



Modeling the "Year Without Summer 1816" with a Chemistry-Climate Model

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Volcanic activity and solar irradiance are thought to be the primary forcing of the pre-industrial climate. In this context, the "Year without summer 1816" is of special interest. The causes of this extreme year, with huge impacts on Central Europe and North America, are not fully understood. The aerosol forcing induced by the Tambora eruption (1815) is much larger than anything observed during the period of instrumental record and is generally thought to be the main cause for the strong 1816 temperature anomalies, although the 1810's period is also characterized by a decreased solar activity (Dalton minimum) which could have contributed.

An attempt is made to simulate the Year Without Summer 1816 in the state-of-the-art Chemistry-Climate model SOCOL, using volcanic and solar forcing and reference simulations. Here we present a detailed discussion of the experimental set-up and boundary conditions, and show the potential benefits of such a model simulation.