Accelerated Scientific Discovery (ASD)
Large Ensemble Climate Intervention Simulations

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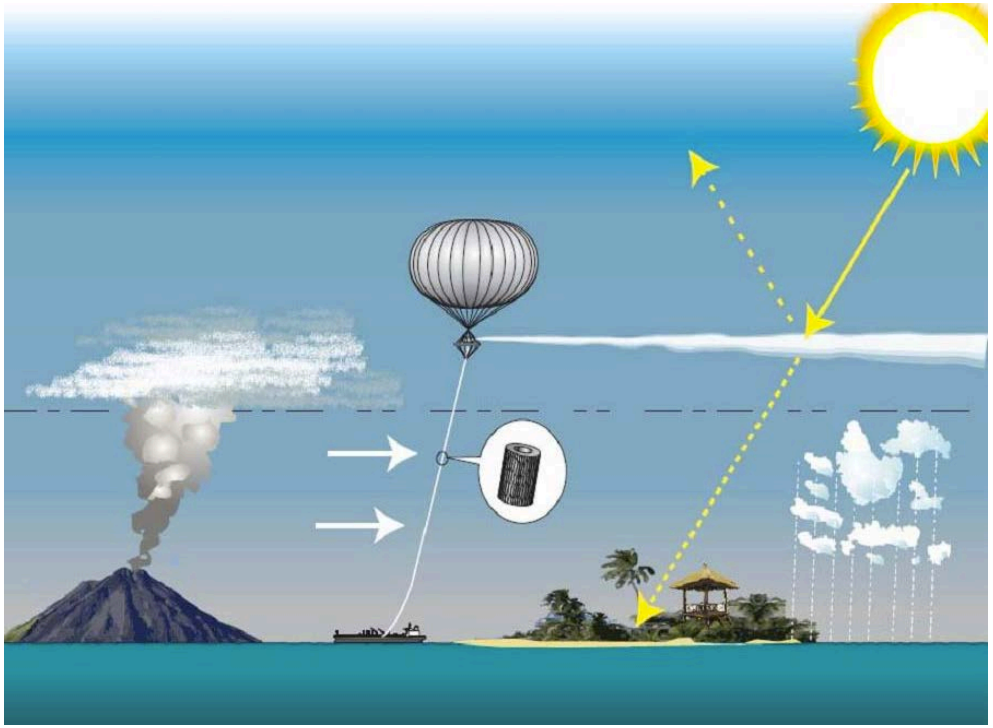
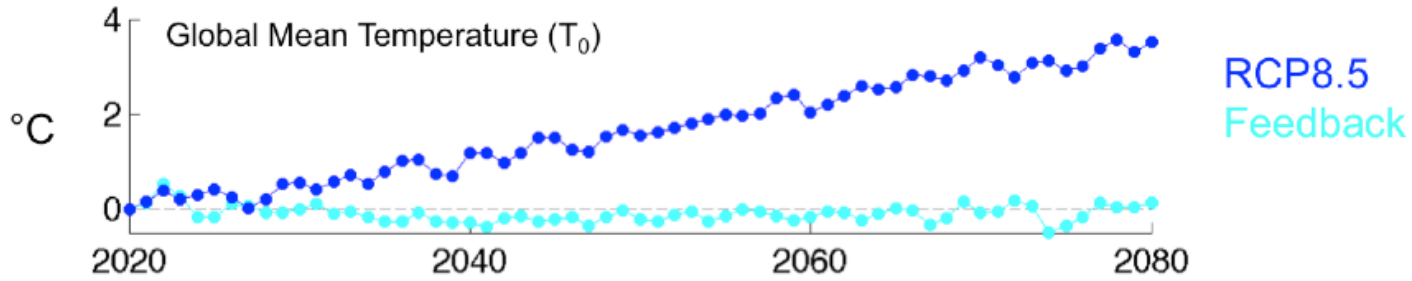


All output will be shared with the community, to analyze many different aspects of climate engineering

Feedback-Controlled Simulation with CESM(WACCM)

