

Near-term Climate Risk and Intervention

A Roadmap for Research, U.S. Research Investment, and International Scientific Cooperation

Escalating climate threats demand better information on climate risks and impacts an expanded portfolio of responses to ensure safety in the next few decades and beyond. The magnitude of these threats, particularly for the world’s most vulnerable people and ecosystems, warrants a concerted effort to improve projections of near-term climate risks and impacts and to assess the potential for climate interventions to reduce them.

To support this effort, the United States, a leading provider of open climate research internationally, **should undertake a “Climate Safety Initiative” to deliver against a roadmap of research supported by \$13 billion in new funding for climate research over 5 years** (60–70% above existing levels).

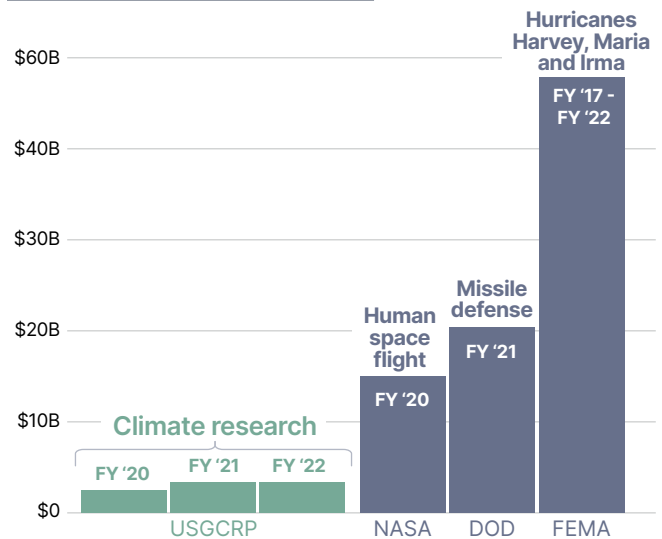
Urgent Need for Investment in Understanding Near-term Climate Risks and Impacts

While reducing greenhouse gas (GHG) emissions is essential, no level of emissions reduction can counter the warming effects of GHGs that are already in the atmosphere. Addressing the short and decreasing window available for reducing heat in the climate system is an urgent priority.

There are large uncertainties in predicting near-term climate, including dangerous “tipping points” for irreversible changes in natural systems and how expected reductions in particulate pollution could add to near-term warming.

Yet, U.S. and global funding for climate research (excluding energy and other emissions reduction) are relatively low given their importance to public welfare and the economy (see Figure 1). This funding has been flat in real terms for several decades and requires increased investment.

FIGURE 1
U.S. Climate Research relative to other Federal Spending



Source: USGCRP, the National Aeronautics and Space Administration (NASA), Department of Defense (DOD), and Federal Emergency Management Agency (FEMA).

