

# Geoengineering climate requires more research, cautious consideration, appropriate restrictions

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deliberately manipulating physical, chemical, or biological aspects of the Earth system to confront climate change - could contribute to a comprehensive risk management strategy to slow climate change but could also create considerable new risks, according to a policy statement released by the American Meteorological Society (AMS) today.

According to the Society, geoengineering will not substitute for either aggressive emissions reduction or efforts to adapt to [climate change](#), but it could help lower greenhouse gas concentrations, provide options for reducing specific climate impacts, or offer strategies of last resort if abrupt, catastrophic, or otherwise unacceptable climate-change impacts become unavoidable by other means.

However, AMS scientists caution that research to date has not determined whether there are large-scale geoengineering approaches that would produce significant benefits, or whether those benefits would substantially outweigh the detriments.

The Society notes that geoengineering must be viewed with caution because manipulating the [Earth system](#) has considerable potential to trigger adverse and unpredictable consequences.

"We can't escape the need to dramatically reduce our greenhouse gas emissions starting immediately," said Paul Higgins, AMS senior policy

fellow and chair of the statement drafting team. "But even our past emissions bring us to uncharted territory and create risks so severe that we must responsibly consider all options."

Geoengineering proposals differ widely in their potential to reduce impacts, create new risks, and redistribute risk among nations. For example, techniques that remove [carbon dioxide](#) directly from the air would confer global benefits but could also create adverse local impacts. Reflecting sunlight would likely reduce Earth's average temperature but could also change global circulation patterns with potentially serious consequences such as changing storm tracks and precipitation patterns.

Even if reasonably effective and beneficial overall, geoengineering is unlikely to alleviate all of the serious impacts from increasing [greenhouse gas](#) emissions.

Still, the threat of climate change is serious. Mitigation efforts so far have been limited in magnitude, tentative in implementation, and insufficient for slowing climate change enough to avoid potentially serious impacts. Furthermore, it is unlikely that all of the expected climate-change impacts can be managed through adaptation. Thus, it is prudent to consider geoengineering's potential benefits, to understand its limitations, and to avoid ill-considered deployment.

The AMS statement has three specific recommendations:

1. Enhanced research on the scientific and technological potential for geoengineering the climate system, including research on intended and unintended environmental responses.
2. A coordinated study of historical, ethical, legal, and social implications of geoengineering that integrates international,

interdisciplinary, and intergenerational issues and perspectives and includes lessons from past efforts to modify weather and climate.

3. Development and analysis of policy options to promote transparency and international cooperation in exploring geoengineering options along with restrictions on reckless efforts to manipulate the climate system.

Source: American Meteorological Society

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