Goal: to keep climate at 2020 conditions using stratospheric SO_2 injections



- Control simulation: CESM (WACCM) (no CLUBB)
- RCP8.5 forcing experiment
- 1 degree horizontal resolution, prognostic SO2 injections, interactive QBO, comprehensive stratospheric chemistry
- Interactive coupling between chemistry, dynamics, aerosols, climate
- Climate engineering: achieve specific climate goal by **running a feedback algorithm** to identify amount and location of annual injection of SO_2
- Prior knowledge of emissions scenario or climate sensitivity not required

Feedback-Controlled Simulation with CESM(WACCM)

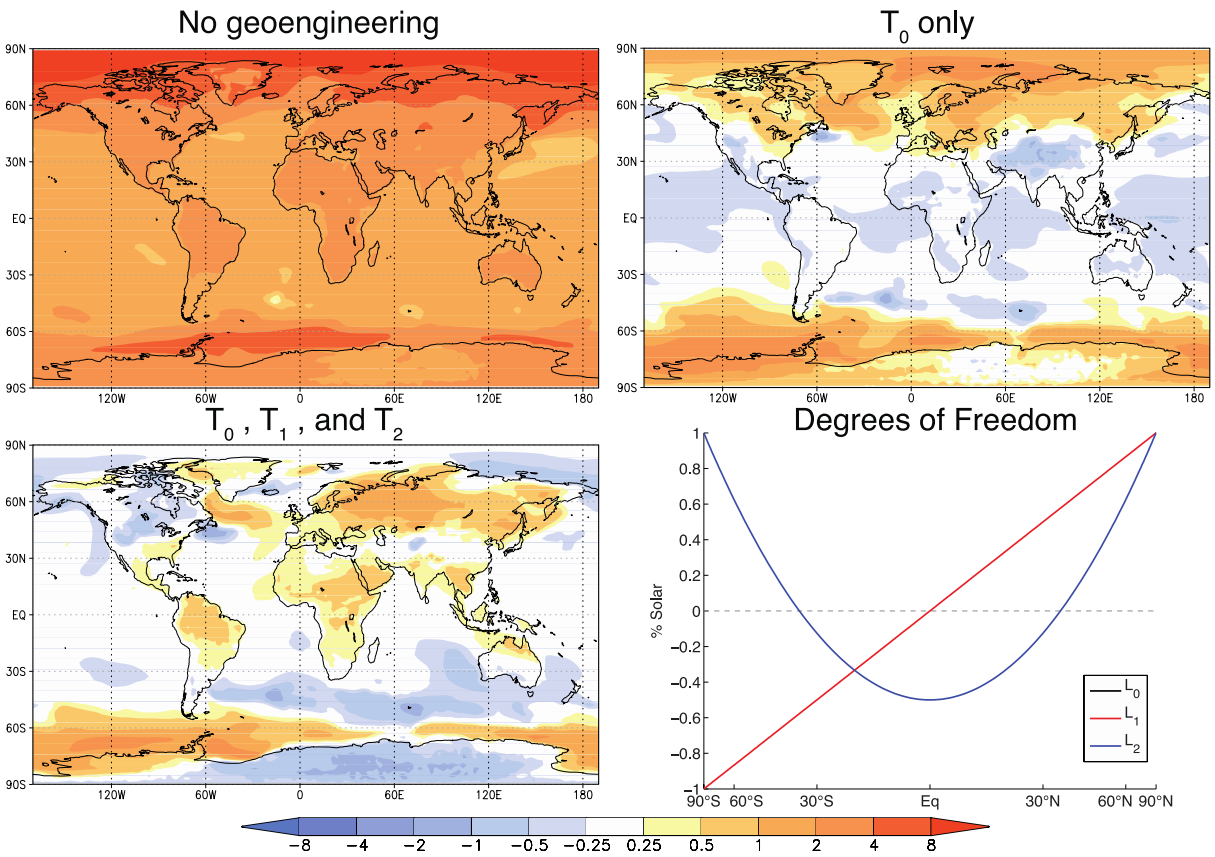
Climate Objectives:

T_0 = Global mean temperature

T_1 = Inter-hemispheric temperature gradient
Prevent shift in precipitation pattern

T_2 = Equator-to-pole temperature gradient
Prevent overcooling of the tropics

-> We explored to do this with SO_2 injections



Kravitz et al., 2016