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Assessing the impact of a future volcanic eruption with the MiKlip prediction system

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The possibility of a large future volcanic eruption provides arguably the largest uncertainty concerning the evolution of the climate system on the time scale of a few years; but also the greatest opportunity to learn about the behavior of the climate system, and our models thereof. So the question emerges how predictable is the response of the earth system to future eruptions? How strong will the volcanic perturbation effect seasonal and decadal climate predictions? And how dependent is the signal to initialization values and model configuration?
To address these questions we performed decadal forecasts with the baseline-1 version of the MiKlip prediction system with the low-resolution configuration and the mixed resolution configuration for the initialization years 2012 and 2013. Each forecast contains an artificial Pinatubo-like eruption starting in June of the first prediction year. For the construction of the aerosol radiative forcing, we used the global aerosol model ECHAM5-HAM in a version adapted for volcanic eruptions.
Our results show that the global cooling response and precipitation decrease is relatively robust to throughout the different experiments. But on a regional scales, we could identify regions - like the North Atlantic - which indeed are sensitive to different initial conditions. In the mixed-resolution version, we could identify a prolongation of the quasi-biennial oscillation following the volcanic eruption.