

As I write, talk, teach and think about climate change seemingly non-stop these days, I frequently come back to the pessimistic conclusion that we cannot solve the climate problem through mitigation of greenhouse gas emissions. I have this pessimistic thought while believing wholeheartedly that we must enact aggressive policies to cut emissions dramatically.

My pessimism stems from at least three places. An obvious one is China and India. No matter what the U.S. does, we cannot solve the climate change problem alone. Even if the U.S. stopped emitting carbon altogether global emissions would still exceed levels that scientists believe are necessary to minimize temperature increases. My second cause for pessimism is that virtually every model used to predict climate-related issues has been wrong in the wrong direction. Global emissions may be [outpacing](#) the worst case scenarios included in the 2007 Intergovernmental Panel on Climate Change report. [Sea levels](#) are rising faster than predicted. And the list goes on. Finally, I fear [tipping points](#) and [feedback effects](#): as the globe warms, “feedback loops” intensify warming (e.g., warmer oceans store less carbon and release more into the atmosphere, [melting sea ice](#) can accelerate the melting of sea ice and so forth) making climate change worse than predicted.

If my pessimism is justified, does it lead to the inevitable conclusion that geoengineering looms in our future? Or at least that we ought to be planning for the possibility? Geoengineering involves either [removing greenhouse gases from the atmosphere entirely](#) or manipulating the climate system through, for example, [injecting sulfates into the atmosphere in an effort to cool the planet](#) or [fertilizing the ocean with iron](#). These proposals can be enormously expensive and, more importantly, could make the cure worse than the disease.

And yet. Shouldn't we be at least planning for the possibility? Credible scientists have begun to step into the fray, led in 2005 by Nobel Laureate Paul Crutzen's [proposal](#) to add sulphate aerosols into the stratosphere. Should auction revenue from a cap and trade program or new scientific funding be targeted toward responsible geoengineering research? Should international organizations work to coordinate global cooperation on the topic aimed not just at regulating behavior but at enhancing research and understanding of geoengineering's possibilities?