

AMOC Responses to Volcanic Eruptions in CMIP5 simulations

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Abstract

This study revisits the impact of volcanic eruptions on the Atlantic Meridional Overturning Circulation (AMOC) using recent coupled model simulations. Some previous studies suggest that major eruptions strengthen the AMOC due to two possible mechanisms: 1) changes in wintertime surface wind stress, and/or 2) increasing the density of surface water and thus its ability to convect; while the this effect is missing in other studies. why do some studies show a dramatic increase in AMOC volume and heat transport, while others show only a weak response? To answer this question, we reexamine this impact through analysis of AMOC response to five huge tropical volcano eruptions: Krakatau (1883), St. Maria (1902), Agung (1964), El Chichón (1982) and Pinatubo (1991).