Weather and Climate Engineering

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This talk is abstracted from an invited chapter on Weather and Climate Engineering of a book on aerosol impacts on climate that I have written. I will begin by focusing on what we have learned from cloud seeding research or what I call weather engineering. I then present an overview of the concepts for climate engineering to counter greenhouse warming. These include seeding in the stratosphere with sulfate-producing gases and aerosols, and carbonaceous aerosols. I also consider hygroscopic seeding of marine stratocumulus boundary layer clouds to enhance their albedo and cause a cooling effect. Also considered is seeding mid-level stratus clouds to enhance their albedo during the day and increasing outgoing longwave radiation during the night time. Cirrus clouds present a major obstacle to climate modification owing to their widespread global coverage and their tendency to warm the surface, thus reinforcing greenhouse warming. Speculations on the seeding of carbonaceous aerosols to clear cirrus through a semi-direct effect are presented. Most of the proposed concepts require a great deal of research to quantify their impacts and potential adverse consequences. I include a long list of the reasons as to why we should not apply climate engineering. Despite these, I anticipate that if we find ourselves in a true climate crisis, politicians will call for climate engineering measures in an attempt to alter adverse climate trends. If this should ever be the case, let us be sure that we do so with the most advanced level of knowledge of the climate system and the full consequences of our actions.
There has been much talk in the media about the potential climate impact of the coronavirus-related shutdown. Europe has come to a virtual standstill, with the majority of countries in some kind of lockdown. Many assume that this is good for the environment. There have been a lot of questions about whether the virus will disappear once the summer weather comes in the northern hemisphere. The answer isn't clear, we don't have enough information yet, and there are so many variables, including how we all behave in our daily lives. What influence on climate is the coronavirus lockdown really having? Browse today's tags. COVID-19 Coronavirus Protest France Opinion pandemic nature Genocide. Climate-related natural disasters are becoming more frequent, more deadly, more destructive, with growing human and financial costs, he said. Image. Flooding in Mogadishu, Somalia, in October. Credit...Feisal Omar/Reuters. Image. Filling water buckets from a government water pump in the drought-ravaged Lamhata village in Uttar Pradesh, India, earlier this year. Credit...Bryan Denton for The New York Times. Image. Bathing in a fountain in St. Petersburg, Russia, during unseasonably hot temperatures in July. Credit...Dmitri Lovetsky/Associated Press. The 2015 Paris agreement called for countries to pursue efforts to limit warming this century to 2 degrees Celsius (3.6 degrees Fahrenheit) above preindustrial levels, with an even stricter target of 1.5 degrees Celsius.