Rapid Climate Interventions

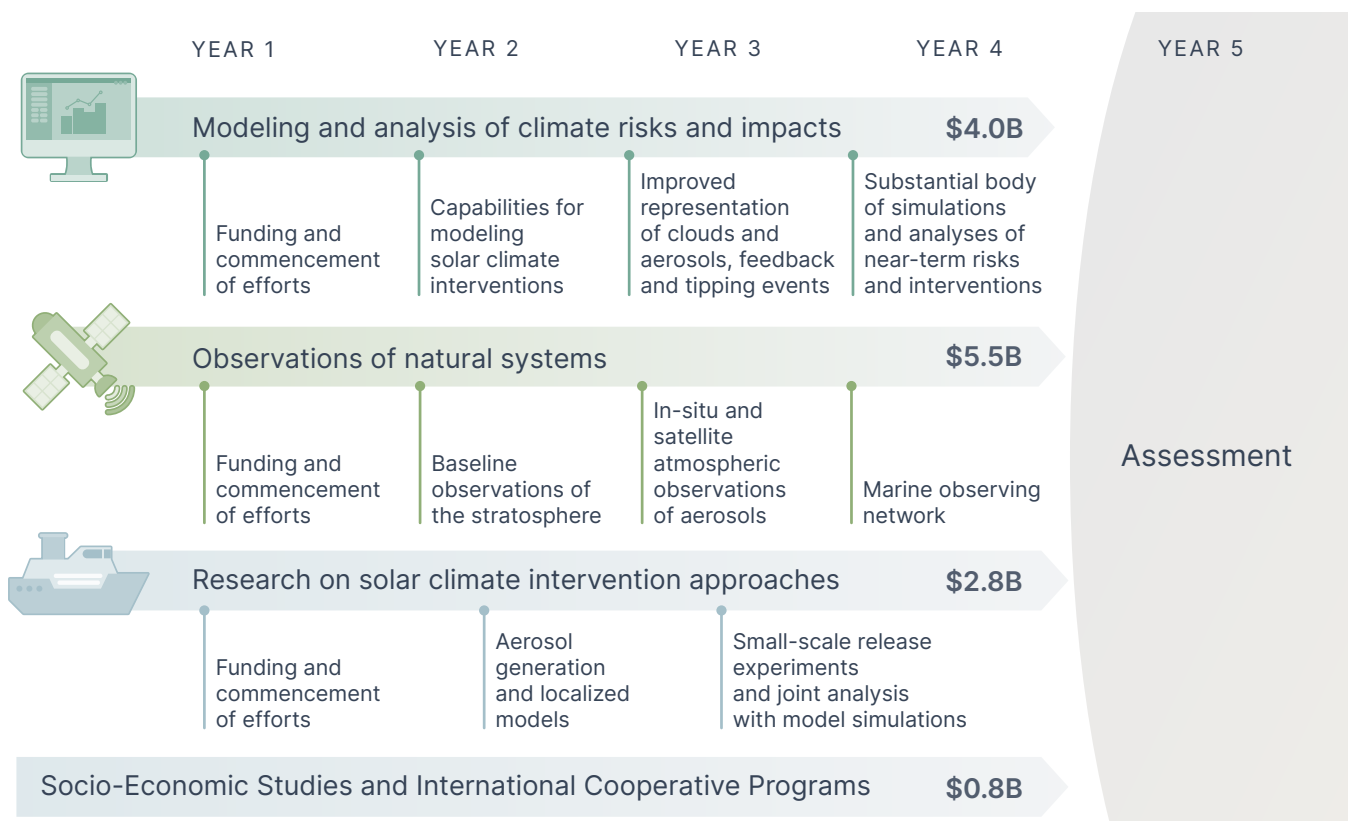
Climate interventions to rapidly remove GHGs or heat energy from the atmosphere could improve safety for the world's people and natural systems in a changing climate. The most rapid approaches—solar climate interventions—leverage natural system processes to increase the reflection of sunlight (or release of longwave radiation) from the atmosphere, by dispersing particles in the upper atmosphere or brightening low marine clouds with sea salt mist.

While startups and other efforts to explore solar climate interventions have emerged, society lacks sufficient information to evaluate their benefits and risks, support decisions about their use or develop mechanisms for monitoring, safety, and governance. This creates an urgent need for robust public research.

U.S. Climate Safety Initiative to Support Research and International Cooperation on Near-Term Climate Risks and Interventions

The United States plays a central role in supporting international environmental science and governance mechanisms. As such, a well-funded and coordinated scientific research effort led by the U.S. could facilitate international participation in research and support effective and equitable decision-making, including for those most affected by climate change. A coordinated U.S. scientific research effort, structured around a 5-year roadmap that includes modeling, observations, and research on climate intervention approaches could improve information on near-term climate risks and deliver a robust scientific assessment of the potential for solar and other promising climate interventions to reduce them.

5-year Research Roadmap to Scientific Assessment



Source: SilverLining

“To bring global temperatures down quickly, the only button we can push—that we know about—is solar climate intervention. There are many uncertainties, which is why scientists should be studying the issue carefully.”

DAVID FAHEY, Co-Chair of the Scientific Assessment Panel of the Montreal Protocol and Director of the Chemical Sciences Laboratory, National Oceanic and Atmospheric Administration