as other activities in that are part of the CCWG.