



Impact of geoengineering on the global hydrological cycle

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The constraint of the global tropospheric energy budget (e.g. Allen & Ingram, 2002) implies that it is impossible for any active geo-engineering scenario to achieve a substantial reduction in global temperatures without a significant impact on the global hydrological cycle. Various papers (e.g. Trenberth and Dai, 2007) have pointed out that this may be a problem for stratospheric-aerosol-based geo-engineering scenarios, but it would also be an issue for a rapid draw-down of atmospheric carbon dioxide through a global direct air-capture programme. Relatively modest changes in global hydrological parameters may result in very significant impacts on regional drought and flood risks, highlighting the need for geo-engineering scenarios to be explored with models capable of simulating the physics of extreme weather and hydrological phenomena before they can be contemplated